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Analysis and Design of an Insurance Claims Management System

Master's thesis

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MBA

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TALLINNA TEHNIKAÜLIKOOL
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Kindlustusnõuete menetlemise süsteemi analüüs ja kavandamine

Magistritöö

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Author’s declaration of originality

I hereby certify that I am the sole author of this thesis. All the used materials, references to the literature and the work of others have been referred to. This thesis has not been presented for examination anywhere else.

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Abstract

The purpose of this master's thesis is to analyse and design an insurance claims management system that would automate parts of the claims management processes and therefore speed up the handling of claims. The main problem addressed is that manual claims handling processes are costly, time-consuming and of uneven quality.

The research objectives of this master's thesis are:

- Identifying which parts of claims filing and claims management processes are the most time-consuming.
- Proposing a solution that would reduce the time it takes to process one insurance claim by 50%.

In order to achieve the research objectives requirements were collected using design thinking techniques in user research. The author also conducted an analysis of regulations, a comparison and analysis of alternative solutions and the analysis of current claims management processes and proposed a solution.

The outcome of this master's thesis is the concept of a claims management system that performs some of the mandatory claims management actions automatically and proposes a claims decision.

This thesis is written in English and is 141 pages long, including 13 chapters, 24 figures and 24 tables.

Annotatsioon
Kindlustusnõuete menetlemise süsteemi analüüs ja kavandamine

Käesoleva magistritöö eesmärk on analüüsida ja kavandada kindlustusnõuete menetlemise süsteem, mis automatiseeriks osa nõuete haldamise protsessidest ja kiirendaks seega kindlustusnõuete käsitlemist.

Peamine käsitletav probleem on seotud kindlustusnõuete haldamise optimeerimisega. Paljudes Euroopa turul tegutsevates kindlustusseltsides toimub kindlustusnõuete käsitlemine käsitsi, mis on tööjõukulude tõttu aeganõudev ja kallis. Selle tulemusena kulub märkimisväärne osa kindlustuspoliiside müügist saadavast käibest kahjunõuete käsitlemise meeskondade tööjõukuludeks. Manuaalselt läbi viidavad kahjunõuete menetlusprotsessid on kulukad, aeganõudvad ja ebaühtlase kvaliteediga.

Käesoleva magistritöö uurimistöö eesmärgid on järgmised:

- Teha kindlaks, millised osad kindlustuse kahjunõuete esitamise ja nõuete haldamise protsessidest on kõige aeganõudvamad.
- Pakkuda välja lahendus, mis vähendaks ühe kindlustusnõude menetlemise aega vähemalt 50% võrra.

Eesmärkide saavutamiseks viis autor läbi regulatsioonide analüüsi, alternatiivsete lahenduste võrdluse ja analüüsi ning olemasolevate kindlustusnõuete haldamise protsesside analüüsi. Autor kirjeldas uut lahendust läbi protsesside kaardistamise, koostades komponentdiagrammi ning luues disaini prototüübid. Magistritöö ülesehitus järgis topelt teemanti disainimõtlemise raamistiku loogikat.

Magistritöö tulemuseks on kontseptsioon kahjunõuete menetlemise süsteemist, mis võimaldab osasid kahjunõuete haldamise protsesse automatiseerida.

Lõputöö on kirjutatud inglise keeles ning sisaldab teksti 141 leheküljel, 13 peatükki, 24 joonist, 24 tabelit.

List of abbreviations and terms

AI	Artificial Intelligence.
API	Application Programming Interface, a connection that allows systems and computers to communicate with each other.
AS-IS	A visualisation of the current state of the process or decision model.
B2B2C	A business to business to consumer e-commerce model for describing a sales logic.
B2C	A business to consumer sales model
BPMN	Business Process Modeling and Notation - a business process modeling language used for depicting business processes in a diagram [1].
Claim	"An insurance claim is a formal request by a policyholder to an insurance company for coverage or compensation for a covered loss or policy event. The insurance company validates the claim (or denies the claim). If it is approved, the insurance company will issue payment to the insured or an approved interested party on behalf of the insured" [2].
Claim filing	In insurance it means making an official request to the insurance company about an incident that caused a loss in order to get compensated according to the terms of the insurance policy.
Claim frequency	The percentage of the number of insurance policies sold for which the insurance company will receive claims for.
Claims handling	Also referred to as claims processing. Studying the information and evidence related to the claim and making a decision to accept all or a part of it.
Claims settlement Claims management	After a positive claims decision, the process according to which the insurance company pays money to the claimant as compensation for the suffered loss.
Complaint	A written expression of discontent towards an insurance company about a lack of action or a service deficiency.
Dasboard	A type of user interface in the application where relevant information is displayed.

Design thinking	A process of problem solving that encourages improving products, processes and services by focusing on the people the services are created for.
Double Diamond	A design thinking framework by the Design Council.
DMN	Decision Model and Notation – a notation designed for the specification and modeling of business decision logic.
End-customer	The customer of the insurance company – a private person.
EU	European Union.
FISA	Foreign Intelligence Survaillance Act – A United States federal law.
FNOL	First Notice of Loss – reporting an insured incident to the insurance company.
Four eye principle	The requirement that two people approve an action.
GDPR	General Data Protection Regulation by the European Commission in the European Union.
Insurance coverage	The amount of risk that is covered by the insurance policy.
Insurance policy	A document that describes the terms and conditions according to which an individual will be compensated in the event of a claim.
InsurTech	A technologically advanced company disrupting the insurance sector.
ISO	International Organization for Standardization that develops and publishes international standards.
Low-code	A visual approach to developing software.
Mock-up	A full size model of a user interface design.
MVP	Minimum Viable Product – an early version of a product with enough features to attract first customers. It serves the purpose of validating a product idea early in the product development [3].
No-code	An approach to designing software applications that does not require any programming.
OCR	Optical Character Recognition – a technology that recognises text in images or handwriting and converts it into editable text.
RPA	Robotic Process Automation – a technology that allows building software robots that emulate human actions.
SaaS	Software as a Service.
Settling	In insurance it means a positive claims decision – the decision to compensate the customer for the claimed loss.

Single Claim Modal	The screen depicting one claim's details in the Claims Handling SaaS software that the claims handler sees after they have clicked on a claim in the backlog.
TO-BE	A visualisation of the futuret state of the process or decision model.
Travel disruption	Also referred to Travel Journey Disruption – a type of risk covered by travel insurance that covers the losses in some cases in case a delay or a cancellation happens before or during a trip abroad.
UI	User interface.
UX	User experience.
UML	Unified Modeling Language

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1 Introduction

The primary goal of this master's thesis is to analyse and design a claims management system that would be a strong competitor in the field of claims handling software in the European market. The competitive advantage of the software will be the user-centric approach to software design, which will focus on mapping the pains and needs of the claim handlers and suggesting a more effective solution. Within this master's thesis, the author will analyse and design the first scope – a Minimum Viable Product (MVP) – of the Claims Handling Software as a Service (hereinafter the Claims Handling SaaS). The purpose of the Claims Handling SaaS is to automate parts of the travel insurance claims management processes in order to save time and simplify the work of claims handlers. Should the MVP turn out successfully, it will be offered as a service on the European insurance market and developed further. The author will use design thinking as a framework for structuring this master's thesis in order to ensure a user-centric approach that allows the flexibility of being able to approach the analysis and design process in an iterative manner.

Within the master's thesis the author will collect information from claims handlers, end-customers and experts in the insurance field in order to map the current situation from different angles. The claims handlers will help the author map the current state of the claims management processes within the insurance company. The end-customers will provide information about their expectations towards claim filing and the handling thereof.

The author will then collect information about the legislation and regulatory requirements affecting the insurance market participants, which will be taken into consideration when describing the requirements for the Claims Handling SaaS. The author will also conduct an analysis describing the market environment and the competitive solutions pre-existing on the market. The competitor analysis will help the author understand if there is a market gap in the claims process automation software and which functionalities should be covered in the Claims Handling SaaS in order to gain a competitive edge and not lose it later.

Based on the research findings the author will set the strategic goals for Claims Handling SaaS as well as describe the Enterprise Architecture of the future company that would

support its goals and ambitions. On the basis of the user research the author will also describe the current state of the claims filing and the claims management processes as well as decision-making models bringing out the problematic areas based on the feedback of the users. The author will then map the business, functional requirements and software product quality requirements and based on those suggest the improved future processes and decision model logic. The author will then conduct system analysis and suggest an initial architectural vision of the system. Finally, the author will design a prototype of the claims management system.

The master's thesis will analyse and improve two claims processes and the subprocesses:

1. Claim filing process
2. Claim management process and the sub-processes:
    a. Claim information review
    b. Acquiring missing information
    c. Claim decision making
    d. Notifying the claimant of the decision
    e. Closing of the claim

While the prototype user testing and the software development of the Claims Handling SaaS are not within the scope of this master's thesis, the author is planning to continue with these steps as well as the preparations for future scopes, the author will also create a roadmap depicting the future plans regarding the software.

2 Problem description

The problem addressed in this thesis is related to the optimisation of the insurance claims management process.

In many insurance companies in the European market, claims handling is carried out manually, which is time-consuming and expensive due to labour costs. As a result, a significant proportion of the turnover from the sale of insurance policies is spent on the labour costs of claims handling teams. Increasing sales requires investment in either increasing the number of claims handlers or automating processes. Furthermore, the increased stress brought on by an increase in the claim volumes can lead to a decrease in the claim handler's ability to spot details and through that an increase in human error.

In short, the problem is that manual claims handling processes are costly, time-consuming and of uneven quality.

2.1 Background information

In the insurance industry increasing sales always correlates to a rise in claims handling costs as more sold policies mean proportionally more claims submitted by the customers of the insurance company. The claims volume increases faster, the shorter the average length of the insurance policy. As the level of automation in claims handling varies and at least a part of it is always done manually, extra claims handlers need to be hired in order to be able to handle the additional volumes. Scaling up manual claims handling teams in turn reduces profit margins. Additionally, hiring and training new claims handlers takes months.

Considering that single trip travel insurance policies usually last anywhere up to a month and the claims are submitted during or after the trip that the insurance policy covers, it means that a rise in sales volumes will affect the claims volumes around a month later. In general, temporary steep fluctuations in sales numbers affect the company's ability to provide a fast service in case of rising claims numbers and decreased profit in case of lower sales numbers as the labour costs still remain the same despite a decrease in sales. This is potentially dangerous to the financial planning and profitability of the company as well as customer satisfaction rates if the service time increases due to high claims

volumes while the team size does not. In short, the problem is that insurance companies cannot increase sales without having to also increase the headcount and labour costs of the claims handling teams, which in turn will potentially require more layers of management, which in turn increases operational complexity.

2.2 Research objectives

The goal of this master's thesis is to propose and prototype a semi-automated claims processing system for insurance companies selling and handling the claims of travel insurance products – Claims Handling Software as a Service (Claims Handling SaaS from hereinafter).

The practical use of this master's thesis is to prepare the necessary input for developing and launching a new insurance claims handling platform targeted at insurance companies in Estonia and the rest of Europe. The secondary objectives of the thesis include:

- researching the problem areas of insurance claims handling processes,
- researching stakeholder expectations towards claims handling,
- comparing competing alternative solutions,
- collecting business, stakeholder and solution requirements for the solution,
- mapping business processes,
- creating an initial architectural vision,
- creating a design prototype of the solution.

The research objectives of this master's thesis include:

- Identifying which parts of claims submission and claims management processes are the most time-consuming.
- Proposing a solution that would reduce the time it takes to process one insurance claim by 50%.

2.3 Scope and limitations

The scope of this master's thesis includes the first stages of the product development process including end-customer (customer of the insurance company) research, competitor and business environment analysis, legislation and regulation analysis, business analysis, system analysis, basic architectural vision description, high–fidelity prototype and the roadmap for completing the project beyond the scope of this master's thesis.

In order to keep the master's thesis at hand within the required length, the author has decided to cut the scope by limiting the insurance coverage types covered in this master's thesis. The Master's thesis and also the first scope of the system will include travel journey interruption claims handling processes and exclude the claims handling of medical, baggage related and other risks. The author prioritized journey interruption claims handling because according to the interviewed claims handling professionals, handling medical claims requires specific knowledge about the healthcare systems as well as medical knowledge and therefore this topic will be analysed in future scopes. Secondly, travel interruption coverage receives the most claims, 29% and therefore the automation of related processes would provide the most value to the stakeholders [4]. Other types of coverage such as personal effects, hazardous sports, lost luggage or rental car related claim processes can be addressed in future scopes.

The author will base their analysis on the data gathered within the European market, some of the research like expert interviews and service terms & conditions analysis concentrating specifically on the Estonian market. The reason for this is that the automated claims handling service will be launched in the Estonian market first and then in other markets within the European Economic Area.

The reasoning behind why the author did not base this master's thesis on any one insurance company and did not conduct the analysis in cooperation with one is that the kind of information conveyed in this master's thesis is considered a trade secret and it would be valuable to competitors even after a 10-year access restriction. For this reason, the author faced the restriction of having to base this work on the publicly available information and interviews with insurance field professionals who did not wish to be identified.

The author will not propose a final architectural solution within the scope of this master's thesis as it will need to depend heavily on the architecture of the insurance companies who will be the first customers.

2.4 Authors role

The author's role over the course of writing this master's thesis was of the Business Architect. The author gathered requirements from various insurance field specialists and other sources, analysed the collected materials, research results and similar existing solutions on the market. Then the author proceeded to describe the future solution and design a prototype of it.

The author involved the following parties during the writing of this master's thesis:

1. Three claims handling professionals were interviewed to map the claims handling related processes.
2. 61 respondents answered the quantitative survey about travel insurance and claims handling.
3. Two claims handling specialists were involved in the Jobs-to-be-done workshop that the author conducted in order to map the needs of the claims handlers and the requirements for the claims management processes.
4. 8 insurance and claims field specialists as well as 2 claims handling professionals mentioned in point 3 were involved in assessing and rating the desired outcome statements.
5. One Risk management specialist was involved in validating the risks mapped by the author for this master's thesis.

3 Travel insurance and claims

Within the following chapter the author will give an overview of the travel insurance product as well as the importance of insurance claims as a part of an insurance service. The author will also introduce management, core and support processes in insurance and finally introduce the claims processes in more detail. The author conducted extensive research on the field of insurance – Travel insurance in particular, which can be found in Appendixes 18 and 19.

3.1 Travel insurance claims

How travel insurance provides protection is that once an accident has happened that is covered by the insurance policy, the insurance company that issued the policy will reimburse the policyholder for the financial losses. This can happen only after an insurance claim has been filed by the policyholder providing sufficient proof of the financial losses and once the insurance company has approved the claim. What the travel insurance policy provides coverage for and how the claim should be filed is always defined in the Terms and Conditions, Policy document and other accompanying documentation provided by the insurance company [5].

Travel insurance is often sold as a package and can include several different types of coverage. The most common coverages included in travel insurance are trip cancellation or interruption coverage, baggage and personal effects coverage, medical expense coverage, and accidental death or flight accident coverage [6]. Since the start of the global COVID-19 pandemic travel insurance often also includes coverage for pandemic related travel interruptions or medical problems.

According to Investopedia [2] “an insurance claim is a formal request by a policyholder to an insurance company for coverage or compensation for a covered loss or policy event. The insurance company validates the claim (or denies the claim). If it is approved, the insurance company will issue payment to the insured or an approved interested party on behalf of the insured.”

EIOPAs “Consumer Protection Issues in Travel Insurance: A Thematic Review” reports that when it comes to the number of claims denied per type of cover, the highest

percentage of total denied claims is the travel journey with 44%. Denied medical claims make up 29%, denied baggage related claims 16% and "other" type of denied claims 11% of the total denied claims [4]. This can be seen in Figure 1. The high number of denied claims is the reason why the author chose travel insurance's "Journey" cover as the insurance cover type to base this master's thesis on.

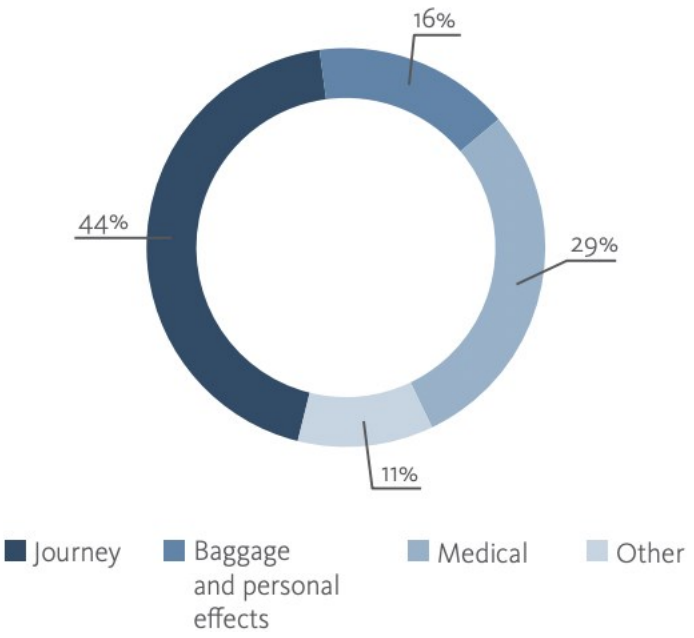

Figure 1. The proportion of denied claims out of the total number of travel insurance-related claims (by EIOPA) [4].

Additionally, according to EIOPAs "Consumer Protection Issues in Travel Insurance: A Thematic Review" the majority of complaints filed, 62%, are about claims handling [4]. While the review does not go into detail about the details of the complaints filed, this percentage is also a strong indicator in the opinion of the author that claims handling needs improvements. Even more so, perhaps with the help of technology, claimants can be guided towards assessing their rights more effectively and therefore filing a lower number of claims that will have to be rejected. That would reduce the workload of claims handlers and likely also lower the rate of dissatisfied claimants.

3.2 Insurance Processes

In order to validate the importance of claims processes in an insurance company the author analysed the processes of Underwriter-type insurance companies and gained an understanding of the high-level process framework used in insurance companies. The process framework was structured according to the process architecture modelling technique presented by La Rosa, M. [7].Such type of companies are also a likely target customer for the Claims Handling SaaS solution being analysed and designed in the scope of this master's thesis. The input for this chapter was collected through interviews from professionals working in the insurance industry.

The Process framework Shown in Figure 2 consists of three high level categories:

1. Management processes,
2. Core processes,
3. Support processes.

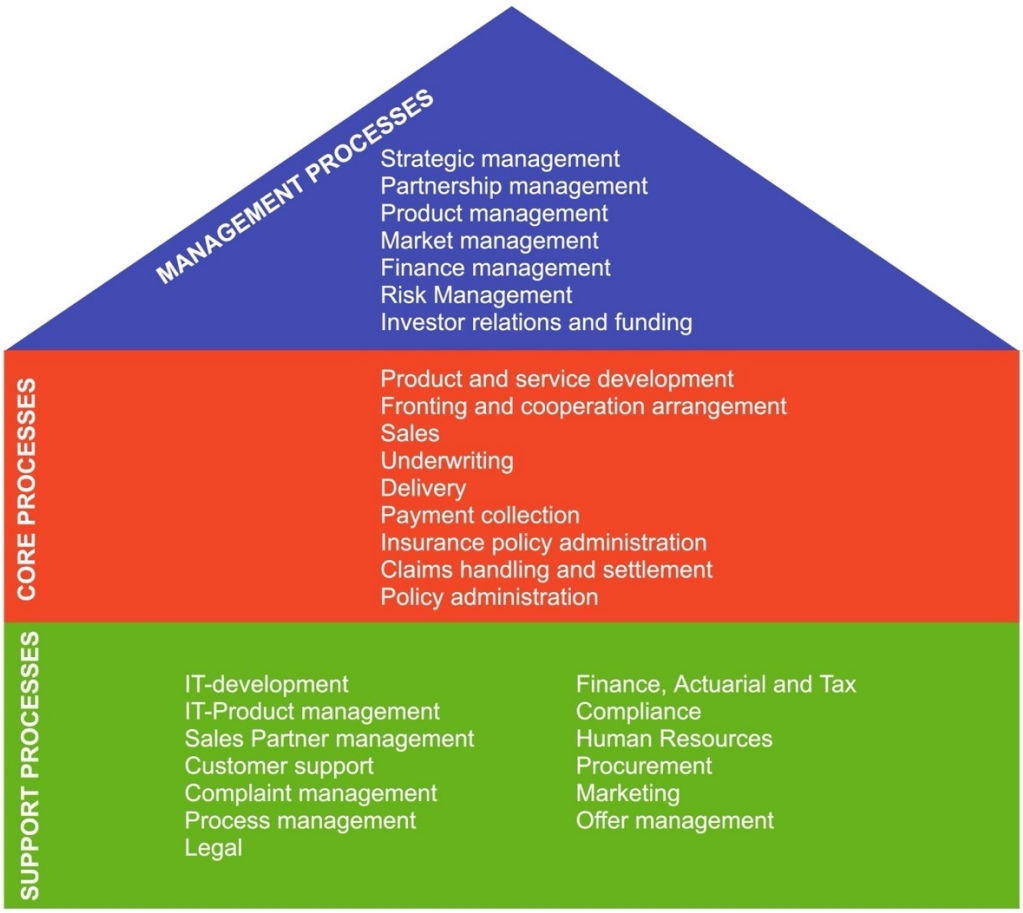

Figure 2. Process framework of an insurance company (by author).

The objective of the management processes is to provide practices, guidelines, rules and direction. The core processes consist of processes where value is generated for the customer of the insurance company (hereinafter "end-customer"). Support processes provide the resources needed in order to successfully execute the other processes.

3.2.1 Management processes

An insurance company's Management processes include strategic management which provides high level and long-term goals to achieve success as well as Product Management which provides practices and gives direction regarding the insurance company's future insurance products. Partnership management provides rules and guidance in sales (a core process), underwriting partner selection (a core process) and the contractual agreements thereof. Finance management includes practices, guidelines and rules for insurance accounting, general accounting as well as budgeting and reinsurance. Compliance provides rules and guidance regarding laws and regulations that the insurance company must abide by in order to retain the license in all of the countries where the company operates. Risk management includes guidance, rules and practice in order to recognise, assess, manage and mitigate all possible regulatory, financial, operational and technological risks that could threaten the company's present and future.

3.2.2 Core processes

The insurance company's core processes shown in Table 1 cover the whole value chain. The Porter's Value Chain Figure can be viewed in Appendix 19. Product and Service development, as well as cooperation arrangements, are aimed at developing the insurance company's product portfolio. Product and Service development includes the process of creating new insurance products whereas cooperation is aimed at reaching an agreement with another insurance company in order to sell insurance products where the cover is partially or fully provided by the partner and the product is sold by the insurance company. Sales are also among core processes – this can be selling to the end consumer through third party sales partners (hereinafter B2B2C) and directly to the end consumer (hereinafter B2C). The company's core processes also include underwriting in order to provide insurance cover to the end-customer of the insurance company as well as the delivery of the insurance policy to the end-customer.

Table 1. The insurance company's core processes, their stakeholders and KPIs (by author).

Core processes	**Stakeholders**	**Examples of metrics used**
Product and service development	End-customers, Sales partners	Satisfying end-customer needs (measured in NPS), earning a profit (measured in €)
Fronting and cooperation arrangement	End-Customers, Insurance companies, Sales partners	Satisfying end-customer needs (measured in NPS), earning a profit (measured in €)
Sales	End-Customers, Insurance companies, Product managers	Sales growth (measured in €), Number of active sales partners (sales revenue by sales partner), Lead conversion ratio (measured in %)
Underwriting	End-Customers, Risk manager	Number of policies sold (measured in pieces), Predicted loss-ratio (measured in % and €)
Delivery	End-Customers, Product management	Number of unsuccessful deliveries (goal: 0, SLA: 0,01%)
Payment collection	End-Customers, the insurance company accounting, payment service providers	Number of successful payments (measured in %) End-Customer satisfaction (NPS)
Insurance policy administration	End-Customers, Customer support	Number of support inquiries and requests (Goal: to lower)
Claims handling and settlement	End-Customer, claims handlers, Claims manager, Risk manager, Underwriter	Time between filing the claim and receiving the decision (Goal: lower) Claim decision accuracy (measured in mistakes made)

As the final point the core processes also include the subject of this master's thesis – claims handling and settlement. The claims handling and settlement processes provide the end-customer with the means to exercise the insurance cover they have purchased by reimbursing or otherwise eliminating the damages to the end-customer. The policy administration process allows for the end-customer or the company to make changes to the issued policy. Payment collection and disbursement allows the company to collect

money for the services rendered. Asset management aims to provide solvency for liabilities.

3.2.3 Support processes

An insurance company's support processes include IT-management, which provides IT-development services as well as IT Product Management which is responsible for managing all IT-development projects making sure that what is developed is valuable for the company and delivered within the time constraints and budget. IT-management and IT-Product Management take care of the IT development and maintenance efforts which result in a functioning digital platform enabling for all the core processes to be performed in a digital environment. Sales Partner management takes care of managing the performance of current sales partners as well as finding enough new ones.

3.3 Claims process

In this chapter the author will explain the process steps and different stages of a typical claims management process. As mentioned in the previous chapter, the claims handling and settlement process (hereinafter "claims management process") is one of the core processes in insurance and also the process the author will focus on in the scope of this master's thesis.

According to Price Waterhouse Coopers [8], the claims management process can be divided into:

1. First notice of loss
2. Claims management
3. Claims assessment
4. Claims settlement

According to IRMI [9] the same process stages are instead called as follows:

1. Claim reporting
2. Claim investigation
3. Claim evaluation (including claim reserving and valuation)
4. Claim resolution and settlement

The author decided to combine the stages suggested by IRMI and PWC as the "Claims settlement" stage does not necessarily include rejection or the step of closing of the claim, which is an important part of the process. IRMI's suggestion "Claims resolution and settlement" is in the opinion of the author a better wording to describe that part of the process. Therefore, the final process stages depicted in Figure 3 are as follows:

Claim reporting - First Notice of Loss – In this part of the process the policyholder fills out a web-based form in order to notify the insurer of a loss that has incurred. It includes describing the incident and including all the necessary documents as proof.

Claims management – in this stage the claim handlers review the information and documents submitted with the first notice of loss, acquire missing information and prepare to make a claims decision.

Claim assessment – This stage includes only the decision-making process regarding whether to settle, reject or close the claim and in case of settling, how shall be paid out as the settlement payout.

Claims resolution and settlement - In this stage the end-customer (also referred to as "claimant" in the context of claims) is notified of the claims decision, in case of settlement the claim payout shall be made to the claimant and the claim will be closed.

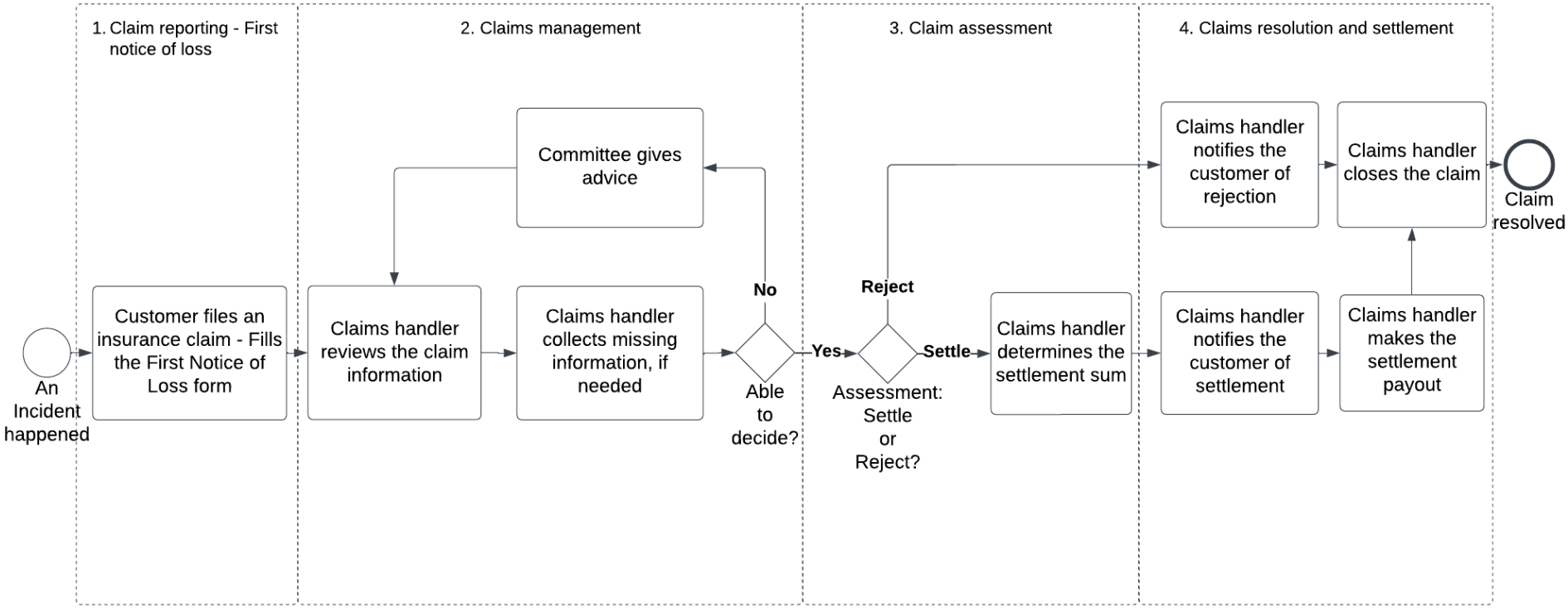

Figure 3. Simplified claims management process including the step of the claimant (customer of the insurance company) filing the claim (by author).

The author will continue the chapter by explaining each process stage separately

3.3.1 Reporting a claim

In order for the policyholder to receive compensation for their loss, all claims first have to be reported to the insurance company. Filing an insurance claim, which is sometimes also called the first notice of loss (FNOL) is the first step in the formal claims process that the policyholder makes to their insurance company following loss or damage of an insured asset [10]. According to IRMIs Claims reporting best practices [11]: "Beyond the importance of quick reporting, the other critical aspect of reporting is the thoroughness and accuracy of what are the basics of what, where, when, how, and who. These essential basics and some of the detail that is sought in the investigatory process enable an early, if preliminary, answer to the question of whether insurance applies, or, in the absence of insurance, a legal obligation has been created typically as a result of some form of negligence causing damages".

The aim of the claim filing process is to start the claims processes in order to finally compensate the policyholder for the losses suffered. It starts off "with a process of ensuring that the details provided at the onset of the policy are still correct at the time of the claim" [12]. The first notice of loss usually requires the claimant (the person who filed the claim) to provide the following: policy number, date and time of incident, location of the incident, police report number, and personal account of how the incident happened [10].

3.3.2 Claims investigation and assessment

According to IRMI[13]: "Central to the claim management process is the investigatory efforts that are focused on gathering the evidence, formally and informally, that enables the analysis necessary to help determine such critical issues as the following" [13]:

- If the insurance coverage applies to described incident
- Who is covered by the policy?
- What is the value of the claim?
- The additional information and documents needed in order to address the claim
- The information that is needed in order to close the claim

A crucial part of the investigation and “a core responsibility of a claim professional” is to file the gathered documentation, which is related to the claim investigation, with great care and accuracy. Due to this claim investigations tend to consume a lot of time [13].

3.3.3 Claim resolution and settlement

The claim assessment and investigation are followed by a decision on whether the claim will be settled or rejected. It is the outcome of the previous stages having been performed with accuracy and diligence. The basis of a good and accurate resolution is the quality of the information that is used to cover the following points according to IRMI [9]:

- Was the claim reported with information that matched the results of the investigation and was it correctly filed?
- Was the investigation conducted thoroughly enough to reach a conclusion that is based on facts, and would it be possible for the parties to mutually agree upon the conclusion?

The claim will be resolved by either the claimant withdrawing the claim, the claim being rejected because the claimed loss is not covered by the policy or the Terms and Conditions or the Claim being settled, and the claimed amount being fully or fully or partially paid out or the loss being compensated in other ways such as replacing the items.

4 Methodology

In the following chapters the author will give an overview of the methodologies used in the empirical chapters of this master's thesis. In this chapter the author will introduce the theoretical descriptions of the analysis methodologies used in the master's thesis while the practical use of the methodologies will be covered partly in the chapters 5 and onwards. The author used the double diamond design thinking framework in order to structure the master's thesis and the sequence of work. Within the double diamond frame, the business analysis, system analysis and design thinking methodologies are used intermittently. The design thinking framework was chosen as a structural basis for two reasons. The first was because the double diamond convergent and divergent thinking approach would encourage the author to explore the problem area more widely and only then take focused action to analyse the information. The following stage, again, would encourage exploring a wider range of solutions after which, the best final solution is chosen. The second reason was that design thinking encourages an iterative approach enabling for the author to go back to the previous stages to explore more or correct assumptions that were proven incorrect. While due to the scope restrictions of this master's thesis not many design thinking methods were used, the framework and mindset of design thinking guided the whole process.

The empirical part of the master's thesis begins with the "Discover" phase with the validation of the problem that the author set out to solve in this master's thesis as well as collecting relevant information and requirements around the subject takes place. Methodologies were used were qualitative and quantitative research as well as the Jobs-to-be-done design thinking technique. The second phase is "Define" where the author will synthesise, analyse and structure the information collected in the previous chapters and use the outcome in preparation for the following "Develop" phase. Methodologies such as stakeholder analysis, SWOT analysis, TOWS analysis and the Balanced scorecard were used in this stage. The author also considers the Motivation, Strategy and Capability planning parts of the ArchiMate model to belong under the define phase even though the Business analysis chapter is marked under the "Develop" phase in the list of methodologies.

In the “Develop” phase the author will construct new processes; decision making logic and suggest an architecture vision of the future solution. For this the author will use various business analysis methods such as business process analysis with Business Process Modeling and Notation as well as Decision Model and Notation. The author will define the business, functional and non-functional requirements and model the future solution as a component diagram. Finally, in the “Deliver” phase the author will describe the project roadmap and future actions and scopes.

4.1 Design thinking

In the following chapter the author will give an overview of the approach to product development and will compare different methods choosing one framework that best serves the goal of this master’s thesis. The author will also propose a modified design thinking framework that will support achieving the goals of this master’s thesis.

Design thinking “is an approach that promotes the understanding of customer needs considering what is technical and economic feasible” [14]. While it is a necessary practise to collect requirements from the stakeholders, there is always a risk that the input is not complete. The author chose to use design thinking methodologies to compliment the rest of the methodologies used in this master’s thesis as in the author’s experience design thinking offers a wide range of very detailed approaches to collecting user feedback, conducting user analysis and validating the findings. This helps first of all, to get better input, but also potentially validate the input to end up with a better solution in the long run.

The aim of using techniques is to find out what is desirable to the customers and users as well as what is possible to build through technology while being beneficial to the business. Through this knowledge it is possible to design new products, services and IT solutions that benefit all the stakeholders – the creators of the products and their customers alike. In general, all design thinking models go through similar stages starting from the identification of the problem through customer feedback, an exploration of ideas to solve the problem and the development of solutions which are then validated with the end-customers. The process is iterative, and the stages are often done in repetitive cycles as new information emerges to achieve the outcome that provides the biggest improvement. It is noteworthy that often uses a visual approach to introduce concepts to

the customers and to obtain information from them. This approach makes development ideas more tangible and easily understood providing higher customer engagement and more accurate feedback [14]. Design thinking "will remove or at least mitigate the uncertainty associated with the definition and understanding of the variability of the content of the project, will reveal the bottlenecks of business processes, will reveal the users pain" [15].

A common approach in all design thinking methods is that divergent and convergent thinking is applied as the team works through the different stages of the method. This can be viewed in Figure 4.

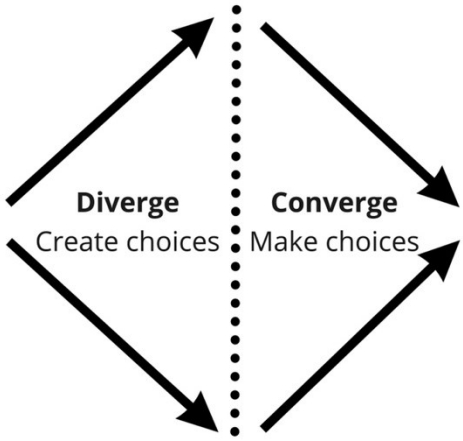

Figure 4. Divergent and Convergent thinking by IDEO [16] visualised by the author.

Divergent thinking encourages the team to look at the problem area and the possible solutions at a wider angle making it possible to identify the root cause of issues or a better, more accurately targeted solution. Divergent thinking implies that through research and exploration of possible information, approaches or solutions all possible ideas are collected and documented without disregarding any. Divergent thinking excels when a wide enough area is discovered in the convergent thinking phase. After each divergent thinking phase convergent thinking is applied and the selection of approaches and solutions are narrowed down to the ones with the most potential [17]

4.1.1 Choice of method

In order to make a choice regarding which design thinking framework to use, the Author selected methods brought out during the studies, methods mentioned by Zancul, E., et al. in [18] as well as methods the author has practised as a part of their work.

The selected methods are brought out in Table 2. The framework used to compare the methodologies is one that was suggested by Zancul, E., et al. [18] as a part of the conference paper. The Author opted, however, to use a different selection of Design thinking methods as the methodologies are more commonly used in the Estonian service design projects and potentially suitable for software development projects in particular.

Table 2. Comparative framework of models of process [18] according to different authors (based on IDEO [19], Stanford d.School[20], Lewrick, Link & Leifer [21], Google Design Sprint [22], UK Design Council [23]).

Model	**Stages of innovation process**							
	Needs Finding		**Concept Generation**			**Concept validation**		**Concept development**
IDEO	Inspiration		Ideation			Implementation		
d.School	Empathize		Define	Ideation		Prototype	Test	-
Google Design Sprint	Understand		Define	Sketch	Decide	Prototype	Validate	-
Lewrick, M., et al.	Understand	Observe	Define Point of View	Ideate		Prototype	Test	-
UK Design Council	Discover		Define	Develop			Deliver	

The author decided to use the same stages as suggested by Zancul, E., et al. [18] are the following:

1. **Needs finding** - includes mainly divergent thinking phases across different methods. The activities conducted during this stage are “focused in the users and their context, trying to deeply understand their needs and desires” [18].

2. **Concept Generation** - can include both divergent and convergent thinking. First, on the convergent approach side it concentrates on synthesizing the gathered information and learnings and turning them into a more focused and defined problem description. After this the process turns divergent again where ideas to solve the previously defined problem are generated in abundance and (returning to convergence) the more promising ones are chosen. This is the first phase of the solution creation [18].
3. **Concept validation** - this phase includes the creation of prototypes, that solve the previously defined problems as well as testing and validation of the said prototypes. The goal of the prototypes is to test hypothesis and get feedback from the customers and it is iterative by nature, which means that new and better prototypes should be developed as feedback is taken on board. Since the time and effort required to build a prototype are significantly lower than that of software development, this phase paired with testing or validating allow the team to fail quickly and cheaply until the right solution is found. Prototyping is considered divergent thinking and testing or validating convergent[18].
4. **Concept development** - once concepts and prototypes have been tested and considered valid, they can be implemented. This means building the final product with the help of professionals from other parts of the company and launching it to the market [18].

In the "Needs finding" phase all of "the models have a common background as they are organized in stages that encompass similar sort of activities that drives the innovation process." The biggest differences between the methods occur in the later stage of the process. Some of the methods "describe application until the prototype and test activities", others also address the implementation and first contact with the market [18].

As all of the compared methods are relatively equal in scope and approaches, the author has determined that the method chosen for use in this master's thesis must meet the following requirements also depicted in Table 3:

1. There must not be a time restriction for the time frame during which the method can be used. The reason for this requirement is the nature and time frame in which the author plans to write this master's thesis.
2. The method must also cover the building (or in other words implementation) of the final product. The reason for this is that the author aims for this system to be

developed on the basis of the outcome of this master's thesis. In the development phase the author intends to use agile software development and design thinking methodologies intermittently to assure a human-centric approach.

3. Case studies, methodology descriptions and learning resources must be readily available.

Table 3. A comparison of the design methods by 3 criteria set by the author based on IDEO [19], Stanford d.School [20], Lewrick, Link & Leifer [21], Google Design Sprint [22], UK Design Council [23] (by author).

model / Criteria	No time restrictions	Must cover implementation	Resource availability	Verdict
IDEO	Suitable	Suitable with shortcomings	Not suitable	Not suitable
d.School	Suitable	Not suitable	Suitable	Not suitable
Google Design Sprint	Not suitable	Not suitable	Suitable	Not suitable
Lewrick, M., et al.	Suitable	Not suitable	Suitable	Not suitable
Design Council	Suitable	Suitable with shortcomings	Suitable	Suitable

While analysing the different models the author found that while all of the other models do not suggest a time limit to the process, Google Design Sprint does so - 1 to 5 days [22]. This makes the model difficult to use for the purpose of the master's thesis and the author decided to therefore disqualify the model for this reason.

Regarding the last phases of the models, which drive the product towards being launched to the marketplace, the author found the same as Zancul, E., et al. [18] that the last, in particular the implementation phase of the models was covered in a vague manner offering very little guidance especially regarding transitioning into Software Development. While 3 out of the 5 models offered no tangible implementation guidance, stopping at the prototype testing and validation phase, the IDEO and Design Councils models offered vague guidance. As brought out in Table 3, 3 out of the 5 models were disqualified due to this.

Regarding the availability of academic articles and learning resources, the author decided to disqualify IDEO as most of the resources available covered projects that did not include software development. For assessing the availability of resources, the Author used Google Scholar, Google and ResearchGate search engines as well as the academic paper "Integrated in Agile Software Development: A Systematic Literature Review" by Pereira, J. C., et al. [14] and "How has design thinking being used and integrated into software development activities? A systematic mapping" by Parizi, R. et al. [24].

Based on this, the author chose the Design Council Double Diamond framework, which fulfils all relevant requirements.

4.1.2 Design Councils Double Diamond framework

The double diamond design process was developed by the Design Council in 2005 and it has become widely used since. It was developed on the basis of "an in-depth study of eleven global brands and the methods they use was conducted in 2007" [25].

The double diamond method was created in order to simplify and visualize the design thinking process [25]. The model consists of two diamonds as shown in Figure 5, which "represent a process of exploring an issue more widely or deeply (divergent thinking) and then taking focused action (convergent thinking)". The two diamonds in turn are divided into four phases: Discover, Define, Develop and Deliver [23].

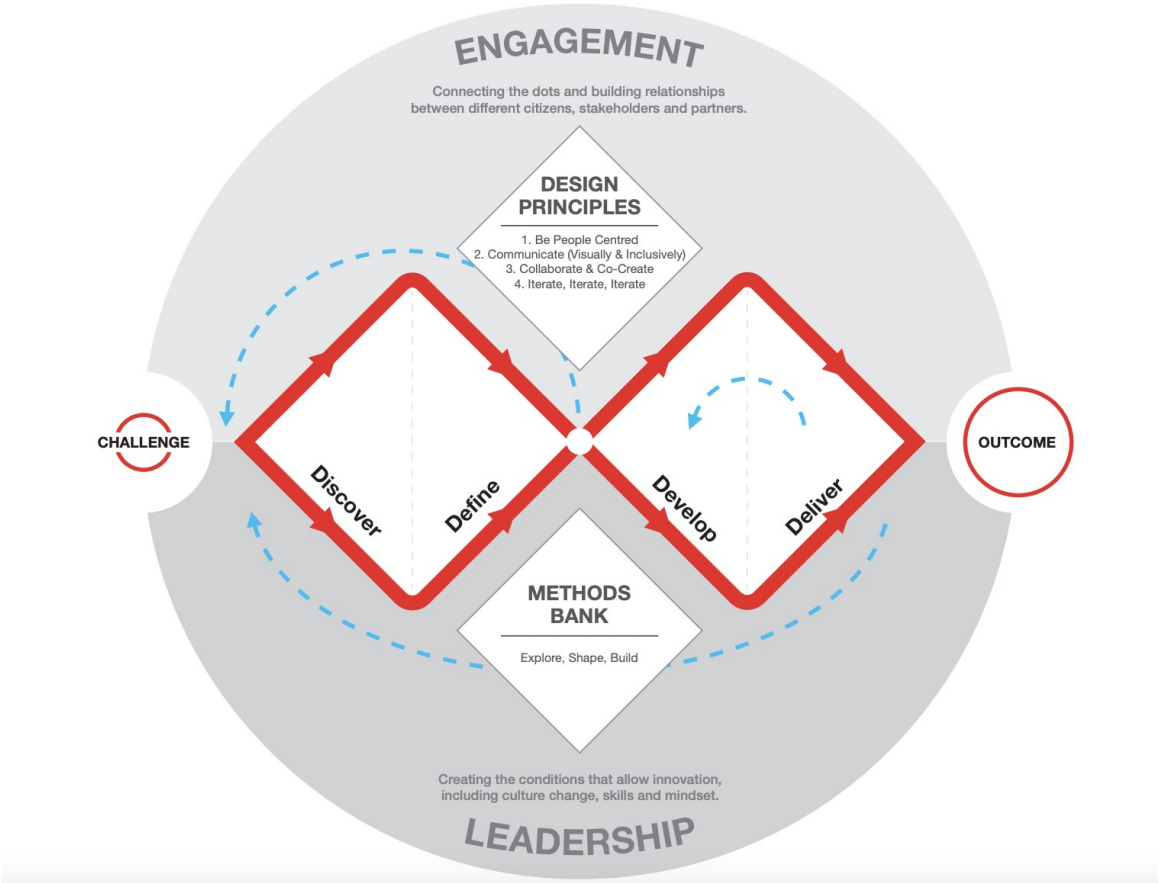

Figure 5. Design Councils Innovation Framework, the Double Diamond design process [23] (by the Design Council).

According to the Design Council [23] the first diamond concentrates on gathering information and understanding it. By the end of the first diamond a problem should be defined. The phases in the first diamond are:

- **Discover** - This is a divergent phase whereas much information is gathered from the parties involved as possible. It involves spending time interviewing, observing and gathering both qualitative and quantitative data. It involves speaking to and spending time with customers who are affected by the issues.
- **Define -** This is a convergent phase where the information gathered in the previous phase is synthesised. This information is used to define the problem which in future phases will be solved.

The Design Council [23] describes the second diamond as phases where the problem that was defined at the end of the previous phase will find a solution and this solution will be implemented. The second diamonds phases are as follows:

- **Develop** - It is a divergent phase where based on the information gathered in the previous phases possible solutions will be devised.
- **Deliver** - It is a convergent phase where out of all the solutions from the Develop phase the best ones are selected and based on feedback from small-scale testing the best ones are improved. By the end of this phase a solution ready to be delivered should emerge.

4.1.3 Methods used

The author will now introduce and define the following methods used in this master's thesis in the chapters ahead. The Author has decided to structure this master's thesis according to the Double Diamond model, but to use both design thinking and Business Analyses in order to reach the goal of this master's thesis. As seen in Figure 6 below the author has modified the Double Diamond design process by adding Business analysis methods into each of the stages and Agile Software Development techniques as the next step after the Deliver phase. The colours used in Figure 6 are illustrative and serve the purpose of increasing readability.

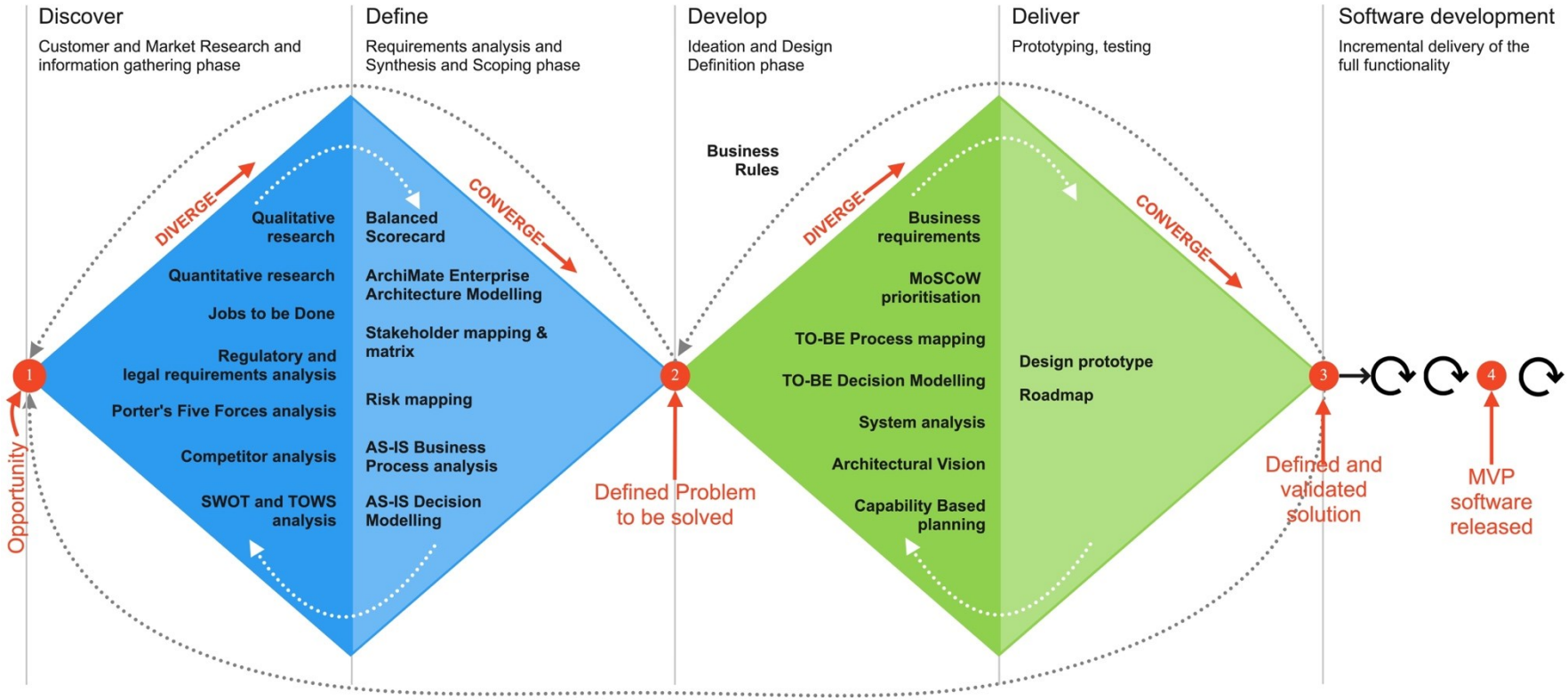

Figure 6. The modified double diamond design thinking model (by the author).

Within this master's thesis the author will concentrate on the Discover, Define and Develop phases. Within the deliver phase the author will construct a prototype of the solution and convey the rest of the activities that will take place within the Deliver phase, but out of the scope of this master's thesis as an implementation roadmap.

4.2 Discover

The purpose of the Discover phase is from one side to understand the work processes and the biggest challenges of the claim handlers in their regular work processes, but also to understand the expectations of the end-customers when it comes to the claims handling of Travel Insurance. Due to the highly regulated nature of the Insurance industry, the Discover phase also includes gathering and mapping legal and regulatory information, business environment information and competitor information.

4.2.1 Explorative interview with claims handlers

The explorative interview is a design thinking research method. The goal of the explorative interview method is to obtain an understanding of the user and the needs they may not even be able to name and "to learn something about the everyday life of the people for whom we are creating a solution" [21].

The group of interviewees is usually not larger than 1-2 people and the interview takes up to 120 minutes. In the interviews the participants are asked to describe their work and the work processes in detail describing the tools as well as the practices used there. The author used the initial claims handler interviews as a basis to prepare the Jobs to be Done workshops as well as mapping and validating the AS-IS processes.

The questionnaire which was used for the interviews was created by the author and can be found in Appendix 2. Due to the highly classified nature of all claims related information, the author was unable to reveal and reference the full information from the discussions. The author will preserve the recordings of the interviews but will not transcribe them or include them in this master's thesis due to the fact that that the interviewees wish to remain anonymous and their persons and the companies they reference may be recognisable in the interviews. The interviewees can be described as shown in Table 4

Table 4. The list of participants who took part in the user research activities conducted by the author describing their current professional roles and the research activities they were involved in (by author).

Participants	**Role and experience**	**Involved in research activities**
Participant 1	Claims handler	Claims handler interview, Jobs-to-be-done workshop, Desired outcomes prioritisation
Participant 2	Claims handler	Claims handler interview, Desired outcomes prioritisation
Participant 3	Former Claims handler (changed jobs less than 1 year ago)	Jobs-to-be-done workshop, Desired outcomes prioritisation
Participant 4	Former Claims handler (changed jobs 10 years ago), currently still working in the insurance field	Claims handler interview, Jobs-to-be-done workshop
Participant 5	Former Claims handler (changed jobs 1 year ago), currently still working in the insurance field	Claims handler interview, Desired outcomes prioritisation
Participant 6	Claims handler	Desired outcomes prioritisation
Participant 7	Claims handler	Desired outcomes prioritisation
Participant 8	Claims handler	Desired outcomes prioritisation
Participant 9	Former Claims handler (changed jobs 1 year ago)	Desired outcomes prioritisation
Participant 10	Former Digital Process specialist in the insurance field	Desired outcomes prioritisation
Participant 11	Digital Process specialist in the insurance field	Desired outcomes prioritisation

All the claim handlers who participated in the research activities are considered professionals in the field. All have accumulated at least over 6 months of professional experience in the field, however, most have over 5 years of experience.

4.2.2 Quantitative user research

Quantitative research is used "to test theories about people's attitudes and behaviours based on numerical and statistical evidence" [26]. The author chose the Online survey method as in this case it allows access to a larger group of respondents and enables the author to get an overview of the experiences that the end-users of the travel insurance products have obtained. The author prepared a list of questions that were designed to obtain information about the respondents' experience with travel insurance as well as general opinions and expectations on claims handling as well as their demographic and geographic information. The survey was aimed at the respondents who have used travel insurance. The results of the survey will be considered when designing the Claims Handling SaaS as the experience of the policyholders filing a claim is critical to the success of the software.

The author prepared the survey in Estonian and English and received altogether 61 responses. According to Budiu, R., et al. a minimum of 40 respondents is needed for the results to be relevant in quantitative studies in usability testing [27]. A minimum amount of 30 is stated by the Interaction Design Foundation [26]. The questionnaire assembled can be found in Appendix 2.

4.2.3 Jobs-to-be-done

Jobs to be done is a design thinking method by Clayton Christensen. "Jobs-to-be-Done Theory provides a framework for (i) categorizing, defining, capturing, and organizing all your customer's needs, and (ii) tying customer defined performance metrics (in the form of desired outcome statements) to the job-to-be-done" [28]. The framework brings forward the types of needs that a user may have that allow for the researcher to get a deep understanding of what the user is truly trying to achieve. Jobs-to-be-done first introduces the core functional job, which is essentially the goal that the user is trying to achieve. Next come the desired outcomes, which are connected to the core functional job and are simply put actions that must be done for the core functional job to be successful. These are the two stages that the author decided to use as the desired outcome statements proved to be a clear and understandable way to map and prioritise customer requirements. Tony Ulwick refers to these stages as phase I "Understand your Customer's Job to be Done" [28]. The next phases will be done in the future as a part of the go-to-market strategy.

As suggested by Tony Ulwick [28], the author first identified the core job executor, then with the help of the core job executor defined the Job-to-be-done. Then through a workshop the job executor's desired outcomes were uncovered.

The Jobs to be Done workshop was conducted in a face-to-face interview form on 2 occasions. The first workshop took place with two claims handling professionals and the second workshop with one. During the workshop the claims handlers chose the sentence "Deciding whether the claim settlement should be paid out or not" to explain what is the core functional job-to-be-done that they aim to complete every day as a claims handler. The interviewees then created a job map of all the actions they take, the information they accumulate and the decisions they make in order to succeed at their job. The workshop was prepared and moderated by the author using the digital canvas tool Miro [28].

After completing the two workshops the author then reworded all the information gathered into the format of "object of control + contextual clarifier". For example, the object of control could be "validate that the claim is not fraudulent ", the contextual clarifier "based on the claimant's prior history". This makes up the sentence "Validate that the claim is not fraudulent based of the claimant's prior history", which describes one of the actions that the claims handlers must take in order to complete the Job to be Done [28].

After wording all the objects of control and contextual clarifiers the author determined the metrics that should be influenced and the direction towards these metrics should be influenced to. Meaning that the author added two more parts of sentence in front of the object of control in order to complete each desired outcome. For example, the author added "Create" as the direction and "Capability" as the metric making up the sentence "Create Capability to validate that the claim is not fraudulent based on the claimant's prior history". The author did this with all 85 desired outcome statements. The author then asked 2 insurance professionals and 8 claims handlers to assess on a scale of 1-10 how satisfied they are with the current way [28]. The author then calculated the opportunity score using Strategyn's Opportunity score formula "Opportunity score = importance + max(importance – satisfaction, 0)" [29].

4.2.4 Direct and indirect competitor analysis

The author collected potential candidates for direct and indirect competitor research by asking for recommendations from interviewed claims handling specialists for claims handling software they have either heard of or used. Additionally, the author conducted searches via Google using the search terms such as “claims processing SaaS EU AI”, “claims management SaaS EU AI”, “claims processing software automation”, “claims management software automation”, “claims processing software automation”, “claims processing software comparison EU” and similar. The author came across a wide selection of claims handling software and made the decision to favour those that came as recommendations from claims handling professionals, those that were in headquartered in the EU, EEA or Switzerland for GDPR compliance reasons and out of those favoured service providers that had received reviews of 4,6 stars out of 5 or higher as reviews. The author also included one service provider that had received 4,7 stars as a review.

The direct competitors were researched using the information that was publicly available about them – mostly information on comparison websites, company profile websites and their own company websites. In one case the author was able to listen to a video introduction about the company – Tautona. The information from the above-mentioned resources was extracted and recorded in the form of a general company information table and a feature comparison table as suggested by HubSpot among one of the templates provided [29].

The author chose a selection of different features and functionalities that were extracted from the previously done discovery exercised such as claims handler interviews, jobs to be done, regulation analysis and so on. Below in Table 5 is the example table of features, functionalities and capabilities mapping that the author created for the feature comparison. The features, functionalities and capabilities are paired with the source where each feature or functionality requirement is derived from. For ease of navigation the Features, functionalities and capabilities are divided into categories.

Table 5. A sample list of requirements that was used in the feature comparison paired with the source where each feature, functionality of capability is derived from. For ease of navigation the list is divided into general categories (by author).

Category	Features, Functionalities and Capabilities	Source
General	Access control	GDPR - access to end-customers data ISO 27001
General	Business Process Management use	Functionality that many competitors share
Compliance	Cloud servers located in the EU or data encrypted with the Key held by a trusted party in the EU	Schrems II, EIOPA Guidelines on outsourcing to cloud service providers
Claim processing	Configurable claim management processes	Jobs to be Done
Claim processing	Capability to process Terms and Conditions information	Claim handler interviews, Jobs to be Done
Fraud	Capability to validate that the claim is not fraudulent	Claim handler interviews, Jobs to be Done
Customer Satisfaction	Capability to check end-customers satisfaction after claim decision	Claim handler interviews, Jobs to be Done

The author then compared all the direct competitors by researching their capabilities and support for the listed features and functionalities. In many cases it was impossible to determine whether the competitor offers a specific functionality or not, in which case the author marked the cell with “N/A”. In case the functionality was offered the word “Yes” was used in the cell. In case a functionality was explicitly not supported, “No” was used. Through this comparison the author aimed to identify a market gap in functionalities that did not have strong competitors on the market yet are important to the users. Based on this information, the author curated the scope and functionalities of the MVP to full that market gap in order to be a strong competitor on the market.

4.2.5 Porter's Five Forces

“Porter's Five Forces is a business analysis model that helps to explain why various industries are able to sustain different levels of profitability” [30]. It was first published in 1980 and is still popular for analysing the industry structure of a company as well as its corporate strategy the industry structure of a company as well as its corporate strategy.

“Porter identified five undeniable forces that play a part in shaping every market and industry in the world, with some caveats. The five forces are frequently used to measure competition intensity, attractiveness, and profitability of an industry or market” [30].

Porter's five forces are according to Investopedia [30] are:

1. **Competition in the industry** - describes the number of competitors on the market which would be able to damage a company’s chances of success - the more competitors and the more similar products, the lesser is the company’s power. When the competition is scarce the company has a higher power to raise prices and get higher profits.
2. **Potential of new entrants into the industry** - describes the amount of time and resources it would take a competitor to enter the market and offer competition by weakening an existing company’s position. An industry with high entrance barriers makes it difficult for new competitors to start challenging the existing established companies, which gives an existing company the upper hand in charging higher prices and setting the terms of the deals.
3. **Power of suppliers** - describes the power and leverage, that suppliers have in influencing the prices by raising the prices of inputs. It depends on how unique the input is and how many suppliers offer it - the fewer suppliers the more the input depends on these suppliers without a possibility to switch to another, the more power the suppliers must raise prices. When there are many suppliers and switching is not a big cost then the company can keep prices lower and profit margins higher.
4. **Power of customers** - describes the power that the customers must affect the prices. This depends on how many customers a company serves and what is the importance of each. A smaller client base gives more power to each individual client and therefore also more chances of being able to influence the prices therefore lowering the company’s profits.
5. **Threat of substitute products** - describes how many products exist in the market that could substitute the products or services the company offers. The fewer substitutes that could replace the company’s products the more power the company will have to raise prices and in negotiating favourable terms.

Understanding Porter's Five Forces helped the author to adjust their business strategy and potentially increase earnings by using how the Five Forces affect the market to their own

advantage. Based on the results of the analysis the author made a choice of strategic approach, which is especially important regarding entering the market, as the Claims Handling SaaS is launched.

4.3 Define

The goal of the Define phase is to understand the customers, define their expectations, the requirements and define the challenges that this IT system will solve. In the case of this master's thesis this means both the insurance companies as well as their customers who consume insurance. The author will explain in this chapter how the following methodology will help in achieving that.

4.3.1 Stakeholder analysis

As a definition of Stakeholder analysis BABOK Guide version 3 states that it is "Identifying and analysing the stakeholders who may be impacted by the change and assess their impact, participation, and needs throughout the business analysis activities" [31].

Stakeholder analysis is an important part of business analysis and can be done once the scope of the solution has been determined [31]. In order to begin analysing the stakeholders an exhaustive list of stakeholders must be produced. The methodologies used to create such a list for the master's thesis at hand were brainstorming and stakeholder interviews [31].

4.3.2 Stakeholder mapping

The next step in the stakeholder analysis is creating a stakeholder list which identifies each stakeholder as well as the role which they hold in connection to the solution at hand and to each other. The stakeholder map is likely to change as the scope and solution are reviewed throughout the project or as changes in the environment, requirements or the organization itself occur [31].

The type of Stakeholder map that the author has opted to use is the stakeholder matrix, which is defined as "Stakeholder Matrix maps the level of stakeholder influence against the level of stakeholder interest." in the BABOK Guide V3 [31]. The author chose the stakeholder matrix as it helps the team determine the approach which should be taken

towards the stakeholder according to their level of interest and level of influence. The four approaches are ensuring the satisfaction of the stakeholder, working closely with them ensuring they are in support of the change, monitoring the stakeholders that their interests or influence do not change and keeping the stakeholders informed.

In the case of this master's thesis several different kinds of stakeholders were identified – the employees of the Claims Handling SaaS, insurance companies who are potential customers to the Claims Handling SaaS and the end-customers of the insurance companies. And finally, the supervisory organisations provide oversight to the insurance market participants. All the stakeholders and their requirements are important to be considered as without the end-customers being happy with the service, the insurance company will start losing customers. And a part of the service (the claim filing process) offered by the Claim Handling SaaS is used by the end-customers. At the same time the software must also improve the internal operations of the insurance company as well be compliant with the regulations. The author will use the results of this exercise as input for requirements and stakeholder communication.

4.3.3 Risk Assessment

A risk is an event that occurs unexpectedly, and it may have positive or negative effects on projects as George, C. states in his paper "The Essence of Risk Identification in Project Risk Management: An Overview" [32]. While the Claims Handling SaaS does not yet exist, the author finds this phase of the project to be a good time to map the initial theoretical risks that could affect the project negatively. The author listed the risks and the and the negative effects these would have. The author then rated the probability of each risk materializing and the impact on the project if it would. By multiplying the ratings, the author found a "Priority level" index, the higher the level, the more critical the risk.

The author used Risk assessment framework in a slightly modified form as per George, C. [32]. The modifications were made in the names of the columns – the author reworded them for clarity.

4.3.4 SWOT and TOWS

"SWOT (strengths, weaknesses, opportunities, and threats) analysis is a framework used to evaluate a company's competitive position", using it helps to analyse the company as

a whole or one single department or product line. It helps in "assessing the performance, competition, risk, and potential of a business, as well as part of a business such as a product line or division, an industry, or other entity" [33].

SWOT analysis is filled and presented in a table similar to the one in Table 6 in which each cell signifying a different topic. Strengths and weaknesses analyse the company internally and map out aspects that are within the control of the company itself. Threats and opportunities map external factors [34].

Table 6. The SWOT analysis matrix table describing which questions each of the categories should answer in order to be done correctly.

Strengths 1. What is our competitive advantage? 2. What resources do we have? 3. What products are performing well?	**Weaknesses** 1. Where can we improve? 2. What products are underperforming? 3. Where are we lacking resources?
Threats 1. What new regulations threaten operations? 2. What do our competitors do well? 3. What consumer trends threaten business?	**Opportunities** 1. What technology can we use to improve operations? 2. Can we expand our core operations? 3. What new market segments can we explore?

The results from the SWOT analysis will help the author further understand the aspects which would enable or stop a claims handling SaaS from successfully operating on the market - both from the internal and external point of view.

After conducting the SWOT analysis, the author will also conduct a TOWS analysis. According to Trade Brains [35] the TOWS framework is used to decide upon business strategies by assessing, creating and comparing them. It is a modification of the SWOT analysis that was created by Heinz Weirich in 1982. The four strategies that TOWS suggests are:

1. Strengths/Opportunities – the maxi-maxi strategy: the aim is to use the internal strengths to make the most out of the external opportunities.
2. Strengths/Threats – the maxi-mini strategy: the aim is to minimize threats with the support of strengths.

3. Weaknesses/Opportunities – mini-maxi strategy: the aim is to eliminate or rework internal weaknesses with the help of external opportunities
4. Weaknesses/Threats – the mini-mini strategy: the aim is to liquidate a company that is in an aggressive environment and has no opportunities for development.

Based on the results of the TOWS analysis the author decided which strategic approaches would be most appropriate to use considering the Strengths, Weaknesses, Opportunities and Threats and their combinations of Claims Handling SaaS.

4.3.5 Balanced Scorecard

The BABOK Guide v3 states that "the balanced scorecard is used to manage performance in any business model, organizational structure, or business process" [31]. It is a technique that focuses on the outcome and gives an overview of an enterprise by interpreting the strategic plan into measurable objectives [31].

According to BABOK [31] the balanced scorecard's four dimensions are:

- Learning and Growth - this dimension includes activities that have to do with employee training and learning. The metrics used in this dimension guide the training budget, mentoring, knowledge sharing and so on.
- Business Process - this dimension covers the area of how well the enterprise and the products can meet the customer needs. It helps determine which business processes need to be in excellent condition for the company to succeed.
- Customer - this dimension helps measure the customer focus, how well the value is delivered and how well the customer's needs are met.
- Financial - this dimension identifies the financial resources needed in order to realise the strategy. It is measured through profitability, revenue growth, added economic value for example.

According to BABOK [31] each of the dimensions contains:

- Objectives,
- Measures,
- Targets,
- Initiatives

The author used the balanced scorecard on the project level as it gave “tangible objectives, specific measures, and targeted outcomes” [31], which were derived from the company’s vision and strategy. The balanced scorecard enabled for the project to be measured in a multi-dimensional manner considering four facets of the organization and its strategy.

4.3.6 ArchiMate Motivation and Strategy Models

The author used the ArchiMate modeling language in order to describe the motivation and strategy layers as well as the needed capabilities for the Claims Handling SaaS. Even though the company does not yet exist, the ArchiMate modeling language allowed for the author to visualise the main stakeholder, drivers, goals and outcomes of the future company in a clear and concise way. This allowed the author to successfully plan the capabilities and the resources needed.

ArchiMate is an open “an independent modeling language for Enterprise Architecture” [36]. It allows for the users to describe the construction of a company, its business processes, information flows and much more, including the technical infrastructure. The knowledge gained from diagramming with ArchiMate allows to communicate the outcomes of decisions and changes [36], [37].

4.3.7 Capability based planning

Capability-based planning is a growing practice in the field of enterprise architecture. Its success is due to the fact that it provides actual value to practitioners and the organizations that employs them. Indeed, capability-based planning helps in a number of ways, from providing a clear understanding of existing capabilities to promoting effective Business-IT alignment.

Capabilities define what an organization needs to be able to do, to successfully achieve the outcomes that are defined as part of the corporate strategy. They are the key building blocks of the business, unique and independent from each other, and tend to be stable over time [38].

According to “Capability-Based Planning with ArchiMate®” [38] Capability based planning has three stages:

- **Capability mapping** - in this stage all the capabilities that a company has in some state are identified, defined and mapped. Each capability can be made more specific through decomposition.
- **Capability analysis** - in this stage the capabilities are analysed and compared against the company's plans and strategy. Capabilities that are lacking or in need of changed are marked in other colours - for example the traffic light.
- **Capability realization** - in this state the desired capabilities and capability levels are realized.

According to Aldea, A. et al. [37] improving capabilities is usually done over time, incrementally. It helps in planning the resources needed and is a good starting point for linking desired business value to architectural change.

The author plans to map and analyse the capabilities needed in order to build a claims handling software as a service MVP for the Estonian market. While the MVP does require for certain general capabilities to be present, making the first phase more intensive in terms of developing all needed capabilities, the capabilities needed for the Claims Handling SaaS will be improved incrementally and in line with the business value goals.

4.4 Develop

The goal of the Develop phase is to prepare the architectural vision for the claims handling software as a service MVP as well as creating the prototype based on the information gathered and analysis done in the previous phases.

4.4.1 Business Analysis

According to BABOK [31] "Business analysis is the practice of enabling change in an enterprise by defining needs and recommending solutions that deliver value to stakeholders. Business analysis enables an enterprise to articulate needs and the rationale for change, and to design and describe solutions that can deliver value."

As a part of Business Analysis, the author will compile a list of Business Requirements, which according to BABOK are "statements of goals, objectives, and outcomes that describe why a change has been initiated. They can apply to the whole of an enterprise, a business area, or a specific initiative" [31]. In the case of this master's thesis these are

high-level statements that cover the goals and value that the Claims Handling SaaS aims to bring to the insurance claims handling market.

As a part of the Jobs-to-be-done workshops the author will collect the stakeholder requirements. Stakeholder requirements "describe the needs of stakeholders that must be met in order to achieve the business requirements. They may serve as a bridge between business and solution requirements" [31]. The Author will, however, not distinguish stakeholder requirements from the functional requirements and for clarity will mix the two.

According to BABOK [31], solution requirements, which consists of functional and non-functional requirements "describe the capabilities and qualities of a solution that meets the stakeholder requirements. They provide the appropriate level of detail to allow for the development and implementation of the solution. Solution requirements can be divided into two sub-categories":

- **Functional requirements** describe what the solution needs to behave and what kind of information it needs to convey [31].
- **Non-functional requirements**, also called "quality of service requirements" describe the under which conditions the system must still effectively function and which qualities it must have [31].

After collecting the functional requirements from various sources, the author prioritized them using the MoSCoW method in order to reduce the scope and only add the most valuable functionalities into the MVP. According to BABOK MoSCoW is "A method to prioritize stories (or other elements) in incremental and iterative approaches. MoSCoW (must have, should have, could have, won't have) provides a way to reach a common understanding on relative importance of delivering a story or other piece of value in the product" [31]. The method helps to categorize all the elements into the four respective groups indicating which ones are of the highest priority that will definitely need to be implemented in the solution (must have), followed by "should have", which are functionalities that are recommended for a solution to have, but not mandatory. The third level down the priority list are "could have" functionalities and items, which are functionalities that are not necessary, but in some situations would bring value. The

lowest priority items are the “won’t have” category and they are ones to bring value and therefore will not be implemented [31].

The author decided to base the structure of the non-functional requirements presented in the master’s thesis on the ISO/IEC 25010 software product quality standard. The author chose this framework over FURPS+, because it also covers security, which is a very important aspect to consider in the design of insurance field information systems among other reasons the highly regulated nature of the field.

The ISO /IEC 25010 looks at 8 aspects about a software product to determine its quality. The aspects are as follows [39]:

- **Performance efficiency** – describes the extent to which the software product meets the needs of the users, with the help of subtopics Time behaviour, Resource utilization and Capacity.
- **Compatibility** – describes how well the software product can co-exist with other systems and perform its functions in cooperation or by sharing resources with other components. The subtopics used are Co-existence and Interoperability.
- **Usability** – describes the efficiency and satisfaction to which the system can be used to achieve the users’ goals, with the help of the subcategories Appropriateness recognizability, Learnability, Operability, User error protection, User interface aesthetics and Accessibility.
- **Reliability** – describes how well the system performs over a period of time, with subcategories Maturity, Availability, Fault tolerance, Recoverability.
- **Security –** describes how well the software product protects data or information, subcategories Confidentiality, Integrity, **Non**-repudiation, Accountability, Authenticity.
- **Maintainability** – describes how easily and efficiently the software product can be modified to improve it, subcategories Modularity, Reusability, Analysability, Modifiability, Testability.

The author will take both the functional and non-functional requirements into account when designing and developing the Claims Handling SaaS MVP solution.

4.4.2 Business Process Management

According to Dumas, M. [40] Business Process Management (hereinafter BPM) is a discipline "of overseeing how work is performed in an organization to ensure consistent outcomes and to take advantage of improvement opportunities". BPM does not deal with individual activities, but rather chains of events and activities which are performed in sequence and whether they add value in an organization [40].

The processes which BPM looks at consist of different parts. Events are actions that happen atomically and take no time. Activities are performed by someone or something and they take time. A typical process usually also has decision points during which a decision is made, and it directs the process towards one way and not another [40].

Dumas, M., et al. [40] also write that a process always involves:

- **Actors**, including human actors, organizations, or software systems acting on behalf of human actors or organizations.
- **Physical objects**, such as equipment, materials, products, paper documents.
- **Informational objects**, such as electronic documents and electronic records.

The BMP life cycle, according to Dumas, M., et al. [40] includes:

- **Process identification** - In the first phase a problem is raised, and all the processes related to the problematic area are identified.
- **Process discovery** (also called as-is process modeling) - In this phase all the relevant processes are mapped out and documented forming one or more models.
- **Process analysis** - In this phase, the as-is processes are analysed and the problematic parts are identified, whenever possible using performance measures.
- **Process redesign** (also called process improvement) - In this phase the problems previously identified are addressed and new to-be process models are created.
- **Process implementation** - In this phase, the to-be process changes are performed. Implementation touches upon two aspects - organizational change and process automation.
- **Process monitoring** - Once the to-be processes have been implemented, the process performance will be monitored and analysed with the aim to spot bottlenecks, errors or any other deviations.

The author has chosen to use the Business Process Model and Notation (BPMN) [1] standard for process modeling due to the fact that it can be integrated with Decision Model and Notation (DMN).

In addition to BPMN the author opted to also use DMN as the claims handling processes contain many decision-making points and BPMN alone did not allow to create enough clarity on the subject. According to OMG [41] DMN is a modeling language that is easily readable by people in different decision management roles and enables the specification of decision-making logic and rules. In the author's opinion DMN brought clarity to the decision-making process parts of the analysis enabling for more precise requirements to be described. DMN also allows for process automation with the help of tools such as Red Hat Process Automation manager [42], this will be considered before technical implementation as an alternative for building a similar system.

4.4.3 System analysis

The author will define the business rules as a logical next step after defining the business and functional requirements and modeling the TO-BE processes. Business rules are a translation of a company's business activities into a concretely described logic. It is conveyed as a set of rules that describe how a business process should be performed. It is done for the purpose of business analysts and engineers to be able to rely on them and apply these rules when applications and processes are developed [43].

Business rules go hand in hand with constructing the Business Information Model. The author will construct the Business Information Model based on the business rules, but also refine and correct business rules according to the Business Information Model later. "The business information model represents the semantics of the data in an organization, and not a database design. It describes the things of significance to an organization about which it is inclined to collect information (as entities), and associations between pairs of those things of significance (as relationships)" [44]. The Author will use the Business Information Model as a basis for the Component diagram that will be constructed in the next step. The author will be using UML to construct the model. According to Fan, X. [45] "UML is a graphical language for specifying, visualizing, constructing, and documenting software systems."

According to Donins, U. et al. [46]: “A component diagram shows the internal parts, connectors, and ports that implement a component.” The author will also be using UML to model the component diagram since it is included in the first version of UML. The component diagram will illustrate the architectural vision of the Claims Handling SaaS.

4.5 Deliver

In the deliver phase all the knowledge accumulated will be used in order to deliver a solution to the market. Within the scope of this master’s thesis the phase the author will construct a high-fidelity prototype of the solution. Beyond this master’s thesis, however the development of the MVP may also be categorized under this phase. Based on the user testing results, the team may always return to the “Develop” phase in order to fix any design flaws or ideate to find a new solution, should the solution prove to be insufficient to the users in the “Deliver” phase.

4.5.1 Design prototype

According to McElroy [47], K. the Oxford definition of a prototype is: “A first typical or preliminary model of something.” Designers in the software industry use prototyping as a way to think through how the used will interact with the interfaces. When testing the interface with the users the designer will get feedback on what works and what does not. For this reason, in the opinion of the author a sufficient number of views must exist to fully demonstrate the software to the user, otherwise the users are unable to give useful feedback as they are unable to imagine using the software.

High-fidelity prototypes provide an illusion of a seemingly functional version of the software. They allow for the user to interact with the user interface or the navigation. The user will feel that they are using a fully functional piece of software[48]. The author plans to create a high-fidelity clickable prototype of the Claims Handling Software as a Service MVP in the Figma software using pre-existing sets of user interface components and modifying them to match the look and structure needed for the Claims Handling SaaS (called Claimo in the prototypes).

5 Discovery of User needs

In the following chapter the author will describe the techniques and results thereof that were used in order to collect and map the pain points and wishes of claims handlers regarding the tools and processes they use. The author conducted a survey aimed at the customers of travel insurance, conducted several rounds of interviews with current and former claims handers and conducted a Jobs-to-be-done workshop. The techniques and results described in this chapter were key elements in understanding how process automation could be used to improve the work of claims handlers and the end-customers of insurance companies who need to file a claim. The author will use the results presented in this chapter as a basis for mapping the AS-IS and TO-BE processes, the functional requirements, the decision model and the key performance indicators.

5.1 Claims handler interviews

The author conducted two rounds of interviews with three former and current insurance claims handlers in order to collect information for this master's thesis. The first round of interviews took place in December 2021 and was conducted according to the questionnaire in Appendix 2. The first round of round of interviews served the purpose of establishing the level of knowledge that the claim handlers have about their working processes and reaching an initial understanding of the processes in use, which were described in point chapter 5 and will be described in chapter 10. In addition, the current shortcomings regarding claims management processes and tools were discussed and mapped. The author used the information gained from these interviews to map the first version of claims management processes and to prepare the Jobs to be Done workshop.

The second round of interviews took place with two former claims handlers in March and April 2022 where the author presented the initial claims management processes to the claims handlers taking feedback in order to correct the process diagrams. The author and the interviewees also validated the shortcomings of the claims processes that had been brought out during the previous interview round and added several missing pain points to the list. This information found extensive use in chapter 10. Additionally, the interviewees helped assess and validate the approximate duration of all the process steps that the claims management process consists of that is brought out in chapter 11.

The author will be referring to the information gathered from the interviews throughout the master's thesis. The author cannot disclose the personal details of the interviewees at their request, which was in many cases the condition upon which they were willing to share their knowledge. The author also cannot transcribe the interviews that were conducted as from the context the persons, or their current or former employers would be identifiable.

The summary of problems that were brought out by claim handlers regarding the current processes and tools used in claims management can be seen in the table 7 below.

Table 7. The problems with manual claims handling according to claims handler interviews and the business impact they have (by author).

Problem	**Business impact**	**Impacted metric**
Handling of each claim is time consuming	1. Each claim requires diligence and a detail-oriented approach due to which the analysis of filed claims cannot be rushed. 2. Acquiring missing information from the end-customers or a connected party is done via e-mail exchange. A large portion of claims need this kind of follow-up. 3. The headcount of the claims handling team needs to grow as the volume of incoming claims grows, which is a financial cost for the company 4. When the claims volume increases abruptly, the team may not be able to handle them as promptly as expected, which could result in decreased end-customers satisfaction or complaints. 5. Closing and archiving claims is time consuming because it takes time to collect all the documents and the systems where the files are uploaded are slow	1.1. Minutes spent handling one claim 2.1. Minutes spent handling one claim 3.1. Salary costs 4.1. NPS 4.2. Number of repeat purchases 5.1 Minutes spent on archiving

	6. Reviewing claim information takes time, because the files need to be opened separately, the claim description needs to be read and analysed, images need to be analysed, phone calls need to be transcribed.	6.1 Minutes spent opening and processing information
Manual claims handling allows for human errors	1. Time pressure and a large amount of information to consider as well as the level of experience of a claims handler can increase the chances of the claims handler missing some information and making a different claims decision compared to their colleagues.	1.1. Number of mistakes made 1.2. Number of complaints

5.2 End-customer research results

In order to explore and map the expectations of the end-customers towards claims handling, the author decided to collect information in the form of an anonymous online survey. The survey received 61 responses, which by standards of UX research is enough to draw conclusions. The survey was designed in four parts (the questionnaire can be found in Appendix 2), which the author will explain below.

It is important to note that quantitative research always raises more questions and unproven hypothesis, as is also the case with the survey at hand. In a project where more time is allocated to end-customer research, the quantitative research can be followed up by another survey or user interviews and the hypothesis as well as the additional questions should be explored using these methods. An alternative approach, that the author opted for, would be to use the user experience tests of the design prototype to validate business hypothesis in addition to the usability of the user interface. The author opted for the latter due to time and scope constraints and because insurance involves concepts that may prove too complicated to explain in words – a visual representation would in the author's opinion aid in clarifying the questions.

The first, “Your experience with travel insurance claims” part gives insights about the kind of experience the respondents have regarding travel insurance and the filing claims. This part serves the purpose of establishing the level of knowledge the respondents have in terms of insurance and the process of claims, giving more credibility to the opinions of the respondents as the vast majority did possess experience with travel insurance. The respondents indicated that all but 2 had purchased travel insurance before and 42,4% have also submitted a travel insurance claim. The most popular loss type was travel interruption, which this thesis also analyses and the most common reason for making the claim was reimbursement for money that had already been paid. 68% submitted the claim via a website, 60% found the correct place for submitting a claim easily. 72% of respondents reported that they had to submit extra information after filing the claim. The majority, 60% rated their satisfaction positively – with a 4 or a 5 out of 5. 20% rated it a 3 out of 5 and 20% a 1 or a 2 out of 5.

88% (22 respondents) of claims had gotten settled and 12% were rejected (3 respondents). The same number of respondents whose claims were rejected also stated that they disagreed with the claims decision, with the rest of the 88% percent agreeing with the decision. However, it is important to note that only two of the respondents whose claim was rejected disagreed with the decision, one agreed. One respondent’s claim was settled, but they disagreed with the decision.

The author used the Net Promoter Score methodology to analyse the 1-10 scale on which the respondents were asked to rate their experience with 1 equalling “horrible” and 10 equalling “exceptional”. 24% (6 respondents) were promoters, meaning they rated their experience with the score of 9 or 10. 62% (13 respondents) passives, meaning they gave a rating of 8 or 7 and 24% (6 respondents) detractors, rating their experience with a 6 or below that. Both respondents who disagreed with their claims decision were a part of the detractors. Another 2 detractors indicated that they had to submit extra documents and they received their claims pay-outs in a time span of “months” and “years” respectively. These respondents also rated their satisfaction with the claims handling speed a 2 our of 5 with 1 being the lowest score out of 5. This is an important factor as this result may indicate that a delayed claims payout could influence the end-end-customer satisfaction drastically – bringing the end-customer to a point where they would actively discourage others to buy services from the company. This hypothesis must be tested and explored further in the later stages of the project.

The respondents who got a rejection for their claim, but still rated their experience with a 9 or a 10 both filed their claim through an insurance broker. They received their claims decision within days and hours (each, respectively). They both indicated that their satisfaction to the claims handling speed was 1 out of 5 with 1 being the lowest score out of 5. This could indicate the fact that in case of rejection, the so-called human touch in delivering the negative news could be vitally important in keeping end-customers happy. This hypothesis also must be tested and explored further in the later stages of the project.

The second part "Claims handling expectations" uses realistic scenario descriptions get an understanding of the end-customers' expectations towards outcomes in claims related situations. 61 respondents replied to all the following questions. One of the most relevant results (figure 7) was that regarding travel interruption claims were that the most respondents (29 respondents out of 61) indicated that would prefer to submit their claim via a web form, with submitting a claim via talking to a person over the phone was a close 2nd (25 respondents). This is important because the author will prioritize the web-based form solution based on this information. A video explanation such as the kind that the USA based Lemonade allows for end-customers to do came in as the least popular with 2 respondents.

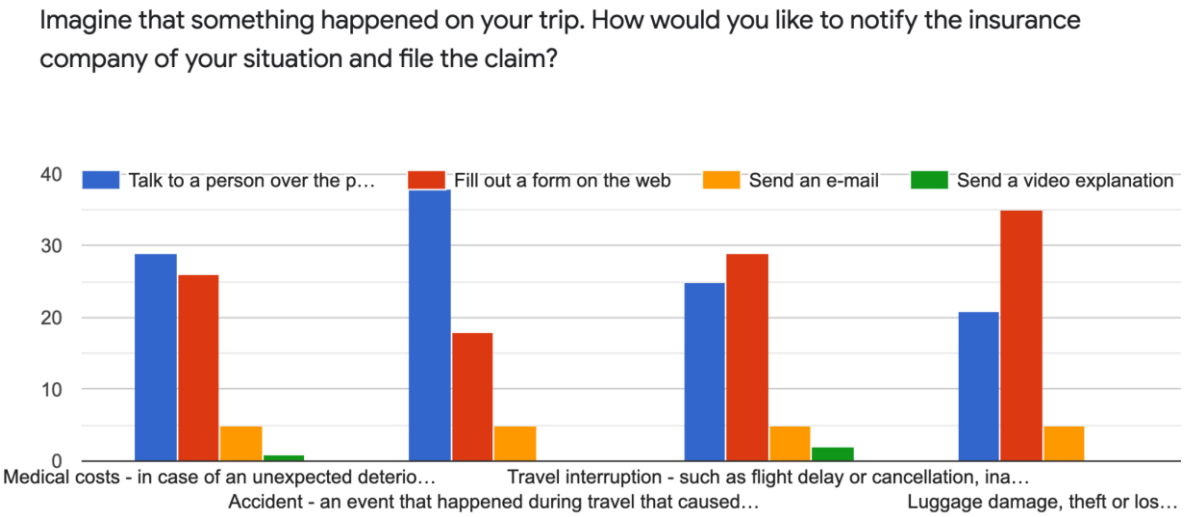

Figure 7. The results of the user survey question "How would you like to notify the insurance company of your situation and file the claim?" divided into loss categories.

Regarding the question "Imagine that you have notified the insurance company of your situation. Imagine that you are claiming a sum of 359€ for each of the categories. What

would be the most appropriate way to handle the claims of each category?" the results (figure 8) showed that in case of travel interruption the respondents preferred that 26 respondents preferred that a computer system reviews and makes a decision on their claim and 22 respondents preferred that a computer system makes a claims decision, but a person reviews and confirms it. The least preferred (13 respondents) method was a person reviewing the information and making the decision. This indicates to the author that the respondents are ready to accept the use of automated or semi-automated claims handling systems.

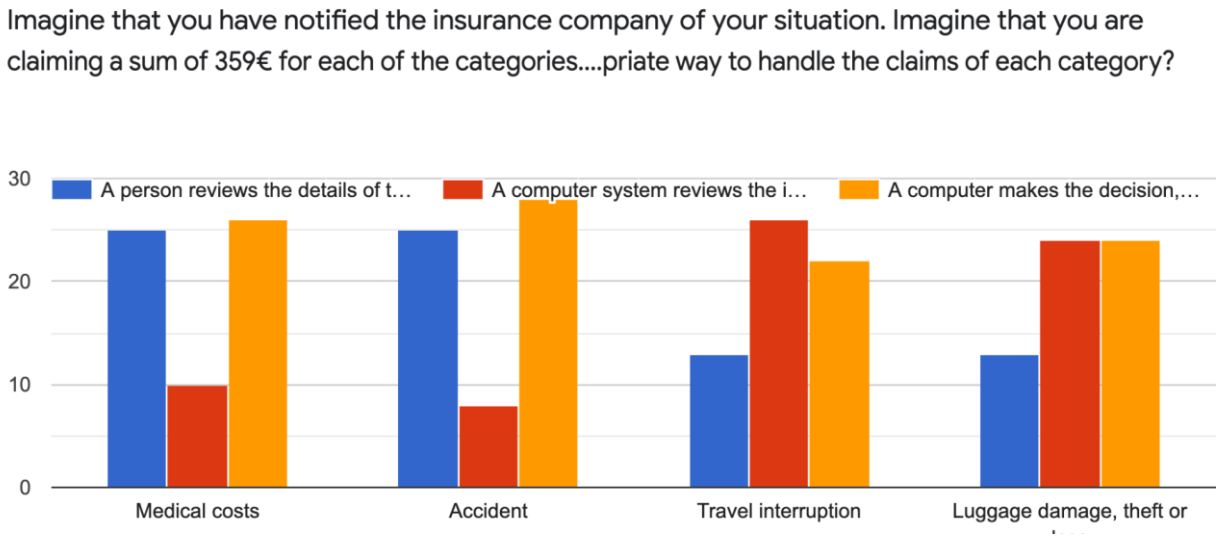

Figure 8. The results of the user survey question "Imagine that you have notified the insurance company of your situation. Imagine that you are claiming a sum of 359€ for each of the categories. What would be the most appropriate way to handle the claims of each category?" divided into loss categories.

Regarding the question "How fast do you expect for the claims payout of 359€ to be made after you have submitted the claim?" the respondents indicated (figure 9) that mostly they would expect the payout to be made within 1-3 days (25 respondents out of 61) or within a few hours (19 respondents). This is an indication that claims handling speed is important to the respondents and the acceptable time frame is up to 3 days.

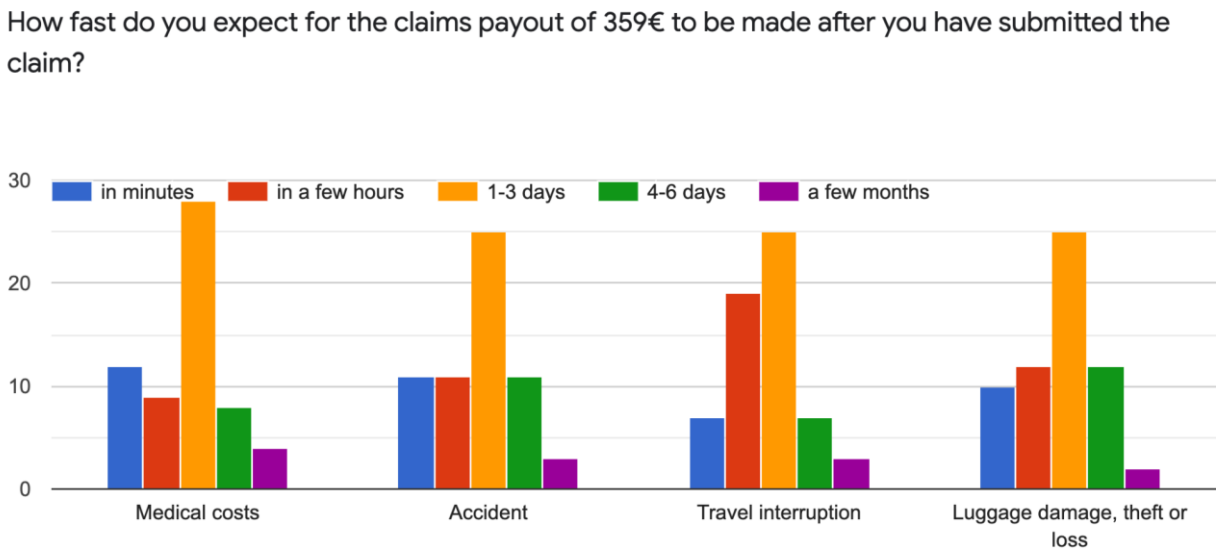

Figure 9. The results of the user survey question "How fast do you expect for the claims payout of 359€ to be made after you have submitted the claim?" divided into loss categories.

In the responses to the questions "How would you react if you were sure that you had the right to receive compensation, but your claim of 359€ was rejected by a person handling the claim? " and "How would you react if the same thing happened, but the rejection decision was automatically, by an IT system?" (Appendix 5) the responses did not differ. In both 51 out of 61 respondents indicated that they would file a complaint if such a claim were to be rejected. This confirms to the author that the rejection of claims is a serious matter to the end-customers and in case handled incorrectly will result in losing an end-customer or a bad review, but in the worst cases there would be an official complaint, which is the first step in legal proceedings.

Furthermore, receiving the claim payout in the full amount is more important to the end-customers than the claims handling time as the responses to "In which cases would you be willing to receive a 10%-20% lower payout for your insurance claim if it was handled automatically and the payout would be in just a few minutes after filing the claim? The alternative would be to wait up to a week and receive 100%" (Appendix 5). For all of the other types of losses the majority preferred a full payout while having to wait a week, however in case of being in another country when one's baggage is lost just over half (31) respondents indicated that they would also be happy with 10-20% less money if the payout were to be instant. In 88.2% cases the respondents preferred monetary compensation as the claims settlement payout instead of the items being replaced for

example. The author interprets this as the claims payout sum being of higher priority than the claims handling speed, but only in certain cases such as lost baggage.

In the "About insurance in general" section the most important information that the respondents gave was that one of the most important aspects about sticking to one insurance company as a repeat customer is a simple claim filing process (Appendix 5). 35 respondents indicated that it is very important and 16 out of 61 said that it was important. 45 out of 61 indicated that they would very likely stick with one insurance company in the case of a good experience when handling a claim. 14 out of 61 indicated that they would likely stay. This indicates to the author that claims handing is more important for the aspect of end-customer loyalty than for example competitive pricing or a friend's recommendation.

5.3 Jobs to be done results

In order to get a deeper understanding of the claims handlers jobs and what it is that they are trying to accomplish the author used the Jobs-to-be-done framework. The desired outcome statements below and the opportunity score were achieved through a job mapping workshops moderated by the author where three claims handlers formulated the statements. An additional six claims handlers and two insurance field specialists later scored the statements on a scale of 1-10 based on the importance and satisfaction in their opinions. The core functional job map can be found in Appendix 7 and the final Desired outcomes table along with 10 participants' scores in Appendix 13.

The author decided to use the desired outcome statements that received an opportunity score of 10 or higher as the basis for stakeholder requirements and functional requirements. The reason behind it is that the score of 10 or above indicates that these aspects are noticeably underserved as well as indicating that these are of the highest priority statements for the claim handlers [28]. The table 8 below shows the desired outcome statements that are within the scope of this master's thesis and received an opportunity score of 10 or above. The sentences should be read as "Metric and direction" + "Object of control and contextual clarifier" – for example "Decrease the time it takes to" + "to determine if the policy is valid and not terminated and the insurance coverage was there". The parts added together make up a desired outcome statement. The desired

outcome statements and the results of the jobs-to-be-done technique will be referred to and used regularly in the future chapters, most importantly the functional requirements.

Table 8. Desired outcome statements formulated as an outcome of the Jobs-to-be-done workshop, with the opportunity scored calculated from ratings given by claims handling and insurance specialists (by author).

Metric and direction	**Desired outcome object of control and contextual clarifier.**	**Opportunity score**
Decrease the time it takes	to determine if the policy is valid and not terminated and the insurance coverage was there.	10
	to gather the booking information to make sure that the trip has really been purchased and paid for.	11
	to determine the correct terms and conditions applying to this specific policy out of different versions of terms.	11
	to gather the information about the amount of damage or loss that was inflicted due to the incident	10
	to organize all the communication transcripts related to this claim to be linked to the claim and saved in the same location.	12
	to upload all the documents to the claim that were provided by the claimant via e-mail later.	11
	to validate that the trip was bought and paid for to prevent insurance fraud.	11
	to validate that the claim does not violate the terms and conditions that are stated in the general or product terms and conditions.	10
	to validate that all the required information and documents are there in order to be able to make a decision.	10
	to update the statuses of the claim so that the claimant can monitor their claim's process.	11
	to update the documents and information of the claim as the claimant reveals new details.	13
	to adjust the costs of the claim as new information becomes available	10
Create the capability	to automatically access info in image and PDF files in order to convert it into a machine-readable form to make it viewable without opening the file.	13
	to prioritize the claims with a higher cost to be able to spend more time on validating the decision.	15
	to validate that the decision can be made based on the decision tree to assure the highest quality standard of the claims decision.	12

Metric and direction	Desired outcome object of control and contextual clarifier.	Opportunity score
Create the capability	to check if the claimant is satisfied with the transaction by asking them for a rating.	11
	to maintain a log of all actions and information to be able to reproduce the reasoning of the decision later.	12
	to store the related invoices in the archive where all the rest of the claim info was stored.	14
Increase the level	of training other claim handlers during onboarding.	12

It is important to note that while many of the desired outcomes aim to reduce the time it takes to perform an action indicating that the functionality already exists, there are also several points where creating a new capability is requested. This may mean that while the claims handlers do perform this task already (as they themselves brought it out during the workshop), so usable helpful functionality exists for them to perform this task.

6 Regulation and constraints

The following chapter the author will analyse regulations and guidelines set to apply for companies active in the field of insurance. The author will highlight requirements that apply to Claims Handling SaaS and are therefore also relevant to for this master's thesis. The author analysed the Insurance Distribution Directive Rulebook by EIOPA [49] but found no points that apply to this solution. Furthermore, the author covered the Solvency II directive, the GDPR, the AI governance principles published by EIOPA, and the ICT security and guidelines also published by EIOPA. The author will base a significant amount of Business requirements as well as functional and non-functional requirements on the results of this analysis.

EIOPA (European Insurance and Occupational Pensions Authority) is the European supervisory body for insurance and occupational pensions services in the European Union. It states its mission as "protecting the public interest by contributing to the short, medium and long-term stability and effectiveness of the financial system for the Union economy, its citizens and businesses [50]. Whereas EIOPA provides guidelines among other areas also regarding the ICT (Information and communications technology) solutions used in the EEA (European Economic Area) insurance field, the Author has opted to base their research on said guidelines. It is important to note, however, that additional requirements may be added depending on the market. For example, the German Federal Financial Supervisory Authority (BaFin), which governs the insurance sector in Germany, has additional requirements for companies active in the German market. The Estonian equivalent, Finantsinspektsioon however, refers to the EIOPA guidelines especially in ICT related topics.

Regarding Claims and the handling thereof EIOPA does not provide any guidance related to the amount of time during which the insurance company is obliged to process the claim. This is governed by the local supervisory authorities, if at all.

6.1 Solvency II

Solvency II "is a comprehensive programme of regulatory requirements for insurers, covering authorisation, corporate governance, supervisory reporting, public disclosure and risk assessment and management, as well as solvency and reserving"[51]. EIOPA has

provided guidelines for implementing Solvency II. Solvency II touches upon the subject of claims on a few occasions, declaring the supervisory duties of the home states of insurance companies. However, since this Claims Handling Software as a Service will not be selling pr handling insurance products and services, the Solvency II points discussing Claims are not relevant to this thesis. The point relevant to this master's thesis according to the EIOPA guidelines [52] is:

Outsourcing – Section 2, article 49: Member States shall ensure that insurance and reinsurance undertakings remain fully responsible for discharging all of their obligations under this Directive when they outsource functions or any insurance or reinsurance activities.

This essentially means that should this Claims Handling Software as a Service be successfully used by an insurance company for claims handling than in the eyes of the supervisory authority, the insurance company is also responsible for the compliance of the Claims Handling Software as a Service in the same way that the insurance company is responsible for its own software and services. This, however, makes it crucial that the Claims Handling Software as a Service follows all regulatory requirements, best practices and requirements of the supervisory bodies in order to avoid any risks for the future clients (insurance companies). Therefore, the Claims Handling Software as a Service needs to comply with the European regulation, the national insurance and financial services regulation as well as the internal policies of the client (insurance company).

While some of the following directives, regulations and guidelines discussed in this chapter were not originally created and released by EIOPA, they are mentioned on EIOPA's website as guidelines or mandatory requirements. In this chapter the author will give an overview of the applicable regulations and the constraints caused by mentioned regulatory requirements.

6.2 GDPR directive

The General Data Protection Regulation (GDPR) (Regulation (EU) 2016/679) came into force in 2018 and replaced the EU Data Protection Directive, its objectives are to provide a better way for the citizens to be in control of their personal data and to simplify the adoption of said regulation by providing unified requirements across the EU. A failure to

comply with the directive will mean a fine of up to 20 000 000 Euros or 4% of the annual global turnover of the company – whichever is greater. It will also mean a risk of reputational damage [60, page 3].

For the Insurance industry GDPR has had a significant impact as great amounts of personal data are obtained and processed constantly in order to provide insurance services.

The according to KPMG [53] the most important aspects of that need to be considered in the insurance industry and therefore also with the Claims Handling Software as a Service are:

1. **Data Portability**: Article 20 of the GDPR dictates that a private person has the right to receive any personal data that they have previously provided to a company or has been observed in a 'commonly used machine-readable format' and has the right to forward this data to another controller. This essentially means that companies who obtain and process personal data must have processes in place to enable private customers to obtain this data and this data has to also be in a specific format that a competitor could process. The insurance company also must have processes in place to constantly evaluate the personal data it has access to and assess its excessiveness considering the purpose of having it. All data that is not directly needed for processing must not be retained or processed. Confidential business knowledge such as underwriting knowledge and risk models, do not need to be shared, while claims data (having been provided by the claimant) is limited to the applicable product and does have to be portable according to Article 29 [53].
2. **Consent management**: As the consent of the private customer can no longer be implied but has to be explicitly asked and freely given with no existing imbalance of power, this is one of the most crucial aspects of what an insurance company has to comply with. This means that the customer must be fully aware of all the data that they are giving to the insurance company and for what purpose and they must freely give this permission while fully understanding the scope of the permission [53]. This is usually done while agreeing to the terms and conditions of the company and the insurance product during the purchasing process. This also means that should an insurance company start using the services of a new third party service provider for claims management this can either only be done for new policies where the terms and

conditions includes the new service provider, or the terms and conditions of existing policies would need to be changed.

3. **Transparency third parties**: Article 14 of the GDPR states that the origin of the data obtained from somewhere other than the data object must be made known. This means that when the insurance company gets data about the customer from somewhere other than the customer themselves, they must let the customer know within a certain time frame [53].
4. **Third party vendors**: The article 26 of the GDPR introduced the concept of joint controllers [of data], which means that there are two or more processors of the customers' personal data, and they must jointly determine the means and reasons for processing the data. These can be insurance brokers or other vendors that the insurance company has a relationship with. If a vendor provides services to the insurance company that require handling personal data, then then this makes them a processor automatically. This means that processing agreements, roles, due diligence and other necessary arrangements are a must in any such contractual relationship and only vendors who are GDPR compliant can be used [53]. This is an important aspect to a vendor offering claims management as the Claims Handling Software as a Service aims to do.

6.3 Schrems II and the FISA Act 702

According to the Court of Justice of the European Union (CJEU) Schrems II ruling in July 2020 the European Commission's Privacy Shield Decision is invalid due to invasive US surveillance programmes which make personal data transfers that are made based on the Privacy Shield Decision illegal [54]. "Companies that continue to transfer data on the basis of an invalid mechanism risk a penalty of €20 million or 4 % of their global turnover, pursuant to Article 83(5)(c) GDPR" [54].

The root cause of the CJEU running is the section 702 of the Foreign Intelligence Surveillance Act (FISA), which authorizes collecting, using and disseminating of electronic communications content stored by the U.S. internet service providers the likes of Google Facebook and Microsoft or telecom providers. The processing of the data of non-U.S. persons located abroad can be done as long as a "significant purpose" of the surveillance is stated as "to obtain foreign intelligence information" [55].

According to iapp [56], Post-Schrems II Data Protection Authorities (DPA) such as the German, French and Portuguese ones and many more have issued rulings condemning the use of U.S. service providers by some local companies based on the fact that the service providers could be subject to FISA section 702 based on their area of business and the European companies' inability to determine whether any data was conveyed to the U.S. Due to the limited number of safeguards to fight the FISA section 702 outcomes the implication seems to be that EU-headquartered service providers are in compliance and able to ensure data protection and should therefore be preferred. In March of 2021 the French court ruled over a case involving a subsidiary of Amazon Web Services located in Luxemburg which was hosting relevant data in Germany and France and determined that sufficient additional safeguards had been provided through the encryption of the data while the encryption key was not held by Amazon Web Services and was trusted to a third party in France instead [56].

The impact on this master's thesis and the Claims Handling SaaS is that the Schrems II ruling essentially sets the requirement of either using non-U.S. service providers or encrypting all data being hosted and conveyed with the encryption key being held by a trusted party in the EU.

6.4 AI governance principles

As according to EIOPA's [57] definition the Claims Handling Software as a Service falls under the point (b) definition of AI, it is important to take the suggested governance principles into account. AI, as stated in the "Artificial Intelligence governance principles: towards ethical and trustworthy artificial intelligence in the European insurance sector": "Artificial intelligence means software that is developed with one or more of the techniques /.../: (a) Machine learning approaches, including supervised, unsupervised and reinforcement learning, using a wide variety of methods including deep learning; (b) Logic- and knowledge-based approaches, including knowledge representation, inductive (logic) programming, knowledge bases, inference/deductive engines, (symbolic) reasoning and expert systems; (c) Statistical approaches, Bayesian estimation, search and optimization methods" [57]. The use case of "Automated segmentation of claims by type and complexity and automated invoice verification and payment process is brought out as an example [57].

According to EIOPA [57] the collection and analysis of collected insurance data has been expensive and often inaccurate. The emergence of big data and the increasing use of artificial intelligence (AI) allow for more accurate and data-based decision making on the side of insurance companies. The use of such technologies coupled with the increasing availability of data, cloud computing and the internet of things for example presents an ethical dilemma in the equal and fair treatment of all different parties on the market even with conflicting interests – individuals seeking insurance, the pool of insured risks and the insurers who manage the pool of risks.

EIOPA [57] brings out the following points in regard to usage of AI in claims related decision making and optimisation:

- Principle of proportionality – meaning that governance measures used should be proportional to the potential impact of the specific use of AI. This should be assessed and measured on a regular basis.
- Principle of fairness and non-discrimination – as in the interests of all stakeholders need to be balanced and the current known inequalities in decision making should be addressed. This also means avoiding measures that may increase the customer's "willingness to pay" or "willingness to accept". Insurance firms should develop the means of fighting biases and achieving fairness and non-discrimination. Records much be kept on such efforts, which is a point also relevant to this master's thesis and the Claims Handling Software as a Service.
- Principle of transparency and explainability – the use cases applicable to the recipient stakeholders should be explained to them. The explanations should be meaningful and easily understandable for the stakeholders to be able to make informed decisions.
- Principles of data governance and record-keeping – should be based on the principles of GDPR with sound data governance implemented throughout the AI system. The data should be stored safely and securely. Documentation and records of data governance should be kept for auditing purposes.
- Principle of robustness and performance – this applies for systems developed in-house as well as outsourced ones and is therefore applicable also for the Claims Handling Software as a Service. AI systems must fill the purpose of their intended use, their performance should be assessed and monitored on a regular basis. Calibration must be done over time in order to ensure that the outcomes are stable.

The systems should be deployed in appropriate IT infrastructures which are resilient also against cyber-attacks.

In claims management EIOPA [57] suggests that AI can speed up the compensation process, which is a benefit to the end-customer. Fairness and transparency should be achieved through training and testing the model, which should be combined with a human quality assurance. As a backup, the end-customers will also have the opportunity to seek redress by filing a complaint. In these cases, human intervention is needed. Regardless, a digital trail should be left about any decision making.

Optical Character Recognition software (OCR), according to EIPOA [57], enables data extraction from documents submitted by the end-customer as a part of the insurance claim. An AI system can go through handwritten or printed data and help flag discrepancies and certain fields on a claim form. An enhanced level of human oversight would not be needed in case of OCR processing in case of small claims. Reliable internal processes for governance, human oversight and data management should be in place and would suffice. In case of claims above a certain threshold, human oversight is necessary, however. It should be kept in mind that while OCR does provide high rates of accuracy, it may still result in errors. To mitigate that risk, human oversight may be necessary. In case of OCR use the end-customer must be informed of the AI system's capabilities and whether they have the possibility to request a human expert to assess the claim.

While the master's thesis does not aim to design an AI system as such, some of the principles mentioned above do touch upon the technology and the logic that the Claims Handling SaaS will use. Therefore it is important to take the guidance into consideration in the functional requirements of this system.

6.5 ICT security and governance

As the Estonian financial institutions' supervisory body Finantsinspektsioon refers to the EIOPA guidelines in terms of ICT security and governance, the author shall use the "Guidelines on information and communication technology security and governance" by EIOPA [58] and "Guidelines on outsourcing to cloud service providers" by EIOPA [58] as the source for ICT security and governance requirements. The author has mapped the responsibilities of the stakeholder organisations and their responsibilities thereof in the

Appendix 6. The ultimate responsibility in the eyes of EIOPA and Finantsinspektsioon falls upon the Insurance Company, however in order to be able to provide the Claims Handling SaaS as an outsourced software to the client insurance company, the software itself must comply with the EIOPA guidelines as well as the client's internal policies. This makes the company providing services via the Claims Handling SaaS responsible for the compliance of the claims handling software, but not other technical solutions used by the Insurance Company).

In order to comply with the guidelines provided by EIOPA, the Claims Handling SaaS shall in the long run follow the requirements of the ISO 27001 standard in order to achieve the required level of information security management, while not pursuing receiving a certification. The ISO/IEC 27001 outlines "the requirements for establishing, implementing, maintaining and continually improving an information security management system within the context of the organization. It also includes requirements for the assessment and treatment of information security risks tailored to the needs of the organization" [39]. The author picked the ISO 27001 standard as it is widely recognized and acknowledged in the insurance industry and mentioned as the final public consultations document by EIOPA on the topic of outsourcing cloud-based services [59], which the Claims Handling Software as a Service will be.

For the purpose of this MVP the author will base the security related requirements and analysis on the Centre for Internet Security (CIS) Critical Security Controls Version 8 document, which is a part of the CIS Best practices and considered acceptable in the insurance industry [60].

In order to comply with the ICT governance and service management related guidelines the company will apply the practices of ITIL 4. The reasoning behind the choice is that it is a widely used framework also in the insurance industry and a potential future team member developing the Claim Handling SaaS is already a practitioner of the practices.

According to CIO "ITIL is a framework of best practices for delivering IT services. ITIL's systematic approach to IT service management can help businesses manage risk, strengthen customer relations, establish cost-effective practices, and build a stable IT environment that allows for growth, scale and change" [61]. ITIL 4 is the latest iteration of the ITIL framework launched in 2019 [61].

7 Market and business environment analysis

In the following chapter the author will give an overview of the European insurance market in statistics as well as in the form of Porter's Five Forces analysis results. The author will perform a competitor analysis comparing service providers operating on the European market whose software could potentially be an alternative solution to the customers that the author would target as the customer base for the Claims Handling SaaS. The author will also identify a market gap – a list of claims management automation related functionalities that are not supported by the competitors.

According to Insurance Europe [62] in 2020 €1264 billion was spent by end-customers on insurance premiums in the European market. In turn €1010 billion was paid out as claims benefits. Whereas Travel insurance often includes both Property & Casualty (P&C) and Accident & Health (A&H) coverages, Insurance Europe counts it under P&C. Annual premiums paid for the Property and Casualty insurance in 2020 were €419 billion in total with €272 billion paid out in claims. In Europe the average spend on P&C insurance is €694 per capita.

The European Insurance in Figures 2020 publication [63] reports that "Other P&C" business line's claims & benefits paid (which also includes travel insurance) had risen by 20,2% in 2020. As travel restrictions were introduced as a part of the COVID-19 pandemic relief measures claims in the travel insurance increased by a significant amount. In Norway for example by 76,3% in the first half of 2020.

The United Kingdom with 21,6%, France with 17,1%, Germany with 16,8%, Italy with 10% and the Netherlands with 7,6% make up the countries with the highest claims and benefits paid also making them potentially the most beneficial markets for this Claims Handling SaaS service [63].

Insurance is a long-standing business area that according to the sales revenue (insurance premiums) plays an important part in the lives of Europeans. It is safe to assume that speedy and fair claims handling play just as important of a role. This is the reason that many end-to-end digital insurance software platforms include at least a basic claims handling module and there are quite a few software options to choose from that concentrate only on claims handling.

In the following chapters the author will analyse direct and indirect competitors in the 4 European Union countries as well as the Estonian market due to its advanced digital capabilities. The author will also analyse the business environment through Porter's Five Forces technique as well as a SWOT analysis. The outcome of this chapter will be used to conduct an analysis of alternative solutions.

7.1 Competitors

In this chapter the author describes some of the closest competitors to table 10 depicts 6 of the most relevant potential competitors to the Claims Handling SaaS. The general profiles of the companies can be seen in Table 9. The companies were chosen by recommendations of the claim management professionals, by end-customer reviews and the location of the Headquarters – favouring European or Swiss companies due to Schrems II. A1 Tracker was added to the selection as it has a strong presence across the world. Tautona was added via recommendation and because their functionality covers claims automation in the same parts of the claims management process as the Claims Handling SaaS aims to impact.

Table 9. The profiles of the companies included in the competitor analysis.

	Tautona [64], [65]	**SchemeServe [66], [67]**	**Innoveo Skye [68], [69]**	**A1 Tracker [70]**	**omni:us [71], [72]**	**ClaimsForce [73], [74]**
Location:	South Africa	United Kingdom	Switzerland	United States	Berlin, Germany	Hamburg, Germany
Employees:	11-50	11-50	51-100	11-50	51-100	11-50
Founded:	2017	2000	2007	2001	2015	2018
Website:	tautona.ai	Schemeserve .com	Innoveo .com	a1tracker .com	Omnius .com	Claimsforce .com
Pricing:	-	Free trial, 1250 GBP per month	Free trial available	Starting from 800USD / month	Free trial available	-

	Tautona [64], [65]	SchemeServe [66], [67]	Innoveo Skye [68], [69]	A1 Tracker [70]	omni:us [71], [72]	ClaimsForce [73], [74]
Target customers:	Large and Mid-sized Insurers	Mid-Size Business, Small Business, Enterprise, Freelance, Non-profit, and Government	Mid-Size Business, Enterprise, and Government - Insurance, financial services, real-estate	Mid-Size Business, Small Business, Enterprise, Freelance, Non-profit, and Government, law firms	Mid-Size Business, Small Business, Enterprise, Freelance, Non-profit, and Government	Third Party Investigators, Insurers, Large, small and mid-sized companies

All the companies are according to Sourceforge and Crunchbase relatively small with employee number between either 11 and 50 or 51 and 100. None of the companies are completely new with the newest having been established in 2018. Only 2 of the companies reveal their pricing - SchemeServe and A1 Tracker with 1250 GBP per month and starting from 800 USD per month respectively. Two of the others indicate a free trial being available, however final pricing would be revealed upon contract negotiations. None of the service providers provide the opportunity to sign up from their website to a standardized subscriptions service. All of them offer a free demo to potential customers. The targeted customers vary from large to small, but also Government agencies as well as industries outside of insurance. Insurance and Mid-sized companies are the common denominator between all the competitors.

The author compared the features, functionalities and capabilities of the competing software the companies. The comparison criteria are derived from the user research and analysis of regulations and guidelines conducted in the previous chapters of this master's thesis. The source from which each criterion was derived from can be viewed in Appendix 9. The comparison table can be viewed in full in Appendix 8. The high-level conclusions of the comparison table can be found in Table 10.

Table 10. A comparison of the features, functionalities and capabilities of six claims management software products compared based on criteria derived from the previous chapters and phases of analysis conducted as a part of this master's thesis (by author).

	Tautona [64], [65]	**SchemeServe [66], [67]**	**Innoveo Skye [68], [69]**	**A1 Tracker [70]**	**omni:us [71], [72]**	**ClaimsForce [73], [74]**
Travel Insurance claims process support	No	No	No	No	No	No
Post-Schrems II GDPR compliance	No	Located in the UK	Yes	No	Yes	Yes
Configurable website-based claim filing process	Yes, configurable, but e-mail based	Yes, website-based, but unsure if configurable	Yes, website based, but unsure if configurable	Yes	Yes	N/A
Configurable claim management processes	Yes	N/A	Yes	N/A	Yes	Yes
Automated claim info and documents processing	Yes	Yes, collecting the data, but not analysing it	Yes, collecting the data, but not analysing it	N/A	Yes	Yes, collecting the data, but no information about analysing
Automated claim settlement decision making	Yes	N/A	N/A	N/A	Yes	N/A
Automated claims decision notification to the end-customer	Yes	N/A	N/A	Yes	Yes	N/A
Automated archiving	No	N/A	N/A	N/A	N/A	N/A
Customer satisfaction survey	N/A	N/A	N/A	N/A	Yes	Yes

In table 10 the colour red signifies a feature or functionality that was confirmed as not supported by the software. The colour yellow signifies partial and not full support of the feature or functionality. The colour green is used for confirmed full support of the feature

or functionality by the software. The letter combination N/A is used when the public information sources that were used for the collection of information neither confirmed nor denied the support for the features or functionalities by not mentioning them at all in the public documentation. The features marked as N/A may still be supported by the software.

While searching for possible competitors, the author could not find any software that was specifically designed to support travel insurance claims handling. That could be an indicator that there is a market gap and therefore an opportunity to offer claims support in that segment. Through the comparison and analysis of the features and functionalities that the competitors offer it seems that Omni:us and Tautona are the only ones offering not only automated collection of data, but also automated analysis and processing of the claims data and documents. As seen in the more detailed comparison table in Appendix 9 it is the capability to extract information from the policy, the terms and conditions and other documents as well as the claim data and documents filed by the claimant. This means that they can use OCR (Optical Character Recognition) to turn images containing text into a machine-readable format text making it possible to analyse the contents without necessarily involving a human. Also, NLU (Natural language Understanding) is used to analyse free text in order to identify the approximate circumstances of the incident described in the claim. Furthermore RPA (Robotic Process Automation) is used to compensate for the lack of APIs available in order to emulate actions that a person would usually perform in order to retrieve data from a user interface.

Furthermore, Omni:us stands out with the fact that the software can process a claim and make the settlement decision fully automatically according to the information available. Tautona, however, can make a claims decision recommendation automatically, but not follow through with the decision. This is intentional, as they claim in the interview in the Liip podcast [64] explaining that with some very complicated corner cases being an unavoidable part of claims handling it is rather a balanced cooperation of humans and automation that brings the best result. Tautona, however, may not be GDPR compliant as their Headquarters are indicated to be in South Africa and the USA. Omni:us, by location at least, does comply. Neither give information about where their solutions are hosted, therefore the author is unable to determine compliance to the EIOPA guidelines.

While Tautona and Omni:us can be considered the closest to the Claims Handling SaaS by the functionality, especially considering their claims processing automation capabilities, the other competitors are still considered direct competitors as they do offer ways of speeding up and simplifying claims processing. Additionally, to the six companies brought out as direct competitors, the author also came across companies that can be considered indirect competitors.

The first category of indirect competitors offers claims handling as a service. This means that they use software solutions as well as their own staff to provide a fully functioning claims handling team to insurance companies in order to cover for a temporary lack of resources or as a permanent cooperation partner. While it is effective as a service to cover claims handling needs, the investment needed to use such a service is probably comparable to sustaining a team of full-time employees. Such services are offered for example by Imperial Claims services [75], with their headquarters in Greece and Dekra [76] with headquarters in Germany.

The second type of companies that the author decided to categorize as indirect are all-in-one digital insurance platforms, which offer end-to-end functionality as an ecosystem covering all areas necessary to run a successful insurance company. Functionality such as sales processes and sales controlling, the capability to offer self-service portals to end-customers and as well as internal users, claims handling processes, customer and product management and much more. Such software providers as for example EIS with headquarters in the USA [77], Instanda with headquarters in the UK [78], Socotra which also has its headquarters in the USA [79] and German based MSG Life [80]. While these software products do have a claims management module, the author was not able to determine that any of them offers automation of claims analysis and processing. They do offer web-based first notice of loss filing and claims documents collection as well as in some cases configurability of claims management processes.

7.2 Porter's Five Forces Analysis results

In the following chapter the author will analyse the business environment on the current European insurance claims handling combined with the business process automation market. As a result of this analysis the author aims to better understand the kind of a market the Claims Handling SaaS would enter, what powers would dictate its success on

the market taking into consideration the threat of new entrants (with the Claims Handling SaaS being one of the new entrants), the bargaining power of the customers (insurance companies) and suppliers, the threat of substitute products and finally the competition and rivalry on the market. All the aspects can be viewed in Figure 10 below.

Regarding the aspect of threat of new competing entrants to the market, the author acknowledges that while business process automation in general is a growing market, it should be noted that entering the insurance field poses many barriers for new entrants. For example, as shown in Figure 10, due to the insurance field being highly regulated, the demands to information systems and the demands for the governance thereof are also very strict and requires a lot of preparation. Another barrier is that the business process automation system for insurance claims would most likely need to have data exchange capabilities with the company's customer database and insurance policy and contracts databases in order to determine whether the claimant has is covered by the insurance policy for example. This, however, is at times difficult as many insurance companies use outdated technological platforms where APIs are not available for data requests and transfers. Work arounds can be found; however, it requires extra effort providing non-standardized solutions to some customers (insurance companies).

Another aspect that can be considered a barrier is the relative complexity of the insurance field with many rules and roles that do not exist outside of it. Additionally, there is also a lack of detailed learning materials regarding risk management and business process best practices as these are considered a trade secret.

Last, but not least it is worth raising the point that insurance is highly regulated, and any technology used must be validated as adhering to the rules and guidelines. Any new technologies not yet approved by the supervisory bodies on the national or European level may need to receive special approval, depending on the country. This may discourage insurance companies from adopting new technologies as it might mean extra effort. Considering the reasoning above the author considers the threat of new entrants relatively low.

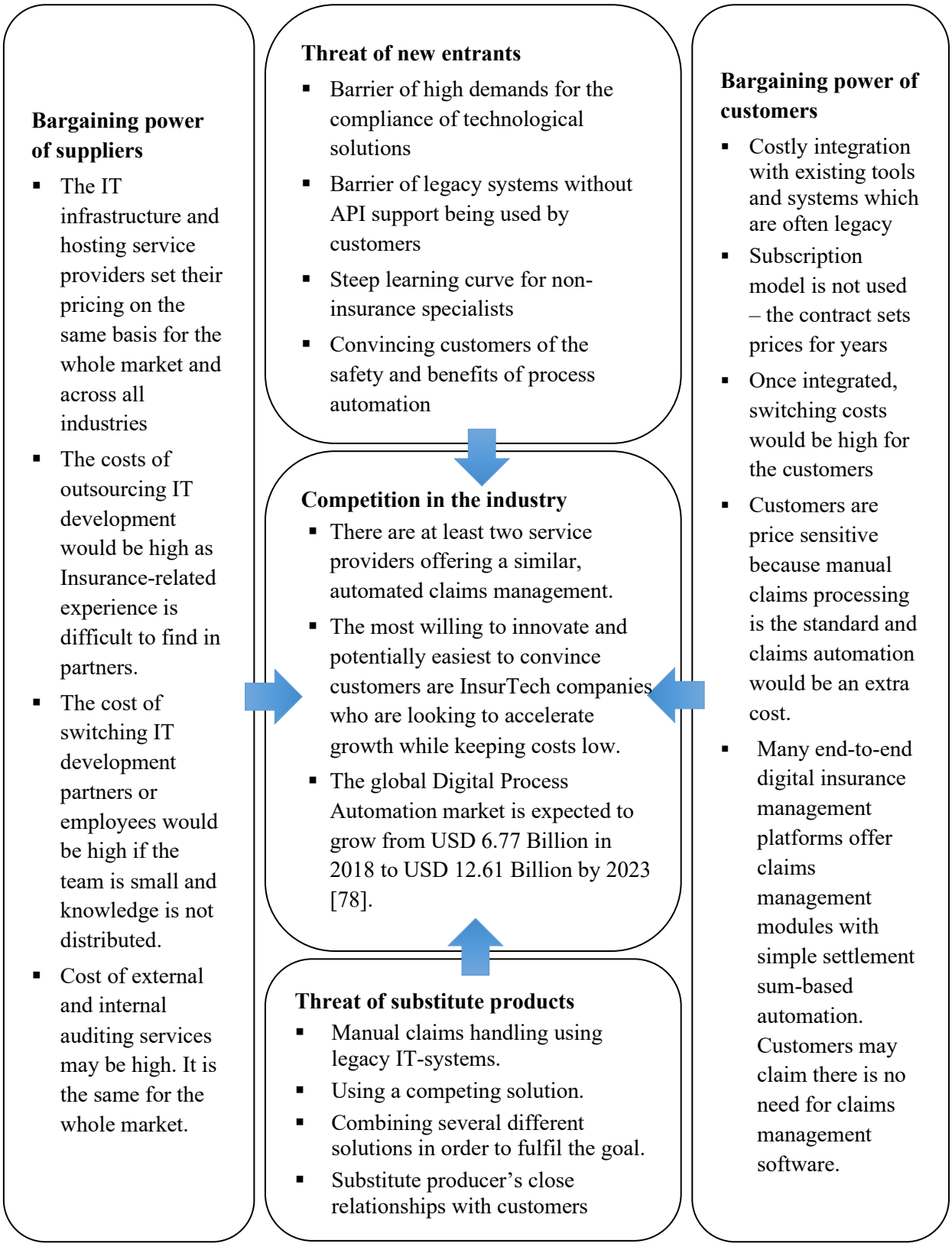

Figure 10. The analysis results of Porter's Five Forces method describing the business environment of the insurance claims process automation market (by author).

The bargaining power of customers (insurance companies) is likely stronger in the beginning of the business relationship as most of the potential customers already have an

existing system and processes set up that work, which means they are not in a hurry to find an alternative. This could also mean that they would view an investment into new software as an extra cost. Furthermore, as some or all the customers' systems may be legacy systems, which means that integration costs could be high, which in turn could discourage the potential customer adopting the new solution. As the subscription model, which allows for a short notice purchase and cancellation of the services is not often used based on the competitor analysis, this means that most probably customized contracts are signed between each service provider and insurance company. This could mean that the pricing gets set and stays at the same level for many years. Once integrated and in use, the software is unlikely to be swapped out for many years as switching to a new system would require an investment and a lot of effort. So therefore, after the first contract term, the service provider is likely to gain some bargaining power back.

The bargaining power of suppliers affects all the market participants the same way and it is relatively low as there are many suppliers on the market. Suppliers are mainly used for hosting and cloud-based IT-infrastructure as service providers. The services offered and their pricing are mostly standardized and similar across the European market. IT development services and the outsourcing thereof could be, however, expensive. Additionally, should the developer need to be swapped out by another, this could prove expensive due to the high complexity of the insurance field and the longer onboarding time of the new developer due to that reason.

Regarding the threat of substitute products – it is relatively high as the market is already well-functioning using other solutions such as manual claims handling using several different tools during the process in order to fulfil the goal. Direct competitors are a lower threat in the author's opinion than old habits to use outdated tools and processes. However, should one of the competitors have a personal relationship with the potential customer (insurance company), it is very likely that this competitor would get picked over the competition.

There is not yet very fierce competition on the European market in the field of claims processing business process automation, however according to Markets and Markets [81] the Digital Process Automation market is expected to grow to USD 12.61 billion by 2023, which would be almost double in value compared to 2018.

As conclusion, the insurance claims automation industry has a relatively low threat of new entrants to the market and there is low competition now. The customers have a relatively high bargaining power in the beginning of the business relationship, but it lowers as time goes by and the new system gets use. The suppliers have a relatively low bargaining power due to high competition. The author concludes that it would be a good time to enter the market offering claims processing business process automation.

7.3 SWOT and TOWS analysis results

In this chapter the author will introduce the results of the SWOT analysis, which are conveyed in Table 11. For the SWOT analysis the author mapped the future strengths and weaknesses of the software product that will be developed and the organisation itself as well as threats and opportunities from external factors taking into consideration the research and analysis results from the previous chapters.

Table 11. SWOT analysis of the Claims Handling Software as a Service (by author).

STRENGTHS	**WEAKNESSES**
1. Configurable claims handling processes 2. Intuitive and user-friendly user interface 3. The level of automation will have the capability to be adjusted according to the risk appetite of the insurance company 4. The client will be able to manage their processes autonomously 5. Schrems II and GDPR compliance 6. A team with strong product management and software development competencies from the insurance field. 7. Strong relationships with several insurance companies in the Estonian, German and British markets.	1. Due to the highly confidential nature of insurance, access to claims handling statistics and insights is limited 2. A small team 3. The system only supports a limited number of coverages in MVP phase 4. The claimant will have to give more information upfront making the claims filing process less user-friendly 5. We are an unknown brand compared to competitors 6. Does not integrate with other digital insurance platforms yet

THREATS	OPPORTUNITIES
1. Different claims handling regulations across the European Economic Area 2. There are several all-in-one solutions on the market al.so offering Claims handling solutions for insurance companies 3. Due to legacy systems, new software is difficult for insurance companies to adopt 4. Some users are less competent and not used to using digital systems in some countries	1. Schrems II court ruling, which deems all service providers with headquarters in the USA not compliant with the GDPR. 2. In several European Economic Area countries, such as Estonia, claims handling is very vaguely regulated 3. COVID-19 pandemic has accelerated the adoption of digital solutions, so potential clients are open to digitalising processes

As can be seen in the "strengths" cell of the table the company's strengths are the configurability of the system, a strong and experienced team, compliance with GDPR post Schrems II [56] and pre-existing relationships with some potential future customers (insurance companies) in the Estonian, German and British markets. The main weaknesses are that this software is being developed largely without access to claims handling related statistics in terms of time and resources needed as this is considered a trade secret. As the author does not yet have contractual relationships with any future customers this data is not shared. Further weaknesses are the team being small and the brand being unknown and therefore potentially not as trusted as some competitors. Also, the first MVP of the software has limited support for insurance products and integrations.

The biggest threats are that claims handling is regulated differently from country to country in the European market, which could mean that each market may need some customer support. Another threat is that there are several all-in-one digital insurance platform providers on the market that also offer claims handling functionality and many of these platforms lack API support making new software expensive to adopt, which could make sales more difficult. Additionally, the competence to use web-based services varies across markets and customer segments, which could mean that a web-based claims filing form could prove too difficult for them to use.

As for opportunities the Schrems II ruling has created an opportunity for new entrants to the market by reducing competition as many US-based service providers are no longer compliant. With COVID-19 accelerating the rate at which digital services are being developed or adopted as physical contact became impossible, new market entrants could have an easier time finding customers. Lastly, claims handling is regulated very vaguely

on the European level, which makes it possible to offer innovation such as automation and the use of Artificial Intelligence in markets that have also not regulated claims handling very strictly.

After SWOT the author conducted a TOWS analysis as an extension of the previous. The results of this can be seen in Table 12. The TOWS analysis helped the author find opportunities through pairing the insights found in the SWOT analysis in order to see further business opportunities.

Table 12. The TOWS analysis results based on the findings from the SWOT analysis.

	OPPORTUNITIES (O)	**THREATS (T)**
STRENGTHS (S)	SO 1. Since many strong competitors are headquartered in the USA, it is a good opportunity to enter the market to fill the gap that the Schrems II ruling left with these competitors no longer being compliant. 2. With the claims processes being vaguely regulated in many EU countries, it provides an opportunity to apply automation to its maximum extent to improve operational capabilities 3. Since COVID-19 has accelerated the adoption of digital solutions and the Claims Handling SaaS offers the possibility to configure processes according to the needs and capabilities of the customer (insurance company), it is an opportune time to convince the potential customers to switch from manual to semi-automated or automated claims handling.	ST 1. Configurable processes are adaptable to the regulatory requirements that vary from country to country across the European Economic Area. 2. Standardized and automated claims processes make claims handling more transparent for claimants and may encourage more trust in the fairness of decision making. 3. For companies whose legacy systems or old service providers are not compliant post Schrems II ruling, it is an opportunity to switch to a GDPR compliant service provider

	OPPORTUNITIES	THREATS
WEAKNESSES (W)	WO 1. Because the Claims Handling SaaS platform does not have integrations with digital insurance platforms yet, future service providers can be chosen carefully and GDPR compliance will be retained.	WT 1. Due to a small team only the most valuable functionalities will be prioritized and built 2. Due to the MVP phase not supporting many product lines yet it is possible to take regulations in different countries into account making development plans for future scopes.

Both, tables 11 and 12 show that the organization and the product both have a larger number of strengths and opportunities at their disposal. The author concluded therefore that the maxi-maxi strategy would be the most appropriate to use in this case. This means that the company should seize the opportunity of relatively low competition in the market and concentrate on markets where regulation allows for claims automation to the fullest. The maxi-mini strategy can also be applied by concentrating on the configurability of the software to make up for the possible regulatory obstacles and by making sure the software stays compliant. Additionally using the fact that a customer may be using legacy technology to strengthen our sales pitch.

8 Business analysis

In the following chapter the author mapped and described the stakeholders of the projects as well as the business requirements. They also mapped and analysed the AS-IS processes based on the information they collected from the interviews conducted with claims handlers and described the improved TO-BE processes, business rules and requirements. Finally, the author described the motivation model and capabilities needed in order to provide services on the market. Based on the results of this chapter the author will create a design prototype of the solution.

8.1 Motivation view

The following describes the Motivation view of the organization that will develop and distribute the Claims Handling SaaS. The motivation view can be seen in Figure 11. The colours of arrows used in the figure are purely decorative and serve the purpose of making the source and destination of each arrow visually easier to detect.

The figure 11 contains the motivation and strategy elements describing the stakeholders, drivers, assessments, goals, outcomes, courses of action, capabilities and resources needed for the company of the Claims Handling SaaS company. This company does not yet exist but will be set up according to the motivation view shown in Figure 11.

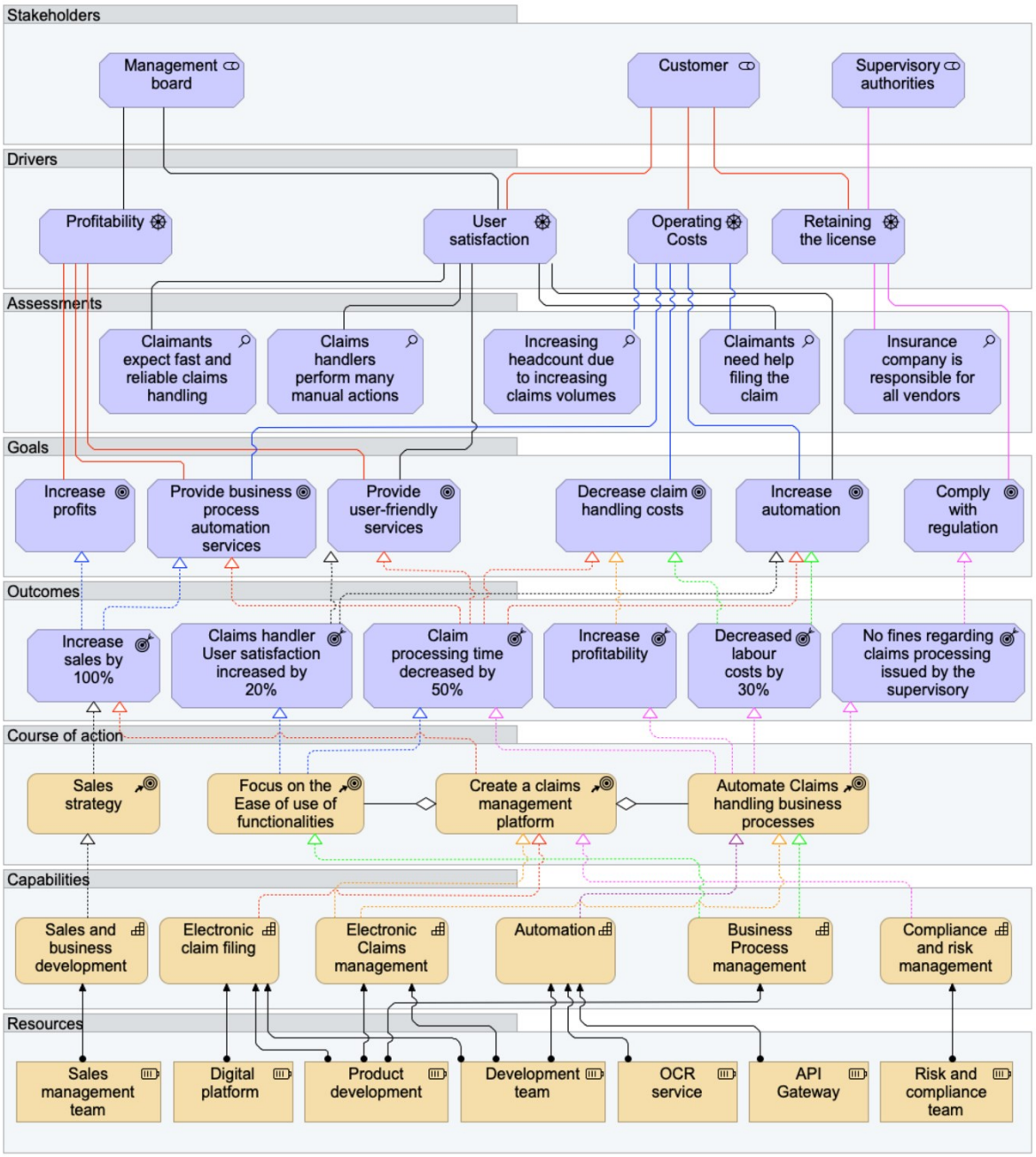

Figure 11. The Motivation model of the organisation that will be developing and distributing the Claims Handling SaaS (by author).

It is important to note that since the company that will be developing the Claims Handling SaaS will be a service company, then the customer (insurance company) as a stakeholder plays an important role in the motivation view. The company will only be successful if it can successfully provide or improve the customer's claim handling capability through automation.

The motivation view depicts three stakeholders – the management board of the Claims Handling SaaS company, the "customer" which signifies any kind of company operating

in the insurance field and providing claims handling services and the Supervisory authorities on the European level (EIOPA) or on the national level. The main drivers for the management board are the profitability of the company and the satisfaction of the users using the software. The customer also has user satisfaction as a driver, and it signifies both the claims handlers as users as well as policyholders who may want to file a claim. Operational costs are only a driver for the customer since high operational costs are significantly impacting their profit margins. Operational costs are currently not an issue for the Claims Handling SaaS company, because the founders plan to keep the operational costs low. Retaining the license is also an important driver for the customer as well as the supervisory authorities who are responsible for issuing and revoking the licenses according to whether the insurance company adheres to the regulation or not.

The goals for the Claims Handling SaaS are increasing profits, which is realized by 100% increase in sales after the launch of the software as well as providing business process automation services, which is realized by a decrease in claims processing time by 50%. Finally, providing user-friendly services is a goal shared by both the Claims Handling SaaS company and the customers. It is also realized by a decrease in processing time by 50%, but also the claims handler satisfaction increase by 20%.

The goals on the customer's side with the aim of improving their services are decreasing claim handling costs, which is also realized by a decrease in processing time, but also an increase in profitability as well as a decrease in labour costs by 30%. The goal of increasing automation will result in an increase in claim handler satisfaction, a decrease in claims processing time and a decrease in labour costs. The goal of complying with regulation will be realized when no fines regarding claims processing will be issued. It is important to note that the goals as well as the outcomes are aligned with the balanced scorecard, however the motivation model does not depict all the goals. The final list of goals is conveyed in the Balanced Scorecard.

The strategic actions that will help realize the mentioned outcomes are a sales strategy in order to start distributing the new software, a focus on the ease of use of functionalities, which is a part of creating a claims management platform, which in turn also allows for automation of claims handling processes. The capabilities needed are a Sales and business development team in order to promote and sell the software. Electronic claim filing and claims management capabilities are also of utmost importance as paper-based manual

processes need a different approach for automation. Automation itself is a capability needed, as well as business process management capabilities along with compliance and risk management. The resources listed in the strategy layer will mostly be provided through internal resources. The Optical Character Recognition (OCR) service resource, however, will be outsourced.

8.2 Capability mapping

In this chapter the author describes the capabilities that the company needs in order to successfully develop and distribute the Claims Handling SaaS to the market. All the capabilities shown in Figure 12 are currently missing as the company is not yet established.

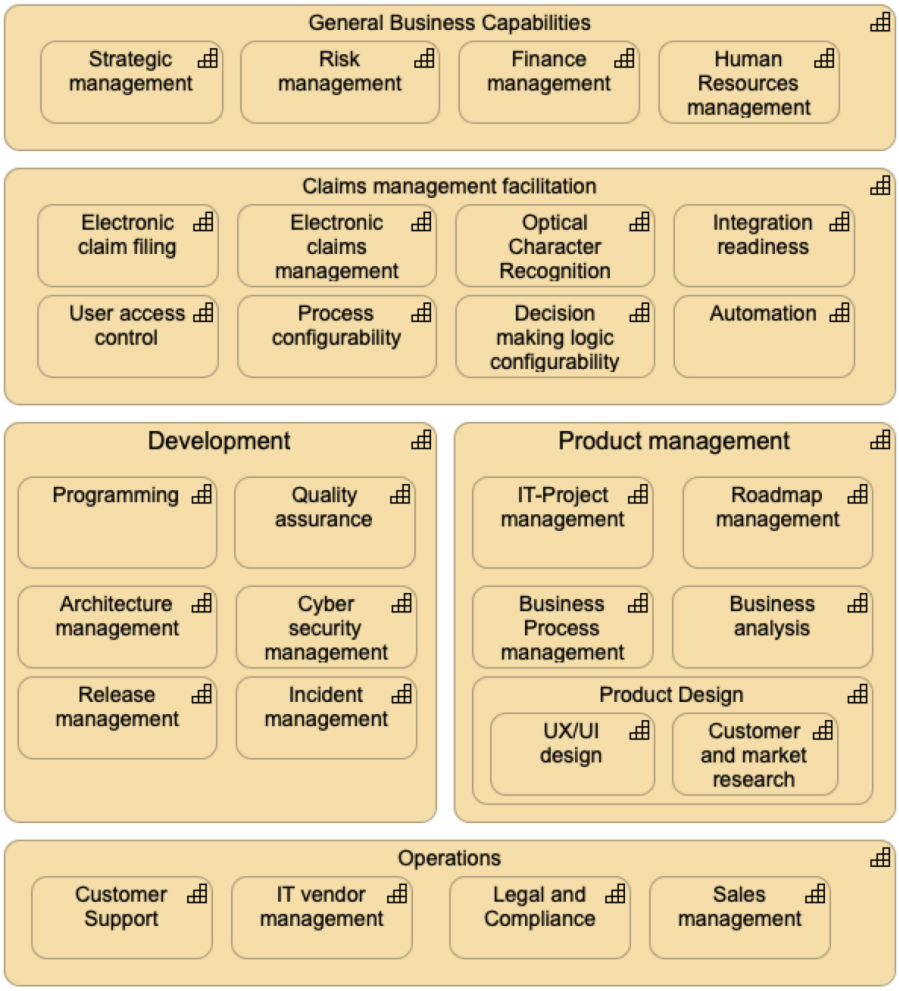

Figure 12. The mapping of capabilities needed in order to develop a Claims Management SaaS, distribute and sell its services and maintain the platform (by author).

In order to be able to develop the Claims Handling SaaS the company needs certain general and operational, development and product management capabilities that are brought out in Figure 12. The author would like to bring out the claims management facilitation capability. This is essentially the core of the company's value offering – it does not offer claims management services but helps conduct the claims management processes in a faster, more streamlined way. In order to be able to do this there needs to be electronic claim filing and claims management capabilities, which allow for machine readable data to be entered into the system through the first notice of loss form and then the claims data to be stored in an electronic format. Optical character recognition capability is needed in order to convert data from images into a machine-readable format. Integration readiness is needed for API integration with contract and policyholder management systems in order to request policy-related information from the insurance company's databases. User access control capability is necessary in order to restrict different users from accessing information and functionality that should be restricted to their user account type or security level. Process and decision-making logic configurability is needed as different customers will have a different risk tolerance as well as processing logic and they will need to therefore be able to set the processes and rules up according to their needs. Finally, there needs to be a capability for automating whole processes or parts of processes in order to reduce the time and effort needed to process one claim.

8.3 Balanced Scorecard

The balanced scorecard allows to view the business from four different perspectives – the financial, customer (insurance company), internal process and learning perspectives. Using the balanced scorecard as a strategic tool will help the company keep in mind not only the financial goals, but also the customer perspective, which describes the value that the services provided should bring to the company's end-customers, the internal processes and learning in order to keep improving to provide better services. The goals and measurements depicted in Table 13 are aligned with the goals shown on the ArchiMate motivation model. Each goal has one or more strategic objectives under it in order to help achieve each goal.

Table 13. The Balanced Scorecard for the Claims Handling Software as a Service (by author).

	Goals	Strategic Objectives	Measurements	Year 1 target	Year 2 target	Year 3 target
Financial	Increase profits	Increase the number of customers (insurance companies)	Number of paying customers	3	10	20
	Increase profits	Keep costs from increasing by keeping the team small	Number of employees	3	6	15
	Increase profits	Increase the number of insurance product claims processes supported	Number of insurance products supported by the software	1	3	6
	Increase profits	Increase revenue	Increase in revenue compared to the previous year (%)	100%	30%	50%
Customer (insurance company)	Provide user-friendly services	Provide an intuitive and simple claims management user interface	Increase of NPS score from users who are claims handlers compared to their previous tools	20%	30%	40%
	Provide user-friendly services	Provide an intuitive and simple claim filing form	NPS score from users who are filing a claim	10	30	40
	Automate Business Processes	Decrease the time it takes to handle one claim	The time it takes to process one claim in min (%)	50%	60%	80%
	Reduce claim handling costs of insurance companies	Increase the number of claims that can be handled fully automatically	Claims handled without the need for an intervention from a human (%)	30%	50%	80%
	Reduce claim handling costs of insurance companies	Keep the claims handling teams from having to increase in size	The percentage by which the claims handling team decreases (%)	≥1%	≥10%	≥30%

	Goals	Strategic Objectives	Measurements	Year 1 target	Year 2 target	Year 3 target
	Comply with regulation	Avoid fines issued by the supervisory authority regarding automated claims management	Fines per year	0	0	0
Internal Processes	Establish internal processes	Create and document internal processes and policies	Percentage of internal processes documented in policies	50%	100%	100%
	Improve internal processes	Improvements made on internal processes	Percentage of processes improved	30%	30%	30%
	Comply with regulation	Make sure the company complies with regulation	Number of regulation reviews per year	1	2	3
	Manage risks	Map and mitigate risks	Risk workshops per year	1	2	2
	Improve teamwork	Improve teamworking skills and methodologies	Time saved achieving a goal in % compared to previously	10%	10%	10%
Learning	Increasing competencies in innovative technologies	Adopt and implement innovative technologies	New technologies implemented per year	≥1	≥1	≥1
	Increasing knowledge on cyber security	Conducting employee trainings on cyber security	Number of trainings per year	≥2	≥2	≥2
	Increasing competencies on insurance claims handling	Organising trainings to learn more about claims handling	Number of trainings per year	≥2	≥2	≥2

The balanced scorecard considers that the company that will develop and distribute the Claims Handling SaaS has not yet been established. Therefore, targets such as “revenue increase” will show 100% in the first year, because the previous year’s revenue is counted as zero. The first year in this case will set the baseline for the targets in the years to come. The targets will be adjusted after the first year in order to better reflect the reality once the team has gained a year of experience on the market.

The Author has coloured the rows with the goals and strategic objectives that this master's thesis will concentrate on, green. While all of the goals and strategic objectives are important for the Claims Handling SaaS, only the green rows will be looked at in depth in the scope of this master's thesis.

8.4 Stakeholders

In order to clarify the reasoning and need behind the requirements for the Claims Handling SaaS the author listed and described the roles of the stakeholders involved in the project on the claims management process management level. Table 14 depicts all the parties participating in the claims management processes, the description of their interest, their level of influence and their level of interest. The level of interest and influence are assessed of a scale of 2 – high and low. The assessment of levels of interest as well as the role distribution on the insurance company's side are indicative and brought out as an example based on the information from the claims handler interviews. The precise distribution of roles and their levels of influence and interest will be mapped with each new customer separately based on the information they give the author. The list of stakeholders can be seen in Table 14. Then the author mapped the responsibilities of the stakeholders in different stages of claims management using the RACI matrix, which can be found in Appendix 10.

Table 14. The list of stakeholders with descriptions of their interests as well as levels of influence and interest mapped according to the perception of the author (by author).

Stakeholder	**Description of interest and influence**	**Level of influence**	**Level of interest**
EIOPA	EIOPA provides guidelines and regulatory requirements that all European market participants must follow.	High	Low
National level supervisory authority	Some regulation overrides the requirements set by EIOPA due to stricter rules. These are set and the compliance thereof monitored by the national level supervisory authorities.	High	Low

Stakeholder	Description of interest and influence	Level of influence	Level of interest
Insurance company management board	The management board is interested in lowering operational costs in order to increase profit margins.	High	Low
Insurance company's process manager	The process manager is interested in ensuring that all processes reach their goal and that they are optimized.	Low	High
Insurance company's risk manager	The risk manager maps and helps assess additional risks that adopting a new software may bring.	High	High
Insurance company's Security officer	The security officer maps and helps assess the cyber security of the new software.	High	High
Insurance company's Technology officer	The technology officer maps and helps assess the technical viability of the new software and compatibility with the existing systems.	High	High
Claims handler	Is interested in a better, more streamlined and faster way of handling claims.	Low	High
Claims manager	Is interested in a more controlled way of handling claims in order to assure correct claims decisions.	Low	High
Customer support	Is interested in receiving a lower volume of claims related end-customer support inquiries.	Low	Low

Stakeholder	Description of interest and influence	Level of influence	Level of interest
Travel Insurance product manager	Is interested in a better end-customer experience in claims handling for the policyholders of travel insurance.	Low	Low
Insurance company's end-customer	Is interested in fast and fair claims settlement decision.	Low	High
Claims Handling SaaS company's management board	Is interested in long term and profitable relationships with the insurance companies as well as innovating the market of insurance claims handling.	High	High

Based on the list of stakeholders and their levels of influence and interest the author positioned all the stakeholders in the correct cell in the stakeholder matrix as seen in Figure 13, determining the approach with the Claims Handling SaaS team will take towards every stakeholder.

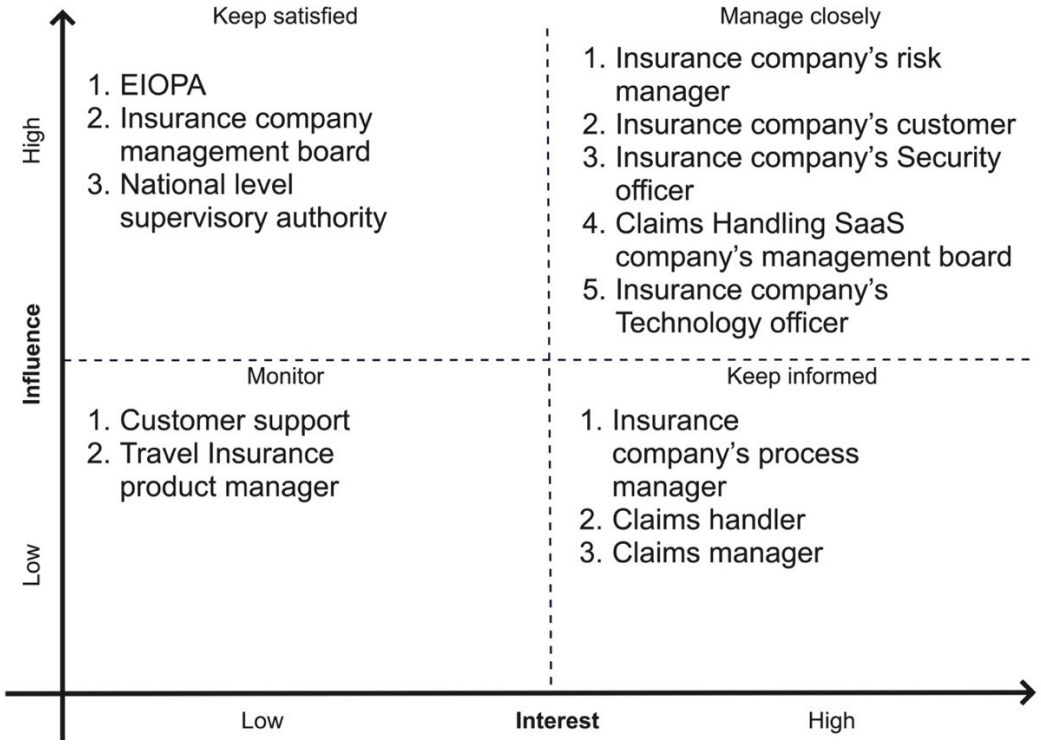

Figure 13. The stakeholder matrix depicting the approach the team should take towards a specific stakeholder according to their level of influence and interest (by author).

According to the stakeholder matrix the closest relationship should be kept with the insurance company's risk manager, security officer and technology officer in order to ensure their support of the project. The insurance company's end-customers should also approve of the solution because the new solution should ensure at least the same level of service towards the end-customers, but ideally even better than before. The Claims Handling SaaS company's management board should also be kept in the loop regarding the progress in the project. EIPOA, the national level supervisory authorities and the insurance company's management board should be kept satisfied based of prior agreements, regulatory requirements or any special requests they may have as without their consent the project cannot succeed.

8.5 Risk mapping results

The author mapped the project risks considering the first, MVP scope of the project. All of the risk owners mentioned in the risk table will be changed into names once the team of the Claims Handling SaaS has been assembled. Below in the table 15 are the top three highest priority level risks based on the author's experience in the field of IT-development and SaaS services in the insurance field. The full list of risk mapping results can be found in Appendix 24.

Table 15. A list of project risks, their impact and probability assessment and priority level with notes in mitigation and responsibilities (by author).

ID	RISK DESCRIPTION	IMPACT DESCRIPTION	IMPACT LEVEL Rate 1 (Low) 5 (High)	PROBABILITY LEVEL Rate 1 (Low) 5 (High)	PRIORITY LEVEL (Impact level * Probability level)	MITIGATION NOTES	OWNER
R1	Scope creep by stakeholders or the development team adding new requirements or tasks without removing any due to new ideas or changes of the circumstances.	The project timeline would increase significantly due to continuous new requirements from future users and customers (insurance companies) pushing the launch date into the far future	4	3	12	- Keeping the original vision and goals in mind - Continuous review and prioritization of the backlog - Continuous assessment of value and effort needed for each backlog item - Continuous validation of new ideas and requirements - Strict deadline, flexible scope	Product Owner

ID	RISK DESCRIPTION	IMPACT DESCRIPTION	IMPACT LEVEL Rate 1 (Low) 5 (High)	PROBABILITY LEVEL Rate 1 (Low) 5 (High)	PRIORITY LEVEL (Impact level * Probability level)	MITIGATION NOTES	OWNER
R4	Insurance companies demand tailor made solutions or changes to the solution	Custom solutions and processes built separately for every insurance company, which would lead to quality issues and to delivery delays.	4	4	16	- Pitch the solution as a standard service - Allow the insurance companies to offer ideas, but do not promise to deliver them - Do not allow	Sales Manager
R6	Inadequate technology choices	The built systems become legacy quickly. It is difficult to find developers for certain programming languages. There is a decline in quality.	3	4	12	- Follow formal best practices guidelines for programming and cyber security. - Make sure that the programming language and platforms chosen are common enough to find competent specialists on the market.	IT Architect

The risks R1 and R6 brought out as the highest priority level are universal in the field of IT development. Scope creep, referring to the situation where additional items being added into the scope after the start of the project extend the timeline sometimes uncontrollably as well as sub-optimal technology choices leading to a quick decline in quality and difficulties finding software developers for example are risks present in almost any software development project. R4 is more specific to SaaS solutions and the development thereof.

8.6 Business Process analysis

In this chapter the author will map and describe the claim filing and the claims management process and its sub-processes according to the descriptions of the claims handlers. The goal of this exercise is to establish a baseline regarding how claims handling is generally done at the time of the writing of this master's thesis. In order to gain a better overview of claims handling both travel insurance claims handlers and claims handlers of other insurance products were interviewed. This was done in order to avoid designing a system that is only able to serve one insurance product (travel insurance) in the long run. The author performed a detailed comparison and analysis of the web-based claim filing processes and also modelled and analysed the AS-IS processes of claims management based on the information collected in the claims handler interviews. Using the processes described by the interviewees the author will create example TO-BE processes. The TO-BE processes will be named "examples", because the order and actions performed in the process steps will be configurable for each insurance product and company individually.

The author wrote this master's thesis as preparation for the development of the Claims Handling Software as a Service (Claims Handling SaaS) which aimed to provide services for several Insurance companies on the market. For this reason, it would have been risky to base this analysis on just one insurance company's needs as the system may not have come out flexible enough to accommodate the needs of others. Therefore, the author decided to base this analysis on interviews with anonymous former claims management and insurance professionals as well as publicly available information about the services of three insurance industry market participants.

The author selected Travel insurance providers from the Estonian market - ADB Gjensidige Estonia, If P&C Insurance AS, and Swedbank P&C Insurance AS - due to the reason that the author had access to most information about these companies through public information and personal experience as a customer. The author excluded additional travel insurance cover entirely as this is out of scope. The author only included the terms and conditions that affect travel cancellation, interruption and delay coverages as all other coverage types are out of scope. The mentioned companies were not involved in any active way in the writing of this master's thesis.

8.6.1 Claim filing process

The claim filing process (also known as the First Notice of Loss or FNOL) is one of the core business processes in insurance. It is essential for providing insurance services since it is the only way that a policyholder can request for the insurance company to cover their losses in case of an incident. The claim filing process is in this case used by the customers of the insurance companies in order to notify the insurance company of an incident that has occurred and a loss that was suffered. Based on the information submitted in the claim that is filed the insurance company's claims handlers will make a decision as to whether the insurance company will cover the loss that was suffered, or it is not covered in the insurance policy.

In the case of ADB Gjensidige Estonia, If P&C Insurance AS and Swedbank P&C Insurance AS the travel insurance claims filing process (Appendix 11), can be done via a web-based form. While they all request similar information, the process structures are quite different. The author decided not to model the AS-IS claim filing processes since the goal of this master's thesis is not to improve the process of any one company, but to suggest a general standard process as an example. Modeling and analysing each company's process would in the author's opinion draw attention to the processes of individual companies instead of allowing a general overview. The author found it relevant to compare the data requested in each of the claim filing processes instead. The comparison can be seen in Table 16.

Table 16. Comparison of information required and the types of fields in the claim filing forms of three insurance companies (by author).

Information required on the claim filing form (column below)	**ADB Gjensidige Estonia**	**If P&C Insurance AS**	**Swedbank**
Is logging in mandatory?	No	Yes	Yes
Classification of the claim	Yes, travel insurance	Yes, travel insurance	No
Classification of the loss	No	Yes, radio buttons	No
Description of loss	No	No	Yes
Name of reporter	Yes, text field	No, automatically filled	No, automatically filled

Information required on the claim filing form (column below)	ADB Gjensidige Estonia	If P&C Insurance AS	Swedbank
ID code of reporter	Yes, text field	No, automatically filled	No, automatically filled
Telephone number of reporter	Yes, text field	No, automatically filled	Yes, text field
E-mail of reporter	Yes, text field	No, automatically filled	Yes, text field
Role of reporter	Yes, radio buttons	Yes, "myself" or can add others	Yes, radio buttons
Policy number	Yes, text field	No	Yes, but no validation
Date of incident	Yes, calendar field	Yes, calendar field	Yes, calendar field
Time of incident	Yes, text field	No	Yes, time field
Country	Yes, text field	Yes, auto complete text field	Yes, dropdown
Place	Yes, text field	No	Yes, text field
Reason of incident	Yes, text field	No	No
Description of incident	Yes, text field	Yes, text field	Yes
Documents	Yes, with general instructions to upload all related files	Yes, with general instructions to upload all related files	No, instructions to send all documents to an e-mail address
Recipient of the settlement	Yes, text field	Yes, radio buttons	Yes
IBAN	Yes, text field	Yes, text field	Yes, dropdown and free text field
Amount of loss	No	Yes, in EUR	Yes
Currency	No	No	Yes
Bank name	No	No	Yes, text field
Notifications sent to other organisations	No	No	Yes
Additional information	No	No	Yes, text field

Whereas all the data required in the claim filing forms (depicted in Table 16) is undoubtedly necessary, something that was also brought out in both the Jobs to be Done workshop as well as claims handler interviews was that often the claims form is not able to collect all the necessary data for making the settlement decision. The travel insurance customer survey also brought out that over 70% of the claimants received follow-up e-mails requesting additional information after the claim had been submitted. The author would like to point out two aspects of the claim filing forms that could be improved. The first aspect is that all the forms have one or more fields that ask the claimant to explain in free text format what the incident was. None of the free text fields instruct the claimants on the level of detail in which the incident should be described. This could mean that some of the claims filed have enough information, others may lack detail and would require for the claims handler to get into contact with the claimant, which would take extra time.

The second aspect is that the file upload or e-mail instructions do contain examples of documents that should be submitted but leave it up to the claimant if they do so and which documents. This could also mean that the claims handler might need to contact the claimant to ask for extra documents.

8.6.2 AS-IS claims processes

As can be seen in Figure 14, after the claimant has filed the claim, the process continues with the claim being added to the claims backlog of the claims team where a claims handler competent at handling travel insurance travel interruption claims will pick it up, assign it to themselves and review the information.

The “Review the information” sub-process can be viewed in Appendix 12. Its goal is to review the information, assess whether all of the information and documents relevant to the claims decision has been acquired and analysing the contents of the information and documents submitted by the claimant. This is done by reading the free text description of the incident written by the claimant and checking whether there is any indication that the case could fall under any of the exclusions brought out in the relevant version of the general terms & conditions of the company or the product terms & conditions that were in force during the time that the policy was sold.

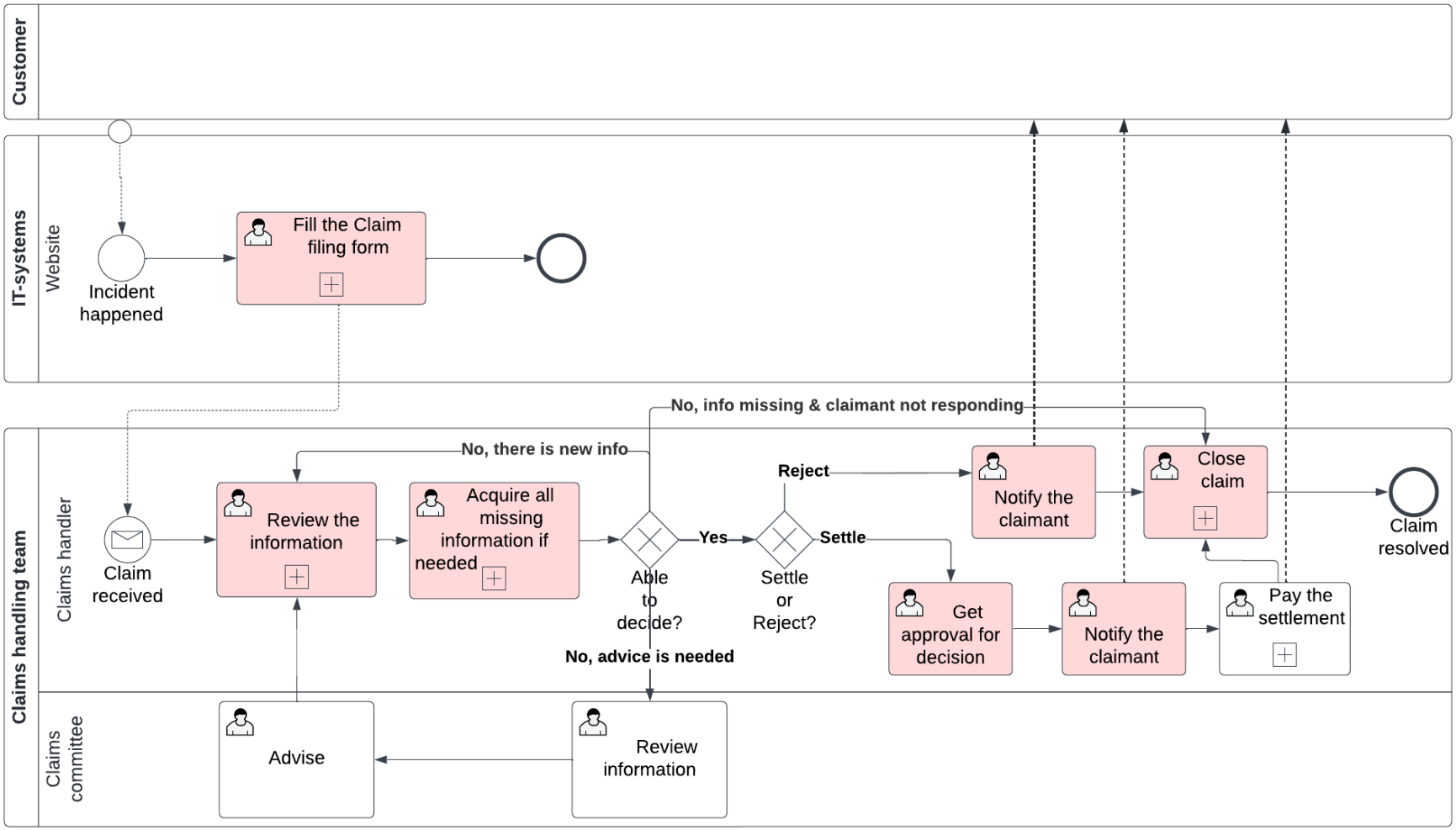

Figure 14. A high-level depiction of the claims process starting from the First Notice of Loss and ending with closing the claim. Process steps marked in the colour red will be improved in the TO-BE process (by author).

The claims handler opens the attached documents one by one in order to check the following:

1. The policy document is checked to determine whether the coverage was valid during the time of the incident. This includes whether the policy was purchased at least 72h before the incident as the coverage comes into effect 72h after the time of purchase as well as the geographical location of the incident and whether the policy covers this region. It is also checked whether the policy has been paid for and there is no debt. In case one of the abovementioned criteria does not match, the claim is rejected without further processing.
2. According to the type of loss that the claimant suffered, check if all of the required documents such as invoices, booking confirmations, the airline's confirmation about a cancelled or delayed flights, confirmation of a cancelled event which was the reason for travel, doctor's note about an illness, photos or else. In case any necessary information is missing, it should be noted that the info needs to be acquired from the relevant party.
3. Determine if the trip was paid for in full or there is a part yet to be paid.
4. It is checked if the suffered loss sum can be covered fully by the policy or only partially, because the policy is bought to cover a smaller loss.
5. It is also checked if the person filing the claim is the same person as the policyholder. If not, then there should be proof that the person filing the claim is mandated to do so.

The "Assess the submitted documents" sub-process diagram can also be viewed in Appendix 12. After checking the submitted documents, the claims handler also checks all the documents and information for signs of fraud. According to the interviewees this is sometimes done also by checking a so called "blacklist" of end-customers, which is a list of private individuals who have been caught committing fraud.

The following claims management process step "Acquire all missing information", which can also be seen in Appendix 12, requires for the claims handler to ask the claimant for additional information or documents. The need should arise during the previous step, while the claims handler was reviewing and assessing the already submitted information and documents. Considering, however, that the claims filing form does not set strict requirements or have in-depth instructions regarding the kind of information that should be covered in the claim, it is likely that the claimant needs to be contacted. Additionally,

in case of flight delays or cancellations the claims handler must ask the airline for confirmation. All of this communication is done via e-mail or phone conversations initiated by the claims handler via a regular e-mail client. Some claims handlers had premade templates that they used as a basis for these e-mails. None of the claims management systems that they used support automatically triggered claimant notification e-mails regarding extra information being needed.

After acquiring and reviewing all the information, if the claims handler is unable to make the claims decision, they have the opportunity to present the case to a claims committee who will give advice. Ultimately it is up to the claims handler to make the claims decision according to the terms & conditions that apply to the policy, the predetermined claims decision guidance (sometimes also called the decision tree) and the guidance of the claims committee. Once the decision to settle the claim or reject it has been made, some claims handlers explained that in case of a settlement decision they need to apply "the four-eye principle" meaning that either a manager or a peer needs to review and approve their decision. Once the approval has been received in case of both a rejection decision and a settlement the claimant needs to be notified of the decision. In case of a rejection the decision must also contain the reasoning and the exclusions or other points in the Terms & Conditions document that led to the rejection decision. In case of the decision to settle, the necessary information needs to be prepared such as the claimant's name and IBAN, the settlement sum and other payment details, which should then be conveyed to the finance department in order for the settlement to be paid out to the claimant.

Once the claimant has been notified and the settlement paid out, the claim must be archived and closed (Appendix 12). For this all the information and documents including the e-mail and phone conversations must be organised, saved into 1 folder, which then had to be uploaded in full to a specific location using a specific name format. This, according to the claims handler interviews can take up to two hours per one claim.

Apart from the "Filling the claim filing form" step, all the process and sub-process steps marked in pink contain one or more manual actions that the claims handlers rated very important (rating 4 to 10) and indicated a low satisfaction rate considering the solution today (rating 3, 2 or 1). This means that while claims handlers have digital tools that they use that help them in handling the claim, such as Microsoft Outlook for sending e-mails and Acrobat Reader for displaying PDF documents, all of the actions in these tools still

need to be performed manually. For example, when the claims handler deems that more information is needed from the claimant, they will compile the e-mail separately for every claimant. One claims handler described using e-mail signatures as a type of make-shift macro. So, she chose an e-mail signature from a list of pre-set e-mail signatures and instead of an actual signature it would contain a pre-set e-mail text that she would then send to the claimant. Also, all of the documents have to be searched for, opened and read by the claims handler, which takes time. In conclusion, all the steps marked in pink either need to take less time or a capability needs to be created in order to perform this action automatically. The "Filling the claim filing form" step, however, should be improved in terms of the data that the form prompts for the claimant to include.

8.6.3 Time-spend per one claim

According to the claim handlers' assessments during the interviews the approximate time spent on every claim management process step can be seen below in Table 17 in the "AS-IS time spent on claims process steps" column. To illustrate this, the author used a modified version of the Cycle time efficiency table introduced in the "Automation of Claim processing system" by Hurini, N., et al. [82]. The "TO-BE target time spend on claims process steps" signifies the time spend needed for completing each of the process stages. The time reduction according to the KPIs should be at least 50%. The cells marked in pink is the time spend the improvement of the claims processes aims to impact. Marked in green is the target time spend after the improvements have been implemented. In some cases, the improvement is 100% - these are the steps where automation could potentially eliminate any involvement by the claims handlers.

Table 17. The customer journey is divided into stages, with the duration of each stage measured in time and the participants in each stage mapped. The colour pink signifies the AS-IS process data and the green the TO-BE data of improved processes (by author).

Claims process stage	**Involved parties**	**AS-IS time spent on claims process steps**	**TO-BE target time spend on claims process steps (based on the KPIs)**
Filling the claim filing form	Claimant	25min	25min
Review of the information	Claims handler	15min	0min
Acquiring all missing information	Claims handler	20min	10min
Providing missing information and required documents	Claimant	25min	5min
Reviewing information and advising	Claims committee	30min	30min
Claims decision	Claims handler	10min	5min
Notifying the claimant about the claims decision	Claims handler	5min	0min
Paying the settlement	Accountant	5min	5min
Closing of claim	Claims handler	30min	5min
Total time spend for Claims handler per one claim		**80min** (90min with paying the settlement)	**32min** (42min with paying the settlement)

The AS-IS time estimates presented in Table 17 are approximates that the author calculated as an average based on the information accumulated from 5 claims handler interviews. The interviewees gave the assessments based on their own experience, however since the process does not happen linearly and in an uninterrupted sequence for all claims it is difficult to measure the exact time it takes to complete each step. Because of this the author decided to calculate the average. The number of minutes was rounded up or down to the nearest 10 or 5. The "Acquiring all missing information" step only

applies if there is information missing from the filed claim. However, considering the fact that the claim filing forms do not provide a precise description of what information needs to be presented and based on the travel insurance customer (claimant) research that the author conducted where 72% of claimants indicated that they have to answer follow-up questions or send extra documentation the author assumes it happens more often than not. For this reason, the author will calculate said step into the final time spend.

The author plans to measure the time spent on each claims management step by using a web analytics solution in the future. The TO-BE processes in the Claims Handling SaaS will be measured and monitored on a regular basis.

8.6.4 Claims management annual cost

Considering that the approximate time that it takes to handle one travel insurance claim is 80 minutes, it means that currently one claims handler is able to handle 0,75 claims every working hour. If we take 5% as stated by ABI as the approximate average claims frequency [83] and for example as seen in Table 18 there were 300000 active travel insurance policies sold per year, means that 15000 claims (5% of the active policies) would be filed that year. Considering that one claims handler can handle 0,75 claims per hour it would take 20 000 hours to handle all these claims. Basing the calculation on an example number of 252 working days in a year with weekends and public holidays excluded (annual leave has not been deducted from that number), the fact that one claims handler has 7h of productive working time every day (in a perhaps unrealistic scenario), it would take 11,33 claims handlers to handle the average incoming volume of 60 claims a day within one working day. The reason the author mentions that it might be unrealistic for a claims handler to be productive for 7h is a row is that the claims handling process is not linear. It involves some waiting – for the customer to answer, it involves a lot of tasks switching to handle several claims simultaneously working on one while waiting for a reply for another. Therefore, in reality it probably takes even more time to handle one claim.

The author decided to take the claims handling speed target as one working day based on the travel insurance customer research where the respondents indicated that the acceptable claims handling speed varied between a few hours and 2 days. The author calculated the average and rounded it to 1 day. In reality, including annual leave and sick leave, probably a higher number of employees would be needed.

Table 18. A calculation of Full-Time Employees needed in the claims handling team in order to be able to process incoming claims within 1 working day, taking into consideration the number of active policies (by author).

	AS-IS Travel Insurance claims	**TO-BE Travel Insurance claims**
Active travel insurance policies	300 000 policies	300 000 policies
Claim frequency	5%	5%
Claims per year	15 000 claims	15 000 claims
Working days per year	252 days	252 days
Claims handled per handler per hour	0,75 claims per hour	1,88 claims per hour
Hours spent to handle claims volume (per year)	20 000 h	7 979 h
Full time claims handlers required to handle each claim within 1 working day (7h per day)	11 full-time employees	5 full-time employees
Payroll costs[1] per one claims handler (per year)	€82,329.00	€82,329.00
Payroll costs of all claims handlers needed (per year)	€933,435.37	€372,381.13

Marked in green is the same calculation, only taking into account the improvements made to the process increasing the velocity of claims handling to 1,88 claims handled per hour by one claims handler and reducing the number of employees needed to 5. The annual payroll costs for the employer, calculated according to the German market, which was data available to the author, also show a significant reduction.

8.7 Claims decision making

The goal of the claims management processes is to decide whether a claim should be rejected or settled. In order for the TO-BE processes not to lose sight of this goal the author deems it extremely important to understand the inputs needed for the decisions

[1] According to a salary search on www.glassdoor.com the average claims handler gross salary per year in Germany is 68 430 EUR per year. According to https://www.icalculator.info/germany/cost-of-employee-in-germany-calculator.html the Payroll costs for the employer would be 82 329,55 EUR.

that need to be made in order to reach the final settlement or rejection decision. In the following chapter the author will analyse the terms and conditions applicable to the travel insurance product and the decision-making logic derived from the documents. The author will then create a decision requirements diagram (DRD) using the Decision Model and Notation standard and analyse the current decision-making logic.

8.7.1 Content analysis of Travel Insurance Terms and Conditions

In order to better illustrate the decision-making logic, the author decided to analyse and standardise the rules conveyed in the Terms and Conditions documents of travel insurance products available on the Estonian market. As the decision-making logic and the connected internal documents are a trade secret in insurance companies, the interviewees were not able to give any information about it. However, the decisions on standard claims cases are made fully based on the general terms and conditions and the travel insurance terms and conditions documents. Therefore, the author decided to use the terms and conditions of the three previously mentioned Estonian insurance companies – ADB Gjensidige Estonia [84], [85], If P&C Insurance AS [86] and Swedbank P&C Insurance AS [87] – as an example for the AS-IS decision model.

The Terms and Conditions of ADB Gjensidige Estonia [84], [85], If P&C Insurance AS [86] and Swedbank P&C Insurance AS [87] were analysed with the goal of understanding how the different companies handle claims management decision. Each company had worded and structured their respective terms and conditions documents differently, which made comparing them and drawing conclusions difficult. Therefore, the author decided to merge all three company's terms and conditions into a standardised format in order to test if any more than one differently structured Terms and Conditions documents can be restructured into a standard format. The test was successful.

The author created two tables of rules combining all three companies' terms and conditions – stating what kind of coverage is provided to the policyholder and under which conditions. The list can be found in Appendix 4. The author then came up with a standardised format in which the claims settlement rules will be worded to increase understandability and readability. The claim settlement rules will be worded in sentences using the pattern (with just one of the choices in brackets being entered into the final sentence):

1. **In case of conditional coverage**: “In case of [cancellation or delay] of the [Insured Person’s or another person’s] trip [before or after] it had started, in case the loss was caused by [what caused the loss, specification of the cause] the claim will [be settled or be rejected] and therefore the loss [will or will not] be reimbursed.”
2. **In case of exclusions**: “In case of [what caused the loss], [specification of the cause] the claim will not be settled and therefore the loss will not be reimbursed.”

The following are example lists containing just three points of the claims settlement rules constructed based on the Terms and Conditions documents of all three companies. The points contradicting each other were removed by the author. The lists include descriptions of situations that are covered by the insurance and exclusions that the travel insurance policy does not cover. The full lists can be found in Appendix 15.

The first three claim rejection rules (hereinafter “general exclusions”) as an example – as stated by the General and Product Terms and Conditions of ADB Gjensidige Estonia [84], [85], If P&C Insurance AS [86] and Swedbank P&C Insurance AS [87] – if one of the exclusions applies, the claim will be rejected:

1. In case of a loss caused by nuclear energy, chemical or biological weapons, electromagnetic fields or any other form of radioactivity, radiological, toxicological or explosive properties of the substance the claim will not be settled and therefore the loss will not be reimbursed.
2. In case of a loss caused by war, terrorism, disturbances, or insurrection the claim will not be settled and therefore the loss will not be reimbursed.
3. In case of a loss caused by a strike or work stoppage, the claim will not be settled and therefore the loss will not be reimbursed.

The first three Claim settlement rules (hereinafter “coverage conditions”) as stated by the Travel Insurance Terms & Conditions ADB Gjensidige Estonia [84], [85], If P&C Insurance AS [86] and Swedbank P&C Insurance AS [87] – those that are settled will be reimbursed, those rejected will not be reimbursed):

1. In case of **cancellation** of the **Insured Person’s** trip **before** the trip because of **sudden illness, injury or death of the insured person** the claim will **be settled** and therefore the loss **will** be reimbursed.

2. In case of **cancellation** of the **Insured Person's** trip **before** it had started, in case the loss was caused by **Life-threatening condition or injury** the claim will **be settled** and therefore the loss **will** be reimbursed.
3. In case of **delay** of the **Insured Person's** trip **after** it had started, in case the loss was caused by **technical malfunction of the vehicle lasting over 24h** the claim will **be rejected** and therefore the loss **will not** be reimbursed.

8.7.2 AS-IS decision model

Based on the contents of the general and travel insurance terms and conditions and the information collected during the claims handler interviews as well as the analysis conducted on the claim filing and claims management processes, the author created the simplified decision requirements diagram using the Decision Model and Notation standard in the figure 15 below.

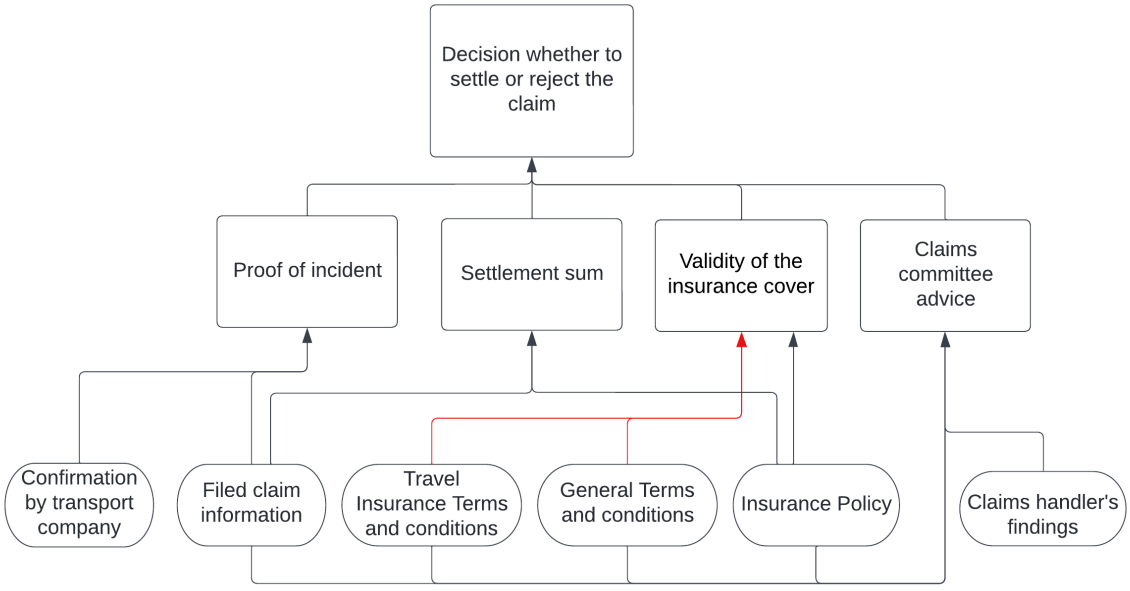

Figure 15. The simplified decision requirements diagram of the decision whether to settle or reject the claim (by author).

As can be seen in Figure 15 in order to make the final settlement or rejection decision about the filed claim several sub-decisions need to first be made. Proof of the incident is established through the information and documents conveyed through the filed claim. It is important to note that different kinds of incidents require different sets of documents to be presented to the insurance company, which can be seen in the AS-IS decision model in Appendix 14. In some cases, the incident needs to also be confirmed by the

transportation company directly to the claims handler. The settlement sum is calculated based on the extent of loss suffered due to the incident. This is also information from the filed claim documents and the maximum coverage stated in the insurance policy.

The validity of the cover during the time of the incident is determined by the purchase date and the expiry dates of the insurance policy, but also by the risks that the insurance policy covers. General terms and conditions and travel insurance terms and conditions are also documents that help determine the validity of the insurance cover. In case the claims handler is not able to make the decision on their own, a claims committee consisting of senior insurance field specialists is assembled. They will review the information as well as the claims handler's notes and give advice on the decision. Once all the necessary decisions have been made based on the existing information, the claims handler will make the final decision to settle or reject the claim. It should be noted that the data input and decision relationship marked in red will be improved in the TO-BE decision model.

8.8 Business requirements

The following business requirements were collected through stakeholder research and interviews and the competitor analysis. Considering that the Claims Handling SaaS aims to be a service company, the business requirements cover not just the change that will take place on the market with the entry of this new service provider, but also the general points essential to operating in a competitive manner. The business requirements cover the MVP phase of the company and will be developed further in future scopes. The busines requirements list can be viewed in Table 19.

Table 19. The Business Requirements of the Claims Handling SaaS (by author).

ID	Business requirement
BRQ1	Must be flexible enough to be able to service the needs of several insurance companies handling travel insurance claims.
BRQ2	Must allow each insurance company to configure their own claim filing forms and claims management processes.
BRQ3	Must offer low-code claim filing form configuration.
BRQ4	Must allow claim filing.

ID	Business requirement
BRQ5	Must offer no-code business process automation.
BRQ6	Must allow claims management.
BRQ7	Must allow claims decision making.
BRQ8	Must offer the possibility for the admin user to choose which automation functionality is turned on, which off.
BRQ9	Must be user-friendly and secure for the users.
BRQ10	Must offer localisation in order to be able to offer services on multiple markets.
BRQ11	Must allow for market-based modifications to be made when needed.
BRQ12	Must be configurable to adhere to the requirements of the insurance company's Corporate Visual Identity.
BRQ13	Must allow integration with customer support platforms, e-mail platforms, SMS sending services, Claims management platforms and Digital insurance platforms.
BRQ14	Must be developed in a sustainable way according to best practices and using technical solutions that are able to endure for at least 3 years not becoming legacy.
BRQ15	Must be able to store, back-up and restore all data.
BRQ16	Must offer all functionalities also in the form of APIs so that the system and functionalities could also be integrated into a pre-existing system.

The point BRQ3 and the term "low-code" is derived from the requirement that each insurance company's claim filing form needs to follow the guidelines of their Corporate Visual Identity. Therefore, while the claim filing form's fields and process logic should be configurable with no programming needed, the styling would need to be done through adding CSS code for styling.

The point BRQ16 is a capability needed due to the fact that many insurance companies are already using a claims management system and do not wish to switch to another. By integrating Claim Handling SaaS with their existing system through APIs they could either ease the switch doing it step by step or just use the specific functionalities of the Claims Handling SaaS that are relevant to them.

8.9 Functional requirements

The functional requirements were derived from the claims handler interviews, the Jobs-to-be-done workshop and prioritisation exercise, the travel insurance customer survey results, the AI governance guidelines by EIOPA [57], GDPR [53] and the competitor analysis. The author also researched market trends regarding insurance claims related improvements introduced in articles such as by Sault, T. [88] and KPMG [89]. The author prioritised the functional requirements using the MoSCoW method. The first criteria that the author took into consideration when prioritising the requirements was the "Opportunity score" calculated in the Jobs-to-be-done exercise where the claims handlers assessed "Importance" and "Satisfaction" of the suggested improvements. As a second aspect, the author took into consideration the security and regulatory aspects, which were mostly prioritized as "must have". Thirdly the author validated the set priorities with 2 claims handlers and 1 insurance professional. The author decided that the first scope – the MVP of the project – would realise the "must have" priority level functional requirements. The "should have" and "could have" will be considered and reprioritised in the future scopes.

The functional requirements were written in the format of user stories as Agile Business [90] suggests that such a format helps to ensure that "each requirement is captured in a feature-oriented, value-oriented way, rather than a solution-oriented way." Wang, X. [91] that the user story format is one of the most widely used requirements representation. The functional requirements displayed in Table 20 are some of the highest (must have) priority requirements. The full list along with the source material reference where the requirement is derived from as well as the type and ID can be viewed in Appendix 16.

Table 20. The condensed list "must have" priority functional requirements (by author).

ID	Functional requirement
FR21	As the person responsible for the claims filing process at the insurance company, I want the claim filing process to dynamically only display the questions relevant to the user according to the answers they have already given so that the claimant would provide all the necessary information, but not be asked for too much information.
FR28	As a claims handler at the insurance company, I want it to be possible to automatically determine if the policy cover was valid during the incident so that I would save time.

ID	Functional requirement
FR30	As a claims handler at the insurance company, I want it to be possible to receive automatic decision suggestions or decisions based on the information in the extracted Policy, documents and Terms and conditions so that it would save time and effort and provide consistently the same decisions for similar cases.
FR38	As a claims handler at the insurance company, I want it to be possible to automatically extract info in image and PDF files to make it viewable on the user interface of the claim management system without opening the file so that I would save time and effort searching for, opening the documents and copying the contents from the documents into the claims management system.
FR42	As a claims handler at the insurance company, I want it to be possible to automatically determine the final settlement sum taking into consideration the loss suffered and the maximum coverage. So that I would know how much the settlement payout would be.
FR53	As a claims handler at the insurance company, I want to be able to generate and send the claimant the claims decision e-mail so that they would be informed about the decision.

The author will base the TO-BE claims management processes, the design mock-ups as well as the architectural vision and the roadmap on the functional requirements listed above as well as the software product quality requirements.

8.10 TO-BE decision model

The TO-BE decision model shown in Figure 16 remains largely the same as the AS-IS version as the information and sources that the decisions are based upon remain the same. The full detailed version of the decision model can be viewed in Appendix 14, which depicts all of the data details needed to make each of the sub decisions leading up to the final decision to settle or reject the claim. The changes made in the decision models are the two business knowledge models “exclusions” and “coverage conditions” marked in green, which were added as new elements. The business knowledge models were created based on the analysis and restructuring that the author did working with the general and travel insurance terms and conditions. The “Claim rejection rules” and “Claim settlement rules” introduced in chapter 10.7.1 and viewable fully in Appendix 15 are what will guide the “validity of the insurance cover” decision, contributing also into the final claims settlement or rejection decision. Should any of the exclusions apply the claim will automatically be rejected for example.

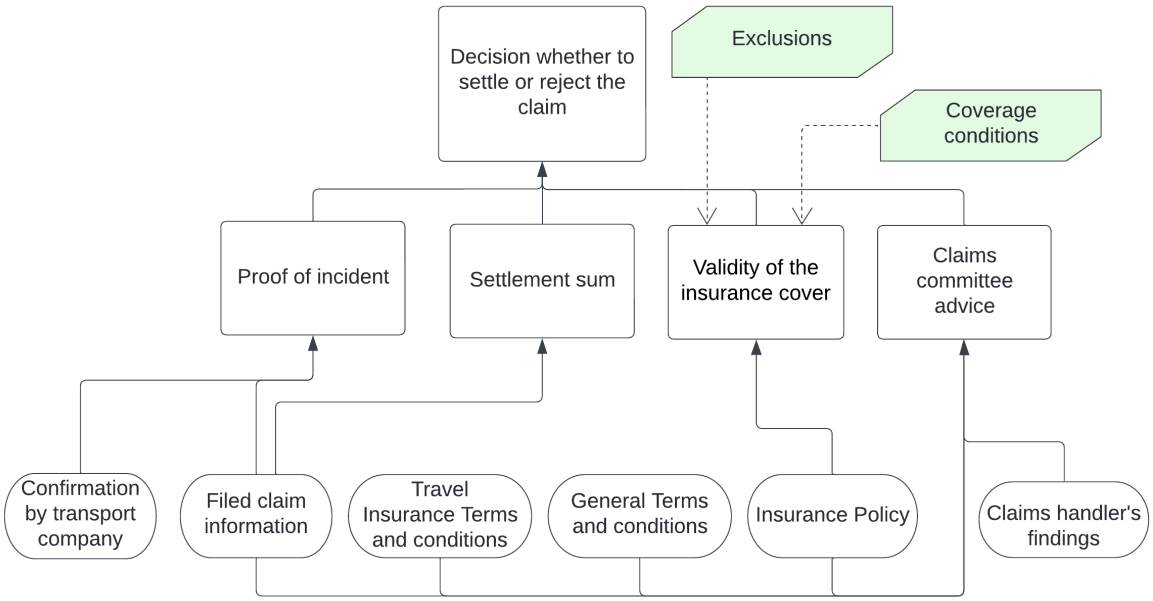

Figure 16. The TO-BE decision model created using the Decision Model and Notation with the new elements highlighted in green (by author).

The decision whether any exclusions apply, and which coverage conditions apply (which are viewable as a full list in Appendix 4) can already be made as early as during or right after the claimant had filled the claim form. The business rule task type signifies this action in the claim filing process diagrams, and it also signifies the list of exclusions and coverage conditions displayed to the claims handler in the "TO-BE Review the information" step of the claims management process.

The transition from decision making based on terms and conditions to a business knowledge model based one serves the purpose of standardising the way terms and conditions are stored and processed in an information system making it possible for the IT system to acquire the information independently and display or use the relevant rules in decision making rather than the claims handler having to find the relevant rules from the terms and conditions and analyse them, which is time consuming. Standardising the business rules derived from three different company's terms and conditions also helped the author validate that it is possible to fit terms and conditions written and structured in very different styles into the same format.

8.11 TO-BE Processes

While the general claims management TO-BE process logic and sequence of steps that can be seen in Figure 17 remain largely the same it is the subprocesses of the actions marked in green that changed. Additionally, the step of the claims handler manually acquiring information has been removed and the notification e-mails regarding the claims decision are now sent automatically once the decision has been recorded in the Claims Handling SaaS.

The author also modelled the TO-BE claim filing process which can be viewed in Figures 18 and 19 illustrating the logic in which the claim filing form should ask the claimant for the information that in relevant to their claim only case. A simple wireframe of the claim filing form's questionnaire can be viewed in Appendix 17. The process starts with a travel interruption incident happening to a person who has purchased travel insurance. As the first step the person will log in to the claim filing web environment as seen in Figure 18.

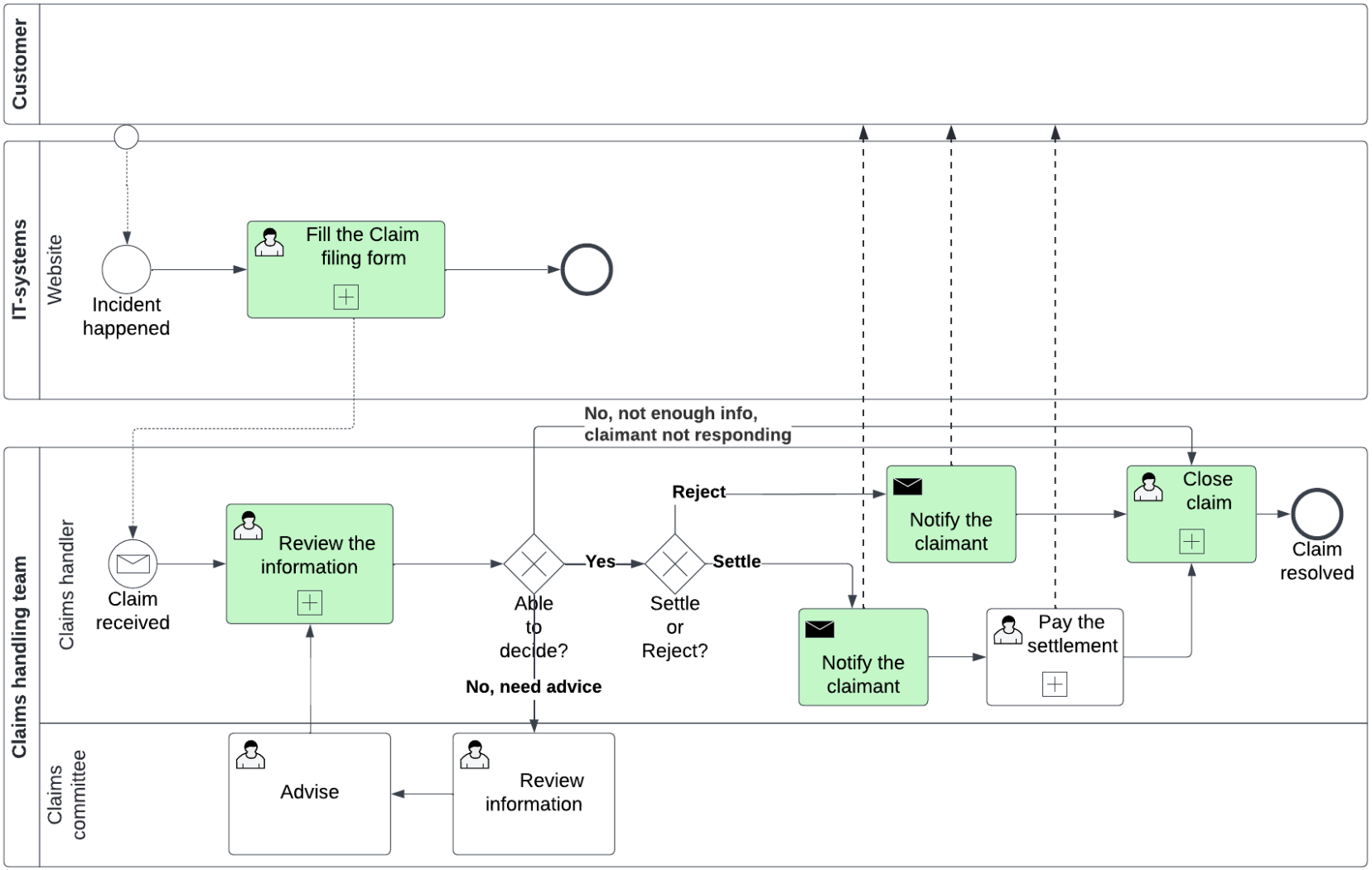

Figure 17. TO-BE high-level claims process starting from filing the claim and managing the claim with changes marked in green (by author).

Logging in is necessary in order to be able to identify the claimant and later automatically request information about their insurance policy without the claimant needing to give that information. It also allows automatically prefilling some information fields such as personal information. As the next step the customer will select the policy under which they would like to make the claim in case they have purchased more than one. Then they will indicate whether the incident happened before or during the trip and whether the incident happened to them themselves or a travel companion.

As the next step the claimant will be asked to indicate whether the incident was a cancellation or delay after which they are prompted to make a selection out of a multiple-choice question where they can select more than one answer. Based on their selection additional info marked as subprocesses in Figure 20 is asked from the claimant along with a list of documents to be uploaded specific to the type of loss selected. The list of documents required for each loss type of loss can be viewed on the TO-BE decision model in Appendix 14 under the "proof of" decisions as data inputs. It is important to note that the claimant will only be asked to upload documents relevant to the type(s) of loss they indicated had happened. This way the claimant is sure to upload all of the relevant documents without missing any and the claims handler will not need to contact them later.

After the relevant questions have been answered and the documents uploaded, parallel processes occur. The claimant will proceed to the next page and the claim filing application will process the data. The claim filing application will compare the answers given by the claimant against the coverage conditions and exclusions in the business knowledge models and mark down which conditions apply to this claimant and if any exclusions apply. The information about applicable coverage conditions and exclusions will later be sent to the claims handler along with the filed claim information. The coverage conditions and exclusions summary applicable to this claim will save the time of the claims handler by removing the need to analyse the terms and conditions documents and write down the relevant points from there in order to document their claims decision

rationale. The claimant will not be notified of the information already being processed.

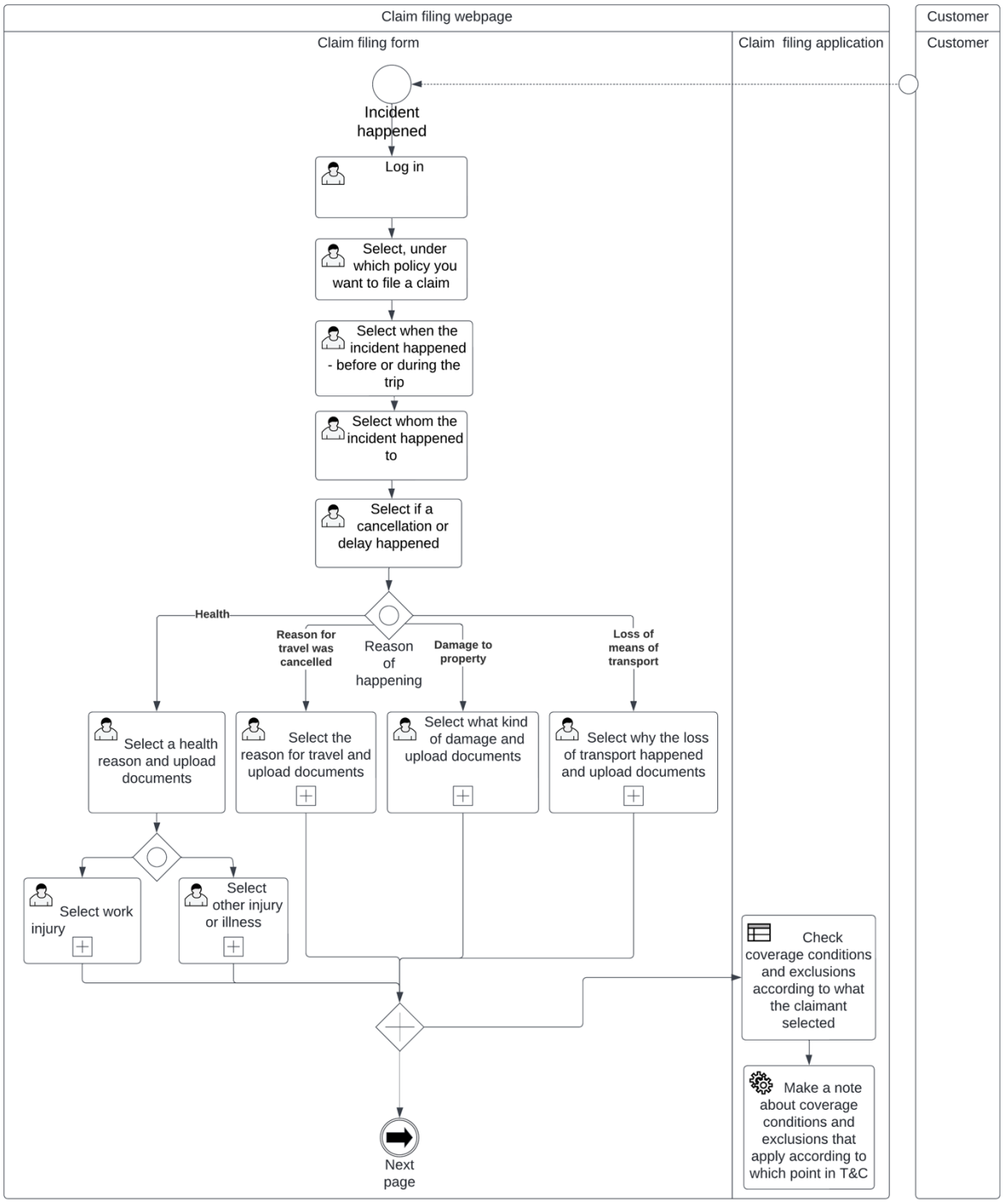

Figure 18. The TO-BE version of the claims filing process. The other colours are used in order to increase readability (by author).

On the second page of the claim filing form the process continues. This can be viewed in Figure 19. The claimant will be asked to choose what they would like to get compensated

for. The choices are “Transportation costs”, “Accommodation costs” and “Other”.

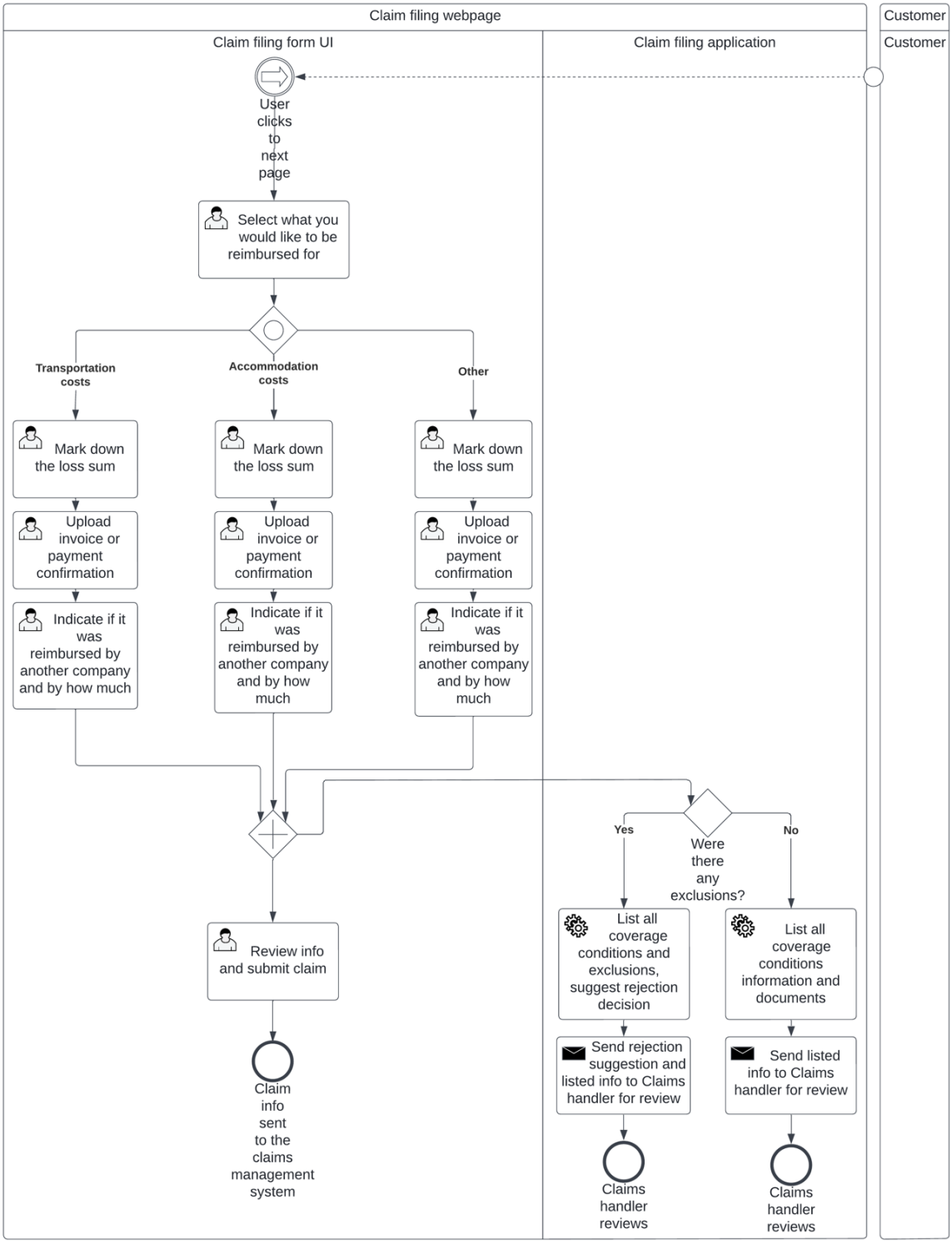

Figure 19. The TO-BE version of claim filing process, page 2 (by author).

In all cases the claimant will be asked to write down the loss sum, upload specified documents proving the loss such as invoices and payment confirmations. The claimant is also asked if this loss has already been reimbursed by another company such as the airline

or travel agency. The claimant can then review the claim information they entered and submit the claim. This is where the process ends for the claimant.

In the background, however, a parallel process continues. The claim filing application determines if any exclusions were recorded by the system during the filling of the claim form – specifically at the end of page one. In case there were exclusions that applied to this claims case, the claims filing application will send the claims handler four types of information: the information from the filed claim, a list of exclusions that apply, a list of coverage conditions that would apply (in case the exclusion did not exist) and a suggestion to reject the claim. In case no exclusions were recorded regarding the answers the claimant gave, the system will send the claims handler two types of information: the information from the filed claim and a list of all the coverage conditions that apply to the claim. The claims handler will then review the information in both cases.

To elaborate more on the logic behind the business rule task depicted in the claim filing process diagrams' right side "Claim filing application" lane. The business rule task occurs right after the claimant has submitted a critical amount of information. Based on the information given by the claimant via multiple-choice answers, the business rule task (which refers to the decision Model's "Coverage Conditions" and "Exclusions" Business knowledge models and in turn the lists of decision-making rules in Appendix 15) determines if any of the rules apply and which coverage "Coverage conditions" apply.

For example, if the claimant marked the answer "chronic illness" as a reason for their trip cancellation then the rejection rule 15 "In case of a loss caused by chronic illness or an illness that existed before the claim will not be settled and therefore the loss will not be reimbursed." Would apply, which the Claim filing application would find from the "Exclusions" business knowledge model. The system would then make a note of that exclusion. The system would also note that the settlement rules 1 and 2 would apply in case there was no exclusion:

1. In case of **cancellation** of the **Insured Person's** trip **before** the trip because of **sudden illness, injury or death of the insured person** the claim will **be settled** and therefore the loss **will** be reimbursed.

2. In case of **cancellation** of the **Insured Person's** trip **before** it had started, in case the loss was caused by **Life-threatening condition or injury** the claim will **be settled** and therefore the loss **will** be reimbursed.

The settlement rules are marked in case the claims handler notices that the customer has made a mistake and the illness is not considered chronic. In that case the claims handler can choose to disregard the exclusion and apply one of the 2 "Coverage conditions" instead and pay the compensation out.

On a final note, about the claim filing process, while the author acknowledges that the claim filing form contains more questions, it does not necessarily mean that filling it will take more time. It contains a lot of multiple-choice questions derived from the terms and conditions of the product, which are relatively straightforward to answer compared to a free text explanation, which the claimants of the three analysed insurance companies ask for. Additionally, multiple choice answers given are also easier to process by the Claims Handling SaaS as automation rules regarding settlement or rejection can be tied to every answer. The time it takes will be measured with the help of analytics and the claims form can be adjusted to a more optimal time spend level once the solution is launched.

The claims process continues with the claims handler receiving the claim from the claimant along with information regarding exclusions and coverage conditions and reviewing it. The process can be seen in Figure 20. The improved process steps are marked in green. The claim type is now identified automatically by the system based on the information about the loss and the reasons behind it the claimant entered the filed claim. The claims handler then assigns the claim to themselves. The next step is that the claims handler reviews the list of coverage conditions and exclusions applicable to the type of loss that was generated by the Claim filing application and that was based on answers the claimant gave while filling the claim form. The list is compiled from the business knowledge models that were created based on the terms and conditions and the answers that the claimant gave in the filled claim form.

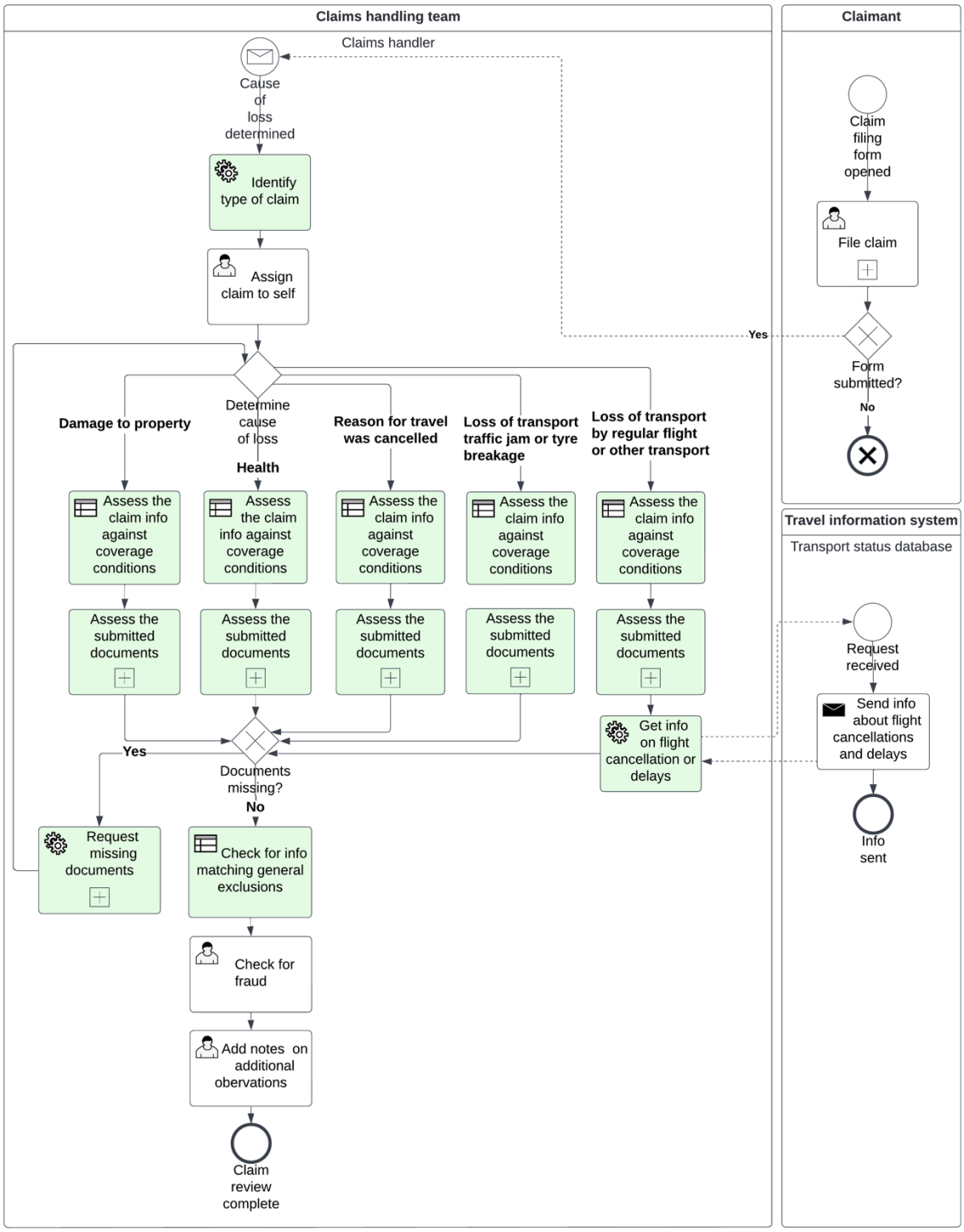

Figure 20. The TO-BE version of reviewing of the claims information and documents by the claims handler process. The other colours are used in order to increase readability (by author).

The claims handler then assesses the rest of the information the claimant gave in the filed claim including the submitted documents, which unlike during the AS-IS process, should all be there. The submitted documents assessment sub-process can be viewed in Appendix 21.

In the “Assess the information” step of the claims handling processes the step of checking if all of the required claim documents have been submitted has been made automatic. This, however, can check if the documents are factually there – the quality and correctness of the documents will still need to be verified by the claim handler – for example if an incorrect invoice has been uploaded. If there is a document missing, an automatic e-mail as shown in the “TO-BE Review the information” process will be triggered to ask for the extra information. The information will be automatically added to the claim when the claimant sends it in a reply e-mail.

Moving forward, the next step is to extract information from submitted PDF documents and images and show the info as well as the documents in one view on the claims management user interface. This is followed by 3 checks – the first, a check whether there is any debt related to the policy, is made manually by the claims handler and entered into the system. If there is debt, the claim will be rejected, and an automatic decision e-mail will be sent to the claimant if the claims handler confirms the rejection. Then the incident’s geographical location will be compared with the geographical coverage of the policy. If the incident happened outside of the coverage area, the claim will be rejected, and the claimant will receive an automated notification e-mail if the claims handler confirms the rejection. And the third check is if the policy’s insurance coverage was valid during the time of the incident. If it was not, then the claim will be rejected, and the claimant will receive an e-mail with the decision if the rejection is confirmed.

For example, if the policy was purchased less than 72h before the incident happened, the system will be able to determine that the insurance coverage was not yet valid and show this info to the claims handler. This replaces the previous process where the claims handler had to find the policy document, open it, check all the policy details one by one in order to make this assessment. The same logic is applied to checking if the place of incident matches with the geographical coverage of the insurance policy and checking whether the claimant is the policyholder or whether they have a mandate to claim this compensation. The automatic checks will be done at the same time and in no particular order and can be done as the claim is submitted and before the claim handler has reviewed it. For the rejections to come to force the claim handler must review and confirm them.

The process also has two more manual checks as to whether the person is in a clack list and if the trip was fully paid for or is being paid for in parts. In case either is true, the

claims handler ticks a checkbox, and the system makes a note of each. After this, the process continues on the “TO-BE Review the information” process diagram and in 4 out of the 4 cases continues with a check for whether there were any exclusions that applied to the case. This, too, is already displayed to the claims handler as the checks were done earlier, as the claimant was filling the claim form. In case there was a cancellation or delay to a regular flight there will be a check done to a database containing transport information, for example the Travel information system where all the flight info is conveyed in real time. This is also the database that some airlines use for customer support. This check is only necessary, if the company does not automatically reject cancellation or delay in regular transport claims, because in those cases either the travel agency or the airline are liable.

The process ends with a manual fraud check and inserting notes on any additional observations if necessary.

At this point, unless it is a complicated claim case and the claims handler needs the advice from the claim committee, the claims handler should be ready to make the decision of whether to settle or reject the claim. They can view all of the information from the automatic checks and whether the results were positive or negative, they can see all the coverage conditions and exclusions applicable, all the filed claim info, info from the documents and the documents themselves. They can correct the displayed info if necessary. In some cases, such as when an exclusion applies, they can also see a recommended claims decision. Based on this the claims handler will choose in the system whether to settle or reject the claim.

Once they have marked their decision in the system by clicking the relevant button. Once that is done an automatic claims decision e-mail will be sent to the customer containing all the coverage conditions and exclusions and rationale applied to the claims decision. In case of a settlement decision, the settlement sum is also added. After this all of the information collected and displayed is saved and uploaded into the archive once the claims handler closes the claim.

9 Systems analysis and architectural vision

In the following chapter the author will describe the software product quality requirements based on the ISO 25010 standard. The author will also describe business rules of the solution as well as create a business information model based on the business rules. Furthermore, author will diagram a component diagram of the future technical solution of the Claims Handling SaaS. The diagrams and the business rules are based on the functional mapped in the previous chapters and the software product quality requirements as well as the business requirements that the author has collected thus far.

9.1 Software product quality requirements

The author will cover the initial non-functional requirements in this chapter. The author took the ISO 25010 software product quality standard as the basis for describing the non-functional requirements, as can be seen in Table 21. The requirements described below reflect only the author's and the Claim Handling SaaS team's vision and will need to be adjusted based on the requirements of the customers (insurance companies) should they have additional must have needs. The non-functional requirements are based on the author's experience, EIPOPA's ICT guidelines, the Schrems II ruling and the non-functional requirements set by the Estonian Information System Authority. The non-functional requirements cover functional suitability, performance efficiency, compatibility, usability, reliability, security and maintainability.

Table 21. A list of Software Product Quality requirements structured according to the ISO 25010 standard (by author).

Characteristic	ID	Requirement
Functional Suitability	NFR1	The software must function as described in the functional requirements and other specifications
Functional Suitability	NFR2	The software must provide results in line with the decision-making logic determined through configuration.
Performance efficiency	NFR4	The software must be hosted on scalable server solutions, which are able to adjust the resources available according to resource demand,
Compatibility	NFR5	The software must support at least the two latest versions of Chrome, Edge, Firefox and Safari [92].

Characteristic	ID	Requirement
Compatibility	NFR6	The software must be able to send and receive information to and from external systems via API and use this information in decision making.
Usability	NFR9	The software's user interface must be designed using the best user experience design practices assuring that it is intuitive and easily understandable.
Usability	NFR12	The software's user interface must support the WCAG 2 standard of accessibility [93].
Reliability	NFR18	All of the information stored in the system must be backed up at least once every 24 hours and recoverable with a maximum data loss of 24h.
Reliability	NFR19	The software must be monitored, and relevant parties must be immediately monitored once the software is not available.
Security	NFR22	The software must ensure that only authorized users get access to view or modify the stored data or computer systems.
Security	NFR23	A log of all user and system actions must be kept and all actions must be traceable.
Maintainability	NFR29	The software must be resilient against the malfunctions of external services [92].
Maintainability	NFR33	The software's critical functionalities must be covered with automated tests and all functionalities built must be instantly covered with unit tests.
Maintainability	NFR34	The data stored in the databases of the software must be instantly downloadable in a machine-readable format and exportable.

More items will be added to the non-functional requirements as the architectural vision becomes more clear and the planning for development kicks off.

9.2 Business Rules and Business Information Model

In the following chapter the author will describe the business rules shown in Table 22 of the Claims Handling SaaS. The author created a business information model based that is shown in Figure 21 based on these business rules. The business description added under Appendix 22 is what the author based both the business rules and the business information model on.

Table 22. The business rules of the Claims Handling SaaS (by author).

ID	Business rule
BR1	One insurance policy can have 0, 1 or many claims filed under it. One Claim can always be filed from under one insurance policy.
BR2	One customer can file 0, 1 or many insurance claims. A claim can only be filed by 1 customer.
BR3	One customer can have 0, 1 or many insurance policies. One insurance policy can only be owned by 1 customer.
BR4	One insurance policy database can have 0 to many insurance policies. An insurance policy always belongs under one insurance policy database.
BR5	One insurance company can have 1 or many insurance policy databases. One insurance policy database can belong under one insurance company only.
BR6	One insurance policy can give 0, 1 or many automatic check results. One automatic check result can only be from 1 insurance policy.
BR7	One customer can have 1 or many user accounts. One user account can only belong to one customer.
BR8	One user account can only belong to one claims handler. One claims handler can only have one user account.
BR9	One claims backlog can have 0, 1 or many claims in it. One claim can only be in one backlog.
BR10	One claim can have 0 or 1 claim decision that is in force. One claims decision can be applied to one claim.
BR11	One claim can have 0, 1 or many automatic checks results recorded. One automatic check result can only be show info about one claim.
BR12	One claims handler can handle 0, 1 or many claims. One claim can only be handled by 1 claims handler at a time.
BR13	One claim can have 0, 1 or many compensation sums. One compensation sum can only be paid out from under 1 claim.
BR14	One claims decision can issue 1 compensation sum. One compensation can be issued by 1 claim decision.
BR15	One archive can contain 0, 1 or many claims. One claim can only be archived under 1 archive.
BR16	One claims handler can have 1 backlog that they are working on at a time. One backlog can have 1 or many claims handlers working on it.
BR17	One customer can receive 0, 1 or many e-mails. One e-mail can only be sent to 1 customer at a time.

ID	Business rule
BR18	One e-mail can contain the results of 0, 1 or many automatic checks. One automatic check result can only be in 1 e-mail at a time.
BR19	One claim decision will trigger 1 e-mail. One e-mail with the same contents can be triggered by one claim decision.
BR20	One archive can contain info about 0, 1 or many compensations. One compensation can only be archived in 1 archive.
BR21	One claims handler can make 0, 1 or many claims decisions. One claims decision can only be made by 1 claims handler.

Every claim is always connected to an insurance policy. An insurance policy is a contract with the insurance company where in the terms and conditions it states which losses and under which conditions are compensated by the insurance company, should an incident happen. Mostly, the terms and conditions of the insurance policy allow submitting more than 1 claim under the policy and so do the business rules of this solution. One customer is also able to file as many claims as they may have many insurance policies.

The customer in this context is the person who has purchased an insurance policy from an insurance company and if they file a claim, they become the claimant. Customers, as mentioned, are able to file a claim and will be contacted if there is a need throughout the claims management process to provide extra information. If no extra information is needed, they will simply be notified of the claims decision.

The customer can have more than one user account simply because the MVP does not support the prevention of duplicate accounts. The claims handler, however, can only have 1 account as this can be controlled through employee databases and accounts being assigned rather than signed up for.

There is one claims backlog that all the claims handlers refer to for picking the next claim for processing. All of the claims will be listed in that one backlog with the type of claim being marked on the claim.

While a claim decision can be overruled by the next claim decision made by a specialist who is more senior, there is only one claims decision that can be in effect. When a claim decision is overruled, then one simply gets archived and the new one comes to effect. Similarly, while one claims decision can cover many losses and several coverages,

ultimately the compensation that gets paid out is just 1 sum with all the loss sums added together. Also, one claims decision will always trigger just one e-mail, while the template and the wording of the e-mail depends on the claims decision, the claims number and the customer's name always change in the e-mail making each e-mail unique.

The business information model shown in Figure 21 depicts the business rules described above. The author used the business information model as a basis for constructing the component diagram of the future Claims Handling SaaS.

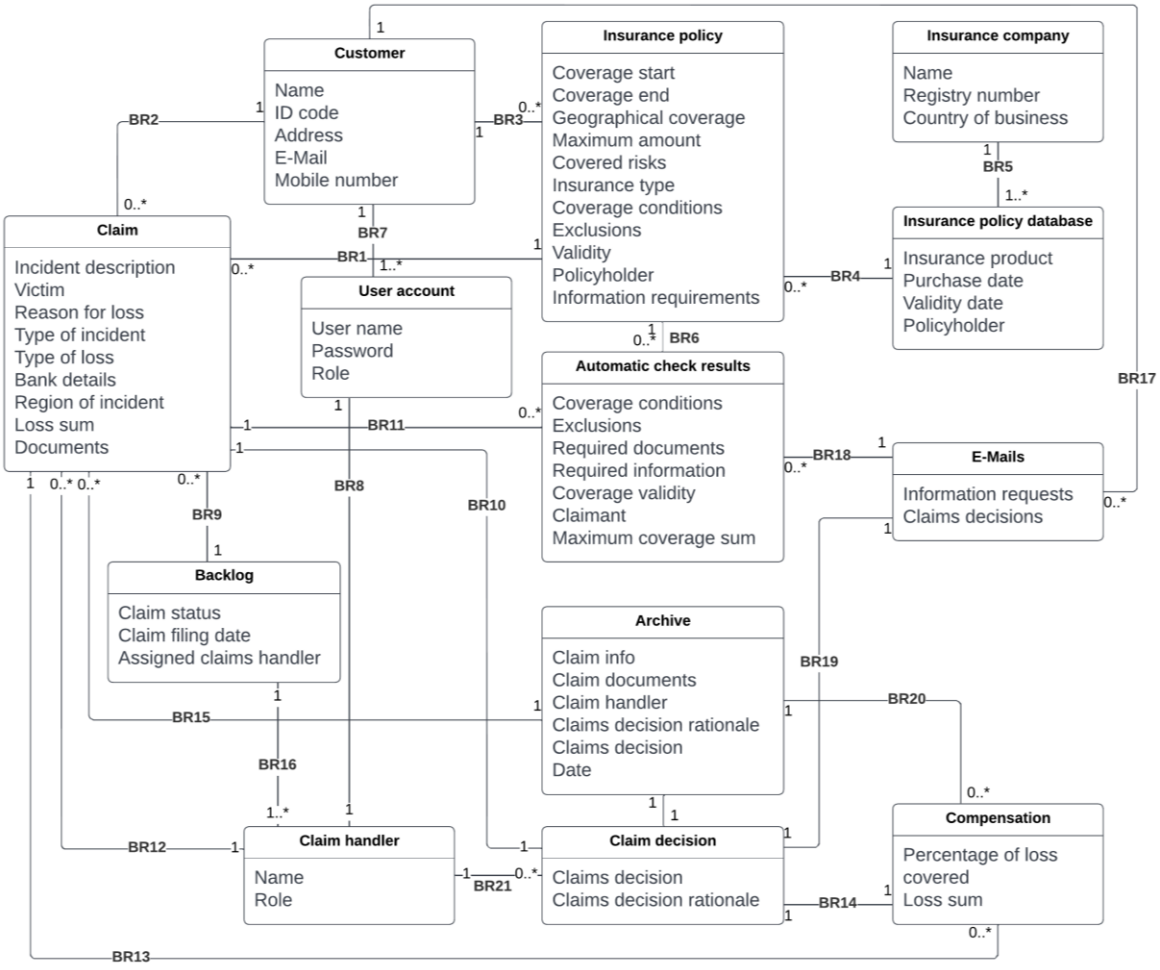

Figure 21. The Business Information Model of the Claims Handling SaaS based on the business rules (by author).

All the terms in the business rules and the business information model have been defined in the business glossary in Appendix 23.

9.3 Component diagram

The component diagram depicts a breakdown of the of the planned Claims Handling SaaS system into essential high-level elements. It also describes the data that is being exchanged between the components. The component diagram can be viewed in Figure 22.

The colour blue marks the systems of the insurance company which is the customer using the Claims Handling SaaS. Insurance product and Insurance policy info is what the Claims Handling SaaS would need in order to provide the claims handler first of all access to the information of the policy under which the claim has been filed and secondly to conduct automatic checks on that information to determine the validity of the insurance cover and other details in order to save the claims handler's time.

The colour yellow signifies external services – outside of the Claims Handling SaaS and the insurance company's systems. Such as authentication via Microsoft, the Travel information system and an OCR service. Ideally the authentication system for claims handlers is the same as the insurance company is using already, however. The colour white signifies the Claims Handling SaaS's own systems.

Figure 22 does not show which technology will be used for data transfer, because especially the data transfer standard used to exchange data with external systems shall be determined once the first customer (insurance company) has been determined, the payment system and the transport information system selected.

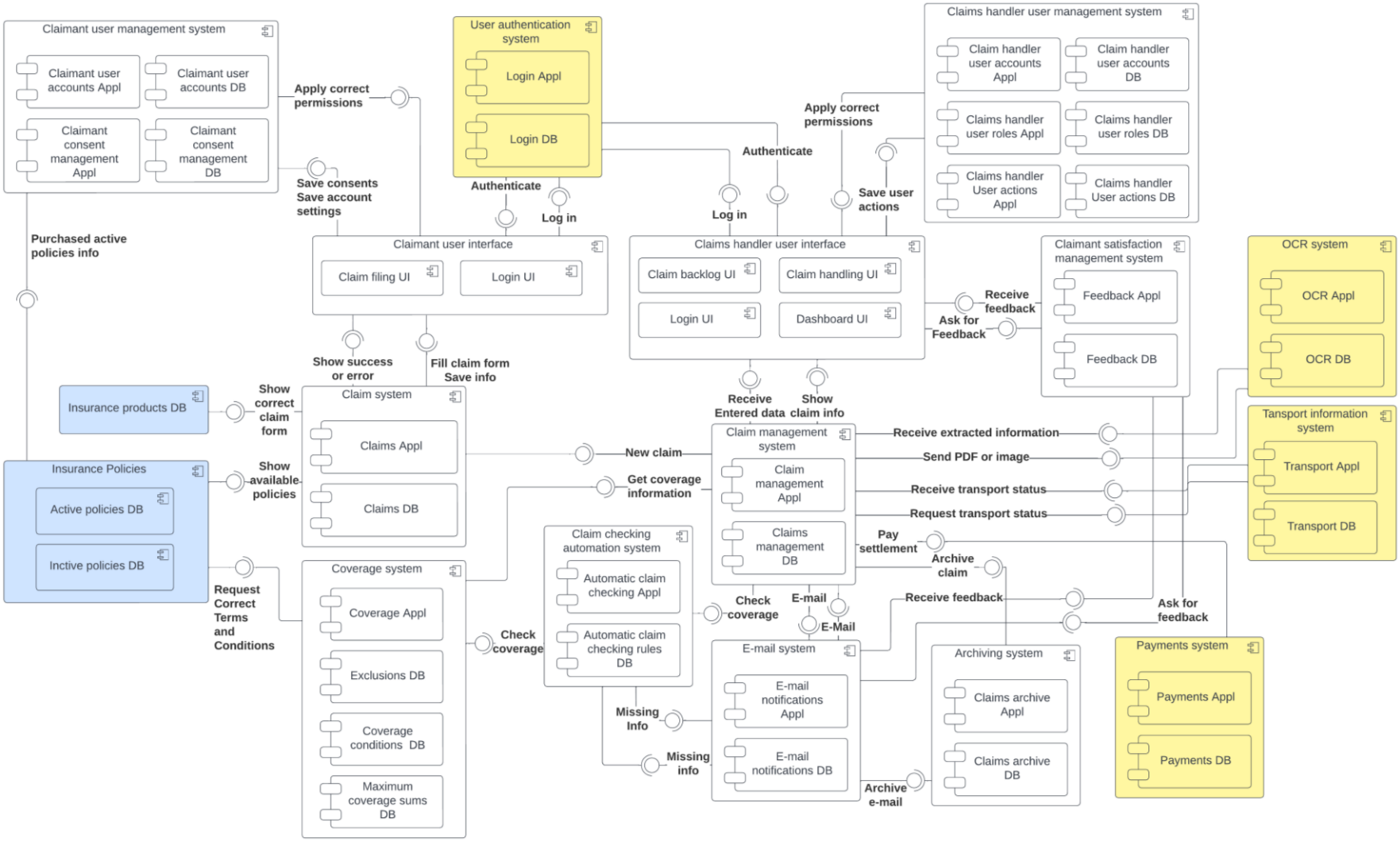

Figure 22. The component diagram depicting the future systems of the Claims Handling SaaS (by author).

The components depicted in Figure 22 are the following:

Claimant user interface – Enables the claimant (customer, who is filing a claim) to log into the claim filing system, view and use the correct version of the file form, fill it and save the information. Does not contain any business logic, function as an interface to use the underlying systems. Saves the filled claim form information into the claim system.

Claims handler user interface – Enables the claims handler to log in, view the claim backlog, pick the claim that they will handle, perform all the claims handling and management actions and view the claimant satisfaction score. It does not contain any business logic; it serves as an interface for using the underlying systems.

User authentication system – Allows for the identification of the user trying to log in with the help of a username and password and a token received from a 2-factor authentication system. It either allows or denies access to the user.

Claimant user management system – Contains logic and information about the roles and permissions of each account and enables for the Claims handler user interface to display only functionality enabled for the role and account logged in. Also, all the actions performed by the used within the system are logged under this system.

Claims handler user management system – Contains user account information and enables the Claimant user interface to display the claim filing possibility for all purchased policies. Also, all consents and confirmations given by the user such as the Cookie consent are stored in this system. Information is served and saved according to the consents given by every customer separately.

Insurance products DB – A database that contains a list of the insurance products that the insurance company is selling. Out of those products only those are used for which claims can be submitted through the Claims Handling SaaS. This is an external database owned by the insurance company.

Insurance Policies – Two databases containing the insurance policies that have been sold by the insurance company and are active and therefore claims can already be submitted and a database of policies that have been terminated, cancelled or otherwise. The policy information is conveyed to the Claims Handling SaaS via API. These are external databases owned by the insurance company.

Claim system – A system where the filed claims with all their information and attached documents are stored. The claim management system displays the backlog based on this system's info. The claims system also stores the information about claim statuses and therefore also controls whether or what actions need to be taken with the claim and determines its urgency and SLA status.

Coverage system – A system that contains the rules according to which the insurance coverage is determined and what is covered and what it not. For example, it contains the exclusion rules according to which the claims are rejected, and it contains coverage conditions, which determine in which cases the compensation is paid out. It also determines the maximum compensation sum that applies for each claim and each type of loss according to the terms of the policy. It also actively requests the version of the Terms & Conditions that apply for each policy and the claim filed under it.

Claim management system – Claim management system contains the logic according to which the whole claim management flow is performed. It manages the claim management processes and the correct data fields to be prompted to the claims handler taking into consideration the type of loss and the status of the claim. The claim decision whether to settle or reject the claim is also made and marked in this system.

Claim checking automation system – A system that performs the automatic checks on the claims in the claim system according to the rules in the coverage system and is able to return the results to the claim management system for the claims handler to be able to review them and take them into account when making the decision.

E-mail system – A system that is triggered by the claim management system when the claim decision is made – to notify the claimant of it. Also, it is triggered when the automatic claim checking automation system indicated that some information or a document that is required is missing – it then automatically requests the info or document over e-mail. When the missing info is provided by the claimant, the e-mail and documents will automatically be saved in the system.

Archiving system – A system that archives all the claims with all the information and documents related to the claim in a structured way into the designated archive database. It also allows for the archive to be searched and for items to be moved out of archive.

Claimant satisfaction management system – Handles the collecting, preserving the history and displaying the ratings that the customers have given about the claims experience.

Payments system – Allows for claim settlement pay-outs to be paid out. Whether the Claims Handling SaaS use an external payment system of their choice or the same one as the customer (insurance company) uses is used will be determined after the MVP.

OCR system – An Optical Character Recognition system which enables for printed characters, handwriting or an image to be turned into text enabling for it to be read or edited by a person or a computer system.

Transport information system – An external information system that provides real time data on regular transport schedules and statuses.

10 Design Prototype

In the following chapter the author designed two high-fidelity mock-ups – one of the claim backlog and the other of a claim that is being processed with all automatic checks being stated on the user interface as well as the filed claim information and documents being displayed. The mock-ups were created based on the input from the functional requirements and the TO-BE decision model and claims management processes. Figures 23 and 24 show the prototypes.

The author opted to create high-fidelity prototypes instead of low-fidelity ones, because claims handlers in the authors experience are not experienced in being involved in the preparation for IT-development projects and therefore find it difficult to understand wireframes. Hence, in order to collect higher quality feedback, the author decided to create a fewer number of mock-ups but make them more detailed.

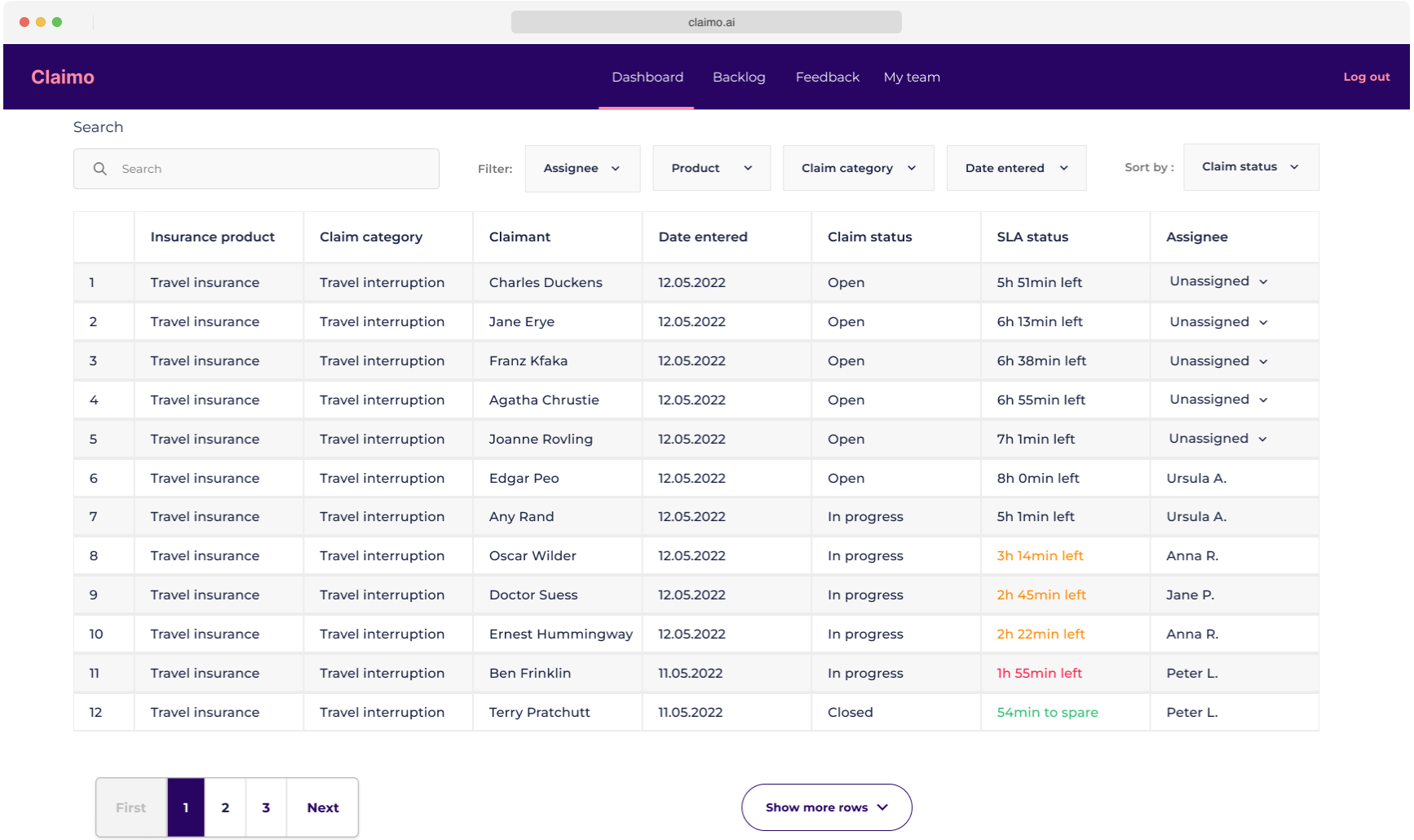

Figure 23. A mock-up of the view that the claims handler sees when they look at the claims backlog (by author).

The claims backlog in Figure 23 is one of the views that the claims handler will see once they have logged into the system. It is meant to give an overview of all the newest claims as well as ones already in progress and being handled by colleagues. The claim backlog highlights the deadlines for each claim and uses the traffic light colours to signify which claims are running out of time as per the set deadline of being dealt with within 7h. The orange colour means that there is under 5 hours left until the deadline is breached. The red colour signifies that there is under 2 hours left. The colour green means that the claim was settled or rejected and closed within the set time frame of 7 hours.

Furthermore, the backlog shows the type of insurance product each claim belongs under – this functionality is important as the Claims Handling SaaS aims to support more than travel insurance claims handling in the future. The type of loss can also be determined from the user interface – this is also important as the Claims Handling SaaS plans to also support baggage insurance claims shortly after the launch of the MVP. The user interface also shows the name of the claimant, the date when they entered the claim and the assigned claims handler. It also offers to assign oneself as the claims handler handling the claim.

The opened travel insurance claims modal view in Figure 24 shows what the claim handler will see when they click on a claim in the claim backlog. The claims modal view shows the unique ID of the claim and the claim category. In the Cover validity check section, the claims handler can view a list of automatic check results that had been performed earlier. The checks are done against the insurance policy document and the terms and conditions. The green circles signify check results which match the requirements, the red circle shows the point in the coverage conditions that determined whether such kind of conditions qualify for a settlement to be paid out – they do not. The point which determines it is also brought forward – point 18 from the Coverage Conditions list of rules.

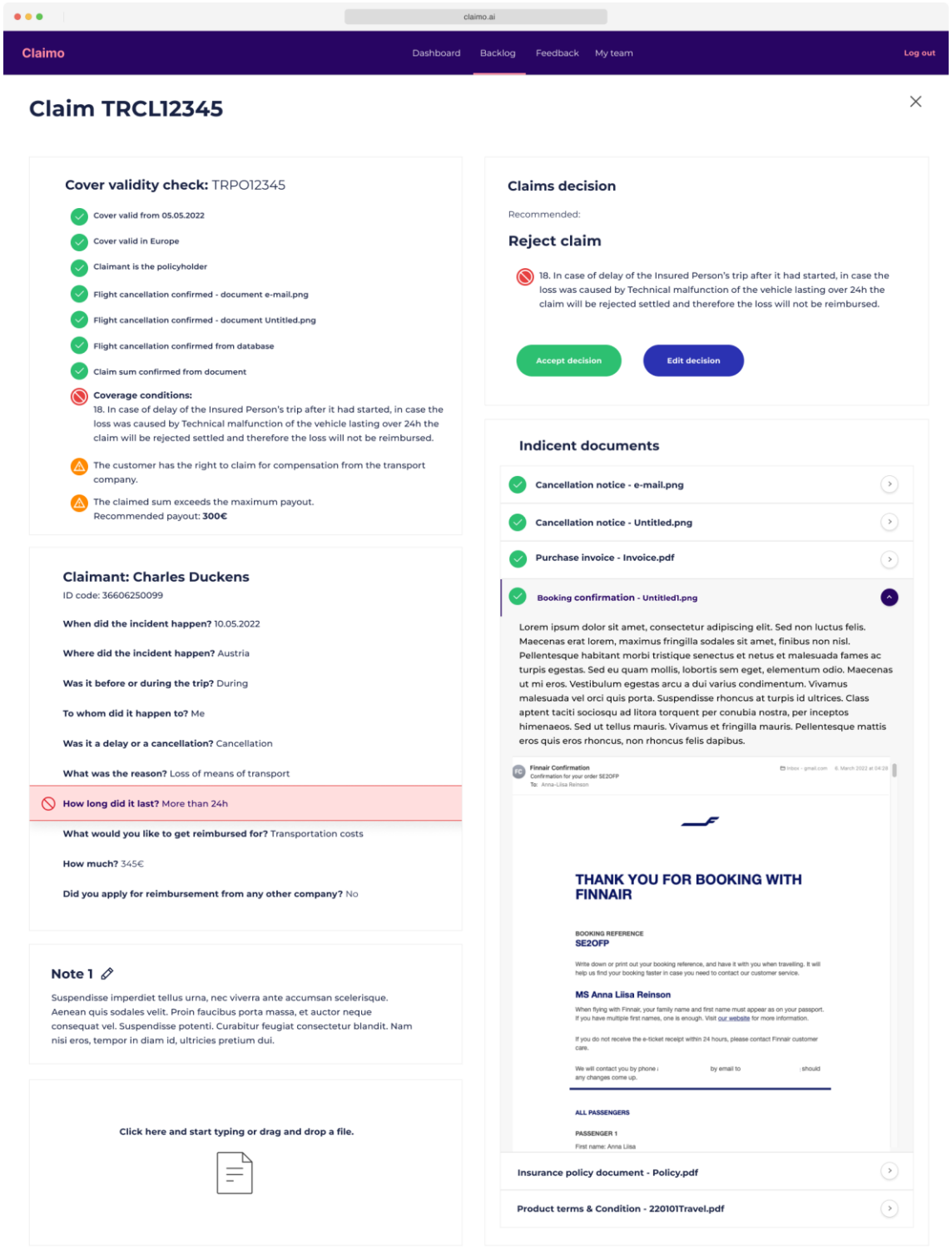

Figure 24. An opened view of a travel interruption claims modal (by author)

The user interface also reminds the claims handler that the customer has the right to claim this compensation from the airline instead. And also, had there not been a rule in the coverage conditions that determines the rejection reason for this rule, then the policy had

been bought for a maximum coverage amount of 300€ for this particular risk. Therefore, the insurance company would only compensate 300€.

Further down the left column in the next section there is a list of claims form questions and the answers that the claimant provided to the multiple-choice questions. One question and answer are highlighted in pink and red – this is the answer that triggered the rejection. The claimant marked that they suffered losses due to loss of transport that took more time than 24h. Further down customer information and the e-mail exchange with the customer is displayed. The latter will be a functionality in future scopes. And the last block in the column is "Notes", which will contain all the notes that the claims handler may want to add. The notes section will become scrollable once there are more notes.

On the right side the first section is the claims decision section. Based on the Coverage condition rule that is highlighted on the left, the Claim Handling SaaS recommends rejecting the claim and brings out the reason why. The claims handler will have the opportunity to simply accept the recommendation or to edit the decision. Should they choose to edit the decision they will be required to write their rationale behind why they will ignore the point 18. Once they are done editing, the Claims decision block will display the decision entered by the claims handler. They will be able to confirm the decision by clicking "accept". Once the claims decision has been confirmed an automatic e-mail is sent out to the claimant explaining the decision and bringing out the coverage conditions or exclusions or otherwise – the reasoning behind the claims decision. The customer will also be able to dispute the claim from that e-mail. The e-mail can be viewed by clicking the link "View Decision E-mail". The dropdown element in the corner shows the name of the assigned claims handler.

Further down all the documents uploaded by the claimant (according to the tool tips in the claim form) as well as the policy and terms and conditions documents are shown in an accordion type of element with the contents of each document brought out in text (with the help of OCR technology) in order for the claims handler to be able to simply copy and paste the info and not spend time typing what is on the image as well as a fully displayed document in a frame – making it possible to view the document right there without having to search for it. The green circles signify that it was a document required from the claimant and they have provided it.

11 Implementation plan

In the following chapter will describe the short-term plans following the scope of this master's thesis. The goal is to follow through with the implementation plan and launch a minimum viable product by the end of 2022 or beginning of 2023. Tables 23 and 24 illustrate the 1st, 2nd and 4th phases following the scope of the master's thesis – the user testing, design and development. All the coloured cells shown in the tables represent a time span of 2 weeks. The "S" in front of the number represents the word "Sprint". All in all, including a buffer time of 50% of the remaining project time the remaining project should last approximately 44 weeks. The orange colour cells represent "must have" priority tasks, which must be completed for the minimum viable product to be viable. The blue cells can be downgraded to "should have" priority, should the project team run out of time.

The first phase following the scope of the master's thesis is planned to be the first round of user testing. As mentioned in the previous chapter, the author decided to create high fidelity mock-ups rather than wireframes for validating the future solution. This is because claims handlers are not accustomed to being involved in development projects and have a difficult time imagining a solution based on wireframes. The plan is instead to have an initial round of interviews to show and discuss the existing two mock-ups, gather feedback, make adjustments and produce the rest of the high-fidelity mock-ups showing every view of the solution.

The full clickable prototype will include:

5. Log-in screen for both the customer and claims handler
6. Claim filing form
7. Claim form configuration view
8. Claims backlog
9. Single claim view
10. Exclusions and Cover Conditions configuration view
11. Configuration of automatic checks view
12. Configuration of user roles view
13. Log of all user actions view
14. Customer feedback view

15. Claim closing and archiving view

After the completion of the clickable prototype in the Figma environment the author will conduct 6 User Experience tests with 6 claims handlers asking them to complete claims handling scenarios given to them as tasks in the clickable mock-up. The author will observe the behaviour of the users and the feedback and will make adjustments to the mock-up.

After the design phase a “Preparation for development” phase will follow. The author will use the preparation time to set up working tools such as Jira and confluence, prepare an epics structure and prepare the user stories. The development team will start planning the architectural vision.

Following the preparation, development will start. It will be conducted using the Scrum methodology [94] also shown in Appendix 26. The author has added an approximate time estimate to each roadmap item, however these are subject to change after a discussion with the development team, who will give more accurate estimates for the development tasks.

Table 23. The roadmap for the first 2 stages following the master's thesis – user testing and design (by author).

Seq. of steps	Action item / 2-week sprints	S1	S2	S3	S4
1. User testing					
1	Testing the first mock-ups on claims handlers				
4	6 UX tests on the clickable prototype				
2. Design					
2	Making adjustments based on feedback from claims handlers				
3	Designing a full clickable prototype				
5	Making adjustments based on the feedback from UX tests				
	Buffer				

The whole complete roadmap for the completion of scope 1 – the minimum viable product – can be viewed in Appendix 25.

After the development phase the Claims Handling SaaS will be launched for 1 customer (insurance company) who is willing to do a pilot project. Following the launch, the claims handlers handling travel insurance claims with a travel interruption loss will start handling their claims using the Claims Handling SaaS. Their work and the time it takes to complete each task will be observed and measured and compared to the way they did it before. The claims handler, the claimants and other stakeholders connected to the pilot project will be interviewed and NPS surveys will be sent out to end-customers as well as claims handlers to assess how satisfied they are with the system and if they would recommend it. At the end of the pilot period a decision will be made whether the Claims Handling SaaS does bring value to the customers and therefore, whether it should be

developed further. If it will be developed further, the next step would be to support handling travel insurance claims fully through the Claims Handling SaaS and start working on adding more insurance products' claims management functionality.

Table 24. An approximate estimation of the fourth phase after the master's thesis - the development plan, which is subject following a refinement and planning meeting with the development team (by author).

Seq. of steps	Action item / 2-week sprints	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17
4. Development													
11	Log in functionality and user roles structure												
12	Claim form customer UI												
13	Claim form configuration functionality												
14	Claims backlog												
15	Single claim view												
16	Receiving insurance policy information												
17	Parsing insurance policy information												
18	Exclusions and Cover Conditions configuration according to Terms & Conditions												
19	Document information extraction via OCR												
20	Document displaying												
21	Automatic checks logic												
22	Configuration of automatic checks												
23	Claims decision functionality												
24	Automatic e-mail notifications												

Seq. of steps	Action item / 2-week sprints	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17
25	Configuration of user roles												
26	Logging of all user actions												
27	User consent management												
28	Customer feedback functionality												
29	Claim closing and archiving functionality												
	Buffer												

More innovative technologies such as machine learning will be considered for the future scopes, should the team decide to proceed with the project beyond the MVP phase.

12 Conclusions

In the following chapter the author will sum up the conclusions made based on the results of this master's thesis.

While the author set out to write this master's thesis with the goal to research the problem areas of insurance claims handling processes, during the claims handler interviews and the jobs-to-be-done workshop it became clear that while there are problematic parts to the claims handling processes, there are no obvious flaws in the process logic itself. The problem is rather the fact that there are a lot of rules to be followed in order to handle a claim correctly and make the correct decision and therefore there are also many small actions to be taken in order to follow these rules – to collect information, to assess information, search for files, open files, ask for missing information from the customer, wait for the customer to reply, write e-mails and so on. All these small actions add up to a significant amount of time spent in order to just handle one claim – 80min.

Based on this information the author searched for and compared possible solutions. Most of the market participants that the author compared, however, did not offer a solution that would match all the needs and wishes that had been mapped. The closest was Tautona, a South Africa based start-up. Tautona, however, also did not cover all the needed functionality – such as the claim filing form. Also, considering the Schrems II ruling it may be considered a risk by the customers regarding data protection despite the fact that they are not US-based.

During the analysis of the AS-IS claim filing processes the author discovered that a part of the problem creating time consuming work for claims handlers might be the claim filing form. Having analysed the forms of three Estonian insurance companies the author realised that while some of the information is collected in multiple answer questions, the most information-rich question – the description of the incident that caused for the claimant to suffer losses – was written in free text. Additionally, no guiding tool tips were provided in most cases as to what to write in that description text or which documents to provide. While this may seem like the more user-friendly approach from the side of the

insurance companies, the fact that over 70% of the people having submitted travel insurance claims declared that they had had to answer extra questions over e-mail, means that the process is not very straight forward for the end-customer or the claims handler. Both sides have to take extra steps.

Therefore, the author proposed a solution where the claims handling form's questions are displayed according to the previous multiple-choice answers given, so that only information relevant to the type of insurance product and type of loss is only ever collected. Additionally, the author structured the form in a way that the description of the incident is given rather in the form of multiple-choice questions. This will help and make sure that the end-customer provides all the necessary information and also allows for some of the information to be checked by a computer system.

Another relatively time-consuming task in the claims management process was checking the validity of the cover based on the insurance policy and the correct version of the terms and conditions. As this information exists already in the databases of the insurance companies, the author assessed that it would be possible to perform the check automatically checking the relevant characteristics of the claim. For this solution to work, however, the policy information would need to be available for the system. Or at least the relevant pieces of information.

The whole solution comes together in the form of a well-structured user interface. By collecting all the relevant pieces of information onto one page, the time spent on additional actions is reduced even more. Finally, as some of the information is checked by the system, in some cases it would be possible to recommend a claims decision to the claims handler. In case the claims handler agrees with the decision, they would simply need to click "accept". If they disagree with the recommended decision they would be asked to write their reasoning down in the system, mark down the new decision and confirm it. The automatic claims decision e-mails that would be automatically sent out would require no additional effort from the claims handler.

Due to the reduction in actions that the claims handler has to perform themselves or manually there will most likely also be a reduction in human error occurrence. The more standard cases where standard exclusion and coverage conditions can be applied most of the work will be done by the system leaving more time for the claims handlers to focus

on cases that may not be standard or where the evidence is ambivalent and making an automated decision is not possible or the claimed sum is significantly higher than average.

All in all, the time spent handling one claim would be reduced to 30 minutes. This will be measured and continuously improved once the solution is launched. The author believes that through small improvements and automation based on observing the work of claims handlers and researching their needs further, continuing with the approach of design thinking, the processes could be improved even further.

It is difficult to predict if the insurance companies who will use the Claims Handling SaaS will result in a reduction of payroll costs as it is the internal strategic decision of each company. It will, however, help slow down the need for increasing headcount in the claims handling departments as sales increase. Perhaps it will also provide an opportunity for some claims handlers to change the focus of their work – to start configuring more automation rules in order to increase the percentage of automated decisions that the system is able to make.

13 Summary

The thesis described the problem of manual claims management processes being time consuming and the results of them being unreliable. The author proposed and prototyped an information system that sped up manual processes through automating parts or eliminating the need for manual tasks altogether.

To achieve this, the author conducted in-depth research of the end-customers and claims handlers in order to understand the problem areas and the expectations of the end-customers and claims handlers. The author also analysed the market situation as well as competitors. In order for the system to be able to be flexible enough to fulfil the needs of not just one, but many market participants, the author based the AS-IS analysis on three international insurance companies active in Estonia.

In order to design the TO-BE processes and the solution the author gathered and described the business, functional and non-functional requirements. The solution includes rules for conducting automated information checks based on the Terms and Conditions of travel insurance products. Based on the requirements gathered the author also created a business information model and visualised an initial architectural vision in the form of a component diagram. Finally, the first design views of the Claims Handling SaaS were created to bring together and to illustrate the solution fitting the requirements collected priorly.

The research objectives were:

- researching the problem areas of insurance claims handling processes,
- researching stakeholder expectations towards claims handling,
- comparing competing alternative solutions,
- collecting business and solution requirements for the solution,
- mapping business processes,
- creating an initial architectural vision,
- creating design prototype of the solution.

All of the research objectives were therefore achieved within the scope of this master's thesis.

The goal of the thesis was to understand which parts of the claims handling processes were the most time consuming and to propose a semi-automated solution for claims management that would hasten the claims management processes by at least 50%. As an addition the solution allows to lessen the chance of human error occurring and therefore also lowering the costs in claims handling.

In the opinion of the author the goal was fulfilled.

References

[1] ‘About the Business Process Model And Notation Specification Version 2.0’. https://www.omg.org/spec/BPMN/2.0/About-BPMN/ (accessed May 19, 2022).

[2] ‘Understanding Insurance Claims’, *Investopedia*. https://www.investopedia.com/terms/i/insurance_claim.asp (accessed May 18, 2022).

[3] ‘Minimum Viable Product (MVP)’. https://www.productplan.com/glossary/minimum-viable-product/ (accessed May 19, 2022).

[4] EIOPA, *Consumer protection issues in travel insurance a thematic review*. 2019. Accessed: May 18, 2022. [Online]. Available: https://doi.org/10.2854/069800

[5] Allianz, ‘Travel Insurance 101: How Travel Insurance Works’, *Allianz Travel Insurance*. https://www.allianztravelinsurance.com/travel/planning/how-travel-insurance-works.htm (accessed May 18, 2022).

[6] ‘What Is Travel Insurance?’, *Investopedia*. https://www.investopedia.com/terms/t/travel-insurance.asp (accessed May 18, 2022).

[7] Marcello La Rosa, ‘Process architecture - Part I’, 01:14:42 UTC. Accessed: May 19, 2022. [Online]. Available: https://www.slideshare.net/mlarosa/process-architecture-part-i?from_action=save

[8] ‘Digital claims transformation | Strategy&’. PwC, 2021.

[9] ‘Insurance Claim Resolution and Settlement | Expert Commentary | IRMI.com’. https://www.irmi.com/articles/expert-commentary/insurance-claim-resolution-and-settlement (accessed May 18, 2022).

[10] ‘First Notice of Loss (FNOL)’, *Investopedia*. https://www.investopedia.com/terms/f/first-notice-loss-fnol.asp (accessed May 18, 2022).

[11] ‘Claim Reporting Best Practices | Expert Commentary | IRMI.com’. https://www.irmi.com/articles/expert-commentary/claim-reporting-best-practices (accessed May 18, 2022).

[12] ‘ENOL- Technology whim or customer requirement | LinkedIn’. https://www.linkedin.com/pulse/enol-technology-whim-customer-requirement-miles-keeble/ (accessed May 18, 2022).

[13] ‘Claim Investigation: Reaching Resolution | Expert Commentary | IRMI.com’. https://www.irmi.com/articles/expert-commentary/claim-investigation-reaching-resolution (accessed May 18, 2022).

[14] J. C. Pereira and R. de F. S. M. Russo, ‘Design Thinking Integrated in Agile Software Development: A Systematic Literature Review’, *Procedia Computer Science*, vol. 138, pp. 775–782, Jan. 2018, doi: 10.1016/j.procs.2018.10.101.

[15] E. Vasilieva, ‘Design Thinking in the Development of Project Management Approaches and Modeling of Business Processes of the Organization’, in *Lecture Notes in Information Systems and Organization*, Springer, 2021, pp. 3–16. Accessed: May 19, 2022. [Online]. Available: https://ideas.repec.org/h/spr/lnichp/978-3-030-71397-3_1.html

[16] ‘IDEO Design Thinking’, *IDEO | Design Thinking*. https://designthinking.ideo.com/ (accessed May 18, 2022).

[17] S. Choudhary, ‘Design Thinking: Divergence and Convergence Cycles’, *Medium*, Feb. 16, 2019. https://medium.com/@i.shubhangich/design-thinking-divergence-and-convergence-cycles-3ce7a6f27815 (accessed May 18, 2022).

[18] G. Silva, E. Zancul, and M. Soares de Oliveira, *Comparative framework of models of Design Thinking process*. 2020.

[19] IDEO, Ed., *The field guide to human-centered design: design kit*, 1st. ed. San Francisco, Calif.: Design Kit, 2015.
[20] 'Design Thinking Bootleg', *Stanford d.school*. https://dschool.stanford.edu/resources/design-thinking-bootleg (accessed May 19, 2022).
[21] M. Lewrick, P. Link, and L. J. Leifer, *The design thinking toolbox: a guide to mastering the most popular and valuable innovation methods*. Hoboken, New Jersey: John Wiley & Sons, Inc, 2020.
[22] 'Share and engage with the Design Sprint Community'. https://designsprintkit.withgoogle.com/methodology/overview (accessed May 18, 2022).
[23] 'What is the framework for innovation? Design Council's evolved Double Diamond', *Design Council*, Mar. 17, 2015. https://www.designcouncil.org.uk/news-opinion/what-framework-innovation-design-councils-evolved-double-diamond (accessed May 18, 2022).
[24] R. Parizi, M. Prestes, S. Marczak, and T. Conte, 'How has design thinking being used and integrated into software development activities? A systematic mapping', *Journal of Systems and Software*, vol. 187, p. 111217, May 2022, doi: 10.1016/j.jss.2022.111217.
[25] D. Gustafsson, 'Analysing the Double diamond design process through research & implementation', 2019, Accessed: May 18, 2022. [Online]. Available: https://aaltodoc.aalto.fi:443/handle/123456789/39285
[26] 'What is Quantitative Research?', *The Interaction Design Foundation*. https://www.interaction-design.org/literature/topics/quantitative-research (accessed May 18, 2022).
[27] W. L. in R.-B. U. Experience, 'How Many Participants for Quantitative Usability Studies: A Summary of Sample-Size Recommendations', *Nielsen Norman Group*. https://www.nngroup.com/articles/summary-quant-sample-sizes/ (accessed May 18, 2022).
[28] A. W. Ulwick and A. Osterwalder, *Jobs to be done: theory to practice*. Houston, TX: Idea Bite Press, 2016.
[29] A. W. Ulwick, 'Outcome-Driven Innovation® (ODI): Jobs-to-be-Done Theory in Practice', p. 27.
[30] 'Porter's 5 Forces', *Investopedia*. https://www.investopedia.com/terms/p/porter.asp (accessed May 18, 2022).
[31] International Institute of Business Analysis, *BABOK a guide to the Business Analysis Body of Knowledge*. Toronto: International Institute of Business Analysis, 2015. Accessed: May 18, 2022. [Online]. Available: http://www.books24x7.com/marc.asp?bookid=88848
[32] C. George, 'The Essence of Risk Identification in Project Risk Management: An Overview', *International Journal of Science and Research (IJSR)*, vol. 9, pp. 1553–1557, Feb. 2020, doi: 10.21275/SR20215023033.
[33] 'How SWOT (Strength, Weakness, Opportunity, and Threat) Analysis Works', *Investopedia*. https://www.investopedia.com/terms/s/swot.asp (accessed May 18, 2022).
[34] S. Calicchio, *SWOT-ANALÜÜS 4 ETAPIS: Kuidas kasutada SWOT-maatriksit, et muuta karjääri ja äri*. Stefano Calicchio, 2021.
[35] O. Chowdhury, 'What is the TOWS Matrix? And how it is used?', *Trade Brains*, Dec. 04, 2019. https://tradebrains.in/tows-matrix/ (accessed May 19, 2022).
[36] 'The ArchiMate® Enterprise Architecture Modeling Language', *The Open Group Website*, Oct. 12, 2018. https://www.opengroup.org/archimate-forum/archimate-overview (accessed May 19, 2022).

[37] A. Aldea, M. E. Iacob, J. Van Hillegersberg, D. Quartel, and H. Franken, 'Capability-based Planning with ArchiMate - Linking Motivation to Implementation':, in *Proceedings of the 17th International Conference on Enterprise Information Systems*, Barcelona, Spain, 2015, pp. 352–359. doi: 10.5220/0005468103520359.

[38] 'Capability-Based Planning with ArchiMate®'. https://www.modernanalyst.com/Resources/Articles/tabid/115/ID/5248/Capability-Based-Planning-with-ArchiMate.aspx (accessed May 18, 2022).

[39] 14:00-17:00, 'ISO/IEC 27000:2018', *ISO*. https://www.iso.org/cms/render/live/en/sites/isoorg/contents/data/standard/07/39/73906.html (accessed May 19, 2022).

[40] M. Dumas, M. L. Rosa, J. Mendling, and H. A. Reijers, *Fundamentals of Business Process Management*. Springer Berlin Heidelberg, 2013.

[41] 'Decision Model and Notation™ (DMN™) | Object Management Group'. https://www.omg.org/dmn/ (accessed May 19, 2022).

[42] 'Chapter 1. Decision Model and Notation (DMN) Red Hat Process Automation Manager 7.5', *Red Hat Customer Portal*. https://access.redhat.com/documentation/ko-kr/red_hat_process_automation_manager/7.5/html/designing_a_decision_service_using_dmn_models/dmn-con_dmn-models (accessed May 19, 2022).

[43] 'What are business rules | IBM'. https://www.ibm.com/cloud/learn/business-rules (accessed May 18, 2022).

[44] 'Business Information Model - Enterprise Architecture'. https://sites.google.com/a/glenlan.com/ea/ea-domains/business-architecture/business-models/business-information-model (accessed May 18, 2022).

[45] X. Fan, 'Chapter 6 - Fundamental UML Structural Modeling', in *Real-Time Embedded Systems*, X. Fan, Ed. Oxford: Newnes, 2015, pp. 131–184. doi: 10.1016/B978-0-12-801507-0.00006-7.

[46] J. Osis and U. Donins, 'Chapter 1 - Unified Modeling Language: A Standard for Designing a Software', in *Topological UML Modeling*, J. Osis and U. Donins, Eds. Boston: Elsevier, 2017, pp. 3–51. doi: 10.1016/B978-0-12-805476-5.00001-0.

[47] K. McElroy, *Prototyping for Designers: Developing the Best Digital and Physical Products*. O'Reilly Media, Inc., 2016.

[48] N. Babich, 'Prototyping 101: The Difference between Low-Fidelity and High-Fidelity Prototypes and When to Use Each', *Adobe Blog*. https://blog.adobe.com/en/publish/2017/11/29/prototyping-difference-low-fidelity-high-fidelity-prototypes-use (accessed May 19, 2022).

[49] C. Champagne, 'IDD Single Rulebook', *Eiopa - European Commission*, Oct. 05, 2020. https://www.eiopa.europa.eu/idd-rulebook_en (accessed May 19, 2022).

[50] R. Delcea, 'EIOPA at a glance', *Eiopa - European Commission*, Feb. 08, 2022. https://www.eiopa.europa.eu/about/eiopa-glance_en (accessed May 19, 2022).

[51] 'What Is Solvency II - Lloyd's'. https://www.lloyds.com/conducting-business/regulatory-information/solvency-ii/about/what-is-solvency-ii (accessed May 19, 2022).

[52] 'Solvency II', *Eiopa - European Commission*. https://www.eiopa.europa.eu/rulebook/solvency-ii_en (accessed May 19, 2022).

[53] 'The GDPR and key challenges faced by the Insurance industry'. KPMG, 2018. Accessed: May 19, 2022. [Online]. Available: https://assets.kpmg/content/dam/kpmg/ie/pdf/2018/03/ie-gdpr-for-insurance-industry.pdf

[54] 'The CJEU judgment in the Schrems II case'. European Pariament. Accessed: May 19, 2022. [Online]. Available:

https://www.europarl.europa.eu/RegData/etudes/ATAG/2020/652073/EPRS_ATA(2020)652073_EN.pdf
[55] 'Section 702: What It Is & How It Works'. Center for Democracy and Technology. Accessed: May 19, 2022. [Online]. Available: https://cdt.org/wp-content/uploads/2017/02/Section-702.pdf
[56] '"Schrems II" DPA investigations and enforcement: Lessons learned'. https://iapp.org/news/a/schrems-ii-dpa-investigations-and-enforcement-lessons-learned/ (accessed May 19, 2022).
[57] European Insurance and Occupational Pensions Authority., *Artificial Intelligence governance principles, towards ethical and trustworthy Artificial Intelligence in the European insurance sector: a report from EIOPA's Consultative Expert Group on Digital Ethics in insurance.* LU: Publications Office, 2021. Accessed: May 19, 2022. [Online]. Available: https://data.europa.eu/doi/10.2854/49874
[58] R. Delcea, 'Guidelines on information and communication technology security governance', *Eiopa - European Commission*, Oct. 12, 2020. https://www.eiopa.europa.eu/document-library/guidelines/guidelines-information-and-communication-technology-security-and_en (accessed May 19, 2022).
[59] 'Final Report on public consultation No. 19/270 on Guidelines on outsourcing to cloud service providers'. EIOPA, 2020. Accessed: May 19, 2022. [Online]. Available: https://www.eiopa.europa.eu/sites/default/files/publications/eiopa_guidelines/final_report_on_public_consultation_19-270-on-guidelines_on_outsourcing_to_cloud_service_providers.pdf
[60] 'CIS Critical Security Controls® Version 8'. Center for Internet Security, 2021. Accessed: May 19, 2022. [Online]. Available: https://www.cisecurity.org/controls/v8
[61] 'What is ITIL? Your guide to the IT Infrastructure Library', *CIO*. https://www.cio.com/article/272361/infrastructure-it-infrastructure-library-itil-definition-and-solutions.html (accessed May 19, 2022).
[62] 'EUROPEAN INSURANCE KEY FACTS 2020 data'. Insurance Europe. Accessed: May 19, 2022. [Online]. Available: https://www.insuranceeurope.eu/publications/2570/european-insurance-key-facts-2020-data
[63] 'European Insurance in Figures - 2020 data', p. 66.
[64] FinPro, *The Leadership in Insurance Podcast - S1, Episode 11, Tautona AI - John Holdsworth & Philip Cooper*, (Jan. 04, 2021). Accessed: May 19, 2022. [Online Video]. Available: https://www.youtube.com/watch?v=W0eAeDoze4s
[65] 'Tautona.ai - Crunchbase Company Profile & Funding'. https://www.crunchbase.com/organization/tautona-ai (accessed May 19, 2022).
[66] 'SchemeServe', *SourceForge*. https://sourceforge.net/software/product/SchemeServe/ (accessed May 19, 2022).
[67] 'SchemeServe - The leading insurance software platform'. https://www.schemeserve.com/ (accessed May 19, 2022).
[68] 'Innoveo | The No Code App Development Platform', *Innoveo*. https://innoveo.com/ (accessed May 19, 2022).
[69] 'Innoveo Skye Pricing, Alternatives & More 2022 - Capterra'. https://www.capterra.com/p/211759/Innoveo-Skye/ (accessed May 19, 2022).
[70] 'A1 Tracker Reviews and Pricing 2022'. https://sourceforge.net/software/product/A1-Tracker/ (accessed May 19, 2022).

[71] ‘omni:us’, *SourceForge*. https://sourceforge.net/software/product/omnius/ (accessed May 19, 2022).
[72] ‘Claims Automation with AI for Insurance | omni:us’. https://omnius.com/ (accessed May 19, 2022).
[73] ‘Claimsforce - Crunchbase Company Profile & Funding’, *Crunchbase*. https://www.crunchbase.com/organization/claimsforce (accessed May 19, 2022).
[74] ‘Claimsforce’. https://en.claimsforce.com/ (accessed May 19, 2022).
[75] ‘Imperial Claims Services | Claims Management Services in Greece - SEE’, *Imperial Claims Services*. https://imperialclaimsservices.com/ (accessed May 19, 2022).
[76] ‘DEKRA | On the safe side’. https://www.dekra.com/en/home/ (accessed May 19, 2022).
[77] ‘Digital Insurance Platform | EIS Insurance Software’, *EIS*. https://www.eisgroup.com/ (accessed May 19, 2022).
[78] ‘No Code, Cloud-Based Digital Insurance Software - UK’, *United Kingdom*. http://instanda.com/index.php (accessed May 19, 2022).
[79] ‘Socotra | Insurance Core Platform for InsurTech MGAs and Carriers’, *Socotra*. https://www.socotra.com/ (accessed May 19, 2022).
[80] ‘Software, Beratung und Cloud-Lösungen für Versicherer’, *msg life*. https://www.msg-life.com/ (accessed May 19, 2022).
[81] ‘Digital Process Automation Market Size, Share and Global Market Forecast to 2023 | MarketsandMarkets’. https://www.marketsandmarkets.com/Market-Reports/digital-process-automation-market-20502054.html (accessed May 19, 2022).
[82] Z. Yi, S. Solehan, A. Nazira, S. Mohd Sobri, and N. Hurini, ‘AUTOMATION OF CLAIM PROCESSING SYSTEM’, Dec. 2019.
[83] ‘Age and Travel Insurance | ABI’. https://www.abi.org.uk/products-and-issues/choosing-the-right-insurance/travel-guide/age-and-travel-insurance/ (accessed May 19, 2022).
[84] ‘Kindlustuse üldtingimused Ü101-2018’. ADB Gjensidige Eesti filiaal, 2018. Accessed: May 18, 2022. [Online]. Available: https://www.gjensidige.ee/-/media/tingimused/%C3%BCldtingimused%C3%BC101-2018_est.pdf
[85] ‘Reisikindlustuse tingimused RK101-2019’. ADB Gjensidige Eesti filiaal, 2019. Accessed: May 18, 2022. [Online]. Available: https://www.gjensidige.ee/-/media/kindlustustingimused/reisikindlustus/20190503/reisikindlustus-rk101_2019.pdf
[86] ‘Ifi reisikindlustuse tingimused TT-20202’. Accessed: May 18, 2022. [Online]. Available: https://tingimused.if.ee/ViewPDF.aspx?ID=b34c080a-a62a-4134-b322-6377cee60783
[87] ‘Reisikindlustuse tingimused’. Swedbank P&C Insurance AS. Accessed: May 18, 2022. [Online]. Available: https://www.swedbank.ee/static/pdf/private/insurance/travel/conditions_travel_EE_20220310_est.pdf
[88] ‘How insurers can optimize claims: automation and humans in the loop’. https://www.ey.com/en_uk/financial-services-emeia/how-insurers-can-optimize-claims-automation-and-humans-in-the-loop (accessed May 19, 2022).
[89] M. G. Smith, ‘New claims solutions: Transforming the value proposition - KPMG Global’, *KPMG*, Sep. 14, 2021. https://home.kpmg/xx/en/home/insights/2021/08/new-claims-solutions-transforming-the-value-proposition.html (accessed May 19, 2022).
[90] ‘Chapter 15: Requirements and User Stories’. https://www.agilebusiness.org/page/ProjectFramework_15_RequirementsandUserStories (accessed May 19, 2022).
[91] X. Wang, L. Zhao, Y. Wang, and J. Sun, ‘The Role of Requirements Engineering Practices in Agile Development: An Empirical Study’, in *Communications in Computer*

and Information Science, vol. 432, 2014, pp. 195–209. doi: 10.1007/978-3-662-43610-3_15.
[92] Riigi Infosüsteemi Amet, 'Mittefunktsionaalsed nõuded'. https://e-gov.github.io/MFN/ (accessed May 19, 2022).
[93] W. W. A. Initiative (WAI), 'WCAG 2 Overview', *Web Accessibility Initiative (WAI)*. https://www.w3.org/WAI/standards-guidelines/wcag/ (accessed May 19, 2022).
[94] 'Scrum Foundations eLearning Series Educational Videos'. https://www.scrumalliance.org/learn-about-scrum/scrum-elearning-series/scrum-events (accessed May 19, 2022).
[95] 'Raamatupidamise seadus–Riigi Teataja'. https://www.riigiteataja.ee/akt/835246 (accessed May 19, 2022).
[96] A. Schoenherr *et al.*, 'European Document Retention Guide 2013', p. 362.
[97] 'Reisitõrke kindlustus', *Eesti Kindlustusseltside Liit*. https://kindlustame.ee/kindlustus/reisikindlustus/reisitorke-kindlustus/ (accessed May 18, 2022).
[98] Allianz, 'Trip Delay, Trip Interruption and Trip Cancellation Insurance Explained', *Allianz Travel Insurance*. https://www.allianztravelinsurance.com/travel/trip-cancellation/travel-delay-trip-interruption-trip-cancellation.htm (accessed May 18, 2022).
[99] 'Insurance value chain: Personal lines', KPMG, Canada, 2020. Accessed: May 18, 2022. [Online]. Available: https://assets.kpmg/content/dam/kpmg/ca/pdf/2020/08/insurance-value-chain-personal-en.pdf
[100] 'What Are the Primary Activities of Michael Porter's Value Chain?', *Investopedia*. https://www.investopedia.com/ask/answers/050115/what-are-primary-activities-michael-porters-value-chain.asp (accessed May 18, 2022).
[101] 'European insurance: Preliminary figures 2020'. Insurance Europe aisbl, 2021. Accessed: May 18, 2022. [Online]. Available: https://www.insuranceeurope.eu/mediaitem/da85f184-c917-478b-b47f-16f670d889cb/European%20insurance%20-%20Preliminary%20figures%202020.pdf
[102] P. Brüggemann, T. Catlin, J. Chinczewski, J.-T. Lorenz, and S. Prymaka, 'Claims in the digital age: How insurers can get started | McKinsey'. McKinsey & Company, 2018. Accessed: May 18, 2022. [Online]. Available: https://www.mckinsey.com/industries/financial-services/our-insights/claims-in-the-digital-age
[103] 'Claims ratio definition and meaning | Collins English Dictionary'. https://www.collinsdictionary.com/dictionary/english/claims-ratio (accessed May 18, 2022).
[104] 'Consumer protection issues in Travel Insurance - Fact sheet'. EIOPA. Accessed: May 19, 2022. [Online]. Available: https://register.eiopa.europa.eu/Publications/Thematic%20Review%20-travel-insurance-factsheet.pdf
[105] R. Alexandrian, 'Non-Functional Requirements (Interoperability)':, *ArgonDigital | Making Technology a Strategic Advantage*, Aug. 09, 2019. https://argondigital.com/blog/product-management/non-functional-requirements-interoperability-requirements/ (accessed May 19, 2022).
[106] 'ITIL Availability Percentage and what the percentages mean : ITILNews.com'. https://www.itilnews.com/index.php?pagename=ITIL_Availability_Percentage_and_what_the_percentages_actually_mean_in_reality (accessed May 19, 2022).

[107] ‘OWASP Application Security Verification Standard | OWASP Foundation’. https://owasp.org/www-project-application-security-verification-standard/ (accessed May 19, 2022).

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Appendix 2 – Claims handler interview questionnaire

General

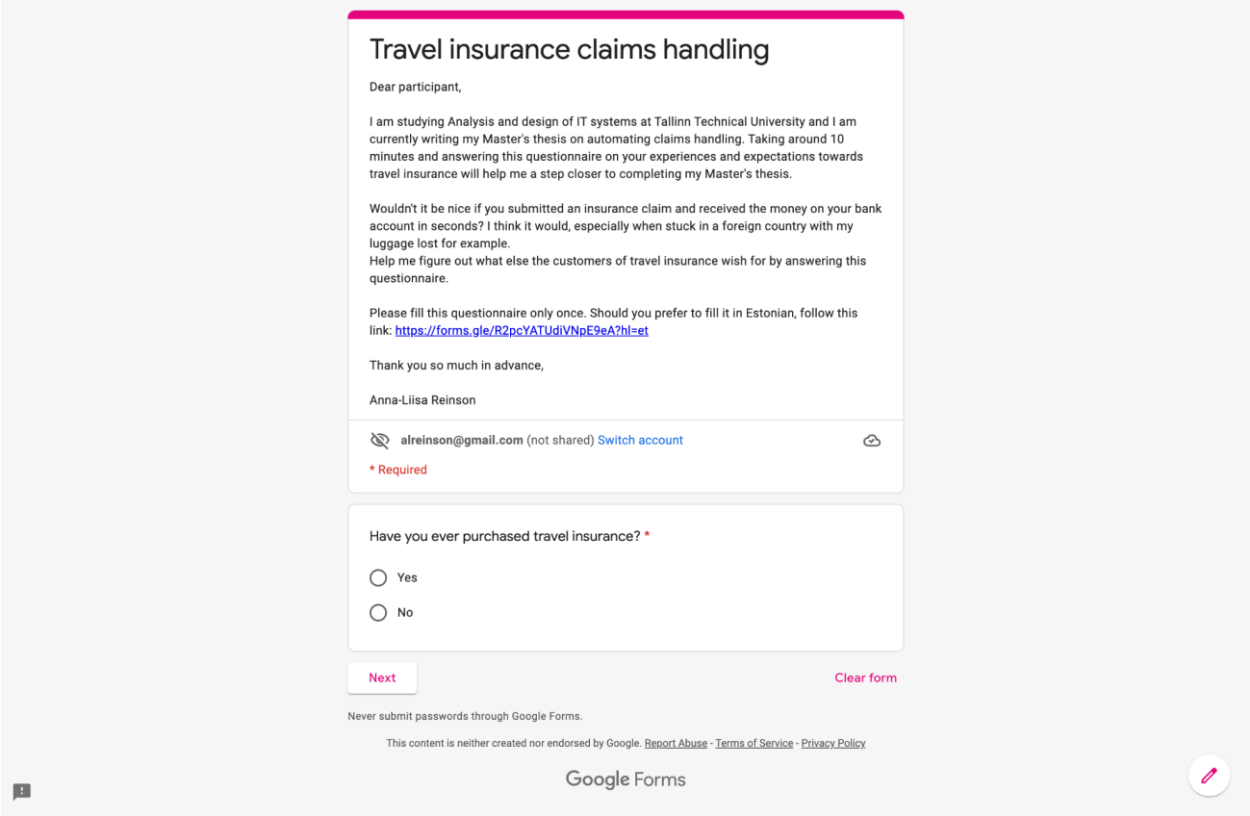
1. Which different kinds of processes exist regarding Claims submission, Claims handling, and beyond?
2. What is the objective of each of those processes?
3. Who are the different parties involved in handling the claims?
4. Who determines the rules according to which these claims processed are handled?
5. Which kind of general rules do you follow in handling claims?
6. Which kind of tools do you use in order to do all the processes from claims submission to the closing of the claim?
7. How do you measure claims processes?
8. What is your assessment of the claims processes?
    a. User-friendliness of the processes How well do the processes fulfil their objective?
    b. User-friendliness of tools used (their combination)
9. Is there any legislation that defines some or all the requirements regarding claims processes?
10. Are any of the processes being constantly reviewed and improved?

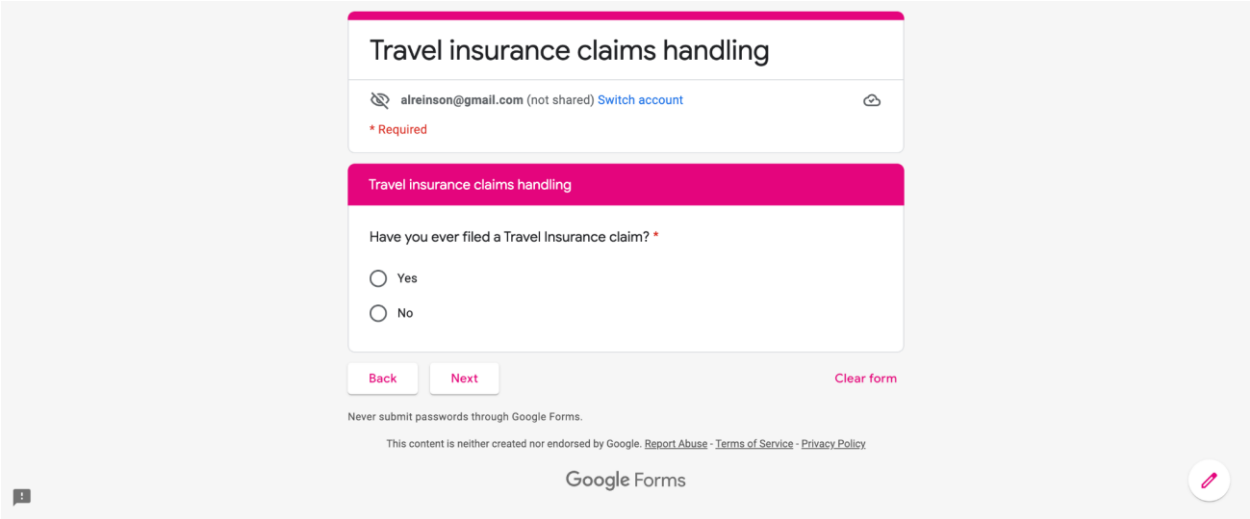
Specific Product Claims

1. What is the customer journey like starting from the customer submitting the FNOL to their claim being closed?
2. What is the customer journey like from the FNOL being received by the claims handler to the claim being closed?
3. Who are the different users of these processes?
4. Which different kinds of processes exist or are needed starting from the FNOL to fulfil all the requirements up until the closing of the claims? For each process:
    a. Where does the process start?
    b. What are the steps involved in the process?
        - What information flows from one person to another?
        - Are there any business rules associated with the process?
    c. Where does the process end?
    d. How long does each process take? How long does it take from FNOL to the closing of the claim?
    e. What work is done in the process?
    f. Who does the work and who is involved?
    g. What is the objective of each of the processes?
    h. How do you measure the success of the process?
    i. What will be the value of the process to customers in future?
    j. What are your reporting requirements?
    k. What are your implementation timelines (SLA) and constraints?
    l. Who will sign off the requirements and final production for this process?
5. Which different kinds of tools do you use in order to fulfil all the process requirements/processes?
6. What is your assessment of the claims processes?
    a. User-friendliness of the processes
    b. How well do the processes fulfil their objective?

    c. User-friendliness of tools used (their combination)
    d. Technical integrity (how often is something broken)
    e. Regulatory compliance of the processes
7. Is there any legislation that defines some or all the requirements regarding claims processes?
8. Do you have use cases and claims decision logic written down?

Appendix 3 – Travel insurance customer survey questionnaire





Travel insurance claims handling

alreinson@gmail.com (not shared) Switch account

* Required

Your experience with Travel Insurance claims

What did you file the claim for? *

- [ ] Medical costs - in case of an unexpected deterioration of your health.
- [ ] Accident - an event that happened during travel that caused damage to health or death.
- [ ] Travel interruption - such as flight delay or cancellation, inability to travel due to medical reasons etc
- [ ] Covid-19 - medical issues or flight cancellations etc connected to the global pandemic.
- [ ] Luggage damage, theft or loss - incase your luggage does not arrive at the destination in time or at all.
- [ ] Sports equipment damage or loss - in an event that your equipment gets damaged
- [ ] Rental vehicle damage - in case the vehicle that you rent gets damaged during your rental period.
- [ ] Personal liability - in case of damage done to the property of someone else.
- [ ] Other:

Why did you make the claim?

- [ ] In order to pay for the damages
- [ ] In order to get reimbursed for what I had already paid for
- [ ] In order to continue my trip
- [ ] Because I was entitled to this sum as I had purchased the policy
- [ ] Other: _____

Did your claim get settled of rejected? *

- ◯ Settled
- ◯ Rejected
- ◯ Partially settled
- ◯ Other: _____

Did you agree with the claims decision?

- ◯ Yes
- ◯ No

How would you rate your experience starting from filing the claims and finishing with receiving the payout or rejection notice? *

	1	2	3	4	5	6	7	8	9	10	
Horrible	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	Exceptional

How did you file the claim?

- ○ via a digital form on a website
- ○ via mobile app
- ○ via phone
- ○ via e-mail
- ○ Other:

Did you find the correct place to submit the claim easily? *

- ○ Yes
- ○ No
- ○ I don't remember
- ○ Other:

Did you have to submit extra information or documents after filing the claim? *

- ○ Yes
- ○ No
- ○ I don't remember

If yes, then what was it?

- ☐ Extra documents
- ☐ Answers to extra questions
- ☐ Pictures
- ☐ Other:

How long did it take for your to receive the payout or negative decision on your claim?

- ○ Minutes
- ○ Hours
- ○ Days
- ○ Weeks
- ○ Years
- ○ Other:

How satisfied were you with the speed of the claims handling? *

	1	2	3	4	5	
Very dissatisfied	○	○	○	○	○	Very satisfied

Is there anything else you would like to add?

Your answer

Back Next Clear form

Travel insurance claims handling

alralnson@gmail.com (not shared) Switch account

* Required

Claims handling expectations

Imagine that something happened on your trip. How would you like to notify the insurance company of your situation and file the claim? *

	Talk to a person over the phone	Fill out a form on the web	Send an e-mail	Send a video explanation
Medical costs - in case of an unexpected deterioration of your health	○	○	○	○
Accident - an event that happened during travel that caused damage to health or death.	○	○	○	○
Travel interruption - such as flight delay or cancellation inability to travel due to medical reasons etc	○	○	○	○
Luggage damage, theft or loss - incase your luggage does not arrive at the destination in time or at all.	○	○	○	○

Imagine that you have notified the insurance company of your situation. Imagine that you are claiming a sum of 399€ for each of the categories. What would be the most appropriate way to handle the claims of each category? *

	A person reviews the details of the situation and makes a personalized decision	A computer system reviews the information and makes the decision	A computer makes the decision, but a person reviews and confirms it
Medical costs	○	○	○
Accident	○	○	○
Travel interruption	○	○	○
Luggage damage, theft or loss	○	○	○

How fast do you expect for the claims payout of 399€ to be made after you have submitted the claim? *

	In minutes	In a few hours	1-3 days	4-6 days	a few months
Medical costs	○	○	○	○	○
Accident	○	○	○	○	○
Travel interruption	○	○	○	○	○
Luggage damage, theft or loss	○	○	○	○	○

How would you react if you were sure that you had the right to receive compensation, but your claim of 359€ was rejected by a person handling the claim? *

	File a complaint to have it reviewed again	Accept the rejection and move on	Write a bad review	Never purchase insurance from this company again
Medical costs	☐	☐	☐	☐
Accident	☐	☐	☐	☐
Travel interruption	☐	☐	☐	☐
Luggage damage, theft or loss	☐	☐	☐	☐

How would you react if the same thing happened, but the rejection decision was automatically, by an IT system? *

	File a complaint to have it reviewed again	Accept the rejection and move on	Write a bad review	Never purchase insurance from this company again
Medical costs	☐	☐	☐	☐
Accident	☐	☐	☐	☐
Travel interruption	☐	☐	☐	☐
Luggage damage, theft or loss	☐	☐	☐	☐

In which cases would you be willing to receive a 10%-20% lower payout for your insurance claim if it was handled automatically and the payout would be in just a few minutes after filing the claim? The alternative would be to wait up to a week and receive 100% *

	Instant payout 10-20% lower	Wait for a week, 100% payout
The claimed sum is under 300€	○	○
The claimed sum is between 301 and 1000€	○	○
The claimed sum is between 1001 and 5000€	○	○
The claimed sum is over 5000€	○	○
You are in a foreign country and your luggage did not arrive	○	○
You are in a foreign country and your flight was cancelled because of a strike	○	○
You are home, but you fall ill and cannot go on your trip	○	○

What would you prefer as a claims settlement "payout"?

- ○ For items that were broken or lost to be replaced in the same or better condition
- ○ For monetary compensation of your losses
- ○ Other: _____

Is there anything else you would like to add?

Your answer

Travel insurance claims handling

alreinson@gmail.com (not shared) Switch account

* Required

About insurance in general

How important are each of these aspects of a travel insurance service in convincing you to stick with one particular insurance company? 1-not important at all; 5- very important *

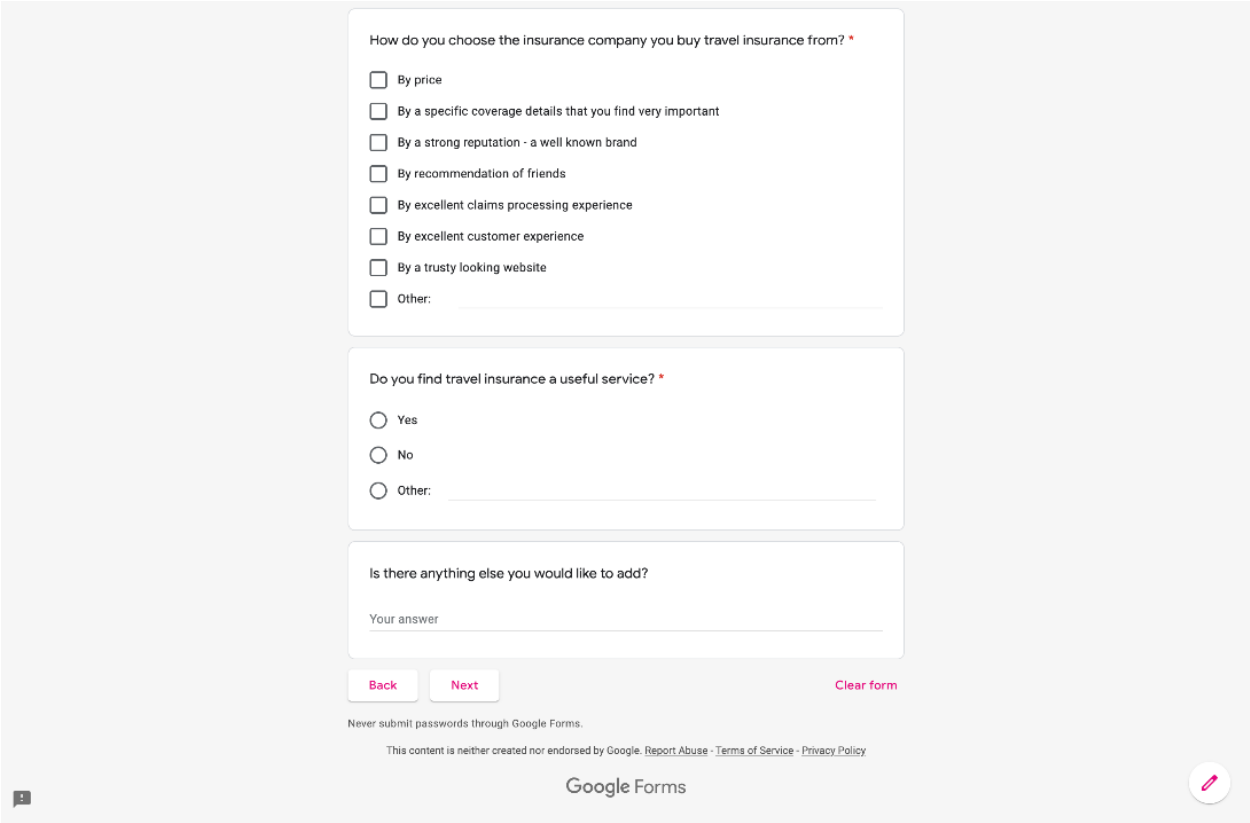
	1	2	3	4	5	I don't know
A quick and easy digital purchasing process	○	○	○	○	○	○
The possibility to purchase it with my trip, not having to go to the website of the insurer	○	○	○	○	○	○
A simple claims filing process	○	○	○	○	○	○
A fast claims decision and payout	○	○	○	○	○	○

What aspects would make you always stick to one insurance company when buying travel insurance? *

	Very unlikely	Unlikely	Likely	Very Likely
Better price than the competitors	○	○	○	○
A good experience with customer service	○	○	○	○
A loyalty programme - every 5th policy for a better price	○	○	○	○
A good experience with the handling of your claim	○	○	○	○
A friend's recommendation	○	○	○	○
The possibility to donate some of the money if you have had no insurance claims	○	○	○	○

Is there anything else that would convince you to stay loyal to one insurance company?

Your answer


How do you choose the insurance company you buy travel insurance from? *
By price
By a specific coverage details that you find very important
By a strong reputation - a well known brand
By recommendation of friends
By excellent claims processing experience
By excellent customer experience
By a trusty looking website
Other:
Do you find travel insurance a useful service? *
Yes
No
Other:
Is there anything else you would like to add?
Your answer
Back
Next
Clear form
Never submit passwords through Google Forms.
This content is neither created nor endorsed by Google. Report Abuse - Terms of Service - Privacy Policy
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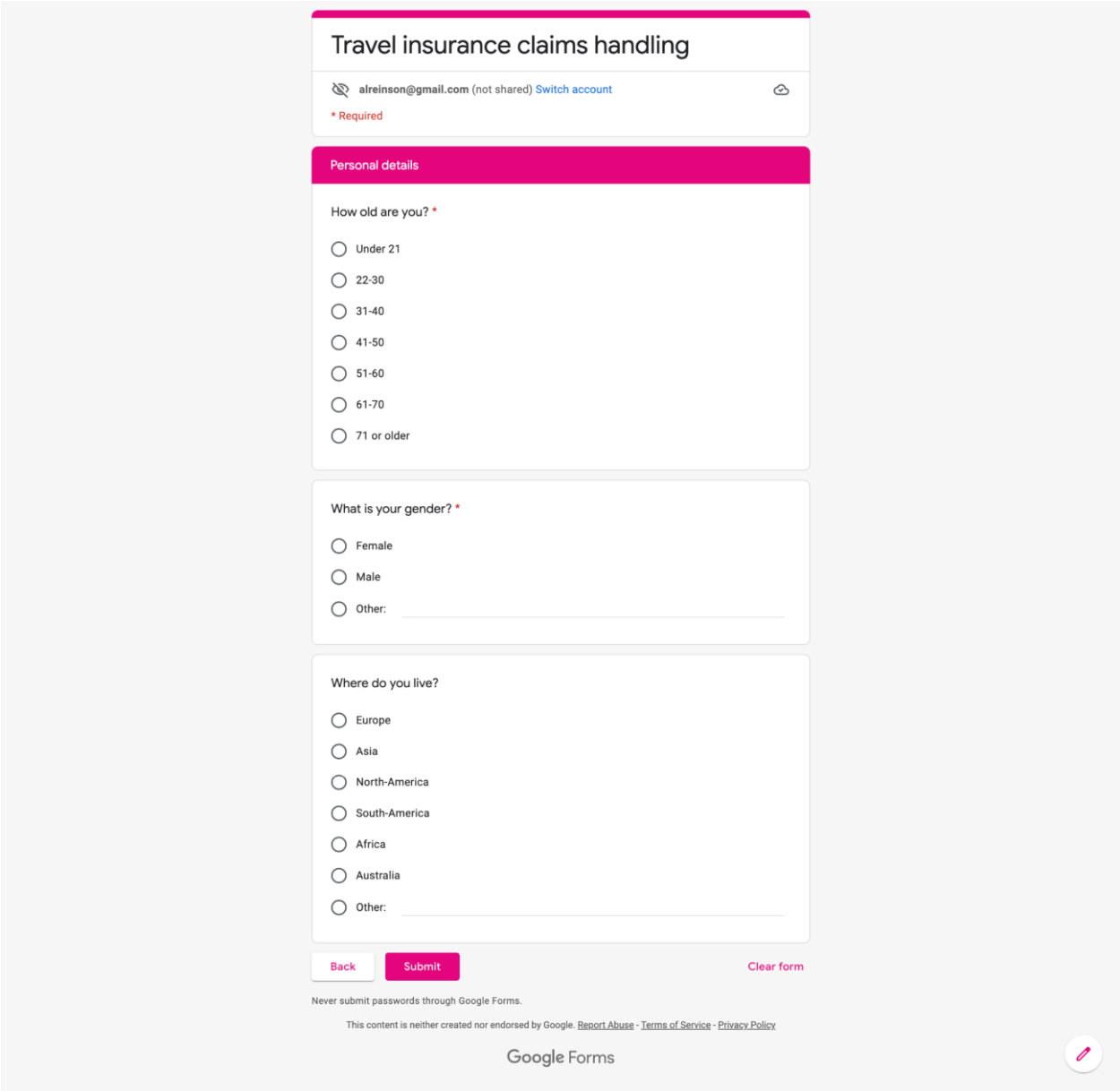
Travel insurance claims handling
alreinson@gmail.com (not shared) Switch account
* Required
Personal details
How old are you? *
Under 21
22-30
31-40
41-50
51-60
61-70
71 or older
What is your gender? *
Female
Male
Other:
Where do you live?
Europe
Asia
North-America
South-America
Africa
Australia
Other:
Back
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Appendix 4 – Insurance coverage rules from terms and conditions analysis

Table 25. A comparison table of exclusions from the general travel insurance terms and conditions documents (by author).

Who did it happen to?	What happened?	When did it occur?	Who or what caused damage?	Sub reason	Will the loss be covered?
Insured person	Cancellation or Delay	Before or During the trip	Nuclear incident	Nuclear energy, chemical or biological weapons, electromagnetic fields or any other form of radioactivity, radiological, toxicological or explosive properties of the substance	No
Insured person	Cancellation or Delay	Before or During the trip	war, terrorism, disturbances, insurrection	-	No
Insured person	Cancellation or Delay	Before or During the trip	strike or work stoppage	-	No
Insured person	Cancellation or Delay	Before or During the trip	archaeological excavations	-	No
Insured person	Cancellation or Delay	Before or During the trip	The person travelling with	Conflict between travel companions	No
Insured person	Cancellation or Delay	Before or During the trip	Extortion, fraud, embezzlement or the use of a	-	No

			weapon		
Insured person	Cancellation or Delay	Before or During the trip	insolvency, bankruptcy	Of the airport	No
Insured person	Cancellation or Delay	Before or During the trip	Tour operator	Act of omission	No
Insured person	Cancellation or Delay	Before or During the trip	You decided to miss it because of a delay	-	No
Insured person	Cancellation or Delay	Before or During the trip	You decided to interrupt it because of incomplete itinerary	-	No
Insured person	Cancellation or Delay	Before or During the trip	Schedule change of regular transport		No
Insured person	Cancellation or Delay	Before or During the trip	Incomplete Travel Documentation	-	No
Insured person	Cancellation or Delay	Before or During the trip	Accommodation company	Accommodation in Estonia	No

Insured person	Cancellation or Delay	Before or During the trip	Breaking the law	-	No
Insured person	Cancellation or Delay	Before or During the trip	Health	Pregnancy or giving birth or related	No
Insured person	Cancellation or Delay	Before or During the trip	Health	Chronic illness or an illness that existed before	No
Insured person	Cancellation or Delay	Before or During the trip	Health	Psychiatric illness	No
Insured person	Cancellation or Delay	Before or During the trip	Health	Self-harming	No
Insured person	Cancellation or Delay	Before or During the trip	Health	Accident is caused by: ● participation in hostilities or presence in the armed forces. ● being in a crisis area as an observer, rescue worker, medical worker or for similar reasons. ● activities of equivalent risk to the above. ● loss of income or non-pecuniary claims;	No
Insured person	Delay	Before or During the trip	Loss of means of transport	Due to airport management, aviation commission, public authority cancelling transport	No
Insured person	Cancellation or Delay	Before or During the trip	Work injury	Accident caused by: ● working in mines, on oil and gas platforms. ● work as a seaman, fisherman, policeman, security guard, rescue worker, member of a ship or aircraft crew, or in any occupation	No

				or employment involving the right to use or bear arms. ● being in a crisis area as an observer, rescue worker, medical worker or for similar reasons. ● activities of equivalent risk to the above.	
Insured person	Cancellation or Delay	Before or During the trip	Damage to property	Intentional damage	No

Table 26. A comparison table of coverage conditions from the travel insurance terms and conditions documents (by author).

Who did it happen to?	**What happened?**	**When did it occur?**	**How long**	**Who / what caused damage?**	**Sub reason**	**Result**
Insured person	Cancellation	Before the trip		Health	Sudden illness, injury or death of insured person	Yes
Insured person	Cancellation	Before the trip		Health	Life-threatening condition or injury	Yes
Travel companion	Cancellation	Before the trip		Health	Sudden illness, injury or death of insured person	Yes
Person close to the insured person	Cancellation	Before the trip		Health	Life-threatening condition or injury	Yes
Insured person	Cancellation	Before the trip		Damage to property	damage that requires presence in Estonia	Yes
Insured person	Cancellation / Delay	During the trip		Damage to property	loss or deterioration (but not expiry) of special travel equipment or travel documents taken on the trip, if the equipment or documents cannot be replaced during the trip;	Yes

Insured person	Delay	During the trip		Damage to property	loss or deterioration (but not expiry) of special travel equipment or travel documents taken on the trip, if the equipment or documents cannot be replaced during the trip;	Yes
Insured person	Delay	Before / During the trip	Up to 24h	Loss of means of transport	Weather conditions or natural disaster	Yes
Insured person	Interruption	During the trip	Up to 24h	Loss of means of transport	Technical malfunction of the vehicle	
Insured person	Interruption	During the trip	Up to 24h	Loss of means of transport	Tyre breakage	Yes
Insured person	Interruption	During the trip	Up to 24h	Loss of means of transport	Emergency landing of the aircraft	Yes
Insured person	Delay	Before / During the trip	Up to 24h	Loss of means of transport	Unexpected traffic jam	Yes
Person close to the insured person	Delay	Before the trip		Health	Life-threatening condition or injury	Yes

Table 27. A comparison table of exclusions from the travel insurance terms and consitions documents (by author).

Who did it happen to?	**What happened?**	**When did it occur?**	**Who / what caused damage?**	**Sub reason**	**Decision**
Insured person	Cancellation / Delay	Before / During	Nuclear incident	nuclear energy, chemical or biological weapons, electromagnetic fields or any other form of radioactivity, radiological, toxicological or explosive properties of the substance	No reimbursement

Insured person	Cancellation / Delay	Before / During	war, terrorism, disturbances, insurrection	-	No reimbursement
Insured person	Cancellation / Delay	Before / During	strike or work stoppage	-	No reimbursement
Insured person	Cancellation / Delay	Before / During	archaeological excavations	-	No reimbursement
Insured person	Cancellation / Delay	Before / During	The person travelling with	-	No reimbursement
Insured person	Cancellation / Delay	Before / During	Extortion, fraud, embezzlement or the use of a weapon	-	No reimbursement
Insured person	Cancellation / Delay	Before / During	strike, stoppage, insolvency, bankruptcy	-	No reimbursement
Insured person	Cancellation / Delay	Before / During	Tour operator	Act of omission	No reimbursement
Insured person	Cancellation / Delay	Before / During	You decided to miss it because of a delay	-	No
Insured person	Cancellation / Delay	Before / During	You decided to interrupt it because of incomplete itinerary	-	No
Insured person	Cancellation / Delay	Before / During	Schedule change of regular transport		no
Insured person	Cancellation / Delay	Before / During	Incomplete Travel Documentation	-	no
Insured person	Cancellation / Delay	Before / During	Accommodation company	Accommodation in Estonia	no
Insured person	Cancellation / Delay	Before / During	Breaking the law	-	no
Insured person	Cancellation / Delay	Before / During	Health	Pregnancy or giving birth or related	no

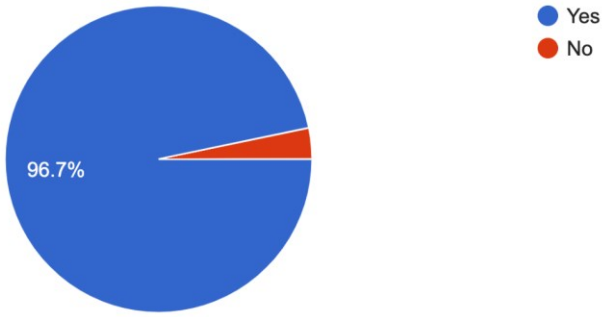
Insured person	Cancellation / Delay	Before / During	Health	Chronic illness or an illness that existed before	no
Insured person	Cancellation / Delay	Before / During	Health	Psychiatric illness	no
Insured person	Cancellation / Delay	Before / During	Health	Self-harming	no
Insured person	Cancellation / Delay	Before / During	Health	Accident is caused by: participation in hostilities or presence in the armed forces; being in a crisis area as an observer, rescue worker, medical worker or for similar reasons; activities of equivalent risk to the above; loss of income or non-pecuniary claims;	no
Insured person	Delay	Before / During	Loss of means of transport	Due to airport management, aviation commission, public authority cancelling transport	no
Insured person	Cancellation / Delay	Before / During	Work injury	Accident caused by: working in mines, on oil and gas platforms; work as a seaman, fisherman, policeman, security guard, rescue worker, member of a ship or aircraft crew, or in any occupation or employment involving the right	no

				to use or bear arms; being in a crisis area as an observer, rescue worker, medical worker or for similar reasons; activities of equivalent risk to the above;	
Insured person	Cancellation / Delay	Before / During	Damage to property	Intentional damage	no

Appendix 5 – Travel Insurance Customer survey results

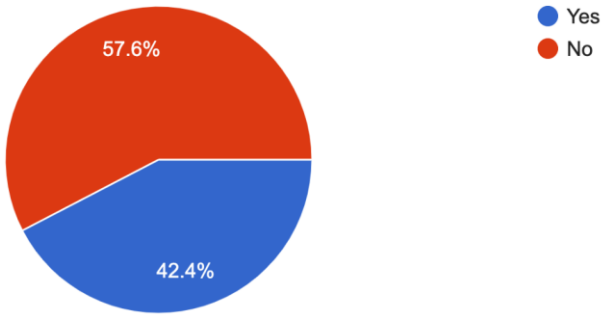
Have you ever purchased travel insurance?

61 responses



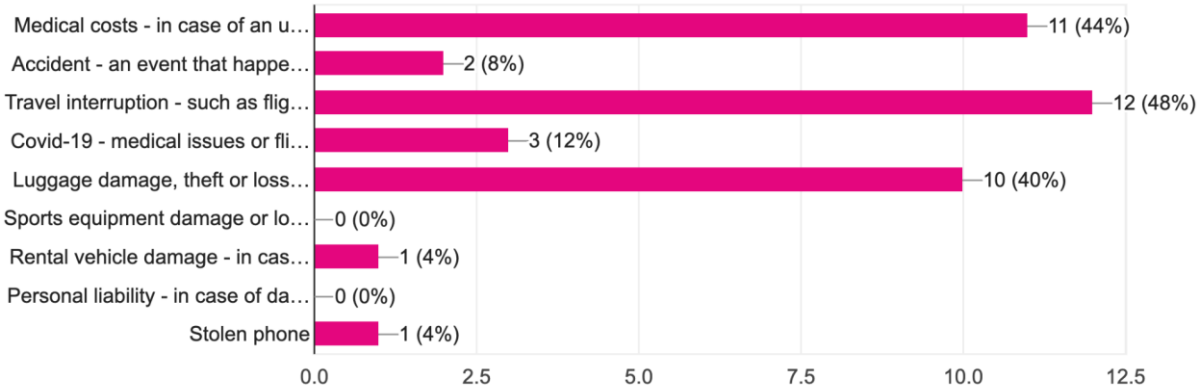
Have you ever filed a Travel Insurance claim?

59 responses



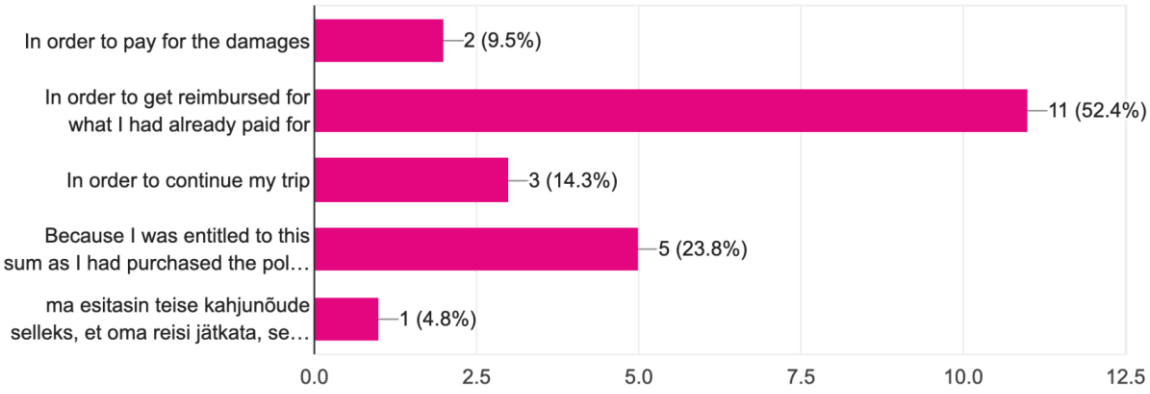
What did you file the claim for?

25 responses



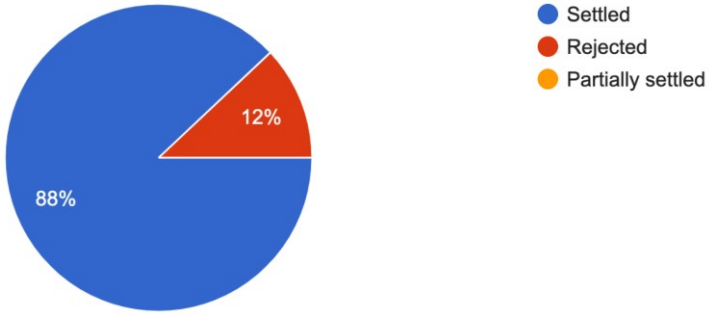
Why did you make the claim?

21 responses



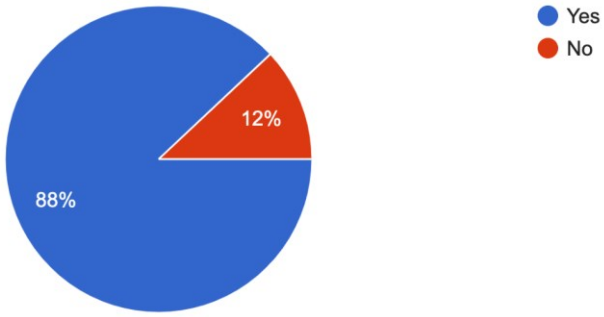
Did your claim get settled of rejected?

25 responses



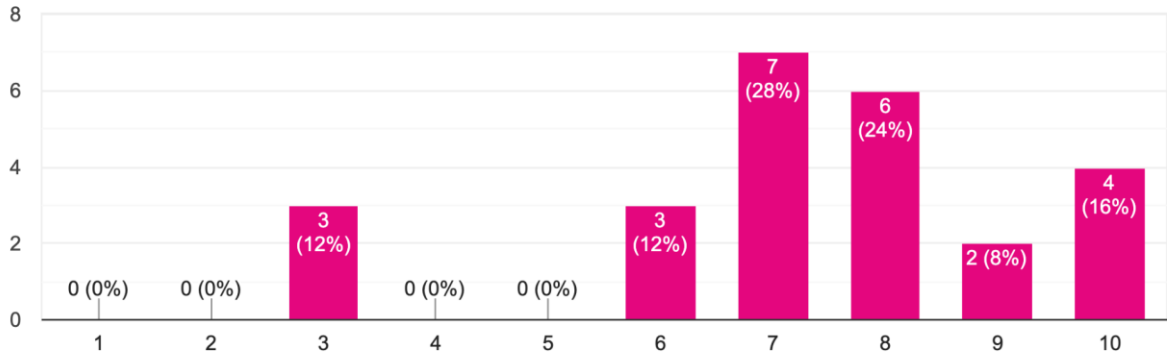
Did you agree with the claims decision?

25 responses



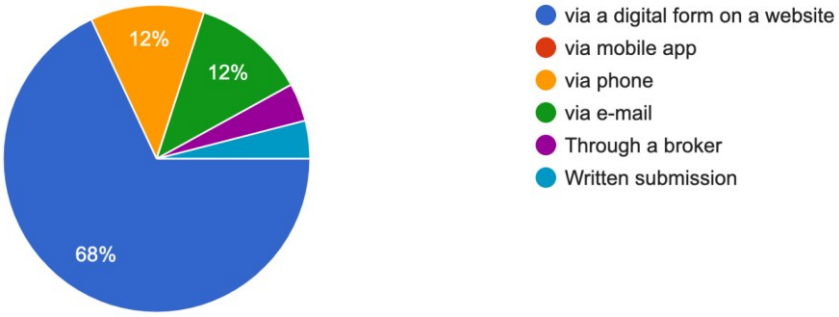
How would you rate your experience starting from filing the claims and finishing with receiving the payout or rejection notice?

25 responses



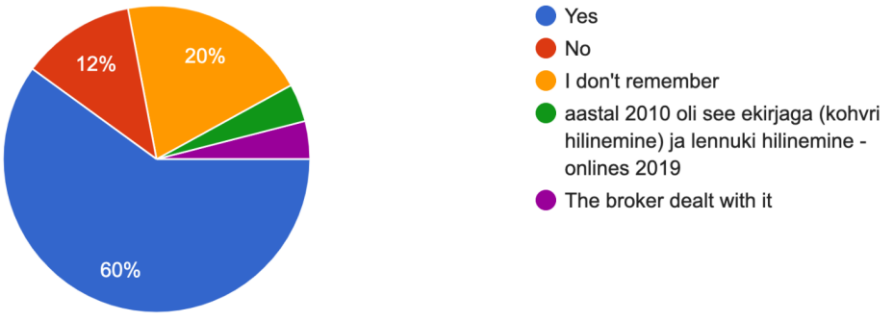
How did you file the claim?

25 responses



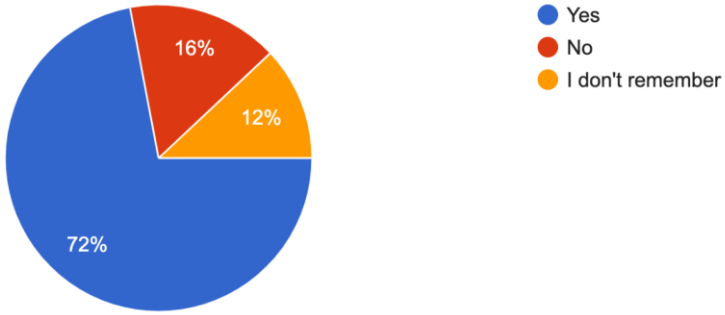
Did you find the correct place to submit the claim easily?

25 responses



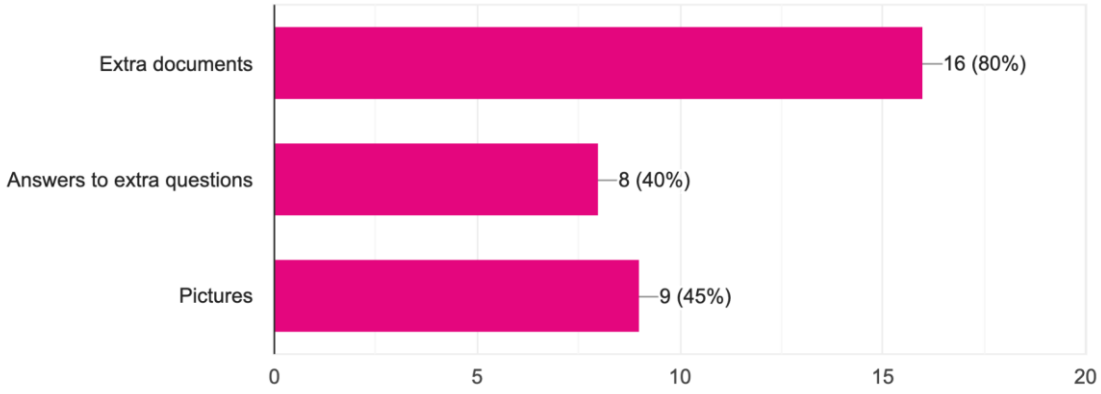
Did you have to submit extra information or documents after filing the claim?

25 responses



If yes, then what was it?

20 responses

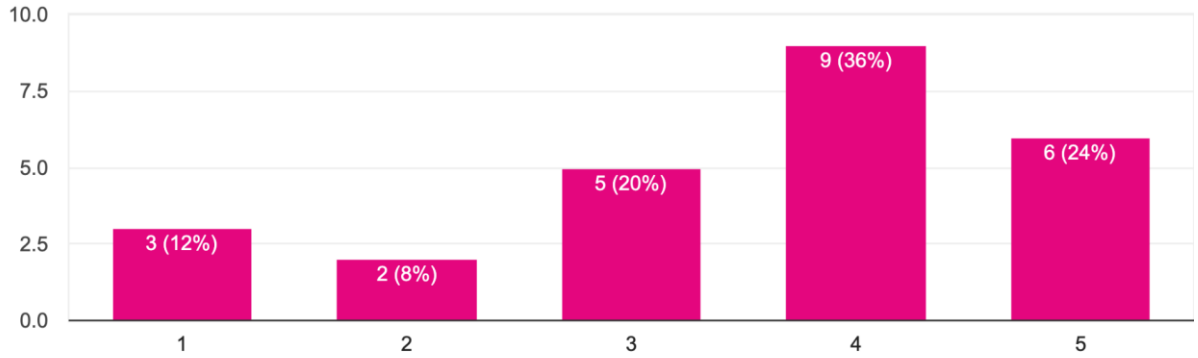


How long did it take for your to receive the payout or negative decision on your claim?

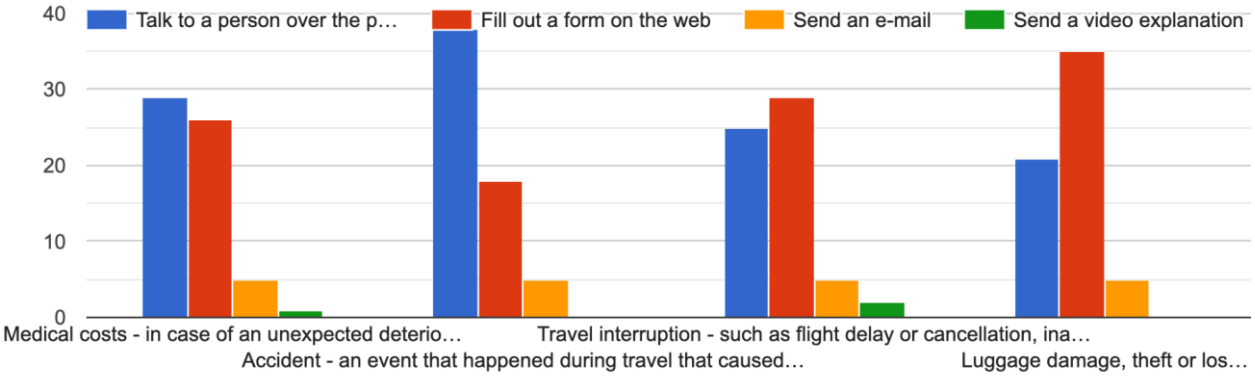
25 responses

How satisfied were you with the speed of the claims handling?

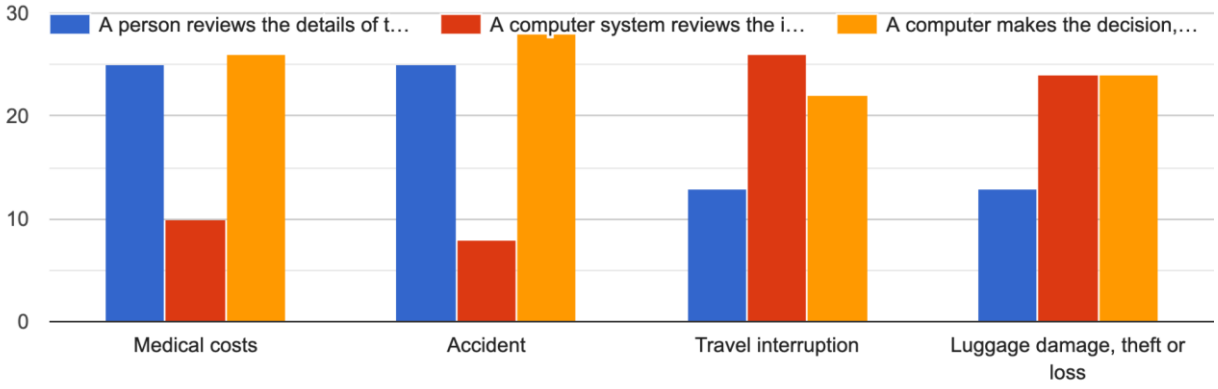
25 responses



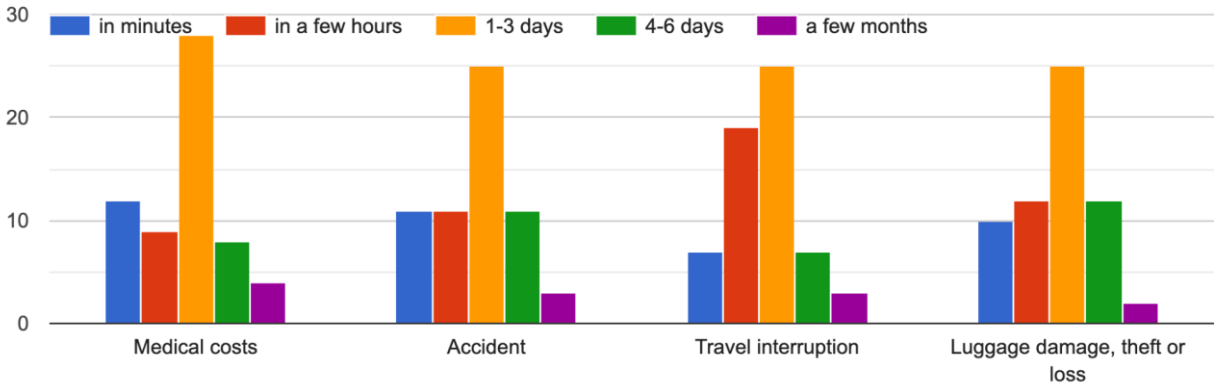
Imagine that something happened on your trip. How would you like to notify the insurance company of your situation and file the claim?



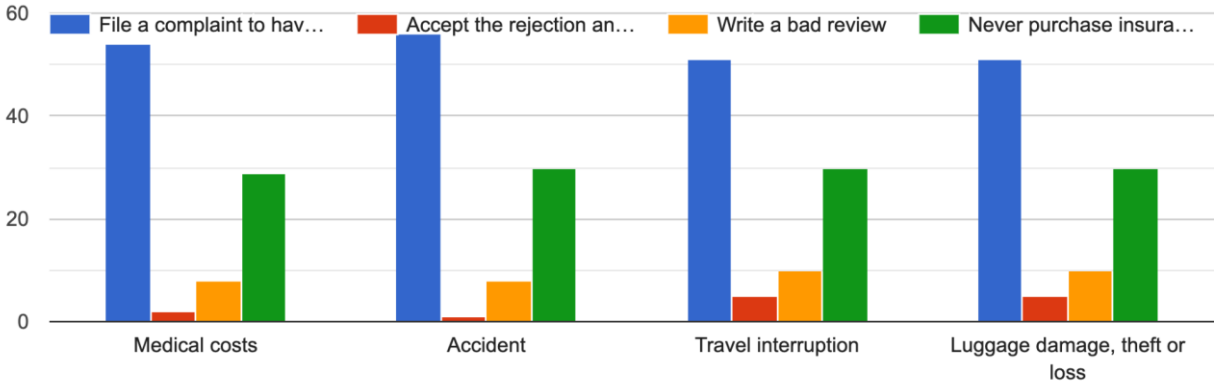
Imagine that you have notified the insurance company of your situation. Imagine that you are claiming a sum of 359€ for each of the categories....priate way to handle the claims of each category?



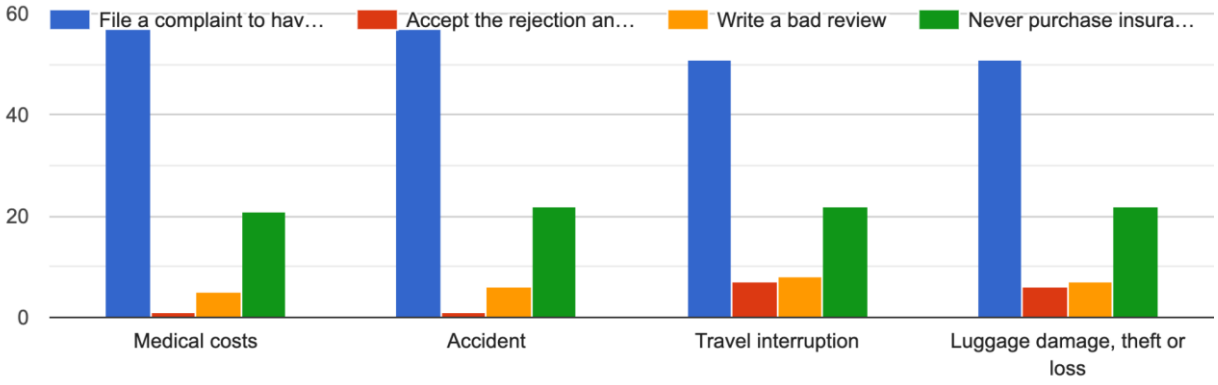
How fast do you expect for the claims payout of 359€ to be made after you have submitted the claim?



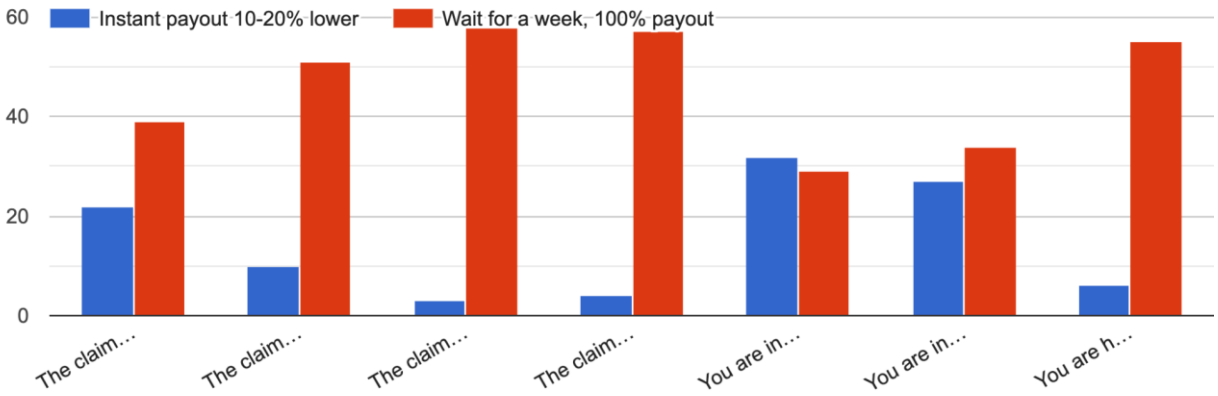
How would you react if you were sure that you had the right to receive compensation, but your claim of 359€ was rejected by a person handling the claim?



How would you react if the same thing happened, but the rejection decision was automatically, by an IT system?



In which cases would you be willing to receive a 10%-20% lower payout for your insurance claim if it was handled automatically and the payout woul...e would be to wait up to a week and receive 100%



What would you prefer as a claims settlement "payout"?

51 responses

Is there anything else you would like to add?

6 responses

About previous question - if I claimed insurance payout for medical costs for a situation which occurred abroad and I had to pay in cash, I would prefer to have the payout rather fast no matter the sum. For any other situation asked before, I'd expect the payout as filled.

In case of travel interruption and lost/damaged luggage, I can also file with the airline in the EU. In case of travel interruption, I would file with both anyway so I am more willing to accept the rejection.

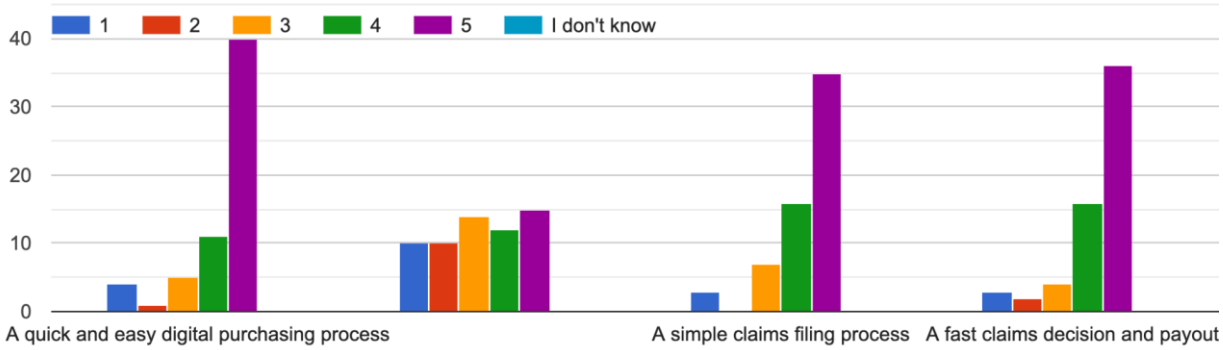
No

The institution must guarantee the issue happened, for example, the Hospital, airline, etc...
The bill should be paid directly to the hospital, hotel, etc with some code(emergency credit).
In all cases, the user doesn't need to spend her money before.

I wouldn't like to deal with an automated bot in case of sudden illness o accident

I prefer written comunication but I think it is still important to have the option of speaking to someone when something important happens to you: in those cases you don't want to deal with a computer, specially if you are an elder person or you are feeling anxious. Besides, I don't think it is right to recieve less in exchange of shorter payment time.

How important are each of these aspects of a travel insurance service in convincing you to stick with one particular insurance company? 1-not important at all; 5- very important



What aspects would make you always stick to one insurance company when buying travel insurance?

Is there anything else that would convince you to stay loyal to one insurance company?

11 responses

The whole insurance package and possibilities of “customised” insurance

A good experience with a claim from a difference insurance policy (different product).

no

No

Customer-centricity

experience

I actually get money/replacement once I have a claim and don’t get rejected or paid out less due to the Terms

Location close to the office/home to easy access and communication with the service provider

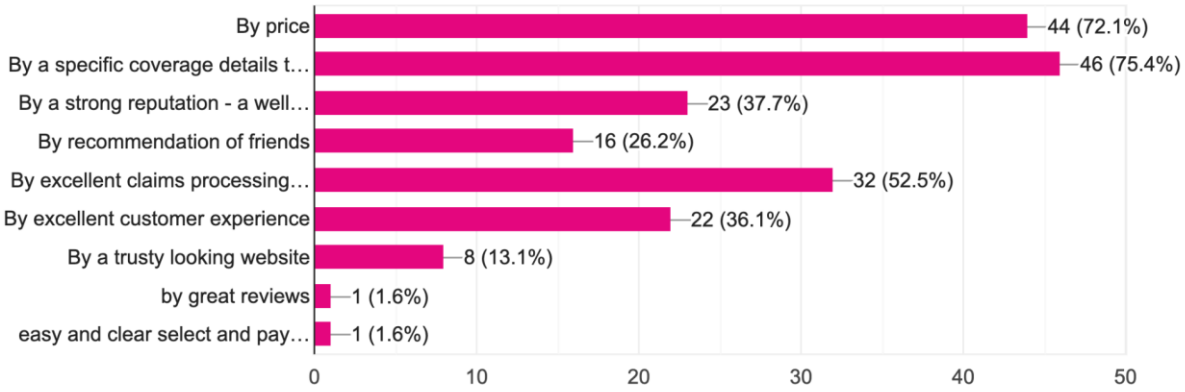
Kui ma saaks mingi kombo pakkumise enda kõigile kindlustustele, kodu, autod, rattad, reis.

easy withdrawal, sometimes you take a inssurance and it's so hard to finish.

I would take it into account it if they had inclusive policies (to deal with people with special needs, for example)

How do you choose the insurance company you buy travel insurance from?

61 responses



Do you find travel insurance a useful service?

61 responses

Is there anything else you would like to add?

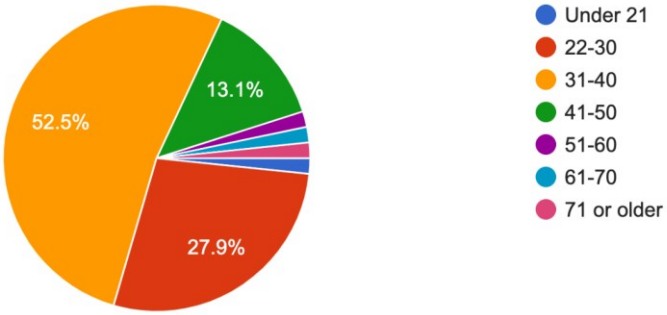
2 responses

When selecting insurance, I often use iizi.ee because I can see the comparison of the terms very easily. It is important to me to know what is covered and some providers make it complicated on purpose. When I buy travel insurance, the customer support availability is essential. If you need to get money right away for new tickets or you need to get a guarantee of payment for a hospital, you need to be able to reach them and so many insurance companies are not available even on the weekends.

No

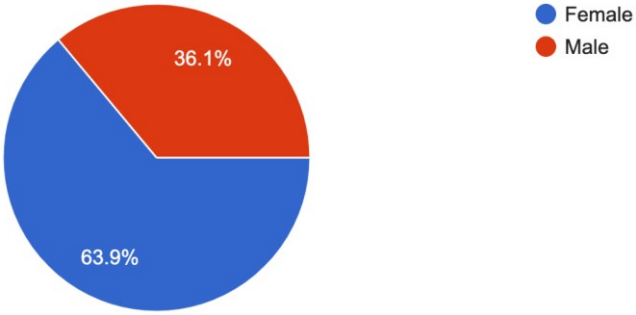
How old are you?

61 responses



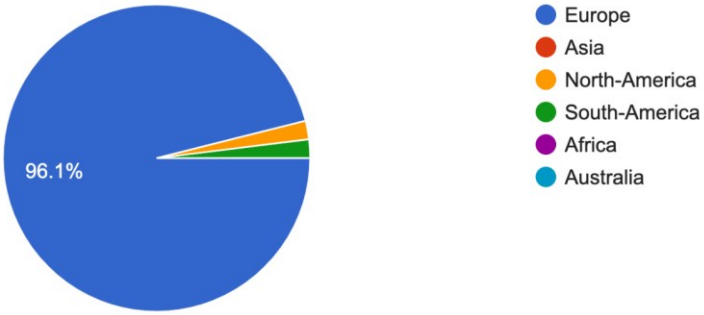
What is your gender?

61 responses



Where do you live?

51 responses



Appendix 6 – The responsibilities of the stakeholders regarding ICT security and governance

Abbreviations used in the table:

- **AMSB** - The administrative, management or supervisory body of the insurance or reinsurance undertaking.
- **CH SaaS** – the software solution that is being designed as a result of this master's thesis.
- **FI** – Finantsinspektsioon, the supervisory and oversight body for insurance services in Estonia.
- **EIOPA** - the supervisory and oversight body for insurance services in Europe.
- **IC** – Insurance company who is outsourcing the claims handling software, using the Claims Handling SaaS.

Table 28. A RACI matrix of stakeholder responsibilities regarding ICT security and governance [58] (by author).

Guidelines	Responsible	Accountable	Consulted	Informed
Guideline 1 – Proportionality	CH SaaS	IC	IC	FI
Guideline 2 - ICT within the system of governance	CH SaaS	IC	IC	FI
Guideline 3 – ICT strategy	CH SaaS	IC	IC	FI
Guideline 4 – ICT and security risks within the risk management system	CH SaaS	IC	IC	FI
Guideline 5 - Audit	IC	FI	FI	FI
Guideline 6 – Information security policy and measures	CH SaaS	IC	IC	FI
Guideline 7 - Information security function – Points 24, 25b, 25c, 25d, 25e	IC	FI	FI	FI

Guideline 7 - Information security function – Point 25a, 25c, 25e	CH SaaS	IC	IC	FI
Guideline 8 – Logical security	CH SaaS	IC	IC	FI
Guideline 9 – Physical security	CH SaaS	IC	IC	FI
Guideline 10 – ICT operations security	CH SaaS	IC	IC	FI
Guideline 11 – Security monitoring	CH SaaS	IC	IC	FI
Guideline 12 – Information security reviews, assessment and testing	CH SaaS	IC	IC	FI
Guideline 13 – Information security training and awareness	CH SaaS	IC	IC	FI
Guideline 14 – ICT operations management	CH SaaS	IC	IC	FI
Guideline 15 - ICT incident and problem management	CH SaaS	IC	IC	FI
Guideline 16 – ICT project management	CH SaaS	IC	IC	FI
Guideline 17 - ICT systems acquisition and development	CH SaaS	IC	IC	FI
Guideline 18 - ICT change management	CH SaaS	IC	IC	FI
Guideline 19 – Business continuity management	IC	FI	FI	FI
Guideline 20 – Business impact analysis	IC	FI	FI	FI
Guideline 21 – Business continuity planning	CH SaaS	IC	IC	FI
Guideline 22 – Response and recovery plans	CH SaaS	IC	IC	FI

Guideline 23 – Testing of plans	IC	FI	FI	FI
Guideline 24 - Crisis communications	CH SaaS	IC	IC	FI
Guideline 25 – Outsourcing of ICT services and ICT systems	IC	FI	FI	FI

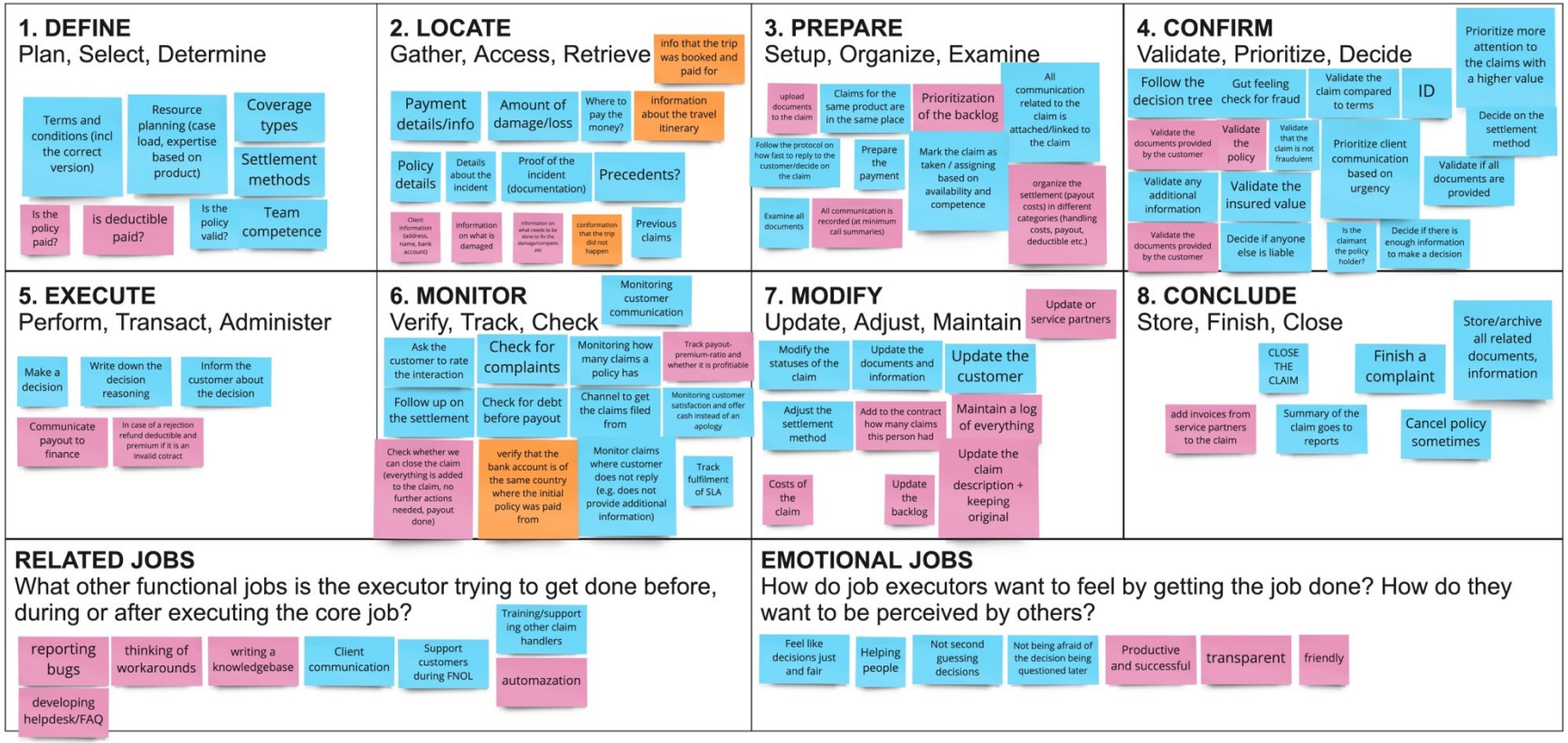
Appendix 7 – The Jobs to be Done Core functional job map

Job Executor (e.g. the end user)

Claims handler

Core Functional Job-to-be-Done (Verb + Objective of the Verb + Contextual classifier)

Deciding whether the claim settlement should be paid out or not



Appendix 8 – Direct competitor comparison

Table 29. Detailed competitor comparison table (by author).

Category	Features and Functionalities	Source	Tautona	SchemeServe	Innoveo Skye	A1 Tracker	omni:us	Claims Force
General	Travel insurance product support	Product type	No, P&C and Property, not Travel insurance in particular	No	No	No	No	No
General	Training by vendor	Functionality that many competitors share	Yes	Yes	Yes	Yes	Yes	Yes
General	Access control	GDPR - access to customer data ISO 27001	Yes	Yes	Yes	Yes	Yes	Yes
General	Localisation to other languages besides English (Estonian)	Official language of the markets must be supported	Info not available	No	Yes	Info not available	No	Info not available
General	Capability to support multiple currencies	Official currency of the country must be supported	Info not available	Yes	Yes	Info not available	Info not available	Info not available
General	Capability to track the fulfilment of Service time in Service Level Agreements	Contractual	Info not available	Info not available	Info not available	Info not available	Info not available	Info not available
General	Simple and fast launching of new processes	Functionality that many competitors share	Yes	Yes	Yes	Yes	Info not available	Info not available

General	No-code digital process setup	Functionality that many competitors share	Info not available	Info not available	Yes	Info not available	Info not available	Info not available
General	Business Process Management use	Functionality that many competitors share	Info not available	Info not available	Info not available	Info not available	Yes	Info not available
General	ISO	Schrems II, EIOPA Guidelines on outsourcing to cloud service providers - consultations	Info not available	Info not available	Info not available	Info not available	Yes, ISO 27001	Info not available
Compliance	HQ located in the EU/EEA/EFTA	Schrems II	No, USA and South-Africa	No, UK	Yes	No	Info not available	Yes
Compliance	Cloud servers located in the EU or data encrypted with the Key held by a trusted party in the EU	Schrems II, EIOPA Guidelines on outsourcing to cloud service providers	Info not available, Provider Google, which is not fully GDPR compliant currently	Info not available	Yes, AWS, can be hosted in dedicated cloud instances. Unclear about encryption	Yes, on premise hosting option	Info not available	Info not available
Compliance	Data backups	A functionality many competitors share	Info not available	Info not available	Info not available	Yes	Info not available	Info not available
Compliance	Capability to keep records of all transactions	Estonian Accounting Law [95] and other European Records retention laws [96], Internal audit	Yes, presumably	Info not available	Info not available	Yes, Audit trail	Info not available	Info not available
FNOL	Branding customisation	Client's Company Corporate Visual identity	Info not available	Yes	Yes	Info not available	Info not available	Info not available

FNOL	Capability to accept claims via a web-based first notice of loss form	Customer survey	No, presumably	Yes	Yes	Yes	Yes	Info not availab le
FNOL	Configurabl e claim filing processes	Customer survey, Product Terms & Conditions analysis	Yes, via e-mail	Info not available	Info not available	Yes	Yes	Info not availab le
FNOL	Capability to validate that no other party is liable for the loss	Terms & Conditions analysis	Info not available	Info not available	Info not available	Info not available	Info not available	Info not availab le
Claim processin g	Configurabl e claim management processes	Jobs to be Done	Yes	Info not available	Yes	Info not available	Yes	Yes
Claim processin g	Capability to categorize damage	Terms & Conditions analysis	Info not available	Info not available	Yes, manually	Info not available	Info not available	Yes
Claim processin g	Capability to triage / prioritize claims with a higher cost, urgency or otherwise	Claim handler interviews, Jobs to be Done	Info not available	Info not available	Info not available	Info not available	Yes	Info not availab le
Claim processin g	Capability to update the statuses of the claim	Claim handler interviews, Jobs to be Done	Info not available	Yes	Yes	Yes	Info not available	Info not availab le
Claim processin g	Capability to retrieve Policy information and documents	Claim handler interviews, Jobs to be Done	Yes, Policy document is retrieved via Robotics Process Automation in case of missing APIs	Yes	Yes	Yes	Yes	Info not availab le
Claim processin g	Capability to extract information from the Policy, documents	Claim handler interviews, Jobs to be Done	Yes	Info not available	Info not available	Info not available	Yes, OCR, Free text interpret ation, handwrit	Info not availab le

	and Terms and Conditions						ten text recogniti on	
Claim processin g	Capability to process Policy information and documents information	Claim handler interviews, Jobs to be Done	Yes, OCR, NLU to check for Policy Coverage	Info not available	Info not available	Info not available	Yes	Info not availab le
Claim processin g	Capability to process Terms and Conditions information	Claim handler interviews, Jobs to be Done	Yes, DMN to validate terms and conditions	Info not available	Info not available	Info not available	Yes	Info not availab le
Claim processin g	Capability to assign claims to a claims handler based on availability and competencie s	Claim handler interviews, Jobs to be Done	Yes, Bot selects field adjuster based on claim type, geography, experience, who inspects and then sends claim to claim adjuster	Info not available	Info not available	Info not available	Info not available	Yes
Claim processin g	Capability to collect the details about the incident	Claim handler interviews, Jobs to be Done	Yes, claim form via e-mail, RPA to retrieve claim form, NER/OCR to extract information	Yes	Yes	Info not available	Yes	Info not availab le
Claim processin g	Capability to collect the documents proving the accident happened	Claim handler interviews, Jobs to be Done	Yes, claim form via e-mail, RPA to retrieve claim form, NER/OCR to extract information	Yes	Yes	Info not available	Yes	Info not availab le
Claim processin g	Capability to collect the information about the amount of loss	Claim handler interviews, Jobs to be Done	Yes, ML to estimate the approximate reserve loss amount	Info not available	Yes	Info not available	Yes	Yes
Claim processin g	Capability to check if all the required information	Claim handler interviews,	Info not available	Info not available	Info not available	Info not available	Yes	Info not availab le

	has been collected	Jobs to be Done						
Claim processing	Capability to collect missing information and documents	Claim handler interviews, Jobs to be Done	Info not available	Info not available	Info not available	Info not available	Info not available	Info not available
Claim processing	Capability to extract information from the claim data and submitted documents	Claim handler interviews, Jobs to be Done	Yes	Info not available	Info not available	Info not available	Yes, OCR, Free text interpretation, handwritten text recognition	Info not available
Claim processing	Capability to examine claim data and documents	Claim handler interviews, Jobs to be Done	Yes, NLU to identify the approximate cause	Info not available	Info not available	Info not available	Yes	Info not available
Claim processing	Capability to access and process previous claims information	Claim handler interviews, Jobs to be Done	No	Info not available	Yes, via API	Info not available	Info not available	Info not available
Claim processing	Capability to organise all the claim documents, communication transcripts and other related data	Claim handler interviews, Jobs to be Done	No	Info not available	Info not available	Yes, the claim log	Yes	Yes
Claim processing	Capability to configure different decision-making logic to different kinds of claims	Claim handler interviews, Jobs to be Done	Yes, DMN	Info not available	Info not available	Info not available	Yes	Info not available
Claim processing	Capability to validate that the claim does not violate the terms and conditions	Claim handler interviews, Jobs to be Done	Yes, DMN	Info not available	Info not available	Info not available	Yes	Info not available

Claim processing	Capability to fully-automatically process a claim, make the decision and close the claim according to pre-configured criteria	Claim handler interviews, Jobs to be Done	No	Info not available	Info not available	Info not available	Yes	Info not available
Claim processing	Capability to recommend the claims decision to settle, reject or close the claim	Claim handler interviews, Jobs to be Done	Yes	Info not available	Info not available	Info not available	Info not available	Info not available
Claim processing	Capability to mark down the reasoning behind the claims decision	Claim handler interviews, Jobs to be Done	Info not available	Info not available	Info not available	Info not available	Info not available	Info not available
Claim processing	Capability to archive all claim information	Claim handler interviews, Jobs to be Done	No	Info not available	Info not available	Info not available	Info not available	Info not available
Claim processing	Capability to close the claim	Claim handler interviews, Jobs to be Done	No	Info not available	Info not available	Info not available	Info not available	Info not available
Fraud	Capability to access and process previous claims information	Claim handler interviews, Jobs to be Done	No	Info not available	Info not available	Info not available	Info not available	Yes
Fraud	Capability to prevent money laundry by checking the origin of the bank account	Claim handler interviews, Jobs to be Done	Info not available	Info not available	Info not available	Info not available	Info not available	Info not available
Fraud	Capability to validate that the claim is	Claim handler interviews,	Yes	Yes	Yes	Yes	Info not available	Info not

	not fraudulent	Jobs to be Done						availab le
Fraud	Capability to validate that the policyholder 's ID is not fraudulent	Claim handler interviews, Jobs to be Done	Info not available	Info not available	Info not available	Info not available	Info not available	Info not availab le
Fraud	Capability to validate that the policyholder is the same person as the claimant	Claim handler interviews, Jobs to be Done	Info not available	Info not available	Info not available	Info not available	Info not available	Info not availab le
Finance	Capability to prepare all the data related to claim payout	Claim handler interviews, Jobs to be Done	Yes	Info not available	Info not available	Info not available	Info not available	Info not availab le
Finance	Capability to check for payment info and debt	Claim handler interviews, Jobs to be Done	No	Info not available	Info not available	Info not available	Info not available	Info not availab le
Finance	Capability to communicat e the payout sum to the finance department	Claim handler interviews, Jobs to be Done	Info not available	Info not available	Info not available	Info not available	Info not available	Info not availab le
Finance	Capability to make the claim payout	Claim handler interviews, Jobs to be Done	Info not available	Info not available	Info not available	Info not available	Info not available	Info not availab le
Finance	Capability to track and verify that the settlement was done	Claim handler interviews, Jobs to be Done	Yes	Info not available	Info not available	Info not available	Info not available	Info not availab le
Communi cation	Capability to generate and send the customer the claims decision letter	Claim handler interviews, Jobs to be Done	Yes	Info not available	Info not available	Yes	Yes, real-time	Info not availab le
Communi cation	Capability to manage claims Reporting	A functionality many	Yes	Yes	Yes	Yes	Info not available	Yes

		competitors share						
Customer Satisfaction	Capability to check customer satisfaction after claim decision	Claim handler interviews, Jobs to be Done	Info not available	Info not available	Info not available	Info not available	Yes	Yes, NPS

Appendix 9 – Direct competitor comparison criteria with sources.

Table 30. Competitor comparison criteria analysis table (by author).

Category	Features and Functionalities	Source
General	Travel insurance product support	Each insurance product needs a different functionality; therefore, insurance software is usually specialized on certain products
General	Training by vendor	Functionality that many competitors share
General	Access control	GDPR - access to customer data ISO 27001
General	Localisation to other languages besides English (Estonian)	Official language of the markets must be supported
General	Capability to support multiple currencies	Official currency of the country must be supported
General	Capability to track the fulfilment of Service time in Service Level Agreements	Contractual
General	Simple and fast launching of new processes	Functionality that many competitors share
General	No-code digital process setup	Functionality that many competitors share
General	Business Process Management use	Functionality that many competitors share
General	ISO	Schrems II, EIOPA Guidelines on outsourcing to cloud service providers - consultations
Compliance	HQ located in the EU/EEA/EFTA	Schrems II
Compliance	Cloud servers located in the EU or data encrypted with the Key held by a trusted party in the EU	Schrems II, EIOPA Guidelines on outsourcing to cloud service providers

Compliance	Data backups	A functionality many competitors share
Compliance	Capability to keep records of all transactions	Estonian Accounting Law [95] and other European Records retention laws [96], Internal audit
FNOL	Branding customisation	Client's Company Corporate Visual identity
FNOL	Capability to accept claims via a web-based first notice of loss form	Customer survey
FNOL	Configurable claim filing processes	Customer survey, Product Terms & Conditions analysis
FNOL	Capability to validate that no other party is liable for the loss	Terms & Conditions analysis
Claim processing	Configurable claim management processes	Jobs to be Done
Claim processing	Capability to categorize damage	Terms & Conditions analysis
Claim processing	Capability to triage / prioritize claims with a higher cost, urgency or otherwise	Claim handler interviews, Jobs to be Done
Claim processing	Capability to update the statuses of the claim	Claim handler interviews, Jobs to be Done
Claim processing	Capability to retrieve Policy information and documents	Claim handler interviews, Jobs to be Done
Claim processing	Capability to extract information from the Policy, documents and Terms and Conditions	Claim handler interviews, Jobs to be Done
Claim processing	Capability to process Policy information and documents information	Claim handler interviews, Jobs to be Done
Claim processing	Capability to process Terms and Conditions information	Claim handler interviews, Jobs to be Done
Claim processing	Capability to assign claims to a claims handler based on availability and competencies	Claim handler interviews, Jobs to be Done
Claim processing	Capability to collect the details about the incident	Claim handler interviews, Jobs to be Done

Claim processing	Capability to collect the documents proving the accident happened	Claim handler interviews, Jobs to be Done
Claim processing	Capability to collect the information about the amount of loss	Claim handler interviews, Jobs to be Done
Claim processing	Capability to check if all the required information has been collected	Claim handler interviews, Jobs to be Done
Claim processing	Capability to collect missing information and documents	Claim handler interviews, Jobs to be Done
Claim processing	Capability to examine claim data and documents	Claim handler interviews, Jobs to be Done
Claim processing	Capability to access and process previous claims information	Claim handler interviews, Jobs to be Done
Claim processing	Capability to organise all the claim documents, communication transcripts and other related data	Claim handler interviews, Jobs to be Done
Claim processing	Capability to configure different decision-making logic to different kinds of claims	Claim handler interviews, Jobs to be Done
Claim processing	Capability to validate that the claim does not violate the terms and conditions	Claim handler interviews, Jobs to be Done
Claim processing	Capability to fully-automatically process a claim, make the decision and close the claim according to pre-configured criteria	Claim handler interviews, Jobs to be Done
Claim processing	Capability to recommend the claims decision to settle, reject or close the claim	Claim handler interviews, Jobs to be Done
Claim processing	Capability to mark down the reasoning behind the claims decision	Claim handler interviews, Jobs to be Done
Claim processing	Capability to archive all claim information	Claim handler interviews, Jobs to be Done
Claim processing	Capability to close the claim	Claim handler interviews, Jobs to be Done

Fraud	Capability to access and process previous claims information	Claim handler interviews, Jobs to be Done
Fraud	Capability to prevent money laundry by checking the origin of the bank account	Claim handler interviews, Jobs to be Done
Fraud	Capability to validate that the claim is not fraudulent	Claim handler interviews, Jobs to be Done
Fraud	Capability to validate that the policyholder's ID is not fraudulent	Claim handler interviews, Jobs to be Done
Fraud	Capability to validate that the policyholder is the same person as the claimant	Claim handler interviews, Jobs to be Done
Finance	Capability to prepare all the data related to claim payout	Claim handler interviews, Jobs to be Done
Finance	Capability to check for payment info and debt	Claim handler interviews, Jobs to be Done
Finance	Capability to communicate the payout sum to the finance department	Claim handler interviews, Jobs to be Done
Finance	Capability to make the claim payout	Claim handler interviews, Jobs to be Done
Finance	Capability to track and verify that the settlement was done	Claim handler interviews, Jobs to be Done
Communication	Capability to generate and send the customer the claims decision letter	Claim handler interviews, Jobs to be Done
Communication	Capability to manage claims Reporting	A functionality many competitors share
Customer Satisfaction	Capability to check customer satisfaction after claim decision	Claim handler interviews, Jobs to be Done

Appendix 10 – RACI matrix claims management processes

According to the BABOK Guide V3 "RACI stands for the four types of responsibility that a stakeholder may hold on to the process level: Responsible, Accountable, Consulted, and Informed"[31]. These responsibilities are determined internally in the insurance company.

After a thorough mapping of the stakeholders and upon further analysis, a level of responsibility that is expected from each stakeholder towards the solution is determined using the RACI methodology. Stakeholders may hold different roles at different stages or regarding different tasks of the solution [31].

The Responsible, Accountable, Consulted and Informed roles as BABOK states [31] are:

"**Responsible (R):** the persons who will be performing the work on the task.

Accountable (A): the person who is ultimately held accountable for successful completion of the task and is the decision maker. Only one stakeholder receives this assignment.

Consulted (C): the stakeholder or stakeholder group who will be asked to provide an opinion or information about the task. This assignment is often provided to the subject matter experts (SMEs).

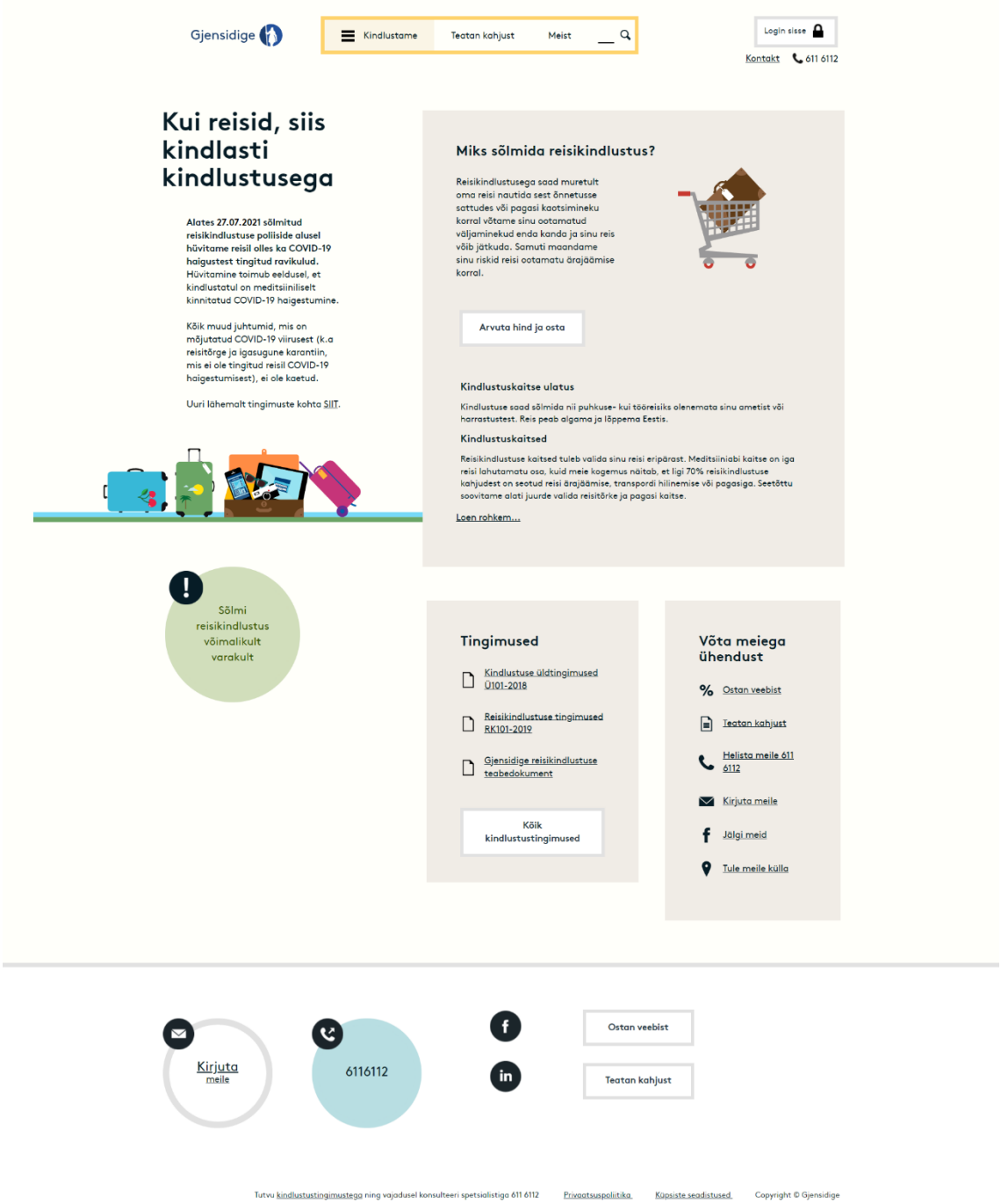
Informed (I): a stakeholder or stakeholder group that is kept up to date on the task and notified of its outcome. Informed is different from Consulted as with Informed the communication is one-direction (business analyst to stakeholder) and with Consulted the communication is two-way".

Figure 31. A RACI table depicting responsibilities between roles during the claims management processes (by author).

	Insurance company's Customer	**Claims Handler**	**Claims Manager**	**Customer Support**	**Product Manager**
First Notice of Loss	R	A	I	C	I

Acquiring missing information	C	R	A	I	-
Reviewing FNOL information	-	R	A	I	-
Claims decision	I	R	A	I	I
Settlement payment	A	R	A	I	-
Closing the claim	-	R	A	I	-

Appendix 11 – Travel insurance claim filing processes of ADB Gjensidige Estonia, If P&C Insurance AS and Swedbank P&C Insurance AS



Gjensidige

Kindlustame | Teatan kahjust | Meist

Login sisse

Kontakt 611 6112

Kahjust teatamine

Kahjust teatamiseks täida **kahjuavaldus veebis.** Gjensidige kontoris kahjuavaldusi täita ei saa.

Sõidukiga juhtunud kahju korral pöördu otse meie koostööpartnerist remondiettevõtte poole, kes aitab kahjustuste hindamisel ja dokumentide täitmisel.

Meie 24h abiteenuste telefonid vastavad sulle eesti keeles, kui vajad abi Eestis või välismaal.

Remondiettevõtted

Helista meile 611 6112

Kirjuta meile

Gjensidige kliendina võid olla alati kindel, et aitame sind kõigi kahjujuhtumite korral ööpäevaringselt.

Teeme omalt poolt kõik, et sinu kindlustusjuhtum leiaks kiire ja mõistliku lahenduse.

Liikluskahju avaldus →

Kaskokahju avaldus →

Kodukahju avaldus →

Reisikahju avaldus →

Õnnetus-juhtumi avaldus →

Ettevõtte vara- ja vastutuskahju avaldus →

Laenumakse-kindlustus →

Võta meiega ühendust

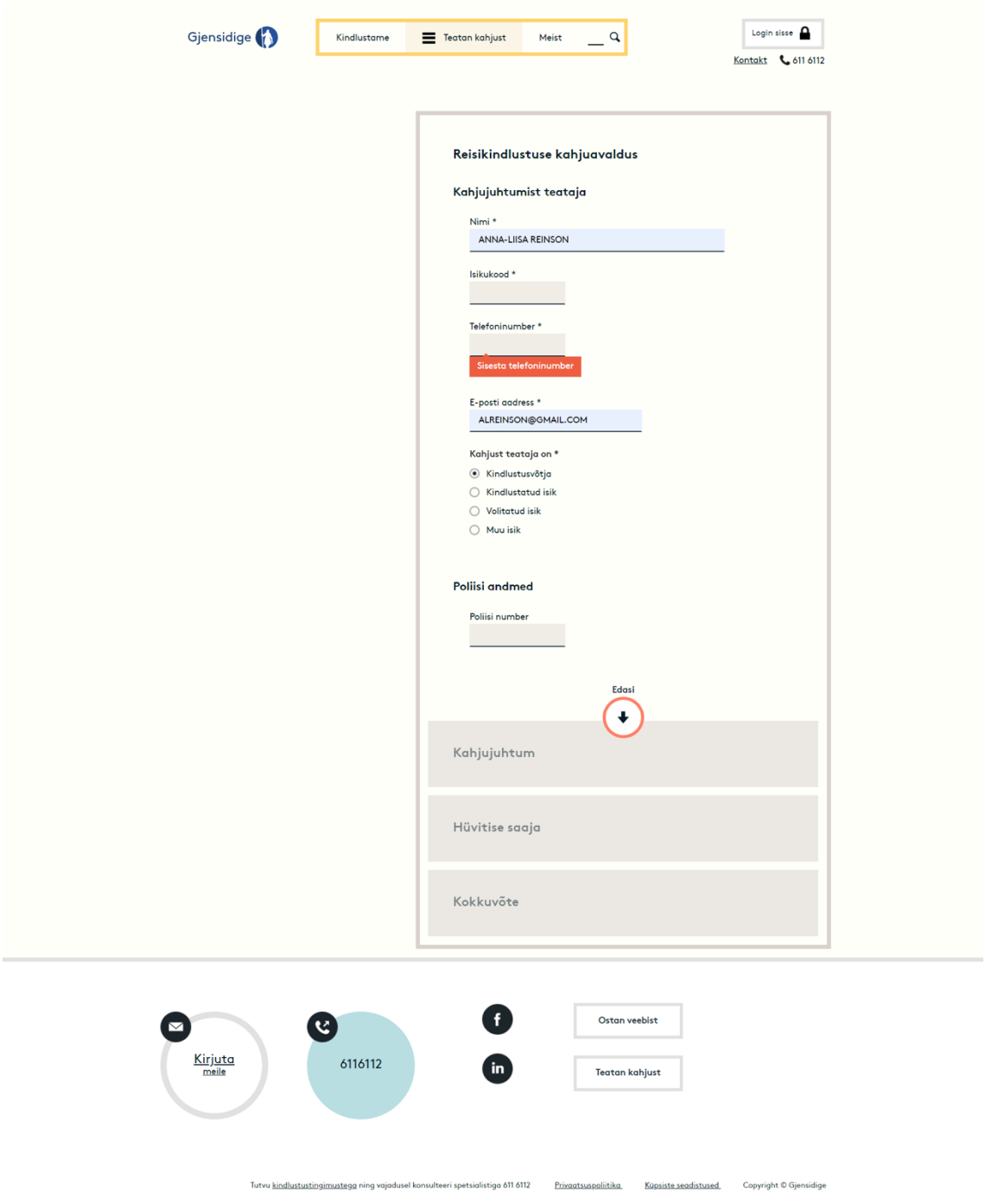
- % Ostan veebist
- Teatan kahjust
- Helista meile 611 6112
- Kirjuta meile
- Jälgi meid
- Tule meile külla

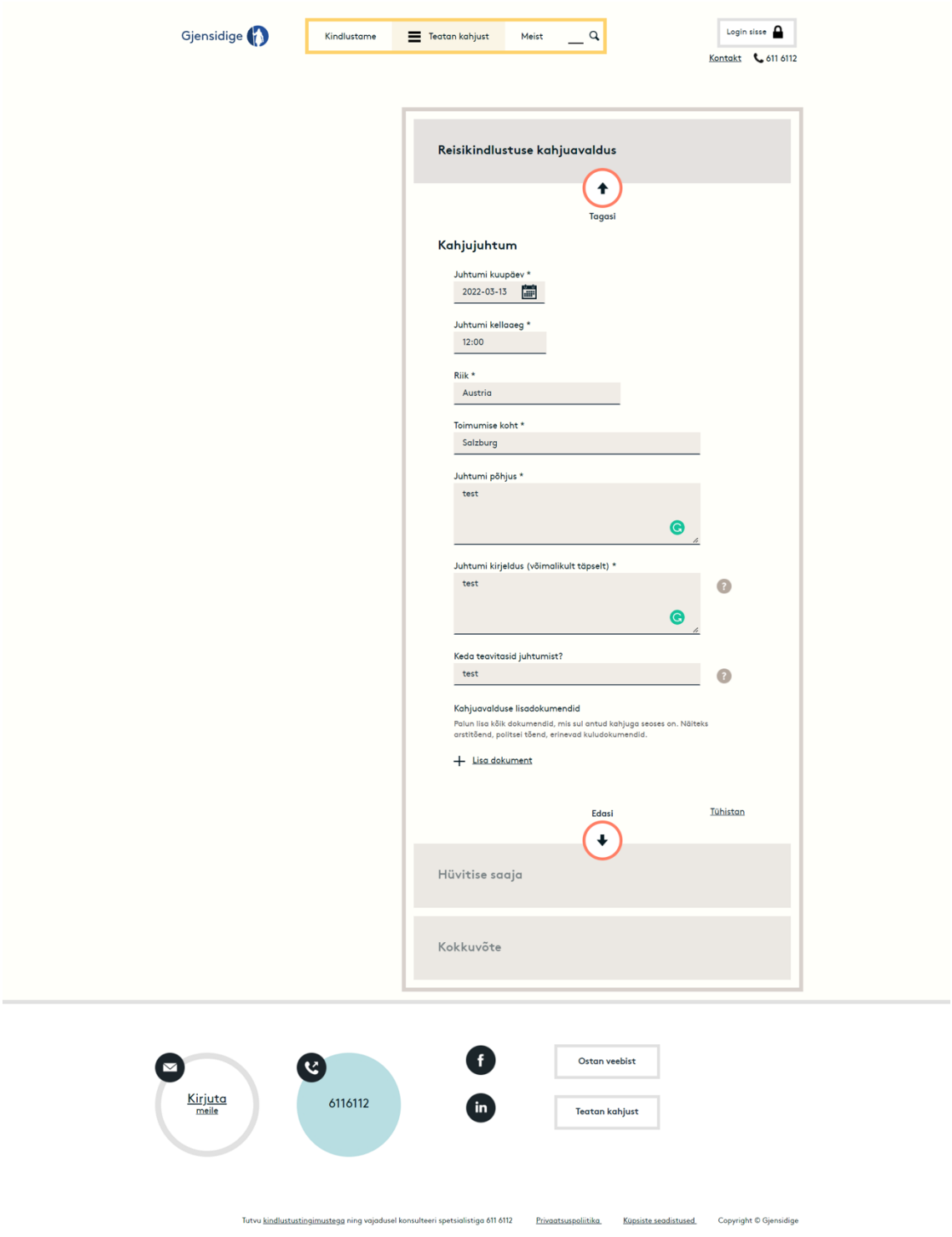
Kirjuta meile

6116112

Ostan veebist

Teatan kahjust


Gjensidige
Kindlustame
Teatan kahjust
Meist
Login sisse
Kontakt
611 6112
Reisikindlustuse kahjuavaldus
Kahjujuhtumist teataja
Nimi *
ANNA-LIISA REINSON
Isikukood *
Telefoninumber *
Sisesta telefoninumber
E-posti aadress *
ALREINSON@GMAIL.COM
Kahjust teataja on *
Kindlustusvõtja
Kindlustatud isik
Volitatud isik
Muu isik
Poliisi andmed
Poliisi number
Edasi
Kahjujuhtum
Hüvitise saaja
Kokkuvõte
Kirjuta
meile
6116112
Ostan veebist
Teatan kahjust
Tutvu kindlustustingimustega ning vajadusel konsulteeri spetsialistiga 611 6112
Privaatsuspoliitika
Küpsiste seadistused
Copyright © Gjensidige


Gjensidige
Kindlustame
Teatan kahjust
Meist
Login sisse
Kontakt
611 6112
Reisikindlustuse kahjuavaldus
Tagasi
Kahjujuhtum
Juhtumi kuupäev *
2022-03-13
Juhtumi kellaaeg *
12:00
Riik *
Austria
Toimumise koht *
Salzburg
Juhtumi põhjus *
test
Juhtumi kirjeldus (võimalikult täpselt) *
test
Keda teavitasid juhtumist?
test
Kahjuavalduse lisadokumendid
Palun lisa kõik dokumendid, mis sul antud kahjuga seoses on. Näiteks arstitõend, politsei tõend, erinevad kuludokumendid.
Lisa dokument
Edasi
Tühistan
Hüvitise saaja
Kokkuvõte
Kirjuta
meile
6116112
Ostan veebist
Teatan kahjust
Tutvu kindlustustingimustega ning vajadusel konsulteeri spetsialistiga 611 6112
Privaatsuspoliitika
Küpsiste seadistused
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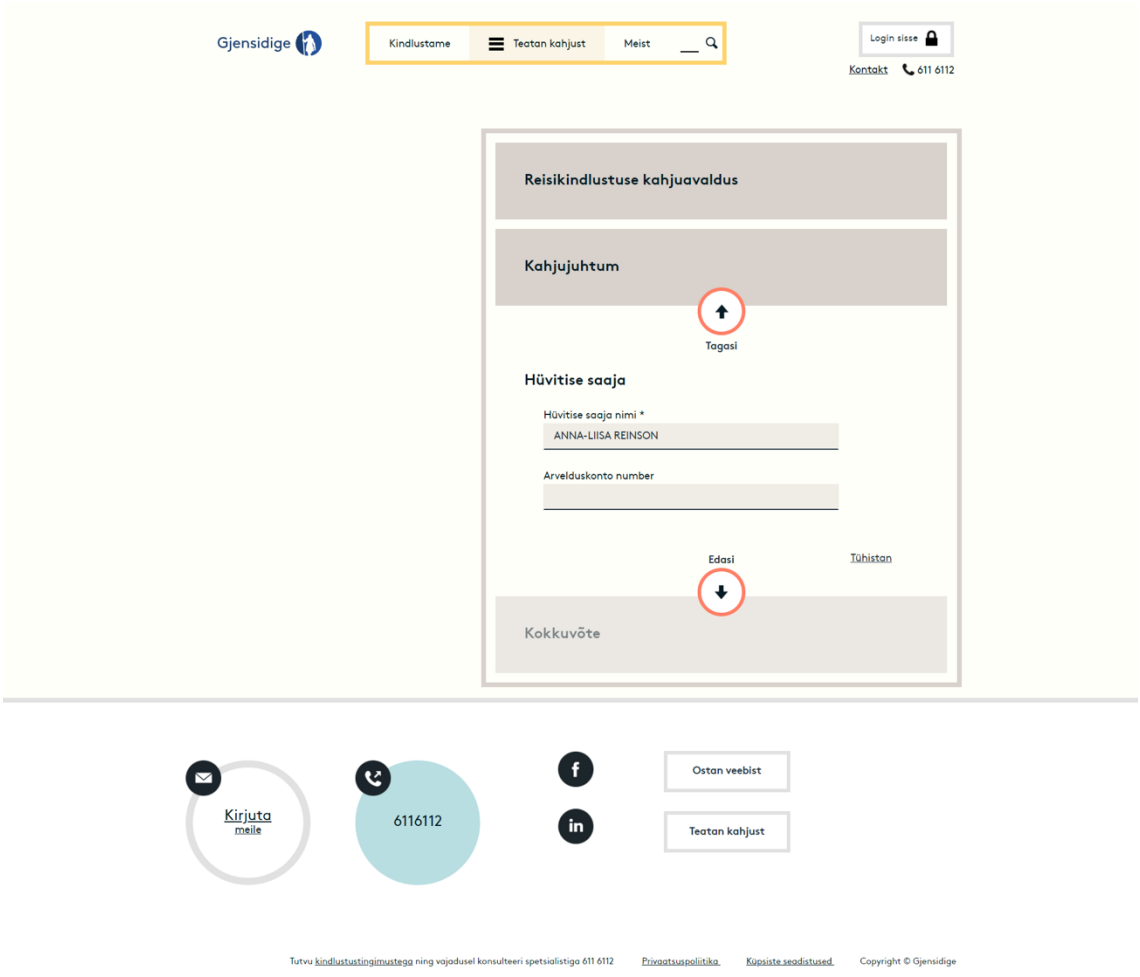
Gjensidige
Kindlustame
Teatan kahjust
Meist
Login sisse
Kontakt
611 6112
Reisikindlustuse kahjuavaldus
Kahjujuhtum
Tagasi
Hüvitise saaja
Hüvitise saaja nimi *
ANNA-LIISA REINSON
Arvelduskonto number
Edasi
Tühistan
Kokkuvõte
Kirjuta
meile
6116112
Ostan veebist
Teatan kahjust
Tutvu kindlustustingimustega ning vajadusel konsulteeri spetsialistiga 611 6112
Privaatsuspoliitika
Küpsiste seadistused
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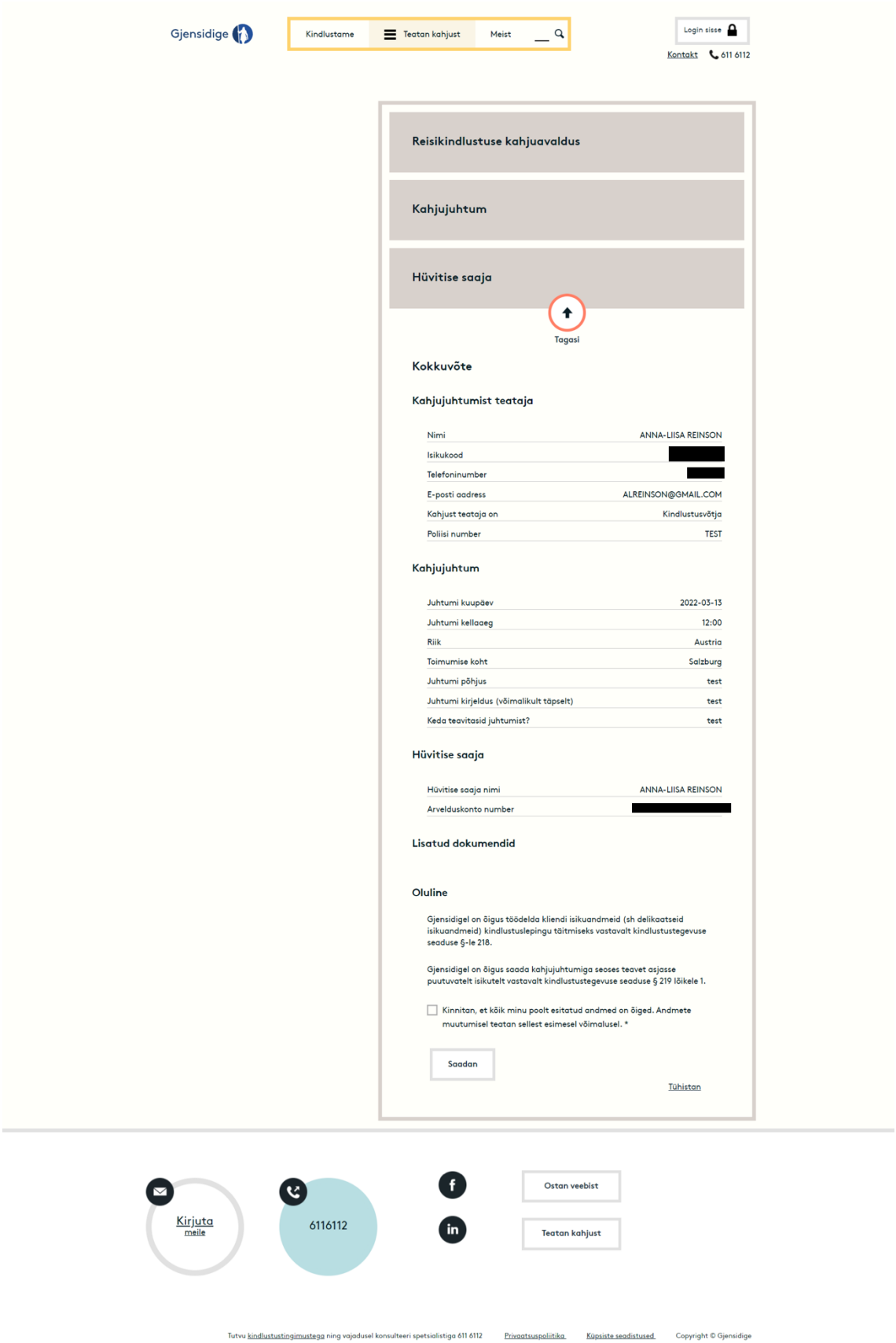

Gjensidige
Kindlustame
Teatan kahjust
Meist
Login sisse
Kontakt
611 6112
Reisikindlustuse kahjuavaldus
Kahjujuhtum
Hüvitise saaja
Tagasi
Kokkuvõte
Kahjujuhtumist teataja
Nimi
ANNA-LIISA REINSON
Isikukood
Telefoninumber
E-posti aadress
ALREINSON@GMAIL.COM
Kahjust teataja on
Kindlustusvõtja
Politsei number
TEST
Kahjujuhtum
Juhtumi kuupäev
2022-03-13
Juhtumi kellaaeg
12:00
Riik
Austria
Toimumise koht
Salzburg
Juhtumi põhjus
test
Juhtumi kirjeldus (võimalikult täpselt)
test
Kes teavitasid juhtumist?
test
Hüvitise saaja
Hüvitise saaja nimi
ANNA-LIISA REINSON
Arvelduskonto number
Lisatud dokumendid
Oluline
Gjensidigel on õigus töödelda kliendi isikuandmeid (sh delikaatseid isikuandmeid) kindlustuslepingu täitmiseks vastavalt kindlustustegevuse seaduse §-le 218.
Gjensidigel on õigus saada kahjujuhtumiga seoses teavet asjasse puutuvatelt isikutelt vastavalt kindlustustegevuse seaduse § 219 lõikele 1.
Kinnitan, et kõik minu poolt esitatud andmed on õiged. Andmete muutumisel teatan sellest esimesel võimalusel. *
Saadan
Tühistan
Kirjuta meile
6116112
Ostan veebist
Teatan kahjust
Tutvu kindlustustingimustega ning vajadusel konsulteeri spetsialistiga 611 6112
Privaatsuspoliitika
Küpsiste seadistused
Copyright © Gjensidige

Reisikahjud

Reisil olles juhtus õnnetus või vajasid ravi? Su reisiaegu muudeti või kaotasid kohvri?

Kahjuteate edastamiseks veendu palun, et Sul on olemas kõik vajalikud dokumendid või fotod neist.

Tutvu vajalike dokumentidega alloleval lehel

Sinu reisis toimus muudatusi/ärajäämisi?

Võta ühendust kasutamata jääva teenuse pakkujaga ning täpsusta tagastatav summa. Ole koos infoga valmis lisama järgmised dokumendid.

- **Reisi jätkamisel:** lisakulude dokumendid (uued lennupiletid, taksokviitung, broneeringu muutmise tasu jms) + esialgset plaanitud kuju tõendav info.
- **Reis jääb ära haigestumise tõttu:** arstitõend haigestumise kuupäeva ja diagnoosiga ja ravi maksumust tõendav info
- **Reis tühistatakse teenuse pakkuja poolt:** teenuse osutaja poolne tühistamise teade
- Reisikahju teadet täitma

Vajasid välisriigis ravi või meditsiinilist abi?

Lisa fotod või failid raviarvetest ja arstitõendist. Jälgi et tõendil oleks diagnoos ja haigestumise kuupäev

Reisikahju teadet täitma

Teata reisikahjust →

Sinu pagasi või isiklike esemetega juhtus viperusi või need varastati?

Lisa fotod või failid pagasikahjust.

- **Kahjustumise** korral lisa foto asjadest ja lennufirma tõend.
- **Varguse** korral lisa politseitõend, nimekiri asjadest koos ostuaja ning hinnaga
- Reisikahju teadet täitma

Muud juhtumid reisil?

Kui Sul on juhtumiga seotud pilte või muid faile (tšekid, pildid, tõendid), mida pead oluliseks, lisa need.

Reisikahju teadet täitma

Teata reisikahjust →

Kuidas toimub reisikahju käsitlemine Ifis?

- **Täida kahjuteade** . Ole valmis lisama vajalikke lisadokumente - protsessi kiirendamiseks tutvu eelnevalt, mis dokumente kindlasti vaja läheb
- Pärast kahjuteate edastamist võtame Sinuga ühe tööpäeva jooksul ühendust.
- Hüvitame kahju Sulle kohe, kui juhtumi asjaolud on selged ja kahju ulatus teada. Vajadusel küsime lisainfot. Info edastame Sulle kirjalikult e-kirja või SMS-i teel.

Kasulikud lingid

- Euroopa Ravikindlustuskaart - milleks seda vaja on? ↗
- Täiendav info reisija õiguste kohta Euroopa Komisjoni koduleheli ↗
- Välisministeerium - reisi-ja konsulaarinfo ↗

Dokumendid

- Arstitõend
- Medical certificate
- Pagasikahju arvutustabel

If Kindlustused → | Kahjukäsitlus →

Helista või kirjuta meile

Ei saanud oma küsimusele vastust või soovid konsulteerida meie kindlustusspetsialistiga? Helista või kirjuta meile:

Kindlustustelefon: 777 1211

E-mail: info@if.ee

Suured riskid Ukraina, Venemaa ja Valgevene külastamisel. Info klientidele

Sulge

Juhtus õnnetus? Teata kahjust

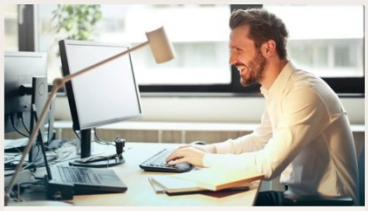
If Kindlustuse kahjuteate esitamiseks:
- Leia allolevast listist sobilik kahjuliik
- Täida kahjuteade iseteeninduses
- Oota meie tagasisidet ühe tööpäeva jooksul

- Liikluskahju
- Kaskokahju (sh. klaasikahju)
- Isiku- ja tervisekahjud
- Kodukahju / Koduse vara kahju
- Reisikahjud (sh. välislähetused)
- Lemmikloomakahju
- Ettevõtte varakahju
- Vastutuse kahju
- Muud kahjud

Loe meie klientide tagasisidet!

Üle 90% klientidest annab meie kahjukäsitlusele hindeks "hea" või "väga hea".

Loe tagasisidet >

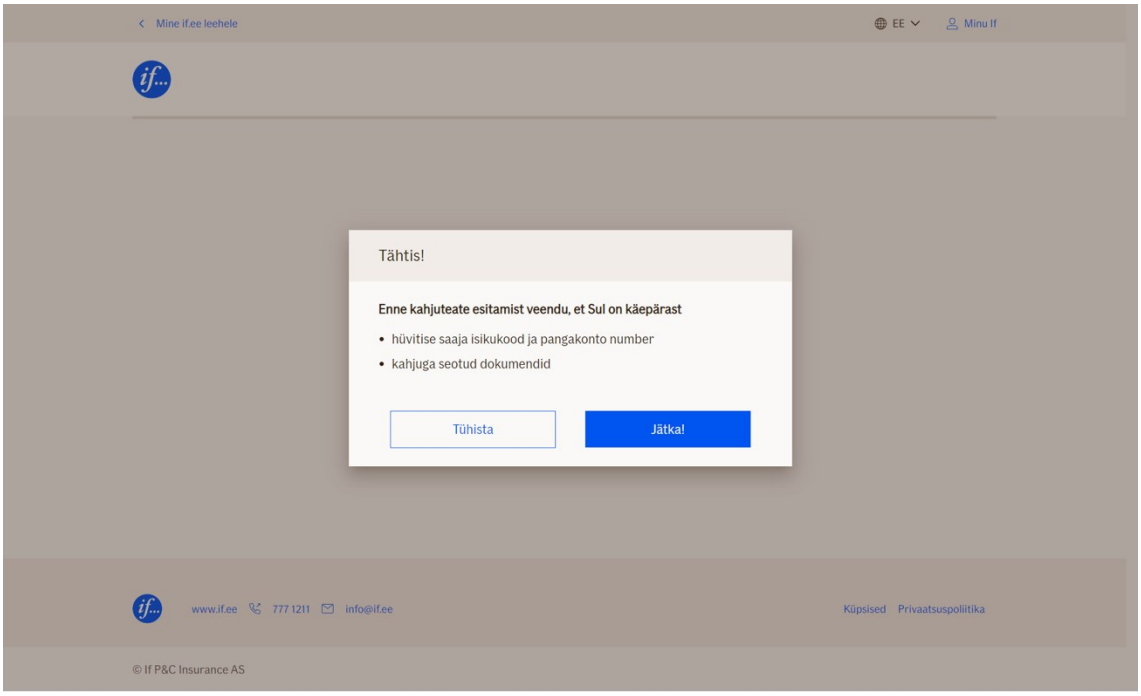


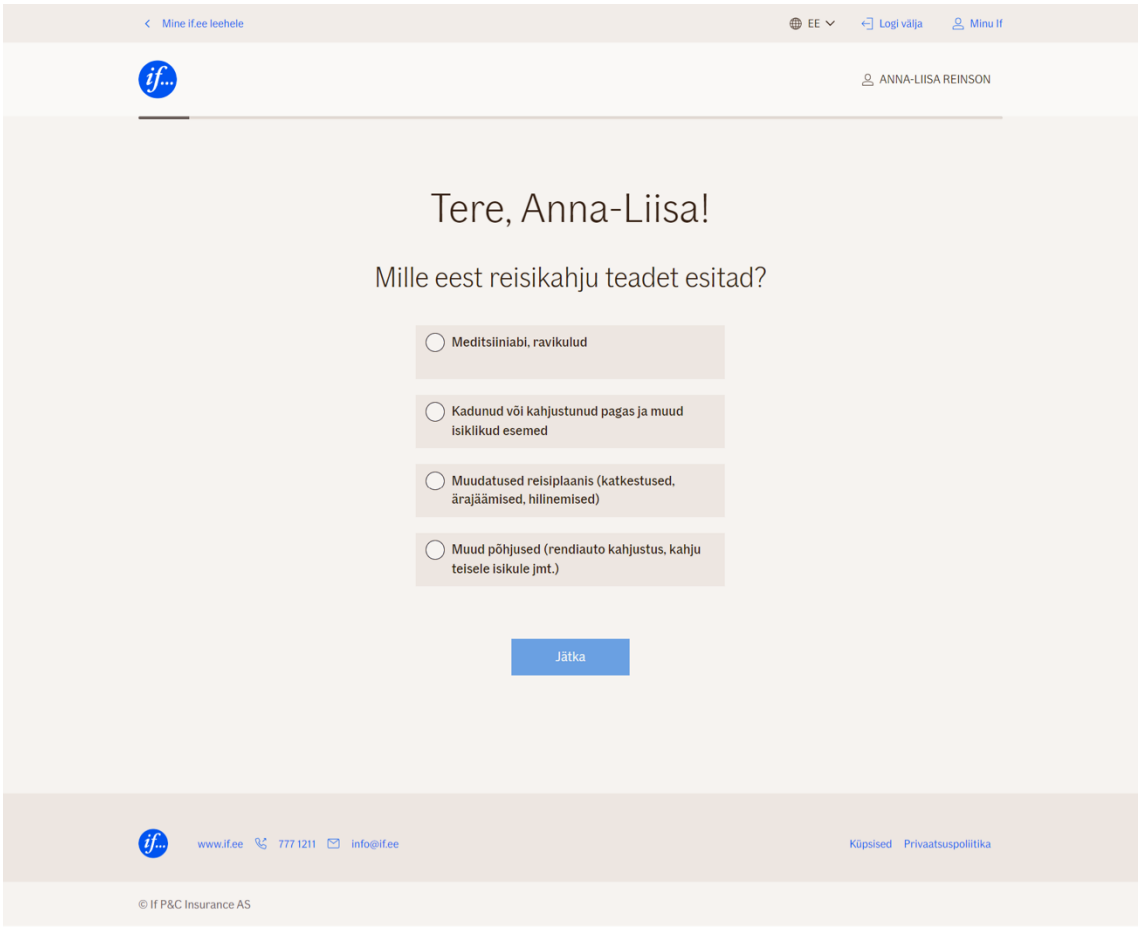
Jäta tagasisidet!

Oled igal ajal oodatud meile omapoolseid mõtteid edastamast.

Saada meile tagasiside/soovitused >

Tere, kuidas saan Sind aidata?


Mine if.ee leehele
EE
Minu If
Tähtis!
Enne kahjuteate esitamist veendu, et Sul on käepärast
• hüvitise saaja isikukood ja pangakonto number
• kahjuga seotud dokumendid
Tühista
Jätka!
www.if.ee
777 1211
info@if.ee
Küpsised
Privaatsuspoliitika
© If P&C Insurance AS


Mine if.ee leehele
EE
Logi välja
Minu If
ANNA-LIISA REINSON
Tere, Anna-Liisa!
Mille eest reisikahju teadet esitad?
Meditsiiniabi, ravikulud
Kadunud või kahjustunud pagas ja muud isiklikud esemed
Muudatused reisiplaanis (katkestused, ärajäämised, hilinemised)
Muud põhjused (rendiauto kahjustus, kahju teisele isikule jmt.)
Jätka
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777 1211
info@if.ee
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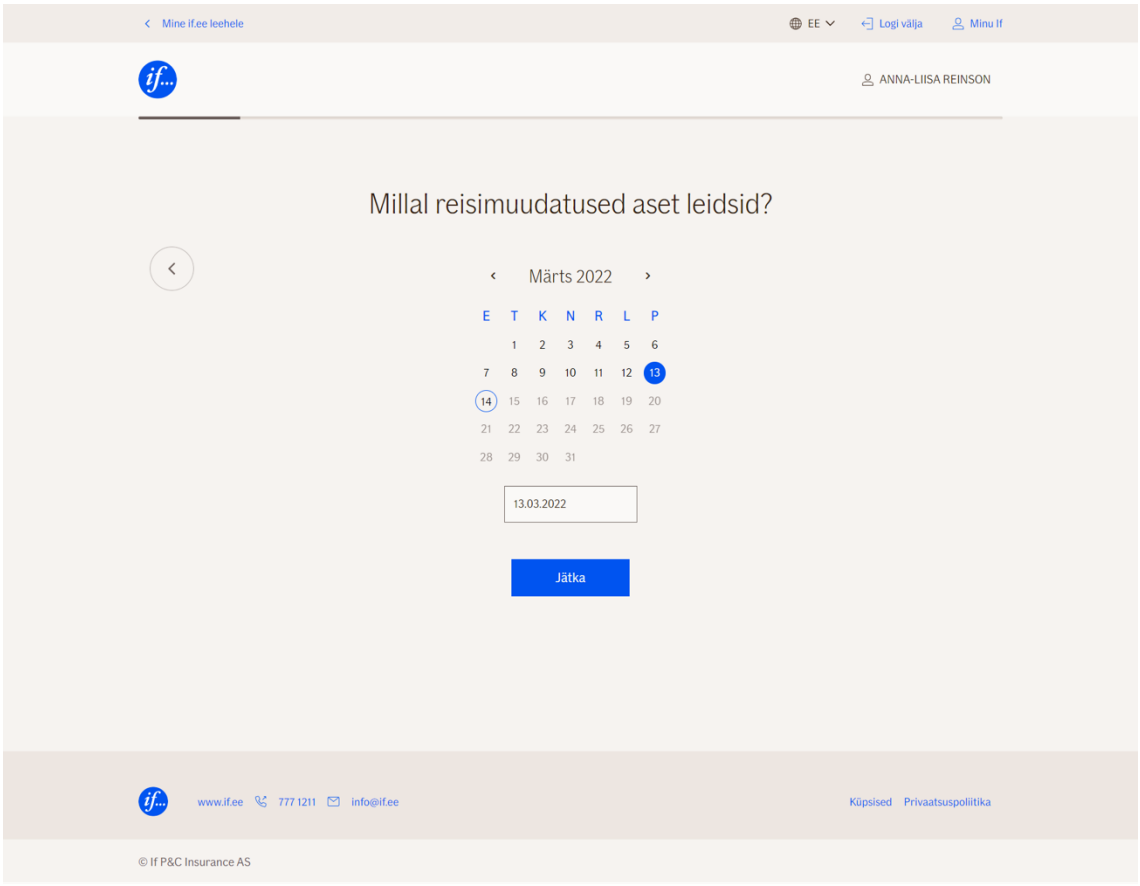
Mine if.ee leehele
EE
Logi välja
Minu If
ANNA-LIISA REINSON
Millal reisimuudatused aset leidsid?
Märts 2022
E T K N R L P
1 2 3 4 5 6
7 8 9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30 31
13.03.2022
Jätka
www.if.ee
777 1211
info@if.ee
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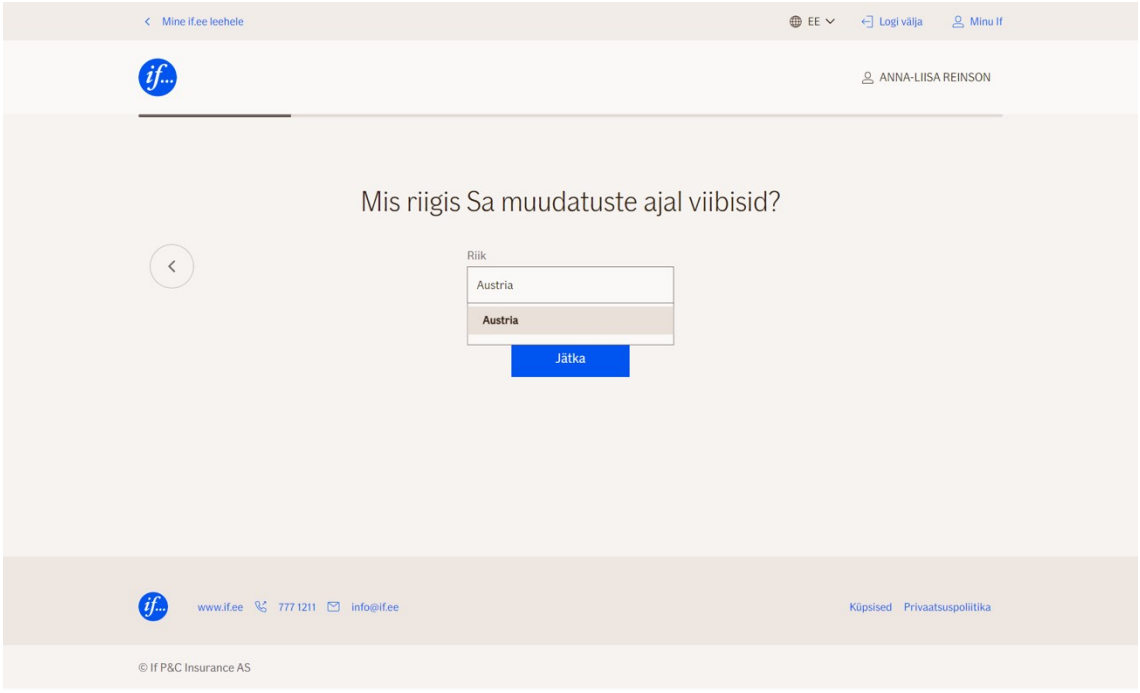
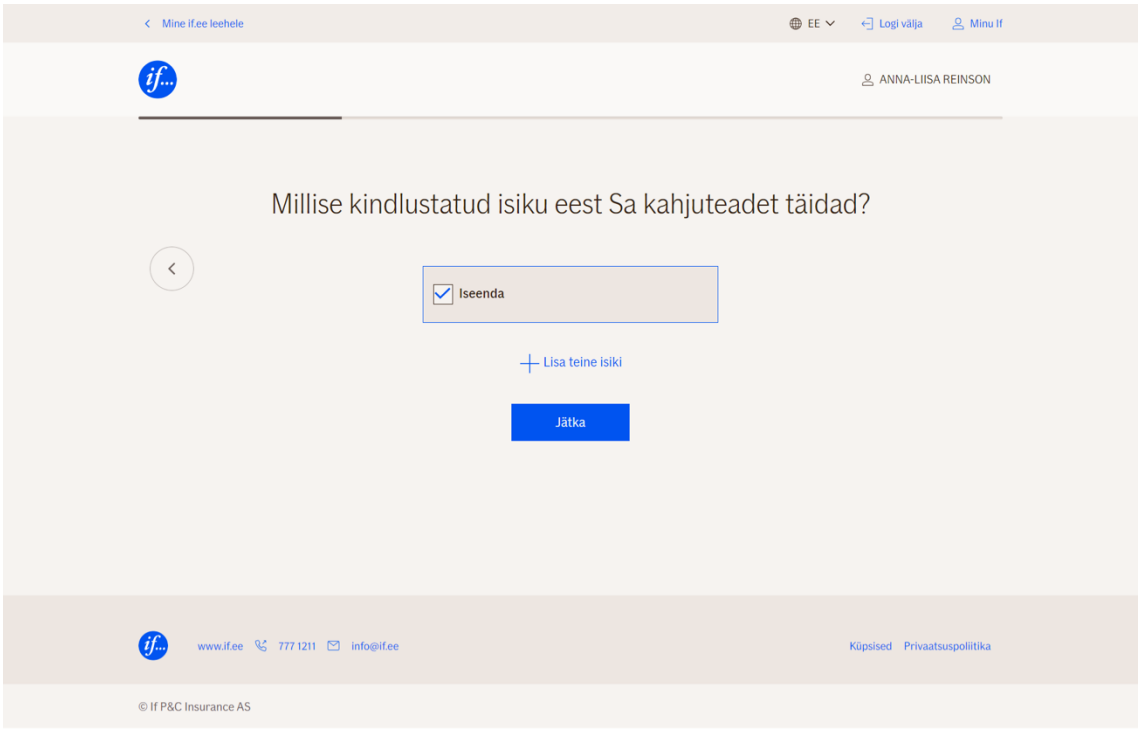
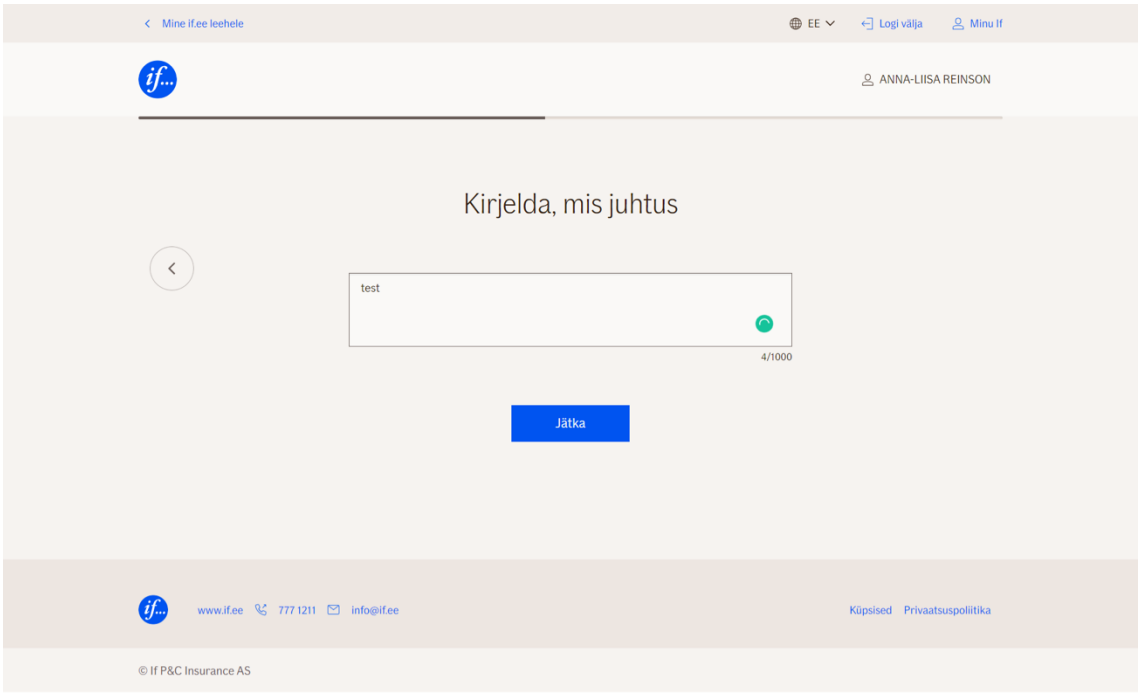

Mine if.ee leehele
EE
Logi välja
Minu If
ANNA-LIISA REINSON
Mis riigis Sa muudatuste ajal viibisid?
Riik
Austria
Austria
Jätka
www.if.ee
777 1211
info@if.ee
Küpsised
Privaatsuspoliitika
© If P&C Insurance AS


Mine if.ee leehele
EE
Logi välja
Minu If
ANNA-LIISA REINSON
Millise kindlustatud isiku eest Sa kahjuteadet täidad?
Iseenda
Lisa teine isiku
Jätka
www.if.ee
777 1211
info@if.ee
Küpsised
Privaatsuspoliitika
© If P&C Insurance AS


Mine if.ee leehele
EE
Logi välja
Minu If
ANNA-LIISA REINSON
Kirjelda, mis juhtus
test
4/1000
Jätka
www.if.ee
777 1211
info@if.ee
Küpsised
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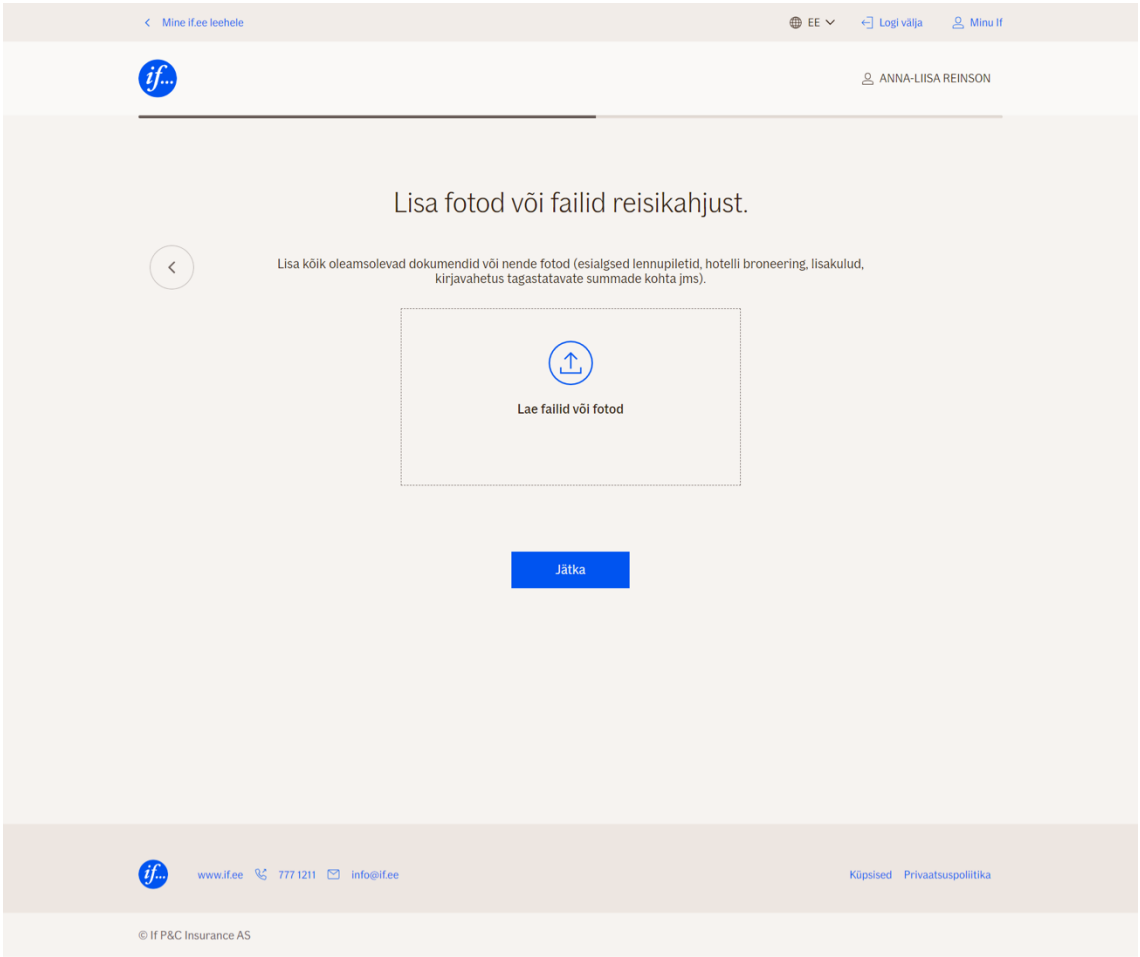
Mine if.ee leehele
EE
Logi välja
Minu If
ANNA-LIISA REINSON
Lisa fotod või failid reisikahjust.
Lisa kõik oleamsolevad dokumendid või nende fotod (esialgsed lennupiletid, hotelli broneering, lisakulud, kirjavahetus tagastatavate summade kohta jms).
Lae failid või fotod
Jätka
www.if.ee
777 1211
info@if.ee
Küpsised
Privaatsuspoliitika
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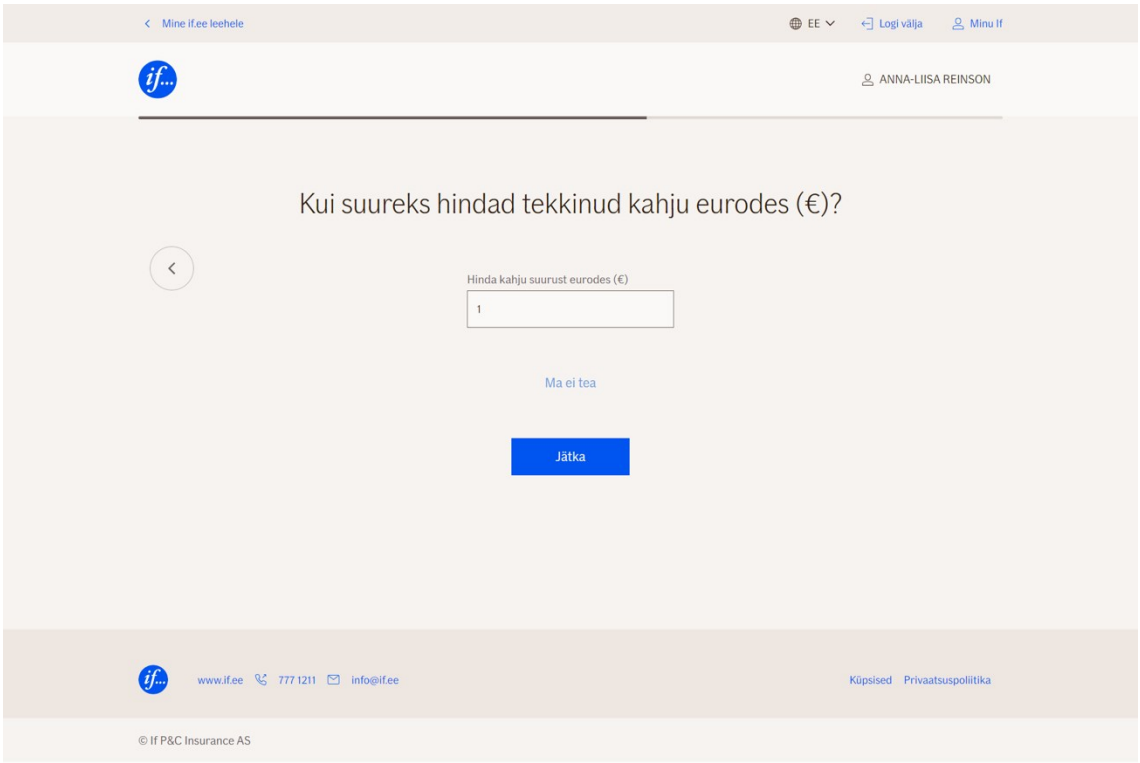
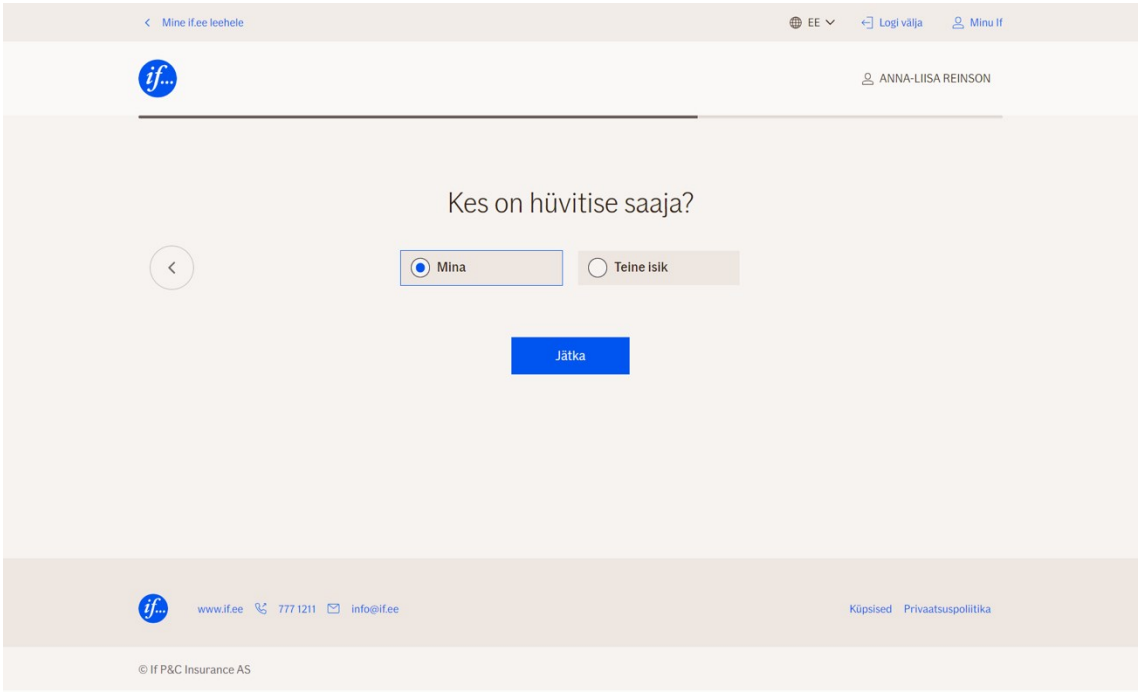
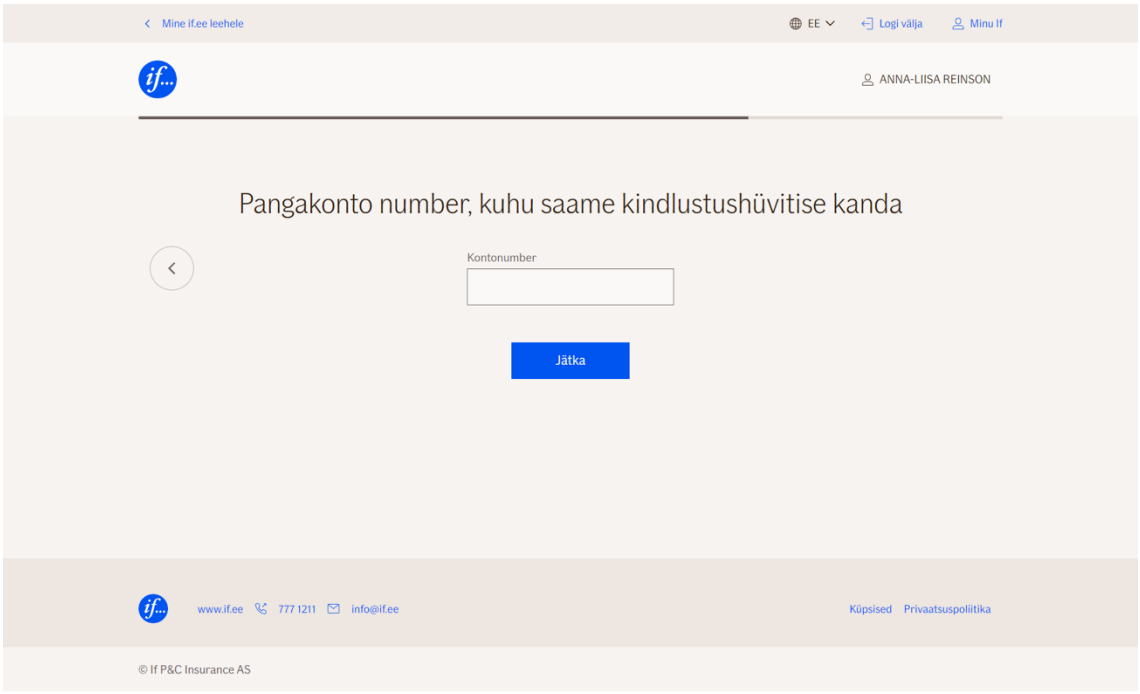
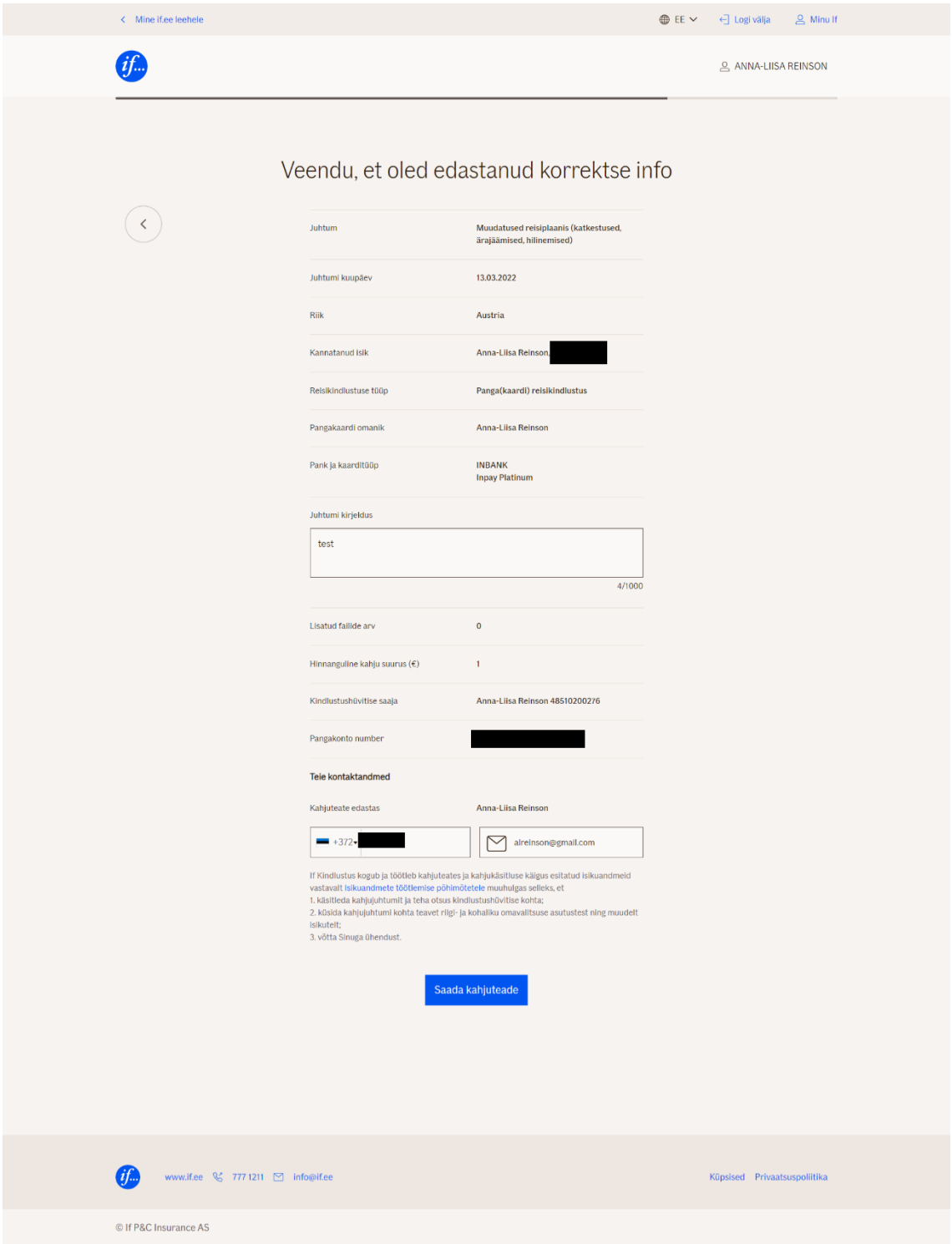

Mine if.ee leehele
EE
Logi välja
Minu If
ANNA-LIISA REINSON
Kui suureks hindad tekkinud kahju eurodes (€)?
Hinda kahju suurust eurodes (€)
1
Ma ei tea
Jätka
www.if.ee
777 1211
info@if.ee
Küpsised
Privaatsuspoliitika
© If P&C Insurance AS


Mine if.ee leehele
EE
Logi välja
Minu If
ANNA-LIISA REINSON
Kes on hüvitise saaja?
Mina
Teine isik
Jätka
www.if.ee
777 1211
info@if.ee
Küpsised
Privaatsuspoliitika
© If P&C Insurance AS


Mine if.ee leehele
EE
Logi välja
Minu If
ANNA-LIISA REINSON
Pangakonto number, kuhu saame kindlustushüvitise kanda
Kontonumber
Jätka
www.if.ee
777 1211
info@if.ee
Küpsised
Privaatsuspoliitika
© If P&C Insurance AS


Mine if.ee leehele
EE
Logi välja
Minu If
ANNA-LIISA REINSON
Veendu, et oled edastanud korrektse info
Juhtum
Muudatused reisiplaanis (katkestused, ärajäämised, hilinemised)
Juhtumi kuupäev
13.03.2022
Riik
Austria
Kannatanud isik
Anna-Liisa Reinson
Reisikindlustuse tüüp
Panga(kaardi) reisikindlustus
Pangakaardi omanik
Anna-Liisa Reinson
Pank ja kaarditüüp
INBANK
Inpay Platinum
Juhtumi kirjeldus
test
4/1000
Lisatud failide arv
0
Hinnanguline kahju suurus (€)
1
Kindlustushüvitise saaja
Anna-Liisa Reinson 48510200276
Pangakonto number
Teie kontaktandmed
Kahjuteate edastas
Anna-Liisa Reinson
+372
alreinson@gmail.com
If Kindlustus kogub ja töötleb kahjuteates ja kahjukäsitluse käigus esitatud isikuandmeid vastavalt Isikuandmete töötlemise põhimõtetele muuhulgas selleks, et
1. käsitleda kahjujuhtumit ja teha otsus kindlustushüvitise kohta;
2. küsida kahjujuhtumi kohta teavet riigi- ja kohaliku omavalitsuse asutustest ning muudelt isikutelt;
3. võtta Sinuga ühendust.
Saada kahjuteade
www.if.ee
777 1211
info@if.ee
Küpsised
Privaatsuspoliitika
© If P&C Insurance AS


Palun kontrollige telefonis turvakoodi ja sisestage PIN1. Teie turvakood on: 1588.

Reisikindlustus

Reisile minnes võta kaasa ka reisikindlustus

- Kindlustada saad meditsiiniabi (750 000€), pagasi ja reisitõrked.
- Spordireisideks ja ohtlike tegevuste harrastamiseks võta lisakaitsed.
- Uus COVID-19 kindlustuskaitse meditsiiniabi- ja reisitõrkekindlustuse juurde. ▸ Lähemalt

Reisikindlustuse kalkulaator

Kindlustuse periood 15.03.2022 – 15.03.2022

Kehtivuspiirkond
- ○ Kogu maailm
- ● Euroopa+ (sh Egiptus, Türgi ja teised)

Kindlustuskaitsed

Meditsiiniabi kindlustus	☑ 750 000 €				
Õnnetusjuhtumi kindlustus	☑ 10 000 €				
Pagas ja isiklikud esemed	○ 0 €	● 500 €	○ 1000 €	○ 2000 €	
Reisitõrkekindlustus	○ 0 €	● 500 €	○ 1500 €	○ 2500 €	
Vastutus- ja õigusabikindlustus	☑ 10000 €				

Lisakaitsed
- ☐ Ohtlik tegevus
- ☐ Välisriigis töötamine
- ☐ Spordireis

Kindlustatud isiku vanus

35 ⊕ Lisan veel reisijaid

Päevade arv	1
Kindlustatud isikud	1
Kindlustusmakse	7.07 €

Lepingut sõlmima

Swedbank P&C Insurance AS töötleb Sinu isikuandmeid automatiseeritult ja kui oled kindlustatud isik ja valid meditsiiniabi kaitse siis teeb ka profiilianalüüsi, et hinnata kindlustusriski, arvutada kindlustusmakset ning sõlmida kindlustuslepingut. Tööteme andmeid, mida Sinult saame ja andmeid, mis meil on Sinu usaldusväärsuse kohta ning samuti Swedbank AS-ilt saadud andmeid nagu Sinu tuvastamise ja kontaktandmed ning Sinu vanus. Kindlustuslepingu sõlmimine võib toimuda täielikult automatiseeritult.

Palun loe lähemalt meie Kliendiandmete töötlemise põhimõtetest siin.

Reisikindlustusest | Kuidas sõlmida? | Tingimused | Teatan kahjust

Kahjukäsitlus

Kui vajad meditsiiniabi, mille kulud on üle 1000 €, siis võta meie kahjukäsitlusega ühendust numbril 888 2111.

Teiste kindlustusjuhtumite korral:

▸ Täida kahjukäsitluse vorm

Pärast kahjuavalduse esitamist võtab Sinuga ühendust kahjukäsitleja ja annab edasised juhised.

Hea teada

- Kui Sinu isiklikud esemed varastatakse, siis tee varguse kohta avaldus kohalikule politseile.
- Kui Sinu lend hilineb või tühistatakse, võta lennujaamast selle kohta vastav tõend.
- Kui Sinu pagas saab lennujaamas viga või jääb hiljaks, registreeri juhtum lennujaama pagasiteeninduses.
- Hoia kõik tšekid ja kulutõendid alles, sest nende alusel hüvitatakse Sulle tehtud kulutused.

Lisainfo saamiseks helista kahjukäsitluse numbril 888 2111.

Sulle võiksid huvi pakkuda ka

Krediitkaardid
Broneeri hotellitube ja maksa nende eest või kasuta rendiautot.

Kodukindlustus
Veendu, et kodu oleks reisile minnes kindlustatud.

Kaskokindlustus
Reisid isikliku autoga? Veendu, et saaksid teel ette tulevate ootamatuste korral abi.

Kontaktid

Swedbank P&C Insurance AS

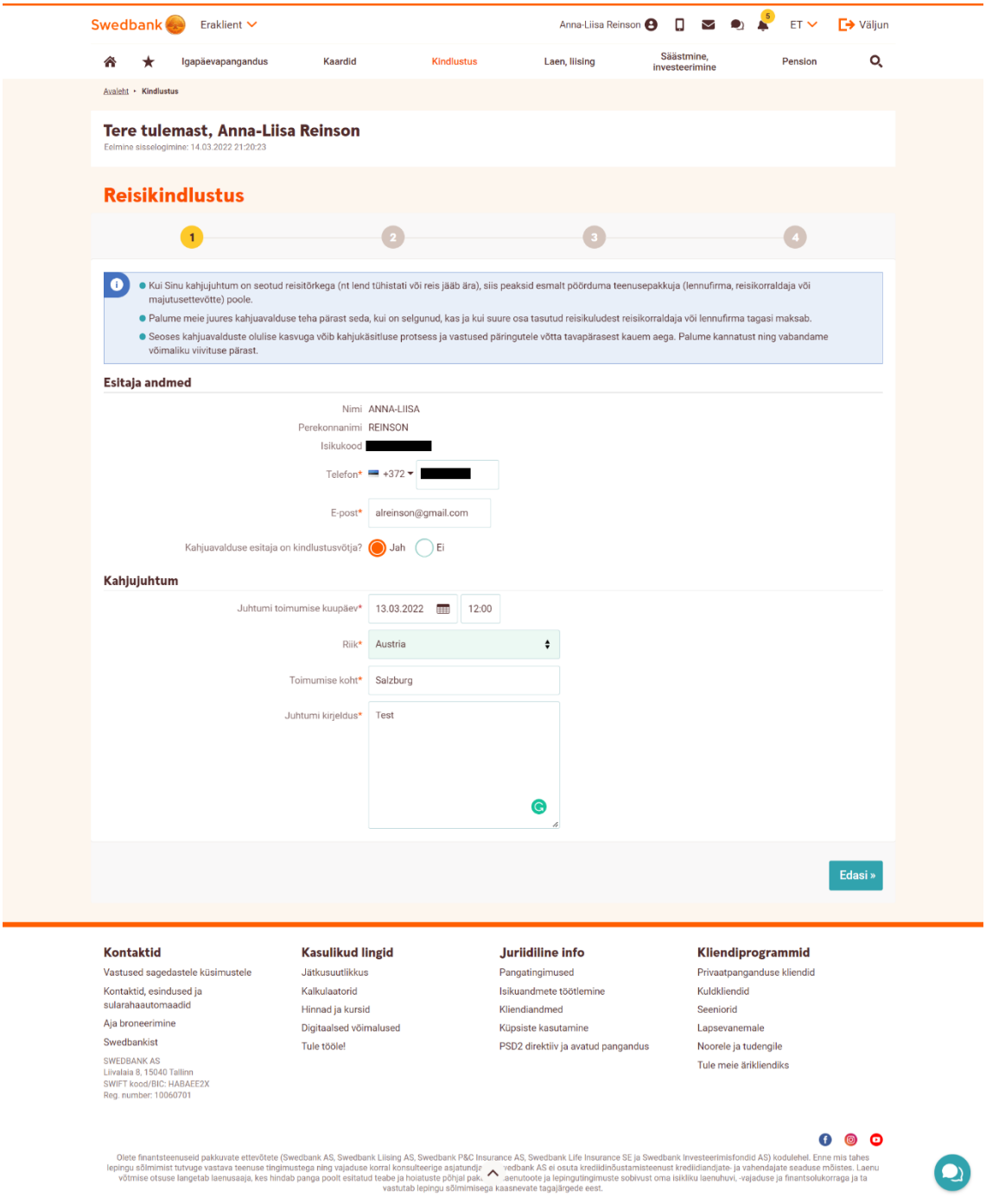
888 1513

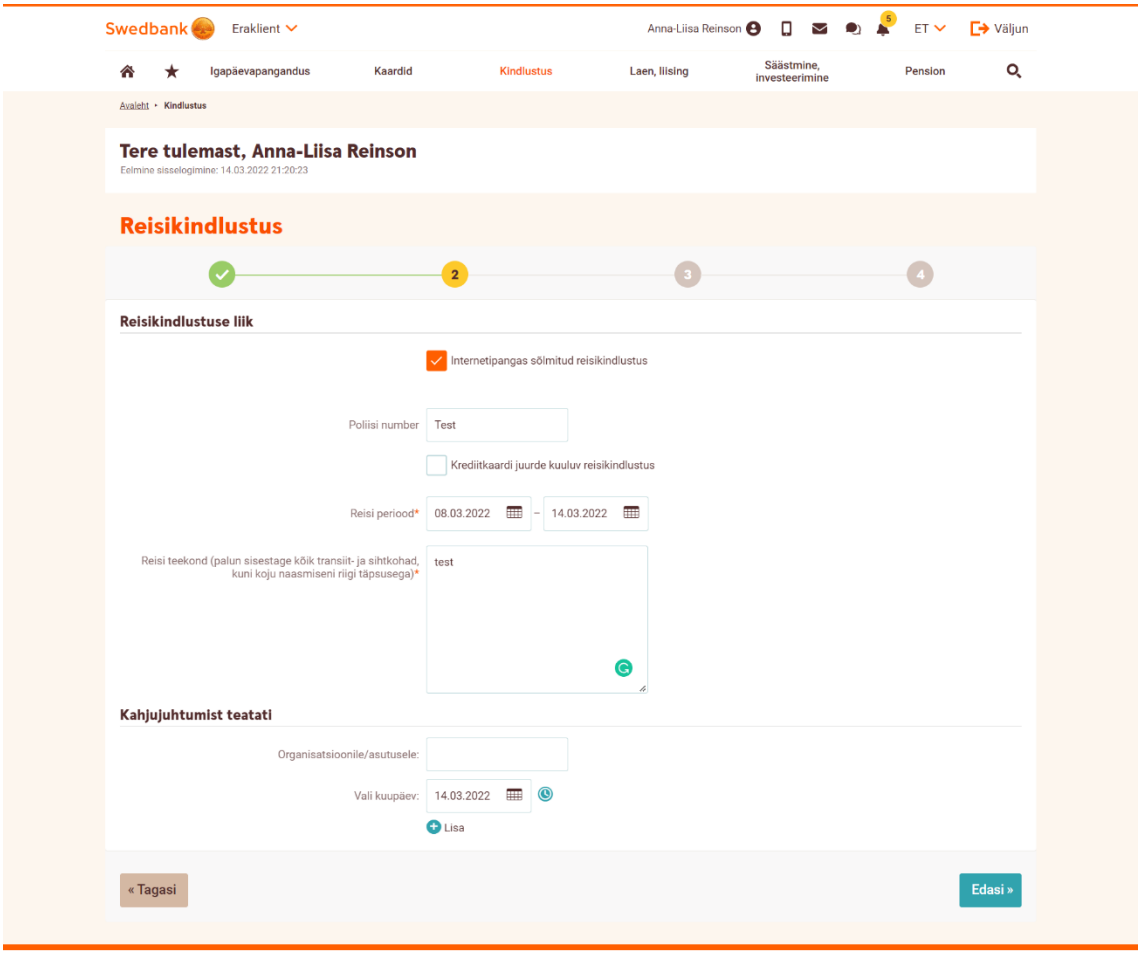
Kahjukäsitlus

888 2111 (24h)

▸ Teatan kahjust

Kui vajad meditsiiniabi, mille kulud on üle 1000 €, anna meile sellest teada esimesel võimalusel.


Swedbank
Eraklient
Anna-Liisa Reinson
ET
Väljun
Igapäevapangandus
Kaardid
Kindlustus
Laen, liising
Säästmine, investeerimine
Pension
Avaleht • Kindlustus
Tere tulemast, Anna-Liisa Reinson
Eelmine sisselogimine: 14.03.2022 21:20:23
Reisikindlustus
1
2
3
4
Kui Sinu kahjujuhtum on seotud reisitõrkega (nt lend tühistati või reis jääb ära), siis peaksid esmalt pöörduma teenusepakkuja (lennufirma, reisikorraldaja või majutusettevõtte) poole.
Palume meie juures kahjuavalduse teha pärast seda, kui on selgunud, kas ja kui suure osa tasutud reisikuludest reisikorraldaja või lennufirma tagasi maksab.
Seoses kahjuavalduste olulise kasvuga võib kahjukäsitluse protsess ja vastused päringutele võtta tavapärasest kauem aega. Palume kannatust ning vabandame võimaliku viivituse pärast.
Esitaja andmed
Nimi ANNA-LIISA
Perekonnanimi REINSON
Isikukood
Telefon* +372
E-post* alreinson@gmail.com
Kahjuavalduse esitaja on kindlustusvõtja? Jah Ei
Kahjujuhtum
Juhtumi toimumise kuupäev* 13.03.2022 12:00
Riik* Austria
Toimumise koht* Salzburg
Juhtumi kirjeldus* Test
Edasi »
Kontaktid
Vastused sagedastele küsimustele
Kontaktid, esindused ja sularahaautomaadid
Aja broneerimine
Swedbankist
SWEDBANK AS
Liivalaia 8, 15040 Tallinn
SWIFT kood/BIC: HABAEE2X
Reg. number: 10060701
Kasulikud lingid
Jätkusuutlikkus
Kalkulaatorid
Hinnad ja kursid
Digitaalsed võimalused
Tule tööle!
Juriidiline info
Pangatingimused
Isikuandmete töötlemine
Kliendiandmed
Küpsiste kasutamine
PSD2 direktiiv ja avatud pangandus
Kliendiprogrammid
Privaatpanganduse kliendid
Kuldkliendid
Seeniorid
Lapsevanemale
Noorele ja tudengile
Tule meie ärikliendiks
Olete finantsteenuseid pakkuvate ettevõtete (Swedbank AS, Swedbank Liising AS, Swedbank P&C Insurance AS, Swedbank Life Insurance SE ja Swedbank Investeerimisfondid AS) kodulehel. Enne mis tahes lepingu sõlmimist tutvuge vastava teenuse tingimustega ning vajaduse korral konsulteerige asjatundja
vedbank AS ei osuta krediidinõustamisteenust krediidiandjate- ja vahendajate seaduse mõistes. Laenu võtmise otsuse langetab laenusaaja, kes hindab panga poolt esitatud teabe ja hoiatuste põhjal pak
aenutoote ja lepingutingimuste sobivust oma isikliku laenuhuvi, -vajaduse ja finantsolukorraga ja ta vastutab lepingu sõlmimisega kaasnevate tagajärgede eest.


Swedbank
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Igapäevapangandus
Kaardid
Kindlustus
Laen, liising
Säästmine, investeerimine
Pension
Avaleht • Kindlustus
Tere tulemast, Anna-Liisa Reinson
Eelmine sisselogimine: 14.03.2022 21:20:23
Reisikindlustus
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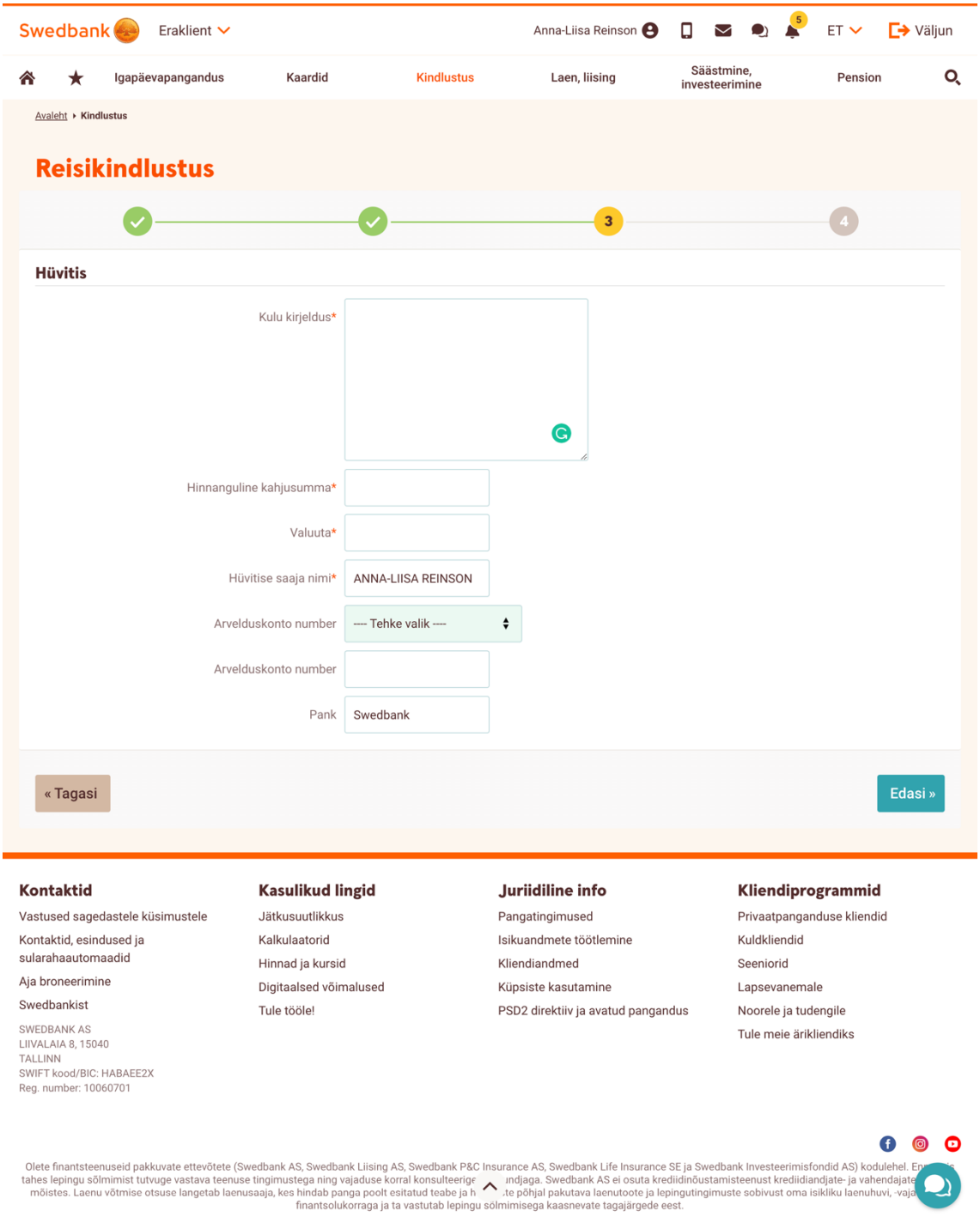
Reisikindlustuse liik
Internetipangas sõlmitud reisikindlustus
Poliisi number
Test
Krediitkaardi juurde kuuluv reisikindlustus
Reisi periood*
08.03.2022
14.03.2022
Reisi teekond (palun sisestage kõik transiit- ja sihtkohad, kuni koju naasmiseni riigi täpsusega)*
test
Kahjujuhtumist teatati
Organisatsioonile/asutusele:
Vali kuupäev:
14.03.2022
Lisa
« Tagasi
Edasi »


Swedbank
Eraklient
Anna-Liisa Reinson
5
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Väljun
Igapäevapangandus
Kaardid
Kindlustus
Laen, liising
Säästmine, investeerimine
Pension
Avaleht
Kindlustus
Reisikindlustus
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4
Hüvitis
Kulu kirjeldus*
Hinnanguline kahjusumma*
Valuuta*
Hüvitise saaja nimi*
ANNA-LIISA REINSON
Arvelduskonto number
---- Tehke valik ----
Arvelduskonto number
Pank
Swedbank
« Tagasi
Edasi »
Kontaktid
Vastused sagedastele küsimustele
Kontaktid, esindused ja sularahaautomaadid
Aja broneerimine
Swedbankist
SWEDBANK AS
LIIVALAIA 8, 15040
TALLINN
SWIFT kood/BIC: HABAEE2X
Reg. number: 10060701
Kasulikud lingid
Jätkusuutlikkus
Kalkulaatorid
Hinnad ja kursid
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Juriidiline info
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Isikuandmete töötlemine
Kliendiandmed
Küpsiste kasutamine
PSD2 direktiiv ja avatud pangandus
Kliendiprogrammid
Privaatpanganduse kliendid
Kuldkliendid
Seeniorid
Lapsevanemale
Noorele ja tudengile
Tule meie ärikliendiks
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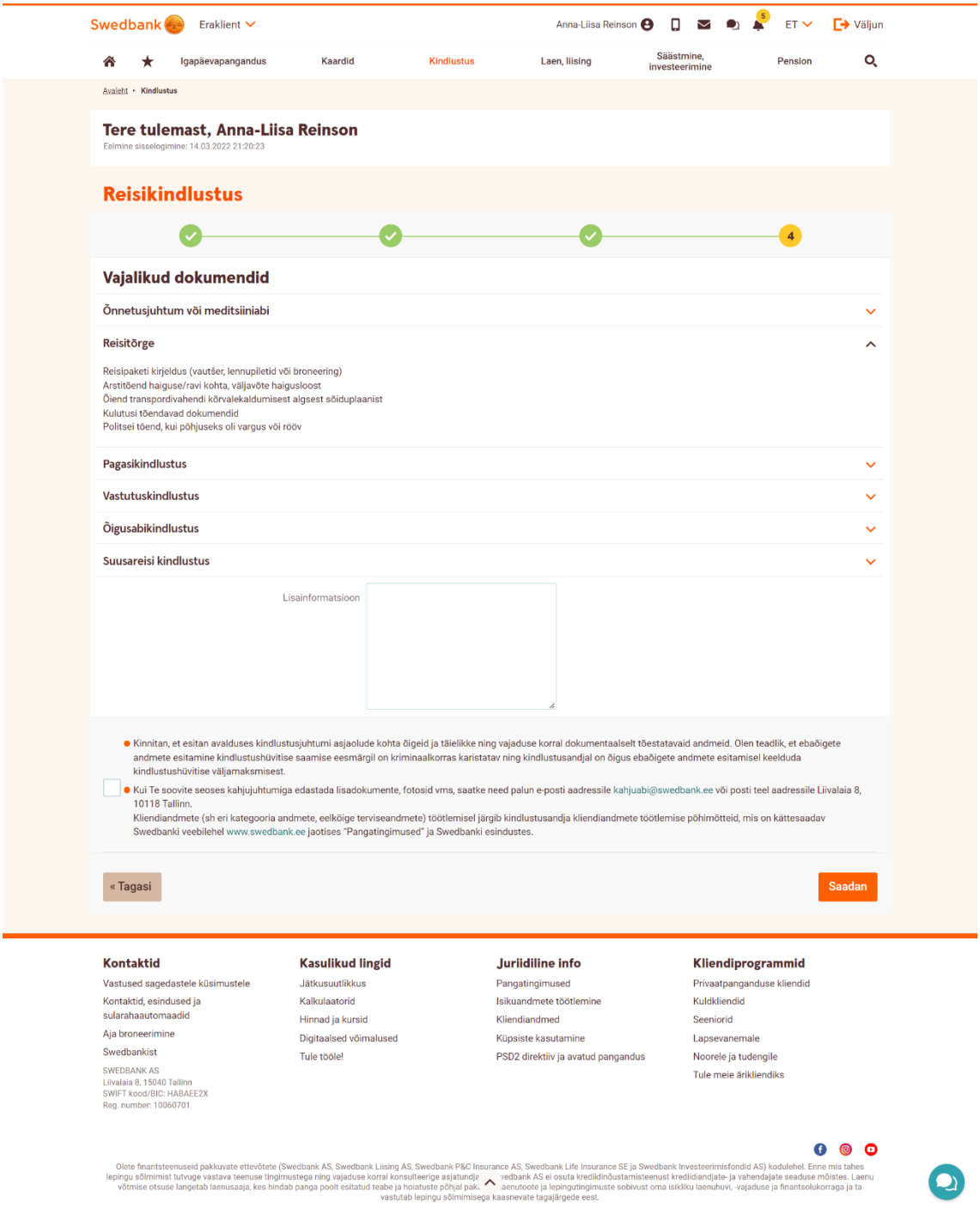
ndjaga. Swedbank AS ei osuta krediidinõustamisteenust krediidiandjate- ja vahendajate
mõistes. Laenu võtmise otsuse langetab laenusaaja, kes hindab panga poolt esitatud teabe ja h
te põhjal pakutava laenutoote ja lepingutingimuste sobivust oma isikliku laenuhuvi, -vaja
finantsolukorraga ja ta vastutab lepingu sõlmimisega kaasnevate tagajärgede eest.


Swedbank
Eraklient
Anna-Liisa Reinson
ET
Väljun
Igapäevapangandus
Kaardid
Kindlustus
Laen, liising
Säästmine, investeerimine
Pension
Avaleht • Kindlustus
Tere tulemast, Anna-Liisa Reinson
Eelmine sisselogimine: 14.03.2022 21:20:23
Reisikindlustus
4
Vajalikud dokumendid
Õnnetusjuhtum või meditsiiniabi
Reisitõrge
Reisipaketi kirjeldus (vautšer, lennupiletid või broneering)
Arstitõend haiguse/ravi kohta, väljavõte haigusloost
Õiend transpordivahendi kõrvalekaldumisest algsest sõiduplaanist
Kulutusi tõendavad dokumendid
Politsei tõend, kui põhjuseks oli vargus või röövimine
Pagasikindlustus
Vastutuskindlustus
Õigusabikindlustus
Suusareisi kindlustus
Lisainformatsioon
Kinnitan, et esitan avalduses kindlustusjuhtumi asjaolude kohta õigeid ja täielikke ning vajaduse korral dokumentaalselt tõestatavaid andmeid. Olen teadlik, et ebaõigete andmete esitamine kindlustushüvitise saamise eesmärgil on kriminaalkorras karistatav ning kindlustusandjal on õigus ebaõigete andmete esitamisel keelduda kindlustushüvitise väljamaksmisest.
Kui Te soovite seoses kahjujuhtumiga edastada lisadokumente, fotosid vms, saatke need palun e-posti aadressile kahjuabi@swedbank.ee või posti teel aadressile Liivalaia 8, 10118 Tallinn.
Kliendiandmete (sh eri kategooria andmete, eelkõige terviseandmete) töötlemisel järgib kindlustusandja kliendiandmete töötlemise põhimõtteid, mis on kättesaadav Swedbanki veebilehel www.swedbank.ee jaotises "Pangatingimused" ja Swedbanki esindustes.
« Tagasi
Saadan
Kontaktid
Vastused sagedastele küsimustele
Kontaktid, esindused ja sularahaautomaadid
Aja broneerimine
Swedbankist
SWEDBANK AS
Liivalaia 8, 15040 Tallinn
SWIFT kood/BIC: HABAEE2X
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Appendix 12 – AS-IS claims management processes

Figure 25. AS-IS version of "Review the information" sub-process which includes the reviewing of the claims information and documents by the claims handler process. Process steps marked in the colour pink will be improved in the TO-BE process.

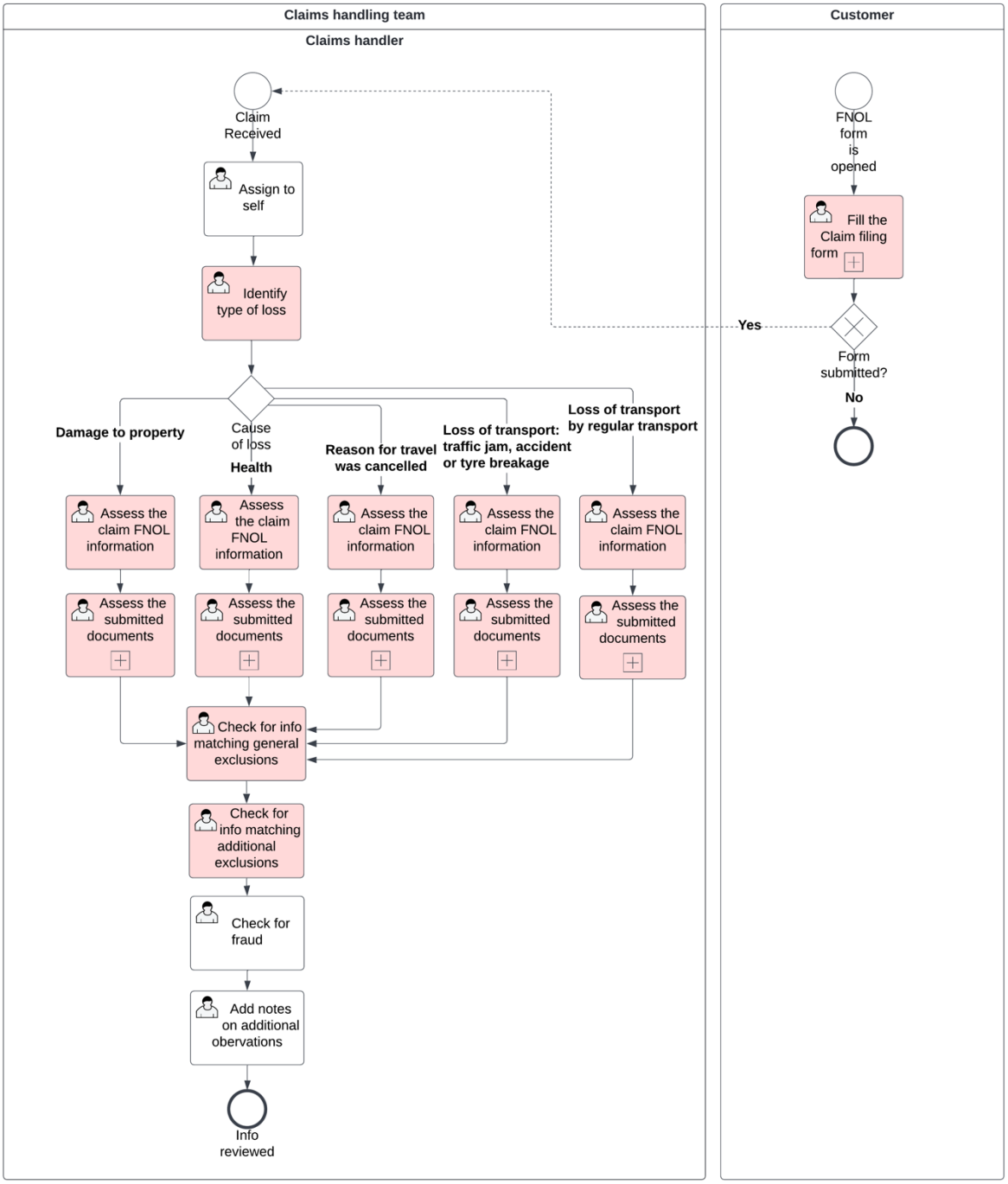


Figure 26. AS-IS version of "Assess the submitted documents" sub-process. Process steps marked in the colour pink will be improved in the TO-BE process.

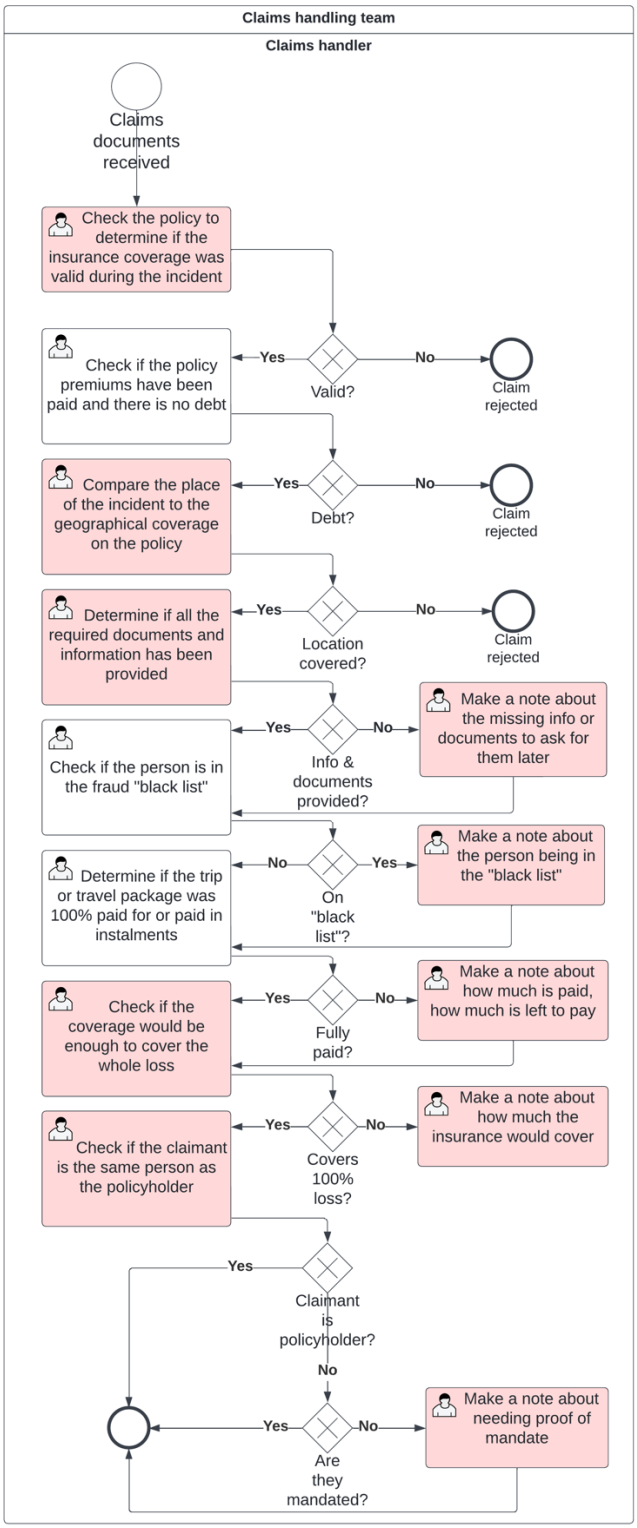


Figure 27. AS-IS version of acquiring missing documents and information process. Process steps marked in the colour pink will be improved in the TO-BE process.

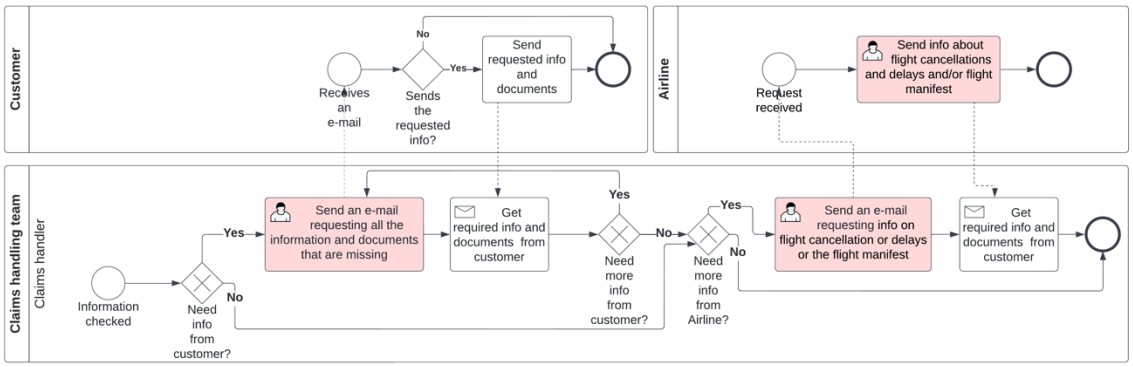
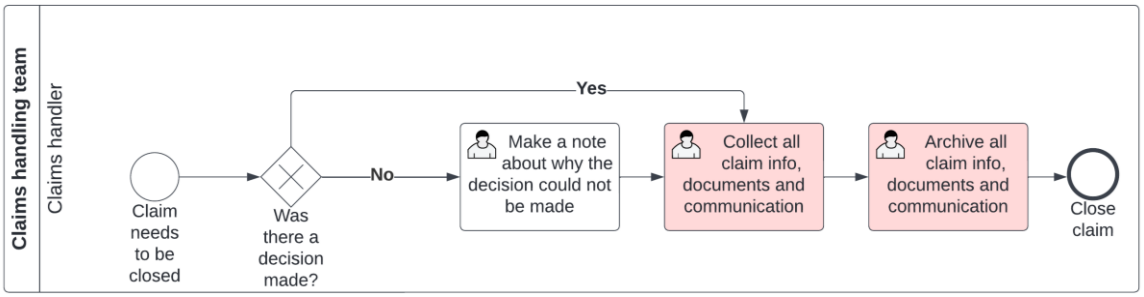


Figure 28. AS-IS version of closing the claim process after the claims management processes have been completed. Process steps marked in the colour pink will be improved in the TO-BE process.



Appendix 13 – The Desired Outcomes statements

Table 32. The full Jobs-to-be-done desired outcomes table with claims handler ratings and the opportunity score (by author).

Desired outcome statement				Importance (number of people voting 4 or higher)											Satisfaction (number of people voting 4 or higher)												
Direction	**Metric**	**Object of control**	**Contextual clarifier**	**Importance Total**	Participants										**Satisfaction Total**	Participants										**Opportunity score**	**Overserved outcomes**
					1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**		
Decrease	Time it takes	to determine if the policy is valid	and not terminated and the insurance coverage was there	10	10	8	10	10	6	10	10	7	7	8	10	5	4	7	7	8	10	8	7	10	4	10	0
Decrease	Time it takes	to plan the resources needed to process this claim	judging by the workload and expertise of the claim handlers	7	8	2	3	5	7	10	10	8	5	2	7	4	2	8	1	5	8	5	7	8	2	7	0
Decrease	Time it takes	to determine the coverage type	of the insurance claim filed for a certain policy	9	10	8	9	10	3	10	10	9	10	8	10	9	6	6	5	10	9	9	7	8	6	9	-1
Decrease	Time it takes	to determine the correct terms and conditions	applying to this specific policy out of different versions of terms	9	10	8	8	10	8	3	10	9	4	8	7	10	2	9	6	4	10	3	6	8	2	11	2
Decrease	Frequency (of happening)	to determine that the team has the competence	to process and make a decision on this type of claim	8	8	3	7	8	10	10	10	9	8	3	9	8	8	4	3	6	10	5	7	10	8	8	-1
Decrease	Time it takes	to determine if the deductible is paid	if applicable	7	10	2	5	10	3	10	10	9	9	2	9	8	9	5	2	8	10	7	7	9	9	7	-2
Decrease	Time it takes	to determine whether the policy is paid for	and the client is not in debt for this policy	5	10	3	10	10	3	3	10	9	3	3	8	8	6	3	4	3	10	7	7	10	6	5	-3
Decrease	Time it takes	to access the policy details	of the contract the claim was made under	7	10	8	7	10	1	3	9	10	3	8	8	10	1	4	6	5	10	7	8	9	1	7	-1
Decrease	Time it takes	to gather flight or other transport cancellation or delay info	in order to verify that the travel disruption really happened	9	10	10	9	10	10	3	9	10	10	10	9	4	4	5	2	5	4	5	5	7	4	9	
Decrease	Time it takes	to gather the booking information	to make sure that the trip has really been purchased and paid for	10	10	9	9	10	10	10	10	9	6	9	9	4	7	6	2	5	9	5	5	6	7	11	1
Decrease	Time it takes	to gather the customer information	such as address, name if applicable	8	10	3	9	9	10	10	10	10	5	3	9	9	8	3	9	10	10	9	8	10	8	8	-1
Decrease	Frequency (of happening)	to gather the bank details	where the customer wants to receive the settlement payment	7	10	3	9	10	8	3	10	9	10	3	9	9	7	5	7	1	10	7	4	10	7	7	-2
Decrease	Time it takes	to gather the details about the incident	that caused for the customer to file the claim	9	10	8	9	10	8	3	10	9	7	8	9	5	4	8	5	3	7	7	7	9	4	9	0
Decrease	Time it takes	to gather the documents that prove the incident happened	from the filed claim or by asking the customer for additional info	9	10	9	8	10	5	3	10	10	10	9	10	4	6	6	5	4	7	7	6	7	6	9	-1
Decrease	Time it takes	to gather the information about the amount of damage or loss	that was inflicted due to the incident	9	10	9	8	10	5	3	9	10	9	9	8	4	7	4	4	3	1	7	6	9	7	10	1
Decrease	Time it takes	to gather the information on what caused the loss	according to the customer's statements	9	10	8	10	9	8	3	7	10	10	8	9	4	4	4	5	4	1	7	7	9	4	9	0
Decrease	Time it takes	to gather information on what kind of compensation is needed	whether it is monetary or something else	8	10	3	7	5	9	6	10	10	10	3	10	8	8	7	5	5	10	7	7	10	8	8	-2
Decrease	Time it takes	to access information about the previous claims	under this policy and for this customer or other companies	6	8	3	5	5	9	3	10	10	3	3	8	6	7	3	1	5	10	8	6	9	7	6	-2
Create	Capability	to automatically access info in image and PDF files	in order to convert it into a machine-readable form to make it viewable without opening the file	10	10	8	7	8	10	10	10	10	10	8	7	5	4	5	1	2	10	6	6	3	4	13	3

Decrease	Time it takes	to organize all the data and documents that are related to this claim	to be saved in the same location	8	10	5	9	8	3	3	9	9	6	5	9	5	5	7	2	4	10	6	6	5	5	8	-1
Decrease	Time it takes	to organize all the communication transcripts related to this claim	to be linked to the claim and saved in the same location	8	10	8	8	7	2	3	10	9	10	8	4	3	2	3	2		10	5	6	7	2	12	4
Decrease	Time it takes	to examine all the information and documents	that were provided in the filed claim	9	10	8	9	10	7	3	10	9	10	8	9	5	5	4	3	5	8	5	7	8	5	9	0
Decrease	Frequency (of happening)	to examine mandatory response time in the service level agreement	that applies to this policy	5	9	3	8	2	3	3	10	9	4	3	8	4	7	2	2	5	10	5	6	8	7	5	-3
Decrease	Time it takes	to upload all the documents to the claim	that were provided by the customer via e-mail later	10	10	5	9	8	8	10	10	10	5	5	9	5	5	7	5	9	10	3	5	10	5	11	1
Decrease	Time it takes	to prepare the information for the claim payment	to be conveyed to the finance department for making the payout	9	10	5	9	5	7	10	10	9	2	5	6	5	3	3	4	4	10	3	6	10	3	12	3
Decrease	Time it takes	to organize the backlog in the order of priory	based on the service level agreements and the filing date	8	3	5	4	2	5	6	10	9	10	5	9	5	4	5	2	4	10	5	6	10	4	8	-1
Create	Capability	to validate that the claim is not fraudulent	based on the customer's prior history	8	10	9	6	3	5	5	10	10	2	9	6	5	2	2	6	2	10	5	6	8	2	10	
Decrease	Time it takes	to validate that the travel plan was booked with enough time to be able to make it to the next transport	at least 2h	8	10	6	7	7	2	3	9	9	7	6	9	4	8	5	5	5	3	5	7	9	8	8	
Decrease	Time it takes	to validate that the trip was bought and paid for	to prevent insurance fraud	10	10	6	9	8	6	5	10	10	7	6	9	4	5	4	5	3	8	5	6	8	5	11	1
Create	Capability	to validate that the ID is not fraudulent	based on photo examination	9	10	5	8	10	2	7	8	5	10	5	6	4	2	1	1	5	10	5	6	10	2	12	
Decrease	Time it takes	to decide on the settlement method	based on the customer's preference and the cost	8	10	3	9	9	6	10	9	7	10	3	8		7	7	2	7	10	7	6	10	7	8	0
Create	Capability	to validate that the claimant is the policy holder	to prevent fraud	8	10	3	5	10	5	5	9	8	7	3	8	4	4	1	4	2	10	8	6	10	4	8	0
Create	Capability	to prioritize the claims with a higher cost	to be able to spend more time on validating the decision	10	7	10	6	7	7	10	10	9	4	10	5	9	1	1	3	3	8	5	7	8	1	15	5
Create	Capability	to prioritize customer communication based on urgency	to assure timely responses	8	10	7	6	10	2	10	10	9	3	7	8	3	5	4	4	2	5	5	7	8	5	8	0
Create	Capability	to validate that the decision can be made based on the decision tree	to assure the highest quality standard of the claims decision	9	10	10	9	6	3	4	10	9	4	10	6	6	3	5	3	2	4	5	6	10	3	12	3
Decrease	Time it takes	to validate that the claim does not violate the terms and conditions	that are stated in the general or product terms and conditions	10	10	10	10	10	5	6	10	9	4	10	10	9	4	5	4	4	9	7	7	9	4	10	0
Decrease	Time it takes	to validate that the payout sum does not exceed the coverage	that is stated on the policy	7	10	3	10	10	4	2	10	10	4	3	10	10	8	8	4	10	9	7	7	10	8	7	-3
Decrease	Time it takes	to decide if there is enough information	to make a claims decision	8	9	7	7	5	3	3	10	9	8	7	8	7	8	3	5	3	8	7	6	8	8	8	0
Decrease	Time it takes	to validate that all the required information and documents are there	in order to be able to make a decision	9	10	9	7	10	4	3	10	8	10	9	8	9	8	8	5	3	2	8	6	6	8	10	1
Decrease	Time it takes	to verify that the bank account provided for the payout is in the same country where the policy was purchased	in order to prevent money laundry	6	8	3	2	1	4	10	9	9	8	3	7	9	9	2	1	2	7	9	6	10	9	6	-1
Decrease	Time it takes	to validate that no other party is liable for this loss	to determine that the claim should be settled	8	10	3	8	10	5	10	10	10	10	3	9	7	6	7		5	9	7	6	8	6	8	-1
Decrease	Time it takes	to make the claims decision to settle or reject or close	based on the gathered claims information	8	10	10	10	9	2	3	10	10	10	10	9	10	7	7	5	3	9	5	6	9	7	8	-1
Decrease	Time it takes	to write down the decision reasoning	for logging purposes	8	10	7	8	5	5		10	5	1	7	7	8	3	2	4	10	9	5	7	7	3	9	1
Decrease	Time it takes	to inform the customer about the decision made	so that the customer could accept of dispute it	7	10	3	5	10	6	1	10	7	4	3	9	9	7	8	4	10	3	5	7	9	7	7	-2

Decrease	Time it takes	to communicate the payout sum to the finance department	in case of a monetary compensation settlement	6	10	3	6	9	5		10	5	1	3	10	6	6	8	5	6	10	5	6	10	6	6	-4
Decrease	Time it takes	to refund the premium in case of rejection	because of an invalid contract	8	10	9	9	2	2	10	8	5	10	9	7	6	1	4	2	5	10	5	7	8		9	1
Increase	Capability	to check if the customer is satisfied with the transaction	by asking them for a rating	7	9	7	5	7	2	1	8	7	1	7	7	5	2	2	9	9	10	6	7	10	1	7	0
Increase	Time it takes	to track the settlement	to make sure it goes through	8	10	3	4	5	6	4	10	8	7	3	5	3	3	2	8	3	10	4	5	9		11	3
Decrease	Time it takes	to check for complaints	on the claims decision communicated to the customer	9	10	5	5	5	4	1	10	9	9	5	7	4	3	3	5	5	10	5	5	10	2	11	2
Decrease	Time it takes	to check how many claims this policy already has	in order to make sure it does not get over-compensated	7	5	3	2	10	6	8	9	9	10	3	9	8	7	6	8	10	10	7	5	8	3	7	-2
Decrease	Time it takes	to track the customer communication	regarding the filed claim	9	10	7	8	9	3	4	10	9	9	7	7	5	5	5	3	5	4	3	6	9	3	11	2
Decrease	Time it takes	to monitor the channel for new filed claims	in order to start processing them	6	10	3	9	5	3	3	10	9	6	3	10	10	9	8	5	5	8	5	5	10	7	6	-4
Decrease	Time it takes	to verify that the claim can be closed	or further actions are needed	6	10	2	3	7	9	3	7	8	9	2	10	6	8	6	4	8	9	5	7	9	5	6	-4
Create	Capability	to track the payout-premium ratio	to track if the contract is profitable	8	10	7	2	1	9	10	9	9	5	7	6	6	2	3	1	2	10	4	6	10	9	10	2
Decrease	Time it takes	to track the claims where the customer does not provide missing data	by not answering	10	8	8	6	10	8	10	9	9	9	8	6	5	4	4	1	2	1	3	6	8	8	14	4
Maximise	Capability	to monitor customer satisfaction	in order to improve and provide a better service	10	10	7	8	8	6	9	10	9	10	7	6	4	3	2	10	4	10	3	7	10	2	14	4
Decrease	Time it takes	to track the fulfilment of the SLAs	in order to prevent fines	7	10	3	6	10	7	3	10	9	8	3	7		5	3	3	5	8	5	7	10	4	7	0
Decrease	Time it takes	to update the statuses of the claim	so that the customer can monitor their claim's process	10	9	8	7	8	5	4	10	10	10	8	6	4	5	2	2	8	4	2	7	7	3	14	4
Decrease	Time it takes	to update the documents and information of the claim	as the customer reveals new details	9	10	6	7	8	5	3	10	9	4	6	7	6	6	3	2	10	8	3	7	9	5	11	2
Decrease	Time it takes	to adjust the costs of the claim	as new information becomes available	9	10	4	7	9	7	3	10	10	10	4	8	6	5	5	2	8	7	2	6	9	5	10	1
Create	Capability	to maintain a log of all actions and information	to be able to reproduce the reasoning of the decision later	10	10	8	9	9	9	8	10	10	8	8	6	5	3	2	3	9	8	3	7	9	6	14	4
Decrease	Time it takes	to update service partners	as new information becomes available	8	10	5	6	9	2	3	10	10	10	5	5	5	5	2	1	2	3	2	6	10	5	11	3
Decrease	Time it takes	to close the claim	once all mandatory actions have been taken	8	10	7	3	10	2	4	7	8	4	7	9	10	6	5	5	8	7	6	7	10	3	8	-1
Decrease	Time it takes	to archive all claim documentation	in the predetermined way and to a predetermined location	6	10	3	8	10	3	3	7	10	4	3	8	7	2	3	5	10	7	5	6	10	5	6	-2
Decrease	Time it takes	to provide summarizing information	for claim reports	8	10	3	4	9	8	5	10	9	9	3	7	5	2	1	2	5	9	5	6	8	6	9	1
Minimize	Amount	to handle a complaint	in case the customer files one	8	10	5	9	10	5	1	10	9	3	5	7	5	2	4	3	5	8	4	6	8	2	9	
Decrease	Time it takes	to cancel the policy	in case the terms and conditions require doing so	8	10	4	9	10	3	1	7	9	10	4	8	9	7	3	4	9	10	5	7	9	2	8	0
Create	Capability	to store the related invoices in the archive	where all the rest of the claim info was stored	9	10	4	8	9	4	3	10	9	7	4	8	5	6	4	3	10	9	5	6	10	2	10	1
Decrease	Time it takes	to report bugs	in the claim handling system	10	10	7	7	7	10	7	10	9	4	7	7	9	4	3	1	8	7	2	7	9	7	13	3
Minimize	Frequency (of happening)	to figure out workarounds	when there is a bug in the system	10	10	8	8	7	9	9	7	9	10	8	5	7	4	3	1	2	1	2	7	8	6	15	5
Decrease	Time it takes	to improve the knowledge base	regarding new claim handling information	8	10	3	5	10	6	5	9	9	10	3	6	7	8	2	1	4	7	2	7	2	4	10	2
Minimize	Frequency (of happening)	to support customers during filing of the claim	if they cannot handle it on their own	10	9	10	9	7	9	7	10	10	6	10	6	7	2	4	2	2	8	2	6	4	4	14	4

Increase	Level	to train other claim handlers	during onboarding	10	10	6	7	10	6	9	10	9	5	6	7	8	9	3	3	4	9	3	6	8	8	13	3
Maximise	Frequency (of happening)	to feel like the decision that was made was fair and just	after making the claims decision	10	10	10	8	4	8	10	10	9	10	10	7	5	7	5	1	7	8	3	7	9	2	13	3
Maximise	Frequency (of happening)	to feel like the work is helping people		10	10	6	6	8	9	10	10	8	10	6	9	8	6	6	2	7	10	5	7	9	9	11	1
Maximise	Frequency (of happening)	to not second guess the made decisions		10	10	10	10	6	9	10	10	8	6	10	7	6	7	7	3	2	9	2	7	9	7	13	3
Increase	Frequency (of happening)	to not be afraid of being accused of making the wrong decision		10	10	9	9	8	9	10	10	8	9	9	7	6	4	3	5	2	8	1	7	9	6	13	3
Maximise	Frequency (of happening)	to feel productive and successful	by being able to process many claims	10	10	5	7	10	6	10	10	9	5	5	7	9	5	5	3	3	9	1	6	9	7	13	3
Maximise	Frequency (of happening)	to be perceived as transparent by the customers	regarding the decision making	10	10	8	9	10	9	10	10	9	10	8	6	10	2	2	1	3	9	4	7	8	4	14	4
Maximise	Frequency (of happening)	to be perceived as friendly	in communication with the customer and colleagues	10	10	5	8	7	9	10	10	8	9	5	8	8	5	3	2	6	9	8	8	8	5	12	2

Table 33. The Jobs-to-be-done desired outcomes opportunity score legend as per Ulwick, A. W. [29]

Overserved (SAT > IMP) - COPY FROM OTHERS
Appropriately served (OPP < 10) - NOT IMPORTANT
Underserved (OPP >= 10) - INNOVATE

Appendix 14 – AS-IS and TO-BE Decision Requirements Diagrams

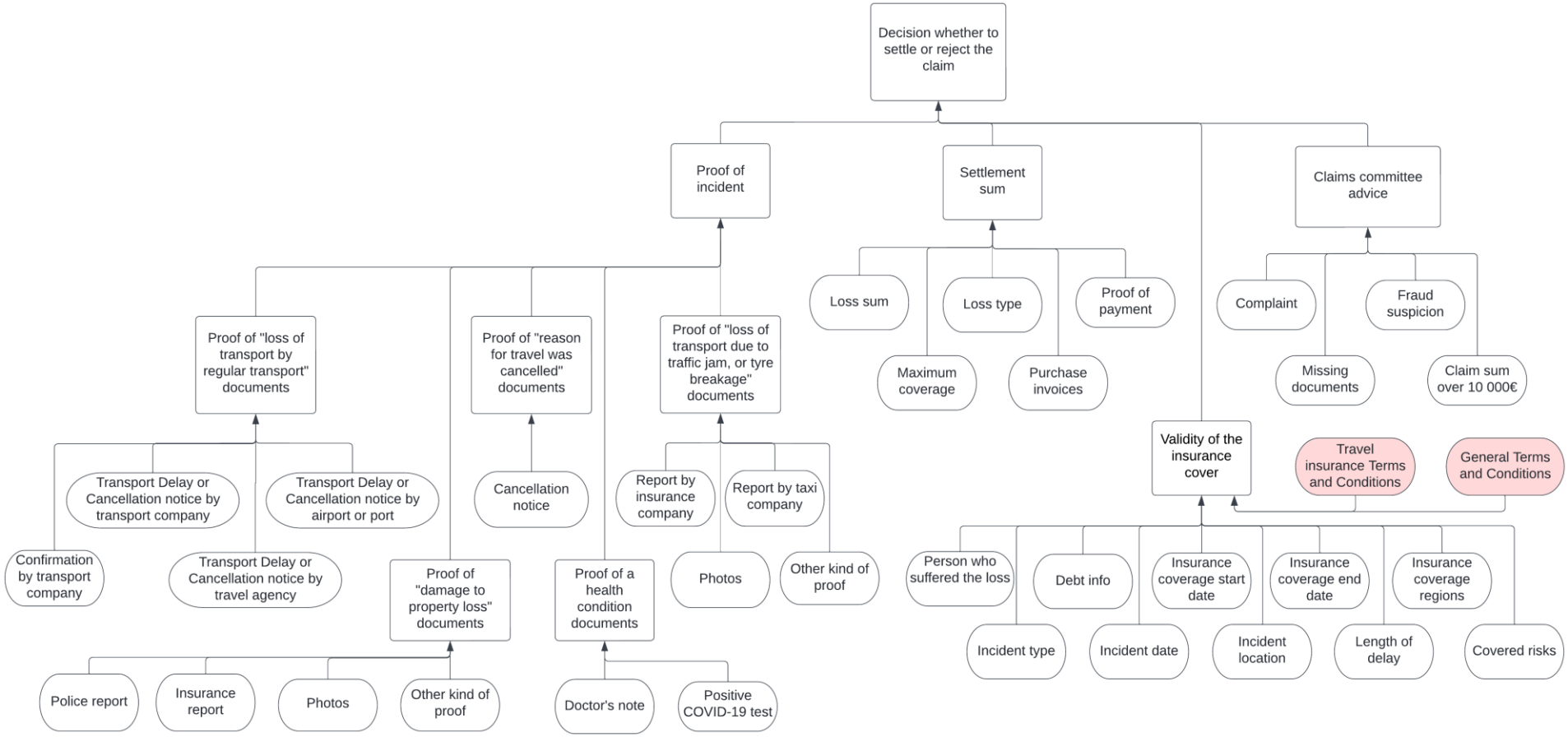


Figure 29. The full AS-IS decision model of travel insurance claims management (by author).

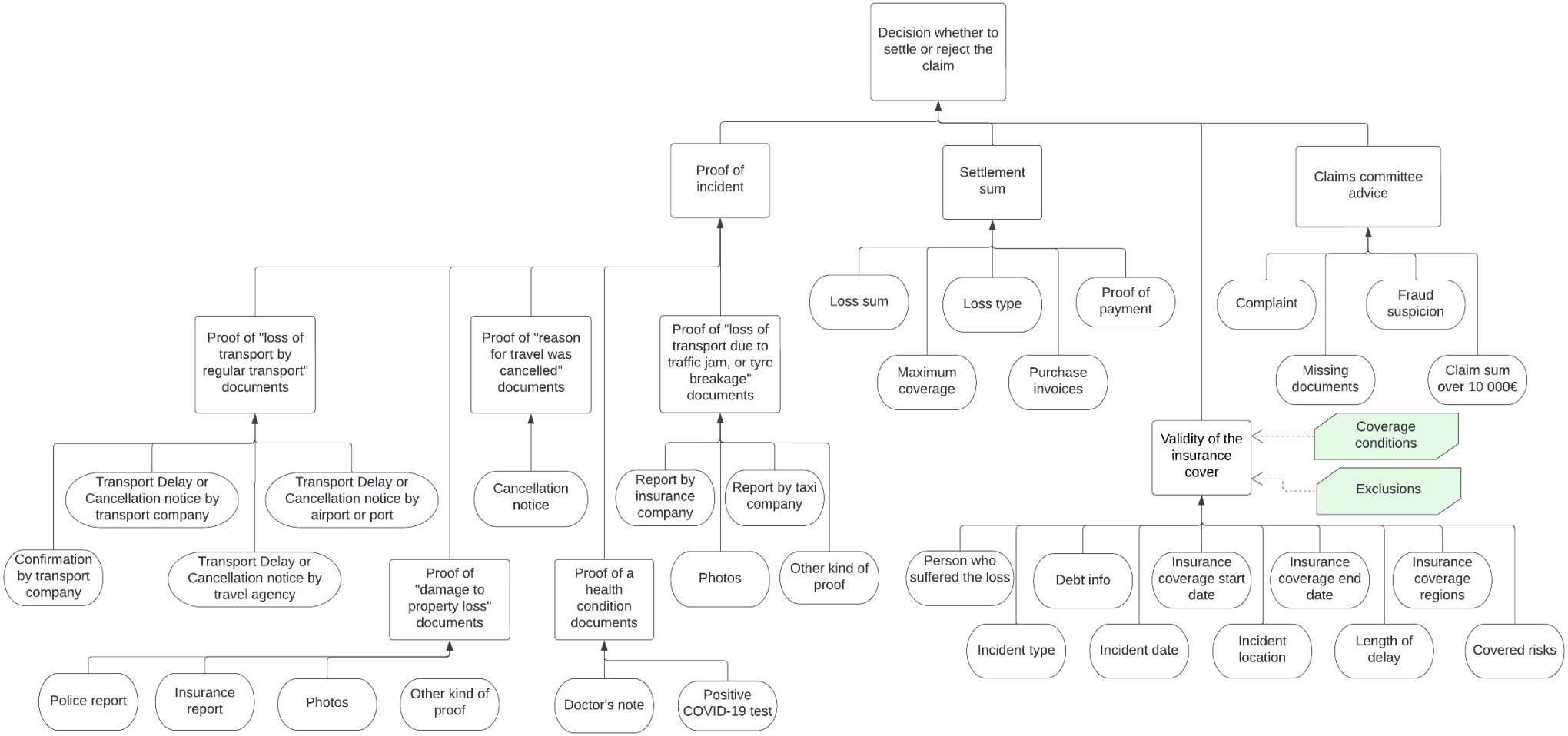


Figure 30. The full TO-BE model of travel insurance decision making model (by author).

Appendix 15 – Decision making rules

Claim rejection rules (hereinafter “general exclusions”) as stated by the General and Product Terms&Conditions of ADB Gjensidige Estonia [84], [85], If P&C Insurance AS [86] and Swedbank P&C Insurance AS [87] - if one of the exclusions applies, the claim will be rejected:

1. In case of a loss caused by nuclear energy, chemical or biological weapons, electromagnetic fields or any other form of radioactivity, radiological, toxicological or explosive properties of the substance the claim will not be settled and therefore the loss will not be reimbursed.
2. In case of a loss caused by war, terrorism, disturbances, or insurrection the claim will not be settled and therefore the loss will not be reimbursed.
3. In case of a loss caused by a strike or work stoppage, the claim will not be settled and therefore the loss will not be reimbursed.
4. In case of a loss caused by a conflict with a travel companion, the claim will not be settled and therefore the loss will not be reimbursed.
5. In case of a loss caused by extortion, fraud, embezzlement or the use of a weapon the claim will not be settled and therefore the loss will not be reimbursed.
6. In case of a loss caused by insolvency, the bankruptcy of the airport the claim will not be settled and therefore the loss will not be reimbursed.
7. In case of a loss caused by the act of omission by the tour operator the claim will not be settled and therefore the loss will not be reimbursed.
8. In case of a loss caused by the fact that the insured person decided to miss the trip because of a delay in the case where the delay did not significantly change the conditions of the trip the claim will not be settled and therefore the loss will not be reimbursed.
9. In case of a loss caused by the insured person deciding to interrupt or delay the trip because of an incomplete itinerary the claim will not be settled and therefore the loss will not be reimbursed.

10. In case of a loss caused by a schedule change of regular transport, the claim will not be settled and therefore the loss will not be reimbursed.
11. In case of a loss caused by incomplete travel documentation, the claim will not be settled and therefore the loss will not be reimbursed.
12. In case of a loss covering accommodation in Estonia, the claim will not be settled and therefore the loss will not be reimbursed.
13. In case of a loss caused by the insured person breaking the law, the claim will not be settled and therefore the loss will not be reimbursed.
14. In case of a loss caused by pregnancy or giving birth or related the claim will not be settled and therefore the loss will not be reimbursed.
15. In case of a loss caused by chronic illness or an illness that existed before the claim will not be settled and therefore the loss will not be reimbursed.
16. In case of a loss caused by psychiatric illness, the claim will not be settled and therefore the loss will not be reimbursed.
17. In case of a loss caused by self-harming the claim will not be settled and therefore the loss will not be reimbursed.
18. In case of a loss caused by health issues caused by participation in hostilities or presence in the armed forces; being in a crisis area as an observer, rescue worker, medical worker or for similar reasons; activities of equivalent risk to the above; loss of income or non-pecuniary claims; the claim will not be settled and therefore the loss will not be reimbursed.
19. In case of a loss caused by the airport management, aviation commission, public authority cancelling transport the claim will not be settled and therefore the loss will not be reimbursed.
20. In case of a loss caused by a work injury through working in mines, on oil and gas platforms; work as a seaman, fisherman, policeman, security guard, rescue worker, member of a ship or aircraft crew, or in any occupation or employment involving the right to use or bear arms; being in a crisis area as an observer, rescue worker, medical worker or for similar reasons; activities of equivalent risk to the above; the claim will not be settled and therefore the loss will not be reimbursed.
21. In case of a loss caused by the insured person's property intentionally by themselves, the claim will not be settled and therefore the loss will not be reimbursed.

Claim settlement rules (hereinafter "coverage conditions") as stated by the Travel Insurance Terms & Conditions of ADB Gjensidige Estonia [84], [85], If P&C Insurance AS [86] and Swedbank P&C Insurance AS [87] - those that are settled will be reimbursed, those rejected will not be reimbursed):

1. In case of **cancellation** of the **Insured Person's** trip **before** the trip because of **sudden illness, injury or death of the insured person** the claim will **be settled** and therefore the loss **will** be reimbursed.
2. In case of **cancellation** of the **Insured Person's** trip **before** it had started, in case the loss was caused by **Life-threatening condition or injury** the claim will **be settled** and therefore the loss **will** be reimbursed.
3. In case of **cancellation** of the **Insured Person's** trip **before** it had started, in case the loss was caused by **Sudden illness, injury or death of insured person's Travel companion** the claim will **be settled** and therefore the loss **will** be reimbursed.
4. In case of **cancellation** of the **Insured Person's** trip **before** it had started, in case the loss was caused by **Life-threatening condition or injury of Person close to the insured person** the claim will **be settled** and therefore the loss **will** be reimbursed.
5. In case of **cancellation** of the **Insured Person's** trip **before** it had started, in case the loss was caused by **damage that requires presence in Estonia** the claim will **be settled** and therefore the loss **will** be reimbursed.
6. In case of **cancellation** of the **Insured Person's** trip **after** it had started, in case the loss was caused by **Sudden illness, injury or death of insured person** the claim will **be settled** and therefore the loss **will** be reimbursed.
7. In case of **cancellation** of the **Insured Person's** trip **after** it had started, in case the loss was caused by **Life-threatening condition or injury** the claim will **be settled** and therefore the loss **will** be reimbursed.
8. In case of **cancellation** of the **Insured Person's** trip **after** it had started, in case the loss was caused by **Sudden illness, injury or death of insured person's Travel companion** the claim will **be settled** and therefore the loss **will** be reimbursed.
9. In case of **cancellation** of the **Insured Person's** trip **after** it had started, in case the loss was caused by **Life-threatening condition or injury of Person close to the insured person** the claim will **be settled** and therefore the loss **will** be reimbursed.

10. In case of **cancellation** of the **Insured Person's** trip **after** it had started, in case the loss was caused by **damage to a property that requires presence in Estonia** the claim will **be settled** and therefore the loss **will** be reimbursed.
11. In case of **cancellation** of the **Insured Person's** trip **after** it had started, in case the loss was caused by **loss or deterioration (but not expiry) of special travel equipment or travel documents taken on the trip, if the equipment or documents cannot be replaced during the trip** the claim will **be settled** and therefore the loss **will** be reimbursed.
12. In case of **delay** of the **Insured Person's** trip **after** it had started, in case the loss was caused by **loss or deterioration (but not expiry) of special travel equipment or travel documents taken on the trip, if the equipment or documents cannot be replaced during the trip** the claim will **be settled** and therefore the loss **will** be reimbursed.
13. In case of **delay** of the **Insured Person's** trip **after** it had started, in case the loss was caused by **Weather conditions or natural disaster lasting up to 24h** the claim will **be settled** and therefore the loss **will** be reimbursed.
14. In case of **delay** of the **Insured Person's** trip **after** it had started, in case the loss was caused by **Weather conditions or natural disaster lasting over 24h** the claim will **be rejected** and therefore the loss **will not** be reimbursed.
15. In case of **delay** of the **Insured Person's** trip **after** it had started, in case the loss was caused by **technical malfunction of the vehicle lasting up to 24h** the claim will **be settled** and therefore the loss **will** be reimbursed.
16. In case of **delay** of the **Insured Person's** trip **after** it had started, in case the loss was caused by **technical malfunction of the vehicle lasting over 24h** the claim will **be rejected** settled and therefore the loss **will not** be reimbursed.
17. In case of **delay** of the **Insured Person's** trip **after** it had started, in case the loss was caused by **Tyre breakage lasting up to 24h** the claim will **be settled** and therefore the loss **will** be reimbursed.
18. In case of **delay** of the **Insured Person's** trip **after** it had started, in case the loss was caused by **Tyre breakage lasting over 24h** the claim will **be rejected** settled and therefore the loss **will not** be reimbursed.
19. In case of **delay** of the **Insured Person's** trip **after** it had started, in case the loss was caused by **Emergency landing of the aircraft lasting up to 24h** the claim will **be settled** and therefore the loss **will** be reimbursed.

20. In case of **delay** of the **Insured Person's** trip **after** it had started, in case the loss was caused by **Emergency landing of the aircraft lasting over 24h** the claim will **be rejected** settled and therefore the loss **will not** be reimbursed.
21. In case of **delay** of the **Insured Person's** trip **after** it had started, in case the loss was caused by **unexpected traffic jam lasting up to 24h** the claim will **be settled** and therefore the loss **will** be reimbursed.

Appendix 16 – Functional requirements with sources

Table 34. The full list of functional requirements (by author).

Priority	ID	Functional requirement	Source
Must have	FR3	As a user of the Claims Handling SaaS, I want to log in to the system so that I can use it.	GDPR
Must have	FR8	As a compliance officer at the insurance company, I want the records of all user actions and transactions to be retained and archived for as long as necessary so that we would comply with regulations and auditors can access them.	Estonian Accounting Law [95] and other European Records retention laws [96], Internal audit
Must have	FR11	As a compliance officer at the insurance company, I want it to be possible to manage the consent given by the customer to comply with the GDPR.	GDPR
Must have	FR13	As a compliance officer at the insurance company, I want it to be possible to manage and retain only the personal data needed and make it only accessible to users who need it and have the right to view it to comply with the GDPR.	
Must have	FR14	As a marketing manager at the insurance company, I want it to be possible to change the appearance of the claim filing form to match the corporate identity of the insurance company so that our customers would recognise the page as ours.	Client's Company Corporate Visual identity
Must have	FR15	As a claims handler at the insurance company, I want it to be possible to accept claims via a web-based claim filing form so that the claimant can provide all the claim evidence digitally.	Customer survey
Must have	FR18	As the person responsible for the claims filing process at the insurance company, I want the claim filing process to dynamically only display the questions relevant to the user according to the answers they have already given so that the claimant would provide all the necessary information, but not be asked for too much information.	Solution requirement
Must have	FR19	As a claims handler at the insurance company, I want the system to save all the data, documents and consents from the filed claim so that I would not have to save or add it manually.	Solution requirement

Must have	FR21	As a claims handler at the insurance company, I want each insurance product to have several different claim management processes associated with it so that I can follow the most relevant one according to the type of loss and the reason it shows me the information directly relevant to this case.	Jobs to be Done
Must have	FR22	As a claims handler at the insurance company, I want it to be possible to automatically prioritise the open claims backlog according to their cost or urgency so that the critical claims get noticed and dealt with promptly.	Claim handler interviews, Jobs to be Done
Must have	FR24	As a claims handler at the insurance company, I want it to be possible to view all Policy information and related documents connected to the claim in 1 place without having to open the documents so that I would save time and effort.	Claim handler interviews, Jobs to be Done
Must have	FR25	As a claims handler at the insurance company, I want it to be possible to automatically determine if the policy cover was valid during the incident so that I would save time and effort.	Jobs to be Done
Must have	FR26	As a claims handler at the insurance company, I want it to be possible to extract information from the Policy, documents and Terms and Conditions and display the information on the claims management user interface so that I would save time and effort searching for and opening the documents.	Claim handler interviews, Jobs to be Done
Must have	FR27	As a claims handler at the insurance company, I want it to be possible to make automatic decision suggestions or decisions based on the information in the extracted Policy, documents and Terms and conditions so that it would save time and effort and provide consistently the same decisions for similar cases.	Claim handler interviews, Jobs to be Done, AI governance
Must have	FR28	As a claims handler at the insurance company, I want it to be possible to display the logic based on which the decision suggestions or decisions were made (based on the policy, terms and conditions and documents) so that I can review the decision making logic.	Claim handler interviews, Jobs to be Done
Must have	FR29	As a claims handler at the insurance company, I want it to be possible to correct the decision and the decision making logic (based on the policy, terms and conditions and documents) in case the decision, the suggestions or the logic were incorrect.	Claim handler interviews, Jobs to be Done, AI Governance

Must have	FR30	As a claims handler at the insurance company, I want it to be possible to display the details about the incident that the claimant submitted via the filed claim on the claims handler user interface so that I would not have to search for it.	Claim handler interviews, Jobs to be Done
Must have	FR31	As a claims handler at the insurance company, I want to be able to extract information from the filed claim documents and display it on the claims management user interface so that I can save time and effort searching for, opening the documents and copying the contents from the documents into the claims management system.	Claim handler interviews, Jobs to be Done
Must have	FR32	As a claims handler at the insurance company, I want it to be possible to make automatic suggestions or decisions based on the information in the filed claim data and documents (based on the filed claim) so that it would save time and effort and provide consistently the same decisions for similar cases.	Claim handler interviews, Jobs to be Done, AI governance
Must have	FR33	As a claims handler at the insurance company, I want it to be possible to correct the decision and the decision making logic (based on the filed claim) if the decision or the suggestions or the logic are incorrect.	Claim handler interviews, Jobs to be Done, AI Governance
Must have	FR34	As a claims handler at the insurance company, I want it to be possible to automatically extract info in image and PDF files to convert it into a machine-readable form to make it viewable on the user interface without opening the file so that I would save time and effort searching for, opening the documents and copying the contents from the documents into the claims management system.	Jobs to be done
Must have	FR38	As a claims handler at the insurance company, I want it to be possible to automatically determine the final settlement sum taking into consideration the loss suffered and the maximum coverage. so that I would know how much the settlement payout would be.	Claim handler interviews, Jobs to be Done
Must have	FR39	As a claims handler at the insurance company, I want it to be possible to adjust the costs of the claim as new information becomes available so that the correct payout can be made.	
Must have	FR40	As a claims handler at the insurance company, I want to be able to check if all the required documents and	Claim handler interviews, Jobs to be Done

		information have been collected so that I can be sure that I am making the decision on the correct info.	
Must have	FR41	As a claims handler at the insurance company, I want it to be possible to trigger a preconfigured e-mail to the customer asking for specific extra information so that I would not have to switch to the e-mail software and type the e-mail and send it manually and keep track of the answer.	Claim handler interviews, Jobs to be Done
Must have	FR42	As a claims handler at the insurance company, I want to be able to acquire specific extra information or confirmation that the flight was delayed or cancelled from the airline so that I would not have to switch to the e-mail software and type the e-mail and send it manually and keep track of the answer.	Jobs to be done
Must have	FR44	As a claims handler at the insurance company, I want to be able to check for payment info and debt to decide if the claim should be settled or not.	Claim handler interviews, Jobs to be Done
Must have	FR46	As a risk officer at the insurance company, I want the claims handlers to be able to validate that the policyholder is the same person as the claimant so that the company would not suffer losses in case of fraud.	Claim handler interviews, Jobs to be Done
Must have	FR47	As a claims handler at the insurance company, I want to make and record the claims decision to finish processing the claim.	Jobs to be done
Must have	FR49	As a claims handler at the insurance company, I want to be able to generate and send the customer the claims decision e-mail so that they would be informed about the decision.	Claim handler interviews, Jobs to be Done
Must have	FR50	As a claims handler at the insurance company, I want it to be possible to easily organise all the communication transcripts related to this claim to be linked to the claim and saved in the same location so that I could later archive being sure I have all the relevant information.	Jobs to be done
Must have	FR51	As a claims handler at the insurance company, I want it to be possible to easily archive all claim information at once so that I can close the claim.	Claim handler interviews, Jobs to be Done
Must have	FR52	As a claims handler at the insurance company, I want it to be possible to close the claim so that I can start working on the next claim.	Claim handler interviews, Jobs to be Done

Must have	FR62	As the person responsible for the claims filing process at the insurance company, I want to be able to ask for the claimant's satisfaction rating after the claim decision, so we can improve the process if necessary.	Claim handler interviews, Jobs to be Done
Should have	FR1	As the insurance product manager at the insurance company, I want localisation to other languages besides English to be possible through configuration so that the company could offer services in different markets and the texts would be easy to handle.	Official language of the markets must be supported
Should have	FR5	As a user of the Claims Handling SaaS, I want there to be a possibility to report flaws and errors in the claim handling system so that they can get fixed quickly.	Jobs to be done
Should have	FR9	As a compliance officer at the insurance company, I want it to be possible to collect and download all information connected with one customer upon request to comply with the GDPR.	GDPR
Should have	FR10	As a compliance officer at the insurance company, I want it to be possible to extract all customer-related data into a machine-readable format and portable format to be sent to another data processor to comply with the GDPR.	GDPR
Should have	FR12	As a compliance officer at the insurance company, I want it to be possible to delete all customer data at the request of the insurance provider, upon the customer's request or at the end of the contractual relationship to comply with the GDPR.	GDPR
Should have	FR16	As the person responsible for the claims filing process at the insurance company, I want the claim filing procedures to be configurable without any programming needed so that they could be set up fast and no development resource would be wasted.	Customer survey, Product Terms & Conditions analysis
Should have	FR17	As the person responsible for the claims filing process at the insurance company, I want each insurance product to be able to have several different claim filing processes associated with it, so the claimant could follow the correct one according to loss type and reason, and it would only contain logic directly relevant to the loss at hand.	Customer survey, Product Terms & Conditions analysis
Should have	FR20	As a claims handlers team lead at the insurance company, I want it to be possible to automatically determine if the claim can be handled based on the standardised decision making logic or if it is an	Jobs to be done, GDPR

		exceptional case to assure the highest quality standard of the claims decision, so that the claim could be assigned to the most competent claims handler.	
Should have	FR35	As a claims handler at the insurance company, I want to be able to handle a claim fully manually in case of exceptional circumstances and cases.	
Should have	FR43	As a claims handler at the insurance company, I want the system to automatically add any new information or documents that were requested by uploading them under the claim once the claimant or the airline responds to the e-mail information request so that I would not have to track the e-mail and upload the information to the correct claim.	Claim handler interviews, Jobs to be Done
Should have	FR45	As a claims handler at the insurance company, I want to validate that the trip was bought and paid for so that I would know how much the settlement payout should be.	Jobs to be done
Should have	FR48	As a claims handler at the insurance company, I want to be able to easily communicate the payout sum to the finance department so that they can make the payment.	Claim handler interviews, Jobs to be Done
Should have	FR53	As a claims handler at the insurance company, I want it to be possible to easily prepare the information for the claim payment so that it can be conveyed to the finance department for making the payout.	Jobs to be done
Should have	FR56	As a person responsible for the claims reports at the insurance company, I want to be able to create claims reports based on the claims handled by claims handlers so that the company can be aware of the claims statistics.	A functionality many conpetitors share
Should have	FR58	As a risk officer at the insurance company, I want the claims handlers to be able to validate that the claim is not fraudulent so that the company would not suffer losses.	Claim handler interviews, Jobs to be Done
Should have	FR59	As a risk officer at the insurance company, I want the claims handlers to be able to validate that the policyholder's ID is not fraudulent so that the company would not suffer losses in case of fraud.	Claim handler interviews, Jobs to be Done
Should have	FR60	As the accountant at the insurance company, I want to be able to make the claim payout so that the claimant would get the payout they are due.	Claim handler interviews, Jobs to be Done

Should have	FR63	As the person responsible for the claims filing process at the insurance company, I want to monitor general claimant satisfaction so we can improve the process if necessary.	Jobs to be done
Should have	FR64	As a risk officer at the insurance company, I want to be able to check for complaints on the claims decision communicated to the customer to solve the issues in order to avoid litigation.	Jobs to be done
Should have	FR65	As a claims handler at the insurance company, I want to handle a complaint in case the customer files one to solve the issues in order to avoid litigation.	Jobs to be done
Should have	FR66	As a claims handler at the insurance company, I want to feel like the decision that was made was fair and correct so that I could be less stressed.	Jobs to be done
Should have	FR67	As a claims handler at the insurance company, I want to feel like my work is helping people so that I can be proud of my work.	Jobs to be done
Should have	FR68	As a claims handler at the insurance company, I want not to be afraid of being accused of making the wrong decision so that I could be less stressed.	Jobs to be done
Could have	FR2	As the insurance product manager at the insurance company, I want multiple currencies and time zones must be supported so that the company can offer services in different markets.	Official currency of the country must be supported
Could have	FR4	As the claims management team lead at the insurance company, I want there to be a possibility to track the fulfilment of Service time in Service Level Agreements so that we can adjust resources accordingly to fulfil our contractual responsibilities.	Contractual
Could have	FR6	As the customer support agent at the insurance company, I want there to be a possibility to help customers during the filing of the claim if they cannot handle it on their own so that they would be able to file the claim.	Jobs to be done
Could have	FR7	As claims handling team lead at the insurance company, I want there to be a possibility for new claims handlers to learn to use the claims management system quickly so that they would be able to start working independently as soon as possible.	Jobs to be done

Could have	FR23	As a claims handler at the insurance company, I want it to be possible to send automatic claim handling status updates to the claimant so that the claimant would know the status and would not contact the company for updates.	Claim handler interviews, Jobs to be Done
Could have	FR36	As a claims handler at the insurance company, I want it to be possible to display previous claims information so that I can identify patterns and prevent fraud.	Claim handler interviews, Jobs to be Done
Could have	FR37	As a claims handler at the insurance company, I want it to be possible to automatically assign claims to a claims handler based on availability and competencies so that the decision quality would be the highest and the volumes would be distributed evenly.	Claim handler interviews, Jobs to be Done
Could have	FR57	As a risk officer at the insurance company, I want the claims handlers to be able to prevent money laundering by checking the origin of the bank account so that the company would comply with the regulation.	Claim handler interviews, Jobs to be Done
Could have	FR61	As the accountant at the insurance company, I want to be able to track and verify that the settlement was done to make sure the payment is made.	Claim handler interviews, Jobs to be Done
Won't have	FR54	As a claims handler at the insurance company, I want to track the payout-premium ratio to track if the contract is profitable.	Jobs to be done
Won't have	FR55	As a claims handler at the insurance company, I want to be able to cancel the policy when necessary so that I would abide by the terms and conditions.	Jobs to be done

Appendix 17 – TO-BE Claims filing form questionnaire

Table 35. Claims filing form questionnaire (by author).

Question	**Multiple choice answers**	**Field type**	**Sub-question (Only shows if that answer is selected)**	**Field type**
What happened?	Options:	Checkboxes		

	▪ Cancellation ▪ Delay			
Whom did it happen to?	Options: 1. The insured person 2. Travel companion of the insured person 3. Person close to the insured person	Radio buttons		
When did it happen?	Options: 1. Before the trip 2. During the trip	Checkboxes		
What happened?	Options: 1. Health	Checkbox	Options: 1.1 Sudden illness, injury or death of insured person 1.2 Life-threatening condition or injury 1.3 Pregnancy or giving birth or related 1.4 Chronic illness or an illness	Radio buttons

			that existed before 1.5 Psychiatric illness 1.6 Self-harming 1.7 Accident through participation in hostilities or presence in the armed forces. 1.8 Accident through being in a crisis area as an observer, rescue worker, medical worker or for similar reasons. 1.9 loss of income or non-pecuniary claims;	
	2. Work injury	Checkbox	1. working in mines, on oil and gas platforms. 2. work as a seaman, fisherman, policeman, security guard, rescue worker, member of a ship or aircraft crew, or in any occupation or employment involving the right	

			to use or bear arms. 3. being in a crisis area as an observer, rescue worker, medical worker or for similar reasons. 4. activities of equivalent risk to the above.	
	Damage to property	Checkbox	What kind of damage? ● damage that requires presence in Estonia ● Did you intentionally cause the damage? ● loss or deterioration (but not expiry) of special travel equipment or travel documents taken on the trip, if the equipment or documents cannot be replaced during the trip;	Radio buttons
	Loss of means of transport	Checkbox	● Weather conditions or natural disaster ● How long did it last? ● 24h or less ● More than 24h ● Technical malfunction of the vehicle ● How long	Radio buttons

			did it last? ● 24h or less ● More than 24h ● Tyre breakage ● How long did it last? ● 24h or less ● More than 24h ● Emergency landing of the aircraft ● How long did it last? ● 24h or less ● More than 24h ● Unexpected traffic jam ● How long did it last? ● 24h or less ● More than 24h ● Due to airport management, aviation commission, public authority cancelling transport ● Schedule change of a regular transport	
	Reason for travel was cancelled	Checkbox	What was your reason for travel? ● Cultural event ● Family event ● Work engagement ● Other	
	● Nuclear incident	Checkboxes		

	• War, terrorism, disturbances, insurrection • Strike or work stoppage • Archaeological excavations • Extortion, fraud, embezzlement or the use of a weapon • Strike, stoppage, insolvency, bankruptcy • Act of omission by Tour operator • My Travel Documentation was incomplete • I broke the law • I decided to miss my trip because of a delay • I decided to interrupt my trip because of incomplete itinerary			
What would you like to get	• Transportation costs	Checkbox	Which type of costs? • Airline tickets • Train tickets • Other	Radio buttons

reimbursed for?	• Accommodation costs	Checkbox	Where was the accommodation? • In Estonia • Outside of Estonia	Radio buttons
	• Other	Checkbox	What would you like to get reimbursed for?	Free text field
Did you get or apply for reimbursement from any other company?	Options: • Yes	Radio button	Which company reimbursed you? • Transport company • Accommodation company • Tour operator • Other How much were you reimbursed for?	Checkboxes Number field
	• No	Radio button		
When was the original departure date?		Date field		
Please give us your bank account details	Name: IBAN: SWIFT:			

Appendix 18 – Travel insurance background information

“Travel insurance is a plan you purchase that protects you from certain financial risks and losses that can occur while travelling. These losses can be minor, like a delayed suitcase, or significant, like last-minute trip cancellation or a medical emergency overseas” [5].

Travel insurance is offered in one of the following forms:

as a single-trip coverage insurance policy, which is valid and provides cover for one trip and only and the specifics of which are selected by the customer according to the exact characteristics of the trip.

As an annual insurance coverage policy, which is purchased once a year and provides coverage for multiple trips [4].

How travel insurance provides protection is that once an accident has happened that is covered by the insurance policy, the insurance company that issued the policy will reimburse the policyholder for the financial losses. This can happen only after an insurance claim has been filed by the policyholder providing sufficient proof of the financial losses and once the insurance company has approved the claim. What the travel insurance policy provides coverage for and how the claim should be filed is always defined in the Terms and Conditions, Policy document and other accompanying documentation provided by the insurance company [5].

Travel insurance is often sold as a package and can include several different types of coverage. The most common coverages included in travel insurance are trip cancellation or interruption coverage, baggage and personal effects coverage, medical expense coverage, and accidental death or flight accident coverage [6]. Since the start of the global COVID-19 pandemic travel insurance often also includes coverage for pandemic related travel interruptions or medical problems.

Coverages can include extra round the clock emergency services, such as replacing travel documents, cash transfer assistance, re-booking cancelled flights, etc [6].

Depending on the insurance company, travel insurance starts 2-5 days after the purchase of the policy. When choosing the amount of travel cancellation insurance, it should be

based on the initial cost of the trip and by calculating how much it would cost to return unexpectedly [97].

Travel interruption insurance

Across Europe this insurance cover goes under many names and varies slightly in what it covers. Some of the many names are for example Trip cancellation and interruption insurance, Trip Delay, Trip Interruption and Trip Cancellation Insurance, Travel interruption insurance.

Within the scope of this master's thesis the term "Travel interruption" shall refer to three general risks that are covered by an insurance company that are combined under this one name - Travel interruption insurance. The three risks are travel delay, trip interruption and trip cancellation.

According to Allianz Travel Insurance the Travel delay "benefit exists to help you get through short(ish), unexpected pauses in your travel plans. It can reimburse you for lost pre-paid expenses, as well as costs you incur because of the delay, including meals, accommodations, communication and transportation" [98].

Trip interruption "occurs when a traveller must unexpectedly cut short his or her trip and return home. Additionally, the interruption can cause you to stay at your destination longer than originally planned. Trip interruption insurance can refund lost prepaid costs, minus any available refunds and up to the maximum benefit amount and cover the cost of your extra accommodations and/or your trip home (depending on which plan you choose)" [98].

Trip cancellation "insurance covers situations when you must cancel your trip before you leave for a covered reason (generally, the same covered reasons that apply to trip interruption coverage.) Trip cancellation coverage can refund the prepaid, non-refundable costs of your trip, such as airfare, cruise tickets, tour bookings and hotel reservations" [98].

Appendix 19 – Porter's Value Chain model

“Claims management is one of the key parts of an insurance products lifecycle”[4]. In the Value Chain model, according to KPMGs “Insurance Value Chain” framework paper it falls under primary activities and is a part of the “Service” cluster of activities [99]. It is a vital part of the insurance service and without Claims management it would not be possible to provide value with any insurance services.

According to the digital publication Investopedia “a value chain is a combination of the systems a company or organization uses to make money. That is, a value chain is made up of various subsystems that are used to create products or services. This includes the process from start to finish” [100].

According to Porter [100] a company’s competitive advantage comes from its processes. “Porter breaks value chain analysis into five primary activities” [100] and then he breaks the said activities further down into activities that support the primary activities. The inbound logistics, operations, outbound logistics, marketing, sales and service are considered primary activities. “The goal of the five sets of activities is to create value that exceeds the cost of conducting that activity, therefore generating a higher profit” [100].

For the purpose of this master’s thesis the author has modified Porter's Value Chain in places where it refers to physical goods and replaced it with digital services and insurance value chain references as described in KPMGs Insurance Value Chain: Personal Lines publication from 2020.

KPMG [99] states that the primary activities of an insurance value chain are as follows:

- Product and service development,
- Distribution and sales,
- Marketing,
- Underwriting,
- Policy administration,
- Claims management,

- Asset and investment management.

Porter's value chain analysis helped the author understand where claims handling falls in the value chain to determine the importance thereof. It helped determine that claims handling is indeed a part of the value chains primary activities.

Porter's Value Chain model in insurance consists of the following:

1. Inbound logistics:

   - Defines how the company accumulates insurance products in its portfolio - through in-house product and service development, through cooperation agreements with other insurance companies and through so-called fronting deals where the insurance company enters into agreement with another insurance company selling their products under the first company's own brand.

22. Operations:

   - Underwriting enables the insurance company to issue insurance policies by analysing and accepting the risk.
   - Reporting enables the insurance company to comply with regulatory requirements.
   - Reserve management enables the company to always be able to pay out any claims.
   - Asset investing management allows providing solvency for liabilities.

23. Outbound logistics:

   - Outbound logistics consists of different sales channels that sell the insurance company's insurance policies and the different delivery methods to get the insurance policy to the end-customers.

24. Marketing and sales:

   - Marketing drives sales and supports sales channels.
   - Sales partner management takes care of enough partners selling the insurance company's products to sustain growth.

- Offer management takes care of the sales offers being relevant to the end-customers. Market management enables the insurance company to expand to markets outside of Germany.

25. Service:

- Claims management processes, settles and rejects claims.
- Insurance policy administration allows us to make changes to the insurance policy.
- Disputes and complaints allow for the end-customers to object to the kind of service they are receiving and to settle them with the company.
- Payment collection enables the insurance company to collect payment for services rendered.

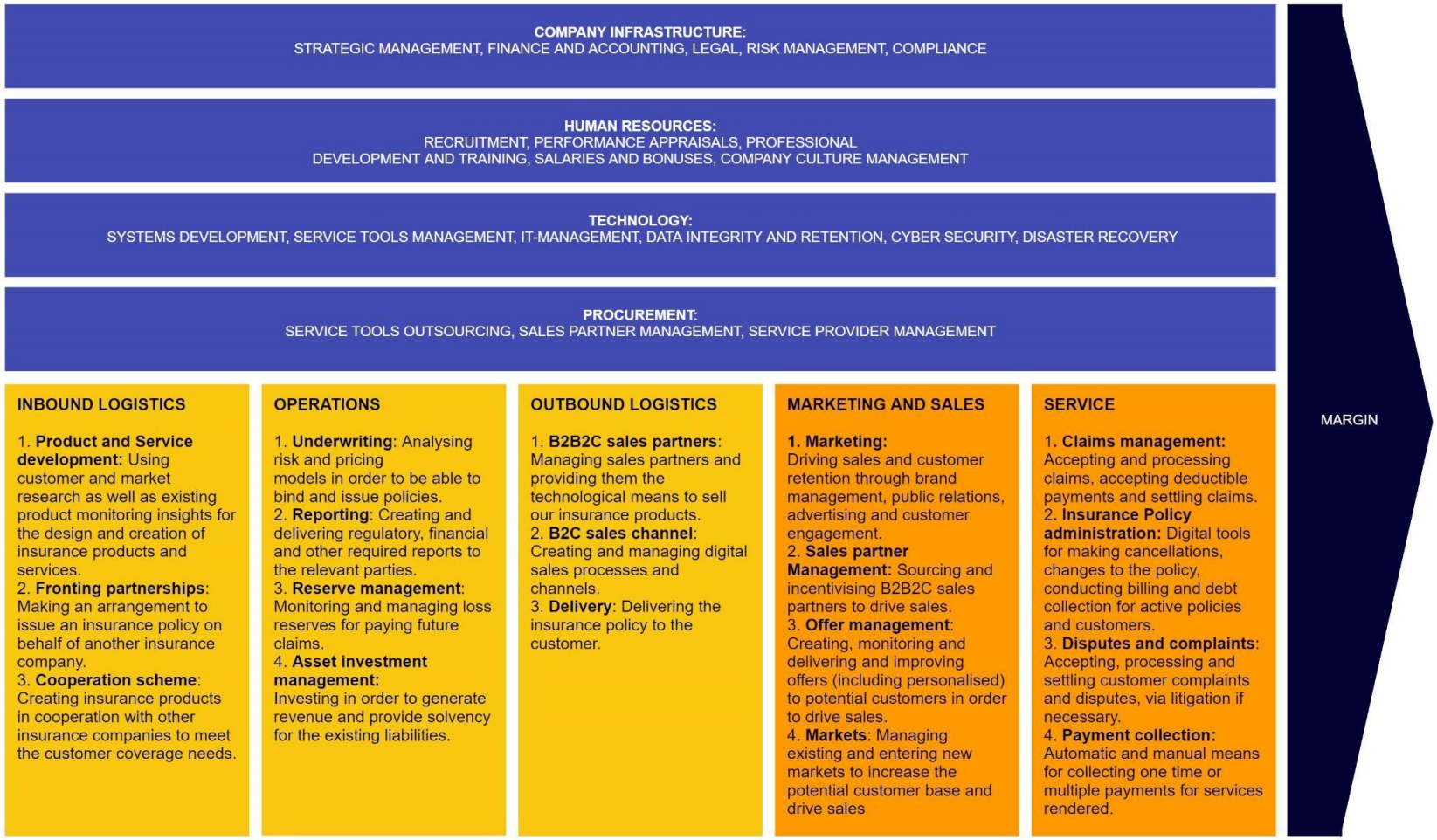


Figure 31. An insurance company's Porter's Value Chain Model with Claims management brought out under the service activities (by author).

Appendix 20 – Insurance claims statistics

In light of the COVID-19 pandemic starting 2020 Travel insurance sales decreased significantly in Europe and with them also the general number of claims. As the pandemic started and borders were closed, a rise in cancellation claims was noted for policies that did not have explicit pandemic clauses in them. There was also a rise in attempted claims against "policies that did not provide cover for the losses concerned, and some markets reported an increase in attempts to defraud insurance companies" [101]. The Estonian Insurance associations statistics confirm the drop of 37% in collected premiums and an 18% in claims pay-outs [102].

One popular Key Performance Indicator used to measure insurance claims is the Claims ratio. The claims ratio is a percentage of the earned premiums that is paid out by the insurance company in order to cover claims costs [103]. It is an indicator that measures the profitability of an insurance product. It also indicates how much value-for-money the consumers get from an insurance product. If a claims ratio is low, then this might indicate issues around high volumes of denied claims or consumers not filing claims because they either simply don't have enough information about what they are covered for, or the covered risks never materialize. It could also indicate that there could be mis-selling of a travel insurance product going on. Low claims ratios could also be a sign of poor value products, meaning that the terms and conditions of the product do not actually allow for the consumers to be covered for the risks they need protection from, or they make it impossible to successfully claim anything, hence resulting in rejected claims [4].

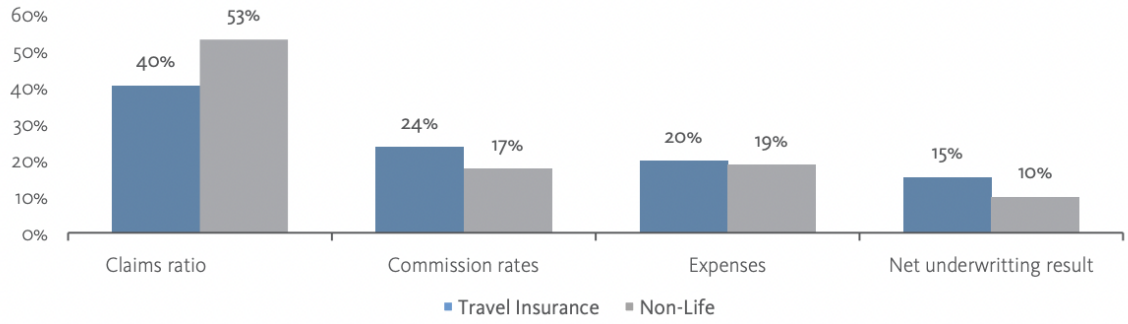


Figure 32. The travel insurance expenses that are paid out in relation to the earned Gross Written Premium, leaving the net underwriting result as profit, in comparison to non-life insurance in general (by EIOPA) [96 page 2].

According to EIOPA [4], [104] and as can be seen in Figure 29 the claims ratio makes up the largest cost that is subtracted from the earned Gross Written Premium of Travel insurance sales in Europe. Should the Average claims ratio be reduced, this would increase the net underwriting result.

Appendix 21 – TO-BE Claims management processes

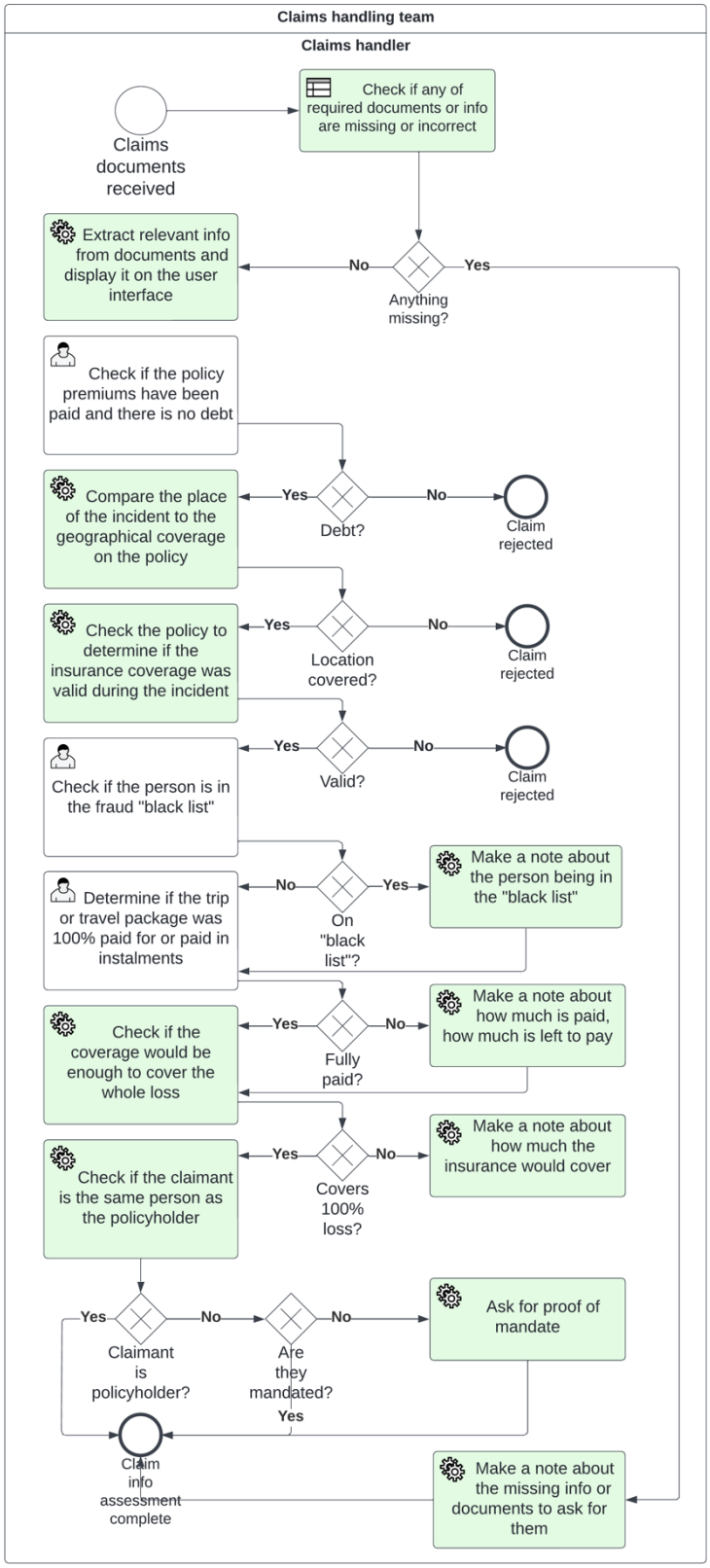


Figure 33. TO-BE Assess the submitted documents subprocess (by author).

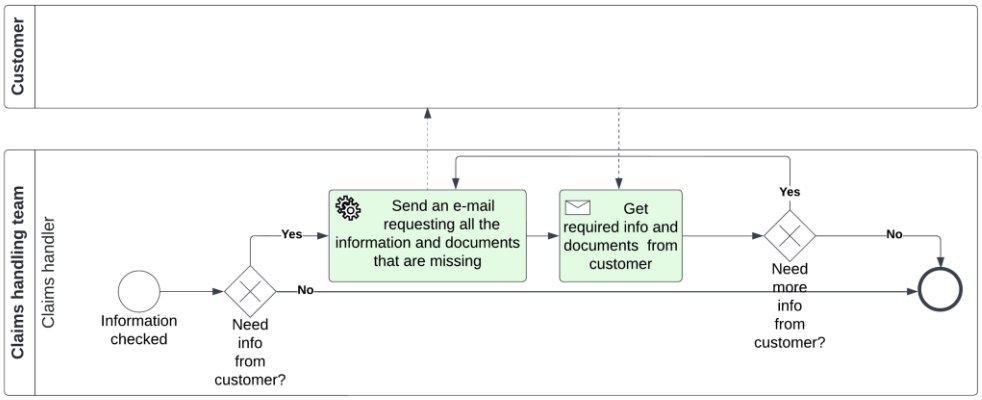


Figure 34. TO-BE acquiring missing information process (by author).

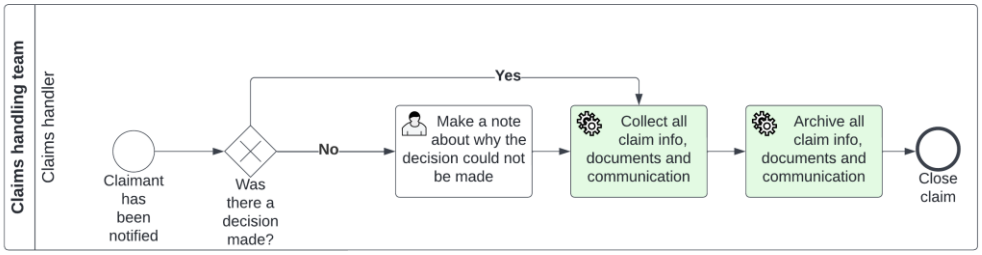


Figure 35. TO-BE. Claims closing and archiving process (by author).

Appendix 22 – Business description

Parties, **Event**, Thing

Claims Handling SaaS is a cloud-based software service that allows the customer of an insurance company to file an insurance claim and a claims handler of the insurance company to process the claim, make the settlement decision and close and archive the claim.

When a travel interruption incident happens to a customer who has purchased a travel insurance policy from an insurance company, then the customer has the right to file a claim to get compensation for the loss that they suffered. To apply for the compensation the customer must file an insurance claim to the insurance company describing the incident that happened. The customer (hereinafter the claimant) must log in, then indicate what type of interruption happened, when it happened, to whom and what was the reason that made it happen. Furthermore, they must indicate what type of loss they suffered that they would like to get compensated for and submit documents such as invoices and tickets proving the loss sum. The customer must also indicate whether any other company has already compensated a part or the full amount of the loss. Lastly, the customer must give banking details where they would like to receive the settlement sum. The form will guide the claimant through the process with helpful tooltips and prompts as data and documents receive an initial validation as they are entered.

Once the claim has been filed, it will be added to the claim handlers' backlog in the insurance company's claims management system. The system will instantly automatically re-check if any of the documents or the information is missing or incorrect and send an automatic e-mail to the claimant to provide the missing documents or information. The documents as well as the claimant's e-mails will be uploaded to the claim automatically as they are received. The system will also extract information from PDF documents and images using OCR technology and check if the claimant had insurance coverage at the time of the incident by requesting and receiving the policy documents from the insurance company's policy database. It will also automatically check what is the maximum insurance coverage amount. In case of loss of transport by regular flight the system will also request information from a flights database and determine whether a cancellation or delay really occurred.

A claims handler who first becomes available and has the competencies to process this type of claim will assign it to themselves and start processing it. The claims handler will assess and consider the exclusions and coverage conditions which apply to this claim and make corrections if needed. The claims handler will then check if the claimant had insurance coverage at the time and place of the incident. If there are still documents or information missing or incorrect, the claims handler will mark it down in the system and the system will automatically request the information from the claimant.

Having manually reviewed if the contract is in debt, whether it has been fully paid for, if the claimant is on a fraud blacklist and whether the claim could be fraudulent as well as marked it all down in the system, the claim handler is ready to make a settlement decision.

The claim handler will either mark the claim as settled or rejected. According to the claims decision marked down in the system an automatic e-mail notification containing the rationale behind the decision is sent to the claimant. In case of a settlement the claimed sum or a part of it will be paid out, the claim information will be collected along with all of the files and info connected to it and archived.

Appendix 23 – Business glossary

The business glossary is as follows:

Table 36. Business glossary for the Business Information Model (by author).

Business rule	**Description**
Insurance policy	A contract between the customer and an insurance company stating which risks are covered by the insurance and therefore compensation will be paid out in case an incident happens.
Claim	A way for the customer who has purchased an insurance policy to apply for compensation in case an incident has happened.
Customer	The person who is in a contractual relationship with the insurance company by having purchased an insurance policy.
Insurance policy database	A database containing all the insurance policies bought – valid and expired going back at least 7 years.
Insurance company	A financial sector company that provides insurance services to protect from possible future incidents that cause loss by providing financial compensation in case the possibility becomes a reality.
Automatic check results	The results from running a series of predetermined and preconfigured automatic checks determining the insurance coverage and the validity of an insurance cover as well as the appropriateness of provided info and documents. The results show whether the insurance claim matches the requirements or not and if not then at which points did it fail to do so.
User account	The means for customers and claims handlers to connect to the Claims Handling SaaS and gain access to the functionality appropriate to their role.
Claims handler	An employee of the insurance company whose responsibility is to process and make decisions on incoming insurance claims.
Backlog	A list of claims that have not yet been closed and that are awaiting processing or are in other stages of claims management processes.
Claim decision	A decision that is based on the evidence whether to reject or settle an insurance claim. In case of settling a sum of money will be paid out as compensation for the loss suffered.
Compensation	A sum of money that is paid out to cover the loss that the customer suffered. It is calculated based on the amount of loss suffered and the maximum compensation sum determined in the insurance policy.

Archive	A database where all claims and all data and documents related to that claim are saved once the claim is closed.
E-mail	An electronic mail message that is sent to the customers.

Appendix 24 – Risk mapping results

Table 37. The full Risk assessment matric of the Claims Handling SaaS project (by author).

ID	RISK DESCRIPTION	IMPACT DESCRIPTION	IMPACT LEVEL Rate 1 (Low) 5 (High)	PROBABILITY LEVEL Rate 1 (Low) 5 (High)	PRIORITY LEVEL (Impact level * Probability level)	MITIGATION NOTES	OWNER
R1	Scope creep	The project timeline would increase significantly due to continuous new requirements from future users and customers (insurance companies) pushing the launch date into the far future	4	3	12	- Keeping the original vision and goals in mind - Continuous review and prioritization of the backlog - Continuous assessment of value and effort needed for each backlog item - Continuous validation of new ideas and requirements - Strict deadline, flexible scope	Product Owner

R2	The team disbanding	Decrease in capabilities and expertise, the project would be delayed	1	3	3	- Regular motivational team building events - Regular meetings and working as a team - Document the work done - Create motivational packages in shares or bonus systems	Management board
R3	Project partners not agreeing	Impaired communication would mean delays in delivery and a possible mismatch between expectations and the actual capabilities of the delivered solution.	1	4	4	- Set accountabilities and responsibilities - Continuously make sure everyone is on board - Use a working language everyone speaks - Work on solutions collaboratively, make sure everyone is listened to - Communicate decisions in a transparent way	Product Owner, assisted by Scrum Master
R4	Insurance companies demand tailor made solutions or changes to the solution	Custom solutions and processes built separately for every insurance company, which would lead to quality issues and to delivery delays.	4	4	16	- Pitch the solution as a standard service - Allow the insurance companies to offer ideas, but do not promise to deliver them - Do not allow	Sales Manager
R5	Delayed launch	Insurance companies (insurance companies) would lose interest due to finding other solutions.	4	1	4	- Keep strict deadlines for the scope deliveries, but be flexible with the	Product Owner

						content that will be delivered	
R6	Bad technology choices	The built systems become legacy quickly. It is difficult to find developers for certain programming languages.	3	4	12	- Follow formal best practices guidelines for programming and cyber security. - Make sure that the programming language and platforms chosen are common enough to find competent specialists on the market.	IT Architect
R7	The product is not relevant on the market	Difficult or impossible to find customers (insurance companies).	2	5	10	- Validate the idea and features and functionalities often - Be ready to pivot if necessary - Be ready to rebuild some of the system	Product Owner
R8	The needs of users not met	The system makes claims handling as difficult as other systems or more difficult.	1	5	5	- Collect feedback from the users often and make changes accordingly - Validate all new features with the users	Product Owner

R9	The system is not compliant to regulatory requirements	The Claims Handling SaaS would not be allowed to be used.	2	5	10	- Ask the insurance companies for their requirements regarding IT infrastructure and security - Follow regulatory changes on the markets where the software operates	Compliance manager / Risk manager
R10	System has security vulnerabilities	The vulnerabilities get exploited and the trade secrets of the insurance companies or the personal details of claimants would be acquired and leaked by the attackers.	2	5	10	- Follow CIS controls and OWASP guidelines - Conduct regular security checks and penetration testing	Security officer assisted by developers
R11	A strong competitor emerges	Insurance companies opt to purchase the services of the competitor instead.	3	1	3	- Find a unique selling point - Conduct regular competitor analyses - Create a better offer for the customer - Target a different segment of customers - Be ready to pivot if needed	Sales Manager
R12	Not enough resources or know-how to finish the project	Project gets significantly delayed or abandoned.	1	5	5	- Conduct trainings to raise competences - Hire new employees with critically important competences	Management board

						- Procure the services of consultants	
R13	The IT-systems of insurance companies do now allow integration or data exchange to get policy info	The insurance companies cannot use a part of the functionality.	3	3	9	- Build Robot Process Automation into the system to emulate human actions - Support insurance companies in building the necessary systems - Import the data manually	IT-architect assisted by developers
R14	The functionalities do not match the business process specifics of insurance companies.	The automation of any of the processes is impossible.	2	5	10	- Validate all functionalities and technical solutions with current and future customers.	Product Owner

Appendix 25 – Roadmap

Table 38. The full implementation roadmap (by author).

Seq. of steps	Action item / 2-week sprints	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16	S17	S18	S19	S20	S21	S22
User testing																							
1	Testing the first mock-ups on claims handlers																						
4	6 UX tests on the clickable prototype																						
Design																							
2	Making adjustments based on feedback from claims handlers																						
3	Designing a full clickable prototype																						
5	Making adjustments based on the feedback from UX tests																						
	Buffer																						
Preparation for development																							

6	Preparing a Jira project and workflow	
7	Architecture and system planning preparations	
8	Preparing a structure of Epics	
9	Preparing an introduction of the topic to the development team	
10	Preparing approximately 2 2-week sprints worth of user stories	
Development		
11	Log in functionality and user roles structure	
12	Claim form customer UI	
13	Claim form configuration functionality	
14	Claims backlog	
15	Single claim view	
16	Receiving insurance policy information	
17	Parsing insurance policy information	
18	Exclusions and Cover Conditions configuration according to Terms & Conditions	

19	Document information extraction via OCR	
20	Document displaying	
21	Automatic checks logic	
22	Configuration of automatic checks	
23	Claims decision functionality	
24	Automatic e-mail notifications	
25	Configuration of user roles	
26	Logging of all user actions	
27	User consent management	
28	Customer feedback functionality	
29	Claim closing and archiving functionality	
	Buffer	
Monitoring and assessment		
30	Measuring the time it takes to handle a claim	
31	Interviewing claims handlers	
32	Interviewing end-customers	
33	Net Promoter Score feedback surveys	

34	Deciding whether to develop the system further																						

Appendix 26 – Sprint plan

Table 39. An example print plan for planning 2-week development sprints [94](by author).

When	**What**	**Who is responsible?**	**Who participates?**	**Result**
Day 1	Sprint planning	Product Owner + Development team	Product Owner + Development team	An event where the team determines the product backlog items they will work on during that sprint and discusses their initial plan for completing those product backlog items. The sprint is compiled according to the backlog previously prioritized by the Product The product owner (the person requesting the work) and the development team agree upon exactly what work will be accomplished during the sprint. The development team has the final say when it comes to determining how much work can realistically be accomplished during the sprint, and the product owner has the final say on what criteria need to be met for the work to be approved and accepted.
Day 1	Sprint starts (2 weeks)	Product Owner / Scrum master	Product Owner + Development team	The length of the sprint is determined by the Scrum Master according to which length is the best for each given team's productiveness and quality of output.

Day 2	Stand up	Development team	Product Owner (Optional)	The team meets to bring everyone up to date on the information that is vital for coordination: each team members briefly describes any “completed” contributions and any obstacles that stand in their way. The team, the Product Owner or the Scrum master commit to solving these obstacles if possible.
Day 3	Stand up	Development team	Product Owner (Optional)	
Day 4	Stand up	Development team	Product Owner (Optional)	
Day 5	Stand up	Development team	Product Owner (Optional)	
Day 6	Stand up	Development team	Product Owner (Optional)	
Day 7	Stand up	Development team	Product Owner (Optional)	
Day 6-8 (optional)	Pre-grooming	Product Owner	Analyst / Developer (if needed)	The Product Owner in cooperation with the stakeholders and the analyst prepares all the backlog items that need to be done in the next sprint, making sure they are in a “ready state” (see: Definition of ready) or as close to it as possible. This includes splitting stories into smaller tasks, adding all necessary information, UI mockups, screenshots and Definition of Done
Day 8-10 (once)	Grooming	Development team	Product Owner	Is when the product owner and some, or all, of the rest of the team review preprepared items in the backlog to ensure the backlog contains the appropriate items (and nothing is missing), that they are prioritized, and that the items at the

				top of the backlog are ready for delivery. If it has not been done prior to Grooming, the team will also evaluate the size of each item via playing Planning poker or giving an estimation in hours. After this meeting the, backlog should be 99% ready for the new sprint.
Day 8	Stand up	Development team	Product Owner (Optional)	The team meets to bring everyone up to date on the information that is vital for coordination: each team members briefly describes any "completed" contributions and any obstacles that stand in their way. The team, the Product Owner or the Scrum master commit to solving these obstacles if possible.
Day 9	Stand up	Development team	Product Owner (Optional)	
Day 10	Stand up	Development team	Product Owner (Optional)	
Day 10	Backlog prioritization	Product Owner	Stakeholders	If not done during pre-grooming or grooming, the Product Owner should reorder the backlog starting from the highest priority items before the sprint.
Day 10 OR Day 1	Sprint review + Demo	Product Owner + Development team	Stakeholders (optional, recommended)	During the Sprint Review, the Scrum Team and stakeholders collaborate and review what was done in the Sprint. Ideally the development team demos what was done during the sprint and the Product Owner explains which part of the increment was delivered. Based on that and any changes to the Product Backlog during the Sprint, attendees collaborate on the next things that could be done to optimize value. This is an informal meeting, not a status meeting, and the presentation of the Increment is intended to elicit feedback and foster collaboration

Day 10 OR Day 1	Retrospective	Scrum Master	Product Owner + Development team	The Sprint Retrospective is an opportunity for the Scrum Team to inspect itself and create a plan for improvements to be enacted during the next Sprint. It is held ideally at the end of every sprint. During the Sprint Retrospective, the team discusses: 1) What went well in the Sprint?; 2) What could be improved; 3) What will we commit to improving in the next Sprint

Appendix 27 – Full size design prototype

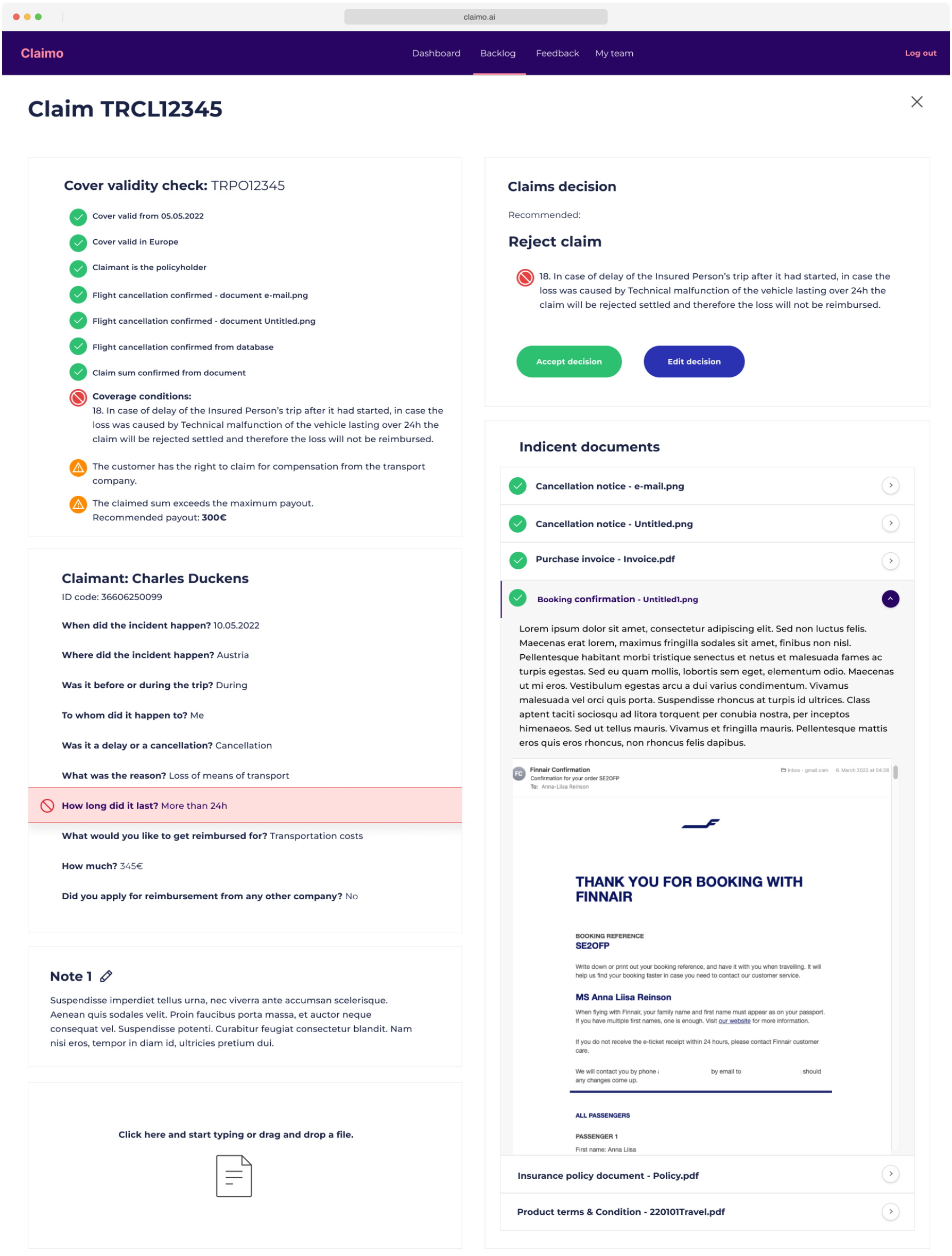


Figure 36. A large format design prototype of the single claim view (by author).

Appendix 28 – The full list of Software Product Quality requirements

Table 41. The full list of Software Product Quality requirements structured according to the ISO 25010 standard (by author).

Characteristic	ID	Requirement
Functional Suitability	NFR1	The software must function as described in the functional requirements and other specifications
Functional Suitability	NFR2	The software must provide results in line with the decision-making logic determined through configuration.
Functional Suitability	NFR3	The software must allow claim filing, management and the recording of all actions.
Performance efficiency	NFR4	The software must be hosted on scalable server solutions, which are able to adjust the resources available according to resource demand,
Compatibility	NFR5	The software must support at least the two latest versions of Chrome, Edge, Firefox and Safari [86].
Compatibility	NFR6	The software must be able to send and receive information to and from external systems via API and use this information in decision making.
Compatibility	NFR7	The information exchange with external systems must be seamless and on demand [105, p.].
Compatibility	NFR8	The APIs of the software must be described in the OpenAPI format [86].
Usability	NFR9	The software's user interface must be designed using the best user experience design practices assuring that it is intuitive and easily understandable.
Usability	NFR10	The software must guide the user where possible helping them achieve their goal.
Usability	NFR11	Every new version containing significant changes to the software's user interface and processes must be tested and adjusted according to the user feedback prior to release.

Usability	NFR12	The software's user interface must support the WCAG 2 standard of accessibility [93].
Usability	NFR13	The URLs must be constructed in a simple human readable format that follows the same logic across the whole software platform [86].
Usability	NFR14	URLs must not contain personal data [86].
Usability	NFR15	The error messages must be displayed in a human readable format and worded in simple explanatory language along with the error code.
Usability	NFR16	The software's user interface must load fast when the website is opened.
Reliability	NFR17	The software must meet the availability standards agreed upon in the Operational Level Agreement (OLA) - 99% [106].
Reliability	NFR18	All of the information stored in the system must be backed up at least once every 24 hours and recoverable with a maximum data loss of 24h.
Reliability	NFR19	The software must be monitored, and relevant parties must be immediately monitored once the software is not available.
Reliability	NFR20	All errors and faults must be recorded into a log [86].
Security	NFR21	The access to data must be restricted for all users through user roles and restrictions between instances to prevent unauthorized access to data.
Security	NFR22	The software must ensure that only authorized users get access to view or modify the stored data or computer systems.
Security	NFR23	A log of all user and system actions must be kept and all actions must be traceable.
Security	NFR24	All logged in user sessions must expire within a certain period - 5min of inactivity unless stated otherwise.
Security	NFR25	Unprotected information exchange is not permitted [86].
Security	NFR26	Defences against the OWASP top 10 threats must be implemented [107], {Citation}
Security	NFR27	The data must be kept in encrypted form with the encryption key stored with a trusted party in Europe.
Security	NFR28	The external dependencies must be clearly documented [86].
Maintainability	NFR29	The software must be resilient against the malfunctions of external services [86].

Maintainability	NFR30	The assets developed for this system must be reusable in other parts of the system.
Maintainability	NFR31	The user actions must be trackable through analytics and allow monitoring of the impact of change and to diagnose deficiencies.
Maintainability	NFR32	The claims filing form and the claims management processes must be configurable through a user interface without the release of a new version of software needed.
Maintainability	NFR33	The software's critical functionalities must be covered with automated tests and all functionalities built must be instantly covered with unit tests.
Maintainability	NFR34	The data stored in the databases of the software must be instantly downloadable in a machine-readable format and exportable.