KOKKUVÕTE

Käesolevas lõputöös käsitlesin vastuvõtu parendamist Ericssoni Eesti AS Tallinna tehases. Lõputöö eesmärgiks oli vastuvõtuprogrammi ning sealse skänneri töö parendaminening praeguse töö kiiremaks ja lihtsamaks muutmine. Töö käigus kirjeldan seda, kuidas saab muuta mainitud töö tegemist kiiremaks, kui asendada praegune skännertäpsemaga ja muuta arvutiprogrammi.Pakun välja skänneri ja seda liigutava mootori, millega muutuks töö mehaaniliseks ja töötajad ei peaks ise liigutama komponente ega lõpp-liigutusttegema. Minu töös käsitletud parendatud vastuvõtuga väheneks ka komponentide katki minemine komponentide skaneerimisel.

Lõputöös käsitlesin uue skänneri ning seda liigutava mootori valikut, tegin muudatuste sisseviimiseks vajalikud arvutused. Uueks skänneriks võiks olla 1D triipkoodi lugemise skänner, näiteks DS4800-1000 mudel, mille tööraadius on parem kui praegusel. Uuendatud programm hakkaks tööle nii, et skänner liiguks valitud servomootori HS-645MG abil. Tõin välja põhjendused, miks muudatused on vajalikud ning, kuidas vähendada seeläbi komponentide katkiminemist. Lisaks sellele tegin ettepaneku automaatse *FINISH*-i ning *BACK* nupu kasutusele võtmiseks. Arvutiprogramm teeks automaatse *FINISH*-i ultraheli kaugusanduri UNAM 12 abil. *BACK* nuppu kasutades oleks võimalik parandada skänneri ja arvutiprogrammi poolt tehtud vigu. Kõik mainitud uuendused hakkaksid tööle tänu elektroonikaplaadile, mille mudeliks on Arduino *UNO*. Lõputöös on märgitud, et uuenenud vastuvõtu korral oleks ajaline võit iga vahetuse kohta üks tund, mis teeks aasta peale kokku ligikaudu 15 tööpäeva.

Töö käigus selgus, et arvutiprogrammile ligipääsu ei saa, kuigi algselt oli seda lubatud. Seetõttu pole muudatuste realiseerimiseni minust mittetingitud asjaolude tõttu jõutud, kuid uue programmi jaoks on valmistatud uuendatud tegevusdiagrammid, mille järgi saab tulevikus programmi parendada.

SUMMARY

Improvement of the receiving of smaller components for Ericsson Eesti AS

The author of this work is currently working at the factory of the Ericsson Eesti AS and this thesis is written based on the author's perception of room for development in the everyday work of the factory. The aim of this work is to propose possible improvements to the reception area of the mentioned factory, in order to improve the receiving of smaller componets, which in the case of implementation will ease the work of the employees, help to save time and contribute to the prevention of broken products.

The work of the factory's reception area can be improved by changing the computer programme and scanner of the reception of products. At the moment, the system of receiving components at the factory is constructed in a way that the scanning of a component and giving the final command must be done manually for every item. The work could be done much faster and easier if the current scanner would be replaced by a scanner that would automatically scan and give the finishing command for every component. The improvement of the scanning system would also mean that less components would break during the scanning.

The thesis work is structured in a way that the first chapters provide theoretical and overall information and the next chapters describe the current and the proposed new situation of the receiving of components in the factory. The first and second chapter provide information about logistics and ergonomics in general and in terms of its implementation in the Ericsson AS Tallinn factory. There is also described the current time expenditure of certain work and given information about the components in question. There is mentioned that every month, about 50 000 components are received by the factory, the scanning of one component takes circa 8 seconds, which means that during every work shift, about 2 hours is spent on scanning. Due to accidents during the scanning, which can lead to breaking of some of the components, around 25 hours in three months is wasted. This problem could be solved by the new scanner.

In the next chapter, there is provided the overall description of possible scanners for the reception area, the current scanner and its working principles and also the information about the new proposed scanner. Currently at the factory, there is two 1D bar code scanners, which

are stationary so all the components have to be scanned manually. The proposed new scanners should be movable by an electrical motor, which means that the items should not be manually moved under the scanner and probability of components breaking during the scanning process could decrease significantly. With the new scanners and the computer programme, the scanning process would be quicker by one hour per every shift, which means roughly 15 less days of work every year.

The fourth chapter includes all the necessary calculations of strength and depreciation of the metal rod holding the scanner in place. Also, there is given the description of the electrical motor needed in order for the new scanner to move. The chosen electrical motor is a servomotor, which will be connected to the scanner by a metal rod and bolts.

The selection process and the description of the sensor needed for the new scanner and the information of the chosen electronic plate, which is essential for the improvements, is provided in the fifth chapter. The best sensor to use would be an ultrasonic distance measuring sensor, which would work in conjunction with the scanner and notify it when a component is placed to be scanned. The programme would start by turning on the electronic plate, following that, the sensor, scanner, electrical motor and the LED lights would also start working.

The last chapter of the thesis describes the current and the new computer programme andlists the necessary changes to the programme. It also explains the new proposed automatic finish function, the sensors needed in order for it to work, and the implementation of*BACK* button. The automatic *FINISH*function would work with the help of a sensor measuring the distance between the scanner and working table and notifing the computer when a component is placed and taken away from the scanner. The *BACK* function would be used in order to fix the mistakes that can be made during the scanning process.