

General Theoretical Approach and Practical Aspects of Innovation Policy Planning: Based on the Example of Estonia

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This problem-solving article treats a general approach to the policy planning, particularly planning of innovation policy (IP) as well as its practical aspects based on the example of innovation policy planning in Estonia. Estonia is a respectable and intriguing case for research, because the Republic of Estonia has been able to achieve fast and outstanding economic success during its relatively short period of re-independence, does have Skype, the genome project, e-government, etc, yet, no generally recognised 'Estonian Nokia' has been found or identified. In this article, the author analyses the pros and contras of the IP planning and offers a number of ideas to enhance the preconditions for success in the future. Author is of the general opinion that it is very difficult to find arguments to claim that Estonia will be successful in its implementation of its innovation policy in the future, as the planning process for most part has not resembled the generally accepted model of a policy planning process.

Keywords: *Analysis, Planning, Estonia, Innovation, Innovation Policy, Policy.*

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Introduction

This problem-solving article treats general approaches to the planning of innovation policy based on the example of that of Estonia. Bruland (1998, 167), Reinert, (1999), Dziura (2001), Nielsen (2003), Goh (2004), Kattel and Kalvet (2005, 17), Meng, (2005, 115) and several other authors consider innovation to be one of the most significant factors from the point of view of economic development. As the Republic of Estonia has been able to achieve fast and outstanding economic success during its relatively short period of its re-independence, studying innovation policy in Estonia is a rewarding object of research.

Estonia's ex-president Lennart Meri initiated discussions for finding the so-called 'Estonian Nokia'. Estonia does have Skype, the genome project, e-government, etc, but no generally recognised 'Estonian Nokia' has yet been found or identified. Although the economic development of Estonia, a small open-economy in a democratic society, has been rapid, it is not certain that the prompt development will be sustainable over a longer-term horizon. Innovation is irrefutably a major factor for achieving economic success and therefore also has an important role in generating general welfare.

In this article, the author analyses the incentives and disincentives of the sustainable progress of innovation policy and offers ideas to enhance the preconditions for success in Estonia, but not only in Estonia.

Although several authors have identified clear sources of success in a number of countries, i.e. in countries where varying innovative policies have been applied successfully, one has to be very careful of transferring their experience to Estonia, as well as comparing the impact of Estonia's innovation policy with that of efforts carried out in other states, as the take-off positions and political, economic, legal, and cultural environments of different countries vary to a great extent. This averment is also supported by Bruland (1998, 161, 162) and by Peet (2006, 48). Meng (2005, 105) claims that all countries are standing at the same starting point in the development and in the application of nanotechnology. Although this claim might be correct on the face of it, this author still disagrees. Big and small societies are in possession of varying resources of knowledge, money, people, competencies, etc. According to Perez (2001, 4) "...need to strengthen human capital and increase capacity for innovation" are in focus. Their political, economic, legal, and cultural internal and external environments vary to a great extent, which is why a common temporal take-off position does not mean that all participants are of identical capabilities and stamina - that all of them inherently are both, "sprinters" and "marathon runners". This idea is supported by Perez (2001, 25), who says that "*staying in the race demands growing support from the environment and constant innovation, intensive investment and probably very skilful manoeuvring in terms of markets and alliances*". This view is supported likewise by Kattel and Kalvet (2005, 13). In compare sans with big, rich, and successful economies, it is more complicated for small societies, even if they may be open to prompt and intensive involvement and exploitation of human capital, investment and other resources.

In light of that, the proficiency, excellence and devotion to innovative policy planning is one crucial success factor in achieving great impact of policy management.

The aim of this particular article is to give an overview of substantial theoretical and practical factors of success or failure of IP implementation process, particularly concerning aspect of planning in the case of Estonia. Results of this particular study are showing more general picture of IP planning in an innovation policy management process.

Author performed this particular research based on qualitative approach of methodology and used qualitative methods of collecting, processing and interpreting qualitative data. Author is of opinion that qualitative approach, methods and data are relevant for solving the main problem of this particular research. Author did make a structural review of a number of possible fields of research and found the field of innovation and innovation policy to be particularly worthy and significant. Author performed also structural and non-structural search of relevant theoretical publications, analysed and synthesised the collected information. Author conducted a search and made qualitative analysis of strategy and policy documents of Estonia and made a decision to focus on that which is most relevant to the research field. Picked out strategy and policy documents concerning innovation and IP were

qualitatively analyzed from the stand point of semantics and content. On the bases of results obtained from the data collected, analysed and interpreted, author made some conclusions of more general character of innovation policy planning.

1. Innovation Policy Research Results in the World

1.1. Approaches to Innovation and Innovation Policy

This chapter provides a brief overview of innovation and innovation policy research results that should be helpful in analysing innovation policy making as regards the choice of the approach, main standpoints, and criteria.

Different authors have treated innovation differently by content, size, nature, types, e.t.c. Perez (1986, 2) treats innovation in an economic context, differentiating clearly between innovation and invention: „*The invention of a new product or process occurs within what could be called the techno-scientific sphere and it can remain there forever. By contrast, an innovation is an economic fact. The first commercial introduction of an invention transfers it to the techno-economic sphere as an isolated event, the future of which will be decided in the market. In case of failure, it can disappear for a long time or forever. In case of success it can still remain an isolated fact, depending upon the degree of appropriateness, its impact on competitors or on the other areas of economic activity. Yet, the fact with the most far-reaching consequences is the process of massive adoption.*” Perez (1985, 9; 1986, 2, 3) and Luggen, Birkenmeyer and Brodbeck (2005, 72) distinguish between increasing or small and radical innovation. Boer and During (2001) and Meyer and Loh (2004) classify innovation into three groups: product innovation, process innovation, and organisation innovation. Logically, it can be concluded that inherently, there has to be a fourth group of innovation, which is general, i.e., innovation covering and binding all the three groups. Luggen, Birkenmeyer and Brodbeck (2005, 73) state that by combining the three types of innovation (organisation innovation, business system innovation, and product/process/service/technology innovation) and the rate of innovation (increasing and radical), it is possible to speak about six types of innovation. Actually, defining innovation and types of innovation is an infinite process, because the content-related limits of innovation are as boundless as the limits of human thought and activity, for example, up to the thinking standards and social innovation.

Different authors have treated differently also enablers, preconditions, success factors. Smits and Kuhlmann (2004) claim that five functions “*play a crucial role in the management of present-day innovation processes: (1) management of interfaces, (2) (de-)construction and organizing (innovation) systems, (3) providing a platform for learning and experimenting, (4) providing an infrastructure for strategic intelligence and (5) stimulating demand articulation, strategy and vision development.*” Sommerlatte (2004, 1) states that sustainable innovation is ensured by five significant thrusts: “*(1) à corporate strategy giving top priority to innovation and to building a competency platform; (2) a comprehensive innovation process; (3) a flexible organization favoring innovation behavior; (4) multiple innovation partnerships; (5) an innovation culture characterized by effective organizational*

learning and knowledge management." Luggen, Birkenmeier and Brodbeck (2005, 71) have established the following as preconditions for successful innovation: innovation competence (prerequisite), innovation process (value creator) and innovation (output). Preiss and Spooner (2003) consider intra-organisational and also external factors important in fostering innovation. These factors may be either conducive or adverse. Meyer and Loh (2004), but also many other authors, consider communication and information technologies very important elements in promotion of innovation.

Luggen, Birkenmeier and Brodbeck (2005, 80) also provide the concept of innovation potential and Lane and Klavans (2005, 186) add the concept of the capability of scientific intelligence. The notion of the capability of scientific intelligence has been treated by many authors. For example, Bruland (1998, 167) states that the determiner of innovation performance forms one of the two components of innovation systems: extensive expansion of innovation in economies characterised by rapid expansion and/or high profitability. The possible number of concepts and notions related to innovation is actually also unlimited.

McPherson's and McDonald's (2005, 38) research about Scotland confirms that the innovation process is a dynamic, non-linear, socially coherent, and interactive process. Luggen *et al.*: *„The innovation process is the value creator. It aims to optimise both the portfolio of innovative ideas (effectiveness in the early stages) and the process of innovation projects (efficiency in the project phase). There are two tasks that have to be done continuously. It is the market intelligence and the technology intelligence.“*

Rabson and Marco (1999) treat innovation as system-based and state that there are two types of innovation systems: creative style type and psychological type.

1.2. Research Results of Innovation Policy Implementation

Meyer and Loh (2004) treat innovation policy from three aspects: innovation in the public sector (e-government); innovation policy in the private sector (fostering technological innovation) and innovation policy in households (building an all-inclusive information society).

Wonglimpiyarat (2005) analysed the development of the Silicon Valley via the prism of funding innovation and found that the capacity to foster clusters of innovation, an effective use of university resources, the supporting infrastructure, the culture of willingness to accept risk, and venture capital (VC) programmes are catalysts for economic development.

Morgan, Blake, Poyago-Theotoky (2003) claim that in introducing innovative technologies in Great Britain, such enterprises have been successful that operate in an environment characterised by innovative culture and structures encouraging innovation by long-term strategies.

Ruttan (2004) makes a generalisation claiming that in the USA, global success has been achieved in the areas where the US government has played a significant role in technological development.

Frederick (2004) compared the influence of business researches on the development of policies in New Zealand, Sinaloa, and Mexico (Sinoa) and concluded: *"In New Zealand, innovation policy is dynamic, but little attention is paid to the actual needs of businesses and their decision to opt for self-employment."* Sinoa, on the other hand, focuses its attention on the creation of businesses, but innovation policy is missing.

Some authors state that structural (Alders, Leede, Looise 2002; Handyside, Light 1998) and socio-dynamic [power and trust (Alders, Leede, Looise 2002), knowledge, devotion, subjectivity] aspects are also relevant from the point of view of successful innovation.

Bruland claims that Scandinavian countries obtained new knowledge by extensive industrial espionage (Bruland 1998, 176) and technical associations (Bruland 1998, 177).

Chew and Chew (2003) claim, based on their studies on Singapore, that *"Singapore is facing two substantial difficulties. First of all, Singapore has limited possibilities, owing to the small domestic market, to involve foreign capital in research and development. Second of all, the public sector has pulled out a lot of knowledge owners from the private sector, which should be the main driver for innovation and development, and that is why the capability of the private sector for innovation is insufficient."* Both of these circumstances are significant and appropriate in the case of Estonia as well, which is why such observations should be closely followed.

Parayil and Sreekumar (2004), who studied the dynamics of industrial development and innovation in Hong Kong, claim that *"the success of Hong Kong derives from the fact the modern national innovation system is dynamic, three-threaded, screw-like, the threads being the government, the industry, and the university, and it seems to be led by motivation-based economy."*

Preiss and Spooner (2003) who studied innovation in Australia, state that *"domestic economy is operated by enterprises, mainly medium-sized and small ones, via the creation and distributing of innovation, but innovation in Australia is inhibited by the tax system and legal restrictions."*

Based on the example of South Korea, Lee and Kwun (2003) claim that *„the current national innovation system of South Korea is government-initiated, target-oriented or plan-based, and input-focused, which has caused its inability to tackle the existing problematic practices, the loss of entrepreneurship among venture businesses, and the continued reliance of private innovation actors on government initiatives."*

Lee and Wang (2003), who studied innovation-driven economy in Taiwan, point out that *"Taiwan is moving from the outdated tax-incentives, science-based industrial parks and public research institutions based model to promote R&D and innovation towards a new model relying on new tools (venture capital, innovation incubators, an open laboratory system, and e-commerce)."*

Tsai and Wang state that during the ten-year operation, the innovation policy measurers implemented by the Taiwanese government (establishment of science and industrial parks, extensive budgets for science and technology) have made a

considerable breakthrough (Tsai, Wang 2005, 254). Meng says that in Taiwan, technology-holding companies are the main ingredients of innovation clusters and the core element of the national innovation system and *"the main players of innovation clusters are knowledge centres, innovation business units, and the industry"* (Meng 2005, 104).

Kattel and Kalvet (2005, 24) have compared the innovation policy systems of different countries and concluded that *"one of the most significant differences in R&D systems is the fact that the structure of R&D financing in Central and Eastern European countries varies greatly across developed countries; the differences are especially vivid as regards R&D expenditure in the public and private sector"*.

Gray and Allan (2002), who studied small and medium enterprises, claim that *"in SME-s, the strongest barrier to innovation are organisational rigidities, staff development and information management, which is why management education becomes very important, being a significant factor of innovational ability"*.

Berg, Pihlajamaa, Nummi, Leinonen and Leivo (Berg *et al* 2004) say that the innovation process requires an appropriate and sufficient assessment system and view the duration and quality of the innovation process from six angles (the quality and duration model): R&D as part of business strategy, R&D as part of product and technology strategy, strategic implementation of R&D, R&D as a sector of business, R&D outputs, and R&D project implementation.

Sutton (1999, 10) classifies policy process into 5 different models: the incrementalist model, the mixed-scanning model, policy as arguments, policy as social experiment and policy as interactive learning. Author is of opinion that innovation policy process in Estonia has in some extent remarkable attributes of all those process models, but there is no clear and clean match with any of those.

Various authors have researched innovation and innovation management in different countries from the point of view of various fields, scopes and aspects and using different methods as well. Their research results are interesting, worthy of attention, and definitely useful. However, it has to be admitted that the results are still too eclectic and fragmented to enable generalisations and fundamental conclusions, which is why it is not easy to pick steady anchors in the selection and usage of innovation policy preconditions, success factors and hindrances for Estonia.

2. Innovation Policy Planning in Estonia.

2.1 Innovation, Types of Innovation, Innovation Policy

In earlier innovation policy related documents, Estonian innovation policy makers have not unequivocally specified what is considered innovation and which innovation types and scopes they focus on. Compared with TEI^I, the picture is considerably clearer in the case of TEII. A clearer and more consistent reference has been made to technological innovation. The key areas of innovation policy that deserve the most attention include development of user-friendly information technologies and information society, biomedicine and material technologies (TEII 2006, 9). However, the research papers of various authors (Kattel, Kalvet, Kurik, Terk) refer to the fact that in Estonia, the main emphasis lies on technological

innovation. Deductively, it is possible to conclude that innovation policy makers have intended to include product innovation, process innovation and organisational innovation. It should be pointed out that it is not certain whether innovation policy planners in Estonia mean innovation as defined by Perez (1986, 2) or not.

2.2 Innovation Policy Documents

A common feature characterising Estonia's innovation policy is the great number and complex structure of various strategic and policy documents, action plans, programmes and projects. (Proos 2006) The most general document is the SE21,²³ which represents, with its fundamental values and nature- and human-centred approach, a philosophical platform for the preparation, interpretation and assessment of all other innovation policy related documents.

The most relevant documents among those outlining technological development, scientific and development activities, and innovation are strategic documents EE2014,⁴⁵ research, development and innovation related documents TEI and TEII⁶, domain strategies, the state budget strategy 2004-2007, „Estonia's National Development Plan 2006“, but also many other domestic, European Union and international strategies, development plans, and programmes. In addition to these, innovation policy is influenced by strategic documents of other structural policies and domains and also such factors that have not been recorded in or covered by in any formal innovation policy strategic document.

EE2014 (2004, 13) claims that „the goals, priorities and common view of the future established in the development plan „Estonia's Success 2014“ form the basis for all other strategic development plans and other documents, especially in the field of economic policy.“ Kattel and Kalvet (2005, 11) confirm this. Thus, both SE21 and EE2014 are „umbrella documents“ of different levels. At times, it is difficult to understand, which document is considered paramount by policy makers. The messages of policy makers are different and in contradictory input-output meaning in different parts of various documents. Principally, lower-level documents do refer to higher-level documents, but it is very difficult to derive or see any interlocking of mentality and clear correlation between these documents. The story is complicated with single documents themselves as well. For example, TEI is on the one hand principally directed towards building up knowledge-based society, but on the other hand it can be treated as innovation policy elements “environment” and “instruments”. The authors of TEII (2006, 5) have tried, at least in words, create some clarity, but it is more a compulsory, seeming, rhetoric activity. The authors of various documents have differing views of society, state governance, policy-making, etc.⁷

Policy-making is an open cyclical process, which means the contents of the documents approved at different times should be reviewed as a full package each time a new policy or sub-policy of policy is being planned. SE21 and EE2014 allow presuming that and the preparation of TEII confirms that this is done in Estonia. At the moment it is difficult to assess how comprehensive and effective this is. It is also impossible to estimate to what extent the content-related meaning of innovation policy is changed without the changes being reflected in policy documents.

From the EE2014 it becomes clear that „*the development plan helps, via competitive economy and knowledge-based society, ensure long-term sustainable economic and socio-economic development, i.e., guarantee people's well-being and quality of life*“. When analysing the EE2014, one cannot help but get the impression that the compilers of this document have been slightly confused. At times, they are speaking about a strategy, then again about an action plan or a development plan. This provides a reasoned ground for concluding that the planners and writers of the strategy are not experts in the best combination of knowledge, experience, and skills. The situation is somewhat clearer in the second part of TEII (2006, 5).

The above-said indicates a confusion in the organisation of innovation policy planning and documentation and in an inadequate quality of planning. This is a clear sign of danger. Among other things, the above-stated also refers to a significant real threat that there may appear a large gap between planned policy and actually implemented policy.

2.3. Description of the Vision

Lucas (2006) claims that there is no longer-term vision in Estonia, that Estonia spends too little money on research, development and innovation and that the quality of lecturers at Estonian universities is low. The assessment provided by a foreign expert may be disputable from the point of view of scientific evidence, but it is certainly a noteworthy comment, despite the fact the vision is recorded *ekspressis verbis* in the SE21, EE2014, TEI (2004, 1, 10) and TEII (2006, 7). One cannot completely agree with Lucas' view, as the author of this article is of the opinion the problem lies in the existence of too many visions in Estonia and in the inability to reach a consensus regarding a common innovation policy vision by domains at different levels. The EE2014 describes impact in too abstract a manner; in other documents impact has been treated more clearly, but in a way that is not measurable by indicators or criteria, except for in the SE21. The EE2014 describes the vision in a separate chapter, but in such an abstract and general manner that enables today's politicians state the vision has been materialised, but in ten years it is still possible to say it has not. TEII also establishes the vision: Estonia is seen as a knowledge-based society. However, the vision of innovation policy has been described in other parts of EE2014 in a measurable way, although fragmentally. The best description of the vision is presented in SE21.

2.4 Innovation Policy Goals

Innovation policy is not important as a thing-in-itself, but as a means to achieve something. Thus, innovation policy inputs derive from more general values and documents embodying more general and extensive objectives, for example, primarily from the Constitution of Estonia, but also from SE21⁸ and other sources. SE21 (2005, 21) sees as the precondition for a successful and significant increase in well-being a transfer from investment-centred economy to innovation-centred economy. Here innovation is both the goal and a means to achieve something more important. Innovation here lies in considerable economic changes. The four prerequisites for innovative success formulated by the authors of SE21⁹ are very self-explanatory. At this point, innovation is seen as a means due to the fact that innovation-centred

economy helps better ensure the competitive ability of the state and economic subjects, thus promoting the increase of general well-being of Estonians.

The main objective of innovation policy has been formulated very generally, but still in the meaning of impact. The main objective is also specified in the form of sub-objectives. It is noteworthy that all the sub-objectives of innovation policy have been expressed from the point of view of their expected influence. In the sphere of Estonia's public administration, this is more of a rare than an ordinary phenomenon.

In the case of the documents containing Estonia's innovation policy, the common problem is that it is impossible to establish the relation between the hierarchies of the goals established in the strategic documents of different levels and also that more specific innovation policy objectives are listed in a chaotic and confusing manner in several places of the same strategic document. In some cases the goal is expressed as a state or an impact, in others - as an output, and in some sources as a means.

A general characteristic and, also viewed as a problem, is that goals are presented in a disorderly manner in the meaning of output and outcome in the field of innovation and in other areas as well, in the meaning of innovation as such, and also in the meaning of the document itself. In several cases, only the objectives of the document, not its substantial meaning is treated. Consequently, innovation policy makers have not been able to achieve clarity of thought and consistency in giving meaning to formulating and documenting the objectives.

Based on the observations stated above, it is only possible to claim that there was and still is no common understanding of the vision and goals of innovation policy among the makers, executors, other significant participants and stakeholders of the policy. Kurik and Terk (2005, 3) also draw attention to this fact: *„There are certain difficulties in achieving a common understanding and smooth cooperation between the Ministry of Economic Affairs and Communication and the other ministries such as the Ministry of Education and Research, and the Ministry of Finance. It seems that every ministry has a somewhat different idea of innovation.“* Having a common understanding is the inevitable precondition for success. Thus, a significant risk in the implementation of innovation policy in Estonia has materialized. Innovation policy makers (in the broader sense – Author) in the future should proceed, for example, from the approach of the SE21 (2005, 12) authors in treating the goals and objectives¹⁰.

2.5 Innovation Policy Inputs, Elements and Factors

The documents treated in this research include references to the fact that different inputs have been used in policy-making, i.e., situation descriptions and analysis, but it is not possible to ascertain to what extent and quality it has been done and how much they have been taken into account in policy-making. SE21 is an exception.

The innovation policy related documents lack sufficient information regarding the data that formed the basis for analyses, who and how the data was used, processed and interpreted, as well as what were the results of the analyses. There is no evidence regarding the assessment of the alternatives or giving causes for the selection of excluded and included target groups and criteria for such selection. No information

allowing to affirm that possible risks have been considered and appropriate measurers timely planned has transferred from the planning process of innovation policy, but not only that, into the documents forming the basis of the current analysis. Again, SE21 forms an exception.

The managerial team, members of the project management organisation, target groups, cooperation partners, the responsible people on political and administrative level – a part of the target groups (on a very abstract level) and financiers included – are identifiable. The research, development and innovation strategy also includes the key areas, the role of the state, and the measurers planned for the materialisation of goals.

A more general problem is that documents of different hierarchies have been prepared not in their logical order but randomly, depending on the subjective preferences of policy makers. SE21 should be a document forming a philosophical basis for other strategy documents. In reality, SE21 was prepared a year after TEI and a year before TEII. Unfortunately, the authors of TEII have not considerably linked the output of their mental activity to the values and more general goals established in SE21 as regards the content of the document. In the same way, it cannot be established that approval of SE21 would have been accompanied by a wave of conscious reformation - connecting, and analysing of all other strategy documents, including those embodying innovation policy.

The EE2014, TEI and TEII provide a basis for concluding that not only the main general policy elements but also particular innovation policy elements are included by innovation policy makers. However, no attention has been paid to the aspect of involving the financial system of the state, financial intermediaries, good governance and concentration of owners. Levine (2003, 6, 21) considers the role of the financial system in promoting innovation as very important. He states that the financial system influences technological innovation (*Ibid*, 2, 16), financial intermediaries influence the extent of technological innovation (*Ibid*, 8), and good governance influences the financing of innovation in the private sector (*Ibid*, 10). The suitability of the financial system and its support for the dispersion of the innovation policy „portfolio“ to manage risks have not been analysed in Estonia.

It is encouraging to know that the authors of TEII (2006, 7) have allegedly proceeded from other strategy documents, but to what extent the goals established in these documents can be implemented in a synchronised way, will be clear only after 2013.

2.6 Problem identification and wording

A clear description of the essence of the problem in the relevant innovation policy strategy documents is not included, and this is of a considerable risk. It is very important to reach a consensus in identifying, interpreting, understanding, acknowledging, attaching importance to, and formulating the problem. If this is not done, it is possible that each single group of participants or each participant may understand the content and scope of the problem in a different way. This may lead to each single group of participants or each individual or a management chain unit initiating activity or activities in implementing innovation policy that do not

result in an actual solution of the problem but embark on solving a problem of their own. Such multiplicity of activities arising from the multiplicity of conceptions impinges significant counter-effect on the activities and the resulting impact of other participants.

Kattel and Kalvet (2005, 11) state: *"At the same time, several recent studies have proved that the most remarkable problem of the competitive ability of Estonia's economy and of the innovation system lies in the business sector"*. whereas the writers and approvers of policies have not acknowledged, reflected or attached importance to this very real problem.

2.7 Preconditions, Success Factors and Measurers

The most thorough, systemic, and substantial reflection on the context and general preconditions has been provided in SE21 (2005, 9-12). The EE2014 describes success prerequisites as preconditions and as five groups of success factors. Under the latter there is one more level of goals that can be interpreted as independent objectives but also as preconditions for achieving the sub-goals. Some of the goals described in clarifying success factors are measurable, some are not; some have an influence on the society and some have not.

In the course of the present research, no basis was found for a direct analysis of the existence, scope and quality of a resource analysis (knowledge, experience, skills, patents, money, time) made during the innovation policy planning process. In addition, it was not possible to establish how it is ensured that the policy priorities related to time and importance are recorded in the same way in every National Development Plan, in every annual action plan, in state budget of each particular year.

A thorough analysis conducted following Carlota Perez's techno-economical (Perez 2003) and technological changes paradigm (Perez 2001) would have significantly, though not existentially, supported Estonia's innovation policy making, but unfortunately, there is no evidence of this having been done. Kattel and Kalvet (2005, 17), too, consider paradigms important, stressing: *"thus, research, development and innovation policies should always proceed from a specific technology and its stage of development"*. Fortunately, the authors of SE21 have realised that, writing: *"Identification of Estonia's three priority areas is in correlation with changes of the global technological paradigm, enabling Estonian scientists and engineers to participate in global research and development and innovation networks"* (SE21 2005, 68).

It was not possible to view innovation policy via the barriers to innovation policy making described by Bullock, Mountford and Stanley, because there is no information regarding the extent of actual time and funds spent on planning the policy and the readiness to take risks by decision-makers and officials.

Different authors have spoken about the importance of the innovation management process (Cooper 2001, Luggen, Birkenmeier, Brodbeck 2005, Meng 2005). Meng says that *"the innovation process varies depending on the industry type, technology, and company size"*. In the case of Estonia, it is not possible to admit that innovation policy makers have paid sufficient attention to this aspect,

although the rhetoric is appropriate (EE2014 2004, 14). Again, SE21 represents a positive exception, as the preparation process of the document has been logical and clearly recorded.

The major factors in innovation policy making are the existence of decision-makers', executers', advisers' and financiers' innovative thinking, i.e., free creative thinking¹¹, visionary abilities, and visions¹². Being a native Estonian, having gained various experience¹³ in both the public and private sector and thus being rather familiar with the situation of Estonia, I dare to claim that as regards the preconditions for innovation policy success, Estonia lacks innovation culture (in sense of broader ground), the country's market is not big enough to attract foreign investment, there are not enough research and development centers of very strong academically-applied competence and capacity; the support of the administrative environment, including the legal and taxation environment,¹⁴ is feeble; the ability of businesses to invest in innovation as well as the general innovative ability are inadequate; the public sector is unable to compete with the private sector in the labour market. All these components have been at least one of the characteristics in the innovation policy success of different countries.

Although Estonia has presented itself as a successful IT-country, there exist different and substantial barriers to receiving necessary IT support upon the implementation of significant policies on the level of the state¹⁵ and local governments and also in the private sector.

2.8 Seedbed of Innovation and Knowledge-based Society

It is a great pity that in the era of information technology and on the way to a knowledge-based society, several opinion leaders are advocating the idea that Estonia's young people should not try to enter universities, but choose a vocational school instead. Such a manner of thinking is a *coitus interruptus* from the point of view of knowledge-based society. Only a narrow-minded dilettante or a self-satisfied cynic, who places instantaneous self-interest first, could in this way endanger the sustainability of the Estonian state and nation by propagating such an idea. TEII states that „*the goals established in the strategy will be achieved via four measurers: human capital development, making the organisation of public sector research, development and innovation more efficient, increasing the innovative ability of enterprises, formation of policies aimed at promoting Estonia's long-term development.* (TEII 2006, 6) Can anyone explain how it would be possible to develop human capital and achieve knowledge-based society without creating a source of educated people?

The threat discussed above is further amplified by the outflow of competent experts to foreign countries from both, the state and local government institutions, research and development institutions, and economic subjects. The current Prime Minister Andrus Ansip is pouring oil on the fire by not seeing the slightest problem here or not wanting to admit it to the public¹⁶. Fortunately, President of the Republic Toomas-Hendrik Ilves, authors of TEII (TEII 2006, 9), Kurik, Terk (2005, 18), and also Woolridge are of the opposite opinion. However, the creation and success of innovation policy preconditions does not chiefly depend on those people, but, to a

great extent, on politicians in the coalition council, the Riigikogu and the Government of the Republic.

2.9 Disclosure of Innovation Policy

Innovation policy was feebly acknowledged, prioritised, clarified and made public to all participants (parliamentary parties, state institutions, business organisations, research and development organisations, investors, venture capitalists; households) and stakeholders. Innovation policy target groups are diverse, starting with every resident of Estonia in a certain sense and ending with various corporative and individual target groups in the sense of single sub-policies of policy or impact aspects. It is impossible to admit that innovation policy makers attached enough importance to communication and marketing activities and thus achieved the concentration of different associations of the society, although authors of EE2014 (2004, 2) claimed that *„implementation of „Estonia's Success 2014“ must now, when we have the opportunity to use new means and possibilities arising from EU and NATO membership, become a process drawing the society together.“* This has not taken place, which is why it is very difficult to believe that all the important participants *in corpore* and every single participant separately have considered and realised, on a meaningful level, the importance of successful innovation, the preconditions for success, the manageability or unmanageability of processes and sub-processes, the essence of the critical chain from the point of view of inputs and outputs, the connections between measurers and single components and their connections to the expected impact.

2.9 Achieving common interests of Stakeholders

The success of innovation policy depends on the attitudes, needs, and preferences of the various groups of the society (as participants but also possible beneficiaries of the impact). We have to agree with Kattel and Kalvet (2005, 13) who claim that *„under the circumstances of globalising economy, political and economic interests may no longer coincide“*. Day-to-day living keeps proving that the interests of various interest groups do not coincide even when we are not dealing with the processes of globalisation. Innovation policy is, due to its high need for resources, an involvement of the entire society; its prolonged duration, and complicated achievement of results is a politically very sensitive issue. That is why a real danger of experiencing a failure exists because of the clashing subjective day-to-day policy related interests and the annual cycle of allocating resources from the state budget. Therefore, it would be naïve to believe that the values of all parliamentary parties and their leaders are dedicated to innovation and knowledge based society, and, that the pragmatic interests of the day-to-day policy support innovation in both the narrower and the broader sense.

The situation in Estonia is even further complicated by the almost perpetual pre-election, election, and post-election time attitudes. During the pre-election time, it is very difficult to believe that cooperation and communication between the three significant parties: the state, the university, and the industry, and the chain of the Riigikogu, the government of the Republic, state institutions, private business, households and individuals can take place with sufficient emphasis, thoroughness

and dedication, at the same time not setting in motion the immediate interests and convictions of single interest groups or individuals, causing likely impairment and the potential achievement of the innovative policy goals¹⁷. It is encouraging that the authors of TEII have considered cooperation as relevant (TEII 2006, 10), but this does not mean that one of the most important factors enabling the materialisation of actual and substantial cooperation, needs and opportunities – money – has been sufficiently taken into account when the state budget was being prepared and funds allocated.¹⁸

3. Conclusion and Proposals

According to Burton, the situation could be improved “*based on four key elements: Knowledge Creation; Knowledge Protection; Collaborative Business Arrangements for Knowledge Creation; and Diffused Entrepreneurship/Entrepreneurial Management.*” There is great deal for improvement in Estonia in implementing these elements into day-to-day life.

In order to escape the current waddling and avoid matters coming to a total standstill, the Estonian innovation policy makers should:

1. Perform an inventory of all the strategy documents, compile a register of these documents, assess the timeliness and topicality of the subject matter of every single strategy, establish a hierarchy of the documents, analyse interaction between the documents and devise a systemic and integral model of strategic planning.
2. Achieve a common long-term agreement for prioritising innovation policy and establishing it in the State Budget Act, and observe that every annual state budget would ensure sufficient financing of innovation policy.
3. Move from the bureaucratic, output-based planning, reporting, and assessment to outcome-centred planning, reporting, and assessment. This does not mean that output-oriented and activity-based planning, reporting, and assessment are useless.
4. Select the criteria and indicators characterising innovation policy as regards its impact in the best way possible and compile them into an integral and comprehensive system of measurers, which will be used to regularly assess the co-effects and counter-effects of all innovation policy strategy documents from the point of view of the most significant aspects.
5. Amend the principles and arrangement of financing long-term strategies from the state budget so that they would more than before support fruitful implementation of such strategies.
6. Amend the legal framework so that it sets in motion and supports the proposals presented above.

Unfortunately, it has to be admitted that if the current development continues, the likelihood of materialisation of innovation policy visions and achievement of innovation policy goals and objectives in Estonia will be rather insignificant, as innovation policy planning does not function according to reasoned expectations,

there are currently not enough prerequisites for its proper functioning, and it is certain that the necessary principal changes will not be made before the 2007 elections.

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Summary

This article treats general approaches to the planning of innovation policy based on the example of Estonia. Bruland (1998, 167), Reinert, (1999), Dziura (2001), Nielsen (2003), Goh (2004), Kattel and Kalvet (2005, 17), Meng, (2005, 115) and several other authors consider innovation to be one of the most significant factors from the point of view of economic development. As the Republic of Estonia has been able to achieve fast and outstanding economic success during the relatively short period of its re-independence, studying innovation policy in Estonia is a rewarding object for research.

In this article, the author analyses the incentives and disincentives of the sustainable progress of innovation policy and offers ideas to enhance the preconditions for success in Estonia, but not only for Estonia.

Although several authors bring forth clear sources of success in different countries having successfully applied innovation policies, one has to be very careful in transferring the experience of other countries to Estonia, as well as in comparing the impact of Estonia's

innovation policy with that of other states, as the take-off positions and political, economic, legal, and cultural environments of different countries vary to a great extent.

Compared with big, rich, and successful economies, it is more complicated for small societies, even if they are open to promptly and intensively involve and exploit human capital, investment and other resources.

In that light, the proficiency, excellence and devotion to innovation policy planning is one necessary and crucial success factor in achieving great impact of policy management.

Unfortunately, it has to be admitted that if the current development continues, the likelihood of materialisation of innovation policy visions and attainment of innovation policy goals and objectives in Estonia is rather small, as innovation policy planning does not function in accordance to reasoned expectations, likewise, currently there are not enough prerequisites for its functioning, and it is certain that the necessary principal changes will not be implemented before the 2007 elections.

Author is inclined to give important advice to the Estonian innovation policy makers: avoid coming to a total standstill in the innovation policy development.

This article consists of four chapters: Introduction, Innovation Policy Research Results in the World Innovation Policy Planning in Estonia and Conclusion and Proposals.

Endnotes

- ¹ *Teadmistepõhine Eesti I* (TEI, Knowledge-based Estonia I, approved by Estonian Parliament (Riigikogu) on 06.12.2001) is the R&D strategy for 2002-2006 and *Teadmistepõhine Eesti II* (TEII, Knowledge-based Estonia II, approved by Government of Estonia 16.11.2006) is the R&D strategy for 2007-2013.
- ² *Säästev Eesti 21* (SE21, Sustainable Estonia 21) is the Estonian National Strategy on Sustainable Development up to the Year 2030. SE21 was approved by Estonian Parliament (Riigikogu) in September 2005.
- ³ SE21: "According to the Terms of Reference, SE21 is an integral conception of the society, which does not go deep into the specific problems of any individual sphere of life but defines the movement of Estonia as a whole on relatively general scales, such as individualism-solidarity, mobility-stability, innovativity-traditionality, etc" (SE21 2005, 4).
- ⁴ *Eesti Edu 2014* (Estonia's Success 2014) is a long-term strategy document of the Government of Estonia.
- ⁵ EE2014: „Estonia's Success 2014 is a development plan enabling the people of Estonia achieve a higher standard of living and better quality of life, in short – higher well-being. "Estonia's Success 2014" helps, via competitive economy and knowledge-based society, ensure Estonia's long-term sustainable and human-centered socio-economic development. "Estonia's success 2014" draws together a purposeful vision of the future and ties it with the role of executive power in policy planning to prepare a general state development plan and guarantee the implementation of the plan." (EE2014, 2004, 1)
- ⁶ On 23 November 2006, the Government of the Republic approved the research and development activity and innovation strategy „Knowledge-based Estonia 2007-2013“ and the accompanying implementation plan. As a follow-up to the earlier similar document, the new strategy determines the principles, goals, and activities of Estonia's research and development activity and innovation. The new strategy shall enter into force after it has been approved by the Riigikogu.
- ⁷ It is important to know that the different documents embodying Estonia's innovation policy have been prepared and entered into force at different times by different political forces (decision-makers) and officials (executors), which means today's decision-makers and

executors do not have a uniform overview of the earlier documents. In addition, there exist different subjective interests and devotions in creating preconditions, removing obstacles, and achieving results in the scope expected as regards implementation of the planned action.

- ⁸ SE21: "Objective no 1: viability of Estonia's cultural space; objective no 2: increase of well-being; objective no 3: coherent society; objective no 4: ecological balance."
- ⁹ Authors of SE21: "First – introduction of the principles of knowledge-based management into state governance. The aim is to move from interest-based (sub) decisions towards inclusive and knowledge-based strategic management in making decisions that determine the development of the society. Second – changes in the creation and use of intellectual resources. As intellectual resources constitute the key resource of the knowledge-based society, a significant increase in and making the best use of this resource is an inevitable precondition for the entire model to take effect. Third – bringing human-nature relations into conformity with the principles of knowledge-based society. Fourth – establishment of sufficient support to movement towards knowledge-based society, since a substantive shift cannot be achieved without it" (SE21 2005, 59).
- ¹⁰ SE21: „The objectives have been described using the following components: content of the objective, components and measurers of the objective, risks to achieving the objective, the expected target status by 2030, the main mechanisms to achieve the objective.”
- ¹¹ The same is claimed by Näpinen: „The more different creative aspirations of free people in the society, the greater the potential of self-organisation, the richer the society without any specific planning or forecasts but from the point of view of the most valuable consciously created products, and the higher the well-being of people....The diversity of creative actions and ideas of free individuals gives rise to the achievements of a free society via self-organisation (in a non-vigorous reciprocal remote interaction between individuals), which are superior to the total of consciously designed achievements. Progress can be expected only from a society where individual freedom is broadly accepted, where it is rooted in its traditions as a decisive ethical principle" (Näpinen 1994, 159).
- ¹² However, it is important that visionaries maintained at least some contact with reality. Kivine (2004) points out the utopian forecasts made by them as one of the reasons for product development failures of enterprises.
- ¹³ The most valuable experiences include such positions as Deputy to the Auditor General, Chief Auditor of the Performance Audit Department, and posts directly related to state administration.
- ¹⁴ This is also claimed by EVCA: "The tax and legal environment for the development of the private equity and venture capital industry is quite unfavourable in Estonia, mainly due to the tax treatment of institutional investors. Limited partners and fund managers, pension funds and insurance companies are still faced with quantitative restrictions when investing in the asset class. Although there is a suitable domestic fund structure for private equity and venture capital, it is not tax transparent for domestic and non-domestic investors, and not free from undue investment restrictions. Furthermore, the country does not provide any tax incentives for investing in the asset class. There is also further room for improvement in the situation for investor companies, with regard to both company incentivization and fiscal R&D incentives. On a more positive note, Estonia has a good environment for retaining talent in investor companies and management funds, although the capital gains taxation for private individuals could still be reviewed." (EVCA 2006, 39) "Estonia does not provide any tax incentives for investing in private equity and venture capital." (EVCA 2006, 41) "The Limited Liability Company is not tax transparent either for domestic or for non-domestic investors. However, non-domestic investors can avoid a permanent establishment in Estonia when investing through this vehicle. Management fees are subject to VAT but

carried interest is not. A Limited Liability Company is not free from undue investment restrictions." (EVCA 2006, 41) "Estonia does not provide a favourable environment for company incentivization as there is no specific scheme for supporting the creation and growth of innovative high-potential start-ups (young innovative company – YIQ). The country also lacks a special company tax rate for small and medium-sized enterprises (SMEs). On the positive side, since 1 January 2006 the new flat income tax rate in Estonia has been 23% (the previous rate was 24%), which is below the European average of 25.2%." (EVCA 2006, 42) "Estonia does not seem to favour any form of investment in R&D as the country does not provide any of the fiscal R&D incentives evaluated in this study: business R&D expenditure, R&D capital expenditure, contracting researchers, technology transfer, cooperation between firms and research institutes/universities, and the creation of innovative firms" (EVCA 2006, 42).

- ¹⁵ The State Audit Office has estimated most of the information systems created 1993-1999 and databases at their disposal to be institution-centred. Decision no 2-5/004 of Chief Auditor of the Operational Audit Department Performance of Development Projects of Information Systems, 23 February 2001.
- ¹⁶ Ansip has repeatedly expressed it both in words and in writing. His most extreme speech on this subject was delivered at the Pärnu Management Conference on 13 October 2006.
- ¹⁷ This conviction is also supported by Kivine (2004), who claims: "The main reason behind poor results is ... the non-functioning of the value chain of EAS activities...".
- ¹⁸ The same is stated by the authors of TEII about TEI: „Unfortunately, Estonia has been unable to follow the financing plan prescribed in the strategy and approved by the Riigikogu. Instead of proceeding from the benchmark level established in the strategy, the actual investments of recent years have been considerably smaller than planned in the strategy, as they have been formed in the course of annual budget negotiations. The strategy has been applied based on the resources actually allocated therefor (TE II 2006, 11).

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