

The Influence of Quangos on National Systems of Innovation – Case Studies of the Estonian Genome Project and e-Learning Initiatives

Margit Suurna

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Abstract

Innovation can be regarded as one of the most important factors in enhancing economic development. However, innovation management policies are extremely complex and dynamic in the sense of constant change and uncertainty. This complexity is significantly compounded by the fact that the public sector itself is constantly changing as well. In broad terms, this is about the transformation processes in policy making both in developing and developed countries, where the hierarchical model of government as the predominant organisational model to fulfill public goals is losing its power to market mechanisms with supposed creative and specialised capacity of enterprises, quasi-autonomous non-governmental organisations (*quangos*), third sector etc. The inadequacy, if not absence, of scholarly attention to the effect that aforementioned organisations have on the implementation of innovation policy is the most important aspect in the context of this paper. As the actual effect of quangos on a NSI remains unclear from the literature and as the effect is very much context-specific, the analysis of two case studies is carried through to explore the theoretical implications in practice. Derived from this, in more narrow terms, this paper is to explore how increasing usage of quangos has affected the functioning of a NSI and its performance in two 'core technologies' in Estonia: on the one hand, in biotechnology (especially the Estonian Genome Project), and on the other hand, in information and communication technology (e-Learning initiatives). Both areas are stated as the priority areas in the development process of catching up and building up the knowledge-based society in Estonia. This paper argues that the decentralised organisational set-up has caused serious problems in policy impact and can be seen rather as a tool used by the government to shift responsibility (including financial) from itself.

Keywords: NSI, quasi-autonomous non-governmental organisations, innovation policy, the Genome Project and e-Learning.

Introduction

“A Government could print a good edition of Shakespeare’s works, but it could not get them written”

(Marshall 1907: 22)

Innovation can be regarded as one of the most important factors in enhancing economic development. At the same time policies to manage innovation are (1) extremely complex (involving government, enterprises, research and development agencies, investors, consumers, etc.) and (2) dynamic, in the sense of constant change and uncertainty. The successful governance of these processes requires extremely systematic and well-informed government policies. This complexity is significantly compounded by the fact that the public sector itself is constantly changing as well. First of all, in democratic societies there are periodic elections that normally bring new priorities, initiatives, etc. Second, the organisation of the public sector (which decides what, when and with what means) has been also strongly changing in the last 30

years. Keywords like privatisation, deregulation, and decentralisation have come to characterise public sector change in developed as well as in developing countries.

The focus of this paper is on the ever-increasing role and involvement of non-governmental organisations, especially non-profit organisations, in policy implementation. This trend can be considered as administrative and external decentralisation (Pollitt & Bouckaert 2004: 81-90), or in other words, the trend towards a ‘*quasi-market*’ (Nelson & Winter 1982), ‘*grey zone*’ (Bertelli 2006c: 584; Greve et al. 1999: 132), ‘*hollow state*’ (Milward 2000), ‘*shadow government*’ (termed by Axelrod in 1992, Eger 2006) or a ‘*New Deal-Style initiative*’ (Goldsmith & Eggers 2004: 10), etc. This paper emphasises the special status these non-governmental organisations – so-called *quasi-autonomous non-governmental organisations* (hereafter *quangos*) – have in a ‘*National System of Innovation*’ (NSI). The NSI is defined as the “*set of distinct institutions which contribute to the development and diffusion of technologies and which provides the framework within which policies are implemented*” (Metcalf 1994: 940). This kind of system approach has been taken in order to set the analysis on innovation policy into some kind of boundaries, especially because of the dynamic and unseizable sense of the term ‘*innovation*’ itself (Schumpeter 2002: 64).¹

The term quango does not have an international definition which is valid for every country; how quangos are treated is strongly dependent on the institutional structure of the state and the specific conditions like finances, ministerial responsibility, control mechanisms, public task and public domain (Greve et al. 1999: 130, 138-141; Pollitt et al. 2004: 8-9). The most common definition, also used in this paper, is given by van Thiel (2004: 176): “*quangos are organisations which, as their main task, are charged with the implementation of one or more public policies, and which are funded publicly but operate at arm’s length of the central government, without an immediate hierarchical relationship existing with a minister or a parent department*” (see for the characteristics of quangos also Pollitt et al. 2004: 10).² When Anthony Barker coined the term ‘*quango*’ in 1982, he foresaw that quangos would enjoy only a short life; in reality, however, there has been a quango explosion at all levels of society – regional, central, European (van Thiel

¹ It needs to be mentioned that the usage of a system approach to study innovation has been absorbed increasingly since the early 1990s (Freeman 2002: 191; Carlsson 2006: 58; Reinert & Reinert 2003: 2; Chang & Chen 2004: 18), including in the several supra-national organisations like the *Organisation for Economic Cooperation and Development (OECD)*, the *European Commission* and *UNCTAD* (Lundvall et al. 2002: 214).

² The list of the organisations which belong under this concept is long and varied: (1) contract agencies; (2) public bodies (e.g., Non-Departmental Public Bodies, Para- and Extra-Governmental Organisations, the Dutch *Zelfstandige Bestuursorganen*); (3) voluntary or charity organisations; and (4) state-owned enterprises and private-sector organisations (van Thiel 2004: 176; Greve et al. 1999: 144; Bertelli 2006b: 241-242).

2004: 175; Peters & Savoie 1994: 420; Massey 1997: 22). The same is the case in Estonia, where the number of these entities as well as the respective allocations from the state budget has been growing rapidly (Tavits & Annus 2006: 6, 11).

The research in the area is highly relevant as the different non-governmental organisations, non-profit sector and private actors play an increasing role in the organisation and governance of modern society, but so far the systematic scholarly attention to such forms of governance has remained rather limited (Kooiman 1996: 9; Mattli & Büthe 2005: 399-400), especially outside the OECD countries (Tavits & Annus 2006: 3). So, although several research papers are foreseeing an important role public policy will play in a NSI (Högselius 2006: 37; Carlsson 2006: 57; Lundvall & Maskell 2000; Nelson 2004), besides a general lack of consideration on changes in the system (Högselius 2006: 31; see here also Sharif 2006), there is also a lack of attention given to the changes taking place in the public sector itself.

Derived from this, the aim of this paper is to assess what is the role quangos play in the implementation of innovation policy and the effect that this kind of policy framework has on the innovation policy outcomes. In more narrow terms, it is about how the ever-increasing usage of quangos has affected the functioning of a NSI and its performance in two ‘*core technologies*’ in Estonia: (1) on the one hand, in biotechnology, in particular the *Estonian Genome Project* (hereafter the EGP), which can be considered as one of the new rising high-technological fields, and (2) on the other, in information and communication technology (hereafter ICT), in particular the case of e-Learning initiatives, as prevailing and ubiquitous technology, which continuously broadens its scope by embedding into traditional industrial and non-industrial sectors.³ Both areas are stated as priority areas in the development process of catching up and building up the knowledge-based society in the Estonian research and development and innovation strategy *Knowledge-based Estonia 2002-2006 and 2007-2013*.

In both cases, the EGP and e-Learning, Estonia uses extensively quangos in policy framework, and in both cases, as this paper will argue this has caused serious problems in policy impact.

In the first section, the main aspects of concern to public policy are discussed in order to support innovation in certain areas (in areas oriented on higher value added). Secondly, a short overview of changes in public sector in terms of quangos is given, focusing here on the reasons for their

³ See here Carlota Perez’s (2002) seminal concept of techno-economic paradigms.

involvement in and possible outcomes of public policy. The third section concentrates on the Estonian case studies, giving at first an overview of the main aspects how a NSI in both cases is built up and then discussing over the main developments. Based on these two case studies a general conclusion is made about the effect of quangos on the functioning and performance of a NSI.

1. The role of the state in economic development in the framework of National Innovation Systems

Although the concept of a NSI has been in use for the past 20 years (Lundvall et al. 2002: 215; Sharif 2006: 745), it is still a rather ‘*fuzzy concept*’ (Sharif 2006: 756, 757; see also Högselius 2006: 38), it is still a subject to a remarkable variety of interpretations (Chang & Chen 2004: 25), and it is still evolving over time (Nelson 2004: 373).⁴ However, the systematic approach that the NSI is broadly about is considered to be in the framework of this paper a useful tool to set boundaries for the evaluation of developments in a certain technological field. Especially this systematic approach concerns the basis how a NSI is built up: (1) patterns of scientific, technological and industrial specialisation, (2) institutional profiles, and (3) structures of knowledge interactions (OECD 1999: 23). As proposed by Carlsson et al. (2002), the core functions of a NSI can be elicited by the following questions: **what** to do; **how** to build up the system so that the overall objectives are met; and **how** to support efficiency and long-term survival of the system?

To start with, the specialisation aspect of a NSI is based on the notion that during the last decade a long-term economic growth has been enjoyed more obviously by the countries emphasising innovation in high-tech areas (Reid & Nauwelaers 2002). The explanation lies in the fact that economic activities (Singer 1950; Hamilton 1791; see for an Estonian case Kattel 2004) or so-called ‘*windows of opportunity*’ (Perez 2001: 109) to innovate are dissimilar in different industries – in qualitatively low activities innovation would result in lower costs; in qualitatively high activities in higher wages, profits and taxes, and so in an increased community standard for living (‘*triple level rent-seeking*’, Reinert 2004: 7). The same is the case with different technologies (Perez 2001: 112-113; see here also Cimoli et al. 2006: 6).

⁴ For example, Freeman (2002) is concentrating on technological aspect, Edquist (2005) on organisations and institutions, Nelson (2004) on R&D investments, and Lundvall & Maskell (2000) on interaction and learning, etc., in the research on NSIs.

In other words, the key for economic development is in the creation and advancing of new knowledge (Reinert 1999: 285; Marshall quoted in Arthur 1994: 3-4). The state's role here is of utmost importance. Firstly, the state can support the change in economic structure towards more knowledge-intensive one through its educational and science policies (see here also Tiits, Kattel & Kalvet 2005: 17). However, too strong emphasis on knowledge and R&D may lead the system into '*path-dependency*' (Arthur 1994: 1-2; OECD 1999: 27) or may see innovation in a too linear and an economic-centered way (Shriner 1973: 454), meaning in its own turn a lack of '*feedback loops*' (Kline & Rosenberg 1986) and hence of creativity (Mothe 2004: 526; Cumming 1998: 21). Not to mention the inadequate risk management system in science-based innovation, often seeking the ways to eliminate rather than to deal with them (Styhre 2006: 302, 310).

Secondly, as the factors leading to successful innovation differ greatly across industries and sectors (e.g., Pavitt 1984), it is the state's power to use the most suitable institutional mechanism for (a) technologies and industries of the dissimilar fields (Nelson 2006: 11-12) and (b) of the different phase of development (Perez 2001). In this paper, the particular emphasis is given on the mercantilist concept based on List, but also on Smith, seen as a '*misunderstood mercantilist*' (Reinert 2004: 15; see also Freeman 2002: 193). This concept is specifying the need for a strong intervention in an infant industry by the state (e.g., patents to protect the creation of new knowledge) and foresees to open the area for market forces only when the certain level of maturity has been achieved (see here also Reinert 2004; Cimoli et al. 2006: 2; Hamilton 1791).

Besides the infant industry protection, the provision of financial means (especially for R&D) has been seen as another important, if not the most necessary, part of the public policies (Högselius 2006: 36; see also Nelson 2004; Freeman 2002: 206; OECD 1999: 21). Furthermore, by investing heavily into the promising technologies/economic sectors in an early stage, the government can create some kind of basic capabilities and stability and thereby encourage an entrepreneurial spirit (Edquist 2005: 191; Trott 2002: 35; Moreau 2004: 866-868). This kind of support is essential, especially when to consider (1) uncertainty and risks, and (2) heavy investment needs with the long lead time in new arising areas (Klay 1998: 141-142; see also Lundvall et al. 2002: 227 from time perspective; Kline & Rosenberg 1986 and Siemon 2006 from financial perspective).⁵

⁵ The role of the state, acting as a '*last resort*', is in particular the main reason for success in the area of biotechnology in US (Lawlor 2003; see also Lehne & Roozendaal 2005: 68). The political choice with respect to

An important aspect of a NSI is its depth in the sense of close cooperation between the actors of the area, being so much more than just an institutional structure and favorable macroeconomic conditions created by the government (see here Porter 2000). At the core of a NSI lies the idea of ‘*tacit knowledge*’ and social capital, based on interconnections, relationships and trust between economic actors (‘*social glue*’ as Porter, 2000: 264, called it), and on learning process – learning-by-doing, learning-by-using and learning-by-interacting (Lundvall & Maskell 2000; Nelson 2004; Edquist 2005: 194; for overview see here Chang & Chen 2004: 27; OECD 1999: 39).⁶ However, these are the aspects which cannot be planned by government or any other actor in a direct way. This is particularly important, when to bring out that according to Lundvall & Maskell (2000) the success for innovation depends on long-term relationships.

Derived from the latter aspect, the evaluation of a technological system should be based on how different players (Carlsson et al. 2002: 233) and activities contribute to the functioning of the system as a whole (Högselius 2006: 37).

2. The change in the governmental organisational set-up and policy making – the rise of quangos

While analysing the effect of quangos on a NSI, it is important to understand why this kind of approach has been undertaken by policy makers. These are the “*diverse, competing and frequently conflicting claims*” about the advantages of creating quangos in public sector that make, however, the issue complicated (Manning & Matsuda 2000). Not to mention here that according to van Thiel (2004: 176) the quango proliferation is likely to be a trend rather than a deliberate choice.

In broad terms, the creation of (quasi-autonomous) non-governmental organisations in the public sector can be seen as an organisational development due to the need to be adapted to the environmental changes, in particular to the dynamic, global and technology-driven economy (Klay 1998; Goldsmith & Eggers 2004; Goodsell 2006; Bevir 2006; Massey 1997; for Central and Eastern European countries see here Drechsler 2004).

issues such as technological and sectoral specialisation and heavy investments in education has claimed to be also behind the success of catching-up countries in the 20 century (Högselius 2006: 45).

⁶ Besides that the NSI is dependent on a wider socio-economic system with political, cultural and historical influences as well as on economic policies (so-called ‘*broad*’ approach of a NSI as proposed by Lundvall) (see here Freeman 2002: 194; Lundvall et al. 2002: 225-226; Kuhlmann & Edler).

So, firstly, in order to manage with the dynamics of economic development and to manage with the complex and unpredictable problems often transcending organisational boundaries (Goldsmith & Eggers, 2004; Mintzberg 1996), also a government should use the public service delivery models of greater complexity (Goldsmith & Eggers 2004) and with wider external linkages (Trott 2002; Klay 1998). Secondly, the policy implementation kept at arm's length through specific agencies is believed to be more effective, efficient, credible (see here van Thiel, 2004), and innovation enabling (Goldsmith & Eggers 2004: 29; Shleifer 1998: 6).⁷ The other important aspect about the trend towards quangos is related to the peculiarities of high-technology, as brought out by Utterback (1996). According to him, because of the technological uncertainty the organisational structure in the early stage of the product development should be rather organic and opened for the frequent adjustments.⁸

When trying to find positive and justified explanations for the preference of engaging quangos in policy implementation, it can be said that the main driver behind is the lack of sufficient capabilities inside public sector to reflect and to affect changes in the economy (or in the society in general). As the result, the need for special agencies of specific knowledge and expertise (so-called '*best of breed*' providers) (Goldsmith & Eggers 2004: 29; see also Elgie 2006: 208; Bertelli 2006c: 585; Pliatzky 1992: 556), especially in the highly technical areas (Mattli & Büthe 2005: 418) together with more flexible organisational set-up has aroused (Milward 2000: 364; Milward 1996: 195).

More specifically, the reasons for the creation of quangos have claimed to be in ensuring better service delivery models which, on the one side, are keeping distance from the shifting political powers between different political parties and hence establish a credible commitment to policy outcomes (Bertelli 2006c: 586; Elgie 2006: 209; Massey 1997: 23; Pliatzky 1992: 556; for critics

⁷ At the same time, there are several theorists claiming that the source of innovation and economic success lies particularly in bureaucracies, e.g., Drechsler (2005a: 95) claims Weberianism to be an important factor behind the economic and social success in the transition countries in Central and Eastern Europe. The positive effect of bureaucracy on the growth in developing countries has been remarked also by Evans and Rauch (1999).

⁸ There are also other explanations for the creation of non-governmental organisations within the public sector. According to Thatcher (2002) there are four important aspects (PS! focus on non-majoritarian institutions): (1) it is the result of process of institutional isomorphism, or cross-national policy transfer, e.g., pressure from the EU to harmonise regulatory structures, (2) it is about long-standing state traditions, where delegation may be a normal part of the political process or be a radical break in current political practice, (3) it is the result of political leadership, or political entrepreneurship, something about party political agenda, and finally (4) it is a part of a wider process of state reform (New Public Management (NPM)) (see also Elgie, 2006). The implication about isomorphism has been found reflection also by van Thiel (2004; see also Pollitt et al., 2004) and the existing politico-administrative culture as an influence on the creation of non-governmental organisations by Pollitt et al. 2004.

see van Thiel 2004: 195), but on the other side, are more in touch with certain specific circumstances and environment (Peters & Savoie 1994: 422), and hence also with the needs of clients (*'increased reach'*) (Goldsmith & Eggers 2004: 28, 34; Rasmussen et al. 2003: 84; Pliatzky 1992: 556). The latter in its turn is providing favorable basis for innovation and creativity (through so-called *'feedback-loops'* and *'chain-linked model'* (Kline & Rosenberg 1986)) and for flexibility and speed as opposed to inflexible bureaucracies which tend to allegedly react slowly in new situations (Goldsmith & Eggers 2004: 31; Bertelli 2006b: 240; see here also Pollitt et al. 2004: 20). At the same time, this kind of approach tends to create instability in the system as a side effect (found evidence also in the case studies by Pollitt et al. 2004).

There are, however, considerable (possible), more severe problems with using quangos. The main issue here is related to the concern of supporting and maintaining public values, i.e., quangos represent a considerable threat to the public sector's accountability (e.g., Nelson & Winter 1982; Rhodes 1994: 151; Wisniewski 1992: 110; Peters & Savoie 1994: 423; Brock & Banting 2001: 155; Goldsmith & Eggers 2004: 12), responsibility (van Thiel 2004: 181; Milward 2000: 366; Drechsler 2005a: 101), and reliability (Drechsler 2005a: 95).⁹ The delegation of public authority may be seen as shifting the responsibility away from government, but also resulting in fragmented policy coordination together with goal congruence, contorted oversight, communication meltdown, capacity shortages and relation instability (for the most fundamental overview in these issues see OECD (2005) but also Goldsmith & Eggers (2004)).

The root of the problem is often in funding schemes. The delegation of public authority may be seen as shifting the funding responsibility away from government (Goldsmith & Eggers 2004: 34; Rasmussen et al. 2003: 84; see also Manning & Matsuda 2000), due to what, however, the public policy is often implemented in a greater *'resource squeeze'* than would be the case in a traditional way (Rasmussen et al. 2003: 90; Brock & Banting 2001: 5). Such resource squeeze is perhaps the main reason, along with a neo-liberal ideological background, why usage of quangos is seen to move public sector activities away from Weberian legalistic rationality (emphasis on the common good) towards economic rationality of efficiency (emphasis on the low costs but

⁹ That is, however, precisely the aspect why it is claimed that from all the actors in democratic government, the bureaucracy is the most preferred one, as it has the greatest capacity to carry out both rule (political power, financial resources, legal authority, technical skills, and professional knowledge) and response (links to elections, representative composition, external accountability, openness to change and acceptance of participation) (Goodsell 2006: 630), and to guarantee greater satisfaction with the services (see here Rhodes 1994: 150).

also customer orientation) (see here Samier 2005: 77-88). Further, the funding practices of quangos may have a negative influence on the implementation of public policy due to the changes in their original mission, and that correspondingly either: (a) to the interest of financiers, e.g., politicians who are controlling public finances allocated to quangos (Mattli & Bütthe 2005: 405; Greve et al. 1999: 140; Bertelli 2006c: 592; Bertelli 2006a: 242; van Thiel 2004: 181) or (b) to the interest of a third party (see here Pollitt et al. 2004: 4).

Secondly, the usage of non-governmental organisations may be seen as a way to provide opportunities for a so-called '*political game*' (Stott quoted in Bertelli 2006b: 239). More specifically: (a) to alter (even to skip) policy priorities and eliminate or reduce state programs (Brock & Banting 2001: 152), (b) to shift blame and so also responsibility for unpopular policies from the government to non-governmental organisations (Elgie 2006: 209; Mattli & Bütthe 2005: 402-403), and (c) to use quangos for patronage purposes (Bertelli 2006a: 233; Bertelli 2006c: 592; Wisniewski 1992: 110; Mattli & Bütthe 2005: 405; Manning & Matsuda 2000).¹⁰ In other words, although separation of ministries into separate organisations providing a single service may improve one aspect of service delivery, it appears to have a negative impact on other aspects (Peters 2006; Peters & Savoie 1994; Pollitt & Bouckaert 2004) – "*what effectiveness and efficiency bring about is always about a decrease in accountability and responsibility*" (Drechsler 2005a: 101). Further, Drechsler (2008) has argued that in order to support innovation and economic development, the public administration should be seen as appropriate instead of modern, innovation-enabling instead of innovative public administration itself, and oriented on investments and not on saving money.

The third important aspect in the issue of accountability is related to the loss of coherence and adequate control over the service implementation by the government.¹¹ The essence lies in the fragmented coordination mechanism (Goldsmith & Eggers 2004: 49; Rhodes 1994: 149, 151; Milward 2000: 363; Milward 1996: 194) and in the lack of ability to manage with instability (in order to guarantee relation stability in partnerships and maintain stable provision of services) (Milward 2000: 363; Milward 1996: 194). As the result, there can be serious discontinuities between what the public policy is about and what an agency is in fact doing (Lambright 1976: 6; Manning & Matsuda 2000; Peters & Savoie 1994: 422). Also the actual capacity of quangos to

¹⁰ For other, less noble motives, see also Pollitt et al. (2004: 20).

¹¹ It is also important to note that too much control is undesirable, as it may stifle the relations between organisation and political authority and so eliminate the reasons why public service delivery was placed in the hands of quangos in the first place (the question of certain autonomy) (Denton 2005).

deliver public programs remains questionable (Brock & Banting 2001: 1-2). This is particularly important in the cases, where quangos are created in the politically sensitive areas (see for Dutch case Pollitt et al. 2004: 71) and are charged with specific tasks requiring remarkable investments in knowledge, equipment, technology, and other assets (van Thiel 2004: 185). The other aspect of fragmented coordination is about decline in efficiency due to the functional and jurisdictional overlapping (Rhodes 1994: 146).¹²

Thus, as a conclusion it can be said that there are several pros and cons for organising government through quangos, yet it seems quite unclear from the literature how and in what way quangos actually affect the NSI. In order to consider this particular question, in what follows we take closer look at two case studies from Estonia. The model, which has been derived from the theoretical analysis and on which the empirical evaluation is to be based on is summed up in an illustrative way in *Table 1*.

Table 1. The possible positive and negative influence of quangos on NSIs

Core elements of a NSI	Positive influence of quangos	Negative influence of quangos
1. What is the field of specialisation (is the selection of the field justified)	- Provision of specific competence not available inside public sector.	- Actual capacity of quangos to deliver public programs in politically sensitive and technical areas.
2. Whether created organisations and institutions are adequate to each other and to the specific area	- Provision of flexible organisational set-up being in line with current economic developments; - Keeping distance from the shifting political power; - Being more in touch with certain specific circumstances and environment.	- Shifting the funding responsibility away from government; - Shifting the original mission of public policy; - Provision of the opportunities for a blame shifting; - Reduction in efficiency due to the functional and jurisdictional overlapping; - Loosing of coherence and adequate control over the service implementation; - Creation of instability.
3. Whether the formal system is favoring the informal one (especially about relationships)		- Creation of monopoly over the provision of certain service.

Source: author.

¹² Furthermore, in the case of quangos the problem about accountability is not only about the lack of democratic control from above (Rhodes 1994: 147; Bertelli 2006a: 232; Brock & Banting 2001: 155; see also Wisniewski 1992: 111), but is also about the lack of market control from below. Thus, autonomy may not mean only 'autonomy from the state', but rather 'autonomy from the market' instead (Greve et al. 1999: 140). The issue is more serious since by supporting the non-governmental agencies may give them monopoly over the provision of certain service (Peters & Savoie 1994: 422) and hence may influence business orientation and entrepreneurship in the area (Auplat 2006: 268).

This means that three aspects in the selected case studies (in biotechnology and ICT) will be emphasised: (1) the justification of the concrete projects or initiatives in the areas under discussion in terms of current necessities and available capabilities, (2) an overview of the organisational-institutional set-up of the areas, focusing mainly on managerial, regulative, funding, monitoring and cooperation issues, and (3) the analysis on the role of quangos: in what possible way and to what extent they have affected the outcomes in certain areas (NSIs), whereas taking into account the peculiarities and development phase of these areas.

3. Case studies from Estonia

3.1. Genome Project¹³

3.1.1. Background for undertaking the initiatives in the area

Biotechnology has emerged in recent decades as an independent field of scholarly activity and of business. Yet, biotechnology as an approach to genetic data and thus also to health and medicine consists of a variety of technologies, scientific and business advances that are in highly different stages of development. The emergence of this new area has in its own turn led to the establishment and the growth of large gene banks on an international level (in 2003, there were altogether 8 population-based genetic databases) (Kaiser 2002: 1158; Austin et al. 2003; Godard et al. 2004), that for many hold the promise of becoming ‘*gold mines for improving health care*’ (Kaiser 2002: 1160).

While analysing the Estonian background for undertaking the genome project and the largest of its kind in Europe (1 mln gene donors (Estonian Genome Project 2001)), it may be said that the necessary preconditions, especially in terms of social capital and of accumulated knowledge (see here Abramovitz 1986; Nelson 2004: 365; OECD 1999: 21) were in place and the selection of the high-tech project considerably reasonable. This is supported by the facts that Estonia has had a leading role in molecular biology in the world since the 19th century (thanks to Karl Ernst von Baer) and that Estonia’s main biotechnological competence lies especially in biomedicine with regard to both science and entrepreneurship (Tiits et al. 2005; Muuli 2005). Also, while evaluating the quality of science in the area, according to the *ISI Essential Science Indicators* database (from 2002), the largest number of high-impact papers (4 429) and citations of them (22

¹³ The research object in this paper is the first period of the EGP 2000-2007, as in 2007 considerable changes in the organisational-institutional framework were made. The past orientation as taken here is the best to analyse the organisational set-up of the project in terms of real outcomes, especially to what extent the stated goals of the project have been achieved and why a new management approach has been undertaken.

274) belonged at that time to the fields of chemistry, clinical medicine, and biology and biochemistry (Allik 2003: 41).

3.1.2. Formal and informal organisational-institutional set-up of the project

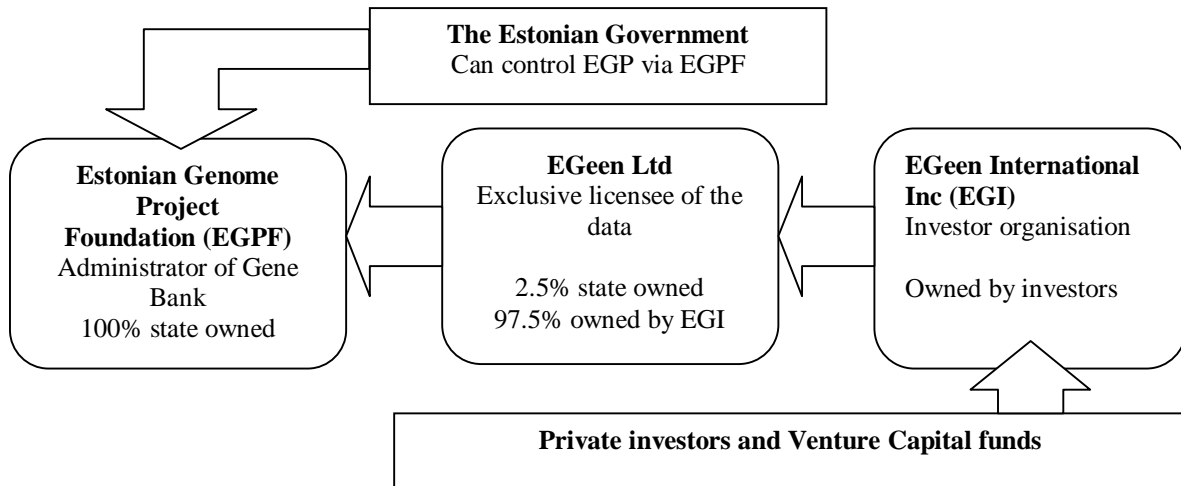
In 2001, the government established a necessary institutional and organisational framework for the EGP by enacting the *Human Genes Research Act* and founding a non-profit organisation, the *Estonian Genome Project Foundation* (EGPF), under the *Ministry of Social Affairs* to govern the project. In the same year, some additional changes were made in the organisational set-up, as the *EGPF* in its turn founded a profit organisation called *EGeen* to finance and commercialise the results of the EGP. In other words, from a public project became a venture capital project (see here also Kattel & Anton 2004 and *Figure 1*).

Although the organisational set-up of the project was transformed, the aim of the EGP remained the same as it was stated at first in the *Human Genes Research Act*. The orientation was given to systematic advances in public health in Estonia. These events occurred despite the fact that *EGeen* together with its parent company had been trying to push through a more disease-oriented approach. This is the approach which would have given more realistic incentives for the private capital to contribute to the project (Kask quoted in Ojakivi 2004), and that because of the research intensiveness, risk and time needed in genetics, and secondly the private sector's interest in more immediate results and capital return.¹⁴ Due to that the concept behind the project meant in practice that the long-term goal, which was oriented on improvement of public health, was tried to be achieved through private means, which are oriented, however, on short-term profits.

Further, it should be highlighted that the *Ministry of Social Affairs* being responsible for public health but also for the EGP in general did not have any competence for handling risky economic projects, the EGP turned to be (Government of the Republic Act, § 63 and § 67).

¹⁴ Not to mention here, that as the *EGeen* is a drug development company itself, the disease-based gene bank would have enabled to serve the best also the company's own private interests. See for the motivations of *EGeen* in the framework of the EGP also Menrad et al. 2002: 64-65.

Figure 1. The ownership structure of the Estonian Genome Project



Source: Anton & Kattel 2004: 119

The orientation of the EGP is particularly important as it influenced how the DNA samples were to be gathered. And as it was done according to the initial plans (containing only general information and arguably not what is needed in the case of specific illnesses (Rozental 2006; Kask 2005)), the project’s path was locked-in rather early, failing to motivate the private sector enough to contribute financially to the project. Furthermore, due to an overly wide orientation of the project and hence too high uncertainties and risks for the venture capital, in 2004, the contract with the main financier *EGeen* was terminated and the capital flows from foreign companies stopped. Altogether, the private company *EGeen* was able to intermediate 67 million EEK for the EGP during three years since 2001 (Estonian Genome Foundation).

The public sector’s financial support for the project was related to the appropriations of 1 million EEK in 2001 (and later in 2001, additional 4 million EEK as a loan from the *Enterprise of Estonia*) for activating the project, and after the termination of the contract with *EGeen* 4.3 million in 2005 and 6.3 million EEK in 2006 for covering the operating expenses of the project and for maintaining the DNA samples. Not to mention here, that together with the establishment of the *EGPF* the state broke its promise to finance the project in its early stage with 330 million EEK by itself (Draft of Human Genes Research Act 2000). So, as we can see, the public sector’s financial support for the EGP was not comparable with the one provided by the private sector. Further, as biotechnology is characterised by the great dependence on financial resources (Lasagna 1996: 228), the termination of the contract with *EGeen* together with uncertainty and instant financial inability of the government to act accordingly to the new situation and to support the EGP by itself, caused a serious resource squeeze for the project and during 2004-

2007 almost tied up its main activities: the main emphasis was given on the maintenance of DNA samples.¹⁵

On the one hand, the shift in the organisational set-up towards venture capital did not support to achieve the goals related to the EGP as were stated by the public sector, and neither did the set-up satisfy the interest of the private sector. On the other hand, one can ask whether this kind of financial scheme based on the venture capital was supporting the development of biotechnology in Estonia in the first place.¹⁶ After all, as biotechnology is still hazardous in its infancy, commercialising the edge of scientific research is an extremely uncertain business,¹⁷ supported by the fact that false starts together with serious setbacks and slower progress have been more frequent than successes in the area (Economist 2003).

As the *EGeen* got exclusive commercialisation rights over the scientific results for 25 years, its foundation meant severe restrictions for creating innovative environment at the scientific as well as at the entrepreneurship level in the field of genomics in Estonia.¹⁸ Firstly, there was a remarkable gap between scientists involved and not involved in the project, as the EGP was strongly related to the one of the universities in Estonia – the *University of Tartu* (consider the composition of the board of the *EGPF* (Estonian Genome Project; see also Rozental 2001)) and in this way was not able create enough synergy with scientists from other universities (especially *Tallinn University of Technology*).¹⁹ And secondly, the *EGeen*'s monopoly position over the database meant in practice a restricted access to and benefit from the EGP by the side of many other actors within the area of biotechnology in Estonia (see here also Anton & Kattel 2004: 111). This is particularly important, when to take into account the fact that scientists involved in the EGP were in a large scale related to their own small companies in the area of biomedicine (Kask

¹⁵ The only project which actually also enlarged the gene bank during the period under discussion was a cooperation project together with Latvia about cancer prevention measures in Estonia and Latvia (funded by the EU), in the framework of what additional 5 000 samples were gathered by the end of 2006 (see here Estonian Genome Project Foundation).

¹⁶ There appears to be a clear tendency to bring genetic databases under public universities and use direct public funding (e.g., Estonia, Latvia and Sweden). In essence this indicates that there is a growing realisation that the main scientific questions about genetic databases are not resolved and thus clear funding and management structures provide better conditions for these questions to be thoroughly researched (Kattel & Suurna 2008).

¹⁷ The main question, which derives from the early stage of the paradigm of biotechnology, is about uncertainty as to whether DNA samples, but also cures for illnesses, are commercial at all – the aspect, which is particularly important from the private sector's point of view. Spielman et al. (2007) show that more than 25% of the genes tested in an initial survey differs significantly between populations.

¹⁸ *EGeen* was obligated to make the annual payment of about 4.7 million EEK and additional fees depending on its financial success (unlimited annual profit payment of 0.5%; 3% of the turnover) for its right to commercialise the data (Sutrop & Simm 2004: 258; Anton & Kattel 2004: 119).

¹⁹ To be critical here, it is hard to give a clear general conclusion on how much the state regulations were affecting close relationships between the main actors in the framework of the EGP.

2004). As the EGP was not able to take advantage of and enhance the existing formal and informal environment in the area, it may be argued whether the NSI relying on the quango had supported the development of the area in a more long-term perspective.

According to the *Gallup Poll*, most of the Estonian population shared the opinion that the gene bank will have a positive influence on the Estonian economy, science and public healthcare and on the Estonian overall image. At the same time, there was an obvious distrust towards the institutions dealing with gathering samples and personal information because of the threat of possible leakage and abuse of the information and the use of data for unethical research (Korts 2007; Sutrop & Simm 2004: 258-259).²⁰ On the one hand, this is the question about the limited role of the *Ethical Committee* to secure the reliable usage of research results and to serve the interests in common. After all, the opinion of the committee was not legally binding for the research to be carried through in the framework of the EGP, and secondly, the *EGPF* itself had a significant influence over the nomination of members to the committee (Sutrop & Simm 2004: 160, see also Human Genes Research Act § 28, § 29).²¹ On the other hand, the distrust towards the project could derive from a minimal debate over the issue in society (Godard et al. 2004: 466).

We cannot say that only the involvement of the quango in the project implementation brought along accountability problems and so hindered the legitimisation of the idea about the gene bank enough in the society, however, the project's reliance on autonomous and hence on not such a transparent organisational form is a part of the problem. Today, when the project is a part of the university, the questions about transparency, monitoring and in overall about accountability should be solved in a considerably better way, as the activity of the project besides the *Human Genes Research Act* is also dependent on the *University Act*. This means that certain monitoring power over the project is given to the *Ministry of Education and Research* and to the *National Audit Office of Estonia* (*University Act*, § 52, 53).

²⁰ When 90% of the people polled acknowledged the positive effect of the gene bank on the Estonian development, only 24% were willing to participate in the project and 40% were sure in their non-participation (Korts 2007). Paradoxically, in order to avoid the negative experience of Iceland, the ethical issues were actually one of the primary topics while working out the *Human Genes Research Act* in Estonia (Explanatory letter for the Draft of Human Genes Research Act).

²¹ However, the public trust towards the *Ethical Committee* itself was rather high (70% of respondents) (see Korts, Weldon & Guðmundsdóttir 2004: 144). So, in the Estonian case the mistrust towards the project could derive also from the overall confidentiality problems in healthcare (Sutrop & Simm 2004: 260).

3.1.3. Outcomes of the project

In general, it can be said that the policy measures worked out in the framework of the EGP had no insights for encouraging innovation. **Firstly**, the usage of the quango did not provide sustainable basis enough for the development of biotechnology in Estonia. The main reason was in the unreliable flow of financial resources. Further, as the set-up of the project was relying too much on the private sector, in the case of difficulties, the government was not able to reorient itself quickly enough, especially in terms of financial support for the EGP. Due to that, the activity of the EGP was practically frozen for several years, meaning that building up of the NSI in the area of biotechnology was hampered seriously. **Secondly**, as the *EGeen* obtained monopoly power in the area, also the institutional framework was not supporting building up of the NSI in biotechnology. And that because of the considerable amount of scientists and companies which were not suppose to gain from the project; not to mention a lack of the attention to the creation of close interconnections here. **Finally**, the organisational set-up played a great role in difficulties to legitimise the idea of the project in the society. At the same time, the support of citizens is an extremely important input to establish the database of a large part of the population (1 000 000 DNA samples). By the termination of the contract with *EGeen*, the database had been able to store information only about 10 319 gene donors.

Today, the Estonian government has substantially changed its role in the project and followed the suggestion above. The Government has promised to exclude 120 million EEK for the EGP for the years of 2006-2009 to continue the activities of the EGP, and that as a scientific establishment under the *University of Tartu*. Also the main goal has been changed: the plan is a database with 100 000 gene donors by 2010.

3.2. e-Learning in Estonia²²

3.2.1. Background for undertaking the initiatives in the area

The educational sector is seen as the determining factor in the drive towards competitiveness and growth in a knowledge-based economy (Stevens & Weale 2003: 26 29; Temple 2002: 41). It means that the educational sector should reorient itself and take advantage of the technological developments under the current paradigm of ICT, and at the same time provide inputs for future innovations and technological breakthroughs; in other words, educational policies must be paradigm-centered (Perez 2002; see here also Kattel & Kalvet 2006). In reality this means that

²² *e-Learning* is defined as learning through the usage of ICT. It encompasses the use of ICT in traditional education (primary, upper-secondary, vocational and higher education).

new skills (technical, intellectual and social) are becoming essential for living, working and participating actively in a society (the e-Learning Action Plan 2001). As a matter of fact, e-Learning is seen by the European Commission as the main mean to respond to the challenges of the knowledge-based society (see here i2010 – Annual Information Society Report 2007; e-Learning – Designing Tomorrow's Education 2000). As Estonia is characterised by having both the well-developed ICT infrastructure and the area of e-services (see here Eurostat), the current challenge is to build up respective social skills to take most of these developments. Due to that, increased attention has been given to the teaching of specific ICT competences, moving slowly towards the usage of ICT-applications in everyday learning process. This trend is illustrated by the several projects undertaken by the Estonian public sector together with some of the leading actors in the private sector (ICT companies, banks, telecoms). These projects have greatly improved the ICT infrastructure together with respective skills at schools and in regionally remote areas as well.²³

The other essence behind the trend of e-Learning lies in the need to increase participation in education and training (including lifelong learning), for that more flexible delivery to meet the students' needs at time, place and of their own learning pace together with improved quality and cost-effectiveness of education is foreseen (Osborne & Oberski 2004: 414-421). At the same time, policy initiatives undertaken in the area have given very controversial results, due to which e-Learning industry has been a victim of much hype and has not produced expected growth (Pailing 2002: 151, 154).²⁴

3.2.2. Formal and informal organisational-institutional set-up of the area

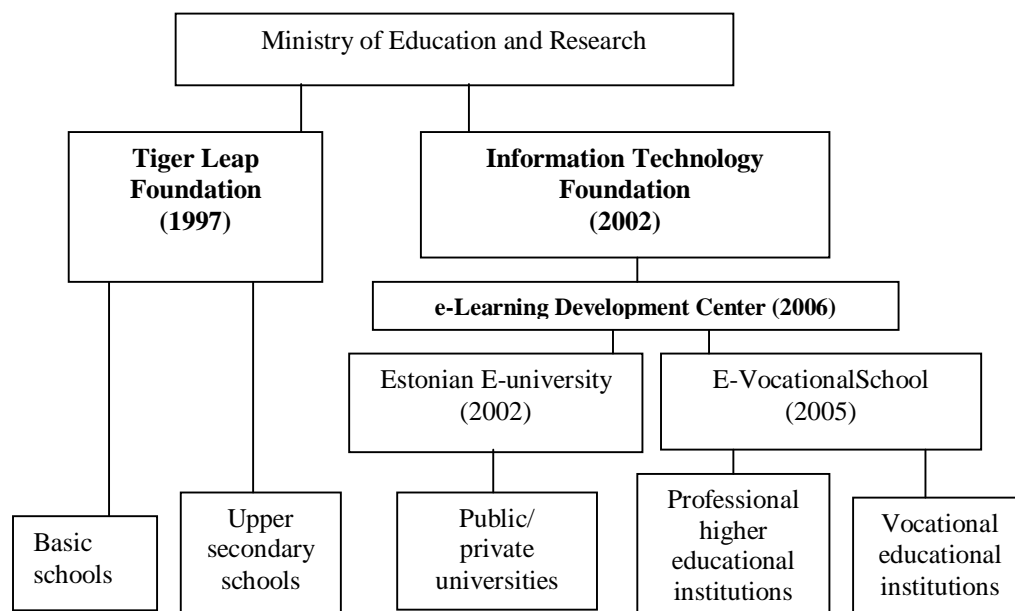
The direct responsibility in the field of e-Learning falls mostly upon the governmental non-profit organisations, such as: (a) the *Tiger Leap Foundation* (TLF) (focusing on general education); (b) the *Estonian Information Technology Foundation* (EITF) together with consortiums under its authority; (c) the *Estonian E-university consortium* (focusing on higher education) and (d) the *E-*

²³ These developments include: (1) the realisation of different *Tiger programs* to provide schools and universities with computers and Internet connections and to support the usage of ICT in the everyday learning process; and (2) the implementation of projects such as *Look@World Training Project* to contribute to the development of people's basic ICT skills.

²⁴ It is interesting that national developments in most EU countries in the area of e-Learning were not very substantial up to the year 2000, although the development was supported by strong policy initiatives. More than four years later the situation appeared very differently – although e-Learning was down in policy discourse, it was up in practice – the e-Learning market was showing a growth rate of 30% per year (European ODL Liaison Committee 2004). One of the important factors behind may be the realisation about the limited usage of e-Learning, being more successful when used as a complementary method of training together with traditional one (so-called '*blended learning*' or in particular '*mixed mode*') than completely replacing the latter (Bates 2004).

Vocational School (focusing on vocational schools).²⁵ Although all aforementioned organisations have been established under the auspices of the *Ministry of Education and Research*, they implement policies independently as agencies.²⁶ See *Figure 2*.

Figure 2. Management plan for developing e-Learning



Source: largely based on the Strategy of the Estonian e-Learning Development Centre 2007-2012

The non-profit organisations such as the *TLF* and *EITF* as well as the *e-Learning Development Center* have all developed out strategies and programs of their own in the field of e-Learning.²⁷ In addition, some universities, like the *University of Tartu*, the *Tallinn University of Technology* and *University Nord* have set their own strategies in the field of e-Learning; at the vocational education level 25 members of the current consortium are working out their respective strategies in 2008 (*E-Vocational School 2008*). The main ICT priorities (including e-Learning) are set by the *Department of State Information Systems* in the *Estonian Information Society Development Plan for 2013* (allegedly in cooperation with the *Ministry of Education and Research*). There are also some other national strategies and policies that address the issues of e-Learning.²⁸

²⁵ Since 2 May 2006, the e-Learning Development Center has led the activities of both the Estonian E-university consortium and E-Vocational School.

²⁶ It is interesting to note here that also in general the efforts of governmental institutions to build up an information society in Estonia have been coupled with those of non-governmental organisations (Kalvet 2004: 17).

²⁷ These are about the *Tiger Leap programs* since 1997, *Tiger University programs* since 2002 and the *Estonian e-Learning Strategy in Vocational and Higher Education 2007-2012* (formerly e-Learning Strategy of the Estonian E-university 2004-2007), respectively.

²⁸ They include the *Implementation of the EU Structural Funds – Single Programming Document 2004-2006* (followed by the *National Strategic Reference Framework 2007-2013*), which has been especially influential from

So, this kind of extremely diversified organisational set-up has in its own turn resulted in the myriad of strategies and programs promoting the area. However, all these aforementioned strategies and programs are practically disconnected from each other. Even the closest action plans that are administered by the same institutions (e.g., *Tiger University* and *e-Learning Strategy of the Estonian E-university* under the *EITF*) do not to have shared goals, priorities, etc. (Laanpere 2006).²⁹ This chaotic situation means that there is no consensus in Estonia about the role of ICT at different formal educational levels or about how the available e-Learning applications, environments and content should be incorporated in the study process. Not to mention, that there is no common interpretation of the term ‘e-Learning’ that results in negative stereotyping (often blamed for abolishing the so-called ‘human touch’ in the learning process) (see for opposite opinion Leinonen, Muukkonen, Hakkarainen & Mielonen).

Secondly, as Estonia has been relying on non-profit organisations, schools and universities, and local initiatives, this kind of decentralised system has resulted in the lack of a coherent system for policy formulation and implementation in the area of e-Learning. In other words, there is not enough cooperation between respective foundations, between schools at different levels as well as between central and local levels. As the emergence of e-Learning into learning process can still be considered to be in the early phase in Estonia, which means in its turn that there is limited knowledge available in the area; this kind of close interaction between relevant actors should be of utmost importance. In other words, apparently the activities (especially of the Foundations) remain limited, if there is no support from the *Ministry of Education and Research*; meaning also that there is no connection created between new and current learning processes. The role of the *Ministry of Education and Research*, which should be the central coordinating unit of e-education in Estonia, has been limited to consenting to allocate money to *TLF* and *EITF* from the state budget and to *INNOVE* from the ESF funds, and to the establishing several information

the financial aspect (see below), the *Estonian Higher Education Strategy for 2006-2015* and *Lifelong Learning Strategy 2005-2008*.

²⁹ Also, the only link connecting the recent strategies in the field of e-Learning (especially the *Strategy of the Estonian e-Learning Development Centre 2007-2012* and *National strategy for using EU structural funds in 2007-2013*) is mainly about how to support the development of web-based courses and materials through the usage of EU structural funds. Even more, the coherence of and support to the goals stated in one strategy, e.g. the *Estonian e-Learning Strategy in Vocational and Higher Education*, is questionable. As the strategy was born out of the *Estonian E-university* consortium and not at the national level, one may argue whether the strategy is applicable to universities or higher educational institutions outside the consortium (Laanpere, 2006). Further, one can question to what extent the Strategy reflects the universities’ own future plans for e-Learning – considering how rarely the representatives of universities meet in the framework of the consortium, and how big a role they can actually play (especially in the situation when since spring 2006 the *Estonian E-university* has belonged to another umbrella organisation, the *e-Learning Development Centre*).

systems in education, which, however, can be rather regarded as the by-products of e-Government services than educational ones.³⁰

The term ‘*e-Learning*’ or ‘*web-based learning*’ is not to be found in any legislative document related to educational area in Estonia. This means that the initiatives of the area do not have a legal base behind them:

- According to the *Regulation of National Curriculum for Basic Schools and Upper Secondary Schools* ICT is not a compulsory course neither at the basic nor upper secondary educational level. At the same time, without making a paradigmatic change in curriculum of general education, there is no hope to expect progressive usage of ICT in the learning process, and that also at the next educational levels;
- The existing ICT qualification standards for students (except the skill requirements for the 9th grade), teachers and principals are inadequate (these standards should have been worked out by 2001);³¹
- The teachers’ (including principals’) participation in ICT-related in-service training has been voluntary. However, according to the *Basic Schools and Upper Secondary Schools Act*, the usage of ICT in everyday learning process is dependent on principals and their competencies, the insufficiency of those may result in unequal study conditions for students in different schools and at different educational levels;
- There is no legal requirement for teachers to use ICT in teaching the subjects (National Audit Office of Estonia 2003). Even more, there is no reference to the usage of audio, audiovisual or electronic materials as additional teaching aids for teaching different subjects in the *Terms and Order of the Correspondence of Textbooks and Workbooks to the National Curriculum* (2007);
- The legal framework for teacher remuneration system is inadequate and not in line with the current developments in the area of e-Learning. The teachers’ salary is based on the number of classes and courses they teach, leaving the use of ICT-based learning to be dependent on the willingness of teachers to use new forms of teaching. Apparently,

³⁰ E.g., *Estonian Educational Information System (EEIS)* and *Admissions Information System (SAIS)*.

³¹ Teachers’ and principals’ ICT qualification standards are dependent on the *Framework for Teacher Training* (2007), which handles the issue very briefly, and on the *Professional Standard for Teachers* (2005), which is not legally binding. A positive development in teachers’ ICT qualification is that the *TLF* has been working on a promising framework for e-Learning related competencies of the teachers. However, this framework has not been finalised, legitimised, or implemented (Laanpere 2006).

teachers have no particular skills, motivation and time to use ICT in the learning process, not to mention, to prepare web-based learning materials on their own;³²

- At the general educational level, the existing ICT infrastructure in classes other than special computer classes is considerably lower than the EU average (Empirica & TNS Emor 2006).³³ In higher education, more special technical equipment (e.g., for videoconferencing) is needed. Essential barrier for the future are also the limited possibilities for the exchange of digital data (e.g. student information) inside and outside Estonian educational and training institutions, as there are no common agreed data formats and database structures and no interactivity between the currently available Learning Management Systems (LMSs), Content Management Systems (CMSs) and Study Information Systems (SISs) (see here also Suurna & Kattel 2008);
- The inefficiency of e-Learning public policy in ‘*soft areas*’, especially in the content producing, where the main content owners (e.g., Estonian TV, radio, publishers) have not been involved in e-Learning development projects (Laanpere 2006). At the same time, it is clear that Estonian educational and training market is too small to create a business potential for learning materials written in the Estonian language.

As we can see, all aforementioned aspects are the ones which require the involvement of the state in guaranteeing necessary and favourable environment for the development of ICT in education – such as standards, qualifications, training, teachers remuneration system, infrastructure, and content, otherwise unequal study conditions may occur for students in different schools and at different educational levels. Based on the distinction between different development phases of e-Learning (HELIOS 2006), it could be said that the first generation of e-Learning that is characterised by the enthusiasm and rejection at the same time, is still prevalent in Estonia.

The developments at the vocational and higher educational levels have been relying very strongly on the availability of resources from the EU structural funds.³⁴ At the same time higher

³² The latter is also related to the problems about authorship rights, especially the resistance of teachers to share their digital content (Suurna & Kattel 2008).

³³ The contradiction here lies in the facts that 70% of financial resources in general education level have been directed to maintaining and improving the schools’ ICT infrastructure (see here Suurna & Kattel 2008). According to the *Programme of the Coalition for 2007-2011*, the issue of ICT infrastructure is in the agenda. The Coalition has promised to give each teacher a laptop computer and launch a program aimed at granting each student in the basic school with technical access to computers and the Internet at home and in school.

³⁴ Actually, financial support for projects related to e-Learning under the *European Social Fund* (ESF) measure 1.1 comprises one of the biggest parts of the ESF budget (Foundation for Lifelong Learning Development

education is the level that is supposed to create some kind of linkage to lifelong learning. In other words, if there is not enough strong development at the higher educational level, there is also no hope for the spill-over of specific knowledge from the area of ICT to the society in general. This statement is particularly based on the concept by Lundvall (2007) who sees the economic development to be highly dependent on the changing role of higher education, due to which the graduates should rather be seen as innovators and equilibrators than just educated persons. In the area of lifelong learning it is possible to bring out only the financial contributions by the private sector, especially those related to the *Look@World Foundation's* initiatives that have been, however, rather extensive (about 39.9 million EEK over a three-year period from 2001 to 2004) (Vaata Maailma 2004).

In reality, notwithstanding the limited financial support, the state has no financial responsibility for the development of the field. In the *Strategy for State Budget 2007-2013*, e-Learning has not been brought out as a priority and hence there are no extra financial resources foreseen by the state in this area for the next years. At the same time the availability of the EU structural funds that has been greatly relied on, has to a certain extent hampered the country's drive to build up its own e-Learning system and support due to its financial logic and has contributed to Estonia's focus on a project-based approach.

Not to mention that the only political survey in the area of e-Learning carried out under the authority of the *Ministry of Education and Research* was aimed at the assessment of the EU's impact on the national e-Learning strategies, financed by the EU structural funds in the framework of the REDEL project. The non-profit organisations, as the main actors of the field, should carry out surveys of their own. To date, only two surveys have been carried out under the *TLF's* responsibility (ordered from the *Tallinn University*).³⁵ The *National Audit Office of Estonia* has carried out six audits within the period 2001-2006 in the field of ICT, however from which only one is about evaluating ICT infrastructural issues in general educational schools. Also, the implementation of the overall priorities of e-Learning as stated by the *Department of State Information System* cannot be assured in reality, as belonging under the authority of the other ministry, this department does not have necessary political power. This all means that there

2007). For instance, the *Estonian E-Vocational School* holds the biggest project called *e-Key* financed under the ESF measure 1.1 – the overall cost of the project is about 35.8 million EEK, from which 26.8 million EEK is covered by the EU structural funds.

³⁵ These are: (1) *Tiger under Magnifying Glass* (for the period of 1997-2000) and (2) *Tiger in Focus* (for the period of 2000-2004). Currently *Tiger in Focus 3* is in process.

is no sustaining organisational or legal system that would guarantee the fulfillment of the priorities of e-Learning in Estonia.

3.2.3. Outcomes of the initiative

The contemporary e-Learning policy has been particularly successful in creating ICT infrastructure at general school level (see here EEIS 2006), including also some e-Learning services like web-based grade-book *eSchool*, LMSs and CMSs like VIKO and KooliPlone, web-based learning materials and learning object repositories like *Miksike* and *Koolielu*; and supporting the development of web-based courses, materials and curriculums, but also the creation and usage of LMSs (IVA, WebCT and Moodle) at vocational and higher educational levels. At the same time, aforementioned developments have not affected the usage of ICT as expected: (1) at general level, the time students spend learning with ICT at school has not increased (Toots, Plakk & Idnurm 2004: 11-18) and the share of the Estonian schools that use computers for teaching (other than special computer labs) is only 28% (Empirica & TNS Emor 2006), (2) at upper-secondary and higher educational level, ICT in education is mainly used for administrative purposes, e.g., for communication with schools and teachers (89% of those using the Internet), for enrolment to a course or a school (51%), for having one's results of national exams delivered by SMS or by e-mail (21%), and for registering for state exams (14%) (Department of State Information System 2007, 92; the same is the case with lecturers, see here Laanpere, Läheb & Plakk 2004: 10). In Estonia, the level of Internet skills is rather high and comparable to the EU average, while the level of computer skills, and even more so the level of Internet interaction skills are considerably lower (see here Empirica 2007, 36). Additionally, the current policy has failed to address the issues about high digital divide and e-exclusion, in other words, there has been lack of attention on older, lower-educational, poorer and Russian-speaking population groups. This means that the Internet usage is highest among students (98.1%) and employed persons (71.4%) (Statistics Estonia 2007). Due to this the question raises how e-Learning can thus mitigate the problem of lifelong learning in Estonia.

In summary, it may be said that ICT-related progress in the area of e-Learning in Estonia has been rather demand-driven than policy-led and led by the misunderstanding that ICT-supported learning is an objective in itself. That kind of '*policy of no policy*' may become the serious obstacle in the future – the development in the area cannot depend only on the new means available, but should deeply consider how to, and with which means actually, support the quality

of education and socio-economic changes. One can describe e-Learning in Estonia as being in a stagnation phase that is characterised by disappointment in policies and hence by low growth. The adoption of the *E-memorandum* in September, 2006 and its orientation to students and teachers rather than policy makers, expresses most explicitly the current attitudes towards e-Learning and its development.

4. Discussion and conclusion

The aim of this paper was to analyse what is the impact the trend towards decentralisation and involvement of quangos in public policy have on the functioning and performance of a NSI in certain areas. Derived from this, an analysis was carried through in the field of quangos from the perspectives of public administration and economic theories. In addition, an analysis of the concrete case studies was needed to explore the theoretical implications (especially those related to innovation) in practice, as the actual effect of quangos on a NSI remains unclear from the literature. However, also based on the case study analysis it may not be plausible to conclude that the near collapse of the EGP and the current ‘stagnation’ phase in the area of e-Learning is precisely the result of the involvement of quangos in public policy framework. Further, as the case studies show the reasons for and the outcomes of using quangos in policy implementation may have certain similarities but also variations in different areas, even if these areas are similar in some aspects (e.g., characterised by the same development phase) and are related to the one country.³⁶ Hence, this paper is to bring out the main examples of possible positive and negative influence of quangos.

While analysing the background and readiness of Estonia for the projects discussed in this paper, it may be said that the necessary preconditions were in place and the government’s initiatives in the so-called ‘*core technologies*’ of the current techno-economic paradigm of ICT and of the possible future paradigm of biotechnology considerably reasonable. The e-Learning initiative can be regarded as an attempt to renew human resources for available highly-developed ICT infrastructure and e-services, and the EGP case as an opportunity to take most of the new emerging technological trend for already existing knowledge and competence in the area, and in this way to support building up the knowledge-based society in Estonia.

The implementation of public policy through autonomous non-profit organisations in the cases of the EGP and e-Learning is supported by the facts that (1) both are highly technical areas that

³⁶ The same claim as been found evidenced also by Pollitt et al. 2004: 252-253, 256-257.

require specific knowledge and capabilities obviously not available inside the public sector, and (2) both are still in the early phase of their development and hence represent the areas of high sensibility, which in turn supports the implementation of the projects away from shifting political powers, especially when we take into account Estonia's current political instability (Randma-Liiv & Tõnnisson 2006: 4) and over-politicised context (i.e., that the strategies are too much influenced by the changing political ideas, and hence not conducive for setting long-term goals with a stable financial footing).

Besides desired flexibility and the provision of specialised knowledge, this kind of organisational-institutional set-up has also brought along a considerable chaos in the implementation of respective public policies. This paper has argued that the decentralised organisational set-up has caused serious problems in policy impact and can be seen rather as a tool used by the government to shift responsibility (including financial) from itself.

In both areas the government has failed to achieve the stated goals or has not been able to state the goals in the first place. This can be illustrated by the multiple actors engaged in one area as well as by the number of single strategies and programs undertaken in the field, which are not sharing common goals and have not been able to create synergy and functional coherency (this is particularly the case of e-Learning). The creation of quangos may be also seen as a way for '*blame shifting*', and that particularly in the case of EGP, where the usage of quangos provided an opportunity for altering the original policy program by the government. Hence in both areas the usage of quangos has resulted in the lack of an overall consensus on the main goals to be achieved, according to which a supporting legal base with necessary financial footing and monitoring system would have been established

In addition, the organisational system relying on quangos has favored the conditions to press through market-based funding (in broad terms also EU structural funds can be seen from this aspect). Not to mention, that in the case of the EGP, the market-based organisational-institutional context was even used to achieve public oriented and hence rather broad and ambitious goals. As the result, the so-called '*resource squeeze*' seems to be a logical outcome. At the same time, the areas under discussion are described by high uncertainty and learning intensity and by a need for heavy and steady investments, as it is specific to the initial stage of scientific and R&D activities and to the areas of high-technology. It is important to note that through the involvement of

quangos in policy implementation, the government has missed to create favorable conditions for the areas in terms of stability.

The other important aspect the state has missed in its innovation policy is about creating interconnections and synergies between the main actors of the NSIs in a way that the projects would have not served only the interest of a few actors: the EGP was rather serving the interest of the *EGeen* and the initiative of e-Learning was too much concentrated on and led by the activities of the *TLF*, *EITF* and the respective consortiums. In this way the initiatives presented in this paper were not able to take advantage of and enhance already existing formal and informal environments in their specific areas. In the case of the EGP, the *EGeen* (because of its exclusive license) is a good example of how the decentralised set-up, the lack of democratic control from above and the lack of market control from below have given a monopoly over the provision of the service to a certain actor. Due to this, however, interaction within the area has been hindered and accountability issues risen up (e.g., public distrust into the project). As in the case of e-Learning, the key role has been played by the quangos, the attention given on the developments taking place on lower and local levels has remained limited by the government. In this way the so-called '*communication meltdown*' seems to be the intentional aim of the government rather than the problem to tackle with (consider also the minimal monitoring over the priorities in the field). In addition, in the field of e-Learning certain functional overlapping between different organisations may be seen.

To sum up, it may be said that, although the Estonian government has followed the suitable organisational-institutional framework (as brought out in theory) to handle the current '*core technologies*', it has not taken over the '*common sense*' of the paradigm, which relies in the change in a way science and educational policies are actually supporting economic growth (Perez 2004), meaning that policy makers have failed to capture the richness of the NSI and have seen it too much in linear terms. After all, although a decentralised organisational set-up may enhance some kind of flexibility, it does not automatically guarantee the effective implementation of policy and that especially in terms of interaction and close relationships, which are considered to be the core in innovation process. One should learn here that while implementing innovation policy the importance of feedback loops should be considered of utmost importance.

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