New Public Management as a trigger and impeder in usage of new medical technology in public healthcare

Sofia Wagrell
STS centre
Uppsala University
Work in progress

Abstract

Keywords: resource interaction, medical technology, scientific use, technology embedding

The incessant contemporary debate on scientific progress puts much emphasis on economical consequences of scientific breakthroughs, especially so on a policy level. Scientific research is supposed to generate fast profit innovations, in the shortest time possible to the content of the society as a whole. This belief in scientific progress and new technology is evident also in the healthcare sector. During the last two decades, Swedish healthcare has been characterized by cutdowns and introduction of new economical models derived from the private sector. The largest public hospitals in Sweden today have typically applied an atomistic view in running their "business", where competition (among public hospitals), market shares and sold healthcare are lead words to become a profitable organisation (Suurküla, 2007; Christensen, 2009). An overall profit awareness within public healthcare has created a surge for new technology as a tool to rationalize treatments in times of economic despair.

This empirical case study presents the struggle to embed a high-tech medical method, in the field of urology, into users resource structure (Håkansson & Waluszewski, 2002), in public health care. The method, launched by a company named ProstaLund, is a result of a highly user-driven process where interaction between users (medical doctors) and producers was crucial. The method is called PLFT *ProstaLund Feedback Treatment* and derives from the general microwave technology called TUMT, *Trans Urethral Micro Thermotherapy.* It offers a high-tech solution for the common disease, Benign Prostatic Hyperplasia (BPH), enlargement of the prostate. The technology of TUMT evolved during the late 1980s as an alternative to surgery, the standard procedure for active treatment of BPH. Today, TUMT is scientifically proved to give a more patient friendly treatment of BPH and claimed to be a more economical solution. When one of the largest urology clinics in Sweden decided to invest in PLFT, they did so within the frames of rationalistic economic thinking. It was supposed to become fast and full adoption of the new PLFT method, an "overnight" change where PLFT *replaced* surgery. An implementation to a large extent forced through by policy. It turned out to be a short-lived project where the old treatment methods of surgery were brought back in and the new technology fast was ruled out much due to high productivity pressure.

Preliminary conclusions concern the difficulties of integrating new technology into an organizational landscape of already established resources, the fact that even if users are willing to work hard towards change there are stable features in existing resource interfaces, which uneasily undertake technological change. The paper puts a special focus on the role of NPM ideas as both a trigger and an impeder of new technology in public healthcare.

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1. Introduction

Swedish public healthcare is today under hard economic pressure (Christensen 2009, Beckman-Suurküla 2007, Vinsa, 2007). With a constantly growing population, extended length of life the public healthcare sector is continuously expanding why higher efficiency in producing healthcare is a necessity for the irreducible equation of healthcare economy to become consistent. Contemporary policy occupies much of its time to supporting the life-science sector to achieve an excellent business climate (Näringslivsutveckling region Skåne, 2009). But policy is attendant in both production of life science and a using context where new technology is brought into active use, the public healthcare sector. Policy is thus on the one hand trying to enhance innovating forces of science to strengthen business and make the economy to thrive while at the other reorganizing public healthcare - with ideas obtained from NPM - to enhance productivity. (Pollitt et. al 2004 p.8, Hood 1991, Hood 1995).

In the *medical field* new science and technology are moreover expected both to improve the quality of people's life, by defeating serious diseases, and to reduce the burgeoning healthcare costs through a higher efficiency. Since New Public Management conquered larger parts of western societies during the late 1980s and 1990s new focus on efficiency and productivity has to a large extent characterized public healthcare administration in Sweden (Pollitt et. al 2004). New high tech solutions have because of new economic orders in public healthcare often been embraced as fast solutions to higher efficiency (Pedersen 2007, Malmberg 2010, Norlén 2007).

This paper intend to shed light on the some times contradicting conditions - in the light of NPM as both a trigger and an impeder - for new technology to become embedded into a user setting. The aim is merely to further underline the troublesome task to economize upon innovations and to illustrate how NPM in many senses bring forth managerial practises both triggering and impeding new technology to enter a user structure. The paper further builds on a discussion initiated by Wagrell & Waluszewski (2008) in *"The innovating process and its organizational setting, fit or misfit?"*. Relying on an interactive perspective the authors show how a new technology's benefits are dependent on contextual prerequisites i.e. investments in place, and point to the complex task for a technology to become embedded into a structure of use (Utterback & Abernathy 1975, Håkansson & Waluszewski 2002, Baraldi 2003). The paper continues to discuss embedding of new high-tech medical technology, but extend the discussion to concern other organizational impediments derived from NPM ideas.

1. Theoretical underpinning

A traditional view of companies and their business activities, to a large extent derives from theories in economics where the market exists as an imaginary structure, characterized by competition where choices of business counterparts are driven by the price mechanism. Empirical work, collected by the IMP group during the seventies though gave a different view of companies and the market. Companies seemed to have a high degree of cooperation rather than competition. Contradicting a traditional atomistic view of the market empirical observations pointed towards network structures between firms and organizations, structures evolved from the establishment of relationships. Networks also showed to be rather stable structures, explained by interdependencies within relationships and their successive evolvement over time. Once companies enter into a relationship, it is regarded as an investment where the parts adapt to each other. The adaptation explains firstly the reluctance

to switch suppliers or distributors because of costs, knowledge exchange and so forth, and secondly why evolved structures tend to be stable (Håkansson & Snehota, 1995:25).

Today there are many different network theories; ANT – Callon (1991) Latour (1987, 1999), Law (1994), strategic nets Möller et. al. (2007, 2003) social networks Powell et al. (1996, 2002) Uzzi (1997). The one constituting the theoretical base in this paper is the "4R" – framework, derived from thoughts within IMP, focusing on resource interaction within relationships. A central stance within this framework is the one of resource heterogeneity, stating that the value of a resource is reciprocally created in combination with other resources (Penrose, 1959). Through interaction, resources change their features or shape when adapting to each other, new combinations create new resources and through new combinations "quasi organizations" are settled between companies. The interdependence between resources emerges from the fact that they are created and shaped in interaction processes. The core issue is thereby how the specific features of single or combined resources are developed and embedded into each other through interaction (Håkansson & Waluszewski, 2002:33, Håkansson & Snehota 1995, Håkansson et. al. 2009). The notion of connectivity is yet another concept extending the interdependence and stability in networks; stating how effects of resource combinations within the focal relationship will have consequences on connected resources, outside the focal relationship and thus in the whole network, as well.

The 4-Rs model includes 4 categories of resources; *products, facilities, organizational units and relationships*, where the former ones are physical and the latter social (Håkansson & Waluszewski, 2002:33).

Within traditional marketing theory *products* are often treated as given, something the customer choose to buy or not. Instead, from an interactive perspective the features of products are consequences of interaction between companies. Due to already established structures such as technical path dependencies, companies tend to create interdependencies when interacting with each other. The prerequisites in these network structures will in turn affect the features of products. Any kind of artefact can be considered a product; raw materials, components or end products ready for use. (Håkansson & Waluszewski, 2002:35)

Facilities are a second type of physical resources referred to as for example production plants, research facilities and warehouses. In linking facilities to each other companies are able to save time and money and increase learning.

An *organizational unit* is a resource of social character referring to the knowledge, competence, organizational structure, routines and skills bound in an organization through its personnel (Håkansson & Waluszewski, 2002:36). The continuous interaction with others within the same network affects the content and skills and how they develop over time as an organizational unit. Also the ability of the unit to cooperate with its counterparts makes part of skills involved in dealing with interaction

Finally, *business relationships* are a special type of resources that to a larger degree are time-dependent, because of past and present interactions as well as expectations on future activities. A relationship is then a result of interaction between business units over time (Håkansson & Waluszewski, 2002:37). Relationships look different and vary in their disposition and content. A relationship can be "thick" in that it contains many levels of cooperation; knowledge exchange, integrated production and product development and

utilizing the same facilities, it can also show a more transactional character with low complexity exchange.

Analytically the interplay between resources takes place on three levels: *economical, technical* and *social* where the social level refers to skills and knowledge bound to a resource (Baraldi, 2003). Investigating the different levels of interaction between resources their *interfaces* (Håkansson &Waluszewski, 2002 pp.199- 212) become important to understand how the resources are connected and interact. It is possible to distinguish three different kinds of interfaces, derived from the above categorization of resources;

Social interfaces – interaction of resources of social character, business units and business relationships.
Physical/technical interfaces – interaction between resources of technical/physical character, namely products and facilities.
Mixed interfaces – interaction between a resource of social charter and a physical/technical resource.

In short the 4R model investigates how the value of a resource is affected when combined with other resources, both inside and outside company boundaries. Thus what is of importance is then not only the resource it self, but the content of what is in-between resources, this helps to understand how resources are connected to each other and the effects of different combinations. In the specific case presented in this paper it helps to shed light on how a technical resource is embedded with other resources in a user setting.

Focusing on resources interaction in studying science and technology has an implicit deconstructing effect of the phenomenon studied. Deconstructing means that processes and artefacts are broken down into resources and resource interfaces, which in a web of interconnections illustrate a complex structure of scientific content. Deconstructing science, or as Latour put it "opening up the black boxes" of science and technology (Latour, 1987), enables otherwise hidden content of science to be brought into light. During the construction and development of a technical artefact, social aspects as investor money, strategic/political decisions, interpretations by others and so forth are intertwined with purely technical knowledge and components. In a ready-made solution – as a high-tech device - these social aspects of a technology are barely physically apparent; rather they are hidden and often taken for granted. Unfolding the multitude of components embedded in a technical/scientific device enables a new opportunity to discover social and technical features pointing towards the *effects* of science and technology in activated structures of use. The effects of scientific work are in turn related to *value* of scientific work. From an interactive perspective scientific value is attained when a claim or artefact is acknowledged among others i.e. connected in a structure with other resources. Accordingly no discrepancy is made between scientific claims and technical artefacts since they stand before the same problems; convince others, gather sufficient resources and to achieve diffusion in time and space (Latour, 1987 pp.29, Håkansson & Waluszewski, 2002).

Given the aim of this paper, the 4R's will be used as a tool to deconstruct the focal innovation and its user context into resources, enabling technical and social features to appear and point to interdependence or lack of the same. Focusing on resources and their interconnectedness, the concept of interfaces becomes an important tool to understand the content and outcome of different resource combinations in which the innovation is embedded.

2. Methodological concerns

The empirical study of embedding the focal medical technology, PLFT encompasses a single case study (Easton 1995). Semi structured interviews were carried out with respondents in diverse settings to give a multifaceted picture of the different resources interacting with the technology. Furthermore respondents representing 1) the producing company 2) physicians and nurses in the public & private healthcare sector 3) management within public healthcare 4) accounting & central purchase. The case is based on a total of 21 interviews. Above interviews the work of data collection has also amounted reading of secondary sources to grasp more implicit technical phenomenon. Also participating observations (Sounders et al. 1997, pp.190) of the interactions between the focal machine and method, medical staff and patients have been carried out.

3. Benign Prostatic Hyperplasia and microwave treatment

The focal technology device under scrutiny is called PLFT, *ProstaLund Feedback Therapy*, which is a derivation of the older and – in medical circles- better known technical device TUMT, *Trans Urethral Micro Thermotherapy.* TUMT is a high tech solution for the common disease Benign Prostatic Hyperplasia (BPH), enlargement of the prostate. In short the technological basis are microwaves heating up tissue in the prostate gland to reduce excessive tissue in the enlarged prostate. BPH is further a common disease, as much as 60-80 % of all men will face larger or smaller difficulties to urinate when past their 60 years birthday[1] due to BPH troubles, out of which 50% are in need of treatment (Schelin, 2006). The high prevalence of BPH also gives an indication of the underlying health economic implications of the disease as a heavy item of expenditure in public healthcare (Kobelt et al. 2004).

Arriving as the economic remedy to BPH treatment in the early 1990's, TUMT was received with open arms, a fast possibility to rationalization in BPH treatment at a time when Swedish public healthcare were under hard economic pressure. TUMT was at the time claimed, by its producers, as well as by its users, the urologists, to give a more patient friendly and economical solution in BPH treatment. It was compared with the traditional "golden standard treatment" a surgical method named TURP[2], which is an efficient treatment with high recovery results. Undertaking a TURP, a patient need anesthesia and hospital care a couple of days after surgery. More over, for some patients it is a demanding treatment and from a producer perspective it is a costly treatment given that aftercare is high cost item. As an outpatient treatment offering the patient to go home hours after treatment, TUMT offered advantages hard to turn down. Unfortunately after a couple of years in treatment TUMT did not have the effects physicians had hoped for. Primarily disappointments concerned the efficiency, few patients experienced any effects at all, and if there were any improvements they were often small. The rare but most unfortunate cases were concerned with severe complications in relation to treatment. These were the main reasons as to why the method disappeared as a treatment from most clinics in Sweden during 1995. (Johansson, 2006, Pedersen, 2007, Häggman, 2006, Norlén 2007, Malmberg 2010)

Sweden there were one small TUMT producer in 1995 ProstaLund, this company became an established TUMT producer around 1991, after a request from Örebro Regional Hospital. Users at a public hospital in Sweden thereby triggered the creation of the company

[1] After age 80,the number is increased to 90%
[2] Trans Urethral Resection of the Prostate

ProstaLund. Although they experienced difficulties as all TUMT producers at the time, but unlike their peers, they got venture capital and chose to develop the technology. This further development of TUMT became the aforementioned PLFT. What is interesting in this second development of microwave technology is that it was financed and fully supported by money derived from policy projects to strengthen small technology startups. (Bolmsjö 2006, Bolmsjö 2010, Pedersen 2007, Carringer 2007)

What instead made PLFT special and different from TUMT treatment was the development from pure technological device offering a standardized treatment to become an individualized adjustable method, i.e. treatment could be adopted to each individual patients needs. In standardized TUMT results had varied gravely between patients and treatment was rather unreliable in that aspect. PLFT had undergone large clinic research and technological development to achieve individualized treatment why results were radically enhanced to reach the same level as standard procedure in BPH treatment. (Wagrell 2005, Schelin 2010, Schelin 2006, Bolmsjö 2005, Häggman 2006, Johansson 2007)

3.1 New Public Management and Swedish Healthcare

New Public Management, NPM, refers to new management reforms conquering public sectors in a larger part of the OECD countries in the 1980s (Hood 1995 pp. 98). Sweden was one of the countries where NPM was employed in the late 1980's. Still the actual provenance and content of NPM has long been subject for discussions among academic scholars and is much a question of definition (Pollitt et. al 2004 p.8, Hood 1991, Hood 1995). In general terms public management reforms can be described as by Pollitt et al.;

"public management reform consists of deliberate changes to the structures and processes of public sector organizations with the objective of getting them (in some sense) to run better" (Pollitt et. al 2004 p.8)

Then NPM could be argued to concern accounting and management techniques derived from the private sector in order to raise efficacy and lower cost within public organizations. There are no specific concepts to claim the properties in NPM similar patterns could be outlined in the countries where it reoccurs. But as recognized in academic literature on the subject is that pervasiveness of different currents within NPM varies and is highly dependent on domestic socioeconomic forces and prerequisites within the country. (Pollitt et. al 2004, Hood 1995 pp.95)

Anyhow recurrent similarities within NPM are the focus on a "marketization" of public administration; by bringing in managerial practises and values derived from the private sector market mechanisms were brought in which in turn has amounted competitiveness among public organizations (Pollitt 2004 pp.187-88, Scott et al. 2000 pp.219, Hood 1991 p.5). Management control takes a central place in these structures putting policymakers on the side in favour for managerial efficiency. Processes focus on economic output and accounting by results claimed to contribute to enhanced efficacy with the incentive to move away from bureaucratic inertia. NPM most salient features are then claimed to primarily be concerned with reversing two of the fundamental doctrines found in the preceding systems of public administration; firstly the distinct separation between private and public sector and a shift in focus from process accountability towards an accountability by results (Hood, 1995 pp.94, Hood 1991 pp.16).

In Sweden the system has been characterized by a cautious conjunction between a competitive market view and a strong state. Instead of high degree of privatization Swedish public administration system has undergone a great decentralisation in the beginning of the 1990s. Compared to other countries as France and UK where centrally employed public servants are just below 50% Sweden had only 17,3 % of public servants employed centrally in 1994 (Pollitt 2004 pp.287). This has implications for how healthcare is governed and also explains much of the variances in governance of healthcare in between counties.

Within Swedish healthcare the system has firstly changed in structure from "orderly hierarchies" towards a more diversified organizational structure providing a competitive basis for public services. Focus is redirected from policy making to a larger concern towards management skills, with the claim of providing a higher efficiency in the public sector. Processes are often germane to contracts and public tendering procedures. In practice it means less of the older hierarchic organisation and a move towards larger flexibility in hiring and less restraints in rewarding systems (Hood, 1991 pp. 5 and Beckman-Suurküla, 2007, Christensen 2009, Tufvesson 2007).

In Sweden one palpable consequence of new politics was increased economical thinking through out the whole hospital organisation. Hospitals struggled to reposition their activities to function under new circumstances. Rationalization through hard cut downs was one way to go, but still activities had to continue in normal pace, hence "production" was not lowered. Clinics strived to find solutions to handle their stringent economy and quite fast pinned faith to rationalisation through new technology (Pedersen, 2007, Norlén, 2007, Malmberg, 2010).

High tech solutions were received with open arms as saviours to cut downs and hard rationalizations. While high-tech solutions were supposed to increase capacity and lower costs, one problem remained; scientific documentation verifying the accuracy of new methods. To belay the accuracy of the new methods there was an urge for clinical research, but little time to conduct such as production of healthcare had to continue at a higher pace than before. New technology were also supposed to rationalize healthcare in the sense it had to *replace* old high-cost surgical methods, putting high demands on functions and use, in an environment where it was always compared to the well established surgical methods. A handful of cost benefit analysis (Koblet et. al. 2004) has been carried out to compare microwave treatment costs with standard surgery, most of them concluding microwave treatment as the most economic option of the two. Still these kind of cost analyses are all out of context analysis. Following parts will go deeper into the user context and trying to identify crucial resources in the user structure to embed PLFT.

3.2 Microwave treatment at Lund University hospital

Located in the region of Skåne, Lund University hospital was not first in the region to use microwave treatment, TUMT in the early 1990's. It was another smaller hospital within the region that acquiring the method with financial support by social insurance office (försäkringskassan). Lund got their TUMT machine shortly after Simrishamn with the incentive to reduce costs as they at the time were under hard economic pressure. At Lund a hundred operations were performed over a period of two years after which they chose to abandon microwave treatment because of poor treatment results as mentioned above.

Lund University hospital used a machine manufactured by ProstaLund and when the company launched their new method PLFT, Lund University hospital had been an active part following

up on results during development. Consequently when clinical studies were settled for PLFT in Uppsala in December 1998, the urology clinic in Lund sent two of their nurses to Uppsala to be trained in how to use the machine properly. After 1998 the method was used sporadically as in many other hospitals in Sweden at the time. (Rosén 2008, Pedersen 2007, Schelin 2010, Malmberg 2010, Broström 2010) The reasons as to why PLFT was not used in any larger scale in Lund were many. Obstacles pointed to by physicians were the clash between urologists training to become skilled surgeons and to replace their handicraft with a technological device. Linked to this issue was also the lack of opportunity to learn the treatment properly. (Carringer 2007, Pedersén 2007, Norlén 2007, Mamberg 2010, Södergren 2006, Vinsa 2007, Berndes 2006)
However in 2001 the clinic changes treatment directions for BPH and it is decided all urologists should from that point and onwards be able to treat with PLFT. From 2001 and onwards it is meant for PLFT to replace a larger part of surgical treatment than before. So what were the underlying reasons to alter their therapeutic standards in BPH treatment in 2001?

It was firstly a larger pressure on privatization ensuing public health care in the county of Skåne. Politicians discussed microwave technology as specialized alternative for private healthcare, the purpose was to create a private clinic specialized in PLFT treatment and to finance such project, an equivalent sum of money had to be cut of from the urology clinics budget since these patients belonging to Lund university hospital now should be treated elsewhere. (Malmberg 2010, Broström 2010)

Even if such suggestion must have been hard to digest for a clinic already under hard economic restraints, the physicians in charge at the clinic contends this was not the primary cause as to why they chose to implement PLFT at its "full potential". Rather their prior cautious use of PLFT was mostly explained by lack of scientific evidence. The purpose was to conduct clinical research during implementation of PLFT hence clinical studies made part of training and gave an opportunity to belay evidence of scientific accuracy. A second important argument to fully implement the method among all urologists was grounded in the mounting waiting time for active BPH treatment. (Malmberg 2010, Broström 2010)

3.3 Embedding PLFT

To get all urologists at the clinic to treat with the method turned out a harder task than first imagined. Firstly because PLFT is not "just a technology" it is more to it, a method to learn. The fact that treatment was a bit more complicated than first comprehended made learning more complex and time consuming than expected. Another aspect was the urologists' professional development; many of the urologists were in a development phase where they were more into open surgery and felt that microwave treatment made them stagnate in their professional skills. (Malmberg 2010)

But since the clinic somehow was obliged to treat with microwaves, two nurses managed PLFT treatment. From clinical testing and full implementation to two nurses treating with PLFT. This seemed as the optimal solution from many aspects in the beginning, but it was still hard to make room for the treatment at their everyday work. The nurses said their work was not hard to reschedule to "make room" for PLFT. But since it was demanded from the physicians' side that one urologist had to be responsible for treatment, even if not performing it or present during treatment. And it was not enough that one of the doctors occupied with

other work at the clinic should stand as responsive physician for treatment, there had to be one specific urologist with committed time to PLFT treatment - even if not performing it.

The implications for the fact that nurses are treating and not physicians could seem to be of no harm for the treatment but according to nurse Eva Broström, today also head at the clinic, it is of vast significance. If interest is low from the profession deciding on treatment then there is a natural reluctance towards the method. This reluctance to treat with microwaves also has a direct diagnostic implication for patients that are seldom on referral for microwave treatment, even if symptoms potentially would be classified as suitable for microwave treatment. The few patients recommended microwave treatment are normally under the category where they have other illnesses or conditions aggravate normal surgery. The fact that only these patients are sent to treatment also diminishes the overall results in microwave treatment. Since these patients already are classified as too ill, too old or other severe condition, any treatment would leap a higher risk to fail.

All TURP surgery was further performed at a smaller hospital in Landskrona (another smaller city within the county) to achieve large-scale benefits in productivity within the county. Implicating there was no active BPH treatment available at Lund university hospital. PLFT then becomes a new treatment category to handle at the clinic, which they have no longer made organizational space for. (Malmberg 2010, Broström 2010)

A rather clear demonstration of the reluctance among physicians is the manor in which PLFT was brought in with full potential when there were several months waiting to get active treatment of BPH. After a few months treating patients with PLFT waiting time was reduced but then physicians argued there was no longer any need for PLFT why from that day on they were able to go back to "normal" and treat patients with surgery again.

Another important aspect concerns reorganizations much due to what can be termed NPM and new management methods it brought with it in the beginning of 1990. Even if policy has changed over the 20 years passed since 1990, cut downs, rationalizations, productivity and a larger economical awareness has pervade the hospital in different shapes and forms. The latest model introduced in 2009 is "lean production", this permeate the whole organization and put high focus on productivity, through both smaller and larger changes. The hospital manager, Bent Christensen, says the personnel in general are content with the changes it has brought with it. Other reports witness of the even more stringent economy and large focus on production of healthcare as a danger to clinical research (Report; näringslivsutveckling, 2009, Christensen 2009, Malmberg 2010, Broström 2010)

The considerable focus on production also has complications for how healthcare is organised and thereby how activities are undertaken. Today the hospital cooperates with other hospitals within the region, the consequences since September 2009 are ambulating urologists, all physicians in the region circulate between five different hospitals. An urologist could thereby be at Lund on Monday just to work in Malmö on Tuesday and in Ystad on Wednesday. Nurses and administrative personnel have fixed working situation, only physicians are "ambulating". Not all, but many of the urologists feel their work suffers from the stressful situation, the inability to follow up on their patients and less control over treatment makes their everyday work to pure production efficiency. Considering microwave treatment in this new organisation, it is harder to find time and space where treatment can be performed. One important aspect is the scarce flow of patients on a regular basis the flow of patients is more sporadically. Today one nurse in Lund performs treatment and all patients within the region

receiving microwave treatment do so at Lund university hospital. To organize time for treatment is however not easy within the new organization why PLFT treatment is not carried out on a regular basis. The head at the clinic even explicitly said that if PLFT would be placed in a surgery theatre then it probably could be utilized to its full potential. But then again such move implicates much of its economical benefits over surgery has vanished. (Malmberg 2010, Broström 2010)

4. Interfaces – supporting and obstructing PLFT treatment

Investigating the fact that PLFT failed to become embedded into a user structure as Lund University Hospital, calls attention to the interfaces between the technology and organisational and physical resources constituting the user context.

Physical interfaces supporting PLFT

- PLFT helped to diminish the waiting time for active treatment of BPH and unburden the overcharged surgery department in Landskrona.
- The clinic had been involved in the development of PLFT and had acquired knowledge about its technical and methodological functions.
- Nurses in Lund were educated in PLFT treatment rather early, why the clinic has a large amount of knowledge and treatment experience, reaching over 12 years, at hand.
- A group of patients supporting PLFT are the patients unable to undertake surgery, these patients create a small but yet important facing PLFT as a unique treatment option.

Physical interfaces obstructing PLFT

- Given only the eldest and/or very ill patients was prescribed PLFT treatment gives it a drawback in treatment results compared to surgery undertaken in patients with higher possibility to get successful results. Since the group is very small it is hard to support the existents of the method with the few patients represented by these specific conditions. Possibility to become a more established treatment method is thereby diminished.
- With nurses in charge of treatment there are less incentive for physicians to make time in their schedule for PLFT. Urologists have never learned the method because it was too time consuming why they are not treating, but yet responsible over treatment performed by someone else. Possibilities for PLFT to become embedded are lowered with delegated knowledge but not responsibility.
- From earlier experiences of TUMT, PLFT was by the using profession, the urologists, much regarded as a technology or treatment tool without much of methodological implications to it. When treatment - technology and method - turned out more complex than expected, the proposal of full implementation among all urologists was no longer feasible.
- The clinic was under financial pressure to start clinical studies of PLFT in order to not risk cut downs in their budget due to political decisions. The urologists reluctance to treat with PLFT was turned into clinical studies to further affirm scientific accuracy.

Organisational interfaces supporting PLFT

- Policy makers wanting to outsource the method to private actors in healthcare, financing such move by cutting the budget with equal amount from the clinic. Policy was in this sense supporting PLFT, through private or public clinic. The aim to conduct clinical studies with PLFT at the clinic would have strengthen the scientific value of PLFT and its position in treatment of BPH.

Organisational interfaces obstructing

- The schedule with ambulating physicians makes it even harder than before to create space for PLFT treatment.
- The strong identity as surgeons among urologists and the view on surgery as normal state. When waiting list was long for active treatment of BPH, PLFT was brought in with higher frequency, when there was no longer any queue for BPH treatment physicians expressed their wishes to "go back to normal" meaning surgical treatment.
- The fact that BPH surgery is performed at another hospital alters the function of the urology clinic in Lund. They are not concerned with inpatient care and since active BPH treatment normally is concerned with surgery and inpatients care, PLFT has a misfit with other activities undertaken at the clinic.

5. Concluding remarks

Scientific novelty is what policy wishes to become innovations, innovations that further more can be a driver to create profitable companies. One important aspect of innovations is within the meaning of the word itself; something that has found spread use. For a new technology to find spread use is a time consuming process, an innovation can not, per definition be a mean to create a business, a new high tech device might have the potential to become an innovation with time and a profitable company would be a consequence of such process.

In undertaking supporting activities to strengthen business growth and development for producers in life science policy supports development of high-tech devices as to become means for a higher efficiency in the public healthcare system. NPM was in turn another way to bring in new managerial aspects into public healthcare administration, which for one were supposed to make it easier for new technology to enter into healthcare and for two new technology became an important mean to reach the goal of higher efficiency.

Thus, while NPM triggers new technology to be taken into the system in order to save money, in the same time it works so hard to rationalize activities and enhance productivity that the technology easily becomes locked out as shown in the case above. Even when the reluctance from urologists to learn the method was foreseen and the organisation stood up behind PLFT, it turned out too time consuming and organisationally impossible to undertake a full implementation to standard procedure within the actual organisation.

It could also be fruitful to compare the user context investigated in this paper with others within Sweden. It potentially points to many differences between hospitals within the same public sector. Differences could be traced from the approach on NPM applied in Sweden of decentralization. These differences draw attention to the impediments for a company to embed a new high-tech device due to the heterogeneity within public healthcare on an aggregated national level. Not only is it the already established activated structure that is hard to enter for a new high-tech device also these established structures found within public healthcare potentially diverge from each other in each setting; with highly dissimilar patterns in how established structures function and stimulate adaptation of new technology.

References

Baraldi, E, 2003, *When Information Technology Faces Resource Interaction – Using IT Tools to Handle Products at IKEA and Edsbyn,* Doctoral thesis, Department of Business Studies, Uppsala University

Easton, G., 1995, Methodology and Industrial Networks, In: K. Möller, & Wilson, D. (eds.) *Business Marketing: An Interaction and Network Perspective*. Boston, Dordercht, London: Kluwer Academic Publisher pp.411-492.

Hood, C, 1991, "A Public Management For All Seasons?", In; *Public Administration*, Vol.69, pp. 3-19

Hood, C, 1995, "The "New Public Management" in the 1980s: Variations on a Theme", In; *Accounting, Organizations and Society*, Vol. 20, No.2/3, pp.93-109

Håkansson, H, & Snehota, I, 1989, No business is an Island; the Network Concept of Business Strategy, In; *Scandinavian Journal of Management*, Vol 5, No. 3, 1989 pp. 187-200

Håkansson, H & Snehota, I, 1995, *Developing business relationships*

Håkansson, H & Waluszewski, A, 2002, *Managing technological development-IKEA the environment and technology*, Routledge, London

Kobelt, G, Spångberg, A, Mattiasson, A, 2004,"The cost of feedback microwave thermotherapy compared with transurethral resection of the prostate for treating bening Prostatic hyperplasia", BJU International, 93:543-548

Latour, B, 1987, *"Science in action"* Harvard university Press, Cambridge MA

Möller, K. and Rajala, A. (2007), Rise of strategic nets ? New modes of value creation, Industrial Marketing Management, 36(7), 895-908.

Möller, K., and Svahn, S. (2003). "Managing Strategic Nets: A Capability Perspective." Marketing Theory, 3(2), 209-234.

Näringslivsutveckling, Bolmsjö 2009, "*Skånsk medicin teknik- en förstudie om tillståndet i Branschen"* Rapport Region Skåne

Penrose, E, 1959, *"The theory of the growth of the firm"* Reprint 1995, Oxford University Press: New York

Pollitt, C & Bouckaert, G, 2004, *Public Management Reform – A Comparative Analysis*, Oxford University Press, Oxford

Powell, W. W., Koput, K. W., & Smith-Doerr, L., 1996, Interorganizational Collaboration and the Locus of Innovation: Networks of Learning in Biotechnology, Administrative Science Quarterly, March 1996, Vol. 41, Issue 1, pp 116-145.

Powell, W. W., Koput, K. W., Bowie, J. I., & Smith-Doerr, L., 2002, The Spatial Clustering of Science and Capital: Accounting for Biotech Firm-Venture Capital Relationships, Regional Studies, Vol. 36, No. 3, pp. 291-305.

Scott, R, Ruef, M, J.Mendel, P, A. Coronna, 2000, "*Institutional change and Healthcare Organizations –From professional dominans to managed care"* The University of Chicago Press, Chicago

Saunders, M, Lewis, P, Thornhill, A, 1997, *Research methods for business students,* Pitman Publishing, London

Schelin, S, 2006, *"Development of Feedback Microwave Thermotherapy in Symptomatic Benign Prostatic Hyperplasia"*, Doctoral Thesis, Department of urology,Lund University

Uzzi, B., 1997, Social Structure and Competition in Interfirm Networks: The Paradox of Embeddedness, Administrative Science Quarterly, Vol. 42, No. 1, March 1997, pp. 35-67.

Utterback, J. M. & Abernathy, W. J. (1975). A Dynamic Model of Process and Product Innovation. *Omega, The* International Journal of Management Science, 3 (6), 639-653.

Wagrell, L, 1999, *"Feedback Thermotherapy for Bening Prostatic Enlargement –a clinical and methodological evaluation"*, Faculty of medicine, Uppsala University

Wagrell & Waluszewski (2008) in The innovating process and its organizational setting, fit or misfit?, IMP Journal, Vol. 2 issue 3, 2008

Wedin, T, 2001, *Networks and Demand, The use of Electricity in an Industrial Process*, Doctoral thesis, Department of Business Studies, Uppsala University

Interviews

1- Bolmsjö Magnus, CEO ProstaLund 2005- 06-28
2- Wagrell Lennart, Urologist, 2005-09-28
3- Rosén Ulf, CEO ProstaLund Operations AB, 2008- 01-25
4- Södergren Christina, CEO county council purchase department, 2005-12-08
5- Berndes, Johan, Purchase manager, county council purchase department, 2005-12-08
6- Häggman, Mikael, head of urology clinic, Uppsala Akademiska hospital, 2006- 11-04
7- Norlén Bo-Johan, former Head of urology clinic, Uppsala Akademiska hospital, 2007-02-23
8- Häggman Michael, Head of urology clinic, Uppsala Akademiska hospital, 2007-02-26
9- Johansson Eva, Urologist, Uppsala Akademiska hospital, 2007-02-26
10- Vinsa Brita, Director of neurology division, Uppsala Akademiska hospital, 2007-09-13
11- Tufvesson Margareta, Director of economy, Uppsala Akademiska hospital, 2007-10-23
12- Beckman-Suurküla Marie, CEO, Uppsala Akademiska hospital, 2007-12-04
13- Pedersen Jörgen, Head of urology clinic, Örebro University hospital, 2007- 02-05
14- Carringer Malcolm, chief physician urology clinic, Örebro University hospital, 2007-10-03
15- Lindskog Carina, Director of health-care development, Örebro University hospital 2007-10-
16- Öberg Tore, CEO, Örebro University hospital, 2007-10-08
17 -Carringer Malcolm, chief physician urology clinic, Örebro University hospital, mail and phone interview, 2008-02-07
18-Christensen Bent, CEO Lund University hospital, 2009-09-17

19- Broström Eva, head of urology clinic Lund University Hospital, 2010-02-10
20- Malmberg Anders, chief urologist Lund University Hospital, 2010-02-10
21-Schelin Sonny, chief urologist, Specialistläkargruppen, Kalmar, 2010-02-19