5.2 Innovation results in Finnish UAS´s reflecting their adaptation to achieve external legitimacy

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Universities of Applied sciences in Finland have three primary missions: to provide higher education, carry out applied RDI activities and promote regional development. This article focuses on RDI and especially innovation results measured by number of patent applications, patents and utility models.

Laurea UAS has initiated a number of critical strategic development projects to improve in-house operations in such a way that they are better prepared for future challenges. One of those projects is focusing on increasing RDI effectiveness. That project seeks to increase the impact of those activities and the funding growth. We focus on assessing the general conditions leading to results on innovation activities.

We suggest that UAS´s strategic orientation, policies and operational logic lead to innovation results that are a logical consequence of the UAS´s adaptation to their environment's external expectations and the nature of competition in these markets.

As a theoretical framework for assessing the situation, we have chosen Tushman and Romanelli´s "punctuated equilibrium model", which seeks to explain organisational evolution. According to them, organisations progress through convergent periods punctuated by reorientations that guide the next convergent period (Tushman & Romanelli 1985, 171). We propose that the positions the organisation dominantly occupies in the Tushman-Romanelli matrix (Tushman & Romanelli 1985, 175) largely explains organisations' innovation results. The more economy/market-oriented organisation is the more it demonstrates its capabilities in performance indicators such as patents and utility models.

We tested this approach by using publicly available information such as number of patent applications, patents and utility models (www.prh.fi). We compare UAS´s results to another branch, namely the telecom industry, and highlight how the transition phase from the year 1995 onward has affected one particular telecommunication company´s innovation results.

CHANGES IN EXTERNAL EXPECTATIONS CREATE THE NEED FOR INNOVATION

There are many definitions of innovation, and it seems to vary according to the concept related. In this article, we adopt the definition from Baregheh, Rowley and Sambrook (2009, 1334), who analysed 60 definitions of innovation from a wide variety of disciplinary literatures and concluded that:

> "Innovation is the multi-stage process whereby organizations transform ideas into new/improved products, services or processes, in order to advance, compete and differentiate themselves successfully in their marketplace." (Baregheh et al. 2009, 1334)

Volberda, Van Den Bosch and Heij (2013, 1) highlight the innovativeness of management as the driving force behind the emergence of innovation. According to them, innovativeness of management is manifested in their ability to build an organisational form, practices, and processes in a new way so that it supports the emergence of innovations. Management acts as a kind of lever for the emergence of innovations. (Volberda et al. 2013, 1.)

Tushman and Romanelli (1985, 174–175) explain that organisations are economic entities and must be **effective** and **efficient**, which means that they must produce product and services that are desired by external economy and the production has to be efficient using the available resources. Organisations are also socio-political entities that **require external legitimacy**, so that their right to exist and their mode of operation is not challenged. **Internal legitimacy** is required from participants to sustain the continuity of personnel and their behaviour. This logic forms polity – economy and external – internal axis. Organisations' adaptation to their environment and competition seems to be the driver in explaining the position of organisations in Figure 1.

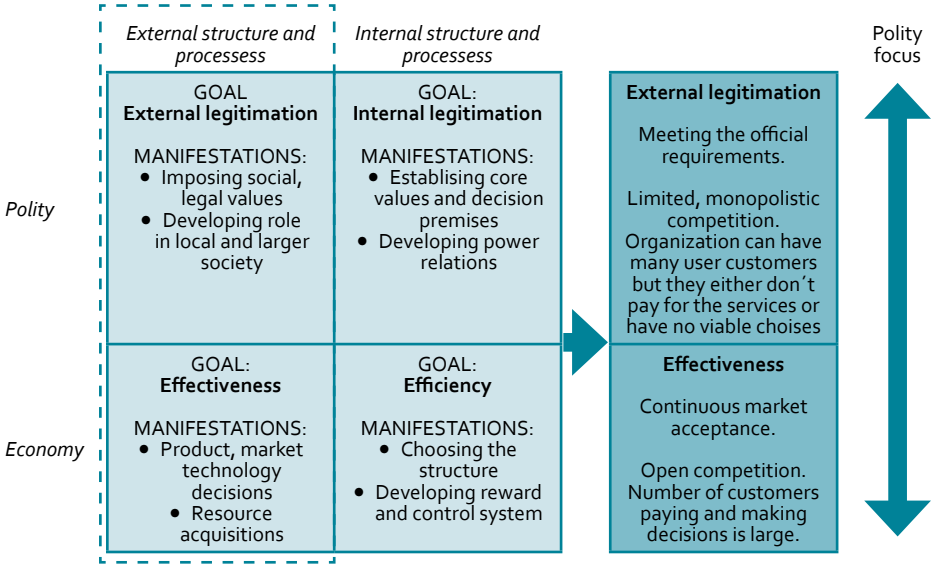

Figure 1. *Political-economy activity domains (modified Tushman & Romanelli 1985, 175). Competition affecting strategic focus.*

According to Schein (1990, 114), the culture of a group is the result of a collective, it can also be the result of learning that a unit develops to create the capacity to survive in its external environment and to manage its own internal affairs. Cultural solutions have worked well enough to be considered valid and they are taught to new members as a correct way of thinking in relation to the problems the organisation is facing. During the convergence, organisations strive to achieve greater consistency of internal activities with strategic orientation and this impedes radical change. In other words, organisations are reluctant to change.

Tushman and Romanelli (1985, 178) claim that there are two basic reasons for change: 1) sustained low performance due to an inability to align activities even though the overall strategic orientation would be appropriate, 2) major changes in external conditions that cause the existing strategic orientation (regardless of its prior success) to cease to be effective.

Tushman and Romanelli (1985, 174) propose that organisations evolve through convergent periods punctuated by reorientations. Their model of organisational evolution is characterised by three defining constructs: 1) process of convergence, which leads to consistency and alignment among complex socio-political and technical-economic activities supporting organisations strategic orientation, 2) periods of reorientation, where consistent patterns are fundamentally reordered toward new alignment, and 3) executive leadership, which serves as a key mechanism of intervention. Lovas and Ghoshal (2000, 876–877) argue that it is not possible to design and build all the desired organisations, but company management can affect the development processes significantly by relative small interventions and these interventions define the role of top management.

They (Tushman and Romanelli 1985, 175) suggest that there are five primary activity domains in pursuing strategic orientation: 1) **Core values and beliefs**, where, why and how to compete, 2) **strategy**, defines the products and markets, 3) internal **power distribution**, controlling scarce resources, 4) **structure**, formalises

hierarchy and roles, 5) **control system, i.e.,** how tight and pervasive, indicates the emphasis on efficiency. There is a top-down coupling between these activity domains. Changes in core values will have a high effect on strategy etc. – on the other hand, changes in a control system have only a weak effect on strategy.

Mohan, Voss and Jimenez (2017, 195) point out that a prerequisite for a successful innovation process is encouraging innovation culture, the creation of which is the responsibility of management. According to them, increasing the number of innovations without fear of punishment for wrong decisions increases the impact of innovations in the organisation (Mohan et al. 2017, 195). The importance of management has also emerged in Kam Sing Wong's (2013, 709,723) study, he notes that especially the active participation of the management in the innovation process has a positive effect on the development of innovations. Agrawal, Catalini and Goldfard (2017, 1069) argue that an organisation living under pressure is better at producing innovations than organisations in an easy and unpressured situation. In a high competition environment, developing innovations becomes part of an organisation's survival. As pointed out previously, Tushman and Romanelli (1985, 180) call these crucial management activities *interventions*.

Is organisational change adapting to external (and sometimes internal) changes and pressures or are organisations (especially managers) active actors that select and influence the environment? In this article, we choose to use an approach that combines these perspectives. Organisational change entails adapting to an external environment, but management has a crucial role in directing the change through interventions resulting in innovations to create new strategic orientation and adaptation to new circumstances.

INCREASED COMPETITION AS THE EXPLAINING FACTOR FOR INNOVATION RESULTS

We suggest that organisation whose strategic orientation is dominated by seeking external legitimacy fulfils three conditions: 1) they operate in markets characterised by limited competition, and 2) they have high revenue predictability, and 3) there is a separation of the user and paying customers. This strategic orientation in turn explains the innovation results measured by a number of patent applications, patents and utility models. It seems that UASes occupy such position in the matrix.

We also suggest that changes in external expectations and conditions create the need for transformation. Punctuation to prevailing equilibrium force management to perform intervention and seek new strategic orientation, which leads to adapting to new conditions and eventually reaching new equilibrium. If the new adaptation shifts the organisation from polity to economy/market focus, this should increase the number of patent applications, patents and utility models.

We used the Finnish patent and registration office database (www.prh.fi) to compile information showing UAS´s combined result and compared this information with telecom company Elisa Oyj´s results. In Finland, the full opening of the telecommunications market to competition took place in 1994. The year 1997 was also a significant milestone for the Finnish telecommunications market. That year, the previous Telecommunications Act was repealed by the Telecommunications Markets Act. This facilitated market entry for new telecommunications operators by designating only the construction of mobile networks as an activity subject to a licence.

Figure 2 shows the number of applications and approved patents and utility models for UAS´combined and telecommunications company Elisa Oyj (www.prh.fi). Elisa has produced significantly more applications and especially approved patents and utility models. Results indicate that Elisa holds a different position

in the Tushman-Romanelli matrix than UAS; Elisa operates in markets where competition is constant and user customers make the purchase decision themselves, so it has to constantly develop the offering to meet customer expectations. We suggest that Elisa´s strategic orientation is dominated by effectiveness as depicted in the lower left corner in Figure 1.

	UASes combined	Elisa Oyj
Patent & utility model applications	48	309
Patent and utility models	7	138

Figure 2. *Patent and utility models and applications 1969–2021 UAS´s and Elisa Oyj.*

However, prior to the opening of the telecommunications market to competition, Elisa was a regional monopoly, where financing was built more under the guidance of the authorities than as a result of an individual customer's purchase decision; it held a similar position in the Tushman-Romanelli matrix as UAS, currently by which we refer to the upper left-hand corner of Figure 1. Strategic orientation was adapted to conditions that did not encourage innovations. Market liberation created competition and this presented punctuation to prevailing equilibrium at that time.

In Figure 3, we find that transformation to competitive markets required Elisa to invest in development and innovation activities. This can be seen in the number of applications and approved patents and utility models (www.prh.fi). During Elisa's monopoly period, revenues were predictable and development and innovation activities did not play a significant role in organisations' strategic orientation, whereas survival in competitive markets seem to require significant investment in development and innovation activities. Elisa's situation before 1996 is very similar to that of UAS´s today, where the predictability of funding is high and the effects of an individual customer's purchase decision is very small.

	Elisa 1969–1995	Elisa 1996–2021
Patent & utility model applications	6	303
Patent and utility models	0	138

Figure 3. *Patent and utility models and applications 1969–2021 telecom company Elisa Oyj.*

To further test our approach, we chose two companies that meet the following criteria: their revenues are predictable, they hold a regulated monopoly position and customers are not able to make real purchasing decisions. This should lead them to pursue strategic orientation that is dominated by "external legitimacy" goal setting and this in turn predicts that they are not investing in innovations. We also wanted to choose technology-oriented organisations because one might presume that they are particularly prone to create patentable innovations.

As Figure 4 shows, the results (www.prh.fi).) are aligned with our reasoning. These companies (e.g. Fingrid, established 1996) do not demonstrate results in applications or approved patents and utility models. These companies are not subject to market development pressures and their pricing models are reminiscent of Elisa's monopoly funding structure. Electricity distribution network companies (like Caruna, established 2014) can, within the framework of restrictive legislation, unilaterally increase their prices, which is a very typical economic rebalancing model in a market situation like this. Management's focus is on achieving greater consistency of internal activities with strategic orientation and introducing radical interventions or changes are not necessary.

	Fingrid	Caruna
Patent & utility model applications	1	0
Patent and utility models	0	0

Figure 4. *Patent and utility models and applications 1969–2021 in companies operating in regulated industries.*

Klingebiel and Rammer (2014, 246–247) point out that targeting innovation resources specifically at the early stages of innovation increases the range and sales of new products. In their view, the allocation of resources to innovation yields a greater result than what has been invested. According to their research, companies that invest especially in the early stages of innovation and thus expand the opportunities for innovation to achieve better benefits than those that emphasise innovation resources in the final stages of the process. From the point of view of success, it would seem that extensive innovation in the early stages and resourcing will lead to a better chances to produce competitive products and services.

CONCLUSION

UASes seem to be in a very similar competitive situation than the former telephone companies were before market liberation. Telephone companies had to change their operating model so that they focused more on customers and the development of the services needed there. At the same time, it meant the transformation of telephone companies into more holistic telecommunications companies. They occupy larger portion of the customer´s value chain than before. Does this analogy with telecommunication companies apply to UASs? Currently UASs are well adapted to prevailing external conditions, but what does future hold? There are some early indications that suggest that change in revenue predictability is approaching.

In practice, the change in UAS´ is being accelerated by a decrease in the state's financial contribution. This income, which has been readily available in the past is declining and this will introduce punctuation in the current equilibrium. The situation was similar for telephone companies in the mid-1990s. Their secure income was based on few services such as the local phone charges. In the absence of competition, prices could be increased to balance the budget.

We suggest that changes in external expectations and a less secure and stable source of income will potentially set the basis for organisational reorientation. In the telecommunications market, it forced companies to adapt either by becoming bigger to achieve economies of scale (mergers and acquisitions), finding a niche (local or specific services), or remaining passive and accepting a steady decline if their balance sheet made it possible. These scenarios could also apply to UASes if such change in external expectations and revenue structure would take place.

At the heart of it all is the management interventions. That is, management can proactively seek to build capabilities that can be crucial in various future scenarios or management can wait until the future reveals itself. One way to prepare an organisation to meet more economy-oriented external expectations seems to be investing in innovation. Developing structures to support the birth and development of innovation lays the groundwork for a new direction.

We intend to investigate this further in future articles. Are some UASes already beginning the transition to more economy/market focus? This might be revealed by examining their innovation and business results.

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