Desperately Avoiding Bureaucracy: Modularity as a Strategy for Organisational Innovation

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Abstract

Back in the 1960s, it was established that bureaucracy and innovation tend to oppose each other. However, not many “innovative” organisations have managed to banish bureaucracy altogether. Topicus, a young software house in the Netherlands, has done this. It has developed an organisational strategy that creates a “spin-off” whenever the organisation becomes too large and is in danger of losing its innovative edge. Topicus has been very successful with this strategy – it has been one of the fastest growing software houses in the Netherlands since its inception, a period which includes the “IT crash”. In general, setting up new organisations is risky, however the new “spin-off” organisation is supported by many resources in every phase of the spin-off process, which makes it a successful organisation. This paper shows that this strategy is effective in an immature environment (when there is no dominant player) but it is not the best strategy when it comes to creating large scale software products or dominating a market. In this paper we illustrate how new organisations that have similar characteristics could consider this growth strategy. The theoretical significance of this research is that it describes a novel strategy for organisational growth. The practical significance is that it provides an approach for high-tech companies to maintain innovation while growing. The strategy seems to be especially applicable when the product that the organisation develops is knowledge based, such as software. Knowledge is easily transferable and employees are fairly rewarded with this strategy, and therefore highly motivated.

Keywords: Strategies, Organisation models, Business process innovation, Project management, Bureaucracy, Modularity, Success factors.
1 BUREAUCRACY: THE ENEMY OF INNOVATION?

1.1 Innovation and Organisations

In 1965, Victor A. Thompson published an influential paper about the conflict between bureaucracy and innovation. According to him, bureaucracy is a result of the drive for productivity and control, which creates an inappropriate environment for creativity. In his research, he describes the characteristics of an innovative organisation as:

- Availability of important resources for innovation: uncommitted money, time, skills, and goodwill. Jobs need to be professionalized, personal and organisational goals need to be aligned, the creative atmosphere should be free from external pressure and diversity should be encouraged;

- An organisational structure based on innovative areas instead of formal departments, creating conditions for generating new ideas rather than on jurisdiction. Everyone in the organisation should contribute innovatively. Furthermore, resource control should be decentralized and the formal structure is only a skeleton.

Nevertheless, while nearly every organisation has the objective to be innovative, an organisation which fits Thompson’s definition of an innovative organisation is hard to find. Large organisations are looking for new ways to innovate, because bureaucracy reduces their success in doing so. “Innovating innovation” as this is called by Chesbrough, a Top 50 innovator, in his book about open innovation (Chesbrough, 2006). Open innovation stimulates innovation by creating a new development path for an idea that is not relevant to the organisation’s core business, for instance by developing it in a new organisation or sell it. In addition, open innovation states that an organisation should use another’s idea when this idea is better than its own. Google, a major IT-innovator, uses this strategy, regularly acquiring smaller companies (such as Youtube in 2006) who have developed innovative ideas.

1.2 A unique strategy for organisational growth and innovation

This paper investigates Topicus, a software company in The Netherlands that avoids bureaucracy in order to stay innovative. Topicus does this by creating spin-offs that focus on separate market niches when the organisation becomes too large and bureaucratic. Topicus has created a highly modular and organic organisational structure that seems to be the exact opposite of those commonly pursued by large IT-companies, such as Google and Microsoft. Such companies focus on growing and extending their business as one large monolithic organisation and thereby dominating markets (Wirtz, 2001), while Topicus believes in staying small and continuing to look for new markets. Topicus is very successful with this strategy. It was set up in 1999 by two entrepreneurs and has realized exceptional growth, even through the burst of the “dot com bubble”. It was the fastest growing IT company in the Netherlands in 2004, and has been in the top 50 every year since its inception. Another thing that stands out is that only three employees left the company since its inception – an average annual turnover rate of 1% over 8 years – while employee turnover numbers in the IT industry are typically around 15% with excesses up to 25-35% (Moore and Burke, 2002).

1.3 Research objectives

In this paper we conduct a detailed investigation of Topicus to find out more about its organisational strategy, to understand how and why it works and whether this strategy could be usefully applied in other organisations. In Section 2, we provide a detailed description of Topicus’ development and its organisational strategy. Section 3 explains the concept of modularity, how one can create such a modular organisation, and what the advantages of such a modular organisation are. Section 4 discusses how the development process of Topicus can be analyzed. In section 5 we analyse the development process of Topicus. Section 6 distils generally applicable rules from this development process which can be used as guidelines for other organisations who are interested in pursuing such a strategy. Section 7 concludes the paper.
2 ORGANISATIONAL BACKGROUND

Topicus’ organisational strategy was developed based on the experience of its directors, who previously owned another software organisation. This organisation also became very successful, and they sold it to an IT-organisation with approximately 3,500 employees. After the owners served several years as a member of the board of directors of this company, they became annoyed at the bureaucracy of such a large organisation. As a consequence, they left and set up a new organisation in 1999 called Topicus. One of Topicus’ explicit objectives was to avoid becoming a large bureaucracy, as seen from its mission statement:

“To become a major player in the software development market, while staying small in order to guarantee quality and customer service”

The way they achieved this was by creating spin-off companies (registered as separate legal entities rather than divisions within the same company) whenever the organisation reached 25 employees. They felt that 25 employees was the point which an organisation moves into the “bureaucracy zone” and where innovation starts to decline. The objectives of this spin-off strategy were to:

- Become a multiple-niche player: to create goal focused, entrepreneurial organisations, each focused on a particular market niche. This supports Porter’s (1985) strategy of becoming a niche player (as opposed to a low cost producer).
- Motivation of employees: to stimulate organisational-personal goal alignment by offering employees shares in the spin-offs;
- Collaboration among “family members”: each organisation should support other Topicus organisations (parents, siblings, children) where possible but each organisation is responsible for its own profit. That is, collaboration is encouraged, but not at the expense of one’s own profitability.

Currently, Topicus develops application services for three different niches: education, finance, and healthcare. Development is done in close contact with its customers using agile programming principles. Topicus remains the owner of its web-service applications and by renting out the application services it is possible to reuse this software for different projects in the different startups following an Application Service Provision (ASP) model.

Topicus grew in different diverse sectors by coincidence. It started with developing software for the financial sector in 2001 and saw that the core ideas behind the application were also applicable to the healthcare and educational sector. In 2005, Topicus created its first spin-off, Topicus Healthcare, while it was working on the second project in this sector. This was set up by one entrepreneur who took three experienced employees with him. In its beginning, Topicus Healthcare hired some employees from the parent and shared the main office. After approximately six months, it had hired new employees and moved to another building. In 2006, Topicus Education was created, and a year after that Topicus Finance. Both were set up in the same way as Topicus Healthcare. Topicus (the parent company) and Topicus Finance both focus on the financial sector but Topicus focuses on insurances and Topicus Finance on mortgages. In early 2008, Healthcare will separate. The new spin-off will focus on the care institutes while Topicus Healthcare remains focused on primary care.

The spin-offs are independent organisations. However, Topicus stimulates communication and activities between them. Topicus publishes a newsletter in which new employees introduce themselves to the entire organisation and all current projects are described. Further, Topicus has its own wiki. Once a year Topicus organizes a conference in which new problems as well as future developments are discussed and every week the directors from the different spin-offs have a meeting. Topicus organizes drinks on the first Thursday of every month. All of these activities help to foster a “family spirit” without reducing the separate identities and autonomy of the various spin-off companies.

What seems to have started as a “lifestyle choice” (the desire of the directors not to work in a bureaucratic organisation) rather than a profit-maximisation strategy turned out to be highly successful as evidenced by the organisation’s sustained levels of profitability and growth. More remarkably however, is that it results in an organisational environment where people are motivated and enjoy working
in (as evidenced by the remarkably low turnover rate). Each employee has the possibility to become an entrepreneur (head of a spin-off) themselves, which creates an environment of high motivation. The next section will develop a theoretical explanation for the success of this strategy.

3 THEORETICAL BACKGROUND

Topicus’ development resulted in a very modular organisational structure based on spin-offs. This section describes background theory that shows the advantages and disadvantages of Topicus’ organisational strategy. This theory is drawn from the IS field as well as organisational science.

3.1 Modularity

Modularity is a concept that provides human beings the possibility to divide-up knowledge and the specific tasks involved in completing a complex design or constructing a complex artifact. Baldwin and Clark (2000) have proposed this as a unifying paradigm for the IT industry. However, modularity is not only applicable to software applications but according to Simon (1996) to all man-made artifacts, including organisations. Something is modular if it fulfils three characteristics: the structure of something is a nested hierarchy, it is built of units that are highly interconnected themselves but largely independent of others and each unit has a well-defined role (Baldwin and Clark, 2000).

Baldwin and Clark (2000) and Simon (1996) identify four advantages that modularity offers:

- Modularity increases the range of manageable complexity;
- Modularity allows different parts of a large design to be worked on concurrently;
- Modularity accommodates uncertainty;
- Modularity creates design options, because it decentralizes options to the periphery of the system.

Simon (1996) and Baldwin and Clark (2000) both believe that modularity stimulates innovation. Baldwin and Clark (2000) describe that this is a result of a decentralized search by many designers for valuable options that are embedded in the six modular operators. A modular design opens up new pathways of development of the design as a whole. The modular operators proposed by Baldwin and Clark are: splitting, substituting, augmenting, excluding, inverting, and porting. These operators add economic value to designs. However, applying such operators is costly.

According to Simon (1996), modularity is applicable to all artifacts. An artifact is any man-made object, a definition that includes physical objects such as automobiles, virtual objects such as information systems and social systems such as organisations. It is possible to characterize an artifact in terms of functions, goals, and adaptation. While the fulfilment of a goal involves a relation between three things: the goal itself, the character of the artifact and its environment. This makes it possible to see the artifact as an interface between its internal and its external environment. If the internal environment is appropriate to the external or vice versa, the artifact will serve its purpose.

A design and a design process are fundamentally isomorphic at the level of design parameters and tasks (Baldwin and Clark, 2000). Therefore, the physics and logic of an artifact, expressed in its parameters, affects the process of designing it. Baldwin and Clark therefore state that the task structure and the internal organisation of a firm are strongly connected. Tasks are mapped to people and the way they work together. Hence, a particular task structure creates a specific pattern of knowledge in the organisation. Interactions within workgroups are by definition frequent, and thus people will tend to build and renew knowledge within their own groups. In contrast, interactions across workgroups are less frequent and may seem less important. Hence, those same persons will not perceive or forget knowledge that crosses over workgroup boundaries.

3.2 Stages of Organisational Growth

Quinn and Cameron (1983) developed a model of organisational growth which proceeds in four stages. This model integrates 9 existing models of organisational lifecycles. The four stages are:
Entrepreneurial: this is characterized by marshalling of resources, lots of ideas, entrepreneurial activities, little planning and coordination, formation of a niche, prime mover has power;

Collectivity: this is characterized by informal communication and structure, long hours spent, a sense of mission, high commitment, innovation continues;

Formalisation and Control: this stage is characterized by formalization of rules, stable structures, emphasis on efficiency and maintenance, conservatism, institutionalization of procedures;

Elaboration of Structure: decentralization, domain expansion, adaptation and renewal.

The first two stages are highly innovative while the last two are much more bureaucratic and oriented towards efficiency. The effect of Topicus’ spinoff strategy is effectively to keep all organisations in the entrepreneurial stage. Rather than move into the later stages, the choice is made to spin off instead.

3.3 Theory of Spin-offs

The modules Topicus is composed of are spin-offs. A spin-off is a new organisation, and therefore economic activity, that builds upon earlier experience or a similar product. There are different kinds of spin-offs and different stages, in which the spin-off can be. These differences are classified by the dimensions: type of parent, initiative from, transferred resources, support of parent, and independence. A spin-off that separates from a parent organisation is defined as a corporate spin-off. In many cases, formal and informal relationships between parent and spin-off remain after separation (Tübke, 2005).

In literature, several factors are found that influence the decision to start a spin-off (Tübke, 2005):

- Organization size: Working in small organisations is more similar to entrepreneuring than working in a large organisation. When the organisation grows, people tend to work for their own ends;
- Vibrant economy: When a niche offers many opportunities people want to profit from them;
- Disagreement with the parent: Reorganisations or disputes drive people to quit;
- Parent’s attitude to entrepreneurship: The parent can contribute to the spin-off when it believes in it;
- Organizational culture: This culture influences how opportunities are perceived and to which extent entrepreneurs are given room for action;
- Possibility to attain a competitive advantage quickly: When the opportunity is easily transformed in an advantage, starting for your own is less risky and therefore people take the decision more easily.

An organisation that uses a structure based on spin-offs offers more similarities with a group of different organisations than with an organisation based on business-units. An important reason for this is that the spin-offs are not supported by a corporate parent which supports business units with information and coordinates them. When an organisation has a diversification strategy or focuses on a large economy of scope, coordination and information costs may become a problem. A certain activity’s distance to the company’s core business as well as its strategic significance are reasons for carrying it out in a business unit or spin-off (Tidd and Taurins, 1999), (Johnson et al., 1988). In today’s unpredictable and rapidly changing environment (Tidd and Taurins, 1999), organisations should focus on flexibility, which is also admitted by Mendelson (2000) and Nadler and Tushman (1999). Another reason for this similarity is the difficulty of sharing resources because transactions are taxed between organisations. This makes an organisation based on spin-offs responsive, flexible, organic, simple, and niche finding, according to Daft(1998). Further, a small organisation can be lead by an entrepreneur who is not skilled in management.

Spin-offs are a suitable technique for entering an immature market and are seen as a source of innovation (Tübke, 2005) (Tidd and Taurins, 1999), because:

- The production techniques are still embodied in skilled capital, which makes it possible for highly skilled people to takeover customers from competitors without much financial capital;
- Markets permit firms to profit from unknown niches with few resources. Individuals working in such a niche are more likely to identify opportunities;
- The absence of a dominant product makes it possible to compete on design instead of price (Garvin, 1983).
Another advantage of a spin-off is that it grows quickly. Tübke (2005) shows with his research that there are two groups of factors that cause this. First, a spin-off takes along many resources that are not taxed from its parent. Important resources are experience, the parent’s business model, its reputation, a market position, and the capacity to create partnerships. This shows that a spin-off is more successful when its product is knowledge based. Second, personnel motivation influences the spin-off’s success. The entrepreneur is the (shared-) owner of the spin-off, which always results in a better focus because his own money is at stake. However, it does not always have to be his decision to start the spin-off. Such spin-offs are less successful (Tübke, 2005). This organisational structure stimulates motivation in the same way as the partnership model that is popular in the legal and accounting sectors. However, the effect of this governance structure reduces when the organisation grows. This is not the case with an organisational model based on spin-offs (Greenwood and Empson, 2003). Table 1 shows the possibilities the different organisational models offer.

<table>
<thead>
<tr>
<th></th>
<th>Spin-off</th>
<th>New organisation</th>
<th>BU structure</th>
<th>Partnership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus on different niches</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Flexibility</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Resource sharing: Tax</td>
<td>-</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Sharing Knowledge</td>
<td>+</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Motivation</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Offering shares: Tax</td>
<td>+</td>
<td>NA</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Liability</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Organizational skills</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Give up a unit</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 1: Spin-offs vs other organisational forms. + is a possibility in the particular model, - is something that is difficult, and NA is not applicable to the model

4 MODEL FOR ANALYZING THE DEVELOPMENT PROCESS

This section creates a theoretical approach for analyzing Topicus’ development by which we want to determine whether this strategy is successful or risky as the failure rate of new organisations is high, being 15% (Tübke, 2005). This extensive analysis is in later sections used to improve Topicus’ development process and to derive general applicable rules from.

To do this, the three phases of the spin-off process are investigated, being:

- Pre-separation, the opportunities are evaluated, which leads to the decision to spin-off or not;
- Separation, the physical division of resources;
- Post-separation, starts when parent and spin-off operate independently (Tübke, 2005).

These stages are very similar to the phases of the entrepreneurial process: opportunity recognition, preparation, and exploitation (Veen and Wakkee, 2005). Recognition is the identification of an opportunity and therefore similar to the pre-separation phase. The preparation step is similar to the separation phase, because both consider the attainment of capitals. However, the emphasis of the spin-off process is on transferring resources from the parent, while in the entrepreneurial process the entrepreneur needs to obtain this. The development process is similar to the post-separation phase because both focus on the exchange with the market. The spin-off process distinguishes itself from the entrepreneurial process through the initial resources available.

Groen (2005) developed a theory for analyzing the different phases of the entrepreneurial process. His theory states that an organisation should have sufficient levels of all four forms of capital in order to
be viable in all phases of the entrepreneurial process. These capitals are derived from Parsons’ (1964) social systems theory. In one of his studies, he applied his theory to an IT-organisation, by which it operationalized the capitals even further. This resulted in the following capitals:

- **Strategic capital**: Degree of goal alignment, basis for goal alignment;
- **Economic capital**: Direct cash, Indirect cash, potential future cash;
- **Cultural capital**: Employee situation, knowledge development, ready to use knowledge;
- **Social capital**: Positional aspects, structural aspects, relational aspects.

The types of capital important in this research that are derived from Topicus’ past:

- Launching customer;
- Possibility to hire employees from the parent;
- Qualified employees at its startup.

As well as the generic resources required for the development of software (Pressman, 2000):

- People;
- Reusable software components;
- Hardware and software tools.

Nevertheless, the model of Groen (2005) does not discuss how organisations should develop in order to become successful. For deducing a pathway of a successful spin-off, Brush et al.’s (2002) “Resource development pathway” is used. With this tool the patterns or pathways of resource building can be analyzed that are important for efficient, effective, and timely management of resource building and therefore wealth creation. The resources are classified by:

- Complexity: highly complex resources can become a unique advantage;
- Application to the production process: utilitarian resources are applied directly to the production process, and instrumental resources are used in a flexible way to attract other resources.

In addition, Brush et al. (2002) discuss the “Resource Pyramid” model. This pyramid classifies the efficiency of combining and using resources in five groups, from generic resources until unique advantages, and therefore it shows three things:

- An organisation’s advantages over its competitors;
- When the efficiency of combining resources decreases, which is a suitable moment for separating;
- Resources are subject to improvement if they are complex but not a unique advantage.

The next section will investigate how the different resources become important in the different stages of the spin-off’s development. Through this, the success of this strategy is examined.

## 5 ANALYZING THE DEVELOPMENT PROCESS

This section investigates the development of the spin-offs by using the literature discussed in the last section. With this investigation, we want to evaluate the success of this organisational strategy.

### 5.1 Pre-separation phase

In the pre-separation phase, the decision is taken to spin-off or not. This decision is based on the potential financial capital the network has to offer and the position of the launching customer in the network because a central position offers many opportunities of organisational development. This decision needs to be made by an experienced entrepreneur, because motivated employees often work harder. The requirement is that there needs to be a senior business analyst, and two senior developers, available at the parent apart from this entrepreneur willing to spin-off.

### 5.2 Separation phase

The objective of this phase is to separate from the parent. The new spin-off starts developing an application as a separate organisation, for which it has to hire employees, preferably new otherwise from
the parent for a while and buy software from the parent. The spin-off copies the development methods from its parent, and it needs to find new customers, which it does in combination with the parent.

5.3 Post-separation phase

This phase is started when the dependencies between parent and spin-off are limited. This limitation is possible because the spin-off develops applications and attracts customers of its own. This is a result of the origination of resources that develop further with every finished application, being:

- Extension of the software database and knowledge of the network increases;
- Sufficient employees are available and they developed themselves;
- Build up a reputation or dependability in the network. This reputation is especially important because this form of social capital replaces the cooperation with the parent.

Figure 1 shows the development of resources in the different stages of the spin-off process. The left picture describes the required resources for the spin-off as well as the resources that need to be attracted in the separation phase. The right picture shows the development of resources in the post-separation phase. Reputation, dependability, and software components are reinforced with every finished application, which makes it easier to attract new customers and the parent not needed anymore.

![Figure 1](image)

**Figure 1:** Resource development pathway, adapted from Brush et al. (2002). Required resources in the pre-separation phase are shown on the left and later stages on the right.

5.4 Split again

Figure 1 also shows the complexity of these resources. By combining resources, advantages over other organisations are created. Figure 2 shows the combination of Topicus’ important resources and their form of advantage over its competitors. As seen, a few resources are obtained by other software houses easily. These resources are called generic resources. Topicus uses the following resources efficiently (and this is crucial for its mission): create dependence for actors in a network, reusable software components, knowledge of the founding team, agile programming, and training employees. With agile programming, and an organisational strategy based on spin-offs it has the possibility to create high quality and cheap software. The figure also shows that the spin-offs are a unique advantage that Topicus has over its competitors, because this strategy is not common, it’s hard to copy, and is an efficient way of entering an immature market (i.e. markets where there is no dominant player).

Nevertheless, the efficient combination or use of these resources becomes hard when an organisation becomes too big:

- Agile programming: Applications are created in a sequential process in which the customer has constant input. Normally, this is at the end of a period, but because of the work in small groups, the developers are often in direct contact with the customer. When the groups become too large it is impossible to let the developers call the customer themselves. Furthermore, a larger division of the program is needed so developers can work in parallel. This requires increased coordination between the customer and the developers. This does not fit the agile programming concept;
- Development of personnel: Working in small teams makes the functions of the employees broader and more challenging. It is impossible to depend only on the entrepreneur. In small organisations, new employees need to figure things out themselves. Furthermore, when there are many senior employees, projects become too expensive because of high salaries and this could be the cause for disputes;
- Quality software: As agile system development becomes harder, the quality of the applications will reduce.

This is not a problem, because the entrepreneurial climate and the small organisation’s size are factors that stimulate spinning-off. Employees automatically look for new opportunities and tend to start on their own when this is the case.

5.5 The process

Figure 2 presents the advantages Topicus has created over its competitors that will result in wealth creation (now or in the future). Table 2 shows that in all phases of the spin-off process all categories of capitals are supported. In the separation phase, the spin-off’s own resources are scarce, but through the close cooperation with the parent, this is accommodated. The spin-off therefore is a mature organisation when it lets the parent go and this reduces organisational failure. This process maintains itself, because people tend to start on their own when the organisation grows, the parent stimulates entrepreneurship, and there is an entrepreneurial culture at Topicus. This makes Topicus’ strategy a successful one. Topicus has acquired a unique advantage along with several strategic assets and at the same time reduced the risks of setting up new organisations.

In the next section, we distil some of the generic design rules from this development process.

<table>
<thead>
<tr>
<th>Economic</th>
<th>Social</th>
<th>Strategic</th>
<th>Cultural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available</td>
<td>Expected</td>
<td>Parent</td>
<td>Reputation</td>
</tr>
<tr>
<td>Pre-separation</td>
<td>v</td>
<td>v</td>
<td>v</td>
</tr>
<tr>
<td>Separation</td>
<td>v</td>
<td>v</td>
<td>v</td>
</tr>
<tr>
<td>Post-separation</td>
<td>v</td>
<td>v</td>
<td>v</td>
</tr>
<tr>
<td>Split</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: 4S-mode, adapted from Groen(2005), applied to Topicus’ development process, v = needs to be available, d = needs to be developed, h= needs to be acquired

Figure 2: Topicus’ Resource pyramid, adapted from Brush et al. (2002).
6 APPLICATION

In the preceding sections, we have analyzed Topicus’ growth strategy using existing theory. Topicus created a successful strategy which could be applicable to other similar organisations. For whom this could be applicable and how it could be applied will be discussed in this section.

Topicus’ organisational model is defined as modular because it fulfils the three characteristics:

- Topicus model is a hierarchy, all spin-offs are until now separated from the parent, the next one will be separated from Healthcare;
- The spin-offs themselves work in the same building and therefore are strongly connected themselves, through meetings, conferences, and parties, some dependencies are still present but limited;
- Each spin-off has its own network on which it focuses. Through this focus, new opportunities are found and the network grows, which makes it possible to grow as an organisation and therefore separate again. For example, the financial sector is now divided in insurances and mortgages, and Healthcare will be separated in Care and Cure.

In this way, Topicus directly profits from three of the advantages of modularity:

- Management is shared over the different organisations, which reduces the management complexity. Management is modularized and the groups that need to be managed are smaller therefore management requires less organisational skills;
- Modularity accommodates uncertainty and spin-offs are easier to write off as compared to business units. The decisions can be taken very quickly and therefore this is a flexible organisational structure;
- By creating spin-offs for specific networks, Topicus finds new opportunities. This is possible, because the modules have much knowledge from the networks. Moreover, when employees want to develop themselves and want to become an entrepreneur of a Topicus unit, they need to find a network for themselves. Therefore, everyone looks for opportunities.

However, there is a fourth advantage of modularity that is not covered by Topicus directly, being, working on different parts concurrently. Now, Topicus does not create applications for an entire network, but only for the different organisations in it. By combining several resources in an efficient way, Topicus can also profit from the available resources. Topicus first examines a network for possibilities. This examination describes important actors in the network, how they are connected and in which way the network can be optimized. When this investigation is used as a domain analysis (Pressman, 2000), it can create a task structure because the network and development process are isomorphic.

As Topicus’ organisation is modular, it is also possible to derive visible design rules from its development. Baldwin and Clark (2000) state that these rules need to cover three elements, an architecture, interfaces, and integration protocols. These elements are needed for developing a product but are not directly applicable to an organisation. An organisation needs to fulfil the elements of the task structure as proposed by Henderson and Clark (1990). These elements cover the rules of Baldwin and Clark, and are: workgroups, communication channels, information filters, and problem solving strategies.

6.1 Workgroups & Information filters

The organisation of Topicus is build up from spin-offs, because they strongly motivate knowledge workers and are an efficient way for entering markets. A spin-off consists of several project teams. At its start, one launching customer is taken from the parent and therefore one team needs to be created. However, the spin-off takes along sufficient qualified employees to manage two projects at a time, so continuity can be guaranteed. When the organisation performs three projects at the same time it is possible to spin-off one of them. This spin-off should have its own network, or path in which it will focus and from which it can profit from its reputation and software/knowledge from the project it is working on. As the spin-off focuses only on one network, this is a form of information filtering.
6.2 Communication channels & Problem solving strategies

Topicus works with very low-coupled organisations. This is possible because the knowledge concerning the networks is much more important and more complex than the knowledge concerning the development of the applications. Therefore, direct contact concerning the development of applications is not required. However, some new ideas need to be communicated over the organisations. For this, Topicus stimulates contact between personnel of the different modules in an indirect way.

This makes the design rules:

- Split organisations when possible this stimulates the entrepreneurial climate in the organisation;
- Organizations can split when sufficient qualified employees can be missed from the parent;
- The spin-off needs to focus on a specific network, different from that of others. Preferably, this network is closely related to the parent's because it can than profit from reputation and software/knowledge yet available;
- Parent and spin-off need to work as one until both have sufficient employees and projects to guarantee continuity of work;
- Create indirect communication channels, so problems and ideas are shared over organisations;
- Focus on immature or changing markets so internal and external environment are appropriate.

There are, however, two limits to this strategy. First, this strategy makes use of the advantages of an organisation in its entrepreneurial phase, which is characterized by a maximum of 30 employees (Swatman et al., 1990). Therefore, the organisation needs to be able to fulfill three projects at a time without crossing this number. Second, this strategy is not applicable to existing organisations because it is hard to create such an entrepreneurial climate, if an organisation has developed as one until now.

7 CONCLUSION

7.1 An Organization without Managers

Topicus created an innovative organisation without the need for multiple layers of bureaucracy in spite of rapid and sustained growth over its lifetime. This is done by creating spin-offs whenever the organisation gets too large. An entrepreneur leads each spin-off but also functions as a project leader. This results in an organisation where there are no full-time managers and therefore no bureaucracy. Spin-offs are highly focused on specific market niches and personnel are highly motivated as they share in the profits of the spin-off. Topicus benefits from this strategy because of the advantages of modularity. Modularity reduces the complexity of the organisation and makes it possible to remain innovative in the face of rapid growth. The organisation stays in the “entrepreneurial” stage of organisational growth no matter how large it grows (Quinn and Cameron, 1983). In general, setting up new organisations is risky. However, Topicus has developed a process that provides sufficient resources for survival in all stages of this process, by cooperating as one until the new organisation is a mature organisation itself.

Topicus’ organisational strategy was not based on any theory but primarily on the desire of the company’s owners to avoid bureaucracy: a “lifestyle” rather than a profit-maximisation choice. However the strategy is very successful as evidenced by Topicus’ sustained growth and low turnover rate. This paper helped to explain why the strategy has been successful even though it seems diametrically opposed to the predominant model in the IT industry of creating large, monolithic organisations (e.g. IBM, Microsoft, Google). This paper also helped to improve the strategy by reducing it to six design rules based on the concept of modularity. These rules cover the important elements for creating an organisation: workgroups, communication channels, information filters, and problem solving strategies. These guidelines can be followed by other organisations who wish to pursue such a strategy.

7.2 A Strategy for Maximising Innovation and Minimising Turnover

IT turnover is a major issue in the IT industry. The most recent SIMS “key issues” survey found that attracting, developing and retaining IT professionals was the second most important issue facing IT
executives (Luftman, Kempaiah, and Nash, 2006). Innovation requires highly skilled, independently minded employees. Such individuals do not respond well to tight controls and many reject traditional forms of management and will seek employment elsewhere rather than submit to them (Baldwin and Clark, 2000). Working in an “organisation without managers” may explain why Topicus’ turnover rate is so low. A side effect of organisational modularity is an environment that people enjoy working in.

Such a strategy is probably a good risk management approach in an industry characterised by regular “boom” and “bust” cycles like the IT industry. If one spin-off fails, it does not affect the survival of the remaining spin-offs, whereas in a single monolithic organisation failure of one business unit can threaten the survival of the organisation as a whole.

However such a strategy is not for everyone. If an organisation wishes to dominate a market (following a strategy of becoming a low cost producer) creating a large monolithic organisation is necessary to achieve the required economies of scale. It also remains to be seen whether such a strategy is sustainable in the long term, for which reason we will continue to monitor Topicus’ development.

REFERENCES