

The interaction between adaptive capacity and organisational structure

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This paper draws on adaptive capacity and organisational structure literature to show that a gap exists in the integration of the two in relation to how companies succeed in surviving external pressure and change. In continuation, it is hypothesised that a defining characteristic of successful companies is their ability to let their internal structure react to external pressure, with "external pressure" typified by the different phases of the adaptive cycle. A comparative literature review of the overlap between the characteristics of adaptive capacity and the elements of a robust organisational structure, combined with two case studies of IT-companies, provide insights supporting the hypothesis. The paper closes with the recommendation for further research in the extend to which how the elements of the organisational structure change withing this cycle and especially how these changes can than be predicted.

Keywords: Adaptive capacity, Organisational structure, Adaptive Cycle

Introduction

The information and communication technology (ICT) domain is a field with great entrepreneurial opportunities. In France alone, over 84.000 new companies aimed at operating in the ICT domain were born in 2001 (Lasch, Le Roy, & Yami, 2007). Great opportunities come with great risks because IT start-ups focus on growth by extremely scaling their activities in highly scaleable markets. Examples of successful IT companies are: Facebook, Instagram, LinkedIn and Spotify. On the other hand, many IT companies fail already before fulfilling their commercial potential, as only one out of three new companies succeed in surviving the crucial first three-years (Lasch et al., 2007). Less than 10% of the failing IT start-ups fail due to competition whereas more than 90% of the start-ups fail due to self-destruction (Lasch et al., 2007).

When surveying the existing literature on success of IT-start-ups and businesses in general, two bodies of theory can be distinguished. First of all on organisational structure and secondly the wider field pertaining to adaptive capacity. In the literature on organisational structure, the organisational structure of a specific entity, institution or business is portrayed as static (Mintzberg, 1981). However, when "zooming out", systemic theories of adaptive capacity (Holling, 2001) posit that in order to be adaptive, organisations have to change in reaction to external pressure and influences. These two theories of organisational behaviour seem juxtaposed in the sense that one theory presents organisations as being (relative) static, whereas the other posits that in order to survive organisations have to interact with, and react to, external stimuli and pressure. However, as already mentioned some companies do survive, whereas the majority of companies succumb to external pressure and self-destruction. This

is interesting since the systemic view on survivability, i.e. adaptive capacity, portrays reactive ability as a key element to sustainable survival.

Derived from the theory of adaptive capacity as being part of a cyclical process, we posit that **successful companies are the ones where the organisational structure can interact and react to external pressure.** As such, with successful companies as the main unit of analysis with "successful" being defined as companies managing to pass the crucial three-year threshold (Lasch et al., 2007), the following research question crystallises: *How does the internal structure of a successful company interact with (and to) external pressure?* In continuation, we hypothesise the following: companies that manage to survive are the ones where the two components of external pressure and internal organisational structure are indeed allowed to interact.

To investigate this claim we will proceed in the following way: firstly, a general theory of adaptive capacity is outlined along with relevant theories on organisational structure. Following this, the two theoretical bodies are integrated in order to show potential gaps in the empirical state of knowledge. This will be followed by two case-studies where we take steps to validate our hypothesis with a subsequent discussion of the results. Lastly, a conclusion will be drawn to underline the consequences of any potential findings for the existing theory, followed by recommendations for further research.

Theoretical framework

Adaptive capacity

Adaptive capacity can be typified as a resource that resides at the individual, the institutional, or at the system level. As



a resource, adaptive capacity allows for the preparation of internal elements in anticipation to external pressure and uncertainty with as goal to avoid collapse (Folke et al., 2010). An institution can be defined as a "stable answer to a recurring problem encountered by a specific collective" (Berger & Luckmann, 1991). This means that an organisation can be viewed as an institution, where the problem encountered is one of facilitating (market) resource extraction. What elements defines adaptive capacity, however, varies by domain, system, and context (Nelson, Adger, & Brown, 2007).

In strong relation to the perspective promulgated by Nelson (2007) is Ensor's (2011) theory of adaptive capacity. Ensor (2011) identifies a set of mechanism which can strengthen and facilitate the adaptive capacity in the domain of institutions and organisations. In doing so, Ensor (2011) identifies three dimensions or institutional mechanisms that all help to strengthen adaptive capacity. These three dimensions are: (1) power sharing, (2) knowledge and information, and (3) the availability of experimentation and testing.

While adaptive capability can be viewed as a resource, another way of defining adaptive capacity is as being nested in, or as part of, a greater cyclical process (Holling, 2001). Here the cyclical process, in which adaptive capacity is embedded, is shaped by a series of clearly defined properties. These properties are: the inherent potential of the system, internal controllability, and adaptive capacity (Holling, 2001). Flexibility is key (Holling, 2001). This notion is also supported in other empirical work where it has been found that more complex and flexible institutions are indeed more adaptive (Pahl-Wostl, 2009). The requirements for these properties also changes over time to adjust to the needs over time, thus making adaptive capacity context specific and conditional on temporal conditions (Engle, 2011).

In systemic terms adaptive capacity denotes how vulnerable a specific system is to external shocks. Changes over time in this cycle results in increase and decrease of resilience. The systemic process captured by the theory of the adaptive cycle provides a valuable theoretical framework in which to place this process and mechanisms through which organisations adapt (Abcouwer & Parson, 2011), with each stage of the cycle being typified by four separate quadrants in the adaptive cycle (Abcouwer & Parson, 2011). Most relevant in the scope of this paper are companies transitioning from the second to the third quadrant of the adaptive cycle 1.

From the general principles of adaptive capacity, Gupta et al. (2010) aims to translate the theory into a set of more concrete tools for gauging the adaptive capacity of a specific institution (Gupta et al., 2010) in six influencing factors. The first factor is the manner in which involvement is encouraged of different perspectives by building an inclusive discourse where different actors at all levels are able and feel free to contribute ideas and knowledge. Secondly, similar to the principle of experimentation and testing outlined by Ensor

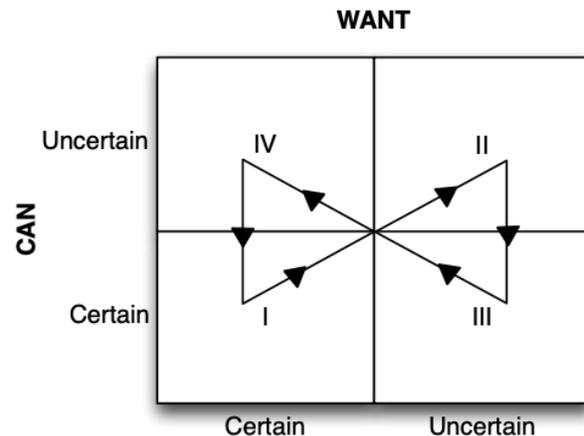


Figure 1. Model of the adaptive cycle as outlined by Abcouwer and Parson (2011)

(2011), Gupta (2010) point out that actors should be enabled to improve and learn. Congruent with the idea of organisational flexibility identified by Pahl-Wostl (2009), Gupta (2010) points out that institutions should allow actors operating in it to adjust their behaviour. This entails that potential systemic constraints of actors in a specific institutions should be minimised. Moreover, mechanisms for mobilising leadership and resources for the implementation of adaptive measures should be in place. Lastly, institutions should support principles of fair governance (Gupta et al., 2010).

When seeking to integrate the theoretical perspectives on adaptive capacity outlined up until this point, a range of re-occurring themes are present. Firstly, it is important to note that adaptive capacity is context and entity specific (Engle, 2011), thus clarifying the lack of an academic consensus regarding its definition. This also helps to underline the importance of understanding adaptive capacity as a function of the context in which a specific system, institution, or actor is embedded (Holling, 2001). Moreover, while adaptive capacity can be framed as a temporal resource (Ensor, 2011), it is helpful to view adaptive capacity as being embedded in a wider systemic process which changes in response to external pressure, with the change being governed by a set of properties such as inherent potential of the system (Holling, 2001), along with the flexibility of the organisations as a whole (Pahl-Wostl, 2009). Furthermore, while some of the theories of adaptive capacity are addressed towards systemic change, institutions and their inherent adaptive capability are formed in interaction with its external environment. Thus, when seeking to translate these into an analytically tool for institutional assessment of adaptive capability, Gupta et al. (2010) derives a range of specific institutional factors that facilitate adaptive capacity.

Organisational structures

Structures are referred to as the relationships between components of an organised whole (Ahmady, Mehrpour, & Nikooravesh, 2016). Mintzberg (1981) defined organisational structure as: "the framework of the relations on jobs, systems, operating process, people and group making efforts to achieve their goals" (p. 8). Organisational structures are pursued to facilitate efficiency in decision making, enable proper reacting to environmental influences, and conflict resolution between internal units and departments. But in order to realise steady growth and maximum market share by an organisation, the organisational structure needs to be in line with the nature of the market and an organisation's tasks and product portfolio (Stverkova & Pohludka, 2018). When an organisation grows and the market changes, business models, communication methods, and internal structures of a company adapt. Since these factors influence the organisational structure, logically the structure has to evolve over time.

Thus, it is beneficial for organisations to internally review their organisational structures in attempt to prevent future difficulties and internal issues (Paternoster, Giardino, Unterkalmsteiner, Gorschek, & Abrahamsson, 2014). Especially in start-ups there is a lack of organisational structure management (Baron & Hennan, 2002), while these start-ups are a prime example of organisations facing changes in their organisational structure due to fast growth or the impact from external changes.

Research on factors influencing the capability to deal with changes and risks consider the robustness of an organisation. Morozenko et al. (2018) identified various internal factors of the organisational structure which influence an organisation's robustness. Robustness can be interpreted as the probability that a system keeps functioning with a given quality, while the environment in which the system operates is changing.

In relation to the organisational factors, flexibility of an organisational structure combined with horizontal system forming has been found to be a contributing factor to organisational robustness. Structures that are rigid, highly formalised, and centralised often limit internal innovation and the ability to communicate among relevant participants (Chen & Huang, 2007). Therefore, to enable the participation and knowledge sharing outside the scope of a specific team or department horizontal system forming is encouraged. In addition, the competence of top management, the existence of standardised managements and decision-making systems, and the communication between horizontal departments in the organisation are just as important for robustness (Paternoster et al., 2014).

The development of innovation and invention is an internal social factor that contributes to an organisation's robustness. Innovative behaviour by employees should be encouraged and supported for organisations to survive and effectively run their business operations (Rhee, Seog, Bozorov, &

Dedahanov, 2017). Innovative behaviour facilitates creative solutions and ideas for unforeseen issues caused by environmental factors. Moreover to stimulate innovative behaviour, methods to develop employee's skills, i.e. systematic training, should be supported. Investing in an employee increases their work engagement, which is characterised as a desirable and positive psychological state which involves a rise of enthusiasm and happiness driven by effort and dedication. These factors positively effect creativity (Li, Chen, & Cao, 2017).

The interaction of organisational structure and adaptive capacity

Theories on adaptive capacity describe characteristics that contribute to an organisation's capability to deal with external pressure. But how do these characteristics relate to the elements of a robust organisations?

First, the appropriate and effective alignment of management and decision-makers is a topic both theories agree on to be beneficial to an organisation's adaptive capacity. Morozenko et al. (2018) state that "competence of top management" and the "existence of a standardised management and decision-making system", contribute to an organisation's robustness. While Ensor (2011) theorises that power-sharing is a main component to increase the adaptive capacity. This leaves to questions whether power-sharing also implies a less standardised management system. It could be argued that power-sharing allows for that decision-makers include involved members to broaden the initial perspective resulting in more options during the decision-making process, while also achieving more consensus about the made decisions. This however, requires flexibility from the standard management structure. In relation to the adaptive capacity, the standardisation of the management systems is also allowing for this flexibility in decision-making.

Second, the internal and social factors adding to an organisation's robustness benefits from the knowledge and information sharing adding to the organisation's adaptive capacity. Creating an environment that allows for knowledge sharing across the working domains enables higher understanding of the overall work, improving horizontal communication, and increasing engagement.

Following the relations the elements of a robust organisational structure and the characteristics of adaptive capacity, there is a reoccurring theme of needed flexibility in both domains. However, adaptive capacity is described as context specific, and it's elements changes over time as described by Holling (2001). Although the elements for a robust organisational structure are often discussed as static requirements and characteristics, the existing relations between the two domains suggest that these will also hold over time. Meaning that the changes in the adaptive cycle also influences to what extent the elements of a robust structure hold. Finally,

hints at this interaction between the domains are found in all elements as discussed. For instance, Engle (2011) addresses that the degree of connectedness in an organisation should be more flexible in times when there is a need for reorganisation.

Case studies

We hypothesise that companies that do survive, i.e. adaptive companies, are the ones where the internal structure of a company is allowed to react to external pressure. But to what extent do the characteristics of adaptive capacity interact with the organisational structure in application? In order to explore some possible manifestations of interactions between these two domains, open-ended interviews were conducted focusing on establishing when, how the organisational structure of the company changed, what kind of external pressure led to the change, and how the organisations dealt with these changes. Further, in our discussion we analyse findings from these interviews in relation to our theory.

Case 1: Bol.com

To discover how organisational structures interact with adaptive capacity, information on one of the biggest web shops in the Netherlands, bol.com, was gathered. In particular, information on the elements that define the organisational structure of bol.com is collected. Semi-structured interviews with two employees who fulfil the task of ‘social media service expert’ at bol.com were held to gain insights. Moreover, existing interviews with board members, reports on bol.com, and bol.com’s internal job offers, were scanned for useful information.

Bol.com is the leading web-shop in the Netherlands, selling over 15 million articles in 20 different categories. With their well-stocked trophy room, including prizes for ‘Strongest retail brand 2018’ and ‘Best Dutch store 2018’, the organisation is considered to be one of the most influential retailers of the Netherlands and Belgium. Moreover bol.com is praised for their high quality customer service. To maintain functioning at the top of their game, over 1400 employees and their daily tasks shape the organisation. To ensure smooth daily operations and timely and efficient fulfilment of tasks, the fundamentals of a matrix structure are incorporated in the organisational layout. In a matrix structure, people with similar skills form departments. Moreover, the structure involves dual-authority relationships, thus not limiting individuals to one reporting line (Harris & Raviv, 2002). Within bol.com the structure translates into departments like ‘product specialists’, ‘social media experts’, and ‘logistics’.

Bol.com’s organisational structure is horizontal, which is a logical effect of the matrix structure (Harris & Raviv, 2002). Quotes in recent job offers of bol.com support this as well.

“Within the roles and responsibilities you have in your team, you have to determine how to reach your goal. Within these boundaries you are allowed to take your own decisions and determine your priorities.”

Moreover, general information on the bol.com job offers page, provides insights on the hierarchical structure. Emphasised is the fact that there is no manager who will determine which roll you will serve in the team. In daily meetings with your team, you will deliberate on who will take on which roles. Moreover, you and your team members are in charge of the activities that are part of your job profile.

Both employees confirm the horizontal structure within bol.com. One employee states that there are so called ‘team leaders’, although they don’t determine how tasks should be executed and decisions can be made individually, or with deliberation in the team. The employee explains that the team leaders take on additional tasks, like scheduling, but do not take on classic boss roles. Furthermore, they are part of the team and do not operate from departments or offices situated elsewhere in the organisations building. Moreover, the more experienced employees, so called ‘seniors’ are always available for help with decision-making. However, the employees directly address a recent shift to a more hierarchical structure. The vastly growing demand for bol.com’s products, driven by black Friday and the upcoming holidays (Christmas), made the customer service department grow rapidly in size in the past half year and demanded a change in daily processes and thus resulting in a more hierarchical structure. This development had an effect on communicating with team leaders, as quotes by the employees prove.

“In the past I could directly approach a team leader when I was sitting next to one. They would directly help. However, recently they often refer me to a senior who will collect multiple issues and communicate them to the team leader at once. The team leaders are less approachable and often separate themselves from the rest of the team.”

Furthermore, the hierarchical structure is all the more reflected by the fact that individuals are limited in their ability to approach a manager who they wish to approach.

“When it’s very busy I get assigned a team leader who I have to communicate with. Whereas in times of calm I can just walk over to any team leader and ask whatever I want”

As stated in the literature, when a company shifts from a flat structure to a more hierarchical structure, room for creativity and thus innovation shrinks. Moreover, when the employees were asked about freedom to express opinions and for creativity, they immediately agree that they are being limited.

"Being creative was always stimulated, whenever you had an idea or a suggestion, there would be somebody who would listen to you and start a discussion. Now a days, whenever I propose something, they tell me to e-mail it and they will look into it. However, some ideas do get picked up."

However, one of the employees mentions that creative ideas and solutions for urgent existing problems, still do get taken seriously.

"Since many new employees were hired in a very short period, the amount of questions asked by them rose rapidly. At one point, experienced employees would spent more time helping new people than doing actual work. So, one of my colleagues proposed the idea to appoint some oracles. They would only focus on helping the new people, so the experienced people could remain in their work flow. The oracles would have an orange flag at their desk to reveal their roles. This turned out to be a great solution."

The employees predicate that, even though they dislike it, they understand the need for the recent change of the organisational structure. Moreover, they expect that the horizontal structure, which they were used to, will return once the workload decreases.

Case 2: Anything Connected

Anything Connected is a relative new start-up that provides small stand-alone hardware solutions that contain various sensors that can be stuck to almost any type of equipment and can connect to (Internet of Things) networks for monitoring and prevention purposes. When founded the organisation's workforce contained the founder and one other person that was the "all-rounder" in technical work. Now roughly two years later we interviewed Kevin Ouwehand, responsible for the hardware boards, in order to discuss the changes in the organisation structure by time. More specifically, we investigate how the organisational structure changed over time for Anything Connected in order to react on external pressure.

"In the two years the organisation has been active, a lot seem to have happened and influenced how the organisational structure formed over time. First, the need for growth due to the realisation that more knowledge and specialisation was needed. The changes in the organisation were a bit chaotic, but first there was just one person working on all the technical details and the founder doing all the sales, communication and basically anything other than the technical work. Then somebody joined to take over the

sales and communication work, by then I also joined to take over the embedded systems part."

In addition to the increase in workforce, the roles of their work also changed.

"[...] there was a transition period where the former technical lead and I worked together to make the second model of the hardware board to work. But after the complete change to a custom board and hardware for the third model, I mainly took over as lead embedded systems while he remained working on the client side front- and back-end."

The dynamics of their organisational structure changed from just two people working to build a working prototype, to six main specific roles.

"[...] the original financial investor returned, but struggled with the organisation structure as he also wanted some say into the decisions being made. They came up with a new structure of three main managers that came together to discuss their progress and decision that needed to be made. Now I discuss my work with one of them and suggest, from a technical perspective, what we should focus on or do next."

The changes to the organisational structure after the immediate financial issues resulting in a more hierarchical organisational structure. However, the "managers" of the organisation functioned more as an additional layer of communication instead of a barrier for the lower layers. Kevin still has the responsibility of the embedded system and he works together with anyone in the organisation when needed. Although there is currently a more specialised division of responsibility, and with the current work load, not much direct team work exists in day to day tasks.

Recently the organisation managed to change from a position where they needed to work very hard to find a new investor, to a more comfortable position of being approach by possible investors:

"Since the last successful pilot program, we are now starting a few more pilots and have gotten to a point where investors come to us instead of us having to find them."

This change allows for more funds for work and growth in the organisational structure in the future. A first manifestation of these changes are in form of interns that work together with Kevin to investigate specific issues. Like the ability to connect the hardware to the existing LORA (Internet of things) network. For now the organisational structure

of Anything Connected is very flexible and changes when new problems are found. But also when new opportunities present themselves, for instance the use of new employees/interns to think of new methods to improve their current product. In conclusion to the expected changes to come, Kevin closed with that in short time they expect to add more people who can improve specific parts of the organisation where they currently don't have time or knowledge for to address.

Discussion

When reflecting on the case studies in relation to the theory, bol.com's organisational structure is considered to be positioned between a flat and a hierarchical structure (Harris & Raviv, 2002). But, most interesting is that the organisational structure of bol.com fluctuates over time depending on the state of the organisation related to their adaptive cycle. When pressure increases through, for example, increased market demand, the internal organisational structure becomes increasingly hierarchical. This is also underlined by the statement that managers are more approachable during "easier times" whereas more external pressure leads to less approachable managers. Thus, the fluctuating organisational structure contributes to bol.com's ability to deal with the external factor, which in this case is a spike in demand during a specific time of year. These changes they are able to make influence the communication between horizontal departments, the degree of centralisation and formalisation. This shows that the organisational structure of bol.com's possesses various characteristics that adds to the adaptive capacity, while also aiming to improve the robustness of their organisational structure in a way that takes temporal changes into account. Due to this organisational structure strategy, bol.com is able to build adaptive capacity for a possible crisis from other external changes.

Different than an organisation with an already large organisational structure is Anything Connected, a relatively small and growing start-up. Similar to bol.com, Anything Connected shows that flexibility of an organisational structure is essential for dealing with external pressure. In time of financial difficulty, the organisational structure changed to enable focus on more knowledge sharing in the decision-making process. While the actual decision-making process was more centralised, but in turn also open for communication. This created a more hierarchical structure, but only at the places where it was needed for that time. In relation to their current and expected growth, the structure will grow flexible adding more decentralised functions that will communicate through their horizontal departments. In the end Anything Connected shows that during the states of the organisation, changes in the structure will help put focus on where is needed: which in the case of Anything Connected is more knowledge for the decision-making process. Interesting would be to see how

the organisation will deal with their expected growth, and if the current structure enables this naturally or if changes will occur again.

Findings from our theory suggests the relationships between the manifestations in an organisation that enhance adaptive capacity and those which make the organisational structure more robust. While the cases studies provided a few examples of how these extend to application. Expected is that many theories on improving organisational structure and their strategies can benefit from findings in adaptive capacity theory. In addition, more research into how these interactions manifest themselves in failed and successful cases help in the formulation of more applicable theory for organisational structure during the different states and external changes an organisation will have to traverse.

Conclusion

Overlap can be found in various parts of the characteristics of adaptive capacity and the elements of an robust organisational structure. The idea that adaptive capacity is part of a cycle means that the current state of the organisation determines the elements that increase adaptive capacity. This would suggest that organisational structures, showing relations to these elements, would also require to change following the current state in the adaptive cycle. The process of interaction between external pressure and internal organisational structure is, however, complex. With our two case studies we found some manifestations of the interaction between the organisational structure and the elements of adaptive capacity and it's continues cycle. For example, the case of bol.com gave insights in their fluctuating organisational structure reacting to external stimuli. Based on our findings we suggest that the existing literature of organisational structure can better be viewed and understood as embedded in the different phases represented by the adaptive cycle. Consequently, we would posit that for companies to enhance their changes of surviving the first crucial years, they should let their internal structure react to the external pressures and embrace the structural changes that they can bring about following the same principles of adaptive capacity. How these changes over time can be predicted and analysed beforehand would be an interesting addition for further research.

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