Impact of Corporate and Organic Growth on Software Development

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Abstract. Many small software companies grow in an organic and corporate manner. When growing, they have to make many organizational changes, mature their processes and adapt them to the rapidly growing customer base and product demands. This may be a challenging task bearing in mind the fact that software organizations lack guidelines for how to grow and mature their software processes in the context of business growth. In this paper, we map out one software company's corporate and organic growth in the course of its historical events and identify its impact on the company's software production processes and capabilities. We also list benefits, challenges, problems and lessons learned as experienced by the company studied. The paper rounds up with the suggestion for incorporating business growth elements into software process improvement models.

Keywords: business growth, process change, process improvement.

1 Introduction

Many of today's software start-up companies grow and expand at fast rate. They do it either in an *organic* and/or *corporate* manner where *organic* means growth in form of increased output and/or sales and *corporate* means growth by being merged with, acquired, or taken-over by some other company [3].

Companies encounter many challenges with respect to sustaining and furthering their business growth rate [15]. They have to think in the long term about business and its environment and quickly adapt to the changing or emerging markets. They have to manage their increasing customer portfolio, and grow their products in quick and strategic manner [15].

Organic business growth implies radical changes to the ways in which companies develop and maintain their software products. Many times start-up companies do not have any software processes in place. Or, if they have any, then the processes may not always be mature and scalable enough to meet the business growth.

Corporate business growth, on the other hand, often forces the acquired companies to adapt to their acquirers' process portfolios. This may be a big challenge bearing in mind the fact that many of these organizations may not be mature or willing enough to change their process cultures overnight [6], [17].

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Even if the majority of the software organizations encounter strong organic and corporate growth, little has been done about finding out their effects on software development processes [3], [14], [15]. Hence, today, we do not have much insight into how much software development processes are impacted by business growth. Neither do we have any guidelines aiding organizations in maturing their processes while growing their businesses. Current process maturity models and frameworks, such as ISO 15504, CMM and CMMI, are not directly helpful [1], [4], [5], [10]. They are focused on what to change to mature the process and not how to adapt it to business growth.

In this paper, we report on the effects of a corporate and organic business growth on the software development process over the course of its eleven-year history. Our goal is to study the impact of organic and corporate growth on software development and identify issues that might contribute to process improvement models. The organizational body under study is a product development group that has started as a small and independent start-up company. It has undergone two acquisitions and ended up as part of a multinational software corporation.

Due to the sensitivity of the results presented herein, we do not disclose the names of the companies involved. Hence, we are referring to the acquired company as *Virtual Software Group (VSG),* its product development group as *Virtual Computing Product* group (*VCP* group) and to its acquirers as *Software Infrastructure Group (SIG)* and *Enterprise Software Provider (ESP).*

The remainder of this paper is organized as follows. In Section 2, we report on our research method. In Section 3, we provide historical perspective of the changes within the company. In Section 4, we describe the impact of corporate and organic growth on software development. Finally, in Section 5, we present the conclusions of this study and list the lessons learned as experienced by the acquired company.

2 Research Method

In this section, we report on our research method. First, Section 2.1 describes research method steps and then Section 2.2 presents the questionnaire used in this study.

2.1 Method Steps

Our case study consisted of three following steps: (1) *Choice of the company*, (2) *Semi-structured Interviews*, and (3) *Data Analysis*. Below, we briefly describe them.

We started our research by choosing a company. We first identified a company which encountered business growth. We then contacted its employees and tried to confirm whether the company fit the aim of our research and was willing to participate in it. This was done by a few unstructured interviews and the reviews of the online information about the company, its business and business growth history.

As a second step, we chose five company employees. The choice was based on their employment length, knowledge of the organization and the experiences of the changes within the past eleven years. We interviewed two team leaders (software developers), a release manager, a system architect and a product manager. All of them

have been working in the company for at least five and at most ten years. Hence, they were appropriate candidates for our study. When interviewing them, we used a semi-structured and open-ended questionnaire presented in Figure 1 and described in Section 2.2. The interviews were aimed to follow the history of software process evolution and identify challenges brought into it by the business growth.

I – Information about the company

I.1: What is the name of the company?
I.2: What is your position within the company?
I.3: What is the size of the company (in terms of people)?
  a. Whole company
  b. Development department
I.4: What does the company work with?
I.5: Which software development method does the company use?

II - Business growth

II.1: Has the company had any business growth?
II.2: Does the company encounter the continuous growth or is it coming in intervals?
In case of the continuous growth:
a. Since when has the company had a business growth?
In case of growth in intervals:
  a. How many business growths has the company had?
  b. How frequently does the company encounter business growth?
  c. What is a business growth in the context of your company?
  d. For how long do the intervals of business growth last? (i) The last one, (ii) The former ones

III – People relation

III.1: Did the amount of employees change as a result of business growth(s)? If yes, how?
  a. Have the roles of the employees changed as a result of business growth(s)? If yes, how and why?
  b. Were new employees hired as a result of business growth(s)? If yes, how many and to which positions?
  c. Were the company employees fired as a result of business growth(s)? If yes, how many and why?
III.2: How has the hiring of new employees affected the software development process?
  a. What training techniques were introduced for newly employed?

IV – Influence of business growth on the software development process

IV.1: If the business growth was coming in intervals (Q. 2.2): For each business growth under discussion:
  a. What was the software development process like before the business growth? Did you use any software development method? Which one? Did you use it fully?
  b. What was the software development process like after the business growth? Did you use any software development method? Which one? Did you use it fully?
IV.2: Was the software development process affected by the business growth?
  a. If yes, how was the process changed and adapted to the growing team? What was done? Please list the changes to the process. For each change/adaptation:
    i. Please name the change:
    ii. Please describe the change: Was this change for better or for worse? Please comment on it.
    iii. How did this change impact the development process?
    iv. Was the change intentional or accidental? Was a change reactive or proactive?
    v. Why did each change occur? What caused the change?
    vi. Who initiated the change? Who supported the initiation?
    vii. What other challenges were met in order to implement the change?
  b. If not, how come that it was not changed?
IV.3: What challenges has the business growth created? Please list the challenges.
IV.4: Please list the problems you have met due to the business growth. For each problem:
  a. What was the problem?
  b. How did you address each problem?

V – The cause of business growth

V.1: What was/were the reason(s) of business growth(s)?
V.2: Was the development process scalable before business growth? Is it scalable now?
V.3: Were the development teams prepared for business growth when it happened? If yes, how?
V.4: Does the company have any business growth plan? If yes, please briefly describe what such a plan covers?
V.5: Do you think business growth will happen again/ continue in this company?
V.6: How is the company prepared for future business growth?
V.7: Does the company plan for business growth? In what way?

VI – Lessons learned from business growth

VI.1: What lessons did you learn from business growth?
VI.2: What is your suggestion to avoid negative impact of future business growth?
VI.3: What can be done to adapt the process for smooth future business growth?
VI.4: How can we keep or even improve the maturity of the process during the business growth? Is it possible?

Fig. 1. Interview Questionnaire

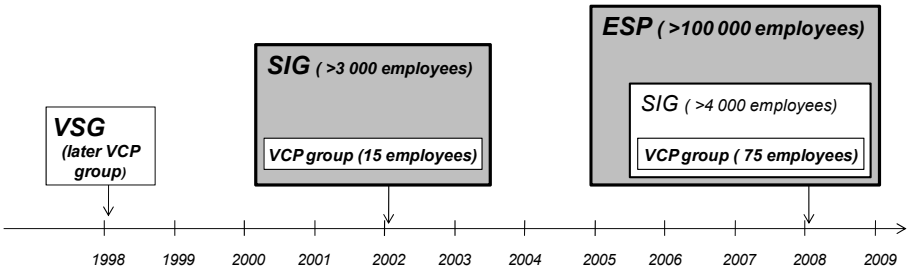

Fig. 2. Historical perspective of corporate growth of *VCP* group

Finally, we transcribed the interviews, analyzed the data using a hermeneutics approach and later confirmed the results of our analysis with the interviewees. In this step, we also identified and analyzed the changes made, benefits gained, problems encountered, challenges met and lessons learned from the business growth.

2.2 Interview Questionnaire

We designed our questionnaire with the purpose of inquiring about the business growth and its influence on the software development process. As can be seen in Figure 1, the questionnaire consists of six sections where each section is dedicated to a specific subject of interest. These are:

I. *Information about the company:* finding out information about the company, its size and development method.
II. *Business growth:* aiming at identifying the scope of business growth and its impact on the company.
III. *People relation:* inquiring about how the business growth has affected the employees of the company.
IV. *Influence of business growth on the software development process:* gathering information about changes done to the process due to the business growth. It also inquires about challenges and problems brought by the business growth.
V. *The cause of business growth:* asking about the reasons for the business growth and the company's state of readiness and preparation to meet future business growth.
VI. *Lessons learned from the business growth:* eliciting the lessons the interviewees have learned and their suggestions for process adaptation for achieving smooth business growth in the future.

3 Corporate and Organic Business Growth

The *Virtual Computing Product group* (*VCP* group) has undergone three major periods. As illustrated in Figure 2, we call them *VSG Period*, *SIG Period* and *ESP Period*. In the *VSG Period* occurring in the years 1998-2002, the *VCP* group was the only development team of a small company called *Virtual Software Group (VSG).* By then, it developed a *Virtual Platform Product (VPP).* In the *SIG Period* taking place in the

years 2002-2008, *VSG* was acquired by *Software Infrastructure Group (SIG)*, an application infrastructure software company. Hence, *VSG*'s development team, the *VCP* group, became one of *SIG*'s development teams and continued to develop the *VPP* products. Finally, in the *ESP Period*, starting in 2008, *SIG* was acquired by *Enterprise Software Provider (ESP)*, a world leading multinational software corporation. As a result, the *VCP* group became a development group within *ESP* where it is still working on the same product line.

The acquisitions by *SIG* and *ESP* have led to substantial corporate growth of the *VCP* group. Besides this, the *VCP* group has undergone a continuous organic growth. This has strongly impacted its organization and processes. Below, we report on these two growths and their impact. The description is based on Figures 2 and 3.

3.1 Historical Perspective of the VSG Period

In the *VSG Period*, *VSG* was a small start up company. It developed initial versions of the *VPP* product for a few customers and users. At that time, the company had only a few developers, who created a small development team called *VCP* group. The team had no role specializations and no process in place. The developers were responsible for all kinds of business and engineering tasks ranging from management, development, to maintenance and support. All their processes were run in an ad hoc manner.

3.2 Historical Perspective of the SIG Period

In the *SIG Period*, *VSG* was acquired by *SIG*. Hence, the *VCP* group became a development group within *SIG* and continued working on the same product. As a result of corporate growth, right after the *SIG* acquisition, the *VPP* product's user base expanded and continued growing thereafter in an organic pace. The *VCP* group also expanded its product portfolio from one to four products altogether. For the first two years, it was managed by managers in the US to be then overtaken by local managers in Sweden in 2004.

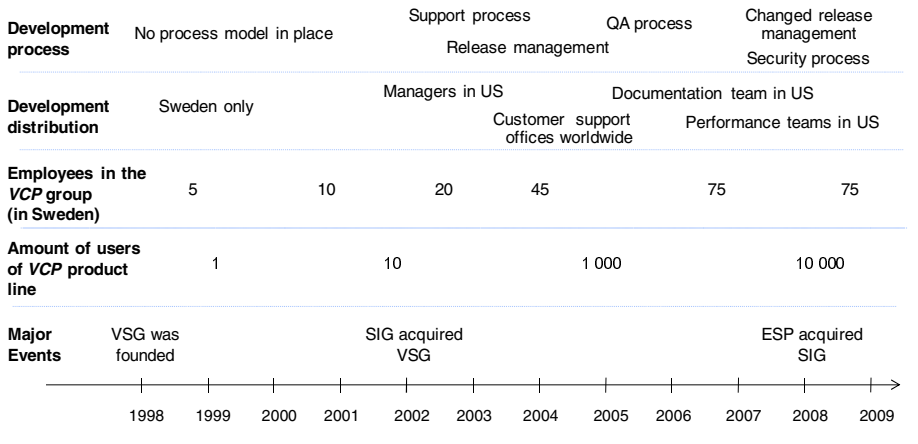

Fig. 3. Historical changes of corporate and organic growth of *VCP* group

In 2002, the *VCP* group had no processes in place whereas *SIG* had many structured and rigid processes in place. Despite this, *SIG* did not force the *VCP* group to change their process cultures. All process introductions were optional. With time, however, due to the fact that *VCP's* customer base grew and consequently the number of developers, the *VCP* group felt forced to introduce some processes. To address the most urgent process problems, they started with the most critical processes such as support, product and release management. Below, we briefly elaborate on this.

Due to fast organic growth, in terms of rapidly growing customer base and increased number of customer demands, the company created a separate support team in the year of 2002. By 2003-2004, they created a two-tier support where a customer support team was placed on the front-end support level and developers on the back-end support level [7]. A few years after, several new customer support teams were created in other countries. Due to the fact that customer support teams are service oriented and are not primary involved in development, those teams are not included in the *VCP* group today.

By 2003, the *VCP* group in Stockholm had grown to 35 people. It was no longer possible for one person to know and manage the whole system. For this reason, the developers became organized into different vertical teams where one team specialized in one or a few product areas.

In the same year, corporate changes were done and the *VCP* group introduced product and release management processes and the role of a product manager. A few years after, these were enriched by introduction of risk management. The group also introduced a requirement management process and an engineering specification. Based on the requirement document, the engineering specification became the main product documentation to be created by developers.

By 2003-2004, the growing *VCP* group tried to introduce Waterfall process to define and structure development method. Development teams however were not satisfied with it. Hence, some tried to introduce Scrum in 2007. As a result, today, the development teams use an unspecified pseudo-agile process evolved from an intersection between Waterfall-like method and some Scrum practices such as Scrum meetings and iterations.

In 2003, the *VCP* group employed a writer whose role was to create and update support and technical documentation for all the *VPP* products. A few years later, a second writer joined the group, both situated in the US. During the last few years, three additional writers were employed in India.

As part of the corporate growth in 2005-2006, the *VCP* group took over *SIG*'s QA and testing process model which they then customized to their own needs. Initially, the QA and testing process model were centralized within the whole organization. They were not smoothly integrated with the *VCP* group' processes. To remedy this, the QA team got integrated with the development teams of *VCP* group.

By 2007, the *VCP* group had reached 75 employees including developers, QA engineers, architects and development managers, all situated in Sweden, 20 additional employees in the US, including QA engineers, managers and writers, and three writers in India. Two QA teams, one in Sweden and one in the US, grew in size and became too large to be managed easily. Since the most important competitive advantage of *VPP* was performance and the QA teams dedicated majority of their time to it, *SIG* split the QA unit into one QA and one performance testing team in Sweden, and two performance testing teams in the US.

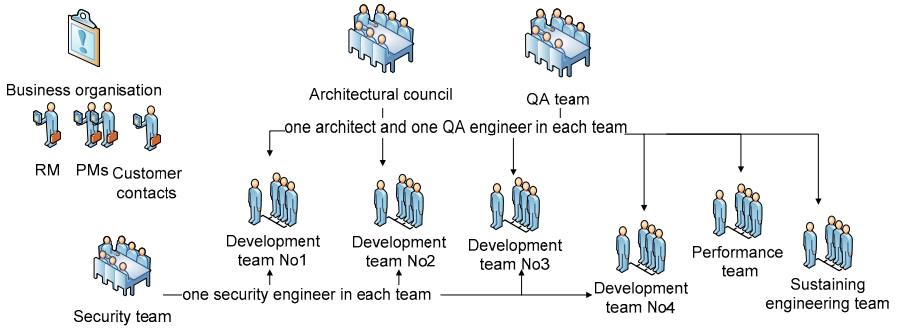

Fig. 4. Organizational structure of *VCP* group in Sweden

By that time, the product had also grown in size and complexity, and it was difficult to get an understanding of its overall system architecture. This led to a creation of an architectural council, which was responsible for creating an overall system architecture and for bringing consistency into the system structure by providing common standards and guidelines. It consisted of senior developers, who originally were part of *VSG* and who had deep knowledge of the product.

3.3 Historical Perspective of ESP Period

In 2008, *ESP* bought *SIG*. This, in turn, implied substantial changes to the *VCP* group. From the beginning, *ESP* decided that large part of its products should use *VPP* (the *VCP* group's product) as a base. Therefore, the amount of customers increased ten times comparing to the amount in 2005. The *VCP* group was not prepared for managing such a large customer base so abruptly.

Since *ESP* is a big company and has many processes in place, they enforced all their newly acquired organizations to follow their processes. All the processes were mandatory. Those who could not introduce them at once had to provide a roadmap on how and when they were going to implement them. The processes that were affected or introduced by this enforcement within the *VCP* group were support process, release management, problem management, risk management and security management.

After being bought by *ESP*, the *VCP* group continued organic growth; however the amount of developers in the group has not changed. Because of the recession and economical crisis, the company only hired the replacements of few *VCP* group members, who quit just after the acquisition. Therefore, the *VCP* group still consists of 75 engineers in Stockholm with a somewhat changed role portfolio including three product managers, a release manager, developers, architects, QA, performance, sustaining and security engineers (see Fig. 4). The group represents a standard research and development department and it is situated in Stockholm. Another 23 engineers involved in developing the products' line are situated in the US and India. Those are performance testing teams and a documentation team.

3.4 Changes

The above presented course of events shows that the *VCP* group has experienced many changes due to the organic and corporate growth. These changes affect organizational concepts such as roles, market, organization and processes in the following ways:

- *Roles*: The role portfolio of the *VCP* group has been substantially changed for the last eleven years. In 1998-1999, during the *VSG Period*, the *VCP* group did not have any clearly defined roles apart from developers and managers. Since 2002, the *VCP* group has been continuously introducing new roles covering various management and development responsibilities.
- *Market changes*: The corporate growth has helped the *VCP* group to find and assure the niche of its product on the market. Today, the *VPP* products are widely used worldwide.
- *Organization*: The acquisitions and organic growth have stimulated substantial changes to the *VCP* group's organizational infrastructure. The group has evolved from one team to nine teams. As shown in Fig. 4, these are four development teams, and one QA, one performance, one architecture, one security and one sustaining engineering team.
- *Processes*: Until 2002, the *VCP* group did not have any process in place. Substantial expansion and acquisitions of the *VCP* group by *SIG* and *ESP* stimulated it to introduce nine processes supporting their development and operation. These are customer support, QA, testing, problem management, requirement management, release management, sustaining engineering, risk management and security management processes.

4 The Impact of Corporate and Organic Growth

The business growth has brought many changes to the process resulting in many benefits, problems and challenges. Organic growth stimulated the *VCP* group to add changes to their organizational structure and to mature their development processes. The corporate growth, on the other hand, enforced some process steps and provided support for the *VCP* group for scaling up their processes. Due to the interdependencies and relation between organic and corporate growths, it is difficult to separate impacts of each growth. Later on, however, we will make an attempt to address benefits, problems and challenges of the two growth types. Before proceeding with their presentation, we would like to clarify our understanding of the terms problems and challenges.

In this paper, we define a problem as an issue or difficulty that needs to be resolved and a challenge as a difficulty of acting upon and dealing with some problem. The problems and challenges described in this paper are interrelated. Some problems are input to some challenges and vice versa. Hence, it is difficult to draw any clear lines of relationship. However, we try to identify the most obvious ones when it is relevant.

4.1 Benefits of Corporate and Organic Growth

Corporate and organic growth at the *VCP* group has lead to five benefits. These concern better utilization of development skills and resources, better control of corrective maintenance and risks, and improved product quality and its quality management. Below, we report on them.

Benefit 1: *Better utilization of development skills and resources:* In the *VSG Period*, the *VCP* group consisted of a few developers. The roles of these developers corresponded to some form of a "*skilled generalist*", a role developing a system from top to bottom. This approach was effective as long as the system, the development team and the customer base were small and easy to manage. With time, however, the developers experienced that they were too much burdened with increasing customer demands and many strongly diversified and time consuming engineering tasks. For this reason, the *VCP* group gradually introduced different roles, thus freeing developers from a broad range of strongly diversified responsibilities and allowing them to become more focused on the clearly specialized ones. In their opinion, specialization of roles has led to more effective utilization of human resources.

Benefit 2: *Better control of the corrective maintenance process:* During the *VSG Period*, software problems were reported and solved in an ad hoc manner. They were not recorded in a structured way, their severity and priority were not analyzed and some critical problems could be left unattended. This has lead to many difficulties. For this reason, *SIG* and *ESP* continuously improved the corrective maintenance process by mainly introducing a two-tier support infrastructure. This has relieved developers from support tasks and from solving minor problems. Instead, they could spend all their time on system development, enhancements and resolution of critical problems. In addition, the *VCP* group introduced problem management process, testing and QA process, and supporting tools. All this has led to better control over the corrective maintenance process and more predictable release plans.

Benefit 3: *Improved quality of the product:* During the *VSG period*, the *VCP* group had a simple testing process, performed by the developers. The company focused on feature development rather than on product stability and system quality. Therefore, the first versions of the product were unstable and customers reported many problems on them. Later on, *SIG* introduced QA and testing infrastructure and new testing roles to the *VCP* group. This has resulted in more quality checks, tests and code reviews. As a result, the *VPP* products today are stable enough to be used as a base for large part of *ESP* products.

Benefit 4: *Better control over the risks:* At the beginning of the *SIG Period*, the *VCP* group did not have risk management process in place. With time, however, due to high product complexity and its wide customer and usage profiles, the *VCP* group realized that they needed to have the process to track and mitigate the risks. They felt that it was important because a delay of major releases could cause bigger problems for the *VPP* products and other products that depended on it. As a result, today, project risks are not only identified at the beginning of each release, but also continuously analyzed, tracked and monitored throughout the whole release cycle.

Benefit 5: *Automated testing and QA environment:* During the *VSG Period* and at the beginning of the *SIG Period*, testing process suffered due to lack of automated testing environment. To support developers, the QA group was created and testing and QA infrastructure were introduced and automated. This saved substantial testing effort and made the code base more robust against faults introduced by new code.

4.2 Problems of Corporate and Organic Growth

Business growth has also brought some problems to the development. These concern lack of a unified development process, loss of productive time, extensions of processes with unnecessary steps and various communication problems. Below, we report on them.

Problem 1: *Lack of a unified development process in the VCP group:* The *VCP* group has not defined and does not follow any unified development process. This, however, was not considered to be a problem when having very few software development teams. Growing in the amount of developers and teams, the *VCP* group has still not achieved any consensus on what process to use and in what context. As a base, the group uses an unspecified pseudo-agile process based on Waterfall-like method and some Scrum practices. The method is supplemented with Scrum and XP techniques in different manner by different teams. As a result, different development teams use different techniques and methods. Also, the involvement of product owners varies among the teams. Some teams have short iterations, frequent demonstrations and meetings with the product owner, whereas other teams work on one specification for half a year and only demonstrate the end product. This contributes to inefficient communication between the teams, and adds to some of the problems described below.

Problem 2: *Loss of productive time due to corporately mandated environmental changes:* Due to the corporate growth and acquirer's company policies, the *VCP* group was forced to change its technical and tool environment concerning customer relationship management tool and hypervisors. All these changes required substantial adaptation effort thus leading to strongly decreased productivity. For instance, it took nearly a year for the group to change to a new hypervisor.

Problem 3: *Misunderstandings and insufficient communication between developers and QA engineers:* When initially created, due to the corporate change, QA was a central organ within the organization. The developers' responsibilities were to develop system code and QA engineers' responsibilities, on the other hand, were to assure that the system code was of high quality. In order to maintain system quality, QA engineers added many checks and processes, which developers had to follow. The centralization of QA and traditional software development resulted in a communication and collaboration problem. Both groups had difficulties in working towards common goals.

The communication problem was solved by adapting an agile technique and by decentralizing QA (one QA engineer became part of a development team, see Fig. 4). Today, QA engineers are integrated with development teams in an agile manner. They perform QA and testing activities already during the implementation process and they

guide development decisions to assure that the final product is testable. Thanks to this change, many of the testing problems are solved earlier in the process.

Problem 4: *Unnecessary or redundant process steps:* Development processes at *VCP* group have continuously evolved and matured. At the same time, more and more unnecessary or redundant process steps were added to the development process. This was because the new processes and standards have been continuously enforced; however, they have been seldom reviewed or analyzed. During the last few years, this problem was partially addressed and some process steps were removed from the development process. Still, however, many unnecessary and redundant steps remain.

4.3 Challenges of Corporate and Organic Growth

Corporate and organic growth has brought many challenges to the development process. These concern tackling growing product complexity and quality, managing maintenance, communication, scalability, and delivery, management of inertia to process changes and upkeep of developer creativity. Below, we report on them.

Challenge 1: *Challenge to manage growing complexity:* During the last ten years, due to the substantially increased customer demands, the product has grown in size and complexity. The number of developers and development teams has grown and the tacit knowledge of the product has become distributed among many developers. All this has led to difficulties to manage and maintain consistency and the growing system complexity. In order to address this difficulty, an architectural council has been created whose role is to bring structure and consistency into the architecture and code.

Challenge 2: *Evolution and maintenance challenge:* Today, developers have to be very careful when making new changes to the system. Because it is already used by many customers and products, the developers have to make sure that the changes do not introduce new problems. Such problems may have substantial ripple effect on the products reliant on the *VPP* products. For this reason, developers put extra effort into studying all complex dependencies both within the product and its environment.

Challenge 3: *Challenge to improve system quality:* The complex system is hard to test. Its testing is challenged mostly by the fact that the product is used both as an independent product and as a base for a large number of other products. Furthermore, customers often use the product in the ways that have not been initially intended for and specified. This has led to an increase of many different problems generating many different testing scenarios and tests. Since the QA resources have not increased, it has become very challenging to maintain satisfactory product quality.

Challenge 4: *Communication challenge:* The bigger the system, the more developers are developing it and the more communication is required [2], [13], [18], [19]. Since the *VCP* group does not have any unified development process (Problem 1) or any inter-team communication pattern, the communication has become a challenging task. Especially challenging is the communication between employees in Sweden and the US, due to the physical distance and time difference.

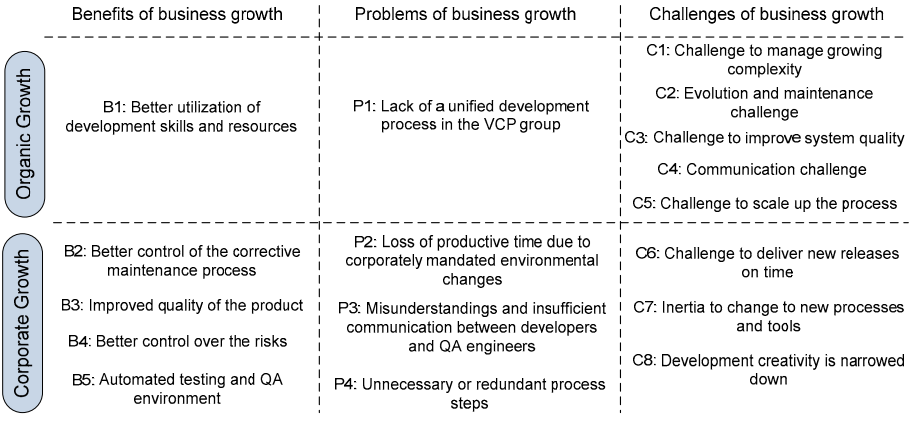

Fig. 5. Impact of corporate and organic growths on the *VCP* group's development processes

Challenge 5: *Challenge to scale up the process:* The process was not scalable during the *VSG Period*. There was no sufficient organizational structure or distribution of responsibilities, which contributed to the communication challenge (Challenge 4). The introduction of processes in the *SIG Period* somewhat improved the scalability problem. The scalability, however, was hampered by solutions such as, for instance, centralized QA and testing at those times. Even, if they have become decentralized, the process at the *VCP* group is still not fully scalable, due to the reasons such as lack of a uniform development process in the group.

Challenge 6: *Challenge to deliver new releases on time:* After *ESP* acquisition, other *ESP* products have become dependent on *VPP*. As a result, *ESP* imposed corporate release schedules. The release scope and time cannot be changed once it is communicated to other development units. This makes the developers of *VCP* group feel challenged to deliver all the desired features within the specified deadline.

Challenge 7: *Inertia to change to new processes and tools:* During the corporate growth, many changes were forced on the *VCP* group. Even if everyone agreed on process or tool related problems, not everyone agreed on their proposed solutions. The *VCP* group was not involved in deciding whether and which processes or tools to implement. Instead, the tools and processes were imposed on them. This has led to a strong resistance to most of the process changes and tools.

Challenge 8: *Development creativity is narrowed down:* By adding more and more corporately mandated processes to the software development, the *VCP* group started to narrow down and loose its development creativity. The processes were added as a solution to every process problem. However, they did not always improve the process but often made it more rigid thus making the development teams less flexible and creative. Because of the limited opportunity to utilize their creativity and other reasons, several employees quit the *VCP* group right after it got acquired by *ESP*.

5 Conclusions and Lessons Learned

In this paper, we have presented a historical perspective of organic and corporate business growth and identified its impact on the software organization and its development process. As summarized in Figure 5, both organic and corporate growths have made the company experience benefits, problems and challenges, which have led to the following lessons learned:

- *Lesson 1*: *Create a support team early in the process if you wish to improve your productivity.* Otherwise developers will be overloaded with support related tasks instead of developing new features.
- *Lesson 2*: *Implement a communication pattern on an intra and inter organizational level.* Otherwise, you will arrive at spending time on ineffective communication instead of business value creation. The importance of communication pattern in a growing business has been reported in [15]. Its significance has also been recognized in distributed development environments in [2], [12], [13], [18] and [19].
- *Lesson 3*: *Focus on quality from the very beginning*. It is only in this way you will be able to grow your customer base and product portfolio in a controlled manner. This lesson has been learned in all types of development contexts [9]. It is however very important for the organizations which grow fast. Not having a stable customer base and product portfolio and trying to put a foot in the very competitive market, the start-up companies may quickly be out of business due to product quality problems.
- *Lesson 4*: *Implement a uniform development process within a development group or unit*, however allow some team-adapted process variants and flexibility. This lesson has been learned in all types of distributed and non-distributed development contexts. From the perspective of growing organizations, it is important to have a control over the whole process without compromising on the developers' needs and well-being and without restraining their creativity. In this way, one may avoid personnel turnover, which may otherwise have a strong impact on companies' future business success.
- *Lesson 5*: *Reflect on and improve the processes on a continuous basis.* Only then, you will be able to adapt to the changing business environment and be capable of evaluating the existing and new process steps. This lesson has also been learned in [2], [6] and [17]. It has proven to minimize the pain of process change and to raise awareness of and spread the best practices along the organization.
- *Lesson 6*: *Plan for process changes and introduce them one by one.* Otherwise, you will not meet satisfactory process acceptance and your productivity rate may suffer. This lesson learned has also been reported in [6] and [16] where the benefit of introducing new processes in a careful stepwise manner was recognized.
- *Lesson 7*: *Educate on newly introduced processes or process steps.* This will help developers understand the reasons behind process changes and be more capable of providing feedback to process improvement. All this will further contribute to the prevention of process inertia.
- *Lesson 8*: *Involve developers in process changes.* It is only in this way they will get convinced to adapt to the new processes.

Lessons 7 and *8* have been recognized in many different contexts throughout recent decades both in agile and non-agile contexts [8], [11]. They are also important in the business growth context, where business growth is strongly dependent on how process improvement steps are accepted by the roles involved in them [15].

The *VCP* group has an intention to continue to grow their business and improve their processes. They would strongly benefit from guidelines on how to change software processes and organization when growing their business. Those guidelines should clarify the following:

- How to coordinate organizational changes with process changes in the context of organic and corporate growth?
- How to evolve inter and intra organizational communication while growing in an organic and corporate manner?
- How to introduce/enforce new or acquirer's processes with minimum resistance and disruption, in the context of corporate growth?
- How to adapt and tailor processes enforced by the acquirer to the needs of the team or organization in the context of corporate growth?
- How to keep processes slim but effective enough during organic and corporate business growth? How to evaluate and reflect on them in a continuous manner?
- How to communicate to and involve developers in newly introduced process changes?
- In what way should start-up companies grow in quality of their products while growing their businesses?
- How to smoothly implement a unified development process and still allow some team-adapted process variants and flexibility both in the context of organic and business growth?

The above-listed guidelines constitute a number of research questions that might be useful for the software community to explore. Putting the research questions into guidelines however, is not enough. In our opinion, organic and corporate business growth should be put as constituents in today's process improvement models. It is only in this way we may make sure that business growth will be considered in all types of process improvement contexts.

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