Exploring Choices of Software Sourcing Methods among Start-Ups

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Abstract. In the paper we discuss the following research questions: How do start-ups provide themselves with software and what are the motivations behind deciding on a specific sourcing option? The questions are motivated from the fact that acquirement of software is a challenging question, and it is especially interesting to explore how start-ups do, since they do not have a legacy to deal with. The research was conducted as a mixed approach including a survey among start-ups followed by interviewing decision-makers in some start-ups. The research indicates that motivations for choosing a specific software application include ease of use, compatibility, reliability, flexibility, and previous familiarity. Right now, sourcing of paid software mostly occurs in a single license set-up, although interviewed start-ups showed to prefer Pay-Per-Use, as it is more flexible and because they feel more in control over how much money they spend. The start-ups said to consider free software options in case alternatives that fulfilled their requirements were available. In the cases where start-ups paid for software the motivation was either because there were no other options available, or they felt that this sourcing method secured support.

Keywords: Acquisition, SME, Start-ups, Software, Sourcing.

1 Introduction

Software sourcing is a challenging task for many organizations. It is a challenge from different perspectives as many variables should be taken into consideration, for instance: which business processes the software should automate, how to integrate it with software that is already in use, deciding on tailor-made software or using standard packages, finding a balance between quality and cost, and so on. The focus in this research is twofold: Firstly it focuses on which software sourcing options are used mostly by start-ups, and secondly it looks into motivations behind selecting these sourcing options. Researching start-ups is especially interesting since they have a unique situation regarding flexibility when it comes to software sourcing. For instance, start-ups do not have to take a large existing system architecture into consideration since they are only in the beginning of their business development. For the same reason, start-ups often do not yet have strictly established business processes

[1] and are therefore also more flexible in terms of how these processes could be automated. From this perspective it is especially interesting to explore how start-ups actually source software, which option do they select and why do they select just that or those specific option(s). For academics it would be interesting to research this since there is no prior research done on this topic specifically and for businesses it can be very useful in order to better meet needs of start-up companies when targeting this group with software packages. In line with this, the following questions are discussed in this research: How do start-ups source software and what are the reasons behind deciding on a specific sourcing option? Start-ups are in this study defined as companies that were founded at most five years ago. The motivations behind this definition will be discussed later in this paper.

The rest of the paper is organized in the following way: Next section presents what we already know about start-ups and software sourcing. Section 3 then presents how the research was done, followed by section 4, that presents empirical data, which then is analyzed and discussed in section 5. Finally some conclusions are presented and possible future research is discussed in section 6.

2 What Do We Know About Start-Ups And Software Acquisition?

Start-ups have been researched from different view-points for a few decades already. For instance, studies have been done about market entry determinants [2] and strategy differences compared to larger companies [3]. Furthermore, Carter, Gartner and Reynolds [4] researched what needs to be done in order to begin a new business. They also investigated the amount of steps that are taken and the order in which start-ups take these steps. They found that entrepreneurs that succeeded in starting a business do undertake specific activities such as: ``*making their businesses tangible to others, looking for facilities and equipment, searching for financial support, forming a legal entity, organizing teams, buying facilities and equipment, and devoting fulltime to the business´´ [4]*

Thus, according to Carter, Gartner and Reynolds [4], arranging facilities and equipment is an important aspect for start-ups. Nowadays, a crucial form of equipment for more or less every organization is supporting software in the form of computer based Information Systems (IS). Several researchers have covered this part of the field as well. For example, Thong [5] wrote about aspects that affect Information Systems adoption within small companies while Davila and Foster [6] studied the rate of adoption of management control systems in early start-ups. Nelson, Richmond and Seidmann [7] focused on software acquisition decisions in particular, whereas other recent studies [8] discuss on a ‘make vs buy’ acquisition model in SMEs (Small Medium Enterprises) or in-house software development characteristics of start-ups [9].

Another aspect that has evolved over time, and not only in start-ups, is the way that companies source their software. Apart from the traditional Single License model**,** Open Source software, Freeware and Shared License, several other types of software sourcing methods have become widely adopted, like Software as a Service (including Pay-Per-Use and Subscription Licensing models), and Entrepreneur Licenses. In

addition because a lot of emerging start-ups tend to be tech related and given the technical expertise of the initial staff, in such circumstances more opportunities for in-house developed products would exist [8].

Computer based Information Systems, otherwise referred to as software applications or just software, offer more efficient and effective methods to execute business processes and sometimes even is a way of gaining competitive advantage in the market [10, 11]. While computing capacities continually grow and digital services become ubiquitous, they become more viable even for limited budgets companies such as start-ups [5, 8]. The results from the study by Knight and Cavusgil [12] that start-ups are more often born globally, meaning that they target an international market from the point they are founded, makes software even more important. For example, communicating and working remotely is facilitated by software in these cases. Thong, Yap and Raman [13] discuss that because of the budget limits some companies make trade-offs to choose lower cost software that maybe are not the best option for what they want to achieve.

While technology evolves, it unfolds new possibilities to facilitate existing services. However, not all start-ups survive in the harsh environment of competition [14]: Actually 60% of newly founded companies fail in their first five years [9], thus a risk always coexists with undertaking business initiatives [9]. Therefore, it can be claimed that start-ups would carefully assess different options, and financially measure each step and acquisition decision, to initially adopt only what is necessary and focus on launching core products or services[15].

It can be claimed that the biggest challenge faced during software acquisition is to choose the option and the system that will increase the efficiency and target different organizational needs [7]. In the specific case of start-ups an emphasis is given to their lack of resources and dependency on third party software application [9].

Giardino, Unterkalmsteiner, Paternoster, Gorschek and Abrahamsson [9] state that, in relation to software sourcing, the biggest advantage of start-ups is their ability to embrace the newest technology without any constraint from previous employed systems and issues in switching systems or data migration. However some drawbacks are also observed as many software applications have specific product features and start-ups do not know yet what they are going to need later thus careful software evaluations are also needed [9].

Because of unclear demands when start-ups want to embrace software systems for daily usage they generally settle for general purpose software systems that they feel can accommodate their future needs and specifications [15].

Daneshgar, Low and Worasinchai [8] did a study on software acquisition and came up with a description of decision-making in the field based on the well-known decision making model by Simon [16]. Following their work, the process of software sourcing typically undergoes four phases: (i) intelligence, (ii) design, (iii) choice, and (iv) implementation. In the first phase the company scans the market and explores for alternatives, during the design phase the alternatives are identified and some criteria for the optimal option is set. The choice process is when the actual alternatives are assessed and a decision is reached, and then implementation of the software follows in the final step.

2.1 Software sourcing methods

As shortly described before, not much research has been done on software sourcing methods by start-ups. The most relevant to our topic in particular being by Nelson, Richmond and Seidmann [7], who developed a framework for software sourcing. In their model, they distinguish between in-house and outsourced software acquisition teams, as well as custom software and packaged software acquisition approaches. Their model is visible in fig 1.

		Acquisition team	
		Insource	Outsource
Acquisition approach	Custom	Internal resources only for needs analysis, coding, etc.	Vendor performs needs, analysis, coding, etc.
	Package	Internal resources only for package selection, installation, etc.	Vendor performs package selection, installation, etc.

Fig 1. Software acquisition model [7]

In this model, companies can follow an acquisition approach of obtaining software package or customize the software, which means that they either choose whether to make their own software applications or to acquire them from third parties. The acquisition team can be insource or outsource, either internal implementation of custom software is done or internal selection of which third party software to select or an external vendor (outsource) is assigned the task of developing a custom software solution or to take over provision and installation of readily available software. With a package insource approach, the company buys the software and makes the decision around it itself. With a package outsource approach, the company buys software from a third party but asks for help to do this, for example from a consultant. The custom outsource approach means that the company buys software that is custom-made for them. The development is done by an external party in this case.

In analogy to the traditional make vs buy decision, the *make* option is the custom insource approach of software acquisition, where the used software is custom made by the company itself. The *buy* option is in the package approach, both insource and outsource, and in the custom outsource approach. Within the Package software acquisition approach, there are different kinds of software licenses that are used. The most traditional, well-known type of software licensing is a Single-User license, meaning that one user pays for the software and only that user can use it on his or her device. Additionally, several other types of licensing are used for software distribution, including Open Source software, Freeware, Shared License, Pay-Per-Use and Subscription. Open Source software is software where not only the software is free but the code is freely available to adapt as well [17]. In the case of Freeware the code itself is not available but the software is free to use [18]. Shared License refers to cases where a limited amount of users can make use of the same license to use the application [19]. With a Pay-Per-Use licensing model, the company pays for each time they use the software [20]. Subscriptions are characterized by the fact that companies pay a specific amount of money for a certain period generally for each

subscriber that uses the application [21]. Finally, another important type of license is Entrepreneur Licenses, such as BizSpark by Microsoft ("Microsoft supports your startup as you grow", 2013), which are offered by some companies and provide usually paid-for software packages to start-ups for free. Although we are conscious that there are a lot of illegal software packages easily accessible, we did not include this in our study since piracy is considered an illegal activity. This point of view is similar to that of previous studies with a comparable subject [8].

2.2 Prior related research on software acquisition/sourcing in SMEs and start-ups

Except for the study by Thong [5], as described in the previous section, there are a few other studies that focus on software acquisition, although not many of them focus on start-ups specifically. However, they do focus on small companies and are thus at least for that matter comparable to start-ups. This is the reason that the results of these researches could be relevant for the current study.

An example is the study by Harrison, Mykytyn Jr and Riemenschneider [22], who studied business executives' decision to adopt Information Technology. They based their research on the Theory of Planned Behavior [23] and studied 162 small businesses (which had between 25 and 200 employees) in different industries. They also looked at a wide variety of IS systems, focusing at systems that provided the companies with a competitive advantage. Results showed that attitude towards IT adoption, subjective norms about adoption and perceived control over adoption influenced the decision on adopting IT.

An important downside of the studies by Thong [5] and Harrison, Mykytyn Jr and Riemenschneider [22] is that both of them are quite old, and that more recent research is lacking in this field. This is problematic since IT has evolved a lot since the 90s and therefore the results of these studies might be outdated. There are however a few articles on software acquisition in start-ups that are fairly recent: Davila and Foster [6] write about the rate of adoption of management control systems (MCS) within start-up companies. They found that financial planning and financial evaluation systems are the first to be adopted by start-ups (80% respectively, 77% of the companies that they studied adopted these systems by the end of their fifth year), followed by Human Resource Planning, Human Resource Evaluation and Strategic Planning. Despite the fact that their main focus does not lie on the motivations behind software acquisition, they do make some comments related to this: for example, they write that in their interviews, they found "*descriptions of specific MCS adoption being associated with the hiring of a particular manager*" [6] and also that "*Early-stage companies adopting product development MCSs sometimes referred to the "requirements" of third parties [...] when explaining why specific MCSs were implemented*" [6]. Important to note about this research is that their definition of start-ups is different from ours: Their research sample included companies which were at most 10 years old and which were independent with in-between 50 and 150 employees. This means that a large part of these companies fall outside of our definition of start-ups.

Another research that is more recent is that of Daneshgar, Low and Worasinchai [8], who studied Small and Medium Enterprises and what factors influence the

decision making in terms of software acquisition within these companies. Results showed that these factors include requirements fit, cost, scale and complexity, commoditization/flexibility, time, in-house experts, support structure, and operational factors.

For a better understanding of existing research related to software acquisition in start-up or SME organizations discussed above, we created table1, where we show an overview of the key aspects of each of the identified research.

Table 1 Prior research on software acquisition in SMEs and start-ups

Author	Researched companies	Focus of research	Core findings
Thong [5]	Small businesses (<100 employees, fixed assets below $7.2 million, sales below $9 million)	Contextual variables as determinants of IS adoption	Determinants of IS adoption are: Decision-maker characteristics IS characteristics Organizational characteristics Environmental characteristics
Harrison, Mykytyn Jr and Riemenschneider [22]	Small businesses (between 25-200 employees)	Business executives' decision to adopt Information Technology	Factors that influence the decision on adopting IS are: Attitude towards IT adoption Subjective norms about adoption Perceived control over adoption
Davila and Foster [6]	Start-ups (between 50-150 employees, age less than 10 years, independent)	Rate of adoption of management control systems within start-up companies	Financial planning and financial evaluation systems are the first to be adopted by start-up companies, followed by Human Resource Planning, Human Resource Evaluation and Strategic Planning.
Daneshgar, Low and Worasinchai [8]	SMEs (not specified more detailed)	Factors that influence decision-making in terms of software acquisition	Factors that influence decision-making in terms of software acquisition are: Requirements fit Cost Scale and complexity Commoditization/flexibility Time In-house experts Support structure Operational factors.

3 Research Method

As technology advances, the competitive environment of start-ups becomes highly dynamic and unpredictable, thus creating a need for academic literature to be updated as well. Considering that IS usage is present in almost every company to some extent, and keeping in mind the limited budget and growing needs of start-ups, it would be of interest to understand how software acquisition is handled within start-ups. This can be done both in terms of what kinds of software they acquire (for what usage purposes

are applications engaged) as well as what software acquisition methods are applied for it and why. As the methods and the motivation are applicable to start-ups in general, while kinds of software could be for example industry-specific, the field of interest for this study is how start-ups acquire their software, and why.

Several authors have written about start-ups, but only few have explicitly defined the term. Blank [24] in his definition of start-ups focuses on their yet unknown business model. However, most prior research (Archibald et al.; 2002, Burgel & Murray, 2000; Carter et al., 1996) does not define start-ups explicitly but seems to focus on the time of existence and / or the number of employees. However a more recent study by Giardino, Unterkalmsteiner, Paternoster, Gorschek and Abrahamsson [9] completes the notion of start-ups as not just newly founded small organizations, but additionally describes the companies to operate in an unexplored and highly unstable market and attempt to solve previously unsolved issues. Another characteristic of start-ups is their unpredictable future, sometimes taking high risks in their first moves but other times expanding quite quickly [9].

Although the uncertain environment referred by Giardino, Unterkalmsteiner, Paternoster, Gorschek and Abrahamsson [9] is used as the pivotal point to differentiate start-ups from any other newly founded company, it clearly makes some distinction based on the innovativeness introduced by start-ups products. If we were to choose our participant companies based on innovativeness or uncertain environments it could turn out to be very complex to measure and moreover we are not interested in getting to know software applications and their acquisition methods in such specific conditions. Therefore, we decided to base our definition and selection of start-ups on company age, and in this research define start-ups as companies that are aged at most 5 years.

The specific approach for this study is mixed methods in the form of that we first did a survey and then semi-structured follow-up interviews to answer our research questions.

Initially we compiled a list with contact information of start-ups in Sweden and Netherlands to be included in our research. These companies were taken from websites such as Ideon Innovation Center (Ideon, n.d.) and SiSP catalogue (SiSP, n.d.) and several websites with start-ups from the Netherlands, like Dutch Startupmap (DutchStartupmap. n.d.).

The survey was sent out as an online questionnaire to start-up organizations in Sweden and Netherlands via e-mail. It was sent to 450 companies from which 63 responded by filling the survey, thus scoring a 14% response rate. Approximately one week time was provided to companies before collecting the data and beginning the analysis phase. Of the 63 responses, 50 were considered valid and analyzed further.

Our main purpose of the survey was to gain an overview on acquisition trends of how software systems were acquired.

After ensuring that our data were clean, it was analyzed by doing descriptive analytics using QlikView. Since it could perform all the needed descriptive statistics and also provide rich graphics to better visualize results, the choice was easy. In order to make an analysis in QlikView possible, we transformed the data by putting it in two separate main tables: a software table and a company table, linked by a key that was based on the company.

The final data structure that we used for the analysis in QlikView is visible in fig 2.

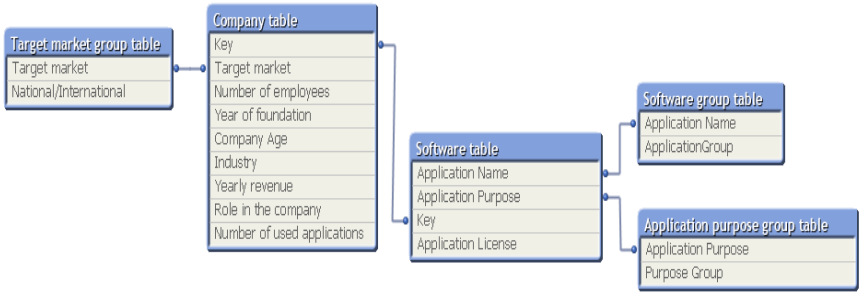

Fig 2. Data structure used in QlikView

As priory stated our sample population was composed of start-ups that were at most 5 years old. Our final sample was on average 2.4 years old, with a median value of 2. An important metric to reveal company size is undoubtedly the number of employees working in a company. Our respondents consisted with an average staff size of 6,7 employees while variations in this variable ranged from having 0 employees (implying the founder is still on his own) to 36 employees.

Most of our participant start-upswere active in Information Technology & Service Industry (33%). Following were Consultancy (10%) and Media industries (8%). In figure 3 a complete overview of the industry areas of all the participating companies is shown. Overall a wide variety of industries was represented in our sample population.

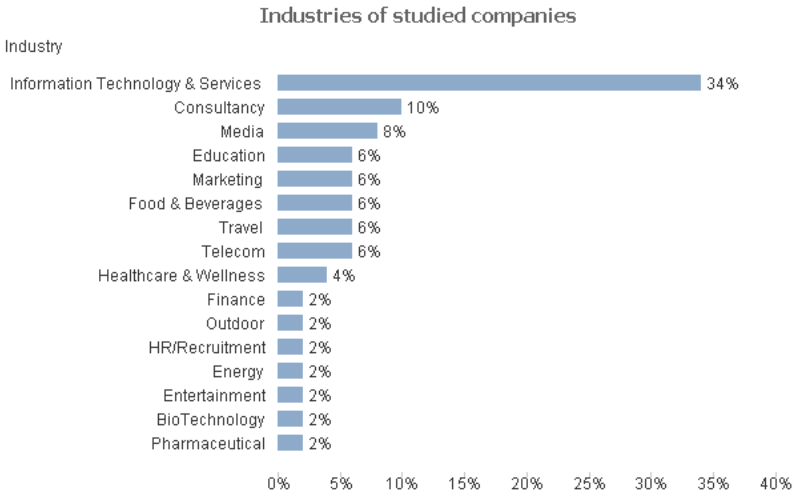

Fig 3. Industry areas of studied start-ups

Half of the participating start-ups indicated that their target market was international (meaning not only Europe). 32% of the companies targeted the Netherlands, 10% targeted Europe and 8% of the participants indicated Sweden to be their target market.

After analyzing the results of the survey, four follow-up interviews were done. The aim of these interviews was to investigate the motivations behind choosing a specific software acquisition method. The interviews were semi-structured.

To select companies for the interviews, we used the results of the survey. To make sure that the companies we interviewed represented as many types of companies present within the survey as possible, we chose to interview one company that uses (almost) only paid software, one that uses (almost) only free software (open source or freeware) and two that use a mix of the abovementioned acquisition methods. In that way we would be able to encounter all aspects from the software acquisition model. Furthermore, we made sure that all four companies were from different industries, to prevent the overall interview results to be influenced by industry characteristics. All interviewed companies also participated in the survey and had indicated they wanted to participate in the interview. This way, we were able to analyze differences in motivations behind the choices that these companies made when acquiring their software. A complete overview of the interviewees is shown in table 2.

Although we had interviewed two companies that used a mix of acquisition methods, we still interviewed both of them as one of these companies had an in-house developed solution and the other one did not. In each category that we wanted to interview in terms of software acquisition methods (almost) only paid software, (almost) only free software, a mix of paid and free software), we had the choice between two or three companies that indicated that they would want to collaborate with an interview. We then proceeded to approach a random company from each of these categories, taking into consideration industry types so that we wouldn't interview companies from the same industry type. Below an overview of our interviewee profile is shown.

Table 2 Interviewees profile overview

	Company 1	Company 2	Company 3	Company 4
Industry	IT & Services	Consultancy	Healthcare & Wellness	Communication & Content Creation
Foundation Year	2014	2011	2014	2012
Country	Sweden	Sweden	Sweden	Netherlands
Interviewee	Founder	CEO Founder	CEO	Owner
Acquisition Type	Open Source	Paid Software (Shared License, Single License)	Mix (Pay-Per-Use, Freeware)	Mix (In-house Developed, Freeware, Pay-Per-Use, Single License)

4 Findings about Software Sourcing in Start-Ups

As described earlier, our categorization of software sourcing methods was based on the Software Acquisition model by Nelson, Richmond and Seidmann [7]. This model differentiates four different types of sourcing methods, being “Custom Insource”, “Custom Outsource”, “Package Insource” and “Package Outsource”. In this model, custom software refers to software that is custom-made for the company and package software refers to existing packages offered on the market. In case of the custom software, insource means that the software was developed in-house, and outsource means that the software was developed by a third party. In case of the package software, insource and outsource refer to the decision-making process around acquiring the software: Package Insource software is acquired by the company, with the decision-making and selection process done within the company. Package Outsource software is eventually acquired by the company, after the decision-making and selection process is done by a third party [7].

In the survey we asked about one dimension of this model, namely about the distinction between Package software and Custom Software. Since there are a lot of different options to acquire Package software, we also differentiated between different kinds of Package software, namely Freeware, Open Source, Single License, Pay-Per-Use, Shared License, Subscription, and Other. Freeware is software that is distributed for free, Open Source is software that is distributed for free and additionally has its code publicly available, Single License software is software that is paid for and that can be used by one user, Pay-Per-Use software is software that is paid for each time you use it, Shared License software is software that is paid for and that can be used by a predefined number of users, and Subscription software is software that is paid for every set period (e.g. month, year). In the interviews, we focused on the second dimension of the Software Acquisition Model [7], which is the differentiation between in-house and outsource.

In the following of this subchapter, firstly the survey results on software acquisition will be presented and secondly the interview results on software acquisition will be presented.

4.1 Survey results on software acquisition

We found the top five used software acquisition methods being Freeware (68 responses), Single License (42 responses), Open Source (31 responses), Pay-Per-Use (23 responses) and Shared License (21 responses). We found no relation between a company’s yearly turnover and their used acquisition method, with the most used methods being dominant in different revenue groups. In table 3 the most widely used acquisition methods by distribution are shown.

Table 3 Distribution of software sourcing method

Software sourcing method	Frequency	Percentage
Freeware	68	31,8 %
Single license	42	19,6 %
Open source	31	14,4 %
Pay per use	23	10,8 %
Shared license	21	9,8 %
Subscription	13	6,0 %
Other	8	3,7 %
Entrepreneur license	4	1.9 %
In-house developed	4	1,9 %
Total	**214**	**100 %**

The least popular software acquisition methods were Subscriptions (13 response), other (8 responses), Entrepreneur License (4 response), and In-house Development (4 responses).

4.2 Interview results on software acquisition

It was very crucial for our study to understand how the software applications are actually acquired by start-up companies: How potential software systems for usage are identified or implemented, who makes such decisions in the company or the extent of using external resources to help make such decisions.

It turned out that all interviewed start-ups admitted making the decision mostly internally, especially the interviewee themselves, or consulting with their colleagues in cases when such discussions are needed. For example, Company 1 stated: "*In the case we needed to collaborate...we did a five minute chat about which alternatives do we have, which is best [...] just the technical people [...] the ones that had to work with the tools*".

Interesting to know was that all the interviewed companies owned internal IT expertise, developers, people that work with technology or somebody dedicated for gathering software requirements. Although, Company 2 admitted just being passionate on exploring software requirements, which is easy thanks to internet resources. The interviewee of Company 2 described himself as an above average user more than an IT professional, but still didn't hire external expertise to advise him which software to use. The companies that stated having IT expertise said that some of the applications they used were in use because of their previous experience with the systems and gained familiarity.

In general our interviewees, who mostly occupied high managerial roles in the company (CEO, founders), felt very comfortable in asking for advice from friends and colleagues and obtain information through social ties as to what other companies are using.

One of the start-ups (Company 2) had a custom made software for very specialized purposes, where an external consultancy was employed to do the job, however

requirements analysis and testing were done by the start-up company itself through continuous and informal communication. The interviewee explained: *"collaboration, and interaction and iteration...it was not a formal work really that we had a long list of detailed specifications that must be fulfilled...it was just a talk over a cup of coffee"*.

Three of our interviewees (Company 1, 2 and 4) revealed not having any plans in the near future to buy software while company 3 admitted that they would re-evaluate a few software applications they were using and would acquire more while they were still expanding and 'scaling up'. We looked back if any relation could be drawn from our respondent regarding their foundation years and future acquisition plans, but we have two companies founded in 2014 that have different acquisition plans in the future. The other companies were founded in 2012 and 2011 making them generally fresh in the market but relatively saturated in terms of software systems since three out of four weren't planning on future acquisitions. However, they said that if they would acquire software in the future, they planned to make the decision of which software to acquire in the same way as they did before, maybe additionally asking for advice among friends and colleagues (Company 2, Company 3 and Company 4) or looking at commonly used software (Company 1).

4.3 Why do start-ups acquire their software in the way they do?

In terms of used software acquisition methods, interviewed start-ups were in a mixed situation, paying for what they should and getting cheap what they could, however they all agreed never compromising on software quality: such as ease of use and flexibility of open source (Company 1); Company 2 stated that "*it's not really the money*" implying if there are no free alternatives, accessing between paid version of software, a couple of thousand euros was not much of a difference, Company 3 stated that if the financial difference was insignificant they would settle for the software delivering the best value and Company 4 said that meeting their requirements was the most important and secondly the price.

Start-ups being charged for some of their software applications said that they chose paid software because it makes them feel more secured to demand support in case something went wrong or they needed updates (Company 2 & 3). Another important reason stated for paying for software applications was "*because no other available free option was identified yet*" (Company 3). Two of our respondents implied that they felt comfortable having to pay as they scale thus employing Pay-Per-Use where there are no upfront costs and one revealing to have more software applications that offered these type of licensing (Company 2 & 3).

Asked on what portion of their budget planning was dedicated to software acquisition, all interviewees implied that software acquisition was not a priority in their budget planning and thus that the importance of software acquisition in their budget planning was very low.

Only one of the respondents (Company 2) had custom made software for his company and that was due to the fact that they need very specialized software for their tools and the company paid for its development performed by an external party. Another respondent (Company 4) had in-house developed product due to the fact that

available alternatives were too expensive and also didn't match entirely with their requirements. However since they had internal employees to deal with the implementation it was stated as not being a problem.

Company 1 which used mainly open-source software did so because they felt free but also owned the knowledge to change and customize functionalities and emphasized that they would be free of forced upgrades in the future.

Since we were particularly interested in the software acquisition method Entrepreneur license, as it is one of the newest and aimed to be targeted for a niche market such as start-ups we were surprised to see that very few companies from the surveyed ones admitted to using it. Therefore we were interested to know if there was any particular reason for this license not to have a wide usage yet. All of our interviews admitted not being informed on this type of licensing.

Additional comments interviewees had, regarding current software offering and how they felt the market targeted start-up needs, were also considered interesting in our research. Suggestions included that start-ups wanted more options for open source software, because they need a bigger level of freedom (Company 1), and more flexible licensing supporting growth (Company 2 & 4).

While Company 2 suggested for more Pay-Per-Use licensing, scaling more gradually from individual to business packages and feeling more in control of their budget, Company 4 stated that sometimes such billing method might get expensive as not all users need the same software to the same extent.

Company 4 suggested that the way software functionalities are communicated to the start-up market can be improved and that they felt the need to have some comparing tool in terms of software functionalities.

One of the respondents (Company 3) pointed out that it was important for them to have full functionalities offered from the start even for small companies and then scale up and pay according to their usage but not being 'forced' to switch the environment entirely because what works in the beginning does not work when they become bigger.

Furthermore, Company 3 mentioned that a smoother integration of different software applications would help them a lot. The interviewee explained: *"some of the software applications [...] could have easier integrations or automatic integrations from the beginning [...].If you could get that in one package that would be pretty cool.."*. Later, the interviewee added to this that he expected start-ups to be willing to pay for this type of software as well: *"Eh, and I think most would be willing to pay for it as well."*

5 Why Start-Ups Acquire Their Software as They Do

Start-ups emphasize on the search for flexibility when thinking about software acquisition. However, despite that the data supports that they actually in a high extent goes for a quite inflexible solution (Freeware and Single license) when deciding on software acquisition method. From the survey data it is found that Freeware is the dominate method, followed by single license. Both could be seen as highly inflexible from a growth and cost perspective, since the software could be downloaded and used

for free. It is actually surprising that single licenses shows a higher frequency than both pay-per-use and subscription type, as it is not as flexible when the company needs to scale up

One reason for why start-ups paid for their software (single licenses), especially in cases where the software served customers, was because they felt more secure to demand a higher level of support in case of facing problems. A likely explanation for the fact that some start-ups took into consideration free options first, if those existed, was that the budget dedicated to software acquisition was pretty low. However main reasons to settle for a specific software application include ease of use, compatibility (both internally and externally), reliability, flexibility, requirement fit and familiarity, even if start-ups had to pay for it. Furthermore an important aspect that was taken into consideration when selecting software is looking at the software that is used by competitors.

In-house development was very uncommon (2 %). However, one of the interviewed start-ups has actually developed their own ERP-system. The reason for doing this was because they felt like the software offered on the market was too expensive and did not meet their requirements. However, it should be mentioned that this is an exceptional case, since this start-up was one of the few that actually developed their own software. Furthermore, another case adapted Open Source software themselves to make it fit to their company. This was mainly done as they wanted the flexibility and freedom to grow and be independent of forced upgrades.

Regarding the Pay-Per-Use software acquisition method, interviewed start-ups were positive about it and especially the fact that no upfront costs were involved, they felt in control of how much money they were spending, and also that scaling and shifting to a business license felt more acceptable. However one company suggested that sometimes not all employees are using the software applications at the same extent therefore in those cases a more flexible pricing model would be beneficial.

Interviewed start-ups also did some suggestions to improve the current offering of software, which gives us information about their motivations behind software acquisition as well. These suggestions include firstly to have more open source software (free software with publicly available code), because it provides a certain level of freedom and flexibility in terms of software acquisition. It should be noted that the start-up that suggested this has a high level of IT knowledge and therefore was able to adapt the software in such ways that it suited their business better. A second suggestion done by another start-up was that of having more flexible licensing, so that a more gradual shift from individual usage to business usage can be made: The interviewee more specifically suggested to have plans that are particularly suited for smaller companies, with for example five employees. Another suggestion made by a third start-up was to provide easier integration or more package offerings of software that include features that are commonly needed by start-up companies. Finally start-ups also emphasized that software vendors need to communicate software functionalities more clearly.

Interviewed start-ups, although operating in different industries (IT & Services, Consultancy, Healthcare & Wellness and Communication & Content Creation), showed to have an extensive IT knowledge and they were very clear what they wanted to have from their software systems. The decision on how to acquire software by referring to the previously identified software acquisition model by [Nelson,

Richmond and Seidmann [7]] in our study, made for the distinguishable associations to be Insource-Package or Outsource-Custom while there is a vague existence of Outsource-Package relation slightly different in start-ups, who seek external advice through social networks/colleagues

By Insource-Package they generally made the decision in-house or from the technical people which software to choose. In the case of specialized developed software (Outsource-Custom) the needs and testing were still done by the start-up itself, the latter being pretty clear in their requirements and needs. This reveals that start-up nowadays, no matter industry, are very conscious and informed on the software market offerings or generally have an employee/co-founder responsible for these operations from the beginning.

We slightly touched the case of Insource-Custom but in two different scenarios, one in the case of the company using open source software since they admitted that they changed the code to accommodate their needs and their ability to grow, suggesting for a slightly different model for start-ups regarding software acquisition. The other case was Insource-Custom in the sense that they developed an in-house software application as no available software packages satisfied their needs. As we did not find many companies using Insource-Custom solutions, we would suggest future research to further investigate this matter. It should be mentioned that in both Insource-Custom cases, economical factors constrained their choices in available software on the market.

In case of the economic category, it seems that cost is not necessarily the top priority when selecting software however it is still important. Start-ups said to consider free software options in case there were available alternatives meeting their requirements. Given the low budget dedicated for software acquisition it was still an important variable in consideration. Viable in this context means selecting budget wise options and considering the limitation of not being able to buy 'premium' products. In the cases where start-ups paid for software was either because there were no other options, they wanted the ability to demand support and then having found the right alternative they were willing to pay. Relating to costs, a preference for flexible licensing types or those without upfront costs was noticed, that made companies feel more in control of their spending.

6 Conclusions

Coming back to our main research question, "*How do start-ups acquire their software and why?*", we are able to say that the major part of software used in start-ups is freeware. The start-ups use freeware as a software acquisition method since this is a way of getting software without any direct financial consequences. However, start-ups are not totally convinced about the quality of the software that comes as freeware and that makes the single license being the second most used acquisition method. The main reason for why start-ups use this method is that they have a feeling that this option gives better support possibilities and that the software is more reliable. In other words, reasons for selecting a specific software acquisition method are related to reasons to choose specific software. This means that ease of use, compatibility,

reliability, flexibility, and previous familiarity with the software influence the way the start-ups provide them with software. Most start-ups prefer free or cheap software, supported also by the fact of their lower budget planning for this purpose, although the start-ups clearly state that reliability and quality of the software should not be compromised, especially in the case of software that serves their customers. In these cases, start-ups confirm that they are willing to pay for their software. Right now, acquisition of paid software mostly occurs in a single license set-up, although interviewed start-ups stated a preference for pay-per-use, as it is more flexible and because they feel more in control over how much money they spend.

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