Tallinn University

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The Effect of Establishing Startup Projects During Hackathons. The Case of Garage48

Master Thesis

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Declaration

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Thesis was finished under supervision of Terje Väljataga and Hans Põldoja.

4. January 2012

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INTRODUCTION

Business development, technology development, services and products are currently in fast-forward. The success stories of social networking websites like Facebook[1] and the largest IPO achiever Groupon[2] have made many people feel there is nothing left to invent. On the contrary: the new generation is in need of free-minded inventors who can move and act fast to lead the dynamic way of development based on the need of customers. The market has changed; entrepreneurs no longer have to come up with original business ideas, but they have to come up with original ideas about how to implement their services and products on a faster scale. Product and service development cycles have dropped from years to just few months. Jon Bradford (2012), founder of Springboard[3], believes there has never been a better time to start a business.

The world is in need of professional team members who are ready to join with initiators to build the next successful businesses. The advantage for these teams comes from their experience, know-how, creativity and contacts through network and community (Bradford, 2012).

Garage48 weekend is an intensive 48-hour hackathon[4] for building technological prototypes. A single Garage48 event joins up to 100 participants and lasts for 48 hours, starting on Friday evening and culminating on Sunday. The working prototypes are presented in an open demo event on Sunday evening. The prototypes differ variously from entertaining mobile application games to queue elimination

[1] Facebook – www.facebook.com
[2] Groupon – www.groupon.com, website that gives major discounts if certain number of customers buy the deal
[3] Springboard – accelerator for start-up and early-stage technological companies
[4] Hackathon – "Meetings to collaboratively write software. They foster direct face-to-face interaction and collaboration among participants" (Cockburn, 2002; Kane et al. 2006, as cited in Lapp et al. 2007)

systems or medicine reminders. Since April 2010, Garage48 events have been organized 13 times in 8 countries (Estonia, Latvia, Finland, Ghana, Nigeria, Kenya, Uganda and South Africa). Further details about Garage48 and similar events are described in Chapter 2.

Garage48 has received positive feedback from participants, investors, entrepreneurs and IT-specialists, as well as favorable media coverage. Garage48's core team receives invitations to create events in new countries and cities. Regardless of the attention, the question remains: What influence has Garage48 given to its participants or the creative community at-large? Are the projects built during 48 hours strong enough to continue after their first demo presentation? Although the participants at Garage48 events often promise to continue with their projects, they do not always succeed. Therefore it is important to understand the reasons made behind their decisions and how the Garage48 Foundation can work to facilitate greater success for its projects and foster networking between potential entrepreneurs.

The purpose of the thesis is to find and show how Garage48 supports and fosters the development of startup communities across the globe.

This thesis has the following research questions:

1. What are the main benefits and drawbacks of dynamically formed startup project teams?
2. What are the conditions for growing a startup project into a startup company?
3. How does the hackathon encourage and prohibit the formation of communities of practice?

These raised research questions will be beneficial not only for Garage48 events and organizers but can potentially give valuable information to entrepreneurs and governmental institutions, as well as support similar initiatives around the world.

For a better understanding of the projects developed during Garage48, events are called startup projects in this thesis, to differentiate between the traditional definition of the startup – a registered company designed to create products and

services under conditions of extreme uncertainty (Dictionary.com, 2011; Ries, 2011). As opposed to a "startup", a "startup project" is the process of developing and initial launch of a minimally viable product.

The communities of practice theory (Wenger, 1998) is appropriate to understanding the influence of formed relationships during Garage48 events and analyzing the importance those events might have for future projects and startups. It is important and interesting to understand what mechanisms foster the possible growth of new high-tech companies in Estonia that may complement Skype[5], and how struggling startup companies in Estonia, Europe and rest of the world could use the benefits of networks and communities built during practical events with lean time schedules.

This thesis is divided into five sections. The first part gives an overview of a theoretical framework focusing on the aspects of communities of practice and team formation (Wenger, 1998). The next chapter continues with a description of Garage48 events and similar initiatives throughout the world, providing context and background information in order to further understand the phenomenon under investigation. An overview of the results is presented in Chapter 4. Under Analysis and Discussion, connections between results and existing literature are made using comments and discussion.

Length of the thesis is 60 pages, the thesis contains 7 figures, 2 tables and 2 appendixes. 36 sources of literature is included in the list of references.

Keywords: startup, community of practice, hackathon, phenomenological research

[5] Skype is a software application for making voice calls over the Internet. Skype software was created in Estonia.

1. THEORETICAL FRAMEWORK

To continue with the development and innovations we are in need of a new generation of innovators. Possible innovators and entrepreneurs need a proper system to support their progress and guarantee needed resources. Many companies smother their creative talent, but peer networks, support and mentoring would help through communities (Cohn, Katzenbach, & Vlak, 2008).

1.1 Community of practice

Communities of practice (CoP) are groups of people voluntarily and informally bound together by shared expertise and passion for a joint enterprise (Couros, 2003; Wenger & Snyder, 2000). Within organizations it is not simple to build up and sustain communities of practice, or to integrate them with the rest of the organization. The dynamic, spontaneous and informal nature of communities of practice makes them challenging to supervision and interference (Wenger & Snyder, 2000).

A community of practice fulfills the need to belong and adds other functions. Wenger (1998) claims CoP is a collective enterprise that is continually renegotiated by its members. The relationships inside the community bind members together into a social entity. Members have a shared repertoire of communal resources (routines, sensibilities, artifacts, vocabulary, styles, etc.).

Wenger (1998) argues that members developing learning and practical knowledge inside a CoP move from masters to beginners; a newcomer develops over time into a skilled "old-timer". It is similar to ancient times when "corporations" of metalworkers or potters had both a social purpose and a business function (Wenger & Snyder, 2000).

CoPs, with shared practices and problems, care for the joint consequences of both. However it is not enough to have a shared syntax to work across. In CoPs, situated and tacit knowledge become important (Carlile, 2002). CoPs are not formed with

rules or strict structures. They are much about dynamic growth and individual interests (Couros, 2003). “They are mostly informal and distinct from organizational units” (Wenger, 1998, p. 1).

Former coworkers are a positive example of CoP, who despite working for competitors might still meet once a month. They meet because of the importance of sharing information, discussing ideas and analyzing different topics.

Wenger (1998) describes 5 stages of CoP - Potential, Coalesce, Mature, Sustain, and Transform. The stages can be compared and viewed by their different levels of synergy and visibility.

1. **Potential** – This is the stage for creating the community, getting to know and talking about the idea.
2. **Coalesce** – Common ground and relationships are formed.
3. **Mature** – Focus on particular topics.
4. **Sustain** – development phase.
5. **Transform** – At this stage the community may fade away.

All members contribute to the community activeness, but usually there is either one leader or a small group of people who have taken the lead (Wenger et al., 2005).

Wenger (1998) claims that organizations that support learning through internal CoPs are more successful than their competitors. Competitors without CoPs can’t get access to the whole knowledge, information and experience of employees. It’s not enough to have a chemical formula; you also need the social know-how that accompanies it. Communities of practice inside and outside organizations help companies recruit and retain talent in addition to supporting existing employees (Wenger & Snyder, 2000). Wenger and Snyder (2000) claim it is not particularly easy to build and sustain communities of practice or to integrate them with the rest of the organization. CoPs are fragile in terms of organizational structure, and too much individual control or focus on individuals can ruin the group identity that is crucial for sharing and participating (Thompson, 2005). Wenger (1998) explains that CoPs can appear after a project or task has started and live long after it’s completed to benefit the members.

Large companies like Reuters have been able to form managers groups all over the company to foster learning, get involved and define further opportunities (Cohn et al., 2008).

1.2 Multidisciplinary teams

Multidisciplinary project teams inside organizations are often specifically set for the purpose of combining their knowledge in new ways to promote innovation (Wenger, 2000; Oborn & Dawson, 2010). They might come with limited longevity and a specific measurable task (Carlile, 2002).

Working inside multidisciplinary teams of CoPs emphasizes key boundary processes to negotiate and broaden the meaning (Oborn & Dawson, 2010). Members benefit from each other's knowledge and experience. Multidisciplinary collaboration is not so much to learn from each other's talk, but to learn to talk with other team members (Oborn & Dawson, 2010). Communication between multidisciplinary teams needs to be encouraged. Diverse teams in organizations (with range of skills and experience) promote creativity, innovation and problem solving (Capozzi, Dye, & Howe, 2011).

Different representatives of disciplines might have rivalries, but they are needed to come together to get the job done. Multidisciplinary teams, even if they only come together for weekly meetings, have proved to be efficient for individual members in both learning and working more effectively inside their own disciplines, while benefiting from working between the disciplines (Oborn & Dawson, 2010).

Learning inside multidisciplinary teams doesn't necessarily mean learning new skills or new knowledge, or wanting to belong to a different CoP. Rather members learn to put their skills in work together with other professionals (Oborn & Dawson, 2010). That challenges participants with boundaries of interdisciplinary understanding.

The irony is that these **knowledge boundaries** are not only a critical challenge, but also a perpetual necessity, because much of what organizations produce has foundations in the specialization of different kinds of knowledge (Carlile, 2002). The

value of organizations is based on how they can put together different knowledge and practice to produce something new. The new product, new service, or existing product with new characteristics should become beneficial to the organization in terms of revenue and popularity. Boundary knowledge, or even an object, establishes a shared syntax or language for individuals to represent their knowledge (Carlile, 2002). The established communication helps to understand further knowledge and explanations. An object might be a visual rough scheme of mobile application that helps all agents to explain their perspective and use a common example for it.

Not all boundary processes enable learning. Oborn and Dawson's (2010) study provides empirical insight on communications that build bridges that foster collective and shared elements of practice to develop further.

Working together in multidisciplinary teams enabled the professionals to deepen their tacit understanding of how other communities of practice know and work. This richer tacit knowledge enabled them to understand their specialty better while drawing on the expertise of other specialists (Oborn & Dawson, 2010). This process differs from learning *inside* a CoP.

The more distance individuals have from each other's disciplines – their engagement in practice - the more difficult it is to communicate the **embedded** knowledge they use (Carlile, 2002). Hence the ability to learn communication to form boundary bridges is needed (Oborn & Dawson, 2010).

1.3 Team formation

The **Forming – Storming – Norming – Performing** model of group development was first proposed by Bruce Tuckman in 1965, who maintained that these phases are all necessary and inevitable in order for the team to grow, to face up to challenges, to tackle problems, to find solutions, to plan work, and to deliver results. A team starts developing after the first stage – its formation. This chapter will look into the researches of team formation.

Before joining the team an agent first ensures that it can match a skill requirement (provide a skill that has not yet been filled) for the task in question (Gaston & DesJardins, 2008). The idea creator or initiator has the same purpose to make sure that the agents who want to join can perform the right type of tasks (Dignum, Dunin-Keplicz, & Verbrugge, 2001). Surprisingly, Smith (2007) found that entrepreneurial teams are not formed based on functional diversity, which contradicts the suggestion that initiators first check whether the right types of tasks are being filled. On the contrary he claims that when team size increases, functional diversity decreases.

The literature about entrepreneurial team formation suggests that teams are formed by (1) a rational instrumental focus or (2) interpersonal attraction and social networks. The latter is supported by organizers of Startup Weekend, who emphasize the importance of individual relationships (Nager, Nelsen, & Nouyrigat, 2011). Teams often spend long hours together in the same room and team members need to get along.

The first task of the initiator is to form a partial (abstract) plan for the achievement of the overall goal (Dignum et al., 2001).

The findings also revealed that interpersonal trust had an impact on **team** learning and new product success, but not on speed-to-market. When realizing the consecutive stages ultimately leading to team formation, interaction with the planning, communication, and social reasoning modules is necessary (Dignum et al., 2001).

Naveen Bisht (2011) has described "*four key take away"* based on his own experience of startup teams. The four keys are (1) chemistry, (2) trust, (3) skill-set and adaptability and (4) positive attitude and positive energy.

According to (Dignum et al., 2001) the main type of dialogue that is needed for team formation for the first stage of potential recognition is persuasion. All members in the team should have individual yet associated intentions, and all members should be aware of this mutual intention to exclude the case of competition (Dignum et al., 2001). Trust is built through communication. Bisht (2011) emphasizes that an official

NDA (Non-disclosure agreement) could be signed, but won't guarantee effective teamwork over trust and willingness.

Team formation theories do not consider the background, experience and initial interest of the participants. Further research in this topic would be needed to distinguish the difference between agents who see and might want a long-term team development, and others who might see it as a "fun" short time experience and a learning lesson. Others might join the team because they liked the idea. Startup Weekend organizers argue that the creator of the idea has to be passionate. People join the team because of the creator, not because of the initial idea (Nager et al., 2011) – after all the idea might change completely during the weekend, but the team will only grow closer. Dignum et al. (2001) have made supportive conclusions that team members' assurances of their colleagues' intentions and motivations in achieving the overall goal play an important role, especially when the initial plan has to be changed due to a changing environment.

1.4 Summary of theory

The section about theoretical aspects described in community of practice and team formation theories, and builds a suitable framework to continue with a description of Garage48 hackathon in next chapter.

To support the community of entrepreneurs and initiators, it is necessary to encourage and improve the communication between interested agents. Community of practice theory emphasizes the importance of members having similar interests to support the peer-to-peer network (Wenger, 1998; Nager et al., 2011). The community of practice and its members can offer necessary resources (Wenger, Snyder, 2000). Successful entrepreneurial teams are multidisciplinary (Oborn, Dawson, 2010). Members need to understand each other's disciplines and practice how to find shared knowledge boundaries. Therefore the joint theoretical framework of informal communities – CoP – and team formation was chosen to understand the functions of Garage48 and its importance in fostering startup companies.

2. DESCRIPTION OF GARAGE48

Garage48 events were started to encourage the entrepreneurship and practical experience among Estonian technological specialists. Single Garage48 hackathons have the same characteristics and agenda that support the development of working prototypes within a lean time frame. The approach is not unique, and there are other similar events in the world.

2.1 Garage48 approach

The first Garage48 event was held in The Estonian Information Technology College in April 2010. It was held mostly as a sample event to see what if any kind of feedback it would create inside the information and communication technology (ICT) community, or if ideas could be built into working prototypes within 48 hours by Estonian developers. It was important to understand if and how Garage48 contributes to demands that were set before and after the first event. The events were continued after positive feedback and the intuitive belief of the founders that similar events are beneficial for startup communities in the long term.

Garage48 events are held to see if a startup idea created during a weekend can prove itself to be viable. Within 48 hours plans and details of the minimum viable product (MVP)[6] are analyzed and it becomes clearer if the idea has the needed strength to be continued after the Garage48 event. In addition to viable ideas and working prototypes, organizers of Garage48 have emphasized the importance of

[6] Minimum viable product (MVP) - is an early product with minimal features that tests the idea of the product . It is built to get quick feedback from possible customers. An MVP might be updated several times a day (Ries, 2011).

working together, forming effective teams, and getting new knowledge and experience, even if the particular idea won't survive after the event (Garage48 Foundation, 2011).

Many people are afraid to start their own business. Common issues are lack of know-how and co-founders, lack of seed money, fear of taking risks and fear of failure or success (Entrepreneur Media Inc., 2010). Garage48 changes that mindset and shows that it's all about positive attitude, creative team members and a motivating deadline (Garage48 Foundation, 2011).

After the first event was successful, the Garage48 Foundation was established, and events have been continuously organized by the foundation in Europe and Africa.

The founders of Garage48 are from the Estonian Startup Leaders Club. Young entrepreneurs leading different startups in Estonia formed the club in 2009. The club consists of more than 50 members (Estonian Startup Leaders Club, 2011). One of the goals of the club is to promote entrepreneurship in Estonia and grow the startup community. It was out of this goal that the Garage48 event was born and executed. The author of this thesis is a member of the core-team at Garage48 and the main organizer for Garage48 Public Services in Estonia, Garage48 Kampala in Uganda, Garage48 Nairobi in Kenya, and Garage48 Johannesburg in South Africa.

From April 2010 to December 2011 13 Garage48 events have been held in 8 countries: Estonia (Tallinn, April 2010 and April 2011; Public Service, February 2011, Tartu, August 2010 and August 2011), Latvia (Riga, March and November 2011), Finland (Helsinki, January 2011), Nigeria (Lagos, May 2011), Ghana (Accra, May 2011), Uganda (Kampala, September 2011), Kenya (Nairobi, September 2011) and South Africa (Johannesburg, December 2011).

A team from Estonia organizes all Garage48 named events; the representatives from the core team are always present and lead the preparations.

Main sponsors for Garage48 events are international technological companies (For example: Google, Nokia, BlackBerry®) as well as important local enterprises (For example: Elion in Estonia, Vodacom in South Africa, Draugiem.lv in Latvia). In

addition to supporting the events financially, mentors from sponsoring companies attend the hackathons.

The goals of Garage48 are organizing practical and fun startup events, and showing that ideas can be built into working prototypes within 48 hours. Garage48 proves it is possible to build working prototypes with a passionate team and a lean budget. It's important to get to know new people and technological skills (Garage48 Foundation, 2011).

Garage48 encourages participants to use Lean Startup techniques to develop their projects, test their viability, and get quick feedback from customers. The Lean Startup approach combines methods of agile development, customer development, and fast development of a minimum viable product while being less "wasteful" (Ries, 2011).

2.2 Agenda and details of Garage48 weekend

Garage48 events follow the same structure and agenda, and only minimal changes are made for individual events.

Garage48 hackathon starts on Friday evening at 18:00, with a presentation of the ideas. Every participant of Garage48 has 90 seconds to present their technological idea, followed by 90 seconds for questions and answers.

Within the short time they give brief background information about themselves, describe the problem, and present their idea for the solution (Garage48 Foundation, 2011).

Teams are formed dynamically at Garage48 events after up to 30 ideas are pitched. Each presenter tries to attract as much interest from the other participants as possible. Teams need at least four members to start their development. The presenters who can't get 4 members join other teams.

On Friday evening the teams write down all the details about their projects, and discuss and analyze the MVP that will be built by Sunday evening. The project

manager is responsible for dividing tasks and making sure the timeframe is achievable.

On Saturday the teams continue developing the prototype, and project managers give status updates in 3 different sessions, where mentors and Garage48 organizers give support and advice. The project managers and participants of different teams are encouraged to help each other with upcoming issues and problems.

On Sunday the teams continue with preparations for their final presentations. Organizers train participants to give fast and influential presentations. The timeframe is crucial, each team has only 3 minutes to show their prototypes. While one of the team members is speaking, other team members are showing the working prototype in the background with the help of a computer or mobile device. Each team has time for questions from the audience. The final demo event is open for public and media.

A jury (organizers, mentors and sponsors) and audience vote for the best project. The jury considers various aspects to choose the winner: the presentation quality, strength of the prototype, revenue plan, influence and importance of the idea, and possible growth in national or international scale.

2.3 Different roles

Garage48 event is like a concentrated sample of building up a "real startup" company with essential elements and team members. Therefore the participants are divided in different roles during their registration.

- **Frontend developers and designers** – know HTML/CSS/JS/AJAX and understand the importance of user experience of web products. They have experience in website design and graphical design.
- **Backend developers and mobile developers** – know php, Mysql, Java, jquery, and python. They plan technical architecture for complex websites and software and test the outcome.

- **Project managers and visionaries** – participants with IT ideas and/or are ready to lead the team of developers, designers and marketing people, and keep them focused and motivated.
- **Marketing and business development** – participants with marketing and sales experience, who have ideas for marketing fresh projects during the 48 hours.

The roles become important when teams are formed on Friday evening. An ideal team at Garage48 event has all 4 roles covered and some additional people for front end and back end development. Dividing and delegating tasks is crucial during the 48 hours. Project managers lead the team and make plans for what to focus on.

2.4 Projects developed at Garage48

During 13 events 164 different projects have been developed to a prototype. About 250 have been presented as ideas on Friday evening, but have not been chosen by participants.

Garage48 projects have limitations. Participants can't plan a project too big to be built during one weekend. They have to focus and choose what functions and parts they can build during the weekend. Therefore team participation is important. It is also critical that potential members ask questions during and after the idea pitch to make the idea presenters understand and focus on the most important parts of his/her idea. This is the only a prototype can be built within 48 hours.

There are different ways to categorize the projects. Projects have been divided in 4 categories based on their main outcome.

- Mobile
- Web
- Web & Mobile
- Offline projects, software

Mobile projects include mobile game applications, other mobile applications, and also SMS projects. Websites are the broadest group – they might be more like an

informative webpage, but they could also be interactive communities or even online software. Offline projects examples are local chat systems working inside a certain network or software to play and move robots.

During 48 hours the goal is to have an MVP ready for the presentation on Sunday evening. It does not need to be accessible publicly.

Garage48 Foundation promotes the mentality of needing a strong team to build ideas into working prototypes. The event is not meant to provide a "cheap work force" to build up a working prototype for the idea creator. The intellectual property of project belongs to the whole team. How to continue with the prototype after the weekend, is up to the team members to decide. Garage48 organizers offer follow-up support, contacts and advice. In addition a Garage48 HUB (an open office space) was opened in Tallinn in December 2010 to encourage the teams continue with their projects and have a place to organize smaller follow-up events.

2.5 Similar programs in the World

The Garage48 idea of creating working technological prototypes within a short timeframe has been introduced by similar events in the past.

Some of the organizations and events that organize similar events are:

Startup Weekend – based in Seattle, Washington, USA. The events are held all over the World by local activists with the help of the team based in Seattle. Startup Weekend is the most known weekend hackathon in the world. It currently has more than 300 events in more than 50 countries (Startup Weekend, 2011).

IPO48 – first held in Nairobi, Kenya with the help of Garage48 founders. By now IPO48 has been organized several times. The main difference of IPO48 is that the winning team is provided with seed funding of up to $25,000, and in return gives up shares in the company it becomes (IPO48, 2011).

iWeekend – started in Barcelona 2007, and has now been organized in many cities all over Spain, Mexico, Russia, India and China (iWeekend, 2011).

Launch48 – says that during their weekend all aspects of business are covered, including planning, marketing, PR, branding, design, finance and development. It emphasizes participants from a range of backgrounds and skillsets, and has the goals most similar to those of Garage48 (Launch48, 2011).

Most of the events described focus on fast development of fresh ideas. Teams might continue with further development after the events. An article about a Startup Weekend event in Boulder, Colorado in 2007 gives an overview of the problems that arise from establishing a planned outcome in 2 days. One of the problems it describes is how the author of the idea might not be the right person to lead the team (Gumpert, 2007).

It is easier now than ever before for ideas to be realized independently. The fast development of technology and availability to technological tools has opened a new opportunity for people with ideas. Access and information flow makes it easier for ideas to be realized. For example Steve Demeter built a virtual game for the iPhone in his spare time while he was working as an ATM software designer. Within a few months Trism gave him $250,000 for it (Certmag Editor, 2009).

Po Chung (2009) has described in his article how a leader has to have followers, and uses Garage48 to make his point. A leader without followers is not a proper leader, because there is nothing to lead (Chung, 2009). The same thought and connection can be drawn through Garage48 events – you can have an idea for long time, but you need a team to make it happen. Another reason often given for why one can't start a business is a lack of money (Nager, et al., 2011). But the thought of starting a business "in a garage", describes how money is not the most important factor. Rather believers and the team are. A leader has to motivate his team, and the team is inspired to move forward.

It's not expected that within one weekend teams establish a fully ready service. But with the help of the team and the work done in 48 hours, founders can develop an idea of whether or not there is hope for the project's continuation. Therefore the intensive 48 hours provides an enormous contribution to the future of the possible startup business.

Building an MVP quickly allows getting quick feedback from your possible customers (McNichol, 2007; Ries, 2011; Nager et al., 2011). The worst mistake that a new entrepreneur can make is to spend long time on development and then find out that the service he provides is not what a customer needs. Therefore it's quicker and easier to make deliberate mistakes – launch even faulty prototypes or services that will make you learn quickly what needs to change (Ries, 2011). Your customers, members and users will tell you what to focus on or if the new function isn't needed at all.

Dogster.com[7] founder admits that Dogster.com had failed repeatedly, but the failures turned out to be a good thing. They have found the way to turn the mistakes into better features (McNichol, 2007).

Google's vice president admits that almost everything they do is an experiment. With experimenting you have to assess data with brutal honesty. A development team built most of the key features of the Google toolbar at least 5 times, and most were discarded within a week of testing. Several features in the final version, including custom buttons and shared bookmarks, were prototyped in less than a week (McNichol, 2007).

The events within the short time frame are often lift-offs for longer term programs (incubators and accelerators) that concentrate on evolving the ideas, developing them, and focusing on bringing the service or product to market.

Incubators like Neutron offer "extreme incubation" but only in return for shares (Higgins, 2008). Incubators offer social events and mentorship (Higgins, 2008) but they are company-focused (registered companies) rather than individual-focused.

[7] Dogster.com is the leading social network for dog and cat owners in the United States.

Table 1 - Overview of incubators and accelerators

Incubator / Accelerator	Investment	Takes equity	Location	Mentorship	Office space	Demo Day	Extra services	Length
Angelpad	Up to $20,000	Yes	US, San Francisco	x	x	x	x	3 m
500 Startups	Up to $100,000	Yes	US, San Francisco	x	x	x	x	n/a
I/O Ventures	Up to $25,000	Yes - 8%	US, San Francisco	x	x	x	n/a	
JFDI-INNOV8 Bootcamp	Up to $15,000	Yes	Singapore	x	x	x	n/a	
Kicklabs[8]	No	No	US, San Francisco	x	x	No	x	3-6 m
LaunchPad	Up to €20,000	Yes	Ireland	x	x	x	n/a	3 m
Seed Hatchery	Up tp $15,000	Yes - 10%	US, Tennessee	x	x	n/a	n/a	3 m
Startup Highway	Up to $14,000	Yes - 10%	Lithuania, Vilnius	x	x	x	x	3 m
TechStars	Up to $18,000	Yes - 5%	5 Locations in US	x	x	x	x	3 m
Tetuan Valley[9]	No	No	Spain, Madrid	x	x	x	No	6 w
Y Combinator	Up to $18,000	n/a	US, Silicon Valley	x	x	x	x	3 m

(AngelPad, 2011; 500 Startups, 2011; i/o ventures, 2011; Innov8, 2011; Kicklabs, 2011; NDRC, 2011; Seed Hatchery, 2011; Startup Highway, 2011; Techstars, 2011; Tetuan Valley, 2011; Y Combinator, 2011)

Most of the well-known incubators and accelerators are situated in the US, and attract the most attention from entrepreneurs and investors. Lately European countries have started their own incubators. There are currently negotiations in the works to start an accelerator in Estonia (anonymous sources). This makes it

[8] Pro-incubator for those who have finished Techstars or Y Combinator
[9] Pre-accelerator before Y Combinator and TechStars etc

even more important to understand the need and importance of Garage48 type of events and their function in startup World.

2.6 Summary of Garage48

This chapter gave insights into the Garage48 hackathon and other similar movements in the World. Garage48 is one of the events where idea creators and dynamically formed teams build working prototypes and learn new skills and experience. All these approaches emphasize quick development cycles and bringing together interested team members. Advancements from hackathons are accelerators and incubators. Development continues with viable ideas, business models and attracting attention from investors.

3. METHOD

This current thesis is an empirical study that focuses on developmental evaluation of the case (Garage48) following aspects from phenomenological research. "Phenomenological research's purpose is to illuminate the specific, and to identify phenomena through how they are perceived by the actors in a situation." (Lester, 1999). The research is based on the personal experience and subjectivity of Garage48 participants. Phenomenological research concentrates on using experience to obtain comprehensive descriptions that provide the basis for reflective structural analysis to describe the significance of the action (Moustakas, 1994). The approach exposes the personal reasons people have for participating in Garage48.

Different research instruments and data sources were used for current research:

- Online questionnaire answered by participants after a Garage48 event
- In-depth interview
- Hackathon participants' registration information (impersonal information)
- Digital trace on Garage48 projects complemented with informal conversations with team members

3.1 Online questionnaire

The questionnaire (Appendix 2) was chosen for it's easy access for participants. 132 participants answered the questionnaire. The full questionnaire was conducted in two series.

1. April 2011 for participants of the first five Garage48 hackathons (Tallinn 2010, Tartu 2010, Helsinki 2011, Public Services 2011, Riga 2011)
2. December 2011 for participants of six Garage48 hackathons (Tallinn 2011, Tartu 2011, Kampala 2011, Nairobi 2011, Riga 2011 Nov, Johannesburg 2011)

Questions for the online structured questionnaire were formed based on observation and participation of Garage48 events by the author of this thesis. The questionnaire aims to find answers to raised research questions, especially information about how participants recognized the teamwork and community support at the event.

Member of a community or group can make conclusions and connections, and ask questions in a way that an objective observer can't as he doesn't have enough information (Moustakas, 1994).

Before the questionnaire was published, it was tested by two sets of five-person groups who had either participated at a Garage48 hackathon or were members of the organization teams. Their feedback was included to optimize the questionnaires' length and eliminate misunderstandings of the questions.

The questionnaire was divided into three different sections.

1. Background information on participants
2. Event-related questions
3. Project and teamwork related questions

Personal questions were mostly about benefits that participants had received and expected to receive from the Garage48 event. The benefits the questionnaire asked about were shaped by ideas from the communities of practice theory (contacts, experience, knowledge, motivation, ideas, challenge).

The questions included what expectations participants had before the event. In the future questions about participants' expectations about Garage48 should be asked before they arrive at their first event – that would be convenient during the registration process. The experience participants did get might influence their assessment on what they expected.

3.2 An in-depth interview

In-depth interviews were chosen for this thesis for their basic structure and additional open discussion. The online questionnaire has its limits and the researcher

believed additional information could be gathered through interviews. The focus was on personal experience. The in-depth interview as a phenomenological research method allowed the author to gather information about opinions, attitudes and the personal experience of Garage48.

Participants for the interview (6 all together) were randomly chosen from a list of all Garage48 participants. They had to either have access to Tallinn Garage48 HUB or be able to use Skype during April 2011.

Interviews were held with participants from different Garage48 events and different countries to get various insights on the experience of Garage48.

Interviews were semi-structured with the aim of understanding the participants' experiences, emotions and expectations of a Garage48 event. More detailed instruction for interview is included at the end of this thesis in Appendix 1.

Interviewees had the opportunity to emphasize the subjects they thought would be and expected to be the most important about Garage48 event.

3.3 Participants' registration information

Participants register for Garage48 events through online registration forms. The form saves their registration information and stores it in a place that is accessible by the author of this thesis. Only data that included impersonal information was used. It was used mainly to get information about all Garage48 participants, and compare it with the sample of participants who answered the questionnaire.

The information was used to determine the participants for specific Garage48 hackathons. It was important for measuring and analyzing the results. The data gave statistical information about exact participants, developed projects, and participants' separation into different roles at Garage48 events

3.4 Digital traces of the projects

Getting information about the status of projects that came out of Garage48 was the most time consuming and scattered part of this thesis. The web projects were easy to track down and determine their current status, but mobile applications or offline technological tools were difficult to track.

Team members who designed offline projects and mobile applications were contacted if information was not accessible through their websites. The answer was considered sufficient if at least one of the former/current team members had provided information about the current status of the project. The project statuses were divided into 3 different groups:

1. Live - projects with user accessible technological parts and an active team still developing and maintaining the product.
2. On hold - projects on hold that might have a user accessible technological part but are not currently under development anymore. The team has not fully decided either to close or actively continue with the project.
3. Closed – projects with no user accessible content and/or a decision from the team to no longer develop or maintain the product.

Two events were excluded from the status report because of the short time passed after the particular events – Riga 2011 Nov and Johannesburg 2011.

The status of all the projects was updated in December 2011. It has all the information dating from the first hackathon in April 2010.

4. RESULTS

The results chapter gives an overview of gathered data from the online questionnaire, the in-depth interviews, participants' registration information and digital information about Garage48 projects.

The questionnaire was answered by 132 participants of Garage48 hackathons, which is 12.7% of all Garage48 participants. Participants from all 13 Garage48 events were represented among the respondents (8% to 20% per event).

Interviews were analyzed with a bottom-up approach. Attention was focused on a specific individual.

4.1 Participants of the Garage48 events

Table 1 shows the participants and projects of Garage48 events during 2010 and 2011. All together there have been 1039 participants (841 individuals) at 13 Garage48 hackathons in 8 countries. This is an average of 80 participants per event. 164 projects have been developed and each team had an average of 6.3 members. Interestingly the most populous event (Riga 2011, 7.6 members per team) didn't produce the most projects. The second event in Tallinn 2011 produced more (18 projects and 5.9 members per team). All the events held in African countries are smaller than the events in Estonia, Latvia and Finland.

Table 2 - Participants and projects and Garage48 events 2010 - 2011

Hackathon	Participants	Projects	Members per team
Riga 2011	122	16	7.6
Helsinki 2011	117	16	7.3
Tartu 2010	110	17	6.5
Tallinn 2011	106	18	5.9
Tallinn 2010	98	16	6.1
Riga Nov 2011	93	14	6.6
Tartu 2011	85	14	6.1
Public Service 2011	81	11	7.4
Lagos	57	9	6.3
Kampala 2011	56	11	5.1
Nairobi	47	10	4.7
Accra	43	6	7.2
Johannesburg 2011	24	6	4.0
Total	**1039**	**164**	**6.3**

Developers (front end, back end and mobile developers) constitute 50% of all the participants, with the remaining participants made up of marketing, project management, and graphic design specialists.

132 participants have been to 2 or more Garage48 hackathons since April 2010. All except 1 of them have attended hackathons in Estonia, Latvia, and/or Finland. Among them are participants who have attended Garage48 with different roles in different events. It would be important to annotate that the participants choose the roles during registration.

4 participants have been to 5 Garage48 hackathons, they are all from Estonia and all except one started from Garage48 Tallinn 2010 event. Only 1 participant from African countries has been to more than 1 event: the Kampala event in Uganda and the Nairobi event in Kenya that were held in successive weekends in September.

42 (32%) of the respondents of the online questionnaire had been to more than one Garage48 event.

Only a small percentage of the participants (see Figure 1) are students or unemployed. More than half of the participants are workers outside Garage48 context.

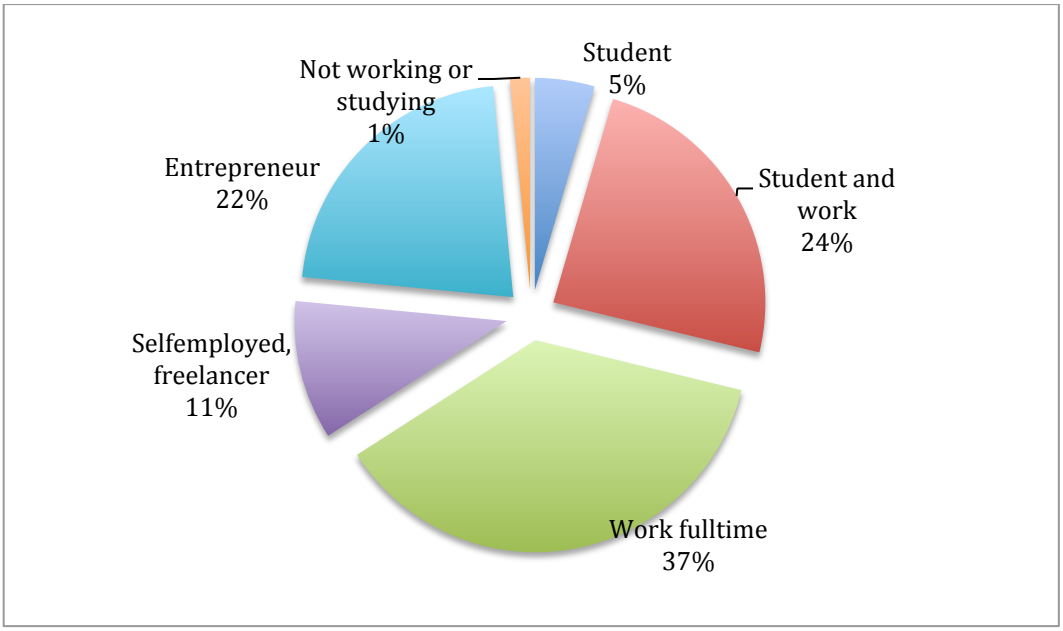

Figure 1 - Participants' profiles

4.2 Participants experiences at Garage48

A participant of 3 Garage48 events said the biggest challenge after the initial hackathon is to decide *who owns the idea, code, and design*: also known as the different parts of the prototype put together during the 48 hours. He said he assumed that the whole team had equal ownership, especially when team members want to continue with development. He mentioned his problematic experience when team members refused to share written code although they had access to parts that other team members had built.

Participants said that *too many differences* between team members might affect smooth and effective teamwork. But at the same time they confirmed they like team members coming from different backgrounds and having different experiences.

One participant said in the interview that with *big team* (8 people), most of the work was done during the late night and early morning, when “advisors” were sleeping and designers together with programmers could focus on tasks, without needing to spend time on explaining what they were currently doing. Interviewees mentioned it was kind of awkward as project managers, marketing specialists and advisors were needed, but at the same time, they shouldn’t disturb the *real* work.

Interviewees mentioned *several problems* they had felt during or after the Garage48 weekend.

- Missing team members during the weekend
- A team member with little experience
- Lack of control by project manager
- Motivation loss after Garage48 hackathon
- Lack of support by Garage48 organizers after hackathon

4.2.1 Participants' expectations and benefits

Participants were asked to mark the reasons why they decided to take part in a Garage48 hackathon. The reasons for taking part in Garage48 (see Figure 2) shows participants expected to get new contacts and new experiences more than they expected to get a job or even present an idea. Under "Other Reasons," three respondents mentioned launching a startup.

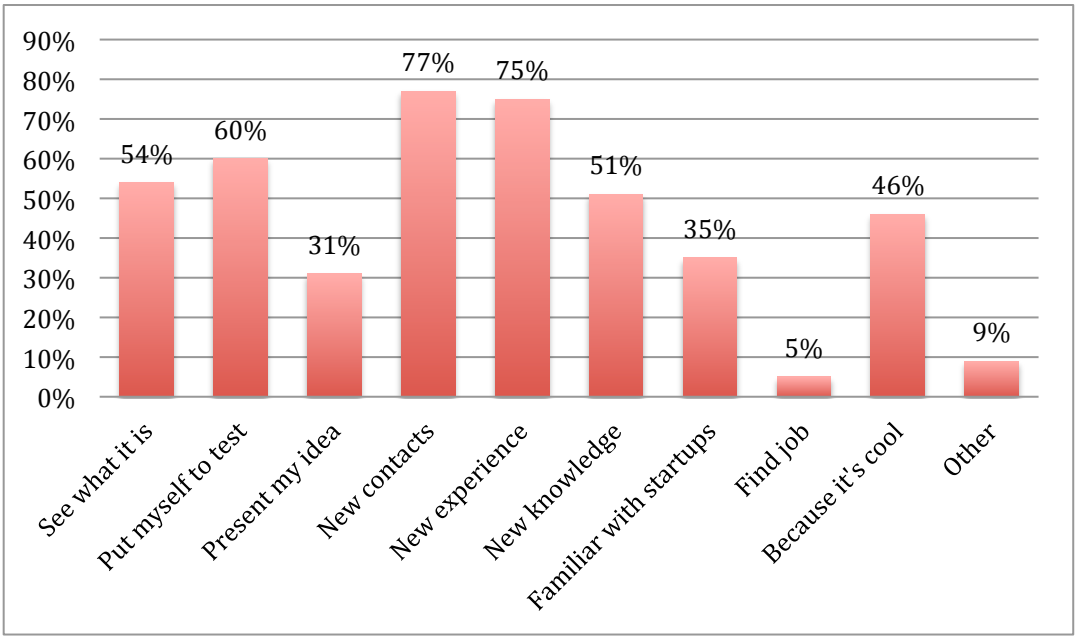

Figure 2 – The reasons of taking part of Garage48

Participants were asked to assess on Likert scale from 1-5 if they agree or disagree on getting certain personal benefits from Garage48 event. Figure 3 shows the

difference between Garage48 continuous participants and one-time participants and what benefits members from each group felt they gained.

T-Test in SPSS was used to analyze the significant difference between continuous and one-time participants. Getting new contacts and ideas are related significantly ($p<0.05$) to participating in Garage48 events several times.

In the Figure 3 participants from African countries are excluded to visualize the difference between the participants who have had a chance to attend Garage48 events several times.

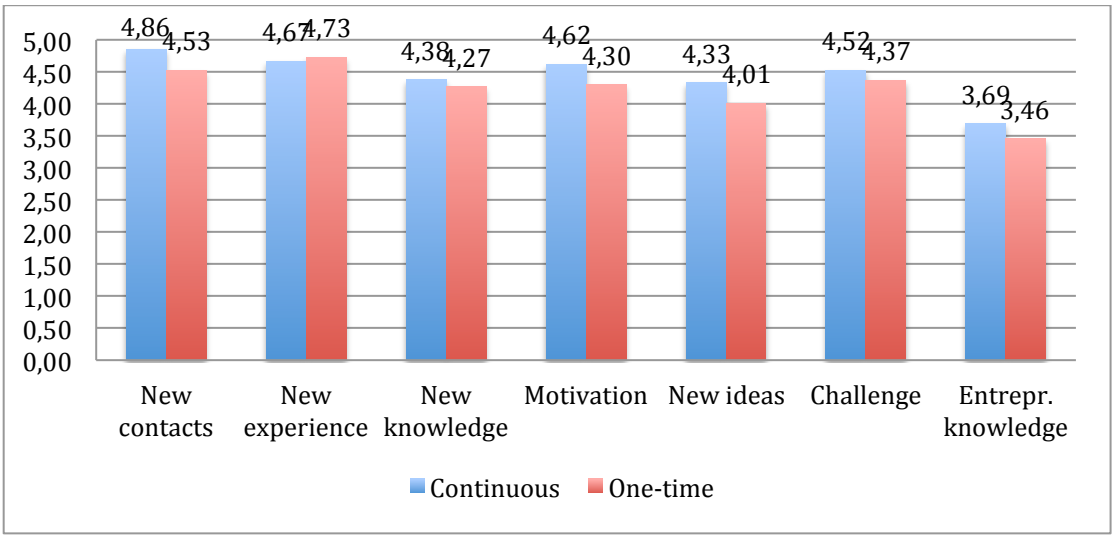

Figure 3 - What did you gain from Garage48

4.2.2 Teamwork

Participants were asked to rate several characteristics that describe effective teamwork in a Likert Scale from 1 to 5 (Don't agree to Agree). The results are shown in Figure 4 – Rating of team characteristics

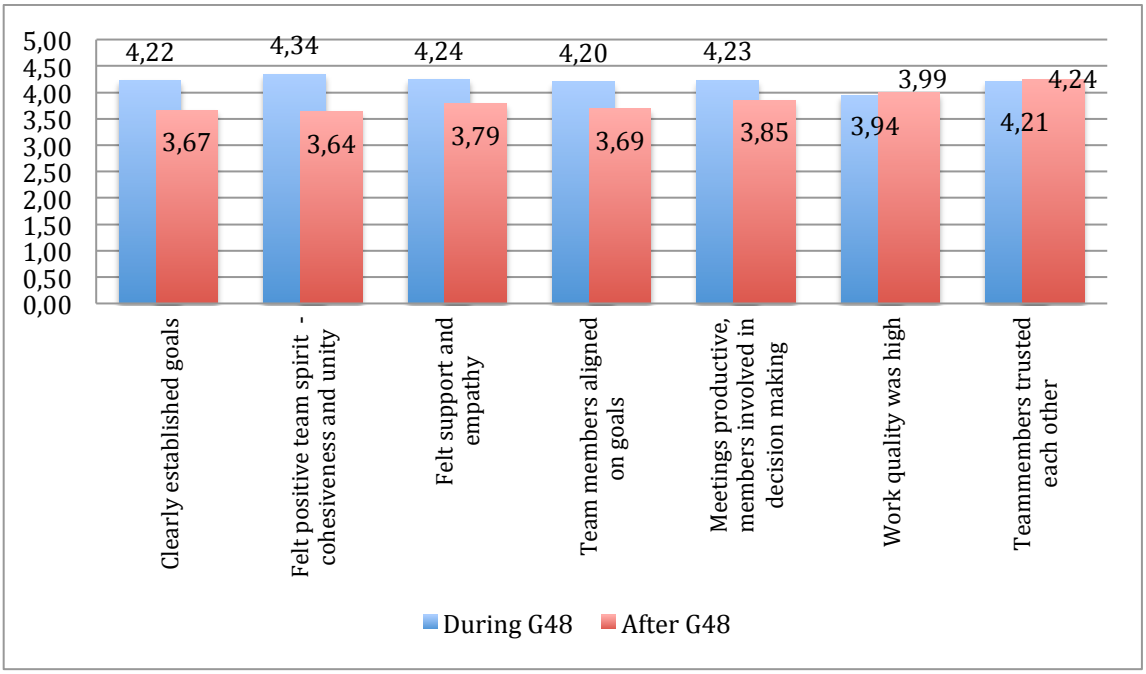

Figure 4 – Ratings of team characteristics

There is a significant difference for team assessment comparison during and after Garage48 according T-Test to compare means (where $p<0,05$) is between five characteristics (clearly established goals, felt positive spirit – cohesiveness and unity, felt support and empathy, team members aligned on goals, meetings were productive team, members involved in decision making)

4.3 Developed projects at Garage48 hackathon

The projects that are considered to be still alive today are projects that (1) have a working prototype that is accessible for users even if the team is not fully active behind the project but they are taking care of the maintenance of the product

whenever necessary and plan to bring out new versions when time comes, (2) have sold their prototype to an outside company - 3 teams have sold their application or other product to a different company after a Garage48 hackathon and (3) teams who work with their projects actively and have tasks for at least every week to continue with the development and/or business side of the project.

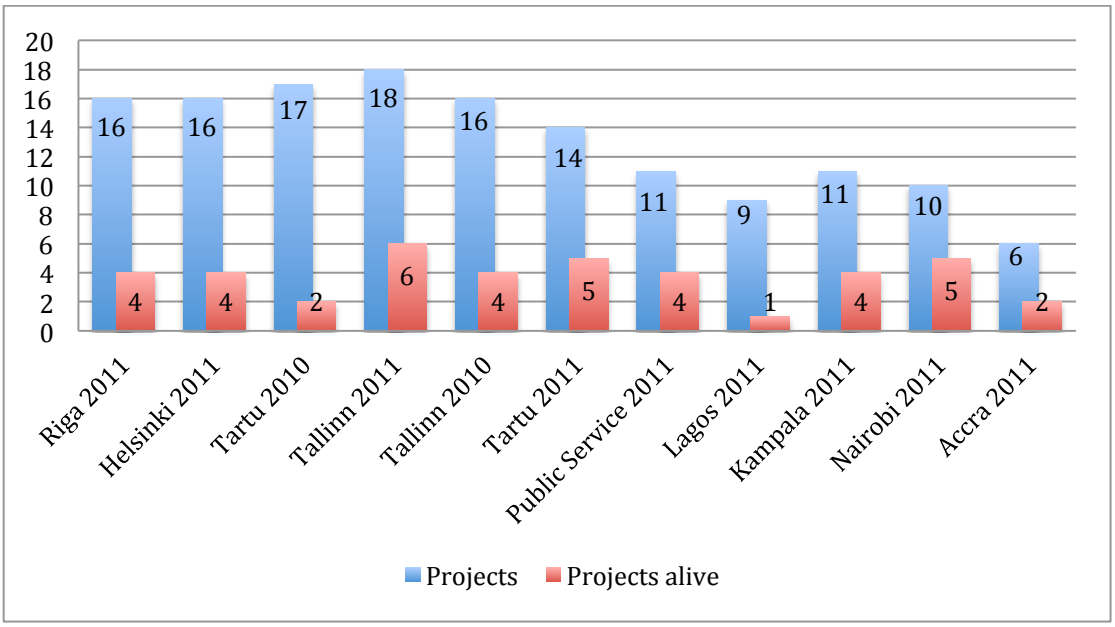

Figure 5 - Developed projects and their status. December 2011

Developed projects and their status (see Figure 5) does not contain information about Garage48 on the Riga November 2011 or Johannesburg 2011 events, because it would be too early to determine if the projects from these events are actively under continuous development or not. Therefore 42 (29.2%) projects out of 144 are considered to be alive as of the 15th of December 2011. 30 of those have formed a registered company which includes either starting a new company by some or all of the founders, or connecting the product with some existing company in order to be able to use juridical body for further development.

Fourteen of the continuing teams were named as runner-ups[10] in Garage48 events (Favorite of the audience, Funniest application, Best Execution etc.). Six were overall Winners.

All the projects developed during Garage48 hackathons were divided into 4 different categories based on their access type. 65% of projects are web based, 18% are mobile, 8% are built for Web and mobile and 5% are offline projects (local software). There is a rather small difference compared to the 42 projects that continue to be developed – 69% Web, 25% mobile, 9% Web and mobile and 5% offline projects.

Figure 6 – Team members continuing with the projects shows the difference of how many promised to continue (see inner circle in Figure 6) after the event and how many actually did continue (see outer circle in Figure 6).

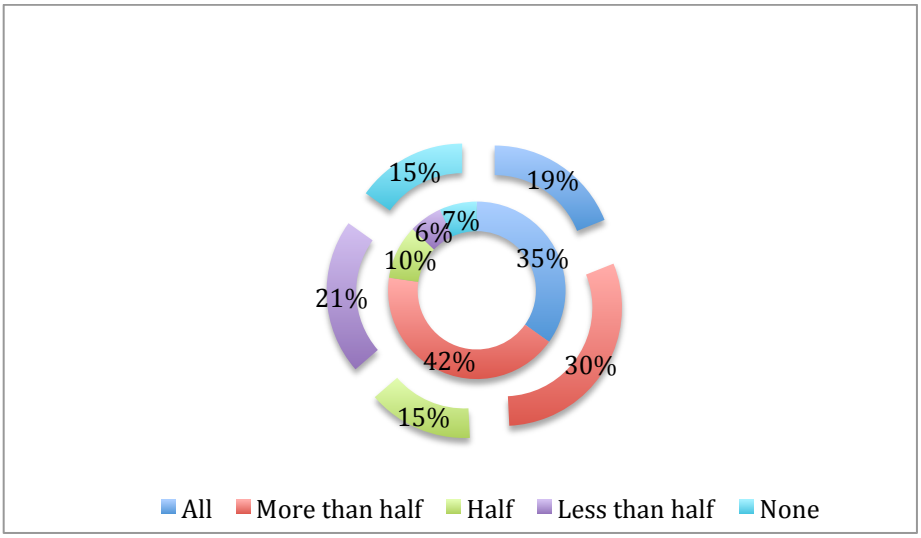

Figure 6 - Team members continuing with the project

All together more than 77% of the participants said that all or more than half of their team promised to continue with the project (35% and 42% respectively). If asked how many participants did continue with the project, the percentage dropped remarkably to 19% and 30.4% respectively. 15% of the respondents said that none of

[10] Runner-ups at Garage48 events are projects that were considered best in some specific category.

the team members did continue while only 7% confirmed it immediately after the event.

Participants were asked in the online questionnaire if they personally continued with the project they helped to establish during Garage48 weekend. Dependent on the answer ("Yes, I did" or "Yes, for a while") they were directed to answer extra questions about teamwork after Garage48 event. Those participants who didn't continue with the project ("No") were lead to continue the questionnaire with entering final personal information.

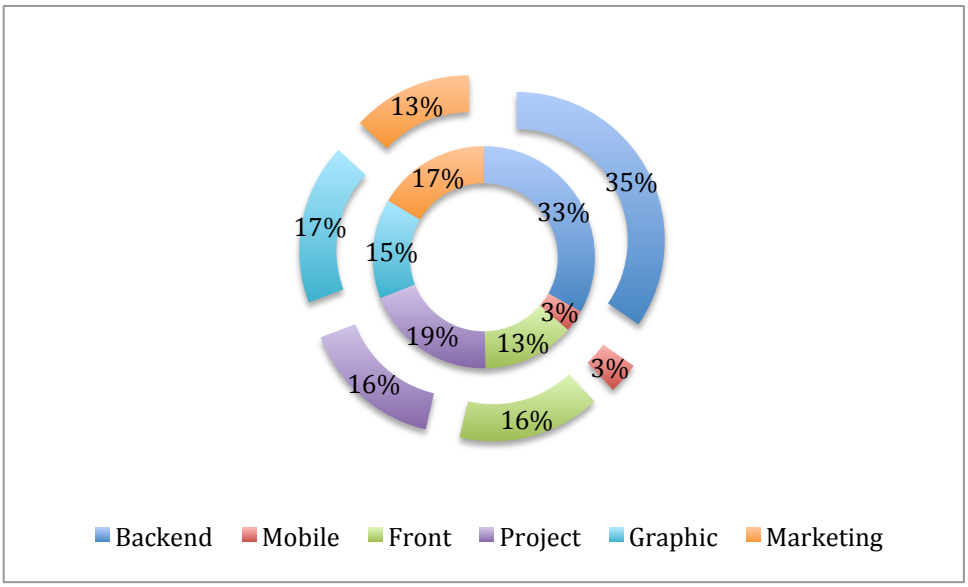

Figure 7 - Roles in continuing projects

Figure 7 shows the overview of roles in teams that have continued the development after Garage48 weekend. The inner circle (see Figure 7) shows the projects that did not continue and the outer circle (see Figure 7) the projects that were continued. Among the teams that continued there is slight move towards having more developers (front end, back end and mobile) and designers, as marketing and project managers' roles decrease.

5. ANALYSIS AND DISCUSSION

This chapter analyses and discusses the results in relation to the aspects of the previously described theoretical framework. Additionally the author of this thesis will assess and comment on the results based on the research questions.

5.1 Benefits and drawbacks of dynamically formed teams

Participants come to Garage48 events to get new contacts and challenge themselves (see Figure 2), but also to participate in CoP for its benefits of new knowledge and experience (Wenger, 1998). In addition participants feel that Garage48 event is cool enough to be one of the reasons for attending.

Continuous participants put greater emphasis on making new contacts (see Figure 3). The result might show that continuous participants have met plenty of new contacts during different events and they are keen and open for communication. Participants evaluated teams relatively highly (see Figure 4). That could mean participants chose the teams carefully and considered the best fit for themselves. The finding supports Smith's (2007) theory of forming teams based on interpersonal attraction. Teams that continued working together after their Garage48 weekend rated their continued team support, established goals, productiveness and team spirit levels lower than they did during the weekend (see Figure 4). The work quality and team members trusting each other has a small difference towards positivity but was not significantly relevant ($p>0,05$). Though interpersonal trust has shown to be related with team learning (Dayan & Di Benetto, 2010).

Teams were formed within a short period of time and the high assessment members made while choosing their teams agrees with considering the needs of the team and the needed skillset of the joining agents before making the decision (Gaston & DesJardins, 2008).

Trust remained the same (see Figure 4) during and after the event, as Bisht (2011) has emphasized as being one of the most important characteristics of startup teams. Trust seems to be one of the main elements that start to evolve during Garage48 event and might influence the direction of the team if it continues. It's interesting that trust was one of two characteristics that increased after Garage48 event.

Positive energy and having fun with a startup team is important for getting the full experience (Bisht, 2011; Nager, et al., 2011). After Garage48 hackathon participants begin to feel the positive team spirit and unity (see Figure 4) fading away. In addition to a lack of physical presence of the team, this could be due to members missing the challenge of finishing tasks within short period. Additionally the support and competitive spirit during the event might make teams feel more united.

Finding the best team members is a viable task. In addition to finding the most brilliant team members, you have to make sure the team members are open for implementing new techniques and approaches. Ries (2011) claims this is a mistake that is done in big companies, where they think that a young brilliant guy who asks questions based on the Lean Startup model is intelligent by himself. According Ries (2011) managers do not realize that the actual success would be implementing the Lean Startup technique in the organization from top to bottom.

Dynamically formed teams might have an advantage, as they are formed from different members with different backgrounds. Participants agreed that it is interesting and functional to have new people to work with.

Connections and contacts with team members have been useful as well, as are connections and contacts with members of other teams.

Participants mentioned several problems they have encountered at Garage48 hackathon.

Missing team member - It is interesting that missing team members was brought up, yet at the same time there is high trust among team members (see Figure 4). It should be quite hard to trust your team members if you expect them to leave the weekend.

Low experience – Most interviewees confirmed they are surprised by the high qualification of other participants. But one interviewee brought out the problem of one of their team member's qualifications in the first Garage48 event he participated. He was pretty sure that this was the reason why they couldn't bring out a better working prototype during the weekend. But he also confirmed that this was a single experience that he did not see happen again.

During team formation possible members should understand what skills are needed in the team they are trying to join. On the other hand the needed skills might change during the first hours because teams might make changes to the initial idea (Nager, et al., 2011). Therefore it might be difficult for the idea creator and the agents to understand if they fit the team with the right skill set. Although Dignum et al. (2001) argued that participants join teams because of the initiator rather than because of the idea itself. If this is true, there should not be drawbacks when the original idea is changed.

The mentioned participant might have overestimated his skills. After the weekend he probably had a better overview of what kind of skills he lacks and how important they are, even if he failed to understand the needed skills in the first place.

Lack of control – Project managers should take more responsibility and lead the team. According to interviewees this was sometimes a problem. It's about asking for more focus and bringing different ideas from the team together to form a viable and effective plan. Gumpert (2007) explained how the idea creator might not be the best project manager, but sometimes it is hard for him or her to give the control away.

The project manager should encourage communication through boundary bridges (Oborn & Dawson, 2010) inside the team that enable faster communication and better understanding.

Motivation drops after Garage48 - Interviewees confirmed that motivation decreases immediately after the Garage48 event is over. The peak of the motivation is the prototype presentation on Sunday evening. Only a day later team members are back in their everyday life and start giving excuses for why they don't have time to participate in a meeting or continue with tasks for their project.

Lack of support – Interviewees think that more support and mentoring after Garage48 would help to keep their projects alive. At the same time they admit not being active, asking questions or approaching Garage48 community to get support. Participants should be more active after Garage48, but Garage48 organizers should talk more about the possibilities of getting support, mentoring and advice from the Garage48 team and the mentors.

Team size - Some of the interviewees were convinced that a team with a maximum of 4 members should be enough to build a prototype in 48 hours. Others said that there should be 7 members, with at least 3 or 4 programmers, but that other roles are equally important. The problem addressed is serious. The 48-hour time slot is short; if team members do not support each other or don't understand the workflow they start to disturb others. Still, most teams seem to have control of the goals (see Figure 4). Most probably it signifies that all team members know their tasks.

5.2 Startup projects growing to startup companies

To find the answer to the second research question all 42 live projects (see Figure 5) are analyzed and considered appropriate for researching what if anything influences the formation of startup projects into startup companies.

The most productive of all the Garage48 events in terms of active projects has been Nairobi 2011 hackathon, where 50% of the teams (see Figure 5) are still working actively with their projects after two and half months. Garage48 Nairobi 2011 and Kampala 2011 teams were motivated to continue in order to compete for access in Seedcamp London[11]. Garage48 organizers have asked the teams to continue to give status updates each week to be able to continue in the running towards the Seedcamp access. Therefore the relative success of Kampala 2011 and Nairobi 2011

[11] Garage48 Foundation has signed an agreement with Seedcamp to send most active and motivated teams to Seedcamp events without the usual application process.

seems to be due to the possibility of gaining further benefits for their project. Startups participating in Seedcamp have a high possibility of getting investment.

Startup Weekend (Nager, et, 2011) claims that 36% of teams report that all the members continue working after the weekend, and 41% of teams say some of the members do. The numbers from Garage48 events are nearly the same, with 35% of the members saying all of the team members promised to continue and 42% saying that more than half promised to continue.

Continuing teams seem to have some drawbacks when it comes to setting their own goals and keeping their meetings productive. This can be explained by participants living in different places, and having trouble with their organization, and with including all team members in decisions after the event. It is easy during the Garage48 event when all team members are gathered around one table for most of the time. The physical presence is definitely one of the benefits of the event but the lack of it is a drawback afterwards. Forming a startup company is menaced if teams can't focus and continue effective teamwork.

Garage48 and Startup Weekend having similar results (although without confirmation of their sample size or location) means the two similar organizations give its participants the same feeling during the weekend. Unfortunately there is no information on how many projects actually continue from Startup Weekend events.

Participants at Garage48 who continue with their projects often do it in addition to their everyday work. They have different backgrounds and experiences and belong to different types of organizational groups and communities.

This difference might come from the excitement and high motivation for the project during the event, while the reality of time management and other responsibilities of everyday life creates a different environment.

Figure 6 shows a slight difference towards having more developers between the roles of team members who now have closed projects and the teams who continued working with their project. One of the interviewees emphasized the importance of having more "real" developers and skilled people in the team and fewer marketing and project managers, in sustaining the projects. The working prototype for Sunday

demo can be a “fake”, as it does not have to be ready for users. If the team decides to continue with the development it emphasizes the importance of developers and designers who have to bring out a working minimal viable product ready for clients.

There is no significant difference of the type of projects that teams continue to develop after Garage48 events (see Figure 7). It should encourage participants to continue with the development of different ideas in search for the viable product.

5.3 Forming communities of practice through Garage48 events

The social entity of CoP is supported with communal resources (Wenger, 1998) which can be found at Garage48 events.

- Garage48 events follow the same structure and agenda, with only minimal changes for different weekends. The structure can be considered as joint **routines** for the Garage48 community. Participants always know what is expected during the weekend.
- **Mentoring** and **guidance** by sponsors, organizers and mentors
- Garage48 provides **facilities** and venue during the event.
- Participants have similar **styles** and expectations of getting new contacts, knowledge and challenges.
- **Sensibility** can be explained best by one of the interviewees cited below who said that he likes the “We are going to invent new Skype” mentality at Garage48 events.

Garage48 participants have wide experience and work relations (see Figure 1). Most of the participants are employed – either working full time for a company, for themselves, or as entrepreneurs. Relating to Wenger (1998), Garage48 is taking the role of organizations that should be supporting the formation of CoP for learning and sharing the experience between their employees. The Garage48 community is multidisciplinary and teaching from “older” to “younger” should be common.

Garage48 hackathons as CoPs enable the “old-timers” to share knowledge and practical experience (Wenger & Snyder, 2000) with new participants. “Old”

members might be those who encourage new ones to communicate more bring their aptitude for useful ideas with the "We are going to invent new Skype" (citation from one of the interviees) mentality of the younger participants.

The assumption, without any evidence, could be that for students the Garage48 hackathon is the first "real" test for development.

The small representation of participants who are not currently working or studying (see Figure 1) shows that Garage48 is an event for professional work, and not for people just trying to find something to do. Still, some of the participants said that they came to Garage48 to get a job (see Figure 2).

Continuous participants have registered with different roles for Garage48 events. For example the people who have been to most Garage48 events have been mostly back end developers, but they have also participated as front end developers, project managers and even marketing people. It supports the suggestion from Startup Weekend organizers who claim events like that are a convenient place to try out new roles and learn new skills with minimal risks (Nager, et al., 2011). The back end developer might understand he is not good at marketing at all and will be happy being able to get back to his coding after the weekend. Trying out different roles during Garage48 events does not comply with theory of (Oborn & Dawson, 2010) multidisciplinary CoP where participants do not learn new skills outside their discipline. The author of this thesis argues that joining Garage48 events with new roles helps participants find the boundaries discussed by Carlile (2002) and Oborn and Dawson (2010) that help participants to learn and understand each other's disciplines better.

African countries have not had follow-up events, but these are planned for 2012, therefore it's impossible to conclude if participants want to attend the hackathon more than once in their home countries or close regions. These conclusions can be made in the future.

Continuous participants are the foundation of Garage48 community. They show that the event is important not only to build new prototypes but also to learn and get new contacts that are important inside a community of practice.

Lack of support after the event mentioned by interviewees might be one of the drawbacks of forming a proper community of practice from Garage48 participants. Both participants and organizers are not active enough to support the teams after the event. This influences forming a future community of practice and its dynamics. The willingness and motivations of continuing with the projects should be encouraged more inside the community.

Chapter 1 (p. 10) described community of practice stages based on Wenger's (1998) theory. These stages can be used to describe the development of the Garage48 community. The description of teams describes the stages, although additionally the same characteristics can be observed through the entire Garage48 event.

1. **Potential** – Initiators present their ideas on Friday evening. Other participants are listening to the ideas and make up their favorites. Participants are getting to know each other, and discussing the ideas and possibilities (Couros, 2003).
2. **Coalesce** – Participants continue discussing the ideas and finding the ones that interest them. The stage is finished with the formation of teams. In this stage it is important for initiators to introduce their ideas for "right" team members and understand their skills and interests.
3. **Mature** – Teams are formed and they focus on discussing how much can be achieved with 48 hours. The initial idea might be changed and additional features may be included or excluded. The stage should end with all the team members knowing their responsibilities and starting to work. Team members communicate through the knowledge boundaries (Carlile, 2002). Team members are getting to know each other and form team values and ways to work.
4. **Sustain** – Team members focus on developing the minimum viable product. During the weekend stress and challenge will influence how team members work together. Project managers share additional information and experience in status update meetings conducted by Garage48 organizers and mentors.
5. **Transform** – Sunday evening ends with demo presentation. Participants' motivation decreases and some of them might lose interest in Garage48 and

the project they built. The continuous participants and public interest towards Garage48 shows continuous change and development in Garage48 community.

An interviewee described that he felt the value of Garage48 hackathon months after he attended the first event. He believed that the connections and ideas he formed would be beneficial to him in long term. He continues to participate in Garage48 events, but communicates with new contacts also outside the organized hackathons. His explanations support Wenger's (1998) description of CoP – that it does not disappear with the end of a task but lives longer than the project itself.

5.4 Obstacles and future research

The research takes a retrospective view of Garage48 events. The questionnaire and interviews were done after attending Garage48 events are the main shortages in this thesis. Some of the questions were about expectations participants had before. These should be compared with future research to see if they were influenced by the event.

The minimum statistical information about similar events (Startup Weekend) is one of the disadvantages of this thesis. A lack of information about the reasons why teams stopped further developments of the projects after the hackathons is another disadvantage.

All the continuing projects were added in the same category although the differences should be considered. 3 projects have received funding, while several others might do as little as fixing bugs when needed, and otherwise do not continue with development.

Additional research should be made to understand the startup communities and forming startup ideas into startup companies. Some of the additional questions for future research are:

1. What are the participants' expectations for Garage48 events before their first Garage48 event?

2. What are the collective interests of formed teams after Garage48 event?
3. What were the reasons behind closing projects to confirm or contradict the statement of the Lean Startup approach?

5.5 Conclusion of analysis

The Garage48 event encourages and supports the formation of community of practice. Analysis showed that individual interests of Garage48 participants are supported.

Several of the ideas developed during Garage48 might not be viable for further development. The Lean Startup methodology supports that approach. Teams were able to develop the minimum viable product that gave them information whether the idea is successful or not.

Personal benefits are the individual interests that support CoP theory. Benefits are getting new contacts, experience, and knowledge but also getting familiar with startups and finding challenge.

The format of Garage48 event is not specific for the IT field only. It can be transformed and used for other fields as well. The most important outcomes of the event are not the projects itself, but the personal gain of the participants and Garage48 as a community of practice.

Garage48 format could be used as an alternative training weekend. If necessary a more structured format could be used to make sure that needed steps are taken and every team follows an overall development format. Similar role division should be made to assure that there are developers, but also project managers and marketing people. There has already been interest from other fields to have events similar to Garage48. Architects, jewel artists and others have expressed this interest.

Garage48 is registered trademark; therefore all events held under this name should be in contribution with the Garage48 Foundation. The Foundation is open for support and collaboration with many interesting projects and different activity fields.

The recent book from organizers of Startup Weekend confirms this approach and claims that events like Garage48 and Startup Weekend are much bigger and influence participants and the community around them much more than can be measured through continuous participants.

Garage48 Foundation has planned to make initial changes for 2012 events. A professional designer, developer and CTO (chief technological officer) will be included in each event to help the organizers' teams. They help teams in specific fields, more than mentors would, by giving advice and possible ideas. The change supports bringing out more elaborate projects, and teaches participants additional skills.

CONCLUSION

This Master's thesis concentrates on the importance of fast development cycles, getting out minimum viable product through organized events. Garage48 is a hackathon where startup ideas are built into working prototypes within 48 hours. The fast change in development cycles has made many people understand that a lack of money is not the main problem in starting new companies.

Communities of practice was used as a framework within this Master's thesis to gain understanding of the Garage48 community.

Garage48 events have been a birthplace for 42 projects that are still being developed. 29 of these projects have formed companies and 3 of them have received funding. Moreover many have received local and international attraction. Although many dynamically formed teams undergo problems, most of them perform and function surprisingly well. During team formation joining members understand what skills are needed. This thesis emphasized that dynamically formed teams not only work together efficiently for short time goals, but might be strong enough to continue further development of the project.

Conclusions of this thesis based on the research questions are:

1. The main benefits of dynamically formed teams are personal benefits for the team members (new contacts, knowledge, ideas, motivation) and effective team work during the Garage48 weekend. The main drawback is losing team members after the event.
2. Formation of startup companies is supported by follow-up support and additional motivating factors. Continuous teams have more developers in the team.
3. Garage48 hackathon encourages formation of CoP by bringing together multidisciplinary participants with similar interests. They are offered support and communal resources.

Explanations for research questions support the apparent questions about Garage48 described in the introduction.

Garage48 participants are often working professionals who might not have time to take additional long-term responsibilities. The importance of face-to-face meetings is evident but can't be achieved due to time limits and geographical locations. Nonetheless there are excellent examples of international teams formed at Garage48 events – one of the three teams with investment has members from Estonia, Latvia and Finland.

Persistent methods should be considered and implemented by Garage48 Foundation to support the teams after Garage48 hackathons. One possibility could be to involve mentors from sponsors also after the events.

In Estonia the Foundation opened a coworking space called Garage48 HUB to support the teams after hackathons. The Foundation organizes events and community members are encouraged to do the same. Therefore trainings, seminars and fun parties are planned and complemented with visitors outside Garage48 hackathons.

Garage48 core-team shouldn't take the responsibility of opening Garage48 HUB type offices in other countries, but can offer support and foster the local teams implementing it. Taking too many responsibilities might be risky. Garage48 main focus should remain organizing Garage48 hackathons and encouraging teams to continue their development. Stronger and continuing projects should look further towards accelerators and incubators.

Initiators with ideas are needed for trustworthy team members and, as a supportive community to develop projects. It's important to get the minimum viable product out as fast as possible. "Less is More" is the rule when developing new technological startups. Participants at Garage48 are able to discuss their ideas and ready to share their knowledge and experience since it will benefit everybody. While the Garage48 idea came from the mere intuition from a couple of founders, this Master's thesis has proved the success of the approach.

KOKKUVÕTE

Käesolev magistritöö “Garage48 ühisprogrammeerimise ürituste mõju algäri projektide loomisele” on kirjutatud inglise keeles. Töö maht on 60 lehekülge ning sisaldab 7 joonist, 2 tabelit ja viidatud allikate arv on 36.

Ettevõtluse ja tehnoloogia areng toimub aina kiiremini. Toodete ja teenuste ehitamine ei võta enam aastaid, vaid ainult kuid või isegi nädalaid. Samas võivad rahvusvahelised edulood Facebooki või Grouponi näitel tekitada hirmu, et pole enam võimalik midagi suuremat saavutada. Vastupidi, uus generatsioon vajab initsiatiivikaid ettevõtjaid ning äri alustamiseks ei ole oluline originaalne idee, vaid uuenduslik viis seda ideed ellu viia.

Garage48 on intensiivne 48-tunnine ühisprogrammeerimise üritus, mille eesmärgiks on ühe nädalavahetuse jooksul ehitada töötavaid prototüüpe. Kusjuures meeskonnad koostatakse ürituse esimesel õhtul dünaamiliselt osalejate enda initsiatiivil. Üritustesari sai alguse Eestis 2010 aastal ning on nüüdseks korraldatud sama meeskonna poolt 13 korda 8’s erinevas riigis Euroopas ja Aafrikas.

Käesoleva magistritöö eesmärgiks on uurida, kas Garage48 on suutnud järgida asutajate püstitatud eesmärke, mille toetamiseks on püstitati järgmised uurimisküsimused.

1. Mis on ühisprogrammeerimise üritustel dünaamiliselt moodustatud meeskondade peamised kasud ja puudujäägid?
2. Mis on võimalikud tingimused tehnoloogiliste projektide ettevõtteks kujunemisel?
3. Kuidas ühisprogrameerimise üritus julgustab ja võimaldab praktikakogukonna kujunemist?

Magistritöös kasutati teoreetilise raamistikuna meeskondade kujunemise ja praktikakogukonna teooriaid.

Dünaamiliselt moodustatud meeskondade peamised kasud on seotud praktikakogukonnast tulenevate isiklike kasudega - uued kontaktid, kogemused, teadmised ja ideed aga ka julgustav motivatsiooni. Samas peamiseks puudujäägiks on teadmatus meeskonnaliikmete jätkamisest.

Magistritöös leitakse, et nädalavahetuse jooksul ehitatud projektide jätkumiseks on vajalik järeltoetus ja juhendamine Garage48 tegijate poolt. Kinnitatakse Garage48 ürituse praktikakogukonna teooriale vastamist läbi esitatud faaside ja ressursside.

Võtmesõnad: algäri, fenomenoloogiline uurimus, praktikakogukond, ettevõtlus

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APPENDIX

Appendix 1. Instructions for Garage48 Participant in-depth interview

Participants

- Interviewer
- 1 Garage48 participant

Equipment

- Computer
- Prepared questions ready
- Computer with Skype
- Recorder if interviewee in the same room

Room

- Quiet space with chairs and tables for sitting or
- Skype with full equipment for reducing noise or disturbance

Time

- The sessions lasts for about 20-30 minutes

Process

1. Preparation and “Ice breaking”
    a. Introduction and explanation that the interview is necessary for Garage48 feedback and understanding the participants
    b. Explain that the questions are asked, but the interview is open and whenever the interviewee wants to add something or comment, he/she is most welcome to do that.

c. Tell that you are going to record the session and the material will be used for research only.
d. If any names are mentioned they won't be used publicly later, but might help to understand and the concept while explaining.
e. Keep the discussion moving towards the purpose of collecting information

2. Ask background information
    a. Name
    b. Attended Garage48 events
    c. Built projects during Garage48 events
3. Continue with questions
    a. Are you currently continuing with your project?
    b. What have been the hardest or most surprising challenges?
    c. Talk about the teamwork during and after Garage48 event?
    d. What are your suggestions for Garage48 to make it better?
    e. What did Garage48 event give you?

Conclusion

- Thank the participant for interview

At the end of the interview you should have background information of the interviewee, up to 30 minutes of recorded session and some written notes.

Appendix 2. Online questionnaire

Garage48 participants questionnaire

Questionnaires give valuable information and help to write Master Thesis. There is a question for your name as well, your name won't be used for nothing else but to make sure you have participated Garage48 event and that you have filled out the questionnaire. It's not a must but please fill it in. Your name will be removed before analysis process. If you have been to more than 1 Garage event, read carefully which event and project to count. There is more than 1 page, just click continue.

Why did you decide to take part of Garage48? *
You can choose more than one answer

- [ ] to see what it is
- [ ] to put myself to test
- [ ] to present my idea
- [ ] to get new contacts
- [ ] to get new experience
- [ ] to get new knowledge
- [ ] to get familiar with start-ups
- [ ] to find job
- [ ] because it's cool
- [ ] Other:

Please rate the following items for Garage48 event *
If you have participated in more than 1 Garage48 event, rate the last one.

	Very satisfied	Somewhat satisfied	Neither satisfied or dissatisfied	Somewhat dissatisfied	Very dissatisfied
Mentors	○	○	○	○	○
Ideas	○	○	○	○	○
Venue	○	○	○	○	○
Support during the event	○	○	○	○	○
Profile (experience) of other participants	○	○	○	○	○

What did you gain from Garage48 events? *
If you have been to more than 1 Garage, choose the last team to rate!

	Agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Disagree
New contacts	○	○	○	○	○
New experience	○	○	○	○	○
New knowledge	○	○	○	○	○
Motivation	○	○	○	○	○
New ideas	○	○	○	○	○
Challenge	○	○	○	○	○
Entrepreneurship knowledge	○	○	○	○	○

Rate your team at Garage48 event
If you have been to more than 1 Garage48 events, choose the last team to rate

	Agree	Somewhat agree	Don't disagree nor agree	Somewhat disagree	Disagree
Clearly established goals	○	○	○	○	○
Project manager focused on planning, organizing and motivating	○	○	○	○	○
Control was kept most of the time	○	○	○	○	○
Felt positive team spirit most of the time	○	○	○	○	○
Any work pressure was overcome	○	○	○	○	○
Team members aligned on goals	○	○	○	○	○
The teamwork was fun	○	○	○	○	○
All team-members were involved in decision making	○	○	○	○	○
Work quality was high	○	○	○	○	○
Teammembers trusted each other	○	○	○	○	○

Did you present your own idea in the event? *

- ○ Yes, I did and found the team (at least at one event)
- ○ Yes, i did but didn't find the team
- ○ No, I didn't

Did you continue with the project *
If you have been to more than 1 Garage48 event, rate the one that was at least 1 month ago!

- ○ Yes
- ○ Yes, for a while
- ○ No

Continue »

Garage48 participants questionnaire

When you continued with the project

If you have continued with more than 1 Garage48 project, rate the oldest!

Rate your teamwork while you continued with the project after Garage48

	Agree	Somewhat agree	Neither disagree nor agree	Somewhat disagree	Disagree
Meetings are productive	○	○	○	○	○
Synergy - the whole team is greater than the sum of it's parts	○	○	○	○	○
Cohesiveness and unity	○	○	○	○	○
High support and empathy for one another	○	○	○	○	○
Good communication - honest and respectful	○	○	○	○	○
Team members are aligned on goals	○	○	○	○	○
Goals were set	○	○	○	○	○
The ability to be flexible to each other's needs and differences	○	○	○	○	○
Team members trust each other	○	○	○	○	○

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Garage48 participants questionnaire

* Required

Tell us about your project

Which Garage48 events have you been? *

- [ ] Garage48 Tallinn, April 2010
- [ ] Garage48 Tartu, August 2010
- [ ] Garage48 Helsinki, January 2011
- [ ] Garage48 Public Services, Tallinn, February 2011
- [ ] Garage48 Riga, March 2011
- [ ] Garage48 Tallinn, April 2011

How many of your team members PROMISED to continue with the project? *

If you have been to more than 1 Garage48 event, rate the one that was at least 1 month ago!

- ( ) All
- ( ) More than half of the team
- ( ) Half of the team
- ( ) Less than half of the team
- ( ) None

How many of your team members DID continue with the project *

If you have been to more than 1 Garage48 event, rate the one that was at least 1 month ago!

- ( ) All
- ( ) More than half of the team
- ( ) Half of the team
- ( ) Less than half of the team
- ( ) None

What best describes your everyday work situation? *

- ( ) I am a student
- ( ) I am a student and work as well
- ( ) I work fulltime for a company
- ( ) I am selfemployed, freelancer
- ( ) I am entrepreneur myself
- ( ) I am not working nor studying

Did your project get media coverage?

If you have been to more than 1 Garage event, rate the oldest.

- [ ] No
- [ ] Online news sites (including blogs except personal ones)
- [ ] Newspaper
- [ ] Radio
- [ ] TV

Is your project live today? *

If you have more than one project, then please use "other" and specify

- ( ) Yes, we are working on it actively
- ( ) Yes, but not actively
- ( ) Neither dead or alive, we haven't decided
- ( ) No, it's on hold
- ( ) No, it's dead, closed
- ( ) Other:

Please enter your age in years *

(for example 25)

Enter your name

Then I know you have answered, and we won't bother you more ;) I will use it only to check you on the list.

Insert your homecountry

What was the biggest difference at Garage48 event from what you first expected?

What surprised you the most?

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