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Master of Science Degree in “Mechanical Engineering”

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**Investigating the Application of Project Management in
Startups**



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Abstract

This research is carried out in order to be able to identify whether project management is used in the field of startups in certain geographical areas, whether it adds value to the start up, and which approach of project management is used, if any. It has been concluded from the literature that there are many ways of linking project management with startups since the two fields share parallels. Data are collected by means of online surveys with closed ended questions that give semi-quantitative results; which, although limiting, are appropriate as a primary source of information. The majority of the respondents apply project management methodologies during different phases of startups. The results showed that most of the entrepreneurs who apply project management methodologies use agile project management because of its flexibility and time efficiency.

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1. Introduction

1.1 Entrepreneurship

Entrepreneurship is an expression used for a wide set of events; numerous definitions can be found in literature and various terms, including self employed. Drucker (1985) connected entrepreneurship with change oriented and innovative behaviour instead of just starting and managing a business; he defined it as the managerial operation of creating and managing innovation, where he views innovations as windows of opportunities.

The past 10 years also recognised a new concept, but is also related, which is entrepreneurship in existing firms or organisations (Bosma et al., 2010).

This includes corporate entrepreneurship, which encourages employees' initiative (a top-down approach) and intrapreneurship, which is a proactive individual employees initiative (a bottom-up approach).

Also public agencies have realised the actual fundamental concepts of “change” and “innovation”. The European Commission (2006, p.20) defines entrepreneurship as “a dynamic and social process where individuals, alone or in collaboration, identify opportunities for innovation and act upon these by transforming ideas into practical and targeted activities, whether in a social, cultural or economic context.” Recently, Bacigalupo et al. (2016) go in depth for defining entrepreneurship as when one acts upon ideas and opportunities and get value out of them for others. The created value can be social, financial or cultural. The previous two cited documents, European Commission, 2006 and Bacigalupo et al., 2016 are dedicated to educating entrepreneurship). Also, the second mentioned suggests something exceptional in the field; the “Entrepreneurship Competence Framework” which defines entrepreneurship as centering the creation of value in all sectors, public, private, combination of the previous, or others. In order to be in line with latest developments in entrepreneurship field, a broader meaning is adopted and entrepreneurship is defined as “[...] changes in existing practices and processes, or the establishment of new activities that lead to changes in the economy and society” (Kuura et al., 2014, p. 216)”. Noting that this definition also fits innovation.

In order to discuss entrepreneurship, one should go back to when entrepreneurship research originated, to be more specific to Joseph Schumpeter. In his economic development analysis, Schumpeter (1947) supposed that economies develop as participants who act in the economy reacted to events and changes in their environment. These reactions could either be “creative” or “adaptive”. Reacting in “adaptive” way meant that the participant altered some of his operations aspects while all fundamental practices continued as they were, in other words, a reaction which was built on current practices and guaranteed their continuity. On the other hand, reacting in a “creative” way meant that the participant generated a completely new way of operations and altered all the current practices in a way that indicated long-term effects. Thus the creative reaction suggested a radical break with all guaranteed assumptions, a break which ex post would be identified as a significant step for the development.

In addition, Schumpeter specified the sort of role that the entrepreneurial agent perform. The entrepreneur could be able to fund his own venture but it was not essential for being considered as “entrepreneurial”. Similarly, the entrepreneur was the person who transformed an idea into a product that is viable commercially, but it was not obligatory that he was the one who generated the idea. To sum up, the participant who acted upon a situation with “creative” responses that continued for long and successfully introduced them to the market, was regarded as a fulfilment for an “entrepreneurial function” in the economy.

1.1.1 Entrepreneurial Acts

From the previous characterization, entrepreneurial acts occur in all the society sectors. Considering his economics background, it was reasonable that Schumpeter studied entrepreneurship regarding economic returns, sales and markets, but also it is reasonable to study entrepreneurship in terms of other fields in the society than business life on their own presumption. In addition, in the majority of the fields of society, although entrepreneurship does not work under the conditions of the economy of a free market, it has economic consequences. Entrepreneurial acts might take place inside an existing organisation, in universities , in voluntary associations, in authorities and in subgroups of society. Entrepreneurial acts may even take place in an individual’s private life. (Lindgren and Packendorff, 2003)

Thus, it should be quite understandable that start ups is only one kind of “creative” reactions. Plenty of the novelties that are introduced to the market initiated and evolved within existing organizations as projects, usually (not always though) they share all the entrepreneurial acts vital characteristics (Kanter, 1992, Zahra et al, 1999, Kidder 2000). After the entrepreneur act has ended, that is when the innovation or novelty has arrived to its market, the project has come to an end and its outcome is handed over to the perpetual organization for more exploitation (Ekstedt et al, 1999). The outcome of a project continues on while the project itself comes to an end and the team members separate. In reality, this happens a lot where firms that has been created newly are concerned (March, 1995, Wright et al, 1997b). With the same way of thinking this can be perceived as an outcome of long term development towards the Society’s “temporisation”.

Looking for projects that are entrepreneurial other than start ups means significantly broadening the empirical basis for the theory of entrepreneurship. Furthermore, not only the acts that are formally named “projects” are that of interest but also entrepreneurial acts in temporary sequence of action form. In addition to broadening the entrepreneurship research empirical basis by recognising more acts as entrepreneurial, it also means that more people are classified as entrepreneurs.

Entrepreneurial acts were viewed as non-permanent in the sense of that they are sequences of temporary actions. When the entrepreneurial act, the project, come to an end, life continues on to something else, maybe a new entrepreneurial act but there could be years of routine, repetitive work. (Lindgren and Packendorff, 2003)

1.1.2 Start ups

Start ups are defined as innovative, new and active business formation (Kollmann et al., 2016; Luger & Koo, 2005, p. 17)

The start up pre formation phase copes with transforming a business idea to a business model and includes planning activities and exploiting resources. The following phase is market launching which is when the idea commercialisation starts then it converts to the growth phase, while the phases boundaries are blurry (Macheridis, 2009).

The learning process may be split up into four stages according to the development process of the customer (Blank S., 2005): problem definition or observation, problem evaluation, solution identification and solution evaluation. It is important to emphasize that the stages of learning are not linear. Start ups are required to go through multiple loops of building, measuring, learning in order to be able to find the sustainable business models.

On the contrary, simultaneously the start up works on the process of product development (8 Blank, S., 2005), which can be further split up into the following: concept, in development, prototype, functioning product with limited users, high growth functioning product and mature product. Learning process is involved with customer oriented activities mainly taking place outside the building, while product development focuses on the product oriented activities that occur internally. As contended by Blank (Blank, S., 2005), in order for the start up to reach success, the two processes must be synchronised all the time.

Life cycle of start up

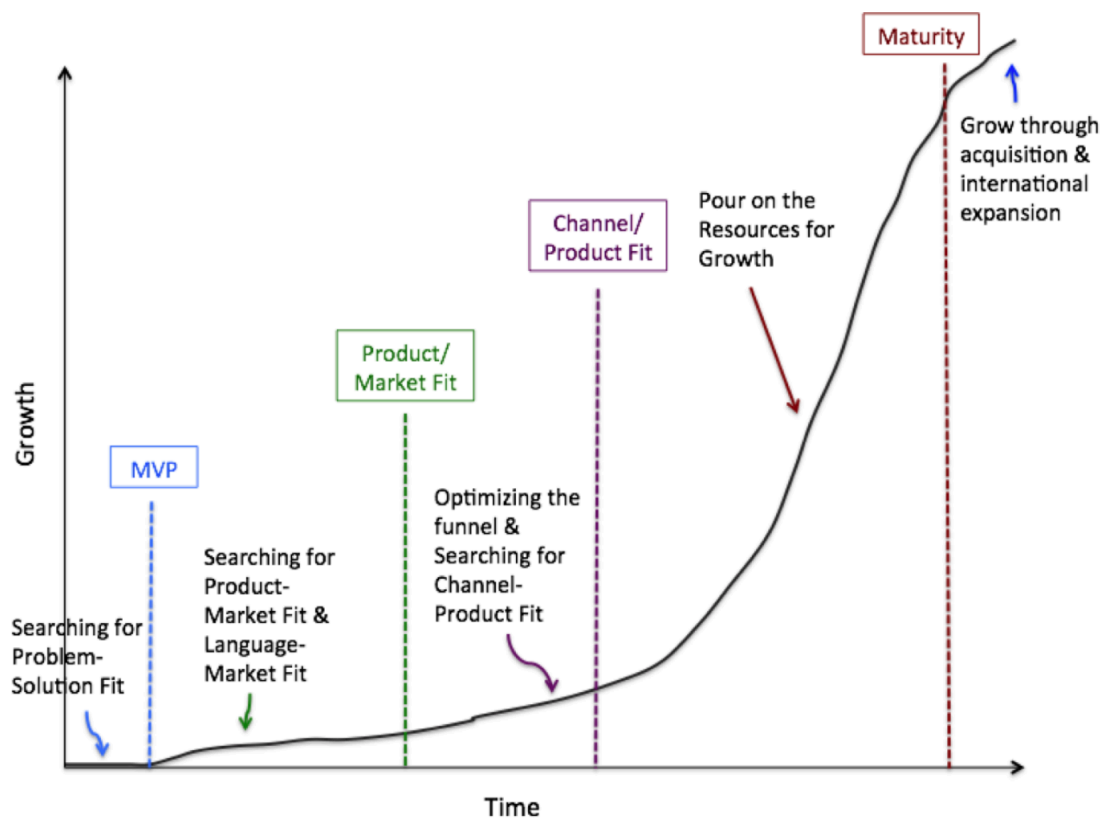


Figure 1 shows the phases of the startup growth lifecycle

Phase 1) Finding a Fit for Problem/Solution

Having an idea for a product or service that helps solving a problem in an effective way and that is when you have a problem/solution fit and hypothesis.

Phase 2) Building Minimum Viable Product

The objective of this phase is to test the hypothesis for the product with the least possible investment of capital and time, thus, minimum viable product. During this phase, a proof of demand and customer behaviour learning while keeping risks at minimum. Once the minimum viable product is out, the following step is to get customers flowing into the product.

Phase 3) Working For fit for Product-Market

Minimum viable product has gained traction, the entrepreneur is learning and iterating, he has customer who are paying, they purchase again and maintain the product usage on frequent basis, maybe they are expanding the market by telling other people. These are revealing indications of product/market fit.

Phase 4) Scale

This is the phase where actions start to be taken towards growth phase. At this stage, a key to effective execution is to broaden the growth team by recruiting specialists that have in depth expertise in the main channels of the start up. At some point, some of the channels will start to reach saturation, thus it is critical for sustainable growth.

Phase 5) Maturity

The rate of growth may decelerate as the start up matures, but it does not stop ever. It is in the DNA and culture. Top companies like facebook still invest in their growth teams, and also they start looking towards localisation and internationalisation as the following growth frontier.

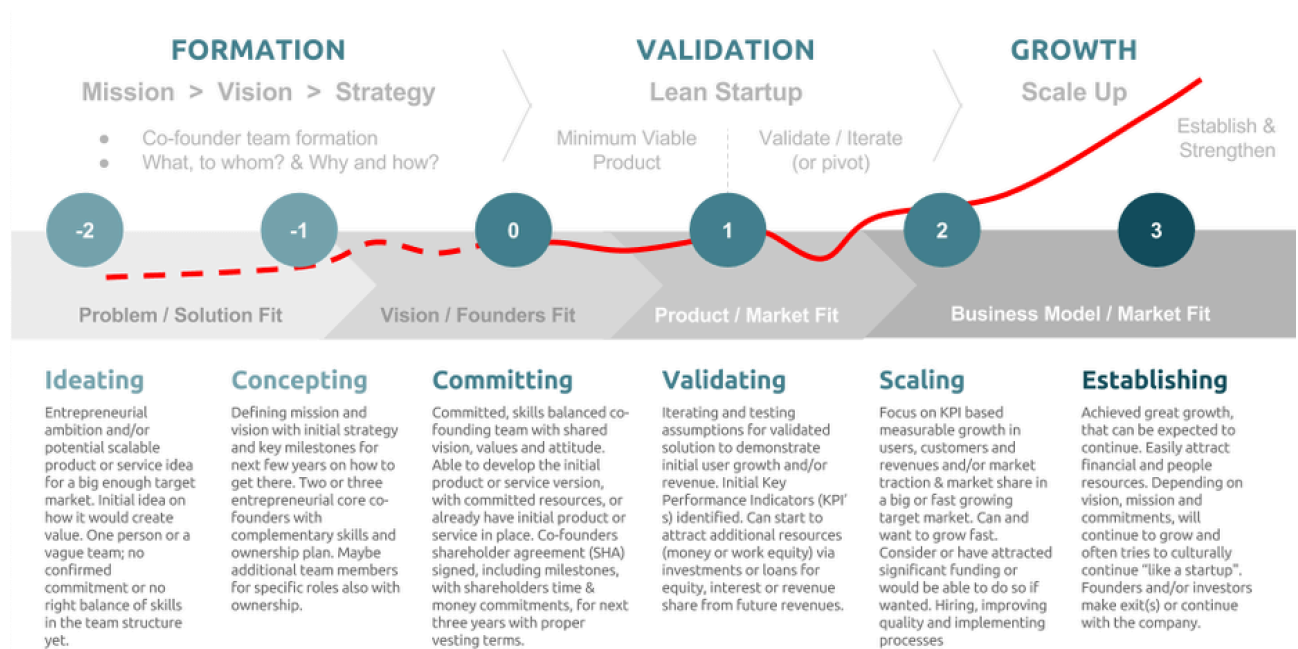


Figure 2 shows the different stages of a startup

1.2 Project management

Project management is basically applying techniques, skills, knowledge and tools to activities of a project in order to meet the requirements of the project.

1.2.1 Traditional project management practices

Project management fulfilled by the suitable application and combination of the process groups of project management. The process groups involves initiating, planning, executing, monitoring and controlling, and closing.

The Project manager together with the team of the project is in charge of achieving the objectives of the project. Managing a project involves determining requirements, adjusting the approach, plans and specifications to fit the different expectations and concerns of different stakeholders and adjusting the demand to fit the scope, cost, time and quality. The connection between these factor is that if one factor is changed, it will affect at least one of the other factors.

Processes of project management are iterative due to the developing elaboration that takes place during the life cycle of a project. Developing elaboration includes repeatedly detailing and enhancing a plan as more precise estimates and more particular information become

available. It also lets the team of project management to manage to a significant detail level as the project develops.

Portfolio Management

A portfolio means a group of programs or projects and other work that is collected together to make effective management easier. The portfolio's projects might not automatically be directly related or interdependent. Portfolio management is about the concentrated management of one or more portfolios and involves identification, prioritisation, authorisation, managing and controlling programs, projects and other relevant work. Portfolio managements concentrates on affirming that programs and projects are reviewed in order to have resource allocation prioritisation, and that portfolio management is harmonised with and put in line to organisational strategies.

Project Management Office

A Project management office is an organisational entity of body that is in charge for coordinated and centralised management of portfolios, programs and projects under its domain. The projects administrated or supported by the PMO might not be connected in any way other than the fact that they are managed together. The particular structure, function and form of a project management office depends on the requirements of the organization that it supports. A project management office might be a representative authority to behave as one of the main decision maker and an integral stakeholder while each phase of the project is initiated, in order to give advices or to bring projects to end to keep consistent the business objectives. Moreover, the PMO may be a part of the management, selection and redeployment of dedicated or shared resources of a project.

Some of the PMO key features involve:

- Shared resources management between all the projects controlled by the PMO,
- Development and management of project procedures, policies, templates, and other shared documentation,
- Identification and development of project management standards, best practices and methodology and,

- Communication coordination between projects

PMOs and Project Managers

PMOs and project managers conduct distinct objectives and work by distinct requirements.

These efforts are in line with the organisation's strategic requirements. Roles of PMOs and project managers difference involve the following:

- The project manager concentrates on the objectives of a certain project, on the other hand, the PMO manages major changes in the scope of program and may perceive them as possible chances to better fulfil the objectives of a business.
- the PMO makes the best use of shared organizational resources between all projects, on the other hand, the project manager manages the allocated resources of the project to best meet project objectives
- the PMO controls the whole opportunity, whole risk, and interdependencies between projects at the level of the enterprise, on the other hand, the project manager controls the schedule, cost, quality, and scope of the work packages products.

1.2.2 Agile Project management

Projects that are of high-uncertainty have high rates of risk, complexity and change. These features cause problems to arise for the conventional predictive approaches that are intended to determine requirements bulk in advance and control changes by a process of change request. Instead, agile approaches designed in order to examine feasibility in short cycles and to adapt quickly according to the evaluation and feedback.

The agile life cycle is an approach that is both incremental and iterative in order to get refined work items and frequent deliveries. Incremental means an approach that generates deliverable that are ready to be used by customers immediately, while iterative is an approach that receives feedback on unfinished work so that it is modified and improves to satisfy the customers' requirements. The team receives feedback early and provides customer confidence, visibility and control of the product. Due to the fact that the team

releases earlier, the project can give an earlier return on investment since the highest value work is delivered by the team.

Agile and Lean thinking

Agile can be thought of as lean thinking descendant. The inherited characteristics focus on waste minimisation, continuous improvement, being adaptable to change, value delivery, being transparent, and respect for people.

2. Literature Review

2.1 Project research

From the very beginning, research on project management was defined by focusing on a sole project that was considered the unit of analysis. It was also seen as a researchable and manageable item which has an intrinsic mechanisms that had to be discussed and elaborated in pursuit of the success of a project (Packendorff, 1995). Practical developments have spread which led to projects dominating the process of organiseng in many firms. Finally, project management research included managing projects in bundles, for example, project portfolios, programs and project management offices, and processes at which granting of projects and programs occured, primacy as organisational forms increased (Maylor et al., 2006). This development was acknowledged by rephrasing “project management research” to “project research” as Söderlund (2004) suggested. It was also in order to broaden the interest area beyond single organizations by the analysis of organising inter-firm projects (Braun, Müller-Zeitz & Sydow, 2012) and by having developments and patterns at both societal and sectorial levels (Lundin & Söderholm, 1998).

For a long time, projects work was perceived as an insignificant method in organisations, it was also put up and seen as an opposite to the on-going operations that were dominating the field (Lundin & Söderholm, 1995; Ekstedt et al., 1999; Cicmil et al., 2009). A well-established firm practical knowledge in the field, which provides project managers with the methodologies and tools to achieve project success, was as a result of the increased utilization of projects and project management in nearly all societal sectors. Originally, the discipline started by planning and controlling which were supported by visual imagery such as network diagrams and gantt charts. Starting the 1970s, a gradual involvement of another various aspects where included, for instance risk management, stakeholder management and team leadership. Creating international project management certificates was also a

crucial step that led to establishing project management in the business society (Hodgson & Cicmil, 2007). Project management also includes ongoing developments in portfolio management for projects and project management offices, and thus broadening the scope to include organisational levels rather than just single project. (Packendorff and Lindgren, 2013)

Project research as a result was initiated in order to comprehend the characteristics of this non-typical way of organizing, treating as projects, temporary organisations, adhocracies or a post-bureaucratic organising instance (Clegg & Courpasson, 2004; Hodgson, 2004; Lindgren & Packendorff, 2006a). The research field was opened due to the increasing need of controlling unusual situations in manner that is structured, and the notion of being unusual is still provocative for research (Hällgren & Wilson, 2011). The practical and theoretical developments were usually similar and project research increasingly embraced theoretical concepts and basis from engineering research and general management that helps improves comprehension of projects and project management (Packendorff, 2014).

The current debates on theoretical perspectives and influences within project research are essential for developments in the future because all disciplines that are well established have ways to avoid stagnation, however, they also face the risk of becoming victims of the same thing. Project research have been expanding in a mature way regarding developments beyond available concepts and theories. It is a growing literature questioning the relevancy and effect of perspectives that are becoming dominant (Packendorff, 1995, Cicmil et al., 2006; Blomquist & Lundin, 2010), root metaphors (Packendorff, 1995), clearly debating, for example, theoretical foundations (Söderlund, 2004, 2011), axiological assumptions (Cicmil & Hodgson, 2006), field limitations (Hallin & Karrbom Gustavsson, 2010), epistemological/ontologicalorientations (Winter, Smith, Morris & Cicmil, 2006; Blomquist & Lundin, 2010; Sergi, 2012), or how the research problems and questions are identified (Hällgren, 2012). Now project management is a dominant method of working in many industries and organizations, which also drew increased attention in the literature of general management (Söderlund, 2011). Researchers working on project management have now better chance to take part in developing general knowledge related to problems and practices of contemporary management (Jacobsson & Söderholm, 2011; Packendorff, 2014).

As project research develops gradually into a separate field on its own, distinguished by guaranteed notions on the way the projects should be theorised and studied, project researchers will certainly have to carry out research in a legitimate way. In another words, to yield to labelling projects without further difficulties, to overstate resemblance between projects while subduing the dissimilarities, and to make extant bodies of knowledge more knowledgable without doubting the *raison d'être* of these bodies, thus being involved in the promotion and sustainability of a specific view of knowledge, reality and difference between good and bad. Also, it would imply that projects that are to be studied are requested in the common industries, between the typical professionals and through the organised channels (Hallin & Karrbom Gustavsson, 2010).

The other option is to support the ambiguity and fluidity of the project concept, perceiving project work like a currently existing social construction in society, of which the communities are all co- constructors, as an institutionalisation and change process, of emancipation and power (Sergi, 2012). However, that does suggest that it is a must that research is based upon explicit assumptions about epistemology, axiology and ontology, rather than sliding into the ease of allowing editors from project management journal assess what is publishable. Concentrating on basic assumptions will improve the project research development and its connection to general management scholars; and will suggest an altered perspective of the way the project management knowledge is made relevant and accessible by practitioners. Knowledge of project management is usually shown to the public as a toolbox, normally compliant and ready for use (Packendorff, 1995), thus conveying an reflection of project management practitioners in serious need of clearness, order and standardised procedures. Pellegrinelli (2010) noted that research should rather be a reflection and articulation... “...of their lived experiences –*what they often see and tend to do*. [...] Managing is often less about planning, directing and controlling and more about *coping*. The absence of clarity and certainty is not an impediment to action, but a call for it – to ‘get on’. Social reality for them feels malleable and changing, amenable (at least to some degree) to their influence. Some practitioners have got over, or learnt to live with, the sea-sickness”.

Debating that a growing focus on the projectification processes in the broad sense would be useful to project research, it will include (1) exploration of the established narrow viewing of the concept; (2) identification thought streams in the emerging projectification

broad view; and (3) providing a demonstration from the current research into the uses of going from a narrow to a broad conceptualisation (Packendorff and Lindgren, 2013).

2.2 Planning in Entrepreneurial Acts

Business planning value has been a controversial issue in literature during the past years. Different empirical samples were utilised in investigation whether planning is worth the time and effort for nascent entrepreneurs (Gruber et al., 2008); whether nascent entrepreneurs should “look before they leap” (Gruber et al., 2008) or “just do it” (Lange et al., 2007). Planning supporters consider the business plan an essential prerequisite for the new venture creation to be successful. In fact, it was the message directed by the mainstream entrepreneurship education during the past 10 years. This perspective’s determination is documented in the different editions of prominent textbooks (for example, Hisrich et al., 2006 or Timmons and Spinelli, 2007). On the other hand, critics doubt that writing a business plan for creation of new venture is a worthwhile activity (Bhidé, 1994, 2003; Honig and Karlsson, 2004, or Lange et al., 2007).

Chowlka A., Raith M. G. (2012) initiated their research by asking about the reason behind the necessity of having a business plan, they stated that business planning should have a measurable value. One could expect to see that enterprises that had a business plan would have better performance in market than the enterprises that did not have one. Based on that, most of the empirical studies on this topic take a comparative, ex-post view of the connection between planning and performance. However, specifically regarding this connection, there is a huge and surprising persistent disagreement among researchers (Chowlka A., Raith M. G., 2012).

Delmar and Shane (2003) show different streams where planning has a positive effect on the business venture (Armstrong, 1982; Castrogiovanni, 1996; Shane and Delmar, 2004; Gruber, 2007, and Kraus and Schwarz, 2007). On the other hand, Lange et al. (2007) pointed out arguments against planning, supporting the hypothesis that new ventures created with a written business plan do not outperform new ventures which did not have a written business plan. Karlsson and Honig (2009) came to a conclusion from this debate, which is that the empirical research on the connection between planning and performance has not yet been conclusive. However, Brinckmann et al. (2010) reach a finding in their empirical literature meta analysis that the results are in favour of planning to a slight extent.

Chowlka A., Raith M. G. (2012) support the latter opinion, even though the empirical research in literature has not ended the debate yet.

The empirical research regarding the connection between planning and performance is inconclusive is partly due to varying interpretations and terminology of business planning process (Chowlka A., Raith M. G., 2012). Chowlka A., Raith M. G. (2012) defined business plan as the result that an entrepreneur reaches after completing business planning process; therefore, they consider entrepreneurs who have a business plan as having been through a planning process. Completing a business plan usually coincides with deciding whether to enter the market or not (Liao and Gartner, 2006). However, business planning does not always result in a business plan; for example, when disbanding of the venture project occurs. Furthermore, business plan is not necessarily a written document, it could be in an entrepreneur's head (Chowlka A., Raith M. G., 2012).

Lately, the discussion has been diverted to what business planning is about. Honig (2004) proposed a planning approach that was based on contingency that allows the entrepreneur to go through diverse, often cyclical learning and planning patterns according to the selected activities of planning. Therefore, in order to understand where the measurable value was obtained, the planning process has to be studied and examined carefully. Gruber (2007) demonstrated empirically the significance of resolving the planning process, concluding that the relevance of planning is crucially dependent on the planning activities type and on the founding environment. Measurable ex-post impact of business planning appear to be connected to planning and learning dynamic interaction (Brinckmann et al., 2010). The decisions' quality in an environment of planning and learning should be dependent on the previous knowledge and experience of the entrepreneur, who is the decision maker in this case. Indeed, this has been validated for the opportunities' discovery (Shane, 2000) and the exploitation (Dencker et al., 2009), measurements are based on ex-post market performance.

The learning relevancy for the planning value brings into light the evaluation significance and decision making, due to the fact contingencies have a significant impact only if they have an effect on the decisions of the entrepreneur regarding the following steps. In order to have the ability to assess this value, one must recognise the different alternatives, those which are not opted included. As Gruber et al. (2008) found, entrepreneurs who have the ability to choose from different available business opportunities are more likely to fare

better regarding the ex-post performance in market than those who had only one option. It is essential to point out that this observation indirectly validates rational choice behaviour, due to the fact that different opportunities can improve performance systematically only if the entrepreneur has the ability to differentiate between the options and opt the best opportunity. Analogously, Dencker et al. (2009) conclude that startups which have a changing product line are more likely to survive. Another underlying assumption is that these start ups can identify and then opt for the better product line. In general, Mullins and Komisar (2009) also assume rational decision making when they claim that entrepreneurs in the process of planning usually benefit from switching to a new plan “B”, and as a result improving on a certain strategy path. As McGrath and MacMillan (2000, p. 338) explicitly say, “The things you elect not to do are as much a part of your entrepreneurial mindset as the things you elect to do.” Based on these opinions, the entrepreneurial mindset requires rational decision making.

2.3 Projectification in Project Research

Projectification, according to literature on project research, is basically defined as the development and maturing of using projects in order to handle extraordinary tasks and renewing creatively in the contemporary organizations. (Midler, 1995; Ekstedt, Lundin, Söderholm & Wirdeus, 1999; Bredin & Söderlund, 2006; Maylor et al., 2006; Kerr, 2008; Arvidsson, 2009; Ekstedt, 2009; Blomquist & Lundin, 2010; Aubry & Lenfle, 2012; Bergman, Gunnarson & Räisänen, 2013).

After Midler, 1995; Maylor, Brady, CookeDavies and Hodgson, 2006 focused on the concept of projectification, Packendorff and Lingren (2013), wanted the concept to be seen further than just a management trend and a structural path in the restructuring of corporate; they thought it should also be seen as a phenomenon that has many aspects and should be studied on its own.

The projectification concept has become a trend when projects became a common method of organising work in all the economy fields during the past decades. It is probably seen the most in the conversion of traditional organisations into “project-based organisations”.

Most “traditional” organisations suffer from the bureaucratic classical problems which are avoided in a controllable way by projects, which are viewed as a time limited and goal oriented method of working and that is the basic reason behind the spreading the project based organisations or the spreading of projectification in general (Packendorff, 1995; Hodgson, 2004; Cicmil, Hodgson, Lindgren & Packendorff, 2009). Projects are perceived as a promising method of both adventure and controllability (Sahlin-Andersson, 2002) and are a must when out of the ordinary and complex tasks have to be managed (Cicmil et al., 2009). Work that is project based is a part of the trend of the recent “post-bureaucratic” organisational forms which have set foot into most of the industries during the past decades (Clegg & Courpasson, 2004; Gill, 2002; Hodgson, 2004; Lindgren & Packendorff, 2006a; Söderlund, 2011).

Existing research shows us where the projectification processes are becoming widely relevant for the comprehension of nearly any a facet of the current economy. However, most of the project research is empirically limited to entitative and reified notions of “programs” or “projects”, without showing the processes where the construction, development and institutionalisation of these phenomena were done. (Packendorff and Lingren, 2013)

Regarding what concerns projectification, the nature of structural and rational approaches taken from traditional project research shows clear limitations to the research questions which could be stated, the methodologies which could be employed, the theoretical views which are seen relevant and the possible analysis and conclusions. The “Narrowness” notion, from projectification point of view which tends to be dominant in project research, grows from such limitations. There are questions, consequences and implicitons of projectification that are suppressed and left unanswered due to the fact that projectification

research was limited to organisational restructurings only. The other alternative is the broad view of projectification, which suggests a wider approach to all the issues. The main

Table 1 shows the narrow and broad conceptualisations of projectification in project research

	Narrow view of projectification	Broad view of projectification
Notion of projects	Organisational units characterised by temporariness, uniqueness, goal-focus and complexity.	Projects as labels, cultural symbols and discursive notions
Notion of projectification	Processes of organisational re-structuring initiatives taken in order increase the primacy of projects within a firm and its immediate supply network	Processes of invoking projects as habitual, legitimate and performative responses
Main theoretical perspectives	Structural organisation theory, contingency theory, strategic management, human resource management	Sociology, symbolic interactionism, discourse analysis, critical management theory
Main research interests	<ul style="list-style-type: none"> • Organisational restructurings towards project-based forms • Drivers of organisational projectification • Consequences of projectification in terms of efficiency, innovation, customer orientation, professionalism and new patterns of work 	<ul style="list-style-type: none"> • Projects and project management as ideal and normal in organisations, societal life and private life • Consequences of projectification for individuals, groups, organisations and societies. • Dominating and suppressed aspects of projects and project management.

differences are shown in table 1. (Packendorff and Lingren, 2013)

The difference between narrow and broad views is not just in defining projectification (formal restructuring vs cultural destruction), there is also the difference in consequences. The purpose of narrow view is to identify how to build the projectified structures and the effects on the prosperity and organizational effectiveness, also the broad view involves consequences for groups and societies as well as individuals. (Packendorff and Lingren, 2013)

2.3.1 Broad and Narrow Conceptualisations of Projectification

Regarding the narrow view of projectification, which is referred to as “organizational projectification” by Taylor et al. (2006), research mainly focuses on the contents and effects of initiatives of organisational restructuring taken so that there would be an increase in the importance of projects in a firm and its instant network of supply.

The narrow view of projectification is usually founded on the basis of structural and instrumental notion of the form of the project as an organisational method to conclude specific types of tasks. This view is similar to theory of classic organization, in which handling non-routine and complex tasks was needed during the peak of the contingency theory. There were some theoretical treatments, for example, single single unit production

tasks identification (Woodward, 1958), the ad hoc form of organisation needed for extraordinary, innovative work (Mintzberg, 1979) and the concept of temporary organisational settings like task oriented and rational exceptions from normal organisational life (Miller & Rice, 1967). These reasoning lines had further extensions in various ways including the suggestion made by Heckscher and Donnellon's (1994) for post-bureaucratic methods of organising work by dividing them to tasks not by dividing them according to the departments, the study by Goodman (1981) on temporary systems as fast growing way of organising work and the idea by Ciborra (1996) which included the thought that the analysis of innovative organisations should be as platforms allowing several organisational forms, experiments and improvisations seeking creativity and innovation.

Further analysis of projects and project management in organisation has been carried out in writing in order to highlight the contribution of project form to the success of the organisation, the combination of project form with other organisational configurations and the managerial challenges that that happen during the processs of on going operations projectification (Söderlund & Bredin, 2011). This is usually achieved by referring to the project based organisation notion as a different organizational form, an answer to some managerial and strategic problems, and the end condition of organizational restructuring series. (Hobday, 2000; Söderlund & Tell, 2009).

Referring to Davies et al. (2006), Maylor et al. thus trace projectification back to the insight that: organisations in all kinds of industries are finding that common organisational structures, including practical departments, business units and divisions set up for managing high-volume throughputs of standardised products and services and for creating choices in an exceedingly comparatively stable technological and market setting, are no longer adequate. In the rapidly ever-changing and progressively turbulent and unsure environment they face nowadays, organisations are finding that some type of project organisation is best suited to the sort of occurrence or temporary issues that they need to deal with" (Maylor et al., 2006)

In contemporary literatures, the increasing utilisation of the project-based view in an organisation takes various shapes and is made reasonable with reference to both intended benefits and historical developments. While such individual projects, a unique, temporary,

complex and goal-oriented undertaking (Packendorff, 1995), appears to instead be a standardised subject, there is a range of possible techniques of including it into a current organisation. The different available matrix arrangements are a repeated theme in the literature (Larson & Gobeli, 1987; Davies et al., 2006; Maylor et al., 2006; Arvidsson, 2009), in addition to the different solutions to the problem of combining multi-project based operations with interrelated portfolios using standardised project management methods and offices (De Maio, Verganti & Corso, 1994; Engwall & Jerbrant, 2003; Blomquist & Müller, 2006; Aubry et al., 2007). The form of project-based organisation consequently centres on the single separate project as the section in which innovation and production occur, in a setting distinguished by systems/product complexity, batch- oriented production, cross-functional cooperation, team-based work and horizontal communication (Söderlund & Tell, 2009; Söderlund & Bredin, 2011).

A small number of studies have explicitly emphasised on projectification processes over time. Midler (1995) and Söderlund & Tell (2009) description of projectification is as restructurings series where conventional functional structures are transformed gradually into heavyweight project forms and projects get more autonomous and customer-oriented. Regarding these cases, the driving forces are external market demands, suggesting increasing customisation and integration of technology, combined with internal aspirations to make decision-making and organisational communication easier and to empower project teams. In addition, Maylor et al. (2006), suggest that these restructurings indicate an increase in the projects number, an increase in dependence on codified bodies of project management knowledge (for example, in- house standardised frameworks and stage-gate models), an increase in emphasis on the performance of a project when assessing the effectiveness of the organisationa, and an increase in the widespread usage of project management offices and similar functional devices connected to project- based operations.

Some of the research is also interested with the projectification consequences. Maylor et al. (2006), Turner, Huemann & Keegan, (2008) and Söderlund & Bredin (2011) shed light to negative potential consequences in both individual and organisational levels, for example, the re-bureaucratisation risk, abandon the need of integrating projects into portfolios or programs, massive deadline stress, insufficient time for knowledge development, and lack of social continuity and trust. Jerbrant (2014) stresses on the point that projectification is certainly guided by recognised consequences, in other words that

every following restructuring resolves some problems however, it also generates new ones, as a result, presenting projectification also as an emerging uncertainties series that should be handled.

The projectification's narrow conceptualisation views massive efforts for the identification of the basic structural tenets of organisations that exhibit a project-based forms and the conditions related to the step by step restructuring of previous functional organisations. Also, the literature explains a well-developed comprehension of the link between technological change, developments of markets and the facets of organisations which are affected and changed during the projectification processes. Some research also considered individual perspectives, departing from the effectiveness of the organisation as well as the wellbeing of the individual as central to the comprehension of outcomes and consequences. The fundamental flaw of the narrow view, i.e. analysing projectification as a straightforward and rational process instead of as a development characterised by aspects such as cultural norms and constructs, bounded rationality, power and politics is, however, not alleviated. (Packendorff and Lindgren 2013).

In addition, projectification has also been defined in a broader view, it concerns the individual project work experience (Packendorff, 2002; Lindgren & Packendorff, 2006a; Hodgson, Paton & Cicmil, 2011; Lindgren, Packendorff & Sergi, 2014) and analysis of projects as a discursive main theme in the current society (Lindgren, Packendorff & Wåhlin, 2001; Chiapello & Fairclough, 2002; Cicmil et al., 2009; Kuura, 2011).

The projectification broad view includes the cultural and discursive societal processes where projects and project-like conditions are institutionalised in lives of individuals, the organising of all types of work, and society overall. Dissimilar to Maylor et al. (2006) definition of 'societal projectification', this broad view is not a small addition to the study of the project-based structures implementation beyond organisations and their instantaneous networks of supply chain, however, instead an altered theoretical view where formal structural units are perceived as institutionalised social constructions and not as firmly established entities. It is a conceptualisation that presents sociological comprehension of a progressive episodic orientation in contemporary society (Bennis & Slater, 1968; Sennett, 1998), project-oriented widespread justification modes (Chiapello & Fairclough, 2002), and the likelihood to view all types of individual and societal processes as transitory and temporary by nature.

Chiapello & Fairclough (2002) were discussing the political and cultural modes of comprehension and giving grounds for reality referring to the mankind history, when they claimed that a new 'justificatory regime' is making an appearance in contemporary society – the project-oriented *cit  *. Comparing with the six historical *cit  s* - that were based on, e.g., market mechanisms, industrial logics, bourgeois civil society values or religious beliefs– the justificatory regime of project-oriented gives priority to activity, initiation of project and social networks as basic principles of societal activity. The prosperous and successful individual is a flexible, adaptive and connective team player, able to handle multiple cultural traditions and generate enthusiasm, always prioritising employability, availability and new projects over social solidity and lifelong plans (Bennis & Slater, 1968; Lindgren et al., 2001).

Life is thought of as a series of projects, the more significant the difference between them is, the higher their value is. It is relevant to be always pursuing some kind of activity, never to be without an idea or a project, to always be seeking, and arranging for, something together with other people, who are gathered by the push for activity. When initiating a new project, all the team are aware of its temporariness. The outlook of a desirable and unavoidable end is set up in the involvement nature, without curtailing the participants' enthusiasm. Projects are accommodated to networking as a result of their transitory forms: the projects succession, by increasing connections and the growing number of ties, results in networks expansion. (Chiapello & Fairclough, 2002).

Beyond the projects notion as a basic facet of contemporary societal life, projectification is as well discursively connected to the dominating and strong project management notion as a codified knowledge standardised field (Hodgson & Cicmil, 2007). By calling something a 'project', a number of expansive forecasts on the work process are obtained from the project management well-established discipline into the local situation by project participants (Pellegrinelli, 2010; Lindgren et al., 2014). Usually projects are expected to be planned, controlled, they require dedication, commitment, passion, task-focussed social relations and flexible action (Nocker, 2009), as strictly harmonised and confined activity systems (Bechky, 2006). Also, they are built as extraordinary work episodes like temporary 'states of emergency' where urgency and danger occur and daily rules and norms do not apply (Lindgren & Packendorff, 2006; Lindahl, 2007). Thus, as exceptional settings in which individuals give in to nearly any type of conditions due to the fact that it is passing

moment only. Also, the projects labelling is closely connected to reification (Cicmil et al., 2006). Usually a project is categorized by its team members into a distinct and independent object that is manageable and controllable if suitable methodologies are utilised. The intrinsic performativity of the concept of the project (Pellegrinelli, 2010; Sage, Dainty & Brookes, 2013), with its rationality emphasis and controlled passion can, as a result, be predicted to be a significant aspect of comprehending projectification.

To sum up, the projectification broad view involves the emphasis on organisational restructuring in the narrow view, and expand the projectification notion into individual and societal life and employs cultural, critical and sociological theoretical perspectives in the processes analysis and the outcomes of this. It suggests that the spreading of projects and processes of project management in organisations is analysed from the point of view of rational structural responses to technological and competitive alters, as well as being set in a discursive and cultural context where projects and project management notions are central to societal development in general. (Packendorff and Lindgren 2013).

2.3.2 Broad and Narrow Conceptualisations of Startups Projectification

As a result of examining planning role in the development of startups, links in the literature developed between start ups and projects (Lindgren and Packendorff, 2003). Basically, there are two different methods, which exist simultaneously, that consider consider different levels of the formation of a startup.

The first approach studies the start up as a whole as one project (the external project based view). The project starts by the planning during the pre formation stage, maintained with the business plan implementation and the post project phase which involves sustainability of the operations of the business (Kuura et al., 2014). The justification of the project based view is based on the emphasis done by Lindgren and Packendorff on the start ups' temporary character. Even though various researchers do not agree on the temporality because the purpose of the start up is to be well established on the market, Lindgren and Packendorff emphasise on the point of entrepreneurial acts being temporary as they are just temporary sequence of actions, they give the example of start ups specifically being temporary in the sense that the exploration phase is going to fade away after some time, giving space to standardised repetition where the new thoughts and ideas are made use of

in daily operations. As a result, they consider a different way of the external project based view, which is still the broad approach, that is the project includes the launching and the growth phases of the start ups till they are well developed on the market, not its whole life cycle (Ajam, 2011; Kiznyte et al., 2016; Kuura et al., 2014).

The second approach, the narrower one, studies the lower level, the micro perspective (internal project based view). This approach subdivides the strategy into smaller projects and thus applies the approach of multi-project. To sum up, it can be said that a start up can be considered a project that can be subdivided into multiple projects. This can also be justified according to Lindgren and Packendorff (2003), who described an entrepreneurial act, including start up formation, as a “collective” experiences that they called projects.

2.4 Links between Project Management and Entrepreneurship; namely Startups

2.4.1 Existing links:

1. Innovation

Lindgren and Packendorff (2002) imposed that projects are meant to make a change to the original environment, therefore they are innovative and can be thought of as “entrepreneurial acts”, however, when the project is over, the result diffuses into permanent context so that it can be exploited further.

Lindgren and Packendorff (2003) explained project based view of entrepreneurship in general, including start-up creation. They summarised it in three words; action-orientation seriality and collectivity. Action orientation was about defining different entrepreneurial acts and that entrepreneurship is not just enterprise start ups. Seriality is an important aspect in the project based view of entrepreneurship, it is basically that during a lifetime, people can create many entrepreneurial acts and perform them in different ways and obtain different results; in other words, that an entrepreneurial act is a project among many other projects that an entrepreneur could do.

Regarding innovation, which could be one keyword regarding the projects-entrepreneurship link, there are some branches. For example, Midler and Silberzahn (2008)

investigated the role of project management in managing the development of high-tech start-ups through two European case studies. In particular, they discussed entrepreneurship common opposition of effectuation vs. planning and linked it to multi project management. They discussed 3 approaches from project management; 1. Project Portfolio approach, 2. Platform approach and 3. Lineage approach (which is basically agile). They showed the role of projects in the process of start-up, which is a genuine entrepreneurial act, as Burgers, Bosch, and van den Volberda (2008) assured that there's a role for projects in corporate entrepreneurship. On the empirical side, Midler and Silberzahn (2008) studied two start up cases empirically and found out that they both learnt from project to project, they characterised their paths, their processes of learning and linked to approaches of multi-project management. One of the start ups was found to follow lineage approach where they maintained exploration and exploitation simultaneously and even if it didn't reach the promising success immediately, it converged towards it with reduced iteration cost and increasing success probability. Ferriani, Cattani, and Baden-Fuller (2009) declared that in enterprises that are project-based, new projects development goes through a typical process of identifying an opportunity and forming a team, which are essential process for every entrepreneurial effort. In these branches in particular, the trend of “borrowing” concepts and approaches for a field and adapting it to another field is becoming more common.

The ‘projects—innovation—entrepreneurship’ induce a promising link concept called ‘entrepreneurial project’, which was developed by various researchers.

Even though some concepts have the tendency to be independent, in the sense of not clearly linking the project and entrepreneurship literatures, this doesn't mean the elimination of potential links. For instance, Casson and Wadeson (2007), imposed that the concepts of “project” and “opportunity” are closely connected. They said that “opportunity” definition was an unexploited project and that definition of “discovery” was identifying an opportunity through scanning the set of potential projects.

2. Network and Collectivity

Semolic and Kovac (2008) pointed out that inter corporate networks formation can utilise project management approaches/methods and that the project form, regarding management, is more efficient than functional approached and the classical management methods. Ferriani et al. (2009) had the concept of “project-entrepreneurs” developed, their performance is dependent on their centrality in the social network and how familiar they

are with the chosen project team; which is basically one of the aspects that agile project management covers. (Lindgren & Packendorff, 2003) discussed collectivity saying that entrepreneurial acts are not acts done by a sole actor but are acts done in temporary densities in network of actors; he defined these densities as projects. They mentioned that one innovative idea is a collection of ideas made by various actors.

3. Development

DeFillippi and Spring (2004) connected project management and entrepreneurship through competencies and explicitly showed four 'project entrepreneurial competencies' (visioning, resourcing, organising and sustaining) and explored the potential career paths of 'project entrepreneurs'. In addition, Burgers et al. (2008) investigated the success/failure of developing projects of new business against the newness of knowledge of market and technology within the firm, especially regarding the organizational competences rather than the individual ones. Meanwhile, they identified that projects are ways of developing a business.

Macheridis (2009) claimed that agile project management is a suitable method of managing entrepreneurial projects, since it helps in structuring the entrepreneurial projects and guiding the entrepreneurs to success.

In Ajam (2011) advisory paper, he clearly explained "the missing link" between business startup and project management. Based on the proposition of starting a business is a project, he claims that project management has a place in this process. Even though, there are useful existing techniques for business planning, which focuses on market, finance and operation), they are not sufficient. The entrepreneur has to give a closer look to project management, including setting targets for cost, realistic time and having a developed understanding of project and enterprise risks. An entrepreneur becomes a project management when starting to execute the business plan; he need to look closely at two aspects; the project (starting from the idea until operations are started) and post-project phase which involves the operations and sustaining the business.

Even though some concepts have the tendency to be independent, in the sense of not clearly linking the project and entrepreneurship literatures, this doesn't mean the elimination of potential links. For instance, Casson and Wadeson (2007), imposed that the concepts of

“project” and “opportunity” are closely connected. They said that “opportunity” definition was an unexploited project and that definition of “discovery” was identifying an opportunity through scanning the set of potential projects.

Moreover, they considered ‘project set’ more useful than popular notion ‘opportunity set’, because the last has (more) intuitive appeal whilst project proposals can be expressed more rigorously. They also argue that “‘Given the state of the economic environment at any one time, there is a set of projects that would best meet the needs of society’” (Casson & Wadeson, 2007). Putting this into project literature words, we can interpret this as there is an optimal project portfolio for a particular society (or economy). Casson and Wadeson did not say this but this is probably because of an insufficient grounding in the project literature. Project portfolio is usually understood as a set of projects (and programmes) that an organisation runs at a certain point of time and this understanding fits their notion of a set of projects. The publication by Casson and Wadeson is a good example about how developments in one field have the potential to permeate another field and benefit from such linkage. Moreover, this links entrepreneurship and projects also on the macro-level.

2.4.2 Framework of Multiproject learning

Midler and Silberzahn (2008) mentioned that technology firms are often based on a market a product idea that would direct their development. The preliminary definition, that is prior to the creation of the firm, of such idea is perceived as an essential factor of success. An early choice, even if, limits the flexibility of the firm; as a result, they have in particular high sensitivity to turbulence and disruptions that would weaken the relevance of the opted target, every disconnection results in unpredictable trajectory, if not termination. Uninterrupted trajectories from product to market concept to succeeding, for example Skype or Compaq, are definitely exceptions. For various cases, the start up survives, and sustains its maturing as an “old start up” by the implementation of series of new projects which redefine and/or conclude the preliminary concept, giving value to the initial experience of the trials that preceded the current one.

The efficiency of learning turns out to be a main factor of success in this context. If the projects are only a series of trials and errors that are not dependent on one another, the start up will quickly consume its resources up and fail. In contrast to that, if the track of learning

generates an increasing positive return of the exploration, the start up development will robustly grow (Midler and Silberzahn, 2008).

Ben-Mahmoud-Jouini made a proposal of a global framework that combines several organizational approaches of learning that involved projects. Her “innovation design system” model of the firm expresses the strategy of innovation, processes of creating knowledge and projects of developments. The model supports mapping and articulating distinct forms of the involvement of projects in learning processes of the firm including capitalisation of ex post cross project, parallel or ex ante learning processes out of the project, within projects learning, exploration project generation in learning through approach of projects, etc. Together with this view, Brady and Davies suggest a model of “project capability building” which takes place when the motion of the firm occurs towards a new market base and/or technology.

Garel et al. have suggested a type of management of multi-projects founded on firm’s the strategic perspective identifying three approaches: the platform approach, the lineage approach and the project portfolio approach.

- I. The Platform Approach: Cusumano and Neoboka, Baldwin and Clark, and Gawer and Cusumano organise the generation of project based on exacter sharing of certain architechite and/or process or product common elements. Projects are derived from the platform and the purpose of this approach is to permit economies of scope. The platform approach is a scheme for mature domains. Projects derived from the platform are not expected to generate new knowledge, the platform already contains all the knowledge. Therefore, the platform approach is not a scheme for exploration learning but is a scheme for exploitation learning in a top down approach of an organization according to Brady and Davies.
- II. The Lineage Approach: Chapel and Le Masson adopt a different approach where the main motive of the orientation and generation of a project is the purpose of learning, defined as expansion of knowledge if value domain is regarded. The main concept in this approach is a significant open value proposition that is going to organise exploration on both the market and technology sides.

III. The Project Portfolio Approach: Cooper et al. developed a competition between the projects regarding sources shortage and ex ante strategic targets contribution. Analysis of ex post project and selection at different development stages is the process of the main decision. Project portfolio can be categorised as from exploration to selection and as surviving projects exploitation. Learning from cross projects is not emphasised.

Therefore multi project management will focus on the connection between project implementation and the following:

1. the creation of knowledge and capitalisation within the company, which is not focused on in the portfolio management approach
2. Advanced innovative explorations that is not in general the objective of the derived projects platform approaches

Lineage management seems to form an opening of the exploration learning of black box concept, where exploration not only a series of random track which are shifted ex-post into exploitation patterns in case they are successful. Explaining the principal concept from early hazardous step seems as a main task to organize more exploration and structure the collective learning in regard of reuse. It permits leveraging the current competencies and knowledge into products that generate revenue in addition to the prudential exploration of opportunities in new markets and development of technology. The following show the way the literature of multi project based learning apply to the context of start up:

- The theory of learning has studied in depth the “exploration to exploitation” matter
- Multi-project management research was developed in big established companies. Project to organisation and project to project learning processes are distinct in the case of fast growing organisations like start ups, where the identity and the structuring of the company cannot be set aside from the decisions taken in projects

2.5 Objective and Methodology

Packendorff and Lindgren (2014), focused on their previous research on the processes of projectification so that there would be an illustration on the way the broad conceptualisation might have a contribution on knowledge and theoretical development. They took into consideration the effects of the increased project orientation in organisations (Lindgren & Packendorff, 2006a; 2006b; 2007, 2008, 2009; Lindgren et al., 2014). Some organisations in consulting ICT and the performing arts have been studied through interviewing individuals who worked on projects and who have been members of the same project teams.

Interview questions included questions about the individuals' spontaneous stories of their lives, that includes both life in general and work, during their respective projects implementation time. Interviews lasted for around two to three hours. Interviews were recorded and material was then typed, then extractions of various narratives connected to projectification aspects by means of thematic analysis. Martin's (2001) method inspired them, and thus they highlighted the narratives which were on the invocation of discourses of project management, the way the individuals linked the way they lived to what happened in projects, the project work form production and reproduction and the dynamic links between projects and organization.

Midler and Silberzahn (2008) wrote an inductive paper which was founded on two case studies of startups in France, the first is a wireless software developer (WSoft) and the second works in the digital cinema field (New picture). Collection of data was done through the presence for two full time years in the companies. The data was analysed by having analysis within the company case, analysis of cross-case and analysis by expert analysis. The first start up (WSoft) case's main data source is the firm's CEO and founder, and also is a member of the research team acting as a reflective practitioner (Schön DA, 1983). While the second startup (New Picture) was added as an outcome of the research (Barthélemy V, 2006). As a standard in qualitative research, the authors' insights validity was examined with each firm's senior executive and other academic members of the research team.

Midler and Silberzahn (2008) decided to choose the previously mentioned firms because as small, recently developed players in their particular markets, they are a typical example of the event of interest, which is the way that an entrepreneurial organization copes with large uncertaining while trying to develop itself to lead in its market. This study play a part in the theories and concepts integration through using the method of extended case, which has a purpose of integrating and synthesising bodies of work. In contrast to the approach of grounded theory, the main emphasis of the extended case study is not to establish a new theory but instead is to combine and expand existing theories by working on a iterative process of going backwards and forward between emerging theory, data and emerging theory.

Kiznyte et. al (2016) wanted to identify key factors that contribute to the success of a startup creation, analyse methods of project management that can be utilised for the business plan needed for startup creation, define project management methods combination that resulted in successfully creating a business plan for their case study, Blendlee. They designed an empirical research by preparing a literature review and a single case study. The paper involved qualitative research, data were collected from three main sources: observing one of the founders directly (one of the authors), from the second cofounder through an open ended interview and through documents of strategy, operations and planning of the startup. Secondary data sources included interviews, scientific literature and online statistical databases. The startup that was taken as a case study divided the creation process into four project cycles, Kiznyte et. al (2016) studied only the first cycle which involved the business plan development.

Auschra et. al (2018) objectives were to investigate similarities between both channels of research and an entrepreneurship increasing projectification. Their study develop the way the instituteional settings necessitate the so called “projectification” in the process of creating a new venture and analyse the implications for ecosystems of startup. They chose case study approach in order to comprehend the way the ecosystems direct the creation of a new venture in the direction of project based organising (Eisenhardt, 1989; Yin, 2013). Berlin startup ecosystem was the case they studied which was chosen based on the reason that high availability of emerging startups and instatetionalised actors such as intermediaries, investors and other supporting institutions which affect the new venture creation process. Auschra et al. (2018), collected data between 2013 and 2016, they carried 52 semistructured interviews with the startup ecosystem representatives including 38 founders and 14 intermediaries and investors. Potential interviewees were identified through their websites and at events. The interviews focused on new venture founding process and the institutional effects focusing on project like or project based trends and notions. They also included in their research a range of publications that are non-scholar and entrepreneurship field documents emphasising on projects. The last source of information was field events such as workshops, entrepreneurship summits, etc.

Their data analysis was not done in a linear way; however, it can be thought of as divided into 3 stages. The first stage involved collecting data in a database for the case study and this was done to ensure reliability (Yin, 2013). The following stage involved writing

descriptions of the process of creating a startup. They looked closely into the entrepreneurial practices that are similar to project based organizing and the practices that are related to temporariness. Moreover, they investigated the identified practices taking into consideration their perspective character, which is classic professional project management. After that they identified the institutional influences which result from the ecosystem. This resulted in a list that included all the practices that are project like and a list that includes all the potential institutional effects. The final stage they performed combined and systematic analysis. They used MAXQDA for the data analysis. They also analyzed links between project like practices and institutional influences.

Decision tree on whether to plan or not

Chowlka and Raith (2012), decided on looking at the necessity and evaluation of the planning process from a different perspective. Instead of comparing the performance of markets of start ups, without or after planning, , from an outer point of view, they analyse the decision of the entrepreneur regarding whether to plan or not from his point of view. Entrepreneur will decide to perform the planning activity if planning positive outcomes outweigh the planning costs. They focus on two interacting but different business planning functions in order to realise all the benefits. First, business planning includes the business opportunity creative development, where the target is to improve the start up market performance regarding both survival probability and financial outcome. Second, business planning copes with evaluating a business opportunity and therefore, giving support to the entrepreneur on his decision regarding the following steps in the entrepreneurial procedure and finally on if he should or shouldn't make an entrance to the market. applicable to the entrepreneur, brought face to face with the decision to “just do it” or to plan, is the informational value of having the ability to make a better decision after planning; for example, if he should make an entrance to the market or break up the start up.

In order to have this value quantified, Chowlka and Raith (2012) adopt a decision theoretic strategy that made them precisely specify when exactly in the entrepreneurial process the planning takes place, and therefore allowed them to identify the planning value at that point in the process based on the expectations of the entrepreneur. The formal structure allowed them to quantify business planning informational value and determine its influencing factors. They clearly show how the planning quality causes a rise in the information value. The chosen decision model allowed them to see the entrepreneur’s choice on what to do as well as comprehend the reason behind doing it. This allowed them to make an interpretation

for the entrepreneurial performance and behaviour empirical observations considering rationality. They later showed, that even when an unambiguous positive value was shown for planning, imposing that it is the reasonable choice to make, the start up's actual ex-post performance, assessable for the observer, does not need to be better compared to without planning. Therefore, their model serves as an explanation for the reasons behind expose performance empirical studies may probably show controversial results.

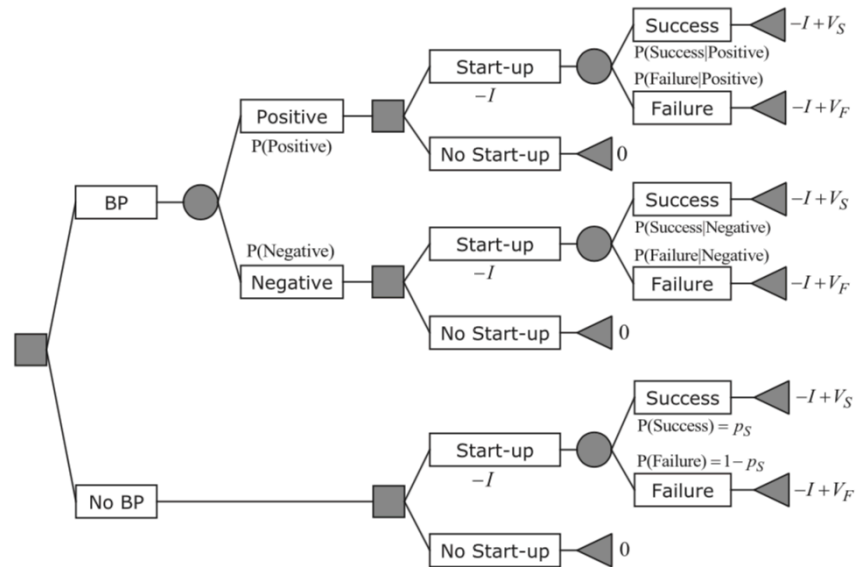


Figure 3 shows the decision tree on whether to plan or not (source: Chowlka and Raith, 2012)

2.6 Findings

Broad and Narrow Conceptualisations

All the studied organisations went through similar problems during the arise of their progressing projectification, often being evident in projects' budgets and overruns, stress experienced by individuals, and a lack of project portfolio overview.

Lindgren and Packendorff (2008), integrated the different problems into a progressing projectification model, finding that they were definitely connected and were likely to sustain each other over time. This was summarised as the “evil cycle of projectification”, which was built from the point of view of narrow conceptualisation.

Based on the analysis from the narrow view, the consequence of neglecting capacity in project-oriented environments (A) is viewed in the attitude of adding more projects and that if a project was started sooner, it is implied that it will be delivered sooner (B). When projects are added to portfolio, it is made possible to identify of human resources who have

enough time to spare to work on additional tasks (C). This results in budget overruns and delays during implementing projects (D), since now it is apparent that the organisational capacity was definitely insufficient in terms of managerial attention and overload. Firefighting and improvisational measures are the reason behind still satisfactorily delivering most projects (E). Thus, the impediments to improvement and learning remain too worthy of attention for the basic insufficient understanding regarding the organizational capacity to be improved (A).

The measures taken in the organisations studied involved anti stress and support training for employees, increased stress on control and leadership in the individual projects, and the launching of models of project portfolio management. However, the fundamental problems

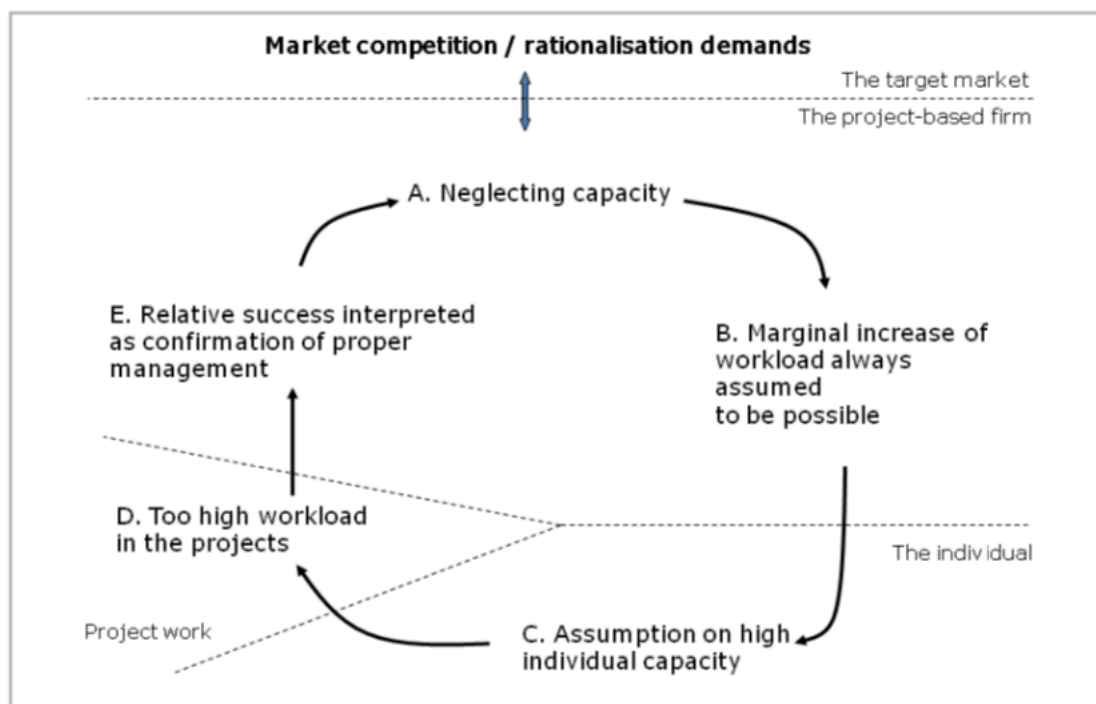


Figure 4 shows the "Evil Cycle" of projectification, narrow-view analysis. Source: Lindgren and Packendorff, 2008. tended to persist.

This analysis of the narrow view of the projectification processes shows that the stepwise and incremental manner in which the form of the project is given priority in organisations (Jerbrant, 2014) and also shows that the fact that the project-based organisations might become subject matter to bureaucratisation and inertia (Hodgson, 2004). Projectification

processes suggests that operations are divided into innovative and flexible units, and also that various aspects of repetitive organising which could be useful in project-based context are left behind. In this case, Packendorff and Lindgren (2013) concluded the familiar likelihood to fail to notice issues connected to load and capacity in project work (Wheelwright & Clark, 1992), an absence of human resources management in project situations (Bredin & Söderlund, 2006), neglecting extra pressures on labourers originating by organisational complexity, and several deadlines (Turner et al., 2008; Cicmil & Gaggiotti, 2009), and an insufficient intuition into the risks of operations connected to dependence on heroic action. In the cases studied in the paper, the projects notion serves operations structuring in a flexible and dynamic way, and to shift accountability and responsibility from managers to individuals and teams without offering relevant organisational resources or infrastructure. From this projectification narrow analysis, Packendorff and Lindgren (2013) were thus able to identify many significant aspects of problematic restructurings in organisation and point out possible methods of resolving them. In addition, it was comprehensible that a significant number of these problems were already recognised by employees and managers in the organisations studied, and that nearly no one would be able to imagine another way of organising project-based work. The ICT consultant Carl and his project leader Eric noted that:

To comprehend the way different actors are likely to be frequently caught up in these situations, employment of projectification broad notion can be of help, where the taken actions are perceived as internalisation of cultural values and referring to performative discourses on project management and projects. From this point of view, general discursive project notions as delimited, adventurous, temporary, controllable and extraordinary are drawn upon in episodes of work named “projects”. Extraordinarisation suggests a discursive perspectives of all the projects as almost unique and thus it is not probably to manage and control them together in fully homogenised way. The temporary notion of projects supports that so they perceive work of project as temporary, optimistically perceive them as opportunities that are not to be missed. The justification made by people of being at the mercy of similar circumstances is by drawing upon the orientation of the project in their identities constructing, executing as dedicated, innovate and flexible professionals. When problems pop out, they might doubt the amount of simultaneous projects and thus dismissing the case as a planning issue. Thus, they comprehend that the case is in need of more planning for the project instead of doubting the processes of temporisation and

extraordinarisation. The following complexities are then categorised as isolated mistakes and as examples of courageous action that have generated some sort of excitement and meaningfulness. When actors perceive their work in a similar way and guarantee that this way of working is unavoidable, work of projects and its effects would be justified as necessary and normal and therefore will be sustained with time.

At the same time, other notions turned out to be concealed and from time to time unreal, for example, repetitiveness (organizations and people go through series of projects, not just one project), normalisation (project work is and must be perceived as daily things in these contexts), risk (risks and deviations of projects are not completely controllable), resilience (being aware of the limited of courageous masculinity is required) and inter relatedness (projects are related to one another and to the remaining of the organization during the period of their existence). Thus, it is concluded that the identified problems and their maintainability might be dependent on resorting to project management in a non-reflective, traditional way and that some of the actions done might in reality make the situation worse,

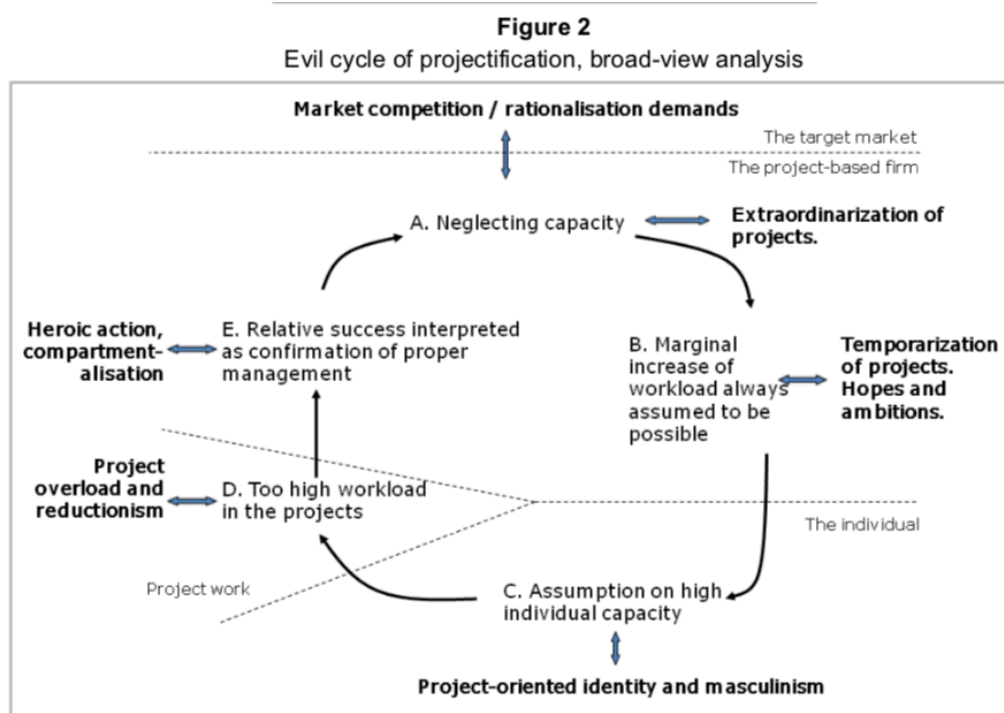


Figure 5 shows the Evil cycle of projectification, broad-view analysis. Source; Lindgren and Packendorff, 2008.

since they as well are founded on traditional notions.

With the previous summarised illustration in figure 5, the projectification broad view is maintained to offer better comprehension of its motives, and also different ways of explaining the continuation and determination of work that is project based inspire of their

problematic effects. Projectification is powered by effectiveness and suitability notions for specific tasks in organisations and project orientation, as an internalised comprehension of the definition of being productive, enterprising and successful person in the society as well as the extensive validity of project management as a rational managerial toolbox. Simultaneously, it is with noting that the broad perception is not external to narrow view and projectification comprehension, instead involves them and constructs on them, but with different axiological, epistemological and ontological assumptions as departure points. Also, it suggests the new ways of resolving and formulating projectification effects become identifiable (Spicer, Alvesson, & Kärreman, 2009). For instance, the broad view shows new methods of attending to the problematic, unwanted effects of organizational projectification as identified by research that employed the narrow views; by giving a new definition to problems with stress, high project failure rates and overload as problems connected to institutionalised high level of optimism, individual's responsibility and powerful expectations in controlling projects, focus might transfer to cultures of organisations and ideologies of management as origins of enhancement instead of control systems and project maturity models.

Perspectives of Multi-project Learning

The first case study covered by Midler and Silberzahn (2008), appeared to be projects portfolio oriented. The startup went through different projects which were relatively unlinked, the cofounders were changed throughout the process, and the projects addressed dissimilar environmental contexts, resulting in creation of their own resources to progress. Each project was operated by its own perspectives and was strongly dependent on the stakeholders that provided the main resources.

On the other hand, the second case study (WSoft) showed how lineage management is done. The projects chain illustrated that knowledge was obtained from each trial and how they were used as a capital as the base for redefining strategy of exploration for the next steps. The track of learning was efficient and continuous beyond the change of market and product which appears to be the trajectory's main rationality, as explained by lineage management. Lineage management gave the firm the chance to operate the exploration of

customer needs and technology, and also organising the value creation reutilisation of knowledge acquired (Midler and Silberzahn, 2008).

The Blendlee case study

Kiznyte et. al (2016) showed how the approach of project management was of help to the creation of the Blendlee startup. The founders chose the project management approach from the PMBoK. First, they treated the overall process of business creation as a project and applied project cycle. Based on the company size and the field of the company, the process was divided into four cycles by the founders: cycle of business plan, cycle of company establishment, cycle of platform development and cycle of business growth. This was done in order to assist with reaching the main goal through having transitional milestones. In the case study, the mile stones were delivery of the document with the business plan, establishment of company, having a fully developed platform and exiting business (IPO- Initial Public Offering). By the time the paper was published, they had delivered the business plan and were in the second cycle, therefore, the analysis scope was narrowed down to only the business plan cycle because it was the only stage that generated results and the authors would be able to assume the success of the used approach and that it can be implemented by other startups.

The Blendlee case used another method suggested by the PMBoK, which is the project process groups approach. Five process groups were used by the founders: initiating phase, planning phase, executing phase, monitoring and controlling phase and closing phase. The process group provides a description on the actions that need to be taken to manage the project. Moreover, Blendlee case made use of the creation phases of lean startup: the business model canvas that was used to make a draft of the business plan, involved modifications and was rearranged several times throughout the process of creation, every time involving an improvement; customer development was achieved through market research that involved a global survey that resulted in receiving feedback on the solution from potential customers/users. For the Business plan, the founders applied a combination of traditional project management methodologies, lean startup and agile project management. The founders mentioned that lean and agile principles and methods assisted them during the creation of a solution that was based on customer needs which were done by taking feedbacks, preparing surveys and market research. They mentioned that these

methodologies ensured flexibility when it comes to scheduling but also helped them to have control over everything to get better results with higher efficiency. Agile project management was an innovative way to design the business plan, they used mini scheduling that was one on daily basis, followed by controlling iteratively and daily meetings that resulted in organizing efficient workflow.

Institutional Influences

Auschra et al. (2014) mentioned that there are various institutional influences in the ecosystem of entrepreneurship that are similar to project like practices. The actors of the institutions influence the creation of new venture process. First, the state and its agencies constrain the creation of a new venture in many ways, including intellectual property development and obtaining legal permissions and other activities that are project like. Their analysis showed that occupational backgrounds, epistemic communities and other various actors affect the creation of a new venture and direct the practices towards projectification (Midler, 1995; Lindgren and Packendorff, 2003; Midler and Sliberzahn, 2008) The projectification is activated and directed by the institutional environment (Packendorff and Lindgren, 2014; Lundin et al., 2015), both in non-science based and science based new ventures, however different institutional effects within the ecosystem significantly affect the process in both contexts. Their results help understand the reasons behind projectification. The main one is the imitation and adaptation of this organizing method that is very relevant in different industries and more broadly in societies (Lundin et al., 2015). Intermediaries such as incubators and venture capitalists use organizing patterns that are project based for legal reasons and as a promising form of organizing. The form of project helps intermediaries to properly control their investments and ensure that desired outcomes are achieved, for instance, by deadlines, milestone planning and project budgeting. Second, Auschra et al. (2014) elaborated on characteristics of projects of new venture creation in their first stages in the temporary organizing context. In particular, they recognized attributes of non-science-based and science-based venture creation processes (Pisano, 2010), which vary according to the practices that are project like nature and the leading institutional influences. Creation of a new venture that is high-tech or is science based usually have longer process and greater regulative and normative influences, unlike high-speed or non-science based venture creation which have a shorter process and the institutional effects are more market oriented and require fast exploitation. While non-

science based ventures are affected by entrepreneurial community and short-term investors, the science based ventures are affected by legal and public bodies, entrepreneurship policy and startup team professions direct the creation process of a new venture in the direction of project-like organizing. Third, the authors contribute to the understanding of entrepreneurship and project based organizing by means of a structuration perspective that has been used in both domains and consider the two practices and their repetitive interaction with the structures of the ecosystem.

3. Research Purpose, Methodology and Data Collection

3.1 Research Purpose and Questions

This Research is done in order to know if the tools of project management can be used to fill the gap in the field of lean startup that lacks a set of independent tools, other than the ones adopted from lean manufacturing.

As mentioned in the previous section, hypothesis-based survey among start-ups in incubators are carried out. A cultural comparative study is conducted between Turin and Bologna in Italy and Cairo in Egypt. The hypothesis tested in the survey is:

Project management, in a way or another, is useful for and is applied in start ups.

Can Project Management tools be used to fill the gap of Lean Startup?

And if project management is not used in startups, is it due to lack of experience or knowledge in project management or if it is not applicable or if there is an evidence of inefficiency?

3.2 Data Collection Method

The study is a semi-quantitative one and is carried out through a hypothesis-based survey among start-ups in incubators.

Broadly speaking, the method of data collection is greatly affected by the methodology and basic research paradigm that basically limits the options of tools that are applicable to collect data. For this study, to obtain a deep comprehension in the field of startups and their decision on using project management tools and methods, it has been decided to conduct surveys as a way of getting primary, semi quantitative data.

Generally, surveys can be online or hard copy distributed among targeted parties. Online surveys were chosen and it is a very common tool in the field of research and enables researchers to easily reach the target parties. Out of the options of open ended, closed ended questions and combination of both, closed ended questions were opted even though they might not be very flexible because the questions are already set and cannot be changed according to the flow of previous questions and responses, there are plenty of other reasons behind this choice. Open ended questions do not limit the choices and does not direct responses in a certain way unlike the closed ended questions which results in fewer irrelevant or confused responses due to the clarification of the meaning of the question that choices give. Although the closed ended questions might not be suitable for getting in-depth information, it is the most suitable for this study due to the fact that it goes straight to the point so it is much easier for the respondent and due to its time efficiency in addition to the fact that for now we need primary information that would direct us on the right track for further research. In addition, the surveys with closed ended questions allow the researcher to group responses into classes, have easier replication and interpret and analyse the data more easily. An advantage that is worth mentioning is the time efficiency which is very important due to the time constraints from the respondents side since they put too much time and effort for their start up. Moreover, the guarantees for privacy also encourages participants to share answers they would not feel comfortable sharing it.

Of course there is a downside of not allowing respondents to answer freely, it doesn't give in depth information so the researcher cannot examine the answers further and sometimes certain answers are not among the choices which results in the respondent choosing a choice that they would not choose in real life or in an open ended question. Also, it could be confusing if there were so many choices. Some respondents might mistakenly mark the wrong choice which affects the accuracy of the results. They also force respondents to make simple choices to complicated issues.

3.3 Finding respondents

Choosing a fitting strategy for finding respondents for a research is important to produce considerable and unbiased research results. The samples were chosen from incubators in Turin, Bologna and Cairo. Incubators in the previously mentioned locations were contacted so that they distribute the surveys among the startups they work with.

3.4 Survey Design

A well-established survey should include:

1. a cover letter discussing the objective of the research
2. It should include an informed consent which should include compensation given to respondents in return of responding to the survey, risks that could arise from responding to the survey, the way the personal information would be protected, mentioning that participants can drop out of the study at any time even if after giving the consent, sharing the contact information of the researcher so that if the respondents have any questions, asking for the participants consent and finally asking the respondents to keep a copy of what is mentioned in points 1 and 2.
3. Sections containing the survey questions
4. Debriefing letter which includes thanking the respondent for participating and sharing the contact information of the researcher if not shared before.

3.4.1 Survey tree

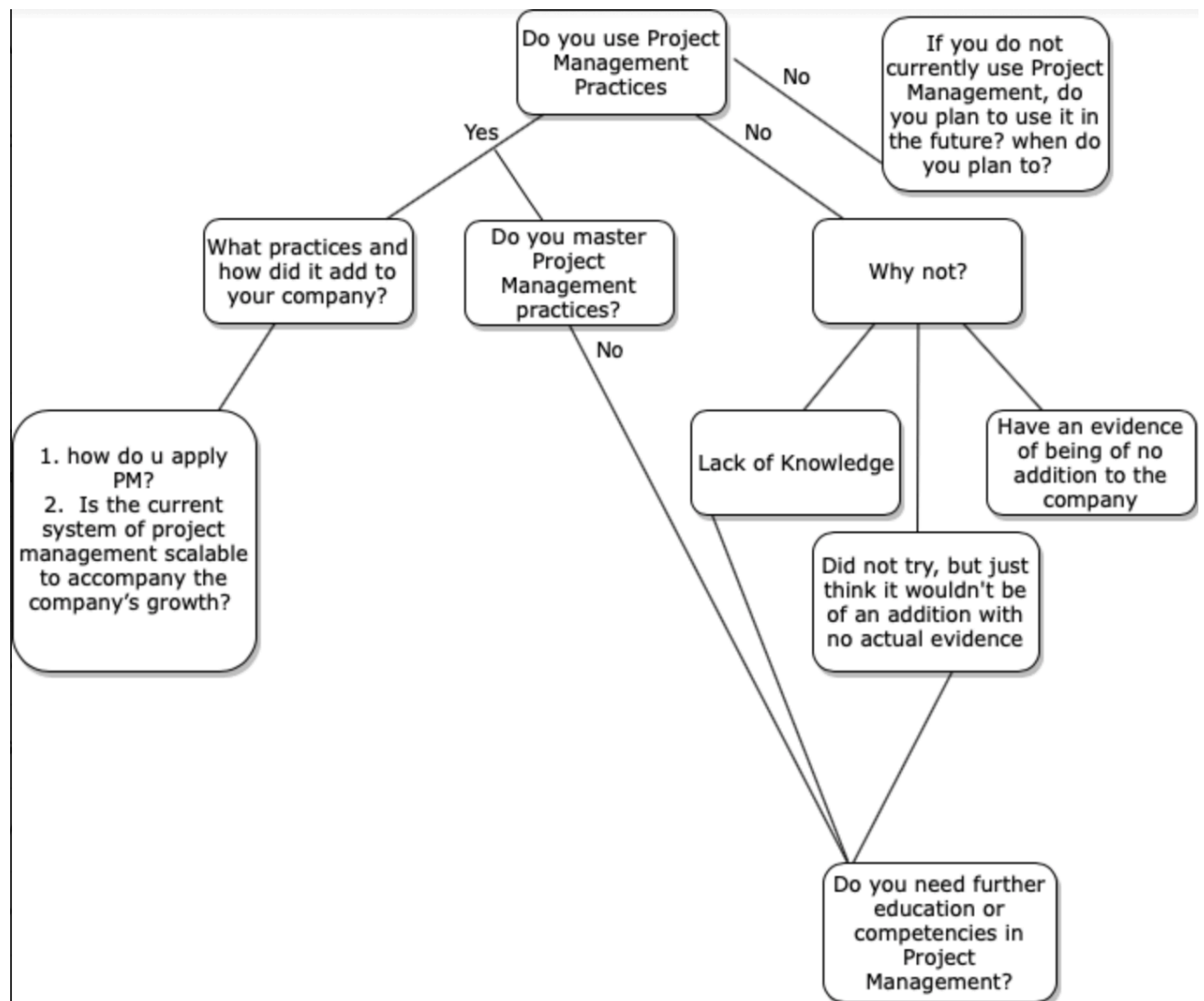


Figure 6 shows summary of the survey

3.5 Data Analysis

Data were analysed using SPSS software. Analysis methods:

3.5.1 ANOVA

ANOVA which is an abbreviation for Analysis of Variance is applied to data in order to know whether there is a significant difference between the means of two or more than two independent samples or groups. It verifies or annuls a hypothesis. The null hypothesis states that there is no significant difference between means which means that the variables are independent.

$$H_0: \mu_1 = \mu_2 = \mu_3 = \dots = \mu_k$$

Where,

μ is the mean of a group and

k is the number of groups

If the ANOVA shows that there is a significant difference between the groups' means we reject the null hypothesis and verify the alternative hypothesis (H_A), which means that the variables are not independent and that there is a significant difference.

Assumptions

The data used needs to meet some requirements which are the assumptions implied by ANOVA test. The assumptions are as follows:

- Observations independence (or independent variables that are distributed identically). This assumption is usually verified when each case is made by different people and when no interaction happened between participants. In our case this is ensured by having one cofounder from each startup.
- Homogeneity: means that the variances of all populations are equal over all the subpopulations. In our case this assumption was verified by Levene's test shown in the results section
- Normality the variables must be distributed normally in each subpopulation. This importance of this assumption reduces as the sample size gets larger.

Interpretation

If the p-value is less than 0.05 the null hypothesis can be verified, if it is greater than 0.05 the null hypothesis is annulled.

3.5.2 Chi-Square

Chi-square independence test is used in order to evaluate the connection between two categorical variables in a population. The null hypothesis states that "two categorical variables are independent." If the null hypothesis is verified and we take a sample of this population, a connection between variables might be seen in the sample because samples usually differ from populations they are taken from. But it is unlikely to find a strong connection between variables in a sample if for the entire population they are not connected. If this happens, it can be concluded that the

variables are not independent in the population. And if this happens then the independence null hypothesis is rejected.

Assumptions

There is an assumption that each cell should have frequency greater than 5, which was not the case in our study and that is why this test has not been chose.

3.6 Research ethics and Privacy issues

Trust, confidentiality and informed consent seem to be the leading ethical issues in the field of research (Kumar, 2014; Ryen, 2004). Since some of the surveys would be filled by people who hold an EU citizenship or reside in Italy, the data collection has to be compliant with the GDPR; the new EU regulations. The GDPR, grants the protection right of personal data

as a basic right.

In general, the GDPR involved the following:

- a. changing the regulatory approach to proactive and substantial, the personal data protection evolved to obtain its own independent importance within the organisations and managements processes of a company or an organization
- b. Strengthen the guarantees and enforceable rights by the individual to be in control of their own information and exercising self determination, taken from the Directive, reassuring many (restriction, cancellation, opposition and right of access); also strengthening the consensus
- c. The increasing responsibility of the data owners with the accountability principle with the purpose of handling the personal information where the risks of non compliant operations are reduced.
- d. It encourages the expansion surveillance systems and the sanctions strengthening

The responsibility of data owners (art. 24 and 25) and data managers (art. 28) is set up as a solid risk taking, expecting the owner to set up suitable organizational and technical

measures to ensure that the processing of data is compliant to the regulation, also considering the obligation nature, the purpose and context of processing and the risks with different likelihood and severity for the individuals' freedom and rights.

Data managers and owners have a new obligatory role for public authorities: the personal data protection head (aka "data protection officer").

The primary responsibility of data managers and data owners: privacy practices by default or design implementation, the assessment of the impact, defining and maintaining procedures for safety, risk assessment, maintaining activity logs and assessing breach of personal data.

The GDPR strengthens the establishment of measures of protection and security and the assurance of integrity during data processing. Particularly, the following are some of the required:

a. Privacy by design art. 25

The measures for privacy by design include:

- i. Minimizing of the personal data in terms of quantity, retention duration and accessibility levels.
- ii. (Reversible) encrypting or darkening of the identification data of the concerned person
- iii. Defining the personal data and duration that are strictly necessary to the data processing for different purposes.

b. Privacy by default

The data manager must enforce appropriate organizational and technical measure to make sure that the data are treated by default, only the personal data that are essential for each certain purpose of the processing. Thus it is important to know the different permissions to read or edit the data.

c. Impact assessment (DPIA) art. 35, 36

This is done in order for the compensation for possible risks depending on their severity. It is required if there is a high risk connected to new introduction of technologies or using special data or surveillance.

d. Security and risk assessment art. 32

The regulation requires suitable security measures to be taken regarding risk assessment.

Data managers and owners are required to do risk assessment starting when they implement the measures of encrypting data and the measures of integrity, availability and confidentiality of information; the systems flexibility and applications processing and their recovery in terms of time in case of technical or physical incident.

e. Breach of personal data and notification- art 4, 33, 34

The regulation refuses the violation of processing personal data. The breach of personal data is basically the security breach that leads to unlawful or accidental loss, alteration, destruction or unauthorised disclosure of personal data processed.

The data manager must inform the authority of personal data control about any breach no later than 3 days from the breach incident, mentioning the details of the violation, the consequences of the breach and the intended measures taken to mitigate the consequences.

f. Disposal of media and devices holding personal data

Rights of Consent

Moving to the consent, the consensus must be informed, specific, voluntary, unambiguous and free. Presumed consent is not allowed.

Consent must be given and expressed by declaring it or by conclusive and unambiguous action (for example, ticking a box on a site, choosing a certain technical setting or any other conduct or statement which shows the intent to accept the proposed treatment. It is not a must to be in writing, even though this is the best mode to confirm that a consent had been unambiguously given.

Content of the information

It is obligatory for the data manager to notify the subject of data about:

- identity and contact information of the data manager
- The purpose of collecting the data and the data processing legal basis and the legal interests of the data controller
- if there is a possibility that the data are transferred to a third country and if this the case, the data has to be protected as well. Also, data portability can be limited.
- the retention period of personal data, or in case of this being not possible, then the criteria that is used to determine that period
- The rights that can be operated by the individual, including: having access to, correcting, editing, cancelling or limiting the processing of the data or the right to transferring data, or taking back the consent at any time with no effect on the legitimacy of the processing that was done before based on the consent expressed before.
- If an automatic decision making process that may include profiling, mentioning the used logic and the significance and expected effects of the processing on the subject concerned.

4. Findings

4.1 Response Rate

Potential respondents were contacted through an incubator in Cairo, Egypt, another one in Turin and a third one in Bologna, Italy. The cofounders of startups were not contacted directly, but the survey was sent out to incubators top management members and communication managers, which then sent it out to cofounders through channels within the incubators. The number of startups in incubators in Turin, Bologna and Cairo were 57, 17 and 20 respectively, summing up to 94 respondents in total. Another approach was taken in order to ensure receiving data and finding responses within the desired period of time. I directly contacted some cofounders of startups which I found online through emails and social media. In order to ensure results accuracy, all the startups websites were checked. An estimate of number of potential respondents directly contacted was 95 and the number of responses were 52. Giving a response rate of 55%. However this is not the true response rate, because many emails were sent to incubators and no answer was ever received and thus the number of startups that received the survey is not known.

4.2 Results Representation

The total number of analysed responses were 44, 26 of which were in Italy and 18 were in Egypt.

Position of the Participant

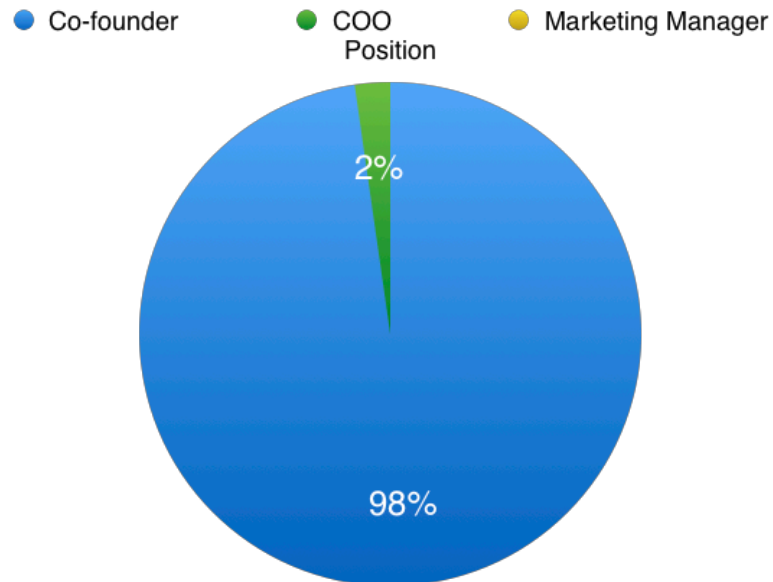


Figure 7 shows the position of participants

As shown in figure [7], 98% of the respondents were cofounders of startups and 2% were Chief Operating Officers.

Size of the Startup

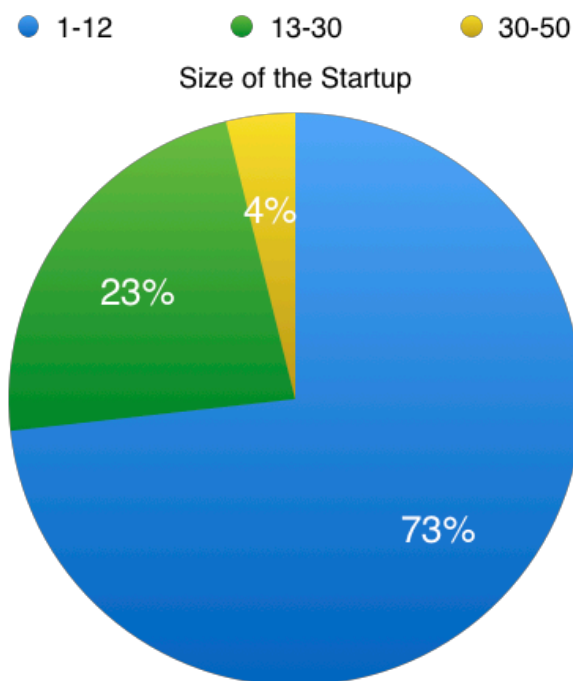


Figure 8 shows the size of the startups

Figure [8] shows the range of the number of employees in the startups, 73% of the startups are made up of 1-12 employees, 23% are made up of 13-30 employees and 4% are made up of 30-50 employees.

Does the startup provide a service or a product?

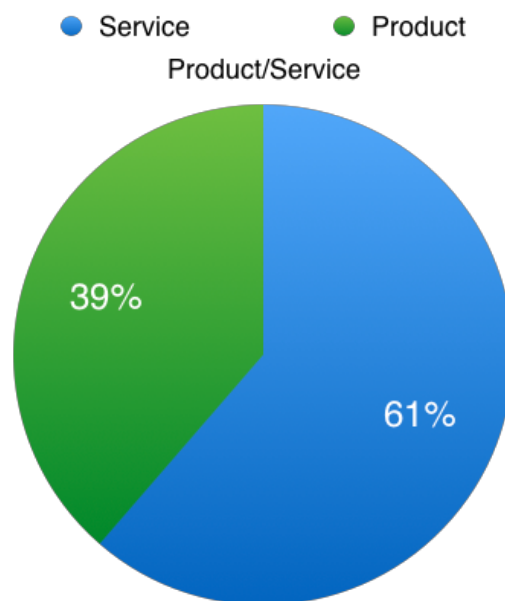


Figure 9 shows percentage of the startups providing a product or a service

Location of the Startup

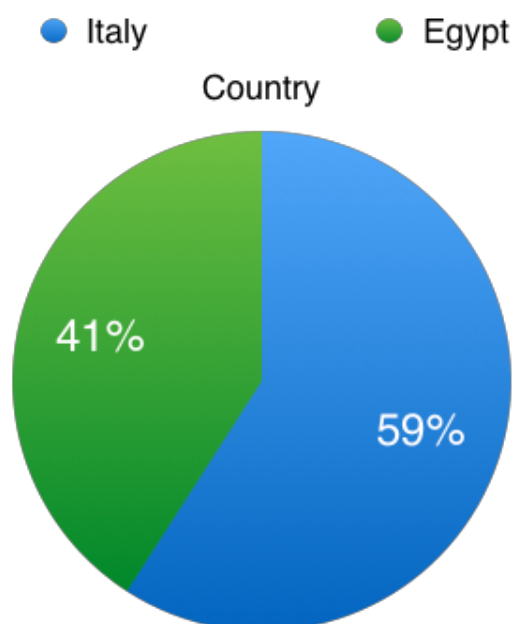


Figure 10 shows the location of the startups

Figure [10] shows that 59% of the respondents were in Italy and 41% are in Egypt.

Startup Stage

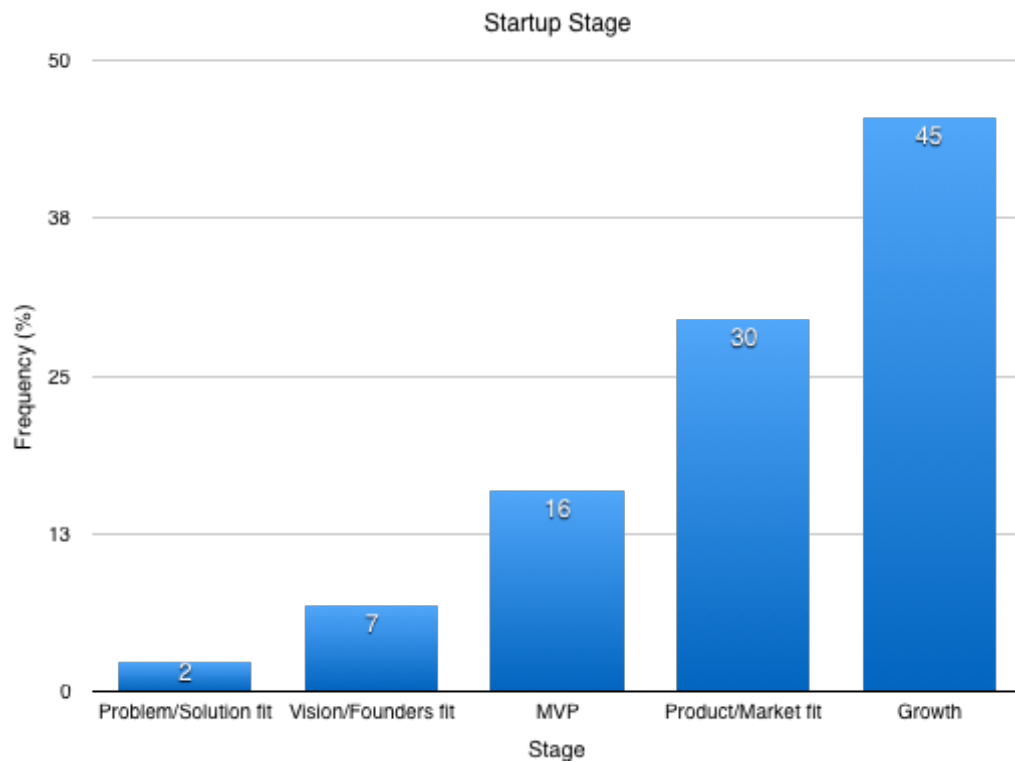


Figure 11 shows the stage at which the startup is

Figure [11] shows that almost half of the startups 45% are in the growth phases which means that they can tell if what they applied was of success. 30% were in the product/market fit phase, 16% of the startups where in the phase of developing a minimum viable product, 7% in Vision/Founders fit phase and 2% in Problem/solution fit stage.

Duration at an incubator

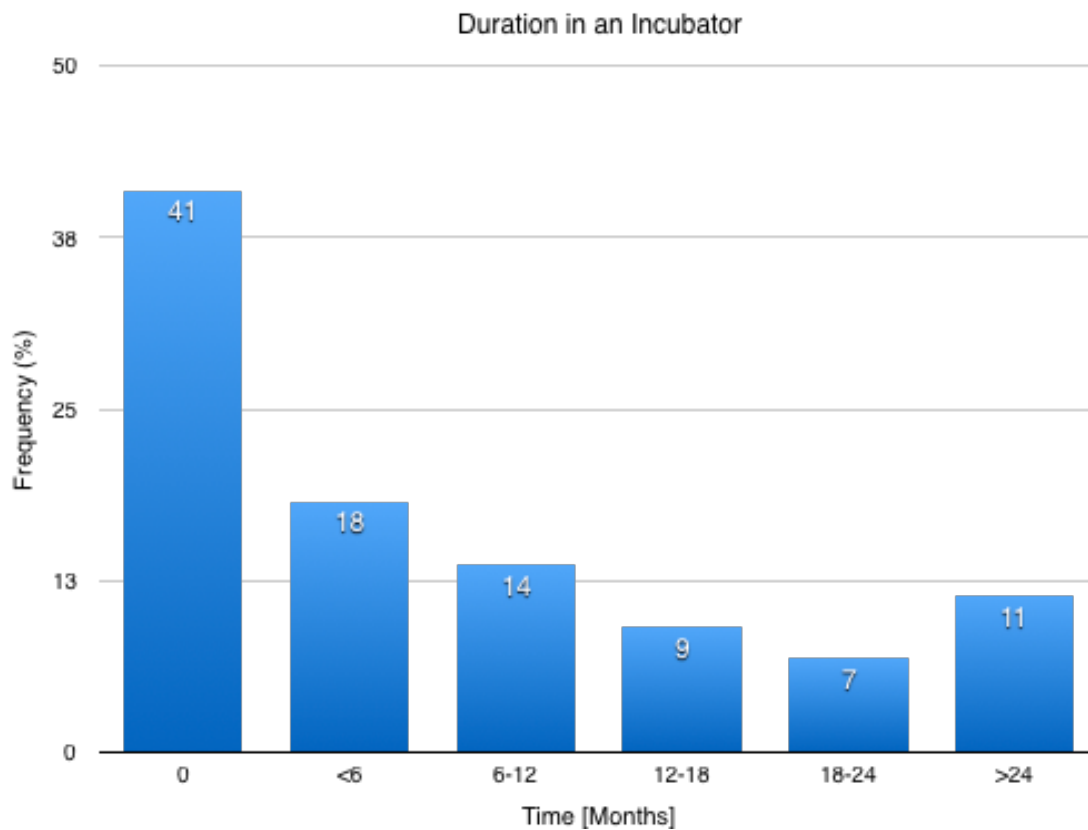


Figure 12 shows the duration of incubation

Figure [12] shows that 41% of the startups either did not join an incubator at all or are in the pre incubation phase, 18% spent less than 6 months in an incubator, 14% spent from 6 to 12 months, 9% spent from 12 to 18 months, 7% spent from 18 to 24 months and 11% spent more than 2 years.

Duration at an accelerator

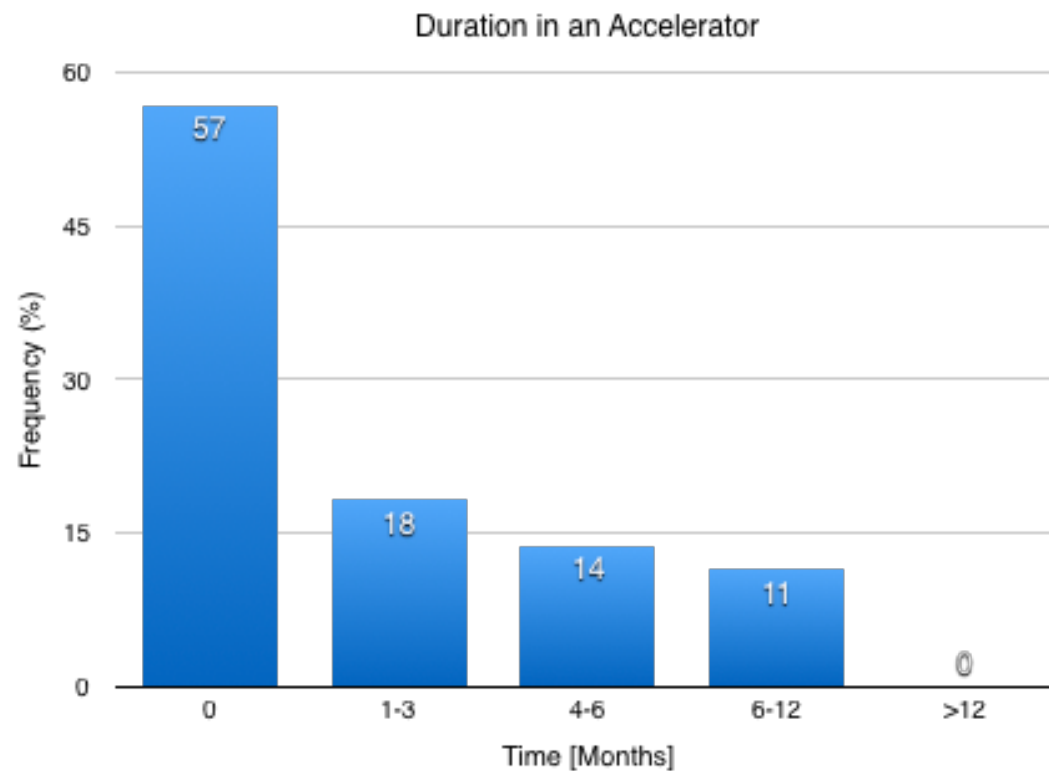


Figure 13 shows the duration in an Accelerator

Figure [13] shows that 57% of the startups either did not join an accelerator at all or are in the pre incubation phase, 18% spent from 1 to 3 months in an incubator, 14% spent from 4 to 6 months, 11% spent from 6 to 12 months and 11% spent more than 12 months.

Number of Cofounders

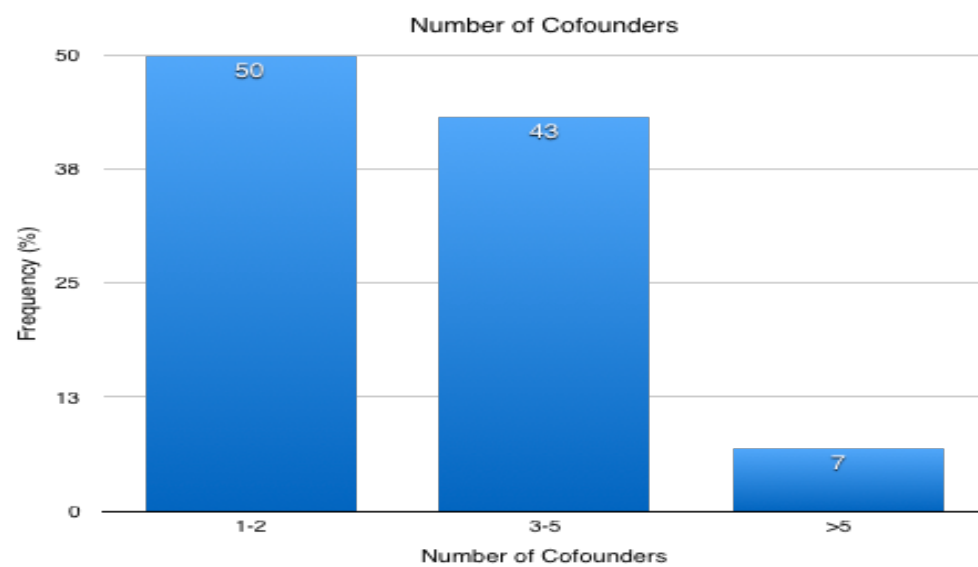


Figure 14 shows number of cofounders in a startup

Figure [14] shows that 50% of the startups were founded by 1 to 2 cofounders, 43% by 3-5% and only 7% by more than 5 cofounders.

Background of Cofounders

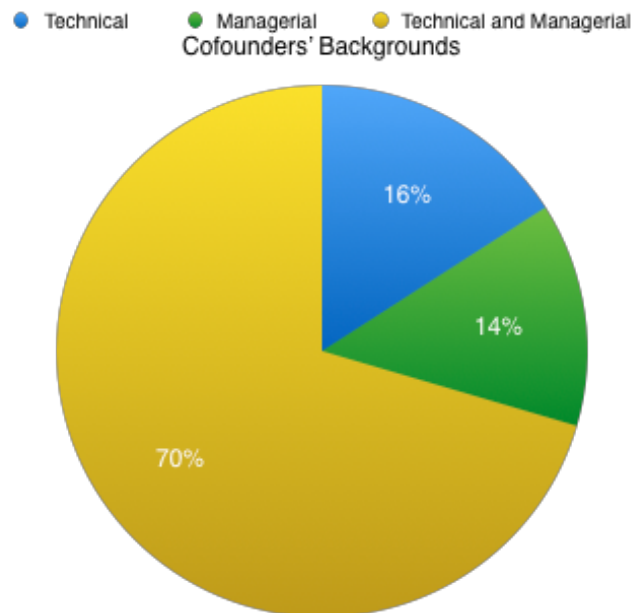


Figure 15 shows the background of the cofounders

Figure [15] shows that 70% of the cofounders had both technical and managerial backgrounds, 14% with only managerial background and 16% with only technical background.

Project Management Background of Cofounders (Degree of knowledge)

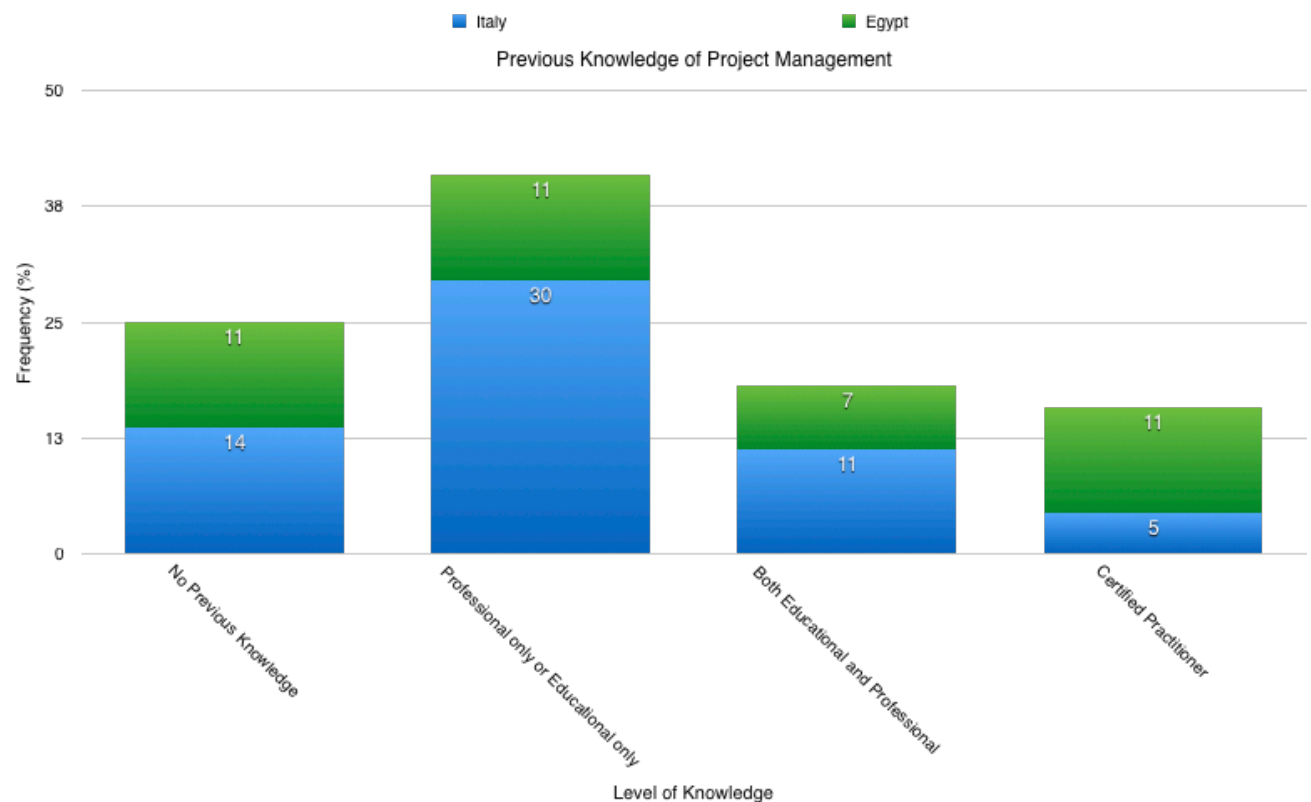


Figure 16 shows the level of knowledge of project management among cofounders

Figure [16] shows that 25% of the cofounders have no previous knowledge of project management, 41% of the cofounders have either only professional background management or only educational background in project management, 18% have both educational and professional background and 16% of the cofounders are certified practitioners.

Project Management Application

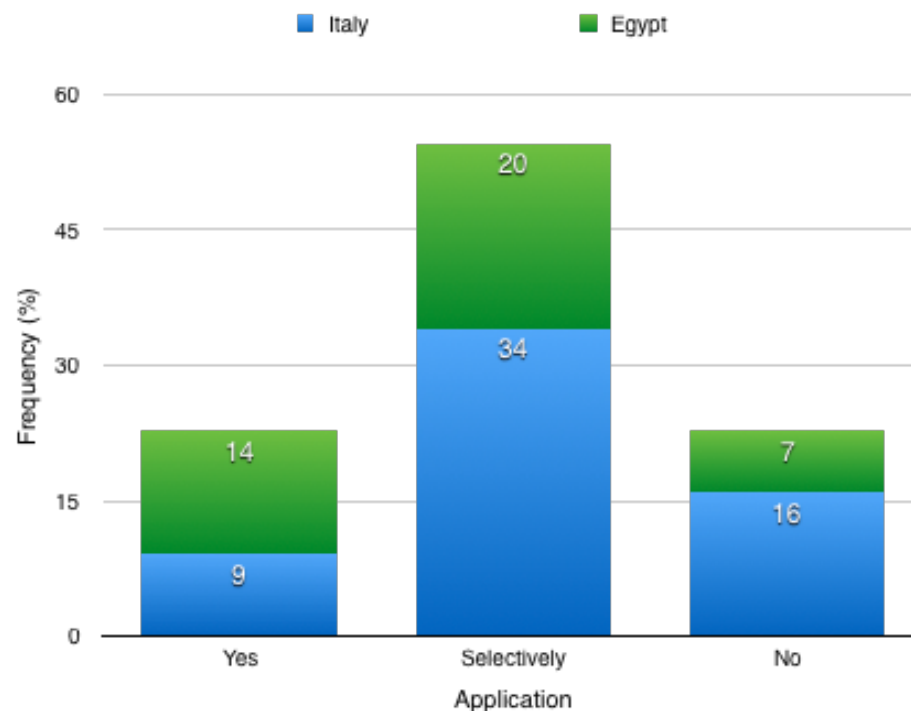


Figure 17 shows the Degree of Application of Project Management

Figure [17] shows that 23% of the respondents apply project management, more than half of the respondents, 55% apply it selectively, they apply it in certain aspects or use some of the project management tools and 23% do not apply project management. Therefore, we can say that for 78% of the participants do apply project management whether in absolute terms like it is explained in theory or even in some aspects using certain tools.

Project Management Methodology Applied

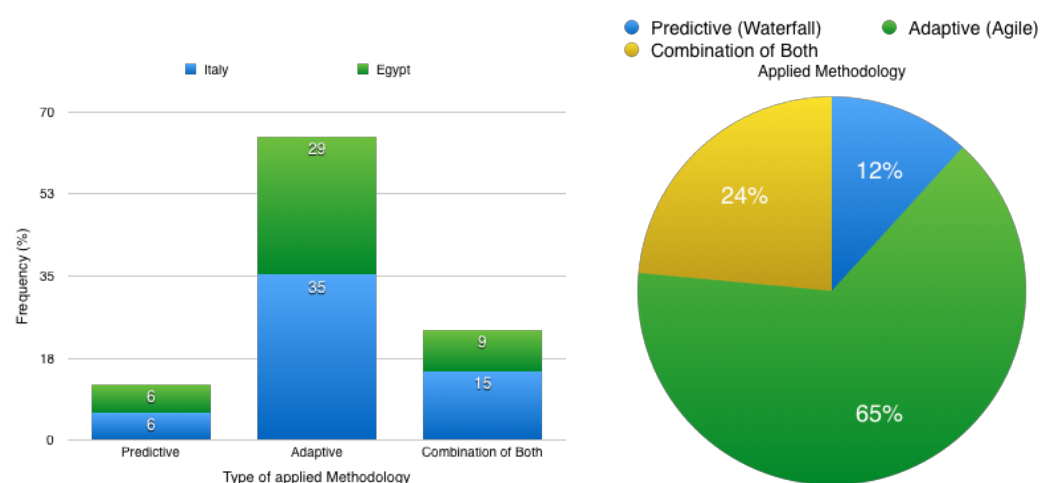


Figure 18 shows the project management methodologies applied in startups

Figure [18] shows the majority of the startups that apply project management (64%) use the adaptive methodology, 12% use predictive methodology and 24% use combination of both based on the aspect. Further insights on this will be shown later during presenting the success factors and the project management addition in figures [19] and [20]

Factors that contribute to the success of a startup

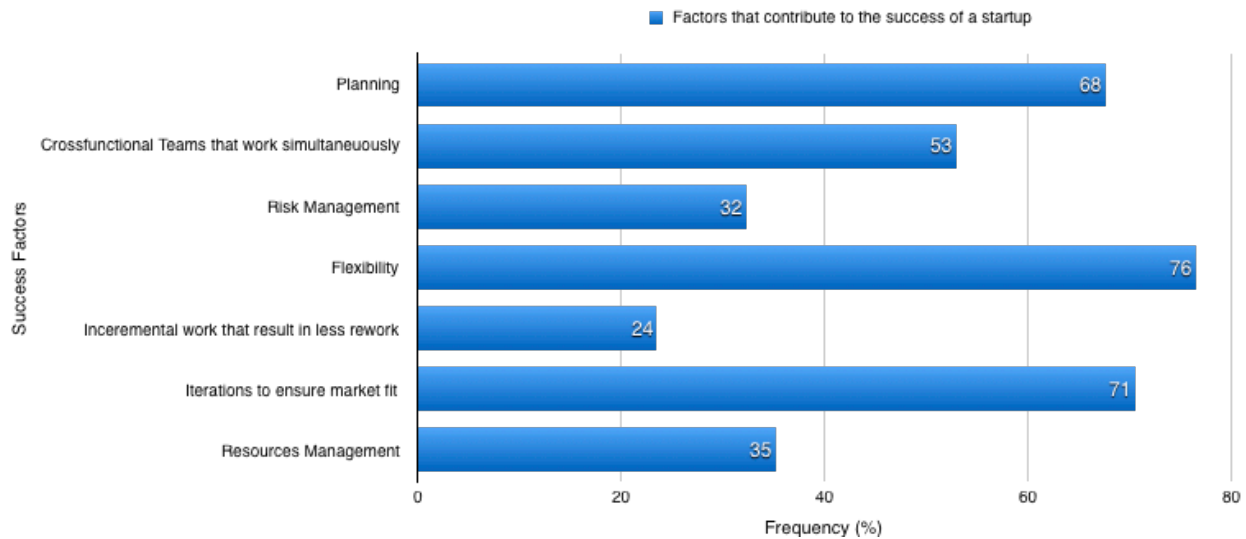


Figure 19 shows the factors the contribute to a startup success

What project management adds to the startup

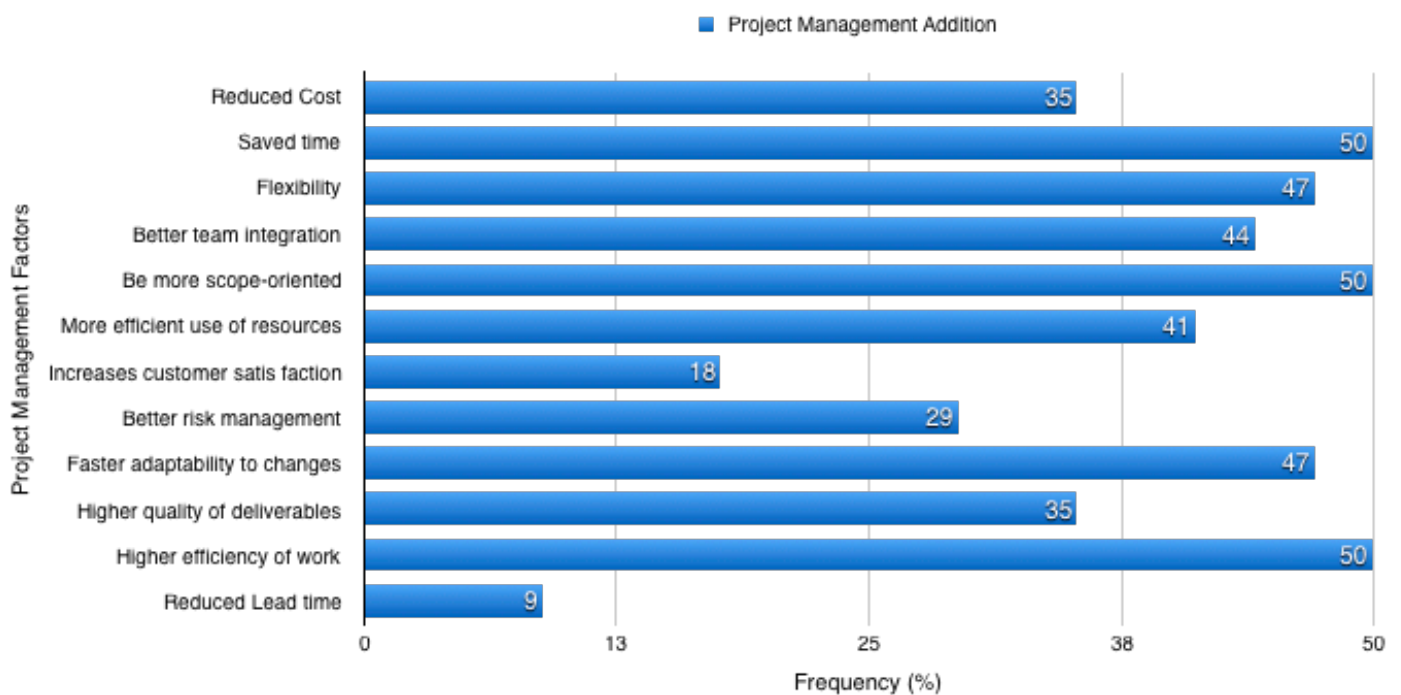


Figure 20 shows project management addition to the startup

Do Cofounders adopt Narrow or Broad Views of startups projectification

● Broad View ● Narrow View ● Broad and Narrow Views

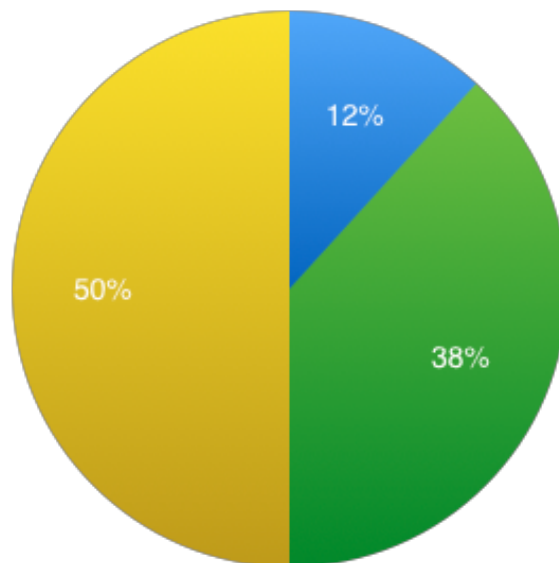


Figure 21 shows the percentage of respondents applying different projectification views

Figure [21] shows that 50% of the respondents apply both the broad and narrow views which is basically treating the startup as a project that can be divided into smaller projects. 38% of the respondents apply the narrow view by dividing the different phases into smaller subprojects. The last 12% apply the broad view which applies the broad view by treating the whole startup as a project and everything as a task included in this one big project.

When did cofounders start applying project management tools/methodologies?

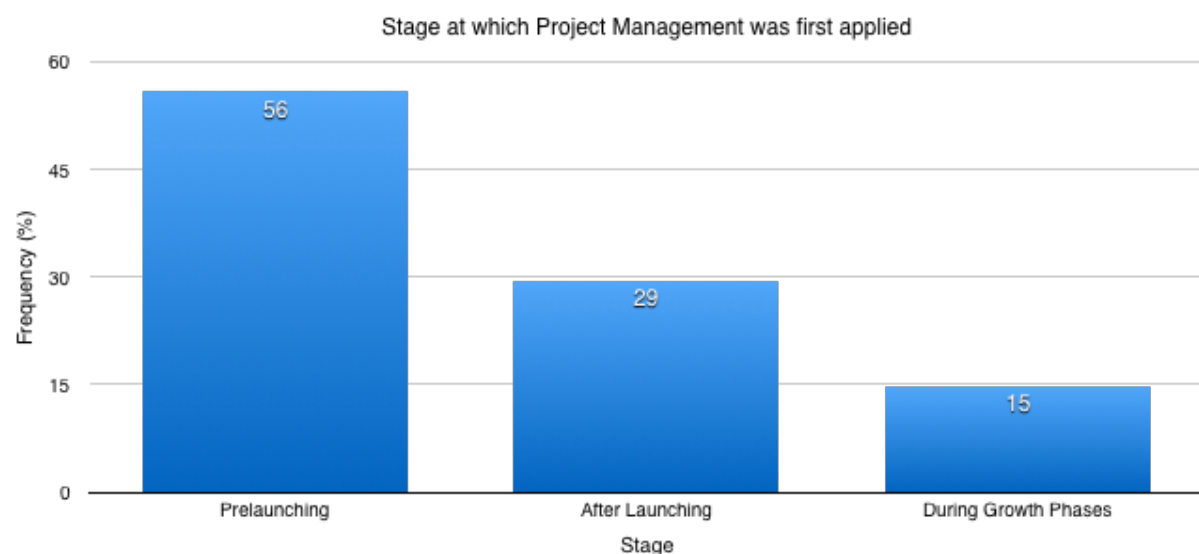


Figure 22 shows the stage at which project management was applied

Figure [22] shows that 56% of the respondents started using project management tools/ methodologies in the prelaunching phases during the planning phases, 29% started using them after launching phase during daily operations and the last 15% started using them during growth phases, treating development processes as a project.

Project Management System Scalability to startups' growth

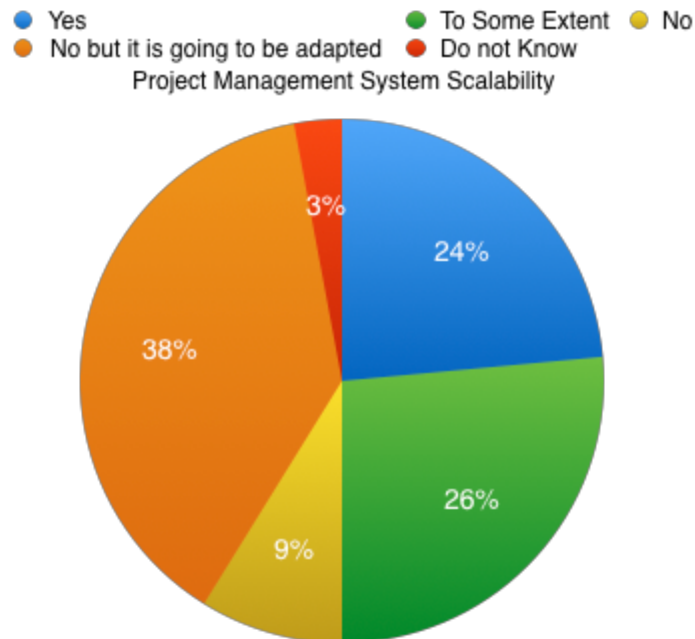


Figure 23 shows project management system scalability to company's growth

Figure [23] shows whether project management system is scalable to company's growth. The biggest share of respondents (38%) said that it is not scalable but is going to be adapted according to each phase. 26% of the respondents said that it is scalable to some extent, 9% said it is not, 3% do not know whether it is scalable or not and 24% think it is scalable. Therefore we can say that 76% have to work on the project management system in order to accompany the company's growth.

Reasons behind not applying project management

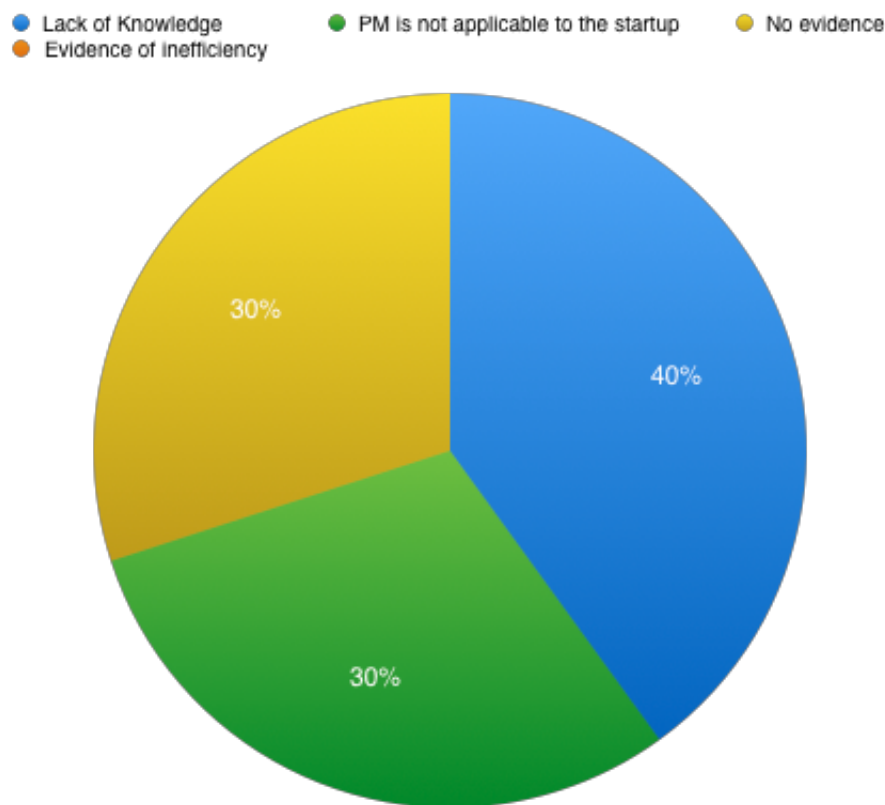


Figure 24 shows the reasons behind not applying project management

Figure [24] shows that the greatest share of the respondents who do not apply project management, 40%, do not apply it due to their lack of knowledge of the project management practices, tools or methodologies, while 30% do not apply it because they claim that project management cannot be applied to a startup and the rest 30% do not apply it because they think it would not be useful even though they do not have an actual evidence of its inefficiency. It is worth mentioning that there was another option that said that project management is not applied because it has been tried and there is a proven inefficiency, that there is an evidence that it would not be useful for startups, and for this choice there were no respondents who chose it. Therefore, according to these findings we do not have a single proof of inefficiency of project management in the field of startups.

For the ones who have not used Project Management yet, will they start using project management in the future?

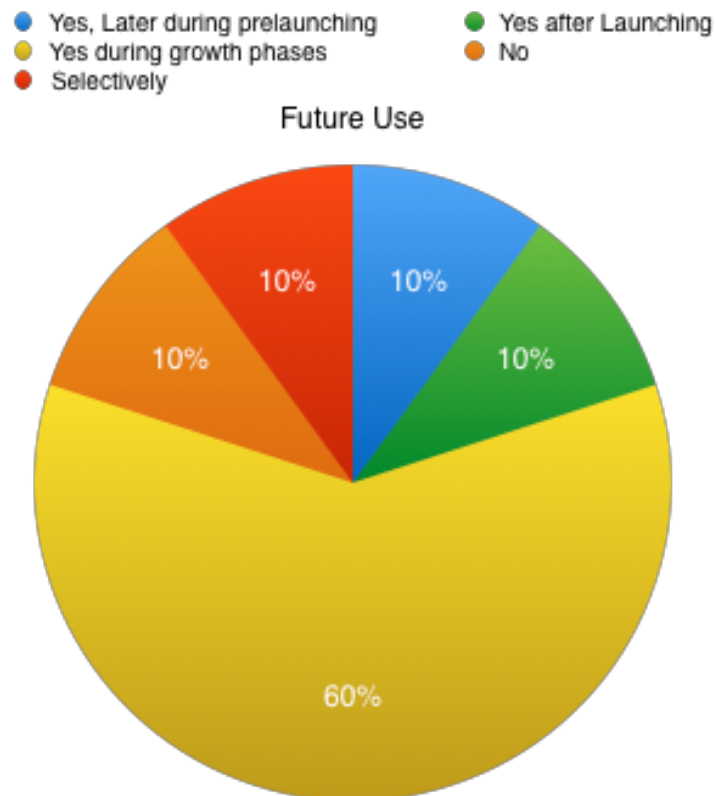


Figure 25 shows future application of project management

Figure [25] represents whether the cofounders who have not applied project management will start to apply it in the future or not. The figure shows that the majority of the responses 60% are willing to apply project management during the growth phases, 10% are willing to apply it later on during the prelaunching phase, 10% after launching during daily operations, 10% are willing to apply it selectively to certain aspects and the last 10% are not willing to apply project management practices/tools at all. To sum up, 90% of the respondents who do not apply project management are willing to apply it at some point in the future.

Do Respondents think they need further project management education or competencies?

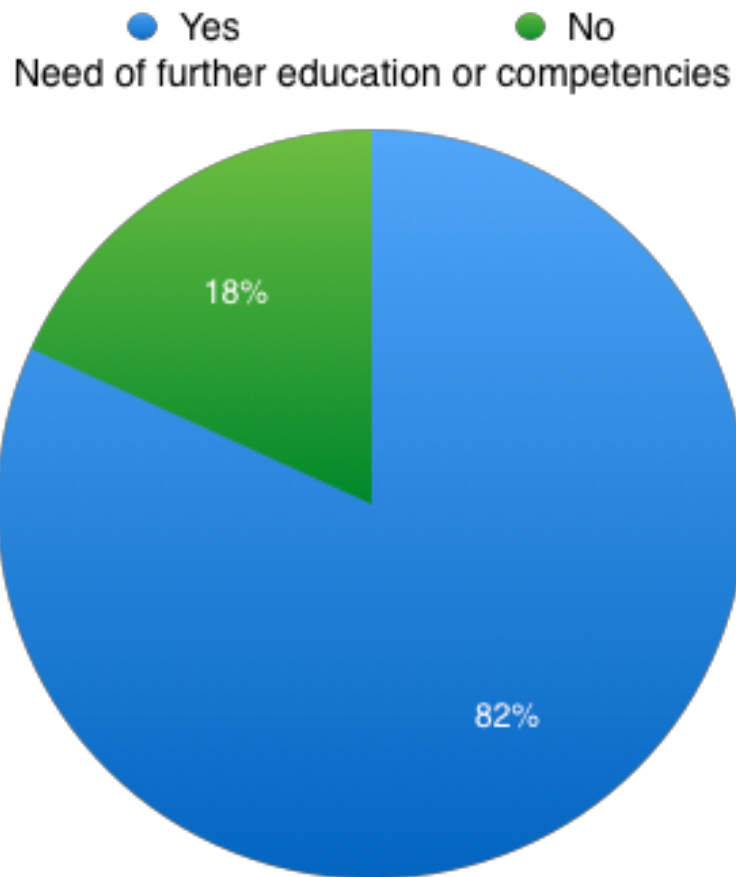


Figure 26 shows the need of further education and/or competencies in the field of project management

Figure [26] shows the percentage of the total respondents who need and do not need further education and/or competencies in project management. It shows that 82% of the total respondents think they need further education and/or competencies in project management and 18% who do not need.

4.3 Outliers

Seven of the responses were eliminated due to being employees who did not join the startup before launching and they were missing some important information and/or due to inconsistency of answers. Two of them included respondents who were employees and most of the answers were “I do not know”, other two did not mention the methodology of project management used. And the fifth eliminated response included inconsistent answers that were a bit contradicting to each other. Other 3 were eliminated because they were out of the geographical scope of the study, which included Italy and Egypt that were chosen based on where the author studies and her home country.

Another outlier, which was not eliminated, was a cofounder who answered to the question asking if the project management system is scalable to accompany company's growth as "I do not know" which also has to be analysed. This respondent had a professional background in project management, he/she does apply Agile project management in his/her startup, but does not know if the system is scalable to accompany the company's growth, there could be various reasons, excluding lack of project management practices knowledge because he answered that he did not need further education or competencies. One of the reasons could be the fast changing environment in startups.

4.4 Statistical Analysis

4.4.1 Applying Levene's Test

Levene's test is applied in order to test for variance homogeneity, which is one of the assumptions for ANOVA .

Following are the results of Levene Test regarding groups of Italy and Egypt

Table 2 show the results from the Levene's Test regarding Country Factor

Descriptives								
SCALEAPP								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Italy	26	2.1154	.65280	.12803	1.8517	2.3791	1.00	3.00
Egypt	18	1.8333	.70711	.16667	1.4817	2.1850	1.00	3.00
Total	44	2.0000	.68199	.10281	1.7927	2.2073	1.00	3.00

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
SCALEAPP	Based on Mean	.364	1	42	.549
	Based on Median	.244	1	42	.624
	Based on Median and with adjusted df	.244	1	41.982	.624
	Based on trimmed mean	.379	1	42	.541

Comment: p-value is greater than 0.05 which verifies the homogeneity of variances and thus ANOVA can be applied to these data.

Table 3 show the results from the Levene's Test regarding Degree of Knowledge

Descriptives								
SCALEAPP								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
No Previous Knowledge	11	2.3636	.50452	.15212	2.0247	2.7026	2.00	3.00
Professional only or educational only	18	2.0000	.76696	.18078	1.6186	2.3814	1.00	3.00
Both Professional and Educational	8	1.6250	.51755	.18298	1.1923	2.0577	1.00	2.00
Certified	7	1.8571	.69007	.26082	1.2189	2.4953	1.00	3.00
Total	44	2.0000	.68199	.10281	1.7927	2.2073	1.00	3.00

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
SCALEAPP	Based on Mean	.175	3	40	.913
	Based on Median	.416	3	40	.743
	Based on Median and with adjusted df	.416	3	39.944	.743
	Based on trimmed mean	.185	3	40	.906

Comment: p-value is greater than 0.05 which verifies the homogeneity of variances and this means that these data can be analysed using ANOVA.

4.4.2 ANOVA

Table 4 Shows Levene test done on both variables

Levene's Test of Equality of Error Variances^{a,b}

		Levene Statistic	df1	df2	Sig.
SCALEAPP	Based on Mean	1.579	7	36	.173
	Based on Median	.716	7	36	.659
	Based on Median and with adjusted df	.716	7	34.454	.659
	Based on trimmed mean	1.652	7	36	.152

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Dependent variable: SCALEAPP

b. Design: Intercept + Country + SCALEPMBG + Country * SCALEPMBG

Table 5 shows results from ANOVA test

Tests of Between-Subjects Effects

Dependent Variable: SCALEAPP

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	4.308 ^a	7	.615	1.412	.231	.215
Intercept	126.693	1	126.693	290.648	.000	.890
Country	.709	1	.709	1.627	.210	.043
SCALEPMBG	3.085	3	1.028	2.359	.088	.164
Country * SCALEPMBG	.665	3	.222	.508	.679	.041
Error	15.692	36	.436			
Total	196.000	44				
Corrected Total	20.000	43				

a. R Squared = .215 (Adjusted R Squared = .063)

Regarding Levene's Test, the p-value is greater than 0.05, which means that the homogeneity of variances is verified.

Comment: Regarding the ANOVA, all the p-values are greater than 0.05, as shown in the previous table, p-value for country variable is equal to 0.210, for the project management background, it is equal to 0.088 and for the Interaction effect is 0.679. This means that the null hypothesis can be verified and thus there is no statistical significant difference regarding the application of project management, between Egypt and Italy and the degree of knowledge of Project Management. This

means that the project management applicant is independent from the degree of knowledge and country, separately as well as both factors combined.

5. Discussion, Interpretation and Conclusion

Accuracy of Results

As seen in the results, the majority of the respondents were cofounders, and the ones who were not cofounders were chief executive officers, thus they are all from the top management which ensures that they have the enough information about the startup to fill in the survey. The majority of the startups investigated, almost half of them, were in the growth phase which makes the results more accurate since they have already passed by all the phases and are aware of what does or does not work.

The Startup Cofounders

Many cofounders tend to have few partners, 93% of the startups had fewer than 6 cofounders. More than half of the cofounders (70%) have both managerial and technical background which is obviously very important so that the ones who have a technical background follows up with the technical work and the ones with the managerial background manages the work based on methodologies that proved to be efficient. The ones who have only managerial background hire someone at early stages who follow up with all the work, similar to the Wikipedia case who hired only one employee who did all the work on his own. While the ones who have only technical background probably should hire a project manager who can manage the timelines and the resources.

Project Management Knowledge

Regarding the previous knowledge of project management, as shown in the results the biggest share goes to having either educational background only or professional background only, so most of them either only studied project management but did not apply it in their jobs, or only learnt it during working with it but did not study it. The second biggest share goes to having no previous knowledge of project management at all, neither professional nor educational, and the percentage of those is not a low one, it's 25%. Then cofounders who have both educational and professional come next followed by certified practitioners. It is worth mentioning that the results showed more certified practitioners in Egypt than in Italy, which can be justified as in emerging or developing countries, practitioners tend to seek certifications more than in developed countries, and this could be because professionals, owners and multinational companies in emerging countries look for proof of competencies, because maybe they do not trust local competencies. The statistical results showed

that the project management application is not a factor that affects the project management applications in startups, but could be if we take a significance level higher than 0.05. Majority of the respondents mentioned that they do need further education or competencies in project management which suggests that universities should work more on adding project management courses in relevant fields like engineering and business

The Application of Project Management Methodologies

The results of this research have shown that most of the cofounders do apply project management during different phases. The majority of respondents do apply project management selectively in certain aspects. The percentages of respondents who apply project management and who do not are exactly equal, however, a higher percentage from Egypt apply the formal methodologies of project management. Regarding the ones who do not apply it, the results showed a lower percentage from Egypt (less than half the ones in Italy). This validates our hypothesis that project management is actually applied in startups. Regarding the applied methodology which was actually expected, the predictive methodology was the least used one, most of the respondents who do apply project management apply the adaptive methodologies like agile, which makes perfect sense because agile project management shares a lot with lean startup, it is all about reducing extra work and scrap. There were some respondents that mentioned that they used a combination of both methodologies which is probably due to some external factors, meaning that startups who work in an incubator or an accelerator should follow some rules set by the incubators and accelerators, meaning that they have some deadlines that they have to fulfill, which can make them apply some of the methods of predictive methodologies like planning and risk management in order to be able to meet the deadlines and convince investors to invest in their projects, but at the same time, within the team, they use agile project management in order to achieve the goals of the startups, for instance, during the development of the minimum viable product. All of this can be confirmed by the results presenting the cofounders responses when they were asked about the factors that they think best contribute to the success of the startup. The highest percentages of the responses go to flexibility, iterations to ensure market fit and planning, which justify all the interpretations done before. Flexibility is ensured by agile methodologies, since the work is divided into small increments and feedbacks are collected very frequently in order to reduce rework and save time, then these feedbacks have to be worked on to ensure that the final product is what is actually required, and basically that is the second factor. Finally, planning is probably for the sake of intermediaries including incubators, accelerators and investors, which at least one of them is one of the main reasons why any startup succeeds. In order to confirm these interpretations, respondents mentioned how project management added to the startup and the responses included many factors but the majority chose time saving, being more scope oriented and higher efficiency of work. As mentioned before, time saving is ensured by both planning in case predictive methods are used or by having

less rework in case of using agile project management, more scope oriented is ensured by all the feedbacks taken on frequent basis and higher efficiency of work which results in better quality and less time is exactly the same thing that was just mentioned. These results mean that the hypothesis was validated, the research question was answered and all the interpretations made sense since we can connect all the factors with the project management tools. It is worth mentioning that there has not been a single evidence of project management inefficiency.

Project Management System Scalability

Regarding the project management system and its scalability to accompany the company's growth, the highest percentage of the respondents said that it is not scalable but is going to be adapted later, this makes perfect sense and is actually consistent with the previous results of the used methodologies, if they use adaptive methodologies, they need to adapt them differently to each phase to ensure achieving the desired goals or targets because there is not one system that works perfectly for everything but at least they are aware that different stages required different systems.

Reasons Behind Not applying Project Management Methodologies

For the respondents who do not apply project management, the highest percentage mentioned that they lacked the knowledge, this makes sense because if you do not have the knowledge, you will not know how to apply it. This is because whenever project management is heard, people think of scheduling, risk management, cost analysis since not everyone is aware of the adaptive methodologies and they probably think that the predictive methodologies would not be very effective and would not add much to the startup. This can be confirmed by knowing that the majority of the cofounders who did not apply project management methodologies yet plan to use it in the future during the growth phases, which is when they plan to expand their markets so they plan to treat the development as a project with a certain timeline and resources and cost constraints.

Implications for Researchers and Practitioners

The research results confirmed that project management methodologies especially the adaptive methodologies are used in the startups field but still the literature is not enough to know which methodologies and tools are of best fit to each phase. After this research we have a data set that includes the entrepreneurs' level of knowledge of project management and the efficiency of project management in the field of startup. Future research has to go in depth to explore the tools that can be used for each phase, extend the research globally and find other factors that may affect the application of project management.

For practitioners, the results showed that the highest percentage of entrepreneurs who applied project management started applying it in the pre-launching phases during planning and developing

the minimum viable product. Thus, entrepreneurs should start considering hiring a project manager at a very early stage so that they have a team member who has enough knowledge in project management and who knows how to apply different methodologies or tools in different phases and situations.

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Annex: Survey

Investigating whether project management tools are useful in start-ups

Dear Participant,

I am Esraa Khafagy, a master student in Politecnico di Torino. My master thesis is about investigating whether project management is useful in start ups. Researchers claim that project management and entrepreneurship are connected in practice. The objective of this survey is to validate the hypothesis namely in start ups and to extend the connection between project and management to theory. The following survey helps to get the hypothesis validated or annulled by getting to know whether start ups apply project management, if yes, how it helps and if no, what the possible reason(s) could be and if the previous knowledge of project management affects the application of project management. Anyone who (co-)founded or works in a start-up can participate in this study.

If you agree to take part in this study, you will be asked to complete an online survey that will take from 10-15 minutes. In order to ensure data protection and privacy, the survey does not ask about any personal information except for the email and phone number, which would not be shared anywhere or with anyone, but would be of help if further information would be needed for further analysis but feel free to not share it if you don't feel comfortable doing so. There is no compensation for responding nor is there any known risk. If you decide to participate, please proceed to the following informed consent form and answer the questions. Participation is strictly voluntary. If you agree to be in the study, but later change your mind, you may drop out at any time. There are no penalties or consequences of any kind if you decide that you do not want to participate.

Thank you for participating as a research participant in the present study. All the information shared will be used for educational purposes only and would be used for thesis conclusion at Politecnico di Torino. If you have any questions regarding this study, please feel free to ask the researcher at this time. Please print or take a copy of this page for your records.

Yours sincerely,
Esraa Khafagy
Master Degree student at Politecnico di Torino
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eakhafagy@gmail.com

* Required

1. **By clicking “I agree” below you are indicating that you have read this consent form and agree to participate in this research study. ***

Mark only one oval.

☐ I agree

Contact Information

2. **Phone Number**
3. **E-mail**

Position of the participant

4. **Position ***

Mark only one oval.

☐ (Co-)founder
☐ Marketing manager
☐ Developer
☐ Other:

About the Start-up

5. **The field of the startup? ***

Mark only one oval.

6. **Location of the start-up ***

Mark only one oval.

7. **Which stage of the cycle is the start up? ***

Mark only one oval.

- ☐ Minimum Viable Product
- ☐ Product/Market fit
- ☐ Maturity
- ☐ Other:

8. **Duration of incubation ***

Mark only one oval.

- ☐ less than 6 months
- ☐ 6 to 12 months
- ☐ 12 to 18 months
- ☐ 18 months to 24 months
- ☐ more than 2 years

9. **Duration in an accelerator ***

Mark only one oval.

- ☐ 1 to 3 months
- ☐ 4 to 6 months
- ☐ 6 to 12 months
- ☐ more than 12 months
- ☐ Other:

(Co-)founders

10. **Number of (Co-founders) ***

Mark only one oval.

- ☐ 2 or less
- ☐ 3 to 5
- ☐ more than 5

11. **Do the (co-)founders have technical or managerial background? *** *Mark only one oval.*

- ☐ Technical
- ☐ Managerial
- ☐ Technical and managerial
- ☐ Other:

12. **Does any of the (co-)founders have an educational or professional background in Project Management? ***

Mark only one oval.

- ☐ Yes, Educational
- ☐ Yes, Professional
- ☐ Yes, both Educational and Professional
- ☐ No previous knowledge of Project Management
- ☐ Other:

Project Management Role in Start-ups

13. **Do you use Project Management in the pre-launching and launching phases of a start up? ***

Mark only one oval.

- ☐ Yes *Skip to question 14.*
- ☐ No *Skip to question 19.*
- ☐ To some extent *Skip to question 14.*

Benefits of Project Management

14. **What methodologies did you use? ***

Mark only one oval.

- ☐ Waterfall
- ☐ Agile
- ☐ Combination of waterfall and agile
- ☐ Other:

15. **How do you apply project management? ***

Mark only one oval.

- ☐ Consider start up as a whole as a project
- ☐ Consider each phase as a project which can be subdivided into smaller projects
- ☐ Consider the start up as whole project which is divided into smaller projects
- ☐ Other: _____

16. **What did project management add to the start up? ***

Check all that apply.

- ☐ Reduces costs
- ☐ Saves time
- ☐ Flexibility
- ☐ Better team integration
- ☐ Be more scope-oriented
-
- ☐ More efficient use of resources
- ☐ Increases customer satisfaction
- ☐ Better risk management
- ☐

Other:

17. **Is the current system of project management scalable to accompany the company's growth?** *

Mark only one oval.

- ☐ Yes
☐ No
☐ To some extent
☐ Other:

18. **Do you master Project management practices?** *

Mark only one oval.

- ☐ Yes *Skip to question 20.*
☐ No *Skip to question 20.*
☐ Other:

Skip to question 20.

Reasons behind not using Project Management

19. **Why don't you apply project management?** *

Mark only one oval.

- ☐ You have an evidence of being of no addition to the startup *Skip to question 20.*
☐ You did not test it but you lack the knowledge of applying project management practices *Skip to question 20.*
☐ Did not try, but just think it wouldn't be of an addition to the startup with no actual evidence or that there is a better way to work with *Skip to question 20.*
☐ Other: _____ *Skip to question 20.*

Further education or competencies

20. **Do you need further education or competencies in Project Management?** * *Mark only one oval.*

- ☐ Yes
☐ No
☐ Other:

21. **If you do not currently use Project Management, do you plan to use it in the future?** * *Mark only one oval.*

- ☐ Yes
☐ No
☐ Selectively, in certain aspects/activities

22. **When do you plan to use project management?** *

Mark only one oval.

- ☐ After launching during daily operations
☐ Later during the prelaunching phase

☐ During growth phases

☐ Other: