

Are lean startups simply better at networking?

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Work in progress

Abstract

In spite of their acknowledged importance to future economic growth, the reasons behind the success and failure of startups remain largely mysterious. The lean start up movement that encourages firms to remain agile and regularly test their market hypotheses has grown rapidly over the past five years. It offers the promise of a higher success rate for new ventures, despite growing levels of uncertainty linked to accelerating technological change in the digital sphere. The adoption of lean startup practices within innovative initiatives of firms of different sizes testifies to its attractiveness for business people, albeit not necessarily to its effectiveness in increasing the success of startups.

This preliminary study investigates the extent to which recent practices emerging from the lean startup movement are linked to existing insights generated by networking theory as it has been applied to new ventures. An exploratory approach was adopted to investigate how different types of startup environments lend themselves to different practices. Three experts in the field of entrepreneurship and seven entrepreneurs were interviewed. Three of these startups were successful while two were not and the success of the final two remains uncertain. Initial analysis reveals that the performance of entrepreneurs can conceivably be improved by adopting the lean startup practices that are in line with the findings network research. However, such practices can be restricted by technological considerations linked to the sector involved but also by network constraints that do not appear on the agenda of the lean startup movement. In addition, not all entrepreneurs are equally capable of adopting and applying lean startup principles.

Longitudinal research on the development of startups that are exposed to the lean startup principles is recommended compared to those who are not. The conclusions of such research could, in particular, prove useful for guiding startups in the rapidly-evolving high-tech sector.

Key words:

Entrepreneurship, lean startup, network.

INTRODUCTION

Few topics appear as uncontroversial in today's economies as the importance of entrepreneurship. Europe's Entrepreneurship 2020 Action Plan, for example, explains that "to bring Europe back to growth and higher levels of employment, Europe needs more entrepreneurs" (European Commission, 2013, p. 3). In the United States, the emphasis in the Startup America initiative is to "accelerate high-growth entrepreneurship" (US Department of Commerce, 2012, p.7-1) while in emerging economies, it is argued that "entrepreneurship matter, and even more so when a country reaches the knowledge frontier" (Naudé and Szirmai, 2013 p.11).

While entrepreneurship is universally acclaimed, however, there is more ambiguity about the rate of success of new ventures. Data from the US Bureau of Labour, based on a five year study of 6,613 startups found that 60% of them survived until the third year of existence and over one third until their tenth year¹. Such data does not indicate the success level or surviving firms, however, or the reasons for the disappearance of those that no longer exist. In France, the state body responsible for supporting innovation conducted a study of 5,500 firms selected for funding between 1998 and 2007 due to technological developments considered innovation and the survival rate was an impressive 85%. The study identified the existence of a significant "death valley" at the 3-5 year period (Oséo, 2012). However, in a study of over 2,000 US companies in receipt of significant venture capital between 2004 and 2010, it emerged that investors in approximately one third of the sample lost all their money but that over 90% of the investments failed to achieve their projected return on investment (Gage, 2012). This work is used in a *Harvard Business Review* article to claim that "75% of all startups fail" (Blank, 2013, p.4).

A clear consequence of the growing interest in startups and or attempts to improve their success rate is the emergence of an ecosystem of support that includes private and incubators and accelerators, venture capitalists and business angels and a variety of agencies and consultants to study, aid and coach budding entrepreneurs in their quest to become one of the success stories. In recent years, this ecosystem has become the breeding ground for a host of new approaches to entrepreneurship and, in particular, since 2009, the "lean startup" movement has been spreading and the adoption of its principles and methods has been exponential.

Lean startups popularity coincides with the acceleration of the growth of the digital economy and the wealth of new Internet-based solutions in all areas of business and consumer markets and the fathers of the lean startup movement are based in Silicon Valley. Its impact, however, has been spreading more widely and is lean startup seminars are now commonplace in large firms who wish to improve the productivity of their internal R&D activities.

LEAN STARTUP

Commentators in the high-tech area characterize the 21st century as a dramatically different environment for firms to what has previously been experienced. Open-source software and cloud services have radically reduced the costs of developing electronic services. Potential clients have an exponentially growing choice of solutions available and markets, as a result,

¹See chart 3. Survival rates of establishments, by year started and number of years since starting, 1994-2010. <http://www.bls.gov/bdm/entrepreneurship/entrepreneurship.htm>, accessed 23 April 2014.

have become far more uncertain. One commentator has termed the period on of “Lego innovation”, “when highly valuable and significant advances in technology are achieved by imaginatively combining components and software available to everyone” (Colvin, 2014, p.22). For the proponents of a new approach to innovation studies, the disruption must also include our constructs for understanding business overall and entrepreneurship in particular. One of the founders of the lean startup approach thus claims that “the first hundred years of management education focused on building strategies and tools that formalized execution and efficiency for existing businesses”. Now, however, according to proponents of the lean startup movement, companies have to deal with “the forces of continual disruption” (Blank, 2013a) and management models must evolve accordingly.

The lean startup method claims to reduce the risk of new ventures by proposing a form of management that is both visionary in relation to product development and analytical in terms of how to develop the optimal solution. The movement emerged from the work of two California-based “serial entrepreneurs”. Steve Blank was the first to highlight the shortcomings of the classical management approach in relation to managing startups. He had co-founded or worked for eight high-tech startups and, as a guest lecturer in Californian universities, he leveraged this experience to emphasize the need for a new vision for startups and a far greater emphasis on client orientation in the development of new products. His book, *The Four Steps to the Epiphany* (Blank, 2013b), insists that the commercial and marketing functions are equally as important as the engineering function in the development of new products. One of Blank’s pupils, Eric Ries, applies and deepens his understanding of these principles in a series of startups that he managed and financed. His book, *The Lean Startup. How Today’s Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses* (Ries, 2011) formalizes the Lean Startup approach and describes the methods to be adopted by firms who wish to innovate in a sufficiently “agile” manner. While the techniques presented were developed within startups in the high-tech sector and in particular in the development of software, both authors suggest that the lean startup vision can be usefully adopted in large firms who want to innovate in new areas.

Ries defines “Lean Startup” as “the application of lean thinking to the process of innovation” (Ries, 2011, p.6). His “burgeoning management philosophy” is outlined as aiming “to help new companies make speedier decisions by taking a more disciplined approach to testing products and ideas and using the resulting customer feedback. Instead of building a software product over months and jamming multiple features into the product, for instance, Mr. Ries advocates continually deploying new software to test whether customers actually want a particular feature. That enables a startup to more quickly decide if the feature is a waste of time to build and if so, to move on. “Lean isn’t about being cheap [but is about] being less wasteful and still doing things that are big,” says Mr. Ries, a serial entrepreneur” (Tam, 2010).

Ries argues that, despite the fact that the movement has its roots in the software sector; its practices can be adopted in startups in all areas and also in innovative initiatives in firms of all sizes.

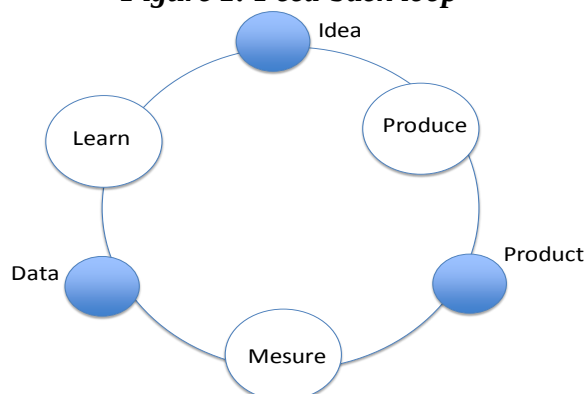
VISION AND TOOLS OF THE LEAN STARTUP

A startup is built on an idea that is made up of three elements (Ries, 2011):

1. A product
2. A business model
3. A motor for growth

The value of a startup is not a result of the quantity of what it produces but of the validation of learning that allows it to generate a sustainable activity. The objective of a “lean startup” is to put together a long-term business by using scientific criteria to experiment in a systematic way in order to pilot the innovation process with an accelerated feed-back loop (Figure 1).

Figure 1: Feed-back loop



Source: Ries, 2011, p.84.

Lean startups must thus function as learning structures, as well as innovating structure and each product, each function and each marketing activity should be analyzed as scientifically as possible to obtain “real-time” validation of hypothesis. In addition, two other elements should be constantly questioned – the value proposition and the growth hypothesis. Ries uses the comparison of Facebook and its competitors on university campuses in 2004 to illustrate these elements: 50% of campus Internet users were consulting the site on a daily basis, thus validating the value proposition and it was the fastest growing of its group, thus validating the growth hypothesis.

MINIMUM VIABLE PRODUCT

While established firms in relatively stable markets can focus on producing the quality of product required by customers, new firms are not in a position to do so, as they do not yet have a clear idea of who the customer is. The minimum viable product (MVP) is proposed as a means by which lean startups can begin the learning by feedback process as early as possible. The minimum viable product is not developed with a view to making design or technological decisions but in order to verify the underlying assumptions of the value proposition. The DropBox example is used to illustrate the concept. Its creator simply produced a video of what he had in mind with a view to explaining it clearly to technophiles. Within 24 hours after posting the video, the number of visitors to the company’s website grew from 5,000 to 75,000.

MANAGING INNOVATION ANALYTICALLY

Lean startups test each step of the design and development of the product with potential clients with a three stage methodology:

1. The minimum viable product is used to gain real-world feedback
2. Adaptations are made to improve the basic offering
3. Potential changes are tested quickly in an analytical way with both upstream and downstream groups to evaluate which ones are most promising. Quantitative testing is accompanied by qualitative measures to understand the results.

To speed up these three phases, lean startups are encouraged to work with small batches so that the speed of the “produce-measure-learn” feedback loop is optimal. Getting real-world user feedback more rapidly is considered to be a key competitive advantage. Based on the results of these investigations, lean startups must decide whether to persevere with the original idea or to “pivot”. Pivoting can involve focusing on functions of the minimum viable product that were particularly appreciated, changing the segment of client targeted, changing the platform or the growth model.

BUSINESS CANVAS

In addition to the concepts of minimum viable product and pivoting, Blank (2013a) uses Ostwalter and Pigneur’s concept of a business canvas (Ostwalder and Pigneur, 2010) as a more suitable framework for guiding decisions taken by startups than a traditional business plan (Figure 2).

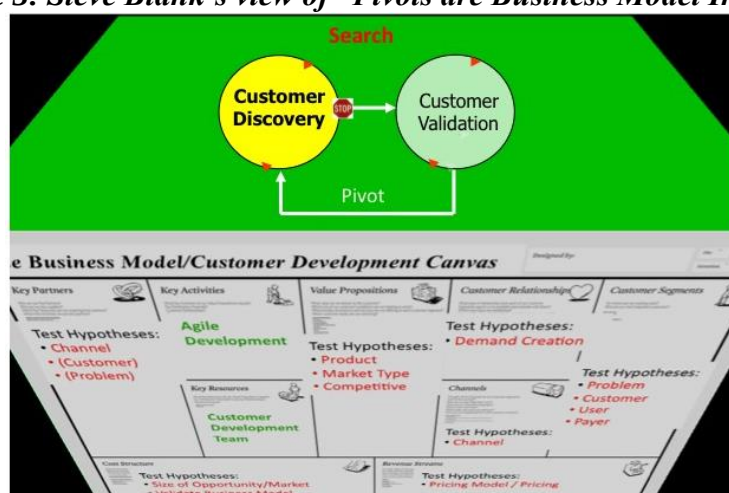
Figure 2: Lean startup business canvas

<i>Key partners</i>	<i>Key activities</i>	<i>Value propositions</i>	<i>Customer relationships</i>	<i>Customer segments</i>
Who are our key partners? Who are our key suppliers? Which key resources are we acquiring from our partners? Which key activities do partners perform?	What key activities do our value propositions require? Our distribution channels? Customer relationships Revenue streams?	What value do we deliver to customers? Which one of our customers’ problems are we helping to solve? What bundle of products and services are we offering to each segment?	How do we get, keep, and grow customers? Which customer relationships have we established? How are they integrated with the rest of our business model? How costly are they?	For whom are we creating value? Who are our most important customers? What are the customer archetypes?
	<i>Key resources</i>	Which customer needs are we satisfying? What is the minimum viable product?	<i>Channels</i>	
	What key resources do our value propositions require? Our distribution channels? Customer relationships Revenue streams?	Through which channels do our customer segments want to be reached? How do other companies reach them now? Which ones work best? Which ones are most cost-efficient? How are we integrating them with customer routines?		
<i>Cost structure</i>			<i>Revenue streams</i>	
What are the most important costs inherent in our business model? Which key resources are most expensive? Which key activities are most expensive?			For what value are our customers really willing to pay? For what do they currently pay? What is the revenue model? What are the pricing tactics?	

Source: Blank, 2013a, p.4, adopted from Ostwalder and Pigneur, 2010, pp.15-42.

Steve Blank (2010) ties the Ostwalder and Pigneur business model canvas to the idea of customer development to explain the value of “pivoting” in order to clarify unknown elements among the nine business model elements (Figure 3).

Figure 3: Steve Blank's view of "Pivots are Business Model Insights"



Source: Blank, 2010

NETWORK-CENTRIC APPROACHES TO STUDYING ENTREPRENEURSHIP

Traditional approaches to studying entrepreneurship have tended to emphasize the ability of the firm's managers to adopt a specific set of behaviors (notably information gathering) that will reduce technological, competitive and market uncertainty and, in so doing, lead to enlightened decisions. This 'internal perspective' on new business formation has been criticized as oversimplifying new venture creation and development as a "one-away process from opportunity discovery to opportunity exploitation by individual entrepreneurs" (Ciabush and al, 2012, p.220). It is argued that focusing too much on internal capabilities means that the external network of the startup is neglected, despite its impact on the future success of the venture.

For researchers whose interest in networks is rooted in the IMP tradition, however, the determining features of the success of new ventures are not located within the boundaries of the firm itself. Based on their longitudinal case study of an Italian car distributor's successful launch of a Chinese entry-level four wheel drive, Ciabusch et al, (2012) argue, for example that "collective action becomes more important for a venture's development and outcomes than individual entrepreneurial acts" (p.227). What other researcher consider as 'independent variables' in models to measure entrepreneurial success factors (Lee et al, 2001) are viewed as "outcomes of the interaction process in relationships with others and are, therefore, constantly evolving" (Ciabusch et al, 2012, p.227).

The implications of such a significant shift in the focal point of studying entrepreneurship are quite significant as the authors point out in their introduction. In examining in detail the emerging network of a new venture over a period of 18 months, the authors were able to highlight three key features of how new businesses assemble the necessary resources and how unpredictable and collective the process turns out to be:

1. "A new business's extensive interaction with other firms across business boundaries necessary when assembling the required resources makes the resource assembly effort emergent, ambiguous, and subject to constant change".

2. “A new business’s need to connect with the resource constellation makes new business formation costly and nonlinear because resource assembly is not controllable unilaterally but requires extensive interaction with other firms”.
3. “The development of new business opportunities is collective and requires co-action. Additionally the case study suggests that new business formation is always an act of organizing the market” (Ciabuschi et al, 2012, p. 221).

Aaboen et al (2013) conducted a longitudinal study of networks and entrepreneurship and relate the findings of in-depth interviews with three B2B firms in both 2009 and 2012, with the use of network drawings of their relationships. Three interaction patterns were outlined as they are considered to be representative of what was found in the larger study of eight firms:

1. Interactions that are used to develop new features of the product
 2. Interactions that develop new customer relationships
 3. Interactions that inspire and shape new strategies that “work through other actors”
- (Aaboen et al, 2013, p.1039).

The authors conclude that the new ventures in the study progressed, over time, from a focus on ‘what to sell’ to become more interested in ‘who to sell to’ and, subsequently, ‘how to build a position in the network’. Strategic practices are viewed as being more sequential than what has been observed in earlier studies and as emerging “over time and in interaction with customers and other actors the companies have changed their ideas about how to strategize in light of their current relationships and network” (Aaboen, 2013, p.1039). The network was thus not seen as an environment for the firm but more fundamentally what makes up the new venture’s access to resources and as part of what determines its “strategizing”.

La Rocca et al. (2013) focus specifically on the question of initial relationship development in new business ventures and adopt a case study approach to study the development of a new contract manufacturing business within a Swiss pharmaceutical firm. The analysis of the evolution of three specific relationships highlight how such developments are means of coping with problems, how they involve multiple actors in order to develop the offering and how this varies between customers and over time. The research concludes that two key managerial tasks are involved in building relationships during the phase of initial venture creation in a B2B environment: relating the venture to the existing network and supporting effective interaction within relationships.

The managerial task of relating involves two elements:

1. Combining “a varied and often complex set of elements into a defined offering and relationship” (La Rocca et al., 2013, p.1030).
2. Adapting to emerging issues both internal to the relationships, such as performance and price, and those external to the relationship such as other relationships with competitors or suppliers.

The task of managing the interaction between individuals in the new venture and multiple potential contacts within the firms contacted initially is seen to be made up of three elements:

1. Framing value formation to take into consideration that costs and benefits will occur at different times and will have an impact on the investment pattern to be followed.
2. Experimentation to reduce the uncertainty linked to the limited experience and resources of the new venture and the novelty of the proposed solution for the potential buyer.

3. Developing interaction strategies requires new ventures to make choices. It is highlighted that “the two parties in emerging relationships need to have a clear interaction strategy and persistence in seeking to develop a relationship in line with their own intentions in the face of pressures from an often powerful counterpart” (La Rocca et al., 2013, p.1030, based on Helfat & Peteraf, 2003). These choices are threefold:
 - a. Whether to confront counterparts or to conform to aspects of interaction that are requested.
 - b. Whether to create a new offering or set of relationships for a counterpart or to adapt existing resources.
 - c. Whether to coerce a counterpart in a specific technical or operational direction or whether to concede to the counterpart’s position on such issues. New ventures tend to have little leeway in this respect, however.

Finally the authors argue that these initial relationship building activities become routine for the new venture and have significant consequences on the future capabilities of the emerging business.

Naudé et al. (2014) adopted a more quantitative approach to investigate the influence of network effects on SME performance. Structural equation modeling and social network analysis was used to analyze the responses of 227 CEOs of Iranian IT small firms to a questionnaire that investigated how network structure and external networking behavior mediated the impact on performance of their level of emotional intelligence and entrepreneurial style. The authors found that emotional intelligence had a strong impact on both network structure and external networking behavior and, subsequently, on performance. Entrepreneurial style, however, did not prove to be related to the mediating constructs and it is suggested that this was due to the turbulent context of the Iranian IT market and the limited nature of the opportunities available.

The positive link between network structure and performance of the SMEs studied is seen as a result of both elements of the construct. Successfully occupying a “structural hole” (Burt, 1992) involves attaining a position where the small firm owner is an intermediary between two otherwise unconnected actors in a network. Secondly, the actors who are connected via the small firm are, themselves, highly connected to others and this affords a higher level of “network betweenness centrality” to the small firm that links them.

PRELIMINARY RESEARCH QUESTIONS

The “lean startup” approach to entrepreneurship is not a research-driven approach, although an initiative, entitled the “Startup Genome project” has been created with the support of Steve Blank that aims “to increase the success rate of startups and accelerate [the] pace of innovation around the world by turning entrepreneurship into a science” (Startup Genome Report, 2011, p.3). The research is based on a sample of firms voluntarily participating in the construction of the database and its finding will thus require careful interpretation for theory building. Nonetheless, the pace at which the principles and practices of the lean startup has spread should intrigue academics interested in entrepreneurship. By offering entrepreneurs, particularly in the growing field of digital startups, a simple “tool box”, lean startup proponents appear to have tapped in to an unconscious, or latent, need among the startup community.

The network approach to entrepreneurship is, on the other hand, concerned with correctly analyzing the reality of how complex and unpredictable set of interactions are developed and evolve in a setting where many other interactions from the past have an influence. In such an approach, the ‘resources’ a firm possesses are only of use if they are perceived as such by another actor within the network. The object of an entrepreneurial study in the networking field is not the startup itself as a stand-alone actor capable of choosing what resources to accumulate but the dynamics of interaction among the range of relevant actors in the firm’s startup activity. The research methodology is far more qualitative and case-study based as a result. It is argued that, from a network perspective, “there are no nice neat solutions or standardized approaches to strategic networking success”, yet it is also conceded that “networks are built on variety, but despite this they do have systemic properties” (Håkansson and Ford, 2002, p.138).

The exploratory research presented here seeks to understand, using concrete case studies, how the concepts developed in the IMP literature can be applied to the growing adoption of “lean startup” business practices. As networks have been studying interaction in networks, their insights should conceivably enrich understanding of how “lean startup” practices can generate improved performance and what limits may exist for such improvements.

Conversely, the rapid adoption of lean startup practices may offer network researchers a significant opportunity to investigate the development of a large number of startups in an accelerated process. At the same time as the firms experiment with the concepts of lean startups, they are clearly engaging in network practices that have already been studied and, in part, explained. In this way, the research seeks to build “a bridge between tradition and innovation” (Cantù et al., 2013) by using empirical work that confronts the conceptual underpinnings of the network school with the rapid adoption of lean startup practices.

Comparing the key concepts outlined earlier from the lean startup approach to comparable findings from network-based research in the entrepreneurial field (Table 1) led to the development of a number of research questions to be explored by engaging with experts in the field of entrepreneurship and entrepreneurs themselves. Some of these research questions (column 3 of table 1) concern how the experience of lean startup practices could be used to enhance our understanding of entrepreneurial networking while other (column 4 of table 2) questions concern gaps in understanding of the potential limitations of lean startup practices in certain contexts, markets and networks.

Table 1: Research questions concerning lean startups and networks

<i>Lean startup concepts*</i>	<i>Comparable network concepts</i>	<i>Research questions Lean startup->network</i>	<i>Research questions Network->Lean startup</i>
Feedback loop (Ries, 2011) and validated learning	‘Relating’ as part of building initial relationships (La Rocca et al., 2013) - Combining - Adapting	Can ‘relating’ be improved by adopting validated learning techniques?	How do lean startups deal with the choices to be made between: - confronting and conforming? - coercion and concession? (La Rocca et al., 2013)?
Minimum viable product (MVP)	‘Experimentation’ as part of managing interaction (La Rocca et al., 2013)	Does the use of an MVP approach improve experimentation processes?	
Business canvas**	‘Framing value formation’ as part of managing interaction (La Rocca et al., 2013)	Does a formal business canvas approach make framing value more effective?	How can a firm fill out a canvas while so much remains uncertain and will only evolve with interactions that inspire and shape new strategies (Aaboen, 2013).
Pivoting	‘Interaction patterns’ to develop new features, relationships and strategies by working through other actors (Aaboen et al, 2013).	Can interaction patterns be accelerated? Does this improve overall performance of interactions?	How do lean startups deal with the choices to be made between developing a new offering or adapting existing resources (La Rocca et al., 2013)?
	Characteristics of entrepreneurs ‘emotional intelligence’ has an impact on network structure and performance		Are some entrepreneurs more susceptible to adopting lean startup practices? Are some market structures more amenable to lean startup practices?
	Small firms benefit from linking two unconnected actors, particularly if they have dense links elsewhere in their networks (Naudé et al, 2014).		Should (and can) lean startups consciously seeking out such ‘structural holes’ (Burt, 1992) during their feedback loops?

*adapted from Ries, 2011 and Blank, 2013b.

** originally devised by Ostwalder and Pigneur, 2010 and adopted by Blank, 2010.

PRELIMINARY RESEARCH METHODOLOGY

In-depth interviews were carried out in France between January and April 2014. An initial round of interviews was conducted with experts in the area of accompanying entrepreneurs, as it was felt that their accumulated experience would be beneficial to the design of the research. These experts were from three different backgrounds, reflecting the variety of stakeholders involved in the field of supporting entrepreneurship (Appendix 1). One was a venture capitalist with 12 years experience (E1), one was a manager in a regional incubator who had been working with startups for 13 years (E2) and one had worked for 7 years for a large firm (E3) who encouraged its employees to engage in startups via an internal incubator. Their cumulative experience covered over 200 startups with the majority linked to technological and, increasingly, digital innovation.

For an exploratory study, a convenience sample of heterogeneous startups was considered appropriate. In order to avoid selection bias, however, the level of success of the startups was varied. Such selection bias could be considered one of the flaws of entrepreneurship research as much work in the area is built on case studies and surveys of surviving firms (Denrell, 2005). Clearly the initiative by the lean-start up movement's proponents to build a database of firms who adhere to its principles will potentially suffer from such selection bias as it will, by definition, not include those firms who adopted lean startup methods but did not survive. More generally in the startup sector, venture capitalists "bury their dead very quietly. They emphasize the successes but they don't talk about the failures at all" (Gage, 2012). In choosing the sample, it was also considered important to have both digital startups and startups involved in other technologies and solutions.

The convenience sample of seven French firms (Appendix 1) thus includes firms who have succeeded, firms who have not and those who cannot yet be classified. There were two female founders in the sample and the age of respondents ranged from mid-twenties to mid-fifties. Through interacting with the ecosystem of entrepreneurship, each of the founders interviewed was aware of the lean startup movement and familiar with the basic concepts. None, however, had participated in a lean startup workshop.

Two of the three successful firms operate in the area of digital platforms. S1 has become a national leader in on-line technical courses with 20 employees. S3 was a "preferred partner" of Facebook and develops applications and other forms of communication for its B2B customers to interact with their B2C customers. It has both diversified into community management and other platforms such as Instagram and WeChat and has internationalized and has grown to employ 130 people in four countries in five years. S2 provides a mobile phone recycling service to telecom operators in four countries. It has 70 employees and uses "socially responsible" practices to develop partnerships that help the insertion of handicapped and disadvantaged workers. All three successful startups have raised capital during the early phases of their development.

In the group of two 'hesitant' startups, one has not yet moved beyond the phase of a single full-time employee, the founder and the second did not grow autonomously but ended up being integrated into the research laboratory of a large firm. H1 is a specialist programmer who works on an opportunistic basis on research projects in areas as varied as 3D programming for websites, robotics for photography and filming via drones. For the moment,

all work is done on a made-to-measure basis. H2 was created as a result of a successful technological development in micro-capsules within a state-funded laboratory. Finding the customer group with the appropriate need to utilize the technology proved difficult and the startup ended up being absorbed by a potential customer, eight years after its creation.

Both unsuccessful startups closed after failing to develop sufficient demand for a product or service that had, nonetheless, overcome technological challenges. U1 was a platform for delivering specialized classes to households but it could not gain traction in its B2C market and did not succeed in transferring to a B2B model. U2 had developed a measurement product that functioned well in one setting but did not manage to develop enough demand. Its alternative applications did not function for technological reasons. Both of these unsuccessful startups had received funding from the French state body for innovation. U2 had received additional funding from a regional authority that supports small firms and U1 had been chosen as a high-potential startup to benefit from additional support and coaching. U1 survived five years while U2 was closed after two years.

The approach to interviews was semi-structured and questions were broad and open-ended. Interviewees were asked to describe how their startup emerged and developed and to identify key periods and decisions. They were then asked to reflect specifically on who they would describe as actors with whom their interactions were particularly relevant and to explain why. Finally, they were questioned about whether the lean startup principles applied to their experiences. For experts, the interview structure was the same with more interviewees being asked to outline their perception of the importance and the effectiveness of both network and lean startup practices in their experience of working with startups. All interviews were recorded and transcribed. Preliminary analysis has been done through discussions among researchers to distill initial impressions and observations and define the major themes (Bryman and Bell, 2007).

RESULTS OF PRELIMINARY STUDY

All three experts had heard of the “lean startup” phenomenon. They acknowledged its pedagogical virtues, but were reluctant to see it as an all-encompassing solution for the difficulties that startups need to overcome. Three specific drawbacks were mentioned, which are linked to the network approaches to entrepreneurship. Firstly, E3 considers that it is dangerous to think that such a tool box can replace what larger firms have in terms of resources within their teams. Such expertise is, he believes, built up over time with many different types of experiences with different phases of the business cycle. Secondly, while E2 considers the “validated learning” of the lean startup method as a useful alternative to standard market research, E3 insists that the tools are only as good as the artisan that uses them and that an entrepreneur can apply such methods incorrectly. Finally, E3 recognizes the need for startups to be agile but feels that the idea of pivoting is not relevant to certain firms who need to invest in the development of technological resources before being in a position to engage with potential clients.

These three considerations were also found to be relevant in analysis of the case study interviews with startups. Firstly, what emerged as extremely important in the “success stories” was that the founders of these firms had established a significant series of relationships before launch. This is particularly striking in the case of S2, for example, as the upstream operational part of the business proved to be a key competitive advantage in later development and was

established while the founder was working as a consultant for firms. The firm's future clients were not his previous clients, but his operations partner was. This upstream relationship would clearly have been part of a network drawing (Aaboan, 2012) in the network approach. The lean startup approach could have included it in its business canvas as a 'key activity' but it is not clear that an inexperienced entrepreneur would have realized the potential of such a relationship. It is also possible that the resource would not have emerged as valuable without the investment of resources by S2 to develop the capabilities of the operation centers. Similarly for H1, without having a ready-made supply of content providers from the non-profit making period of the business development, the platform would have faced the classic "chicken and egg" dilemma. Both H1 and the content providers had already invested in these activities and such valuable resources are thus not available on the market to be "inserted" into new entrants' business canvasses.

S3 is another example of a 'platform-based' firm whose technological expertise, developed while trying to compete with Facebook, proved to be the key resource in establishing itself in a "structural hole" between advertisers and the new platform that was emerging as dominant.

The existence of relationships, however, is not by definition only a good thing. Unsuccessful U2, for example, suffered from both over-investment in an early user and an exclusive contract signed with an upstream partner that reduced future options. This example highlights how upstream partnerships can also be dangerous at early stages in business development by limiting future agility. In the lean startup approach, both of U2's relationships limit the firm's ability to pivot but each would have been considered as "validation" of the value proposition. The network approach, by contrast, has recognized that firms building relationships need to make such choices and that smaller firms, without existing network resources, are most at risk of being coerced on both technical and operational issues (La Rocca et al., 2013).

S3 has consciously avoided becoming over-dependent on its relationship with the all-powerful actor, Facebook, and has developed ancillary activities and resource to develop applications on alternative platforms. It has witnessed comparably successful firms disappear overnight as a result of Facebook unilaterally changing its application programming interface (API).

Secondly, in relation to the application of tools, the case studies highlight the specific personality of the entrepreneurs and the influence this has on their decision-making. The struggling H2, for example, finds it difficult to choose among interesting projects and thus spreads her efforts thinly across different customers and products. In the lean startup model, she could be engaged in "validated learning" but she could also be considered to be indecisive. She herself acknowledges this and plans to be more concentrated on a smaller number of projects. The timing of this decision will partly determine the clients she chooses to concentrate on, however, and not simply the logic of validated learning. Only a longitudinal case-study methodology would identify this factor in relationship building unlike a "photograph" of her decision at the time she chooses to make it. For U1, positive feedback from non-paying consumers was considered to be validation of the business model. While this could be considered wishful thinking on the part of the entrepreneur, these results were also considered as part of a business plan that helped the business gain access to an incubator, a business support program and bank funding that was guaranteed by the French state agency responsible for supporting innovation. Understanding what exactly constitutes "validation" for lean startups is thus still a matter for interpretation and one that needs further clarification in order to be operationally useful.

Thirdly the question of how much a startup should invest in developing a solution that is specific to a particular customer remains unresolved. H1 is typical of this dilemma as its technology requires adaptation before a convincing prototype can be used to win even early customers. The advantages of the technological are not seen as sufficiently important to customers to invest the finance and the market uncertainty means that finance is not forthcoming. The firm does not therefore know how to pivot as it cannot get rich enough feedback from customers without more investment which means it is no longer working on a “minimum viable product”. This potential dilemma was also highlighted by La Rocca et al. (2013) as one of the choices that firms need to make as they develop their interaction strategies.

The lean startup concepts thus appears less relevant in relation to more disruptive innovations and areas where it is necessary to invest in technology in order to have useful feedback from customers. In France, one of the roles of the state body that supports innovation is to step in to fill this financing gap. However, in the case of U1, the agency’s need to have a technological aspect in order to guarantee the bank loan conceivably encouraged the entrepreneur to invest in more technological development than was necessary as the greater level of uncertainty was market-based. Other actors who are not central to the relationship can thus influence a firm’s choice in a way that makes it less lean but in a collective and far less controllable way that is recognized in networking research (Ciabushi et al., 20102).

CONCLUSIONS AND AGENDA FOR FURTHER RESEARCH

This preliminary and exploratory study of how lean startup principles and networking research complement and contradict each other was based solely on three interviews with experts in entrepreneurship and seven interviews with startups. Nonetheless, the preliminary results highlight promising future avenues to develop the research in order to achieve two objectives:

- To strengthen the conceptual basis underlying lean startup principles by linking them to an existing knowledge base in the area of network dynamics.
- To enhance future network research in the area of entrepreneurship by linking it to a management phenomenon that may impact on network dynamics.

The experts interviewed stressed that the proportion of digital startups they are encountering is growing significantly and are seeking tools to offer these entrepreneurs whose profiles and market challenges may differ from what they are used to dealing with. Future research should therefore include different types of startups – digital and non-digital – and should also include entrepreneurs who have attended lean startup seminars, in addition to those who have not. Such research should consider ways to understand the different profiles of entrepreneurs (Lee and Tsange, 2001; Baum and Locke, 2004) and explore how to measure personal networking competencies, as a complement to emotional intelligence (Naudé et al., 2013).

In her detailed comparison of how different research approaches address networks in the context of entrepreneurship, Jack (2010) outlines the uses and drawbacks of both quantitative and qualitative methodologies. She concludes that qualitative methods are underutilized and states: “often dismissed through concerns relating to time, generalizability and tendency to be descriptive rather than predictive, in reality the potential benefits and contribution of qualitative work far outweighs its limitations...not only do such approaches offer the

opportunity for in-depth understanding of the views and personal experiences of individual respondents to be arrived at, they also provide a mechanism to uncover network content and complex patterns of networking behavior (Jack, 2010, p.132). She underlines, in particular, the value of longitudinal methods that address the how and why questions of network development from a dynamic perspective.

A longitudinal methodology based on network drawings (Aaboen et al, 2013) is thus considered most adapted to compare a larger number of startups in both digital and more traditional technology sectors over a period of at least 3-5 years, in order to cover the process of birth, development, growth and/or decline or acquisition. Ideally, such longitudinal work would be done in a number of countries for comparative purposes as different institutional actors in different countries can have an impact on network dynamics. The role played by the financing process put in place by French body for promoting innovation, for example, has already emerged as one that encourages firms to engage in technical development at a very early stage in the new venture's life cycle.

In this preliminary work, the convenience sample included startups whose businesses had not thrived and this proved to be a rich source of comparative 'stories'. Even when such unsuccessful firms seek to develop relationships in a network, their lack of resources may disadvantage them and force them to make choices that limit their flexibility and ability to work with other firms. In addition, the personality of certain entrepreneurs may reduce their ability to apply the principles of lean startups in a similar way that certain entrepreneurs may not have developed useful networking skills. In further research, it would be interesting to compare if more 'pedagogical' lean startup techniques have proven successful in changing such mindsets and generating superior networking capabilities.

Finally, it is recommended that future empirical work on entrepreneurship and networks include firms with different levels of performance – from highly successful to moderately successful to unsuccessful. Such work will be a useful addition to existing studies – both qualitative and quantitative – that tend to overemphasize success stories. Such data collection should help investigate the question of over-investment in certain relationships, for example. Potentially "negative" impacts of upstream and downstream relationships that limit agility are not specifically highlighted in previous studies on entrepreneurship, although network literature acknowledges such limitations (Ciabaschi et al, 2013). This constraint can prove to be a key difficulty faced by startups that prevents them from implementing the lean startup practice of "pivoting".

The managerial objective of such research is to add analytical rigor to the principles of lean startup and, where relevant, to provide empirical insights for networking researchers who can more easily communicated with the growing numbers of entrepreneurs in the digital and high-tech sectors. Such research will not seek out optimal solutions for managers of such startups, as there are many complex and varied interactions possible and no-one is capable of determining in advance how a network will evolve. By formulating questions in a vocabulary that is becoming increasingly common in the startup ecosystem, such research will be a useful addition for both managers who need to take decisions in conditions of great uncertainty and researchers who wish to contribute to improving the success rate of new ventures.

APPENDIX 1: INTERVIEWS WITH EXPERTS ON ENTREPRENEURSHIP

	<i>Expert 1(E1)</i>	<i>Expert 2 (E2)</i>	<i>Expert 3(E3)</i>
<i>Role</i>	Venture capitalist	Regional incubator	Large company incubator to work with small firms
<i>Experience</i>	70 new ventures funded over 12 years	58 new ventures supported over 13 years	100s of startups selected, accompanied and coached over 7 years
<i>Types of startups</i>	Technical profile, often in IT area	Initially research linked, but less technology push over time, 80% digital projects	Digital sector as linked to company's core business as telecom operator
<i>Views of importance of network</i>	Entrepreneurs with more experience have networks Relations with broad eco-system important	Higher success rate for entrepreneurs established in their sectors already	Actively sought out by good entrepreneurs and supported by structures such as incubators
<i>Views of Lean startup movement</i>	Agility always necessary, but pivoting more difficult for technological startups	An alternative to standard market research, more relevant for digital projects than technological ones	Basic marketing concepts distilled down for engineers. Needs to be applied intelligently

APPENDIX 2: MAIN CHARACTERISTICS OF STARTUPS INTERVIEWED

‘Successful’ startups	
Startup S1	Digital B2C platform created in 2007 that has become a national leader in its sector of on-line technical courses. The initial idea was based on the two co-founders hobby over the previous 8 years. The firm has 20 employees and its current income is from mainly from advertising to users but also partly from access to paid content and B2B partnerships with upstream content suppliers. A first round of venture capital was raised in 2012 and a second in 2014.
Startup S2	B2B provider of a mobile phone recycling service to telecom operators. Created in 2007, the firm has 70 employees and operates in 4 countries. It is positioned as a ‘socially responsible firm’ as part of the recycling is done by NGOs who employ handicapped and disadvantaged workers. The raised capital in 2010 and 2013.
Startup S3	B2B2C agency that provides applications, advice and community management services for firms wishing to communicate via Facebook. Finance was raised to expand into Asia and, five years after its creation, the firm has 130 employees in France, India, Singapore and China.
‘Hesitant’ startups	
Startup H1	An activity set up by an individual programmer who initially developed a drone that was used in filming in 2009 and then went on to develop a streaming service for conferences. The individual entrepreneur works on a contract basis on EU research projects and sees opportunities in specializing in 3D for clothing websites as well as adapting robotic technology for multiple photo sessions. Interns from specialized schools can help with the workload but the entrepreneur would like to raise funds to develop a more industrialized process for a more limited set of innovative services.
Startup H2	Two researchers in physics/chemistry working in a state-funded scientific laboratory developed a superior technology for creating microcapsules. A state body for commercializing public research put them in contact with a laboratory looking for such a process but it was a small scale venture. Other contacts with larger firms did not give rise to successful applications as the technology was not advanced enough to meet their requirements. After contacts with the vaccination sector, the firm and its technology was integrated into the research lab of one of the leading firms, eight years after its creation.
‘Unsuccessful’ startups	
Startup U1	A platform for delivering specialized classes interactively to participants who sign up and pay to have a class with a renowned expert. Funding from the French state body for innovation was received, as the platform used proprietary technology, developed with by an external programmer. Despite having built good relations with high-quality content providers, users do not appear willing to sign up for specific times and pay for interactive classes. Moving to B2B partnerships with firms in the sector who would benefit from the classes for PR, product place and content generation for websites proved difficult and the business was closed two years after its creation.
Startup U2	A new application of an existing technology that improved performance of measuring equipment in the agricultural sector created in 2008. Initial contact with the professional body of one branch led to the development of a prototype with funding from the French state body for innovation and the regional council. However, when an exclusivity agreement was signed with a manufacturer for entry into a new branch, the adapted technology was not considered superior. PR from the professional body led to a small number of sales but directly accessing the small number of potential buyers in the original branch was seen as too costly and the firm closed in 2013.

APPENDIX 3: INTERVIEWS WITH STARTUPS

	<i>Network</i>	<i>Lean startup</i>
‘Successful’ startups		
Startup S1	The founders’ reputation within the field helped to build a network of high-quality content providers	Experimentation on platform – new services attempted and quickly abandoned.
Startup S2	The founders began with a B2C website and developed key production skill with upstream partners.	The initial B2B tender was won after three weeks intensive work customizing the original B2C platform.
Startup S3	The initial project did not succeed as a competitor to Facebook but the founders learned enough about platform development to become a Facebook “preferred supplier”. Potential customers were lacking in skills and demand was growing exponentially.	By definition, the firm develops its services in close collaboration with its clients as they are tailor-made. It develops new projects on a step-by-step basis with pioneering clients, often in partnership and test them as part of its development process. It has been willing to abandon projects quickly that did not gain traction.
‘Hesitant’ startups		
Startup H1	Not yet capable of convincing financing bodies as too many different activities and no clear plan	Talking to firms about ideas leads to intensive work on R&D and non-scalable outcomes
Startup H2	Significant help at early stage from state agency.	Early-stage technology requiring specific development for each application
‘Unsuccessful’ startups		
Startup U1	Selected for incubation and acceleration programs Access to key upstream partners did not generate downstream demand	Sticking to minimum viable product would have meant foregoing innovation funding. Validated learning wrong
Startup U2	Exclusivity contract with manufacturer reduced options	Prototype of interest to potential user but wanted to see final version first

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