2013

How Software Startups Survive: a Model based on Resource-based View and Dynamic Capabilities

Yunfei Shi
Business school, University of Queensland, y.shi@business.uq.edu.au

Dongming Xu
Business school, University of Queensland, d.xu@business.uq.edu.au

Information Systems: Transforming the Future

24th Australasian Conference on Information Systems, 4-6 December 2013, Melbourne

Proudly sponsored by

ACIS 2013 Principal Sponsor

How Software Startups Survive: a Model based on Resource-based View and Dynamic Capabilities

Yunfei Shi
Dongming Xu
School of Business
University of Queensland
Australia
Email: y.shi@busines.uq.edu.au
d.xu@busineess.uq.edu.au

Abstract

Rapid advances of IT have encouraged many software startups to enter the market place. Our research seeks to investigate the little-studied phenomenon of software startup survival. The research is based on the resource-based view and on dynamic capabilities. We present a research model that investigates factors affecting software startup survival by examining how startups survive in their competitive environment. First, we categorize the resources of software startups into three areas based on socio-technical theory. Specifically, we view entrepreneurial resources as influencing both IT innovation and environmental resources. Second, we view dynamic capabilities as mediating the relationship between interactions among resources and software startup survival. Finally, we investigate the effect of competitive actions in moderating the relationship between dynamic capabilities and software startup survival. Our research seeks to contribute to extant research by proposing the first empirical study of which we are aware that addresses factors influencing software startup survival.

Keywords

software startup survival; resource-based view; dynamic capabilities; socio-technical theory; IT innovation

INTRODUCTION

Startups are human institutions designed to create new products and services under conditions of extreme uncertainty, and typically are accompanied by high innovation-driven growth (Ries 2011). The focus of this paper is software startups. Looking back to the Internet Boom during the 1990s, numerous software startups poured into the market and attracted unbelievable amounts of venture capital, but a few of them survived when the bubble burst and eventually developed into successfully established companies, such as Ebay, Google and Amazon. With the development of information systems, such as cloud computing and open source software, the barriers to entry for software startups have decreased significantly in recent years. “Software as a service” has been a rapid growing fashion in software industry (Benlian 2011). Recently social media based services are responsible for a new boom of software startups, and many startups aiming to design new services enter into the market. Some of them survive and grow into successful established firms, such as Facebook, Twitter. However, there is a “cruel rule” in startup ecosystem that nearly 80% of startup companies cannot survive in the competitive environment within their first three years (Feinleib 2011). Therefore, it is demanding for people to understand what the driven forces for software startup survival are and how to help software startups achieve sustainable business performance. The purpose of the paper is to answer the following two questions: (1) what determines software startup survival? (2) How can software startups survive?

It is meaningful for IS scholars to understand about software startups (Sawyer 2000; Li et al. 2010). The software industry is one of the biggest growth markets worldwide and also one of the most international sectors. It affects the development of other industries, since software has been necessary for any other industry of the information society. In the meantime, startups have influential impact on economic growth. They play important roles in creating job and in driving innovation (Kane 2010). The IS literature indicated the missing link between IT and entrepreneurism including software startups (Giudice and Straub 2011). Therefore, understanding software startup survival is in need for IS field.

Some research exploits resource-based view to explain firm survival or high firm performance phenomenon, but little is specialized to software startups. The reasons why software firms fail were investigated by Li et al. (Li et al. 2010). Their research focused on the relationship between capabilities and firm survival for mature firms with the average firm age of 9.6 years. However, the antecedents for younger and older firm failure are different, and failures of younger firms may be attributed to the deficiency in resources and capabilities (Thornhill and Amit 2003). Wu examine the relationship between dynamic capabilities and firm performance with the emphasis on

the impact from external partner cooperation for high-tech startups. This study did not focus on software startups and is lacking an overall analysis on firm resource dynamics (Wu 2007).

In this research, we utilize resource-based view (RBV) and dynamic capabilities as the basic theories to explain why some software startups survive in the competitive ecosystem. We integrate the resource-based view and dynamic capabilities theory into one model, and analyze resources of software startups from the perspective of socio-technical theory. The research model also indicates the important role of competitive actions on software startup survival. The rest of the paper proceeds as follows: we introduce the theoretical background, which presents the reasons why we interpret the resources of software startups by drawing on the socio-technical theory and why we extend the traditional RBV model by incorporating dynamic capabilities. Second, we present the research model and propose six hypotheses. We focus on the interactions among resources, the mediating role of dynamic capabilities between interactions among resources and software startup survival, and the moderating effect of competitive actions from dynamic capabilities to software startup survival. Third, we describe the research methodology on data collection and measurement development. Finally, we present our conclusions.

THEORETICAL BACKGROUND

Both RBV and dynamic capabilities are used to analyze firm survival or high firm performance. RBV emphasizes the importance of resources, but lacks of explanations on how resources can lead to high firm performance (Sirman 2007). Comparably, dynamic capabilities focus on building capabilities. In spite of the different foci from RBV, dynamic capabilities theory enhances RBV by addressing the evolutionary nature of firm resources in relation to the changing environment (Ahenkora et al. 2012).

Resource-based View

The core idea of RBV is that firms should achieve high performance by exploiting resources (Barney 1991; Wernerfelt 1984). Within the context of firm performance, resources, capabilities, and sustained competitive advantage are three main constructs in RBV model where resources are the driver of capabilities and capabilities are the direct source of high firm performance (Grant 1996). Resources can be tangible or intangible (Wernerfelt 1984). For instance, financial and technical resources are intangible assets and human and organizational resources are tangible assets. Resources should be valuable, rare, inimitable and un-substitutable (Barney 1991). Some literatures demonstrate the direct effect of complementary or accumulated resource on high firm performance (Bharadwaj 2007; Oliver 1997). Others consider resources as a kind of capability, and focus on the indirect effect of resources on high firm performance (Bharadwaj 2007; Bhatt and Grover 2005). Capabilities are defined as firms' ability to deploy resources based on developing, carrying, and exchanging information within the organization (Amit and Schoemaker 1993). The process of how resources are utilized to develop capabilities can be better disclosed, if resources and capabilities are investigated independently (Ravichandran and Lertwongsatien 2005). In order to unfold through what mechanism resources can lead to software startup survival, we therefore analyze resources and capabilities separately. RBV is used extensively to examine resource and/or capability-driven high firm performance. However, traditional RBV focuses on deploying existing resources within the firm, and does not include environmental resources, which are crucial for software startups. Because most software startups do not have sufficient resources at the early stage of their business development, environmental resources including business opportunity and partnership are extremely valuable for their survival. Furthermore, static resource stock is not sufficient for firm to achieve high performance. Especially for startup companies which live in a highly volatile environment, resources for them should be accompanied with dynamic flow (Mckelvie 2009).

Dynamic Capabilities Theory

Although both RBV and dynamic capability theory consider that firm is a bundle of resources and address the way in which they can lead to high firm performance (Ambrosini and Bowman 2009). Dynamic capabilities theory argues that simply accumulating resources is not enough to support high firm performance, and companies should have timely responses to rapidly redeploy internal and external resources (Teece et al. 1997). It explains that firms should also be able to sense and shape opportunities and threats and to seize opportunities (Teece 2007). Dynamic capabilities theory emphasizes the effect of environmental resources on high firm performance, which is neglected by RBV. Compared with traditional RBV with the emphasis on resources selection, dynamic capabilities theory focuses on capability building (Barney 2001) which is treated as an extension of RBV. Dynamic capabilities are highly suitable for firms in the innovation-based competitive environment (Teece 1997), especially when they involve new product development (Winter 2003). The software industry is experiencing intensively innovation-related competition and software startups always involve new product development. So dynamic capabilities are essential for them to adapt with the uncertain ecosystem and achieve survival eventually.

RESEARCH MODEL AND HYPOTHESES

Before defining "software startup survival" in our research context, we first look at business discontinuance. Business discontinuance is a broad definition of firm failure that refers that the change of ownership or cessation of business (Waston and Everet 1993). The discontinuance of business not only includes firms close due to lack of performance, but also incorporates firms acquired by established companies. Some software startups are sold to other firms with most of their productivity remaining in the industry (Lane and Schary 1991). To avoid bias from including startups that are taken-over due to high profitability, **software startup survival** is defined as the continuance of productivity without declaring bankruptcy. Despite the fact that firm survival and firm performance are different, small business must survive if they are to eventually achieve to high performance (Scot and Bruce 1987). It is therefore not contradictory for us to use high performance-driven theory to analyze software startup survival.

Figure 1 shows the research model. Our research model illustrates the mechanism by which software startups can survive in the highly competitive and changing environment based on RBV and dynamic capabilities. Interactive resources achieve optimal performance for dynamic capabilities. Second, dynamic capabilities of learning, integration, and response are essential for software startups to adapt with the changing ecosystem and survive eventually. Third, software startups need to take competitive actions to promote their products/service and get into the markets to compete with the existing competitors. Finally, the competitive actions can enhance the effect of dynamic capabilities on software startup survival. In summary, the interaction of different resources leads to dynamic capabilities, and the leveraging of dynamic capabilities and the complementary effect between dynamic capabilities and competitive actions result in software startup survival.

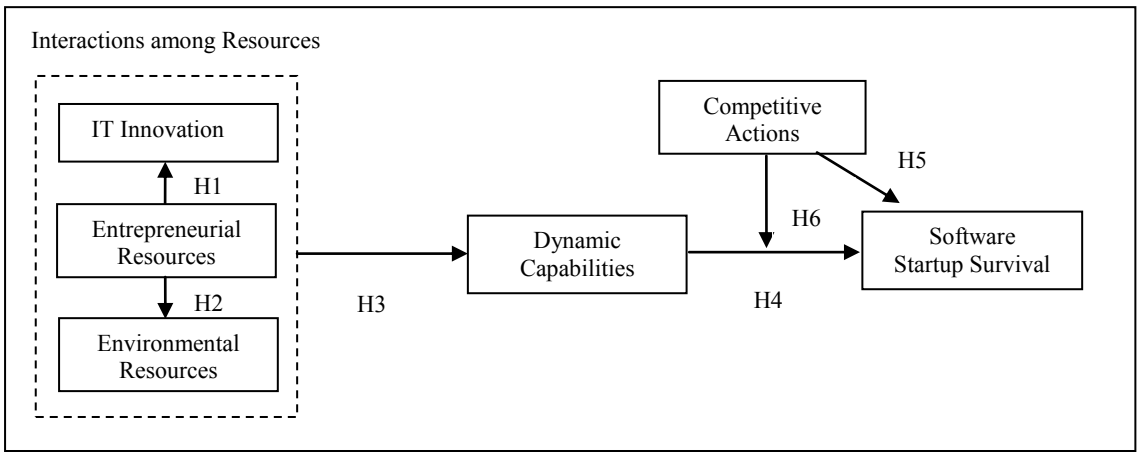

Figure 1. Research Model

Resources

Socio-technical theory supports our design to integrate both internal and environmental resources when conducting the resource stock. Resources are defined as stocks of available factors that are owned or controlled by firms (Amit and Schoemater 1993). Resources are inputs to production process. They could be owned by the individual firm or obtained from the external environment (Grant 1996). Resources are the source of capabilities, that is, what firms can do critically depends on what they have. Resources should be developed and updated over time. The renewed resource stock is helpful for firms building dynamic capabilities. Socio-technical theory is used to interpret the interaction among different resources. From the point of socio-technical theory, organizations are analyzed from three levels: technical system level, organization system level, and macro social system level. The fit among the three subsystems can result in high firm performance (Trist 1981). The technical system and the organizational system can be viewed as internal systems, while the macro social system is an external system. In software startups, IT innovation and entrepreneurial resources are the internal systems and environmental resources belong to the external system.

Entrepreneurial resources (ETR) include entrepreneurial personality (Zhao and Seibert 2006), know-how knowledge (Wu 2007) and social capital (Wu et al. 2008). Successful entrepreneurs tend to have some certain personal traits in common, such as conscientiousness, extraversion, and openness to experience, which play critical influence on startup survival. Furthermore, their know-how knowledge and social relationship affect their startups' growth to a large extent. Entrepreneurs are the impetus of the whole organization and play a pivotal

role in resource integration. Entrepreneurs should identify the gap between what the firm has and what they need to acquire from the social environment, and combine internal and external resources together (Brush et al. 2001).

IT innovation (ITI) is defined on the basis of Swanson's understanding: IT innovation is innovation in the organizational application of digital computer and communication technologies (Grover et al. 1997; Lyytinen and Rose 2003; Swanson 1994). IT innovation is an intangible firm asset. Previous research has shown that technology-driven innovation has a profound influence on new firm survival (Giudice and Straub 2011). Consistent with the typology of IT innovation for small software firms (Carlo et al. 2012), we investigate three types of IT innovation: base innovation, process innovation, and product and service innovation. Base innovation reflects changes of computing capabilities in software startups. For instance, software startups enable large scale reuse and improve communications among developers by choosing design patterns. Process innovation involves the improvement of the development process. Software startups need to modify their design procedures through "learning by trying" or "learning by doing" to adapt with changing customer needs. Many software startups use open source development to reduce operational costs. Product and service innovation involves creating new software or delivering new service based on software creation.

With respect to the relationship between entrepreneurial resources and IT innovation, entrepreneurial resources influence IT innovation. Influencing innovation is an important role for entrepreneurs in small and medium enterprises (Hébert and Link 2006). For software startups, most IT innovation derives from entrepreneurs. Personal traits of an entrepreneur -conscientiousness, openness to experience, and extroversion- have crucial impact on IT innovation (Zhao and Seibert 2006). Further, entrepreneurial social relationships and know-how have an essential influence on innovation (Capaldo et al. 2003). The success of some well-known startups, such as Google, Facebook and Dropbox, may be attributed to a great extent to innovative entrepreneurs. Therefore, we propose the first hypothesis as follows:

H1: Entrepreneurial resources are positively associated with IT innovation in software startups.

Environmental resources (**EVR**) of software startups incorporate business opportunity and cooperator, which are important in assisting small business survival (Street and Cameron 2007). Business opportunities are decisive for software startups' development. Additionally, firms should not only identify business opportunities but also exploit the partner network to obtain opportunities (Jarillo 1989). Software startups are less resource-endowed firms and they need technical, managerial, financial, and human resources to develop their capabilities through sponsorship or partnership (Hitt et al. 2000). Software startups depart from a good business opportunity and enrich their resources through the sponsorship-based or partnership-based cooperators.

With regard to the relationship between entrepreneurial resources and environmental resources, entrepreneurial resources are the main driver of absorbing environmental resources for startups. Utilizing environmental resources is necessary for new firms' growth (Jarillo 1989). Entrepreneurs have strong impact on identifying business opportunities and play a positive role in partnership construction (Baron and Enslay 2005; Ucbasaran et al. 2007). The willingness of external partners to cooperate with startups is primarily determined by the attractiveness of the promised entrepreneurial resources (Wu 2007). Thus we propose the second hypothesis as follows:

H2: Entrepreneurial resources are positively associated with environmental resources in software startups.

Dynamic Capabilities

Dynamic capability (DC) is the capability to renew or reshape resources in a changing environment (Lockett and Thompson 2001). Stronger dynamic capabilities mean that firms have the better chance of surviving (Chien and Tsai 2012; Wu 2007). For software startups, we look at dynamic capabilities in the following categories: learning capability, integration capability, and response capability (Teece 2007; Teece et al. 1997; Bowman and Ambrosini 2003). Learning capability is the ability to acquire new knowledge to make organizational routines effective and efficient. "Learning by doing" and "learning by trying" are the main characteristics of IT innovation. IT technical staff needs to constantly acquire new knowledge or skills to improv software functionality. Integration capability is the ability to combine market or technical knowledge into existing resources. The outcome of integration ability is to renew the resources base of the firm. For instance, software startups embed cloud computing into their software development process or integrate open source software into the development platform, which results in the low cost of work routines. Response capability refers to the ability to respond to the dynamic environment. The software industry is highly competitive and startups need to be equipped with fast response ability to cope with the business opportunity or with threats to business. They also need the rapid response ability to react competitors' strategies or customer need.

With respect to the association between interactions among resources and dynamic capabilities, the interactions among IT innovation, entrepreneurial resources, and environmental resources has positive influence on the

development of dynamic capabilities in software startups. An adequate resource stock is not a simple combination but a systematic integration of internal and external resources. Dynamic capabilities derive from organizational routines rather than are bought from market (Eisenhardt and Martin 2000), and organizational routines embed in the interactions among different resources. Accordingly, dynamic capabilities can generate economic profits when software startups involve in the high degree of interactions among different resources. Therefore, we propose the third hypothesis as follows:

H3: Interactions among resources are positively associated with dynamic capabilities in software startups.

With respect to the link between dynamic capabilities and software startup survival, dynamic capabilities including learning, integration, and response capability are essential for software startups gaining more market share and eventually survive. Hence we propose the fourth hypothesis as follows:

H4: Dynamic capabilities are positively associated with software startup survival.

Competitive Actions

Competitive action (CA) is externally directed, specific, and observable competitive moves initiated by a firm to enhance its competitive position (Ferrier 2001). Early research on dynamic theory converged on individual competitive action and then extended to competitive action repertory (Rindova et al. 2010). Competitive action repertory is the set of market oriented actions used by an organization to attract, serve or keep customers (Miller and Chen 1993). It provides an overall picture on the aggregate effects of a set of competitive behaviors comparing with individual competitive action. More frequent and diversified competitive moves lead to higher firm performance (Chi and Andrevski 2010). Competitive actions are categorized into pricing, service, new product development and so on (Smith et al. 2001). For software startups, we conduct three types of competitive actions: pricing, customer involvement, and service. Pricing for information service has arisen increasing attention. Many studies investigating on pricing schemes think them as a crucial competitive behavior to help firms gain more profits (Wu and Banker 2006). In reality, different firms adopt different pricing strategies. Some software startups, like Facebook and Twitter, do not charge from their users at the early stage of development, whereas others such as Dropbox implement diversified pricing methods for different customers. Customer satisfaction on the new software or service is deterministic for software startup survival. Customers are valuable sources, since they can facilitate companies to have a deeper understanding of their market by contributing their ideas to the new product launching (Hanna et al. 1995). This view is an important trend in relationship marketing (Lagrosen 2005) and has shown its efficiency in software industry (Cheung et al. 2011). Software startups deliver online or offline service based on their software creation, so service is a competitive weapon for them to increase market share or profits. It is highly important for software startups assessing and fulfilling customer needs when they launch a new software product. Excellent service quality can guarantee software startup's competitive advantage.

With respect to the association between competitive actions and software startup survival, the effect of competitive actions on firm survival has been confirmed by competitive dynamic theory (Ferrier 1999). The assembled impact of competitive repertory involving pricing, customer involvement, and service can lead software startups to pursue high performance. Consequently we propose the fifth hypothesis as follows:

H5: Competitive actions are positively associated with software startup survival.

With respect to the moderating impact of competitive actions, the alignment of dynamic capabilities and competitive actions can augment the likelihood of software startups survival. Competitive actions account for firms' capabilities (Chen 2009). In a hyper-competitive environment, such as software industry, companies must outpace competition by constantly exploring and pursuing new sources of competitive advantage (Lyytinen et al. 2002). Dynamic capabilities, as a kind of source of competitive advantage, focus on strategies exploiting resources to build up internal capabilities. Competitive actions emphasize the moves responding to external turbulence. For instance, by taking competitive actions, such as customer involvement, software startups increase the capability to respond to changing market. Therefore, we propose the sixth hypothesis as follows:

H6: Competitive actions increase the positive effect of dynamic capabilities on software startup survival.

Control Variables

In the paper, we control firm age and establishment size which are highly related to firm survival (Aspelund et al. 2005; Thornhill and Amit 2003). The firm's failure rate will change according to its life cycle (Agarwal and Gort 2002). The startup stage is referred as the period spanning from the establishment of the startup to the mass production of its first product (Wu 2007). During the startup stage, software startups accumulate resources and dynamic capabilities as time processes, so their life expectancy will increase as their age increases.

Establishment size is another factor influencing startup survival. We exploit the number of employee to proxy establishment size. Large entrepreneurial team increases the venture's range of feasible strategies and the probability of effectuating a successful strategy (Aspelund et al. 2005). For software startups, the large initial firm size reflects the rich internal resources, therefore, means the larger chance to survive.

Table1. Construct Measurement

Construct name--type of Construct	Sub-construct name--type of sub-construct	Items	Source or basis
Entrepreneurial Resources (ETR) --Formative	Personality --Reflective	Conscientiousness, openness to experience, and extraversion	Zhao and Seibert 2006
	Social Capital --Reflective	Structural capital, relationship capital, and cognitive capital	Liao and Welsch 2003
	Know-how --Reflective	Informatics and e-business, marketing, and human resource management	Omerzel and Antoncic 2008
IT Innovation (ITI) -- Formative	Base Innovation --Reflective	Number of base innovation, such as three-tier or higher level architecture, software patterns	Carlo et al. 2012
	Process Innovation --Reflective	Number of process innovation, such as open source development, new specification techniques	
	Service Innovation --Reflective	Number of service innovation, such as innovation business intelligence using Internet, intranet	
Environmental Resources (EVR)--Formative	Business Opportunity --Reflective	Inconsistencies in existing service and quality, industry growth, and imperfect of the market	Timmons and Spinelli 1994
	Cooperator --Reflective	Sponsorship-based and partnership-based	Lee et al. 2001
Dynamic Capabilities (DC) --Formative	Learning Capability --Reflective	Managerial commitment, openness and experimentation, and knowledge transfer	Jerez-Gómez et al. 2005
	Integration Capability --Reflective	Internal integration and external integration	Johnson and Filippini 2013
	Response Capability --Reflective	Assess product performance, assess customer need, and assess promotional performance	Heinrichs and Lim 2013
Competitive Actions (CA) -- Formative	Pricing --Reflective	Share competitor's information, discuss competitors' strategy, and target competitive advantage	Ingenbleek et al. 2010
	Customer Involvement --Reflective	Frequency of meetings , extent of consultation , representation of customers, and number of relevant tools used	Carbonell et al. 2009
	Service --Reflective	Tangibles, reliability, responsiveness, assurance, and empathy	Gibson et al. 2007

RESEARCH METHODOLOGY

Data Collection

In our data sample, we will control for firm age less than 6 years and the number of employee less than 15. Therefore we will select software startups established after 2008. We will collect data from entrepreneurs based on the "***" registers of Australian software startups. This list of *** startups will provide adequate sample size for the tests (described below). We will follow the best practices to guarantee the response rate (Dillman et al. 1974).

Measurement Development

For all the independent variables, we will adopt the measurements from existing literature and make some modifications according to our research context. The construct measurement is shown in Table 1. We will measure each item on a Likert-type scale. We will then invite a number of scholars in the area to review our questions. We will modify the items based on their suggestions. After the initial development of measures, we

will conduct a pilot test using a small group of entrepreneurs. The participants will be requested to make comments on the format, content, and wording of the measurements. We then will clarify any ambiguous wording and any errors based on their feedback.The dependent variable is measured by a binary variable. "1" represents the startup exists in the industry, while "0" represents the startup does not survive.

CONCLUSION

Although software startups have important impacts on society, little research has been specifically conducted to address their survival. This research-in-progress paper focuses on the determinants of their survival and how they can survive in the competitive environment. Our research makes three potential contributions to the literature. First, we provide a new way of looking at firm resources by drawing on socio-technical theory. Compared with traditional RBV, environmental resources are incorporated into the resource stock. We investigate the role of entrepreneurial resources in enabling IT innovation and addressing environmental resources. Second, we propose a research model to explain by what mechanism software startups can survive on the basis of resource-based view and dynamic capabilities. Specifically, we conduct the interactive effect of IT innovation, entrepreneurial resources, and environmental resources on dynamic capabilities. We then examine the impact of dynamic capabilities on software startup survival. Finally, our research is the first work of which we are aware to examine the moderating impact of competitive actions from dynamic capabilities to software startup survival.

REFERENCES

Agarwal, R., and Gort, M. 2002. "Firm and Product Life cycles and Firm Survival," *The American Economic Review* (92:2), June, pp 184-190.

Ahenkora, K., and Adjei, E. 2012. "A Dynamic Capabilities Perspective on the Strategic Management of an Industry Organisation," *Journal of Management and Strategy* (3:3), September, pp 21-27.

Ambrosini, V., and Bowman, C. 2009. "What are Dynamic Capabilities and are they a Useful Construct in Strategic Management?" *International Journal of Management Reviews* (11:1), January, pp 29-49.

Amit, R., and Schoemaker, P. J. 1993. "Strategic Assets and Organizational Rent," *Strategic Management Journal* (14:1), January, pp 33-46.

Aspelund, A., Berg-Utby, T., and Skjevdal, R. 2005. "Initial Resources' Influence on New Venture Survival: a Longitudinal Study of New Technology-based Firms,".*Technovation* (25:11), November, pp 1337-1347.

Barney, J. 1991. "Firm Resources And Sustained Competitive Advantage," *Journal of Management* (17:1), January, pp 99-120.

Baron, B.A., and Enslay, M.A. 2006. "Opportunity Recognition as the Detection of Meaningful Patterns: Evidence from Comparisons of Novice and Experienced Entrepreneurs," *Management Science* (52:9), September, pp 1331-1344.

Benlian, A., and Hess, T. 2011. "Opportunities and Risks of Software-as-a-service: Findings From A Survey of IT Executives," *Decision Support Systems* (52:1), January, pp 232-246.

Bharadwaj, S, Anandhi, B and Elliot, B. 2007. "The Performance Effects of Complementarities between Information Systems, Marketing, Manufacturing, and Supply Chain Processes," *Information Systems Research* (18:4), December, pp 437-453.

Bhatt, G. D., and Grover, V. 2005. "Types of Information Technology Capabilities and Their Role in Competitive Advantage: an Empirical Study," *Journal of Management Information Systems* (22:2), June, pp 253-277.

Bowman, C., and Ambrosini, V. 2003. "How the Resource based and the Dynamic Capability Views of the Firm Inform Corporate Level Strategy," *British Journal of Management* (14:4), December, pp 289-303.

Brush, C. G., Greene, P. G., Hart, M. M. and Haller, H. S. 2001. "From Initial Idea to Unique Advantage: the Entrepreneurial Challenge of Constructing a Resource Base and Executive Commentary," *The Academy of Management Executive* (15:1), January, pp 64-80.

Capaldo, G., Iandoli, L., Raffa, M. and Zollo, G. 2003. "The Evaluation of Innovation Capabilities in Small Software Firms: a Methodological Approach," *Small Business Economics* (21:4), December, pp 343-354.

Carbonell, P., Rodríguez-Escudero, A. I., and Pujari, D. 2009. "Customer Involvement in New Service Development: An Examination of Antecedents and Outcomes," *Journal of Product Innovation Management* (26:5), May, pp 536-550.

Carlo, J. L., Lyytinen, K, and Rose, G. M. 2012. "A Knowledge-based Model of Radical Innovation in Small Software Firms," *MIS Quarterly* (36:3), September, pp 865-896.

Chen, M. J. 2009. "Competitive dynamics research: An insider's odyssey," *Asia Pacific Journal of Management* (26:1), January pp *5-25*.

Cheung, C., Lee, M., and Jin, X. 2011. "Customer Engagement in an Online Social Platform: A Conceptual Model and Scale Development," in Proceedings of the 32th International Conference on Information Systems, Shanghai, China.

Chi, L., Ravichandran, T., and Andrevski, G. 2010. "Information Technology, Network Structure, and Competitive Action," *Information Systems Research* (21:3), September, pp 543-570.

Chien, S. Y., and Tsai, C. H. 2012. "Dynamic Capability, Knowledge, Learning, and Firm Performance," *Journal of Organizational Change Management* (25:3), September, pp. 434-444.

Coleman, S., Cotel, C., and Farhat, J. 2013. "A Resource-based View OF New Firm Survival: New Perspective on the Role of Industry and Exit Route," *Journal of Developmental Entrepreneurship* (18:1), January, pp 1-25

Cox, D. 1972. "Regression Models and Life Tables," *Journal of the Royal Statistical Society Series B* (34:2), June, pp 187–202.

Dillman, D. A., Christenson, J. A., Carpenter, E. H., and Brooks, R. M. 1974. "Increasing Mail Questionnaire Response: a Four State Comparison," *American Sociological Review* (39:10), October, pp 744-756.

Eisenhardt, K. M., and Martin, J. A. 2000. "Dynamic capabilities: what are they?" *Strategic Management Journal*, (21:10-11), October, pp 1105-1121.

Esteve-Pérez, S., and Mañez-Castillejo, J.A. 2008. "The Resource-based Theory of the Firm and Firm survival," *Small Business Economics* (30:3), September, pp 231-249.

Everett, J., and Watson, J. 1998. "Small Business Failure and External Risk Factors," *Small Business Economics* (11:4), April, pp 371-390.

Faraj, S., Gosain S., and Sabramani M. 2004. "Strategic Action Repertoires and Performance of Firms in the Internet Industry," in Proceedings of the 14th International Conference on Information Systems, Washington, DC, USA.

Farjoun, M. 2002. "Towards an Organic Perspective on Strategy," *Strategic Management Journal* (23:7), July, pp 561-594.

Feinleib, D. 2011. Why Startups Fail: And How Yours Can Succeed, NY:Apress.

Ferrier, W. J. 2001. "Navigating the Competitive Landscape: the Drivers and Consequences of Competitive Aggressiveness," *Academy of Management Review* (44:4), December, pp 858-877.

Ferrier, W. J., Smith, K. G., and Grimm, C. M. 1999. "The Role of Competitive Action in Market Share Erosion and Industry Dethronement: A Study of Industry Leaders and Challengers," *Academy of Management* (42:4), December, pp 372–388.

Gibson, C. B., Porath, C. L., Benson, G. S., and Lawler III, E. E. 2007. "What Results When Firms Implement Practices: the Differential Relationship Between Specific Practices, Firm financial Performance, Customer service, and Quality," *Journal of Applied Psychology* (92:6), June, pp 1467.

Giudice, M.D., and Straub D. 2011. "IT and Entrepreneurism: An On-Again, Off-Again Love Affair or a Marriage?" *MIS Quarterly* (35:4), December, pp iii-vii.

Grant, R. M. 1996. "Toward a Knowledge-based Theory of the Firm," *Strategic Management Journal*, 17, December, pp 109-122.

Grover, V., Fiedler, K., and Teng, J. 1997. "Empirical Evidence on Swanson's Tri-core Model of Information Systems Innovation," *Information Systems Research* (8:3), September, pp 273-287.

Hanna, N., Ayers, D. J., Ridnour, R. E. and Gordon, G. L. 1995. "New Product Development Practices in Consumer Versus Business Products Organizations," *Journal of Product & Brand Management* (4:1), January, pp 33-55.

Hebert, R. F., and Link, A. N. 2006. "The Entrepreneur as Innovator," *Journal of Technology Transfer* (31:5), May, pp 589-597.

Heinrichs, J. H., and Lim, J. S. 2008. "Impact of Marketing Model Application and Competitive Intelligence Utilization on Strategic Response Capability," *Journal of Strategic Marketing* (16:2), February, pp 91-110.

Hitt, M. A., Ireland, R. D., Camp, S. M., and Sexton, D. L. 2001. "Strategic Entrepreneurship: Entrepreneurial Strategies for Wealth Creation," *Strategic Management Journal* (22:6-7), June, pp 479-491.

Ingenbleek, P., Frambach, R. T., and Verhallen, T. M. 2010. "The Role of Value-Informed Pricing in Market-Oriented Product Innovation Management," *Journal of Product Innovation Management* (27:7), July, pp 1032-1046.

Jarillo, J. C. 1989. "Entrepreneurship and Growth: the Strategic Use of External Resources," *Journal of Business Venturing* (4:2), February, pp 133-147.

Jerez-Gomez, P., Céspedes-Lorente, J., and Valle-Cabrera, R. 2005. "Organizational Learning Capability: a Proposal of Measurement," *Journal of Business Research* (58:6), June, pp 715-725.

Johnson, W. H. and Filippini, R. 2013. "Integration Capabilities As Mediator of Product Development Practices–performance," *Journal of Engineering and Technology Management* (30:1), January, pp 95-111.

Kane, T. 2010. "The Importance of Startups in Job Creation and Job Destruction," Kauffman Foundation Research Series: Firm Formation and Economic Growth.

Lane, S. J., and Schary, M. 1991. "Understanding the Business Failure Rate," *Contemporary Economic Policy* (9:4), April, pp 93-105.

Lagrosen, S. 2005. "Customer Involvement in New Product Development: a Relationship Marketing Perspective," *European Journal of Innovation Management* (8:4), December, pp 424-436.

Lee, C., Lee, K., and Pennings, J. M. 2001. "Internal capabilities, External Networks, and Performance: A Study on Technology- based Ventures," *Strategic Management Journal* 22(6-7), June, pp 615-640.

Li, S., Jennifer S., and Sandra A. S. 2010. "Why do Software Firms Fail? Capabilities, Competitive Actions, and Firm Survival in the Software Industry from 1995 to 2007," *Information Systems Research* (21:3), September, pp 631-654.

Liao, J., and Welsch, H. 2003. "Social Capital and Entrepreneurial Growth Aspiration: a Comparison of Technology- and Non-technology-based Nascent Entrepreneurs," *The Journal of high technology management research* (14:1), January, pp 149-170.

Lockett, A., and Thompson, S. 2001. "The Resource-based View and Economics," *Journal of Management* (27:6), June, pp 723-754.

Lyytinen, K., and Rose, G. M. 2003. "The Disruptive Nature of Information Technology Innovations: the Case of Internet Computing in Systems Development Organizations," *MIS Quarterly* (27:4), December, pp 557-596.

Lyytinen, K., Rose, G.M., and Yoo,Y. 2002. "Learning in High Gear: Hyper-learning and Dynamic Capability in Seven Software Firms," *Sprouts: Working Papers on Information Systems* (2:16), August, pp 2-16.

McKelvie, A., and Davidsson, P. 2009. "From Resource Base to Dynamic Capabilities: an Investigation of New Firms," *British Journal of Management* (20:s1), December, pp S63-S80.

Miller, D., and Chen, M. 1996. "The Simplicity of Competitive Repertoires: an Empirical Analysis," *Strategic Management Journal* (17:6), June, pp 32-36.

Oliver, C. 1997. "Sustainable Competitive Advantage: Combining Institutional and Resource-based Views," *Strategic management journal* (18:9), September, pp 697-713.

Omerzel, D. G., and Antoncic, B. 2008. "Critical Entrepreneur Knowledge Dimensions for The SME Performance," *Industrial Management & Data Systems* (108:9), September, pp 1182-1199.

Ravichandran, T., and Lertwongsatien, C. 2005. "Effect of Information Systems Resources and Capabilities On Firm Performance: A Resource-based Perspective," *Journal of Management Information Systems* (21:4), April, pp 237-276.

Ries, E. 2011. The Lean Startup: How Constant Innovation Creates Radically Successful Businesses, NY: Crown Business.

Rindova, V., Ferrier, W. J. and Wiltbank, R. 2010. "Value from gestalt: how sequences of competitive actions create advantage for firms in nascent markets," *Strategic Management Journal* (31:13), July, pp 1474-1497.

Sawyer, S. 2000. "Packaged Software: Implications of the Differences from Custom Approaches to Software Development," *European Journal of Information Systems* (9:1), January, pp 47-58.

Scott, M., and Bruce, R. 1987. "Five Stages of Growth in Small Business," *Long range planning* (20:3), September, pp 45-52.

Sirmon, D. G., Hitt, M. A., and Ireland, R. D. 2007. "Managing Firm Resources in Dynamic Environments to Create Value: Looking Inside the Black Box," *Academy of Management Review* (32:1), January, pp 273-292.

Smith, K. G., Ferrier, W. J., and Ndofor, H. 2001. "Competitive Dynamics Research: Critique and Future Directions," Handbook of strategic management, M.Hitt, R.E.Freeman, J.Harrison (eds), Blackwell, London, pp 315-361.

Street, C. T., and Cameron, A. F. 2007. "External Relationships and the Small Business: A Review of Small Business Alliance and Network Research," *Journal of Small Business Management* (45:2), June, pp 239-266.

Swanson, E. B. 1994. "Information Systems Innovation among Organizations," *Management Science* (40:9), September, pp 1069-1092.

Teece, D. J. 2007. "Explicating Dynamic Capabilities: the Nature and Microfoundations of (Sustainable) Enterprise Performance," *Strategic Management Journal* (28:13), July, pp 1319-1350.

Teece, D. J., Pisano, G., and Shuen, A. 1997. "Dynamic Capabilities and Strategic Management," *Strategic Management Journal* (18:7), July, pp 509-533.

Timmons, J. A., Smollen, L. E., and Dingee, A. L. 1977. New venture creation. Homewood, IL: Irwin.

Thornhill, S., and Amit, R. 2003. "Learning about failure: bankruptcy, firm age, and the resource-based view," *Organization Science* (14:5), May, pp 97-509.

Ucbasaran, D., Westhead, P. and Wright, M. 2009. "The Extent and Nature of Opportunity Identification by Experienced Entrepreneurs," *Journal of Business Venturing* (24:2), June, pp 99-115.

Wernerfelt, B. 1984. "A Resource-based View of the Firm," *Strategic Management Journal* (5:2), June, pp 171-180.

Winter, S. G. 2003. "Understanding Dynamic Capabilities," *Strategic Management Journal* (24:10), October, pp 991-995.

Wu, L. Y. 2007. "Entrepreneurial Resources, Dynamic Capabilities and Start-up Performance of Taiwan's High-tech Firms," *Journal of Business Research* (60:5), May, pp 549-555.

Wu, S. Y., and Banker, R. D. 2010. "Best Pricing Strategy for Information Services," *Journal of the Association for Information Systems* (11:6), June, pp 339-366.

Wu, W. Y., Chang, M. L., and Chen, C. W. 2008. "Promoting Innovation Through the Accumulation of Intellectual Capital, Social Capital, and Entrepreneurial Orientation," *R&D Management* (38:3), September, pp 265-277.

Zhao, H., and Seibert, S. E. 2006. "The Big Five Personality Dimensions and Entrepreneurial Status: A Meta-analytical Review," *Journal of Applied Psychology*, (91:2), June, pp 259-271.

COPYRIGHT