Digital business innovation: roadmaps and attitudes from a FutureEnterprise perspective

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Abstract

The paper investigates the potential axes and dimensions of roadmaps for digital business innovation for entrepreneurs as well as enterprises. Actually, digital business innovation requires a change of perspective with regard to IT governance and management of IT infrastructure. This is due to the need to adapt them to the constant evolution and changes in business models, consequent to the digitalization of company products and services. Also, the paper considers the business models fitting the diverse roadmaps showing their mapping to a company value chain. Finally, the paper discusses the characteristics of four key types of digital business organization "attitudes", resulting from their orientation towards execution or else differentiation. The paper is based on insights and results from the FutureEnterprise project, which aims to deliver a research roadmap on new forms of internet-based enterprise innovation. The focus of the project is on what are defined there as "enterprises of the future", that are driven by constant business model transformation and innovation, acting as multi-sided platforms built on - as well as emerging from - digital innovations at the global as well as local level to produce shared value including that beyond monetization.

Key words

Digital business innovation, digitalization, business models, roadmaps ■

1 Introduction

The article investigates the potential axes and dimensions of roadmaps for digital business innovation for entrepreneurs as well as enterprises. Actually, digital business innovation requires a change of perspective with regard to IT governance and management of IT infrastructure. This is due to the need to adapt them to the constant evolution and changes in business models, consequent to the *digitalization* of a company products and services [11,12]. Also, the paper considers the business models fitting the diverse roadmaps showing their mapping to a company value chain. Finally, the paper discusses the characteristics of four key types of digital business organization "attitudes", resulting from their orientation towards execution or else differentiation. The paper is based on insights and results from the FutureEnterprise project. In particular, the paper arguments and perspectives are adapted from Alvertis et al. [2] and Yoo [4], and other contributions by the author to the two documents. The FutureEnterprise project aims to deliver a research roadmap on new forms of internet-based enterprise innovation. The focus of the project is on what are defined there as "enterprises of the future", that are driven by constant business model transformation and innovation, acting as multi-sided platforms built on - as well as emerging from - digital innovations at the global as well as local level to produce shared value including that beyond monetization.

The paper is structured as follows first we discuss the potential alternative roadmaps identified for enterprises and entrepreneurs willing to adopt business models enforcing digital business innovation. Then, mapping is provided of a set business model innovations for the identified roadmaps on the value chain primary and support activities. Finally, types of organization configurations are presented suitable to support companies understanding of their actual « attitude » towards digital business innovation. Conclusive remarks and future work end the paper.

2. Roadmaps

In this Section we discuss a framework for identifying the roadmaps that diverse business actors (entrepreneurs, small and medium enterprises- SMEs, and large enterprise) follow when undertaking specific evolution paths. These paths are driven by the business models innovation (BMI) the actors may chose, in terms of *design* or *reconfiguration* [6], on the basis of their strategic orientation towards differentiation[1] and/o the focus of the diverse actors on execution or operational effectiveness[2].

1 *Differentiation* refers to the creation of something (product or service) either unique (or perceived unique) in a given market or «brand new», thus, leading to the creation of a new industry or market. Differentiation may also refer to a price advantage due to the capability of a company offering to increase the customers' willingness to pay [9]. Thus, in the framework shown in Figure 1 the content element is characterized by the highest degree of differentiation, due to its direct influence on the components of an offering.

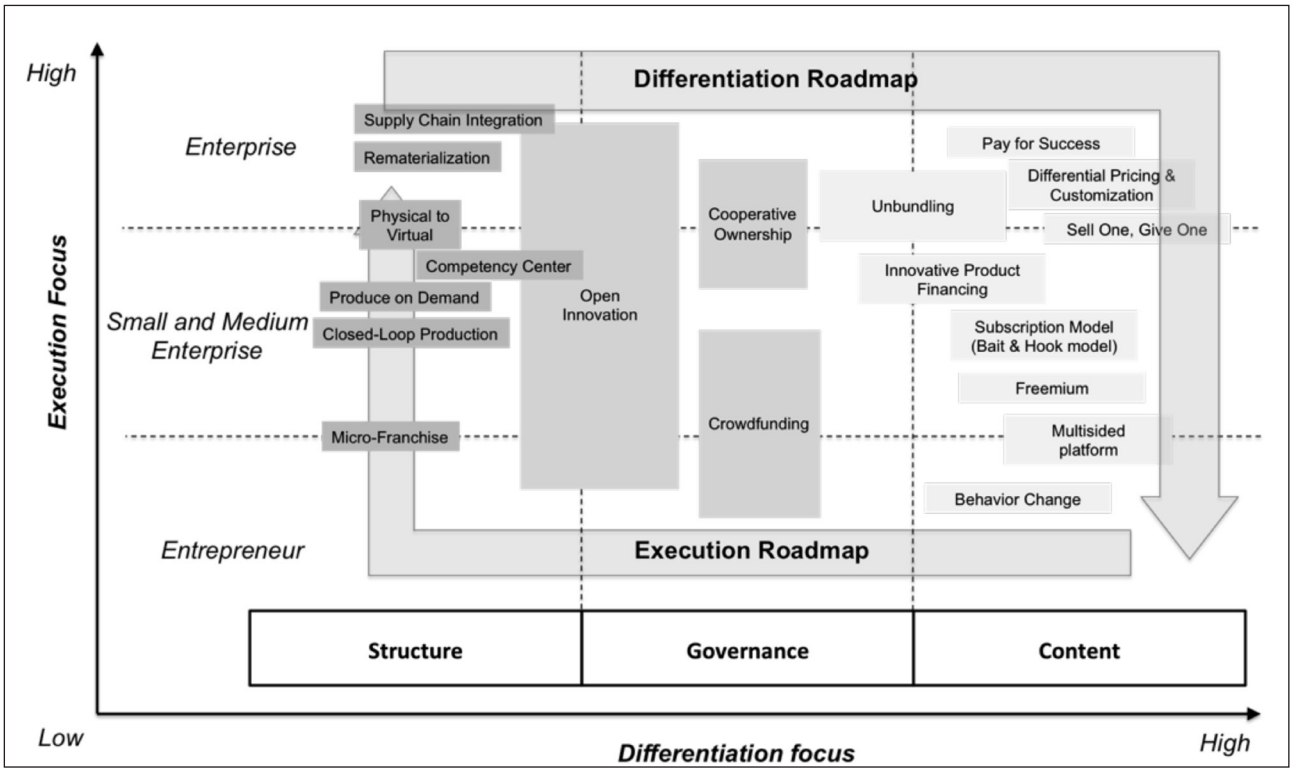

Figure 1: Exploration framework for Business Models Innovation Roadmapping, adapted from Alvertis et al. [2].

Thus, the framework is also based on a classification of available business models (BMs) in terms of i) their design core elements and ii) the types of business actors suitable to adopt them. The *design core elements* refer to an activity systems perspective on business models [3,13], where activity system design describes how firms do business, and captures the essence of the business model. In particular, according to [3], *activity system content* refers to the selection of activities that are performed, while *activity system structure* describes how the activities are linked as well as their relevance to the business model (being them core, supporting or peripheral). Finally, *activity system governance* refers to who performs the activities and its role in decision-making or gatekeeping.

The framework is shown in Figure 1, where gray scale shades are used to differentiate BMs on the basis of their design core element. Dark gray is associated to BMs having *structure* as design core element, light gray to the BMs having *governance* as design core element, while gainsboro indicates BMs having *content* as design core element. Then, the diverse design core elements are further characterized on the basis of their strategic orientation towards differentiation and the consequent strategic focus; whereas the considered business actors are positioned on the basis of their focus on execution or operational effectiveness. Finally, the identified BMs are distributed on the resulting roadmap (see again Figure 1) on the quadrants at the crossroad between the associated design element degrees of differentiation and the business actor execution focus.

It is worth noting that some BMs can cover areas pertaining to diverse core elements and actors than the ones primarily characterizing it (in Figure 1, this issue is represented by the thickness and extension of the different BMs colored boxes, such as, e.g., in the case of the «open innovation» BM). This creates two different roadmaps for the diverse business actors: one leading to higher level of execution and the other to a differentiation leadership. The idea behind this BM roadmap is that (large) enterprises, SMEs, and entrepreneurs have to move in the roadmap focus through the key elements (e.g., entrepreneurs may focus mainly on content, SMEs start from structure to arrive at content, enterprise may start with governance to arrive at content). Thus, supposing that entrepreneurs are initially more interested in differentiation rather than execution, however, once reached the higher level of it, probably they will have evolved towards being a SMEs or else even a (large) enterprise, consequently moving along the steps of the execution roadmap. The opposite path can be supposed to be the one followed by (large) enterprises and SMEs.

3. Digital business impact on the value chain

In this Section we provide a mapping of a set of BMIs identified for the roadmaps discussed above on the value chain primary activities (product and market related activities) and support activities (related to infrastructure,

2 *Execution* refers to the ability of a business actor to perform its core activities better than the competitors or else obtaining more out of its own resources [9], e.g., in terms of efficiency, cost leadership, etc. Consequently, the framework shown in Figure 1 sees execution as more focused on business processes and infrastructure management in established enterprises (being them large or small and medium sized).

propose a sequence of adoption of the different business models by a generic enterprise willing to approach digital business innovation.

Considering the support activities (Figure 2a), the adoption of BMIs such as, e.g., *BMI#2 - Physical to Virtual* and *BMI#17 - Competency Centre*, allows an integrate organizational change of all of the support activities, technology, procurement, and human resource management). For the full description of the BMIs we refer the reader to Alvertis et al. [2] and other sources as, e.g., Afuah & Tucci [1], Chesbrough [5], Osterwalder & Pigneur [8]. As to the mapping shown in Figure 2a and Figure 2b, we namely *firm infrastructure*, *human resource management*, *technology development*, and *procurement*. The change in this case is oriented towards execution as well as the corresponding roadmap path. Combining these actions with a focused change on firm infrastructure through, e.g., *BMI#15 - Micro-Franchise*, the enterprise is able to start experimenting on *BMI#21 Multisided platform* and *BMI#18 - Open Innovation*, thus, with a consequent early orientation towards a differentiation roadmap path. It is worth noting that the BMIs shown in bold letter in Figure 2a and Figure 2b impact primary activities as well.

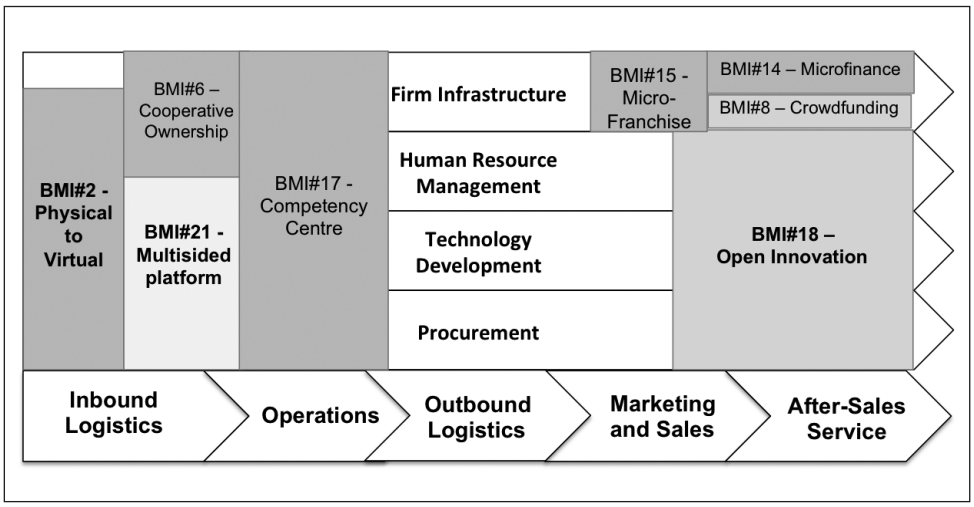

Figure 2a. Business Model Innovations impact on value chain support activities.

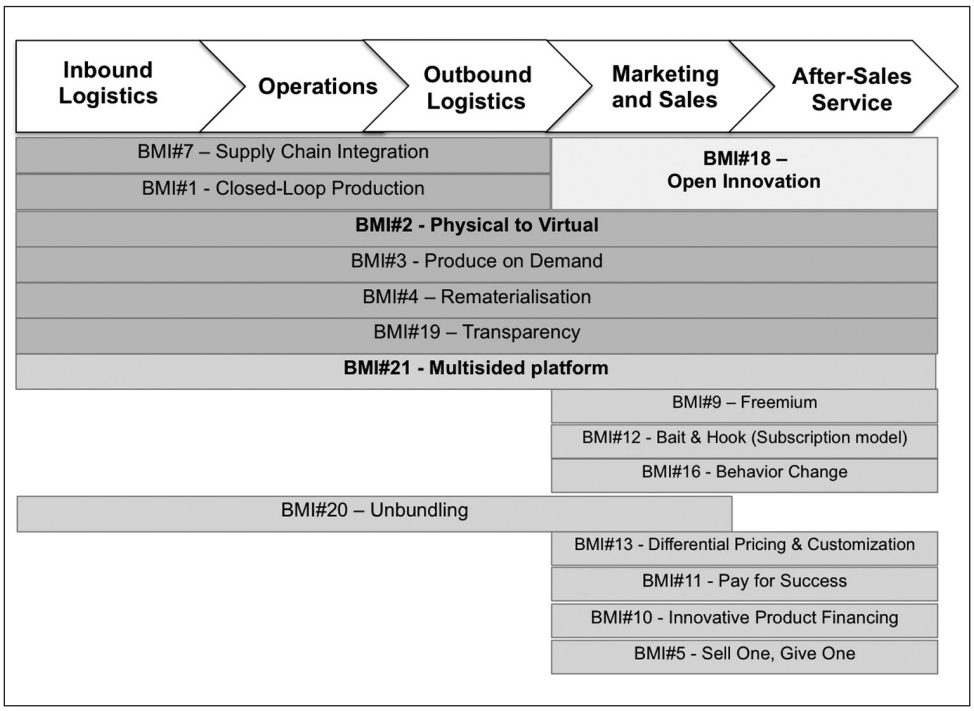

Figure 2b: Business Model Innovations Impact on value chain primary activities

As to the primary activities (Figure 2b), the execution oriented BMIs above considered for support activities, have their execution complements here represented, e.g., by *BMI#7 – Supply Chain Integration* (covering logistics and operations), *BMI#2 – Physical to Virtual* and *BMI#3 – Produce on Demand*. The adoption of the latter BMIs is a relevant basis for further adoption of differentiation oriented BMIs and a consequent roadmap differentiation path to follow.

4. Attitudes

This Section outlines the types of organization configurations a business actor may have or adopt when looking to take advantage of the diverse BMIs associated to the above-discussed roadmaps. The types of organization configuration are discussed in detail by [2,4] and are based on an extension of the [7] typology for the digital business innovation. Thus, adopting BMIs associated to a certain roadmap may lead businesses to follow different trajectories and having a specific *attitude* toward digital business innovation, either focused on execution or differentiation and all the hybrid configurations in between. However, to better elicit the changes in the organizational structure to take advantage of the diverse BMIs and roadmaps a further set of dimensions have to be considered as to the *response patterns stability* and *consistency* [7].

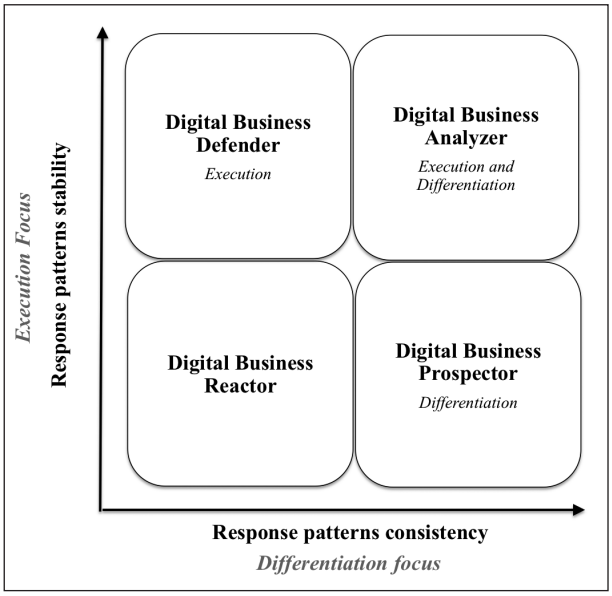

Figure 3: Types of Digital Business organization configurations and attitudes. Adapted from Cave & Cave [4]

Hence, for each of the considered business actors, the combination of the BMIs roadmap strategic orientation (differentiation vs. execution) and the response patterns (degree of stability and consistency characterizing them) allow to identify four types of digital business organization configurations. Figure 3 shows the four types based on an adaptation to digital business challenges of the classic [7] typology (made up of *defenders*, *prospectors*, *analyzers*, and *reactors*). However, it is worth noting that the description of the types characteristics preserves the core facets of the original typology (see [7]). Thus, we summarize them in what follows:

- *Digital Business Defender* is an organization focused on being competitive in a narrow and well-defined (product-service)-market in digital business, thus, mainly giving attention to efficiency, productivity, and improvement of existing operations.
- *Digital Business Prospector* is an organization focused on continuous differentiation and innovation of service-products, and constantly looking for new digital market opportunities, giving a primary attention to experimentation.
- *Digital Business Analyzer* is an organization operating in two markets, i) one stable and with a limited degree of digitalization, ii) the other highly digitalized and evolving or being subject to change. In the first market the organization operates as the defender does, while in the second it acts as a prospector does.
- *Digital Business Reactor* is an organization unable to respond effectively to change and uncertainty in the business environment, due to inadequately articulated strategy or an organizational structure improperly linked to strategy or the adherence to an obsolete strategy and structure.

Considering the response patterns axes in Figure 3, it is worth noting that according to [7], reactors response mechanisms are unstable and inconsistent[3]. Thus, organizations in that quadrant have to move to one of the other three types in order to exploit the BMIs suitable to enable them taking advantage of digital business in an execution or else differentiation oriented strategy. However, it should also be noted that, due to the high variability and velocity of change driven by digital technologies, becoming a digital business reactor could be the case also for organizations having chosen or adopted one of the three stable and consistent response types, for they embraced digital technologies become obsolete.

In what follows the former types are discussed as "attitudes" for the target business actors, highlighting the specific issues they encompass as for four «universal» problems of organizing: *task division*, *task allocation*, *reward provision*, and *information provision* [10]. Finally, it is worth noting that the subsequent description of types follows and adapts the original proposal by [7].

Digital Business Defender (DBD) organizations usually are oriented towards execution as cost efficiency and penetration in their current markets. Thus, planning is actually a relevant activity to develop and carry out digital business initiatives, then evaluated and eventually revised. As for task allocation, DBDs adopts a functional organizational structure, with high degree of formalization and division of labor. The efficiency orientation influences the reward provision as well as human resources allocation (focus on cost-control areas and operations). As for information provision DBDs adopt "long-looped" vertical information systems and simple forms of coordination (standardization and scheduling). The main risk faced by DBDs in the current digital business environment is actually the failure to detect new service/products opportunities.

Digital Business Prospector (DBP) organizations are oriented towards differentiation through innovation and market responsiveness. The DBP type is constantly ready to alter its organizational structure to accelerate responses to environmental change. DBP is suitable to be adopted by tech start-ups and tech driven enterprises focused on digital business innovation. Thus, testing, prototyping as well trends scouting and ideation are preliminary activities to develop and carry out digital business initiatives, then evaluated and only as a final step formally planned. Planning is actually problem solving and findings oriented, heavily dependent on experimental and testing feedbacks (see also [7]).

As for task allocation, DBPs adopt a decentralized organizational structure, relying on self-control and information located at the diverse units. Indeed, DBPs localize the resources to project teams to develop a new product and services or explore a niche market. Consequently, DBPs have a less division of labor and tasks

3 With regard to the original Miles & Snow typology, we have proposed here to consider different degrees of instability and inconsistency.

with a low degree of formalization, due to constant and frequent changes of the tasks to perform. Also, rewards are results-oriented with a great part of intangibles as the recognition by community peers (as, e.g., in open source domains). As for information provision, DBPs adopt short horizontal feedback loops information systems and complex forms of coordination based on digital platforms driven communication, coordination, cooperation, and networking. The main risk faced by DBPs is related to their failure orientation, that is, investments may not provide the expected results and they may have overload of resources.

Digital Business Analyser (DBA) organizations have a double orientation either towards execution on their main market and differentiation as innovation and market responsiveness. As said above, in the first market they operate as the DBD does, while in the second they act rather than a DBP. Thus, they have a matrix organizational structure, made up, on the one hand, of functional budget oriented divisions for the stable business; on the other hand, they rely on self-contained projects as well as results oriented groups for the research and development of innovative solutions. Consequently, as to information provision, the DBAs adopt both simple and complex forms of coordination, combining "long-looped" vertical information systems and short horizontal feedback loops). The DBA attitude is suitable to be adopted by large enterprises and SMEs.

5. Conclusion and future work

The article has discussed the potential axes and dimensions of roadmaps for digital business innovation for entrepreneurs as well as enterprises, also providing a mapping on value chain of some relevant BMIs for the diverse strategic orientations identified for the roadmaps (execution vs. differentiation). Then, we have discussed types of organization configurations a business actor may have or adopt as "attitudes" when looking to take advantage of the diverse BMIs associated to the above-discussed roadmaps strategic orientation. The roadmaps and types presented in this paper are based on the analysis of secondary sources and case studies from practitioners' reports and documents as well as academic literature. In future work empirical research is going to be developed on real cases for the business actors engaged in digital business innovation, to ground the proposals presented in this paper on empirical evidence and make them evolve according to the results.

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References

[1] A. Afuah, & C. Tucci: Internet business models and strategies; Harvard Business School Press, Boston, 2003

[2] L. Alvertis, P. Kokkinakos, S. Koussouris, F. Lampathaki, J. Psarras, G. Viscusi, and C. Tucci (eds.): Deliverable D1.2.1 – Research Roadmap on new forms of the Enterprise – Draft Release. FutureEnterprise, 2014

[3] R. Amit & C. Zott: Creating value through business model innovation; MIT Sloan Management Review, 53(3), 2012

[4] B. Cave & J. Cave, J. (eds): Deliverable D1.3.1 - Business Value for Enterprise Innovation – Draft Release; FutureEnterprise, 2015

[5] H. Chesbrough: Open Innovation: The new imperative for creating and profiting from technology; Harvard Business Review Press, 2003.

[6] L. Massa & C.Tucci: Business Model Innovation; in M. Dodgson, D. M. Gann, & N. Phillips (Eds.), The Oxford Handbook of Innovation Management, Oxford University Press, 2014. doi:0.1093/oxfordhb/9780199694945.013.002

[7] R. E. Miles & C. C.Snow: Organizational Strategy, Structure, and Process; Stanford University Press - Stanford business classics, 2003 (Originally published in 1978, McGraw-Hill, NY, USA).

[8] A. Osterwalder & Y. Pigneur: Business Model Generation. A Handbook for Visionaries, Game Changers, and Challengers; John Wiley & Sons, 2010

[9] M. E. Porter: Competitive Advantage: Creating and Sustaining Superior Performance. New York: The Free Press, 1985.

[10] P. Puranam, O. Alexy & M. Reitzig: What's "New" About New Forms of Organizing?; Academy of Management Review, 39(2), pp. 162–180, 2014. doi:10.5465/amr.2011.0436

[11] D. Tilson, K. Lyytinen & C. Sørensen: Digital Infrastructures: The Missing IS Research Agenda; Information Systems Research, 21(4), pp. 748–759, 2010.

[12] Y. Yoo: The Tables Have Turned: How Can the Information Systems Field Contribute to Technology and Innovation Management Research?; Journal of the Association for Information Systems, 14, pp. 227–236, 2013.

[13] C. Zott & R. Amit: Business model design: an activity system perspective; Long Range Planning, 43(2-3), pp. 216–226, 2010. doi:10.1016/j.lrp.2009.07.004

Biography

Gianluigi Viscusi (PhD) is research fellow at the Chair of Corporate Strategy and Innovation (CSI) of the EPFL. His research interests include information systems planning and business modelling, public policy and technology Innovation, e-Government, information quality and value, service management and engineering, social study of information systems. He has been consultant on e-government planning, policy design, and implementation roadmap for international organizations such as, e.g., the OECD. Currently, his research focuses on three main streams: crowd-driven innovation, social value of open government, and translational research in innovation and technology management. His research has been published in a range of books, conference proceedings, and journals such as, e.g., Government Information Quarterly. In 2010 he has co-authored with Carlo Batini and Massimo Mecella the book "Information Systems for eGovernment: a quality of service perspective" (Springer, Heidelberg).