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Business Model Design: An Activity System Perspective

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Building on existing literature, we conceptualize a firm's business model as a system of interdependent activities that transcends the focal firm and spans its boundaries. The activity system enables the firm, in concert with its partners, to create value and also to appropriate a share of that value. Anchored on theoretical and empirical research, we suggest two sets of parameters that activity systems designers need to consider: *design elements* - content, structure and governance - that describe the architecture of an activity system; and *design themes* - novelty, lock-in, complementarities and efficiency - that describe the sources of the activity system's value creation.

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Introduction

Consider the case of FriCSo, a young engineering company that has achieved a significant technological breakthrough in friction reduction technology.[1] Friction is the arch enemy of mechanical systems - it reduces the power of machines, leads to overheating, and causes wear, breakdown and seizure in moving parts. Suppose FriCSo's technological invention can reduce friction by over 15,000%: surely such a staggering technology - with clear and wide applicability to products and industrial applications that involve moving parts (such as machine manufacturing, automobile, shipbuilding, etc.) - will be a sure bet for commercial success? Or will it?

Once a target industry (say, automobile) has been chosen, what kind of company should be built to commercialize the intellectual property? What 'model' or 'template' should a firm adopt in order to embed itself into the existing ecology of original equipment manufacturers (OEMs), and the myriad tier one, two and three industry suppliers? Should it choose to become a machine

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manufacturer, building machines that embed the new technology, and selling them to the OEMs? Or would it be better to build and operate a factory (a 'job-shop') that would perform the surface treatment of moving parts for clients who would outsource that step in their commercial production line to the focal firm's factory? Or would it be better to opt for a pure R&D firm model, and simply sell the technology (e.g., via licensing agreements) to third parties such as machine manufacturers?

Each of these choices involves a fundamentally different business model, that is, implies a different set of activities, as well as the resources and capabilities to perform them - either within the firm, or beyond it through cooperation with partners, suppliers or customers. And each choice will have implications for the venture's performance potential - it will affect what capital expenditures are necessary, what prices can be charged and what margins earned, and, perhaps most importantly, which customers and competitors the new firm will deal with. In other words, the design of the business model is a key decision for an entrepreneur who creates a new firm — and a crucial - perhaps more difficult — task for general managers who are charged with rethinking their old model to make their firm fit for the future. Once the template is set, the activities are in place, and the resources have been developed and honed, that template will be difficult to change, due to forces of inertia and resistance to change.

Given the vital importance of the business model for entrepreneurs and general managers, it is surprising that academic research (with a few exceptions) has so far devoted little attention to this topic. We need a conceptual toolkit that enables entrepreneurial managers to design their future business model, as well as to help managers analyze and improve their current designs to make them fit for the future. This article draws attention to the system of activities performed by the focal firm as well as by third parties (partners, suppliers, customers) as part of the focal firm's business model. We believe that improved knowledge about how to describe the architecture of the activity system, e.g., its key design parameters, will bring the importance of the topic to the forefront of managers' and researchers' thinking, and help them design better business models. In particular, we suggest concepts that are intended to:

- give managers and researchers a 'language,' concrete tools and a tight framework for business model design that can foster dialogue and promote common understanding;
- highlight business model design as a key task of the entrepreneurial manager;
- emphasize the importance of system-level design, as opposed to partial optimization (for example, whether a particular activity should be outsourced or conducted in house).

We start by describing the firm's activity system and explain how it captures the essence of its business model, and then support this idea with a brief review of the recent literature on business models. We draw on our own recent work on business models to suggest two sets of parameters that activity systems designers need to consider: *design elements* (content, structure and governance) that describe an activity system's architecture, and *design themes* (novelty, lock-in, complementarities and efficiency) that describe the sources of its value creation.[2]

Activity system: key to understanding the firm's business model

Our previous work notes that the overall objective of a focal firm's business model is to exploit a business opportunity by creating value for the parties involved, i.e., to fulfill customers' needs and create customer surplus while generating a profit for the focal firm and its partners. That objective is reflected in the customer value proposition, and has been characterized by Magretta as '*the value creating insight on which the firm turns*'.[3] An *activity* in a focal firm's business model can be viewed as the engagement of human, physical and/or capital resources of any party to the business model (the focal firm, end customers, vendors, etc.) to serve a specific purpose toward the fulfillment of the overall objective. An *activity system* is thus a set of interdependent organizational activities centered on a focal firm, including those conducted by the focal firm, its partners, vendors or customers, etc.. The firm's activity system may transcend the focal firm and span its boundaries,

but will remain firm-centric to enable the focal firm not only to create value with its partners, but also to appropriate a share of the value created itself.

[the] purposeful weaving together of interdependent activities … performed by the firm itself or by its suppliers, partners and/or customers - is the essence of the business model design.

Interdependencies among activities are central to the concept of an activity system, and provide insights into the processes that enable the evolution of a focal firm's activity system over time as its competitive environment changes.[4] These interdependencies are created by entrepreneurs or managers who shape and design both the organizational activities and the links (transactions) that weave activities together into a system. Such purposeful design - within and across firm boundaries - is the essence of the business model.[5] Some activities relevant to the focal firm's business model will be performed by the firm itself, others by suppliers, partners and/or customers. The architecture of the firm's activity system - shaped by the choice of activities, how they are linked, and who performs them - captures how the focal firm is embedded in its 'ecology,' i.e., in its multiple networks of suppliers, partners and customers, as well as defining who are the firm's potential suppliers, partners and customers (and competitors) in the first place. Thus, if FriCSo (the technology-based startup noted above) were to adopt the business model of a machine manufacturer in order to exploit its unique friction-reduction technology, it would choose OEM suppliers as its customers, and other machine manufacturers would be its competitors. However, if it adopted a technology-licensing model, it would choose both machine manufacturers *and* OEM suppliers as its customers. These important consequences of the firm's business model design choice have obvious ramifications for its ability to create and capture value. The stronger the competition implied by the choice of the business model, for instance, the more difficult value appropriation will be.

The firm's revenue model also plays an important role in value appropriation. Our previous work has highlighted how the revenue model - akin to a pricing strategy for specific products or services - refers to the specific modes in which a business model enables revenue generation. In that sense, a revenue model complements a business model design, just as a pricing strategy complements a product design. Although the concepts may be quite closely related and sometimes even intertwined (as with, for example, Gillette's pricing strategy of selling cheap razors to make customers buy its rather expensive blades), business models and revenue models are conceptually distinct.

A business model is geared toward total value creation for all parties involved. It lays the foundations for the focal firm's value capture by co-defining (along with the firm's products and services) the overall 'size of the value pie,' or the total value created in transactions, which can be considered the upper limit of the firm's value capture potential. Again we have noted in previous work that the business model also co-determines the focal firm's bargaining power: the greater the total value created, and the greater the focal firm's bargaining power, the greater the amount of value that the focal firm can appropriate. How much of the total value the firm actually captures, however, depends on its pricing strategy, or revenue model. For example, Loch et al. have noted how the FriCSo executives contemplated a business model based on licensing, in which they would sell the rights to use their technology (a combination of proprietary polymer tools with a software-supported process) to machine manufacturers and suppliers in the automobile industry. But even though they understood how the necessary activity system would have to be designed, they struggled to find an appropriate revenue model (to be embodied in their pricing strategy) that would be both acceptable to their automotive clients, and allow them to maximize their profits. While their business model had taken shape, the venture's revenue model - how to charge for each element of the technology - was still uncertain.

A business model is geared toward total value creation for all parties …. the greater the total, the greater the focal firm's bargaining power, and the greater the amount of value it can appropriate.

When delineating their firms' activity systems, managers need to bear in mind that identifying technologically and/or strategically distinct activities can be conceptually challenging because (as Porter points out) the number of potential activities is often quite large. Santos notes how many seemingly inseparable activities can be broken down further, especially given ongoing advances in information and communications technologies. One way to deal with this issue is to define activities at different levels of aggregation. Davenport, for example, mentions the supply chain operations reference model, which lays out top-level activities (plan, source, make, deliver, and return), and also specifies sub-activities that can be delineated at second, third and fourth levels, while Stigler notes that, at high levels of aggregation, activities could comprise whole business functions, such as accounting, or human resource management. At low levels of aggregation (i.e., high levels of decomposition), activities could be as specific as the processing of customer e-mails based on their content, or the translation of product manuals into a foreign language. In this paper, for simplicity and conceptual clarity, we accept the level of aggregation at which an activity is described as a given.[6]

Brief review of the recent literature on business models

The emerging literature on business models suggests that a focus on activities can indeed be useful and unifying.[7] In our own work, we have defined the business model as depicting '*the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities*'.[8] Of course, transactions link activities, and transactions and activities can be viewed as two sides of the same coin.[9] For an analogy, consider graph theory with its dual perspectives on nodes and arcs. A graph can be described either by focusing on its nodes and by listing all the other nodes to which they are linked, or by focusing on the arcs and describing which nodes pertain to each arc: both are equivalent in that they yield a complete description of the graph.

Similarly, a business model can either be conceptualized as set of transactions or as an activity system — in Afuah and Tucci's words, a '*system that is made up of components, linkages between the components, and dynamics.*' Viewed as an activity system, the business model encompasses what Afuah notes elsewhere as '*the set of which activities a firm performs, how it performs them, and when it performs them.*' Johnson et al. catalog key activities that might include '*training, development, manufacturing, budgeting, planning, sales and service,*' while Mitchell and Coles emphasize that the business model addresses the 'how' of providing customers and end-users with products and services, and Eisenmann suggests it refers to the nature of the services that firms provide to customers, and the activities that they perform to deliver those services. Chesborough and Rosenbloom consider the business model as a construct that mediates between technological inputs and economic outputs. Accordingly, the business model defines the structure of the value chain (an activity-based concept), creating value (as Chesborough notes elsewhere) '*by defining the set of activities from raw materials through to the final consumer…with value being added throughout the various activities,*' thereby addressing the underlying logic of how the firm delivers value to its customers at an appropriate cost. In a nutshell, the received literature on business models, explicitly or implicitly, supports an activity system perspective.[10]

Some scholars have pointed explicitly to the boundary-spanning nature of business models by emphasizing the need to consider activities performed for the focal firm but outside its boundaries by partners, suppliers or customers. This allows the focal firm to rely on the resources and capabilities of third parties, and harness external ideas and technologies through 'open business models'.

Indeed, in some instances entire key activities - such as product development - are shifted outside the firm; but they remain, nevertheless, a central part of the firm's business model.[11]

The design parameters of activity systems

This section describes two sets of design parameters that capture the purposeful, firm-centric design of activity systems — *design elements* and *design themes*.

Design elements: content, structure and governance

One set of important design parameters that characterize an activity system are the *design elements* of *content, structure* and *governance*, which go beyond interdependencies among activities or notions of network structure.

- *Activity system content* refers to the selection of activities, i.e., those that are performed. For example, in addition to the typical activities of a retail bank, Bancolombia adopted activities designed to offer microcredit to the more than 60% of Colombians who did not have access to banking services. To perform these new activities, the bank needed to train its top management, hire and train new staff, develop new capabilities, and link the new activity to its existing system (platforms, applications, and channels)[12];
- *Activity system structure* describes *how* the activities are linked (e.g., the sequencing between them), and it also captures their importance for the business model, for example, in terms of their core, supporting or peripheral nature. Consider IBM: triggered by a severe financial crisis in the early 1990s, the firm switched its core and peripheral activities, shifting its focus from being a hardware supplier (old core) to becoming a service provider (new core). Building on a body of know-how built over decades, IBM launched a range of new activities in consulting, IT maintenance, and other services: by 2006, more than half of IBM's $90bn revenues came from these activities, which had barely existed 15 years earlier.[13]
- *Activity system governance* refers to *who* performs the activities. Franchising, for example, represents one possible approach to activity system governance. It can be the key to unlocking value, as was the case when Japanese retailing entrepreneur Toshifumi Suzuki realized in the early 1970s that the franchise system developed in the U.S. was an ideal response to the strict government regulations which limited the size and restricting the opening times of Japanese retail outlets. In franchising Seven-Eleven stores in Japan, Suzuki adopted a novel type of activity system governance and managed to create value through professional management and local adaptation.[14]

Managers often need to make decisions on all these parameters, often simultaneously. For example, consider P2P lending companies like Lending Club, Prosper or Zopa, which aim at enabling direct small, unsecured loans between individuals. Important business model design issues for these firms founders in their early stages were: (1) whether to include a secondary market for trading loans in their activity systems or not (a content issue); (2) how precisely to link borrowing and lending activities - for example, would they provide an algorithm to automatically match borrowers to lenders, and if so, to whom and to how many (a structure issue)?; and (3) who should perform the credit risk assessment of the borrower, the P2P firm or the lender (a governance issue)?

the design parameters of activity systems can be seen as independent and orthogonal, but they can also be highly interdependent.

For simplicity and conceptual clarity, we have described the design parameters of activity systems as independent and orthogonal, but they could also be highly interdependent. The founders of the US P2P lending company Prosper, for example, made the conscious early decision to let lenders

choose which borrowers they wanted to lend their money to. This was a structural choice (settling the question of how lending and borrowing activities were linked) but at the same time constituted a decision about governance (in that evaluation and selection activities were shifted to the customers, and not performed by the firm).

Thus, activity system design describes *how firms do business*, and captures the essence of the business model. Questions about business model design can thus be framed as questions about activity systems.

NICE design themes: novelty, lock-in, complementarities, efficiency

An activity system can also be characterized through what we call *design themes*, which detail the system's dominant value creation drivers. Design themes are configurations of design elements, or the degree to which they are orchestrated and connected by distinct themes. Conceptual and empirical research has established that the common design themes that we can say orchestrate and connect the elements of an activity system include: *N*ovelty, lock-*I*n, *C*omplementarities and *E*fficiency (summarized by the acronym NICE).

- *Novelty:* The essence of novelty-centered activity system design is the adoption of new activities (content), and/or new ways of linking the activities (structure), and/or new ways of governing the activities (governance). A prominent example is Apple, which used to be focused on the production of innovative hardware such as personal computers. Through the development of the iPod and the associated music download business iTunes, Apple was the first electronics company that included music distribution as an activity (content novelty), linking it to the development of the iPod hardware and software (structure novelty), and digitizing it and thereby pushing many subactivities of legal music downloads to its customers (governance novelty). That is, Apple expanded the locus of its innovation from the product to its business model.
- *Lock-in:* Activity systems can also be designed for lock-in, their power to keep third parties attracted as business model participants. Lock-in can be manifested as switching costs, or as network externalities that derive from the structure, content and/or governance of the activity system. For example, in eBay's activity system, most of the marketing and sales activities (such as photographing and describing items for sale) are performed by the customers (sellers). What keeps them attracted to eBay and motivates them to perform these activities and prevents them from switching to other service providers? Arguably, one very important factor is the strong positive network externalities inherent to the eBay activity system. With a massive base of potential buyers, sellers know that they are more likely to perform a trade at a convenient price on eBay than elsewhere — so they keep coming back: they are locked in. The same applies to social networking sites such as Facebook - besides enjoying friendship-based networking externalities, Facebook members typically invest considerable time and effort in personalizing their web pages, and these investments form strong impediments to switching to other providers.
- *Complementarities:* Complementarities are present whenever bundling activities within a system provides more value than running activities separately.[15] For example, in commercial banking, deposit activity is an important source of funding that complements the banks' lending activity - banks without access to such funds suffered severely in the recent liquidity crises. In the pharmaceutical industry, R&D conducted by innovative biotechnology firms can provide the drug pipeline for the marketing and distribution activities of large pharmaceutical companies who partner with the biotechnology firms. Similarly, in the diamond business, organizing polishing and distribution within a single business model is advantageous because it enables the focal firm to tailor stones to the demand in each market segment.
- *Efficiency:* Efficiency-centered design refers to how firms use their activity system design to aim at achieving greater efficiency through reducing transaction costs. For example, a focal firm may decide to integrate vertically to avoid being 'taken hostage' by its trading partners, who may

have an incentive to exploit a co-dependency situation. Or consider the reverse case, in which a firm manages to standardize the interfaces between the activities in its system, and so can lower its transaction costs by outsourcing some activities to third parties, a design theme behind the rise of the business process outsourcing industry in India, where companies like TCS, Wipro, Infosys, Satyam or WNS have more than 20,000 employees each and revenues of over $1bn. Another example is First Data Corporation, a U.S. firm that employs 30,000 people handling crucial activities for 1,400 card issuers, including dealing with applications, authorizing credit lines and processing transactions for 420 million credit card accounts.[16] These are examples of efficiency-centered designs where the governance of the activity system is implied. Firms can also aim at achieving efficiency through their activity system content and structure. Some low cost airlines drop activities considered standard by regular airlines entirely, like on-board catering or seat assignment, as well as changing the way activities are performed and linked to each other (e.g., by having customers book tickets directly online).

Each of these four sets of examples shows how firms' business model design has been shaped according to an overriding design theme, in many cases resulting in models that are significantly different from their original designs, and that have created new value. Together they amount to an activity system design framework, as summarized in Table 1.

Discussion and conclusion

Benefits of an activity system perspective on business models

In this article, we argue that the activity system perspective on business models is consistent with the various approaches that have been advanced in the literature. A business model can be viewed as a template of how a firm conducts business, how it delivers value to stakeholders (e.g., the focal firms, customers, partners, etc.), and how it links factor and product markets. The activity systems perspective addresses all these vital issues, and gives managers and academics a language and a conceptual toolbox to address them and engage in insightful dialogue and creative design.

To return to FriCSo, who had developed a world-class technology for friction reduction, and then had to decide on its future business model. As Loch et al report, the founders and their venture capital investors jointly decided to reject the choice of a machine manufacturing business model, as it would have been too capital-intensive and would have pitted the small start-up against powerful and entrenched competitors with similar activity systems and resource advantages that it would

Table 1. An activity system design framework

Framework provides insight by:	
Giving Business Model Design *a language, concepts, and tools*	
Highlighting Business Model Design as a *key managerial/entrepreneurial task*	
Emphasising *system-level design* over partial optimisation	
Design Elements	
Content	*What* activities should be performed?
Structure	*How* should they be linked and sequenced?
Governance	*Who* should perform them, and *Where*?
Design Themes	
Novelty	Adopt *innovative* content, structure or governance
Lock-**I**n	Build in elements to *retain business model stakeholders, e.g., customers*
Complementarities	*Bundle activities* to generate more value
Efficiency	Reorganise activities *to reduce transaction costs*

have found hard to beat. Instead, FriCSo adopted the business model of a machine tool manufacturer, positioning itself as a supplier to the powerful players, focusing on selling them products that had great value added through their intellectual property. (Another advantage was that automotive industry suppliers were used to buying tools, so this business model was familiar to them.) In fact, the choice of the business model was vitally important in this case: it did not simply determine future profit potential - rather, it was the key to the young firm's survival. If the founders had opted for a machine manufacturing model, they would probably not have received the equity capital they needed from their VC investors — lacking funds to finance ongoing research and development efforts, the firm could well have gone out of business.

Why is the activity systems perspective advantageous for managers and academics concerned with past, current and future business models? First, a focus on activities is a natural perspective for entrepreneurs and managers who must decide on business model design. Should activities X and Y, which are central to the business model, be governed within or outside their firm's boundaries? How should X and Y best be organized, given the firm's (and its potential partners') pre-existing strengths and weaknesses, core competencies and disabilities?[17] The importance of activities-based thinking is also evident from the extensive managerial literature on outsourcing.[18]

an activity system perspective encourages systemic, holistic thinking in business model design, instead of concentrating on isolated choices.

Second, the activity system perspective encourages the firm in systemic and holistic thinking when designing its business model, instead of concentrating on isolated, individual choices (such as 'make or buy' decisions about particular products, or outsourcing a particular activity). The message to managers is clear: look at the forest, not the trees - and get the overall design right, rather than concentrating on optimizing details. The fast-growing Spanish fashion retailer Inditex, which manages global brands such as Zara, has clearly understood and internalized this message and made business model thinking a corporate priority. Their Annual Report begins by explaining the Inditex business model and highlighting its innovative elements.[19] The company has made many activity system choices that, viewed in isolation, might seem inefficient. For example, they perform many generic activities in-house, such as dyeing and cutting fabric, and washing, ironing and ticketing finished garments. They have also chosen to outsource sewing to small workshops located close to their Spanish production facilities. Both of these choices might seem questionable: but, taken as a whole, Inditex's carefully designed activity system allows it to bring new garments from the design stage to the shop floor in record time - days as opposed to months - which makes a big difference in the fast moving fashion business.

Third, a focus on activities allows us to relax several assumptions made in the transaction cost economics (TCE) literature - for example, that the governance challenges of firms involved in an exchange will be homogeneous. Focusing on activities allows us to concentrate on the focal firm that must decide on its business model design, e.g., how to link a new activity into its current business model, and who should govern that activity. Indeed, of the two parties involved in a bilateral exchange, in practice only one - the focal firm - has to make a decision about its business model, e.g., whether to outsource an activity or not: for its counterpart - a specialized provider of services - this question is irrelevant. Moreover, much TCE literature assumes homogeneity in firms' production capabilities and costs - assets are assumed to be equally productive in the hands of different firms, given similar governance arrangements and transaction characteristics. Indeed, in the TCE analysis of governance structures, production costs are largely determined by transaction attributes rather than by the attributes of the firms involved in the exchange.[20] By contrast, much of the recent strategy literature acknowledges firms' differential resource endowments and heterogeneity in the

way these are deployed in activities. An activity systems perspective on business models encourages the incorporation of those ideas, and thus promotes a synthesis of theoretical perspectives.

[as well as] their transactional dimension, we might consider more carefully the social aspects of relationships between various business model participants drawing on different resources…

A fourth advantage of our proposed conceptualization is that it embodies rich possibilities for further theoretical development and refinement. For example, we might consider more carefully how activities are produced by organizational actors drawing on various resources - that is, we might consider the social aspects of relationships between business model participants, as well as the transactional dimension of their relationships. In their landmark contribution, Weick and Roberts explain how the 'heedfully' performed interrelated actions of organizational actors minimize the risk of serious accidents during the taking off and landing of planes on aircraft carriers.[21] These developments are valuable because they point to the importance of social action and interaction as the micro-foundations of business model performance. To explore the relationship between individual actions, organizational activities and business model performance further, scholars could also draw on activity theory, which has received scant attention in the management and organization literatures to date.[22] The activity system perspective on business models encourages researchers and managers to consider what goes on within the 'black box' of activities, and suggests possibilities for probing deeper and gaining a better understanding of the micro-mechanisms of business models, for example by drawing on social theories of action.

To summarize, the main contribution this paper is to develop an activity system perspective on the business model. The activity system perspective could be an important step toward fostering improved empirical understanding of past and current business models, the development of cumulative predictive theory on business model design, and the development of new and exciting business models for the future.

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18. See, for example S. Burdon and A. Bhalla, Lessons from the untold success story: Outsourcing engineering and facilities management, *European Management Journal* **23**, 576–582 (2005); J. B. Quinn and F. G. Hilmer, Strategic outsourcing Summer *Sloan Management Review* 43–55 (1994).
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20. M. H. Riordan and O. E. Williamson, Asset specificity and economic organization, *International Journal of Industrial Organization* **3**, 365–378 (1985).

21. K. E. Weick and K. H. Roberts, Collective mind in organizations: heedful interrelating on flight decks, *Administrative Science Quarterly* **38**, 357–381 (1993).
22. For exceptions, see F. Blackler, Knowledge and the theory of organizations: organizations as activity systems and the reframing of management, *Journal of Management Studies* **30**, 863–884 (1993); P. Jarzabkowski, *Strategy As Practice: An Activity-Based Approach*, Sage, London (2005); J. C. Spender, Organizations are activity systems, not merely systems of thought, *Advances in Strategic Management* **12**(B), 154–174 (1995); Activity theory was originally developed by Russian psychologists with the objective of explaining the links between individual thought, behaviour and action, and collective practices in society (e.g. L. Vygotzki, *Mind in Society*, Harvard University Press, Cambridge, MA, (1978). It offers a theoretical anchoring of the activity concept that could also be useful for the study of business models. According to the theory, an activity fulfils a specific need or objective, and involves human action and interaction. All actions and interactions that contribute toward the fulfillment of the specific need or objective are part of the activity. Organizational activity can thus be conceived as collective, goal-oriented action, a social process that is shaped by its context and that in turn shapes the context. These concepts could help us analyze and understand the origin and evolution of business models better, and the dynamics of business model change.

Biographies

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