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Research Article

BUSINESS METRICS TO MEASURE THE SUCCESS OF SMEs: AN APPROACH FOR CRAFTING AN EFFECTIVE BUSINESS MODEL INNOVATION TOOL

Kobilerde İşletme Başarısı Ölçütleri: Etkili Bir İş Modeli İnovasyonu Aracının Oluşturulmasına Yönelik Bir Yaklaşım

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ABSTRACT

There is a need for multi-faceted perspectives specifically requiring attention for SMEs to hold the largest market share and maintain the market leadership status. Therefore, it is vital for SMEs to engage in innovation as a perpetual process, which is a systematic approach, rather than random creativity. The process of innovation can be measured through diverse criteria such as the number of projects, ideas created, individuals involved in the innovation process as well as new product launch, earnings from newly introduced products, R&D budget, and sales from previously introduced projects. Thus, business metrics should be applied to evaluate organizational performance in terms of reinforcing the role of innovation within a firm and delivering capability to organizational, operational and strategic areas. Within this framework, potential measures primarily associated with knowledge management, R&D capabilities and innovation capacity help create a shared understanding that efforts are needed to create an organizational structure to leverage the organizational performance and capacity. Hence, business models are critical in creating the business impact that facilitates improved business activities, boosted profits, growth in revenue, increased customer satisfaction. In the modern business world, there is an increasing necessity for SMEs to continuously renew their business models to adapt rapidly changing external environment. SMEs have been experiencing problems putting a sound performance measurement model in practice and this entails SMEs to focus on establishing standards for performance measurements known as business metrics. The goal of this study is to explain the need for business metrics to measure the performance and success of organizations and present a method and approach for crafting an effective tool to address the importance of the business model innovation process at the organizational level. In this context, a business model innovation tool has been created with the contributions of the Illinois Business Consulting (IBC) group at Illinois University.

Keywords: Small and medium-sized enterprises (SMEs), innovation, business model, business model innovation, business performance metrics

ÖZET

Pazar payına sahip olabilmek ve pazardaki liderliği sürdürebilmek açısından özellikle de KOBİ'ler tarafından dikkate alınması gereken çok yönlü bakış açılarına ihtiyaç duyulmaktadır. Bu nedenle KOBİ'lerin gelişigüzel yaratıcılıktan ziyade sistematik bir yaklaşım çerçevesinde daimi bir süreç olarak inovasyona yönelmesi son derece önem taşımaktadır. Proje sayısı, üretilen fikir sayısı, inovasyon sürecinde rol oynayan bireylerin sayısı ile yeni ürün geliştirilmesi, yeni tanıtılan ürünlerden elde edilen gelirler, Ar-Ge bütçesi ve geçmiş projelere ait satışlar gibi çeşitli kriterler aracılığıyla inovasyon süreci ölçülebilmektedir. Böylelikle, işletme içinde inovasyonun rolünün güçlendirilmesi ve örgütsel, operasyonel ve stratejik alanlara kabiliyetin kazandırılması bakımından örgütsel performansın değerlendirilmesi amacıyla işletmeler için ölçüm teknikleri uygulanmalıdır. Bu çerçevede, öncelikli olarak bilgi yönetimi, Ar-Ge yetenekleri ve inovasyon kapasitesine ilişkin potansiyel ölçüm teknikleri yardımıyla örgütsel performans ve örgütsel kapasiteyi üst seviyeye taşıyabilecek örgütsel yapının oluşturulması hususunda çaba sarf edilmesi gerektiğine dair ortak bir anlayışın oluşması sağlanabilmektedir. Böylece iş modelleri; işletme faaliyetlerinde gelişme, kârlılıkta artış, gelirlerde büyüme ve müşteri memnuniyetinde yükselmeye imkân sağlayacak işletme etkisinin ortaya çıkmasında kritik bir öneme sahiptir. Günümüz iş dünyasında, KOBİ'lerin hızlıca değişkenlik gösteren dış çevreye uyum sağlayabilmeleri bakımından iş modellerini sürekli olarak değiştirme gereksinimleri artmaktadır. KOBİ'ler sağlıklı bir performans ölçüm modelinin gerçekleştirilmesi konusunda hâlihazırda sorun yaşamaktadır ve bu durum, KOBİ'lerin performans ölçütleri olarak bilinen performans ölçüm standartlarını oluşturmaya odaklanmaları yönünde bir ihtiyaç hissettirmektedir. Bu çalışmanın amacı, işletmelerde performans ve başarı ölçütlerine duyulan ihtiyaca değinmek ve örgütsel düzeyde iş modeli inovasyonunun önemine dikkat çekmek üzere etkili bir araç oluşturmaya yönelik bir yöntem ve yaklaşım sunmaktır. Bu bağlamda, Illinois Üniversitesi bünyesindeki Illinois Business Consulting grubunun katkılarıyla bir iş modeli inovasyonu aracı oluşturulmuştur.

Anahtar kelimeler: Küçük ve orta ölçekli işletmeler (KOBİ'ler), inovasyon, iş modeli, iş modeli inovasyonu, işletmelerde performans ölçütleri

1. INTRODUCTION

There is a consensus among scholars on small and medium-sized enterprises' (SMEs) flexibility in reacting against sudden changes, although these enterprises often face scarce resources or capabilities to make innovation, act with resilience or expanding locally or globally (Lee, Park, Yoon, & Park, 2010). SMEs need to respond and adapt to changes in the marketplace since they have not full control over the market (Hudson-Smith & Smith, 2007). According to Papazov and Mihaylova (2016), market failures due to challenging external environments led to the efforts exerted to formulate strategies that are more focused on managing competition in the market. SMEs, therefore, should have the ability to visualize how their business works and thereby boost the value of their products and services through business models. SMEs are differentiated from large businesses by their more limited capabilities, costs (Cagliano, Blackmon, & Voss, 2001) and specialization particularly refer to products and markets (Berends, Jelinek, Reymen, & Stultiëns, 2014). According to Cagliano et al. (2001) priorities are often established on the quality of production, quick delivery, resilience, and sensitivity to customer needs. Hudson Smith & Smith (2007) suggested that flat organizational structures facilitate close communication among employees and thereby enhance their responsiveness to competitor's innovative actions and their flexibility to changes in an unstable business environment (Papazov & Mihaylova, 2016). The entrepreneurial facet for measuring business performance is also vital since the human source is regarded as one of the primary success factors in organizational performance. In this context, the personal characteristics of individuals are influential on the success of any organization (Taormina & Lao, 2007) and human behavior is a driving force for diverse managerial characteristics. Personal characteristics show variance or stability in the course of time. The role of leadership is a critical aspect to reveal the intellectual capacity of individuals at the workplace and the leaders should be aware of employees' characteristics that can be utilized as an innovation source for the successful accomplishment of the projects. Pfeffer and Salancik (1978) describe the performance of a firm as its capacity to create activity and satisfactory outcomes. Hence, there is a necessity for relevant terminology and operational variables that can be measured as a performance criterion for the corporates such as business metrics. SME performance can be viewed as corporate manager's satisfaction on business growth, profitability and revenues (Alasadi & Abdelrahim, 2007). Despite the evidence that SMEs use performance measurement systems, SMEs have still been suffering the issues hindering the implementation of the performance measurement system model (Manville, 2006). A firm's success in fulfilling its objectives is a criterion for organizational performance which can be measured through both qualitative and quantitative parameters. Quantitative performance variables including efficiency, production, marketing, the number of products sold, expenses and financial outcomes are widely applied practiced utilized by large enterprises (Tattichi et al., 2008). Qualitative performance indicators are an accomplishment of objectives, supervisors' perceptions on organizational performance, employees' effectiveness and attitudes within the organization. According to Kauranen (1993) firms' level of profitability is different in diverse industries since the capital intensity varies according to the type of industry.

2. EFFECTIVE MEASUREMENT METHODS OF FIRM'S PERFORMANCE

Knowledge management, innovation and R&D processes should be carried out at the institutional level for the fulfillment of lucrative growth and the organization's culture should be established on innovative thinking. Successful implementation of innovative techniques and measurement of a firm's performance are the basic requirements for the institutionalization of these activities.

2.1. Knowledge Management

Professionals are indeed faced with the challenge of measuring the success of knowledge management projects. It is almost unlikely to measure the value by applying conventional methods. The investments made for knowledge management solutions are differentiated from those in other business solutions (Hanley, 2014). These solutions reflect harder to measure organizational objectives for results (promoting the accession to knowledge, managing and reusing knowledge assets) that pose more measurement challenges worthwhile to use (Hanley, 2014). The solution can be analyzed in terms of its contribution to improved revenue and profit as well as enhanced customer satisfaction and business operations (Hanley, 2014). A knowledge measurement is an approach composed of a range of activities that can help address decisions necessary to identify, select and apply metrics for measuring the business effect arising from the investments related to knowledge management. The stages composing the knowledge management metrics are given in Figure 1:

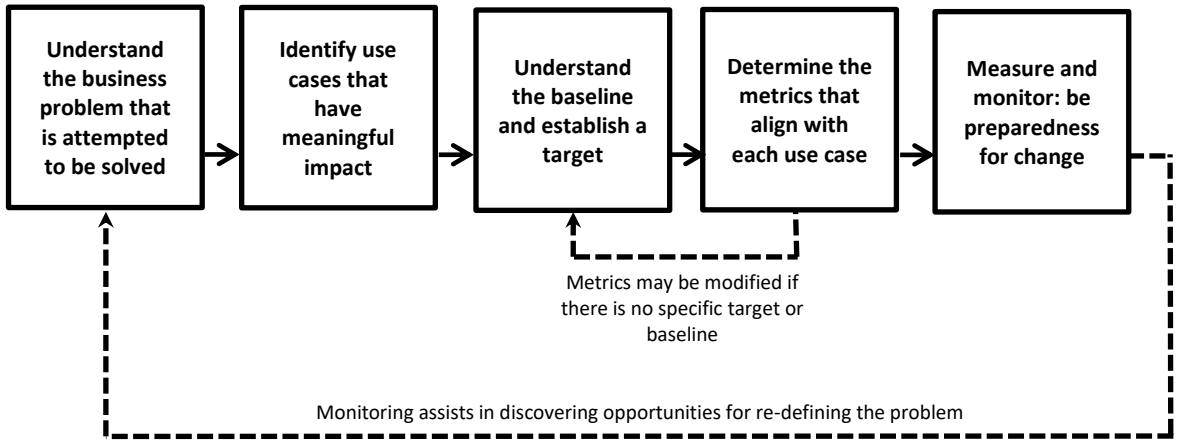


Figure 1. Metrics Life Cycle (Hanley, 2014)

An extensive understanding of the business problem is necessary for planning an effective knowledge management solution that should include multiple technology systems particularly regarding the transfer of knowledge. The performance of knowledge management highly depends on having a concrete and significant business problem. An organization should plan the knowledge management strategy by listing primary strategic initiatives. Knowledge management is viewed as useful if appropriate use cases are selected. Metrics should comply with each use case and more than one metrics is required to generate a solid organizational goal (Hanley, 2014). System metrics offer hints regarding business value which is identified through examining the search results and the solution should capture value based on the possibility of obtaining applicable outcomes for users' questions. This can be realized by conducting surveys with survey participants with the aim of quantitatively and qualitatively describing the proposed manner the solution is solved for each use case (Hanley, 2014). It is recommended that metrics programs should cover both quantitative and qualitative metrics methods. Quantitative measurement produces hard data relying on tangible measures for the assessment of the performance between the specified periods such as the previous month to the current month. Remarkable changes such as sharp increases or drops in the measurement can provide critical hints to the solution. Qualitative measurement produces soft data such as customer reviews, customer satisfaction and future scenarios. Qualitative metrics can become more effective and beneficial for stakeholders in the absence of meaningful quantitative measures.

2.2. Measuring R&D Activities

Measuring the effectiveness of R&D activities has long been a primary emphasis of many researchers and there is a growing need for R&D metrics in the last few decades (Cosner, 2010). There are several factors increasing the importance of the reliability of R&D metrics. The necessity for the verification of R&D investments with top executives and tools predicting the economic value of R&D investments in terms of sustainable growth of the firm and the efforts for the efficient use of R&D resources. According to Rothwell (1994), over the last three decades, R&D activities have been characterized by being flexible and time-dependent, giving a great emphasis on quality and customer satisfaction and establishing strategic alliances. Open innovation in R&D has become a critical aspect in the modern business world (Chesbrough, 2003). Kerssens-van Drongelen and Bilderbeek (1999) argue that improving the effectiveness and productivity of R&D activities has emerged as a demanding task for firms due to the volatile business environment. R&D performance measurement, therefore, has become a challenging issue since its ambiguous nature (Bremser & Barsky, 2004). There have been significant efforts to measure the success rates of R&D activities performed by the firms. The metrics for R&D, therefore, have become the primary need for these organizations. The rapid change in the business environment and technological advances entails challenges in identifying reliable metrics to measure the effectiveness and lucrativeness of R&D activities. The content of R&D metrics has been evolved to encompass an enhanced range of measures from financial issues to strategic collaborations (Andrew, Hannæs, Michael, Sirkin & Taylor, 2008; Hauser, 1996; Roussel, Saad, & Erickson 1991). Research-on-Research Working Group (2005) was organized by the Industrial Research Institute to evaluate the effectiveness of R&D activities and address the insufficiencies specific to metrics options. The group employed the Technology Value Pyramid in order to identify whether the metrics are reliant upon the organization type and ultimately make the categorization of metrics options that are useful for businesses.

The Technology Value Pyramid

The CEOs of organizations have been searching for ways to minimize manufacturing. In 1992, Industrial Research Institute (IRI) started studies to develop R&D metrics that was resulted from the Technology Value Pyramid (TVP). This model hierarchically classifies the basic components of R&D and provides the linkages among those components and their impacts on business outcomes over a short and long period of time (Tipping, Zeffren, & Fusfeld, 1995).

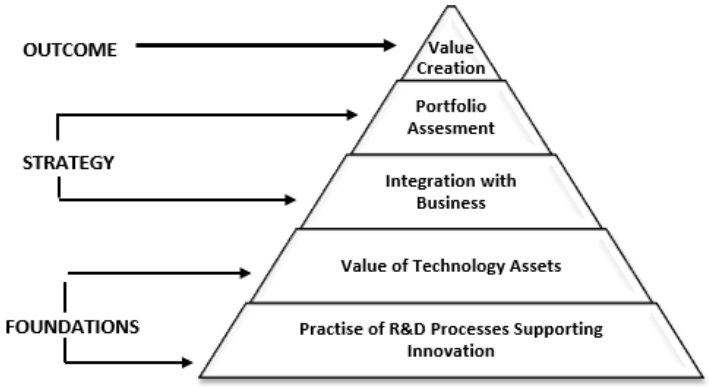


Figure 2. The Technology Value Pyramid (Schwartz, Miller, Plummer and Fusfeld, 2011)

Value creation metrics analyze the return of investment in R&D projects. Downward sections including *portfolio assessment* and *integration with the business* impact the investment returns (Schwartz, Miller, Plummer & Fusfeld, 2011). *Portfolio assessment* metrics investigate the distribution of the possible return, timing and risk related to R&D investment (Schwartz et al., 2011). *Integration with the business* metrics involves with R&D group's mutual action with other business groups based on teamwork, process and the organization itself (Schwartz et al., 2011). *Value of technology assets* focuses on developing key skills and competencies that are underlying factors for growth and competitive advantage (Schwartz et al., 2011). The *practice of R&D processes supporting innovation* evaluates R&D practices in terms of their capability to foster technology development and examines the organization's R&D activities and procedures. According to the pyramid, financial metrics are included in the outcome and strategy segments while the foundations segment encompasses the metrics regarding the number of technical reports (Schwartz et al., 2011). Some enterprises articulated the necessity of the development of new metrics since they have suffered from the fact that existing metrics have failed to quantitatively measure the demands and needs of a business enterprise. This gave rise to the development of new metrics (Donnelly & Fink, 2000; Germeraad, 2003). The TVP comprises 50 metrics totally. Two surveys were conducted by IRI in the years 2008 and 2009 on two different groups that composed of R&D executives, and chief technical officers. Participants are asked to score 33 metrics (included in the original survey carried out in 1994) in Survey A and are asked to score 50 metrics (the extended version) in Survey B based on their significance to their organizations. The survey data was used to identify the linkage between the metrics selected and the type of business, sector and innovation. Corresponding R&D metrics with R&D functions has emerged as one of the major difficulties. The results of the surveys are given in Table 1, Table 2 and Table 3.

Table 1. The results of Survey A: Top metrics based on the surveys in 1994 and 2009

1994	**2009**	
	For-Profit	**Not-For Profit**
Financial return to the business	Financial return to the business	Strategic alignment with the business
Strategic alignment with the business	Strategic alignment with the business	Accomplishment of project milestones
Projected value of R&D pipeline	Projected value of R&D pipeline	Quality of R&D personnel
Sales or gross profits from new products	Gross profit margin	Portfolio distribution of R&D projects
Accomplishment of project milestones	Product quality and reliability	Clarity of project goals
Portfolio distribution of R&D projects	Sales or gross profits from new products	Product quality and reliability
Market share	Accomplishment of project milestones	Rating of project benefits by customers
Customer satisfaction surveys	Achievement of R&D pipeline objectives	External peer evaluation of R&D
Development cycle time	Quality of R&D personnel	Customer rating of technical capabilities
Gross profit margin	Level of business approval of projects	Number of technical reports
Product quality and reliability (tie)	Comparative manufacturing costs (tie)	

Source: Schwartz, Miller, Plummer and Fusfeld (2011)

Table 2: The results of Survey B: Top metrics based on the TVP

Metric	Ranking
Outcome	
Financial Return	1
Gross Profit	2
Market Share	3
Projected Value of Pipeline	4
IP Management	5
Strategy	
Financial Return	1
Projected Value of Pipeline	2
Gross Profit	3
R&D Investment/Sales	4
Strategic Alignment	5
Foundations	
IP Management	1
Number and Quality of Patents	2
People Development	3
Creativity	4
Cost versus Budget	5

Source: Schwartz, Miller, Plummer and Fusfeld (2011)

Innovation strategy is regarded as influential on R&D metrics; thus, the results were examined in innovation strategy context based on the "innovation games" approach (Miller, Olleros & Molinié, 2008). Miller et al. (2008) defined eight innovation strategy approaches to be practiced by businesses according to the type of industry. The metrics can be used to evaluate the effectiveness of R&D efforts since the innovation game approach embodies the goal of R&D efforts.

Table 3: The Results of Survey B: Top Metrics Based On Innovation Game Approach

Innovation Game	TVP Level		
	Value Creation	**Strategy**	**Foundation**
New & Improved (Standalone)	Financial Return Projected Value of R&D Pipeline Gross Profit Gross Margin	Financial Return	None identified at statistically significant level.
Pushing the Envelope (Integrated Systems)	Financial Return	Financial Return	People Development
Consumer Products	Financial Return Product Quality & Reliability Gross Margin Gross Profit Market Share	Financial Return Gross Margin Gross Profit R&D Investment as % of Sales Probability of Success	People Development Intellectual Property Management Number and Quality of Patents
Services	Intellectual Property Management Financial Return	Financial Return	Idea Generation and Creativity R&D Process People Development Quality of Personnel Number and Quality of Patents

Source: Schwartz, Miller, Plummer and Fusfeld (2011)

2.3. Measuring Innovative Capacity

According to Cooper and Kleinschmidt (1995), a large number of firms are not interested to measure their innovative capacity even though innovation is a key driver for growth. The importance of innovation is grounded on two reasons: Metrics provide managers with the opportunity of intelligent decision making that relies on unbiased data by considering the risk related to specific innovation projects. Metrics make objectives consistent with a firm's interest (Hauser & Zettelmeyer, 1997). The literature encompasses scholarly articles that indicate the development of measures for innovation (Chiesa, Coughlan, & Voss, 1996). The development of technology and R&D activities are central issues for these metrics. Strategies become ineffective due to market saturation, consumers' expectations to find novelty in markets and optimization programs yield diminishing returns. This will have resulted in consumers' powerful position in

bargaining for lower costs than in the past (Hamel & Valikangas, 2003). Maintaining innovativeness at high levels is required to keep the strategy effective. The following innovation framework (see Figure 3), which gathers three innovation approaches relating to resource, capability and leadership, enables firms to evaluate and improve the innovation capability.

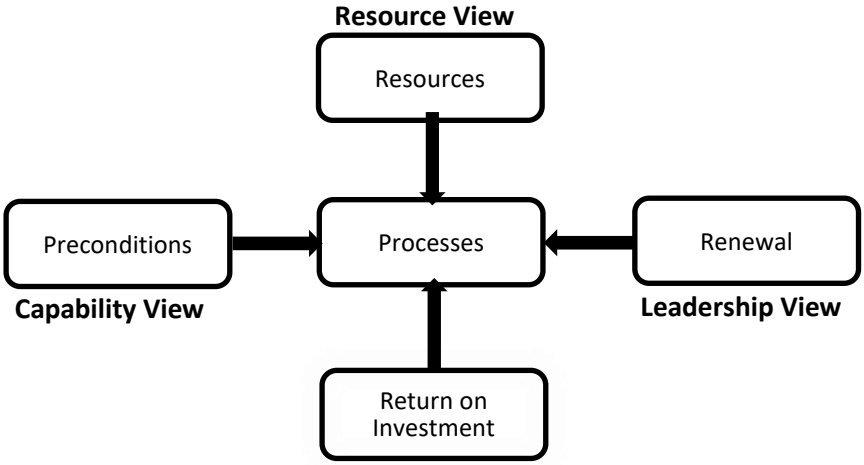


Figure 3. The Resource, Capability and Leadership View (Muller, Välikangas & Merlyn, 2006)

According to the *resource view*, firms should use balanced optimization and innovation in which tactical and strategic investments are made (Muller, Välikangas & Merlyn, 2006). Tactical investing is to current business, while strategic investment approach deals with investing in new businesses. The allocation of resources (property, workforce, capital, equipment and time) impacts the balance and *resource view* aims to achieve a return on innovation investment through the utilization of resources (Muller, Välikangas *&* Merlyn, 2006). Capital refers to the resource invested in proposing and analyzing ideas for new products/services. The workforce skill is measured according to the number of entrepreneurs in the firm. Time means the labor force time spent on innovation activities. Return on investment is viewed as the output in innovation and depends on the number of new products/services introduced to the market in the previous year. The positive changes in firms' market value reflect the success of return on investment can be yielded by dividing firms' market value overall industry's market value.

The *capability view* evaluates the degree to which the organizational capabilities and culture facilitate the transformation of resources into innovation opportunities that revitalize the business (Muller et al., 2006). The capability view indicates the degree to which an organization is ready to make its competence, equipment, workforce and culture tailored to innovation. The *capability view* aims to create new knowledge and develop new strategic skills that give rise to innovation and the generation of strategic options conducive to the development of existing business (Muller et al., 2006). The business renewal depends on the number of new skills, knowledge and new market entries that enable a firm to create a uniquely positioned in the marketplace.

The *leadership view* determines whether leadership styles in firms encourage innovation by assessing the participation of leaders in innovative activities and formalizing the processes to foster innovation (Muller et al., 2006). Firms' innovativeness depends on top management's strategic efforts and time dedicated to innovation activities and the frequency of reassessment of firms' core operations are pivotal. Leaders' training status on innovation tools is also regarded as an important contribution to innovation. Innovation processes embrace science parks, incubators, technology clusters, technology spillovers, R&D funds, government-funded research, etc.

2.4. Performance Indicator Maps: A Way to Improve Business Metrics

The complex structure of organizations puts pressure on leaders and employees to be more aware of the fact that their organizational performance attainment is impacted by other organizations' performance and particular activities. Performance indicator maps, which are graphical illustrations of linkages among performance indicators within an organization, are able to leverage the feedback created via dashboards, induce improvement activities daily and allow organizations to get the desired outcomes for the future if they are designed appropriately. Performance indicators are alternatively mentioned as business metrics that represent certain and tangible measures of firms' activities, processes and outcomes that allow firms to

possess necessary information that provides a better way for sound decision making. According to Guerra-López (2010), these indicators serve as a foundation for data that can be monitored at present and in the future and employed for decision-making in particular activities for continuous improvement. Havnes, Smith, Dysthe and Ludvigsen (2012) suggest that the opportunity to better use of this feedback is created when the feedback is provided in the right way by the individuals involved in performance-enhancing better.

3. METRICS TO MEASURE THE SUCCESS OF THE BUSINESS MODEL INNOVATION

It has been suggested that business model typology demonstrates business models with value venturing and delivering at a particular point in time (Fritscher & Pigneur, 2010; Linder & Cantrell, 2000). One of the primary aims of business models is to enable change through attaining adequate flexibility (Cavalcante, Kesting, & Ulhoi, 2011). However, designing a new business model or changing the existing ones are not considered an easy task (Casadesus-Masanell, & Ricart, 2010). According to Osterwalder and Pigneur (2010), "what if" questions can help to remove existing limitations associated with business models. Given that the modification of a business model is a collective action rather than happening alone, the interaction among multiple individuals including suppliers, customers, competitors and other network actors is fundamental to redesign business models (Khanagha, Volberda, & Oshri, 2014). The measurement of innovation relies on the ideas created, new product launches, the patents issued, revenue yielded from a new product release, the number of employees involved in innovation activities and other measurement criteria. The metrics, therefore, should be developed to strengthen the importance of innovation within the firm. The business model and business model innovation are heavily predicated on organizations' design of value creation, value delivery and value capture processes. The business models are necessary to complement the operations associated with value creation, value delivery and value capture, while business model innovation refers to new modifications on these complementary interconnections.

3.1. The Concept of Business Model

According to Masanell and Ricart (2010), business models are firms' dominant logic and they explain how a firm conducts its operations and enables value creation for all stakeholders. Thus, the selection of a specific business model can be implied as a specific method for competing, operating and creating value for stakeholders. On the other hand, some researchers (Keen & Qureshi, 2006; Magretta, 2002) consider business models as a kind of value creation hypothesis that should be tested and verified in the marketplace. Furthermore, Osterwalder and Pigneur (2010) and Teece (2010) regard a business model as architecture or design that defines the mechanism it uses for generating, delivering and capturing the value.

3.2. Fundamental Elements of Business Model

Besides the key concepts relating to business models, there are also constituents of business models such as value proposition, market segment, value chain structure, value network, revenue generation and profit margin and competitive strategy (Chesbrough & Rosenbloom, 2002).

Table 4. Components of the Business Model

1	**Value Proposition** refers to the identification of customers' problem, delivering the product addressing the problems, the customers' view of value for the product.
2	**Market Segment** is a particular cohort of customers in a target market, the probability of introducing innovation is increased in case of different target audience.
3	**Value Chain Structure** defines the firm's activities and the position held by the firm in the value chain and the way firm will seize part of value created in the chain.
4	**Revenue Generation and Profit Margin** describes the way revenue is generated, the cost structure and profit margins targeted. The revenue includes income from sales of goods and services, subscription fees, renting leasing, support, etc.
5	**Value Network** Defining the rivals, partners and network effects that can be used to offer more value to the customer
6	**Competitive Strategy** defines how the firm will achieve competitive advantage via the strategies including product differentiation, cost leadership or niche marketing.

Source: Chesborough and Rosenbloom (2002); Shafer et al. (2005); Trott (2017)

3.3. The Theoretical Framework for Business Model Innovation

According to Lindgren (2012), the objective of business model innovation is to improve the strategic position of business models through satisfying new, unmet or latent requirements of customers. Magretta (2002) suggests that a successful renewal of an established business model should facilitate the enhancement of value-offering to relevant parties when compared to those existing options. Any enterprises may have sudden disruptions in their functions due to external factors such as technological advancements, customer demands socio-economic, political and legal forces and this is the most likely cause of changes in business

models (Bouwman et al., 2008; Teece, 2010). Globalization and macro-environmental factors such as IT-based innovations are conducive to the creation of new business models (Casadesus-Masanell & Ricart, 2010). According to Teece (2010) business model innovation possibly yield a competitive advantage if the business model is different than those of incumbent firms and difficult to replicate by these firms. De Reuver et al. (2013) and Magretta (2002) suggest that business model innovation initiates the design of novel products and services to satisfy customer demands, the application of new technologies, the manufacturing, sales and distribution of current products/services in a more effective and lucrative way and focusing on new collaborations. Irrespective of the extent of an organization's innovation capability, there is an inevitable necessity of value creation, value proposition and value capture for business models (Baden-Fuller & Haefliger, 2013; BadenFuller & Mangematin, 2013; Johnson, Christensen, & Kagermann, 2008). It is necessary to measure the changes in three fundamental domains of the business model in order to take advantage of business model innovation. The measurement of innovations of the business model domains, therefore, needs to be diagnosed in terms of their sub-constructs. Based on the current literature, the majority of business model components are found to be associated with value creation, value proposition or value capture. External factors concerned with technology, finance, and law are also integrated into the business model (Voelpel, Leibold, & Tekie, 2004). Although external factors are often not regarded as a component of the business model; many scholars have reached a consensus on the effects of these factors on business model innovation; (Heij, Volberda, & Van den Bosch, 2014; Schneider, Spieth, & Clauss, 2013).

4. CRAFTING BUSINESS MODEL INNOVATION TOOL

In this study, a method and an approach for crafting a business model innovation tool are proposed to describe firm-specific problems, issues related to a business model and potential solutions for firms, particularly SMEs and create a useful tool to analyze this knowledge in a scalable and measurable approach to pursue the success of a business. This tool has been developed by E.S.METE with the contributions of Illinois University in 2014. The main issue in designing the tool is to find the answer to how innovation can be implemented in SMEs' business models since innovation is necessary for the components of the business model in order to ensure superior practical use. Thus, the basic requirement for this tool is to enable firms to innovate their business models. The business model innovation tool initially defines the challenges that firms experienced and makes research on firm-specific solutions. As shown below in Figure 5, the business model innovation tool starts with the instructions page. The Business Model Innovation Tool comprises the components as Infrastructure, Offer, Customers and Finance. Each component is composed of elements and elements that embrace the issues that are discovered through research and address solutions, explanations and transferability differing from each other.

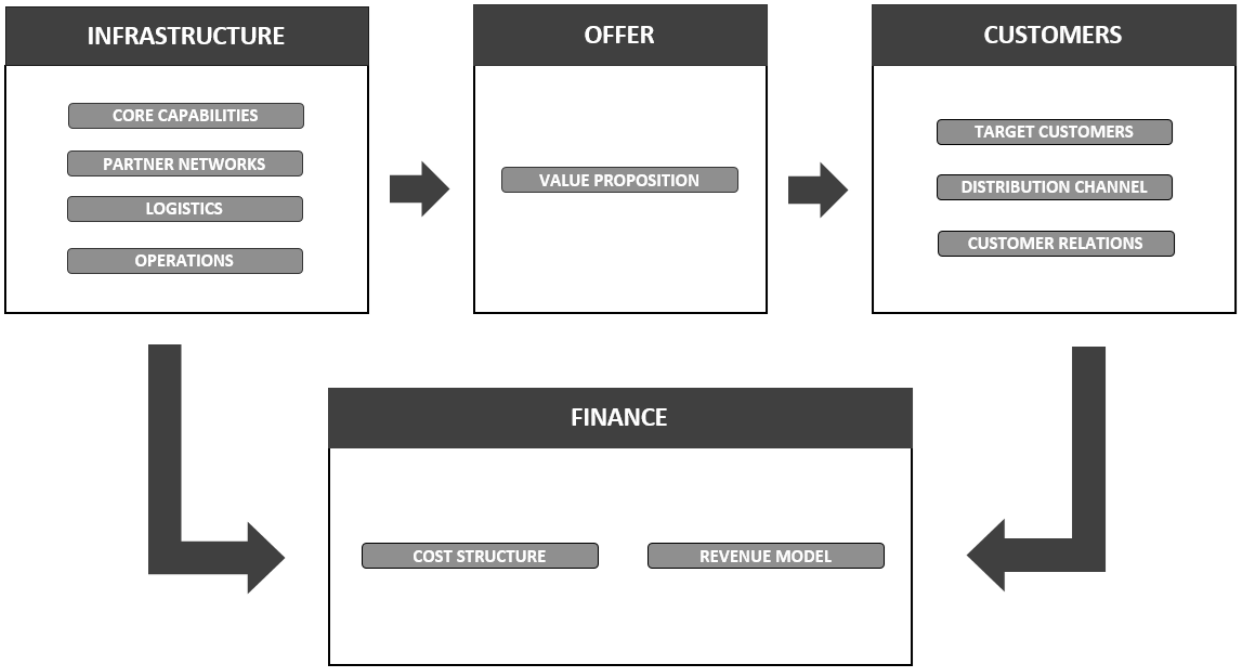


Figure 5. The Components of Business Model Innovation Tool (Mete & IBC, 2014)

The *Infrastructure* component is divided into four elements that are *core capabilities, partner networks, logistics* and *operations.* When the user clicks on the *Infrastructure* component, three specific issues will appear on the screen. As shown in the following screenshots; the solution, explanation and transferability options will pop up on the screen after selecting one of these three issues. *Core capabilities* indicate the firm's superior competencies that can help the firm offer better products/services than competitors. *Partner networks* aim to identify the eligible partners to cooperate with. *Logistics* discovers the way materials will be transferred into and out of our business. *Operations* signify how the goods will be produced. The *Offer* component is composed of a *value proposition* and aims to reveal the reason why customers should buy the firm's products. The *Customers* component consists of *target customers, distribution channels* and *customers relation* elements. *Target customers* are the potential consumers that the products should be sold. *A distribution channel* refers to how the goods are transported from the manufacturer to the customers. Customer relations shows the manner to retain customers to do business with the firm. The *Finance* component consists of *cost structure* and *revenue model* elements. *Cost structure* aims to find out how costs are managed to improve the profit margin. The *revenue model* indicates how the money will be earned from the customers.

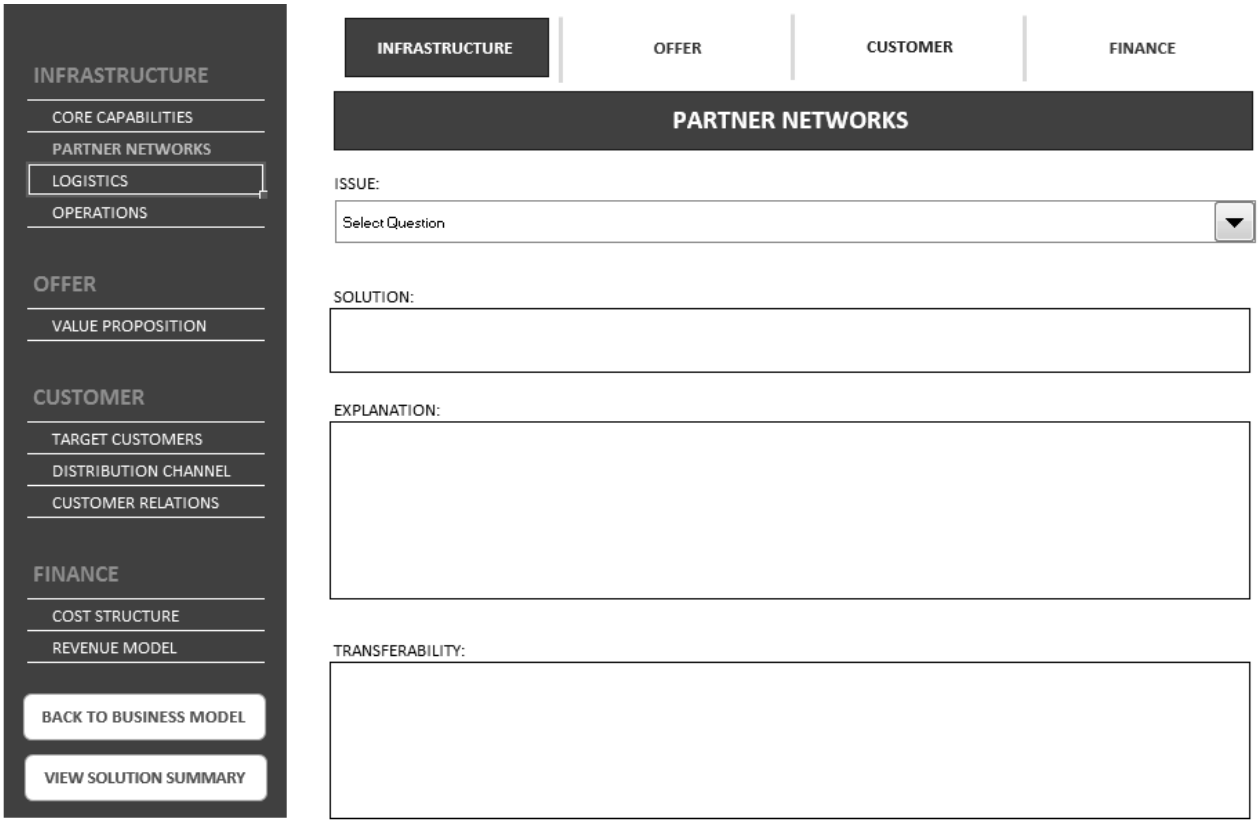
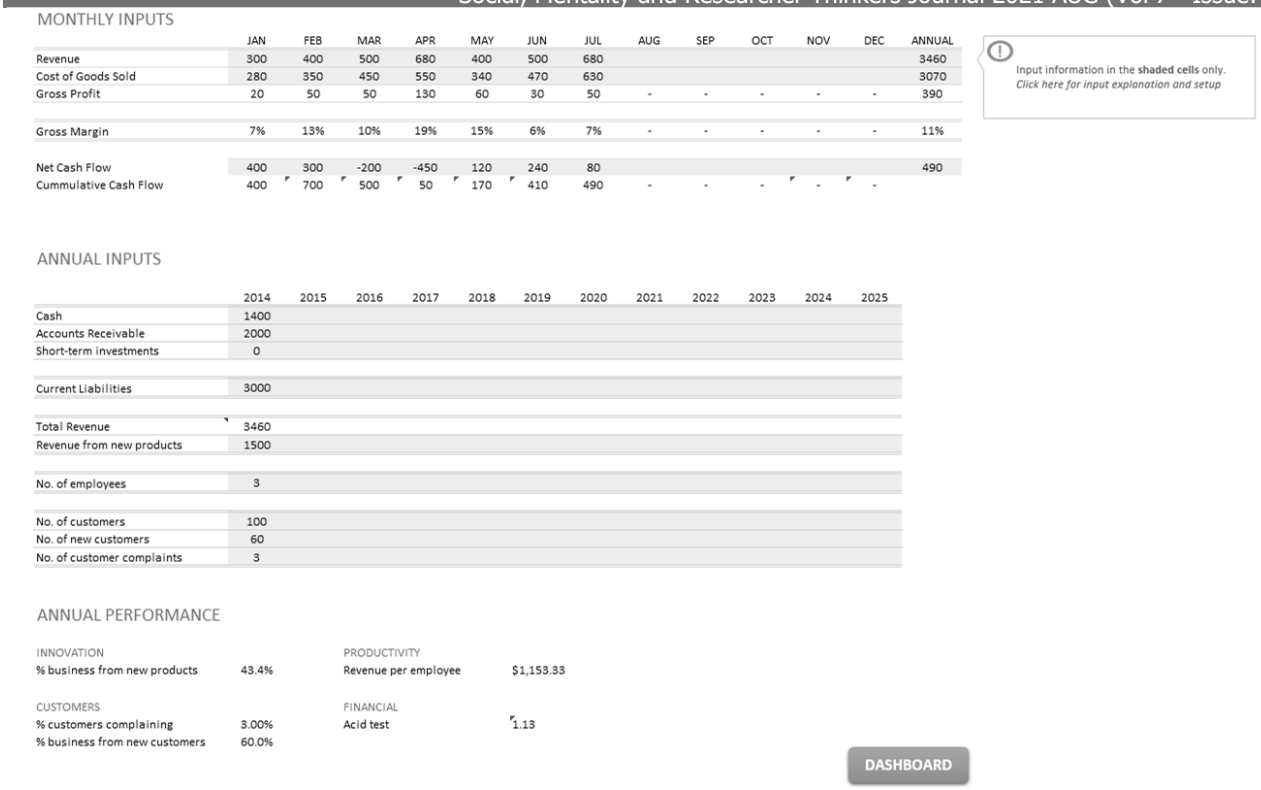


Figure 6. Issues, Solution and Explanation for the Components (Mete & IBC, 2014)

Firms are able to make an assessment about their success status by entering firm-specific numerical values as metrics inputs that can be monitored on a monthly and annual basis. Monthly metrics inputs contain revenue, cost of goods sold, gross profit, gross margin, net cash flow and cumulative cash flow, whereas annual metrics can be denoted as accounts receivable, short-term investments, current liabilities, total revenue, revenue from new products, number of employees, number of customers, number of new customers and number of customer complaints. The metrics inputs can be practically used across diverse industries. The metrics should give the firm's annual performance in terms of innovation, productivity customer status and financial health. To explain more precisely, the leveraged metrics framework offered by the tool provides quantitative insights on the revenue per employee, business coming from new customers, acid test ratio as well as the business comparison between new and existing products. *Cash flow* refers to the accessibility of cash that is transferred into and out of a business; revenue is the money earned from the business activities, gross margin means the percentage of revenue retained after incurring direct costs.



MONTHLY INPUTS

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
Revenue	300	400	500	680	400	500	680						3460
Cost of Goods Sold	280	350	450	550	340	470	630						3070
Gross Profit	20	50	50	130	60	30	50	-	-	-	-	-	390
Gross Margin	7%	13%	10%	19%	15%	6%	7%	-	-	-	-	-	11%
Net Cash Flow	400	300	-200	-450	120	240	80						490
Cummulative Cash Flow	400	700	500	50	170	410	490	-	-	-	-	-	

Input information in the **shaded cells** only.
Click here for input explanation and setup

ANNUAL INPUTS

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Cash	1400											
Accounts Receivable	2000											
Short-term investments	0											
Current Liabilities	3000											
Total Revenue	3460											
Revenue from new products	1500											
No. of employees	3											
No. of customers	100											
No. of new customers	60											
No. of customer complaints	3											

ANNUAL PERFORMANCE

INNOVATION		PRODUCTIVITY	
% business from new products	43.4%	Revenue per employee	$1,153.33
CUSTOMERS		FINANCIAL	
% customers complaining	3.00%	Acid test	1.13
% business from new customers	60.0%		

DASHBOARD

Figure 7. Sample Metrics Input Page (Mete & IBC, 2014)

The *acid test* is regarded as an indicator of financial health and calculates the liquidity (ability to pay short-term liabilities instantly) of the firm with the formula given as follows:

(Cash + Account Receivable + Short-term Investments) / Current Liabilities

Revenue per employee indicates employees' contributions in terms of profitability and productivity. *Customer complaints* can help reveal gaps in improving performance. *Business from new customers* refers to the increase in customer numbers. *Business from new products* evaluates success rate at developing and launching new products. The metrics can help to detect problems and areas that need to be improved before using the tool for searching for a proper solution. After applying all recommendations provided by the tool, the metrics should be used to track the performance with an emphasis on ease of application. The business metrics dashboard illustrates the overall landscape and trend of the firm by providing numerical results such as acid test ratio, gross margin, the percentage of customer complaints, product revenue, annual revenue per employee, new product revenue and net cash flow.

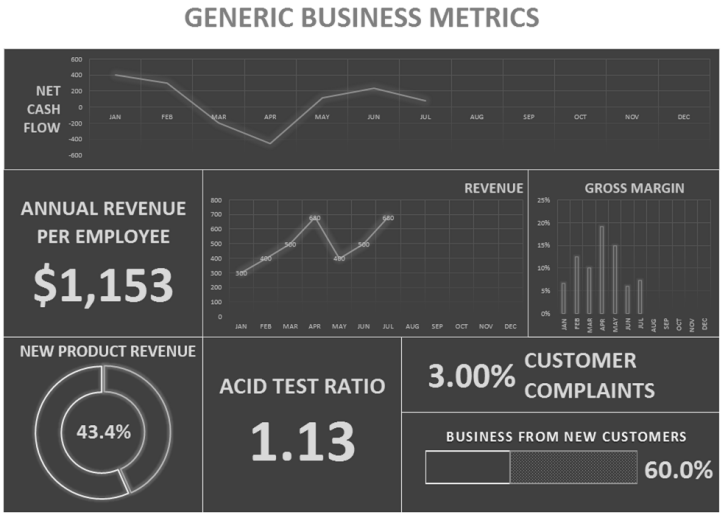


Figure 8. Sample Metrics Dashboard Page (Mete & IBC, 2014)

5. CONCLUSION

Thi study adopts a scalable and measurable approach in crafting the business model innovation tool for SMEs. Businesses such as SMEs have suffered from challenges arise from increasing market demands and use their efforts to find ways in reducing infrastructural deficiencies with an ultimate goal to create value for customers. Besides maintaining sustainability, organizations should engage in customer-focused value creation. The organizations, therefore, use metrics and tools to assess their performances and detect their vulnerabilities to find appropriate solutions in leveraging their capabilities. In this context, the concepts including knowledge management, innovation, R&D efforts and business model become central topics to secure lucrative and sustainable growth for organizations through enhanced financial strength and perpetual cash flow.

Knowledge management in qualitative and quantitative aspects is important in specifying which solution is advantageous to deliver business value. The quantitative and qualitative business metrics help measure the effectiveness of knowledge management. An applicable approach is, therefore, required to determine useful metrics to appraise the potency of knowledge management investing.

The metrics for R&D performances generate meaningful outcomes for SMEs in evaluating their R&D capabilities. Thus, it is essential to understand that R&D metrics are more critical to determine innovation strategies specifically for high-tech manufacturing industries. In advance of selecting metrics, it is important for companies to evaluate their capacity by comparing their performances against other firms. This means that firms should acquire information performance outcomes that range from growth in revenue to customer satisfaction. Besides performance benchmarking, SMEs should compare their business models to those of others for achieving strategic planning and competitive advantage. R&D metrics should be in line with firms' business strategies and objectives of measurement. In this case, the segments of TVP help choose the applicable metrics by considering the firm-specific factors. Political, social, cultural and economic factors, which shape the external environment of the organizations, are influential design and application of performance indicator maps.

Performance indicator maps should be designed to be complying with firms' functions and strategies. There should be a consistent association between performance metrics, performance outcomes and desired performance. The effectiveness of performance metrics is predicated on the functionality of performance indicator maps that are targeted to increase organizational performance as well as return on investment. Besides the management processes, firms should involve in innovation activities to produce customer-centric solutions. Entrepreneurs need to create value by prioritizing customer requirements and giving secondary emphasis on survival-oriented strategies. Innovation address the importance of creative activities that could be an opportunity for firms' lucrative growth and innovative product development is necessary to boost the return on investment for firms. In this context, the business model innovation tool is a gate for enhancing capabilities to manufacture innovative goods/services and to get a higher return on investment.

One of the primary purposes of this study is to prioritize what is most important to improve the performance of SMEs by probing the concepts of business metrics, business model and business model innovation tools specific for SMEs. The literature suggests that business models should be established on simple, rational, inclusive, functional, practical and operationally effective (Morris, Schindehutte & Allen, 2005). The simplicity of business models does not mean that they are not comprehensive enough to be practicable in situations particular for firms. The business model innovation depends on the changeability of business model configuration that allows quick adaptation to change conditions. According to Massa and Tucci (2014) business models are resulted from the architecture of the business model.

In addition, the characteristics of SMEs are influential on how they create and apply tools to improve their performances and build strategies accordingly. SMEs and large corporations should possess a tool to increase the usefulness of their existing business model. Large corporations display more tendencies to implement business model innovation tools, whereas SMEs have limited knowledge and resources. Many SMEs recognize the importance of this tool that enables changes in their business model, albeit they need guidance to generate and practice this tooling. From an entrepreneurial perspective, the leaders' knowledge and capacity for designing a business model and implementing business model innovation should be examined in terms of their ability and familiarity to use business innovation tools.

The impact of business model innovation should reflect on the techniques that deliver more value to all stakeholders (Magretta, 2002). Hence, this research would provide guidance to elucidate the underlying

factors for choosing effective metrics applications and serve as a good example of business model innovation tool practices. In order to generate comprehensive insight on the importance of performance improvement and business model innovation, the investigation of the literature helps address the practices that should be given the emphasis the most importance.

This study makes several contributions to the existing literature by validating the significance of the business model and innovation and by enhancing the understanding of choosing the right metrics and business innovation tools for SMEs.

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