

Business Strategy with Exploratory & Exploitative Innovation: The Analytics Role from SMAC Technology

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Abstract

In the context of SMAC technology, the paper investigates the analytics focus that plays a vital in the business strategy. The SMAC technology has been using to insight into business issues to increase the firm's performance and sustain the business. On the basis of a comprehensive literature survey, we explore the two business strategy such as cost leadership and differentiation and two types of innovation focus such as exploratory & exploitative. Analytics focus in the firms is increasingly recognized as the application base that leads to enhancing competitiveness. Further, we build a theoretical framework and give four propositions that can clearly identify how the different strategic firms would require different types of analytics. In addition, we investigate the relationship between exploratory/ exploitative innovation, cost leadership/differentiation strategy, and analytics applications.

Keywords

Strategy, analytics, SMAC technology, exploratory innovation, exploitative innovation

I. Introduction

SMAC is the fifth wave of Information Technology Architecture and a new concept of IT model that blends Social, Mobile, Analytics and Cloud technologies (Verma et al., 2016). Social, Mobility, Analytics, and Cloud (SMAC) are individual technologies and platforms which have risen during the past few years and have shown immense growth while each of these four components has been evolving individually, companies are beginning to treat them as an integrated whole (Gohel & Gondalia, 2014). It is the newest version of ICT (Information and Communication Technology). All four attributes of SMAC play a vital role to increase business performance. In this paper, we focus on single attribute i.e. Analytics application. SMAC based organizations are capable to develop an attractive customer engagement process and it consequently unfolds vast revenue opportunities for business.

There are many studies in the literature that show that strategic alignment with information technologies is important and that it improves business performance (Choe, 2003; Chivandi et al., 2014). Additionally, Guttman (2004) noted that when IT and business strategies are properly aligned, the various parts of an organization move synchronously to better achieve results. Furthermore, according to Teece et al. (1997), IT has an influence on strategic alignment. Moreover, Luftman and Brier (1999) state that strategic

alignment is important, as it can build a strategically viable advantage that will provide organizations with increased visibility, efficiency, and profitability to operate in today's ever changing markets. From these statements, we draw an attention that SMAC technologies also have a relationship with strategic alignments because SMAC is a part of information communication technology (ICT). But in this study, we focus on single attributes i.e. Analytics from SMAC stack. Analytics we can define as "analytics is the process of applying advanced analytics and visualization techniques to large datasets to uncover hidden patterns and unknown correlations for effective decisions making". It helps businesses to make better decisions by analyzing large volumes of structured and unstructured data, predict and identify change and identify new opportunities such as new business segments, best suppliers, associate products and sales seasonality. Analytics application also helps to achieve a better competitive advantage. In addition, according to Cadez & Guilding (2008) analytics lies at the heart of decision-making in all business applications.

Whenever we try to use SMAC technologies any organization then we have to take care of their strategy because every organization is following some kind of business strategy. In this paper, we focus on two kinds of business strategy i.e. cost leadership and differentiation. Cost leadership strategy means having the lowest per-unit (i.e. average) cost in the industry –that is the lowest cost relative to your rivals. In other words, cost leadership strategy emphasizes that firms can gain a competitive advantage by achieving the low cost within the industry (Hilman & Kaliappen, 2014). Differentiation strategy is focused on to achieve competitive advantage by providing unique services or products that are a different form of industry competitors. Based on these strategies we try to identify that fit between strategy and SMAC technologies. Moreover, we also considered exploratory/exploitative innovations and their relationships with analytic as applications from SMAC technologies because the use of analytics applications in the organization also enhances the prospects for innovation, improved agility and increased profitability (Dinodia Capital Advisors, 2013). Moreover, according to the recent survey by Gartner, Analytics mobile technologies and Cloud computing are three topmost priorities of CIOs world over and these services are set to change the face of the global IT-BPM market drastically over the course of the next few years (Dinodia Capital Advisors, 2013).

In this paper, section 2 gives a brief review of existing literature on SMAC stack, exploratory/exploitative, and business strategy. Section 3 relates theoretical framework and propositions with past literature; Section 4 briefly outlines the discussion and conclusions of the study.

II. Literature Review

This section provides an exhaustive review of the relevant literature. First, it provides an insight into SMAC. Next, it addresses the business strategies i.e. cost leadership and differentiation. Finally, it identifies the relationship between them.

A. Business Strategy

Business strategy is a very old and wide term and it can be defined in many ways in the literature. It can be defined as the long-term plan of action a company may pursue to achieve its goals. Skinner (Skinner, 1969) defines strategy as follows: "Strategy is a set of plans and policies by which a company aims to gain advantages over its competitors." Moreover, Schneider and De Meyer (1991) define strategic as "environmental events that may have an important impact on organizational performance." There are numerous authors in the strategic management literature who gave different typologies of strategy such as prospector, defender, analyzer and reactor by Miles and Snow (1978); Caretakers, Marketeers, and Innovators by Miller and Roth (1994); and cost leadership, differentiation and focus by Porter (1985) etc. In this paper, we focus on the Porter (1985) typologies of business strategy.

Porter (1980) gives five competitive forces like potential entrants, buyers, suppliers, substitutes, and competitive rivalry. In coping with these five competitive forces, there are three potential successful generic strategic approaches to outperforming other firms in an industry: overall cost leadership, differentiation, and focus (Porter, 1980). These strategies have dominated corporate competitive strategy for last 30 years (Bordean et al., 2010). Total commitment and supporting organizational arrangements

are required to the effective implementation of the strategy. A business can maximize performance either by supporting to be the low-cost manufacturer or producer or by differentiating its product or services. The relationships between these two strategies are shown in Figure 1.

Cost leadership

The concept of cost leadership has been popularized in Porter's (1980) writings on generic business strategies. According to Porter, a firm can gain a competitive advantage through achieving the lowest cost structure in the industry without neglecting other important areas such as service and product quality. The cost leadership strategy requires the sale of a "standard or no-frills" product (Porter, 1985, p.13) combined with "aggressive pricing" (Porter, 1980). In other words, a cost leadership strategy is based upon a business organizing and managing its value-adding activities so as to be the lowest cost producer of a product (good or service) within an industry (Bordean et al., 2010).

Cost leadership requires the aggressive construction of efficient-scale facilities, vigorous pursuit of cost reductions from experience, tight cost and overhead control, avoidance of marginal customer accounts, and cost minimization in areas like R&D, service, sales force, advertising, and so on (Porter, 1980). According to Miller & Friesen (1986), this strategy provides above average returns because its adherents may lower prices to match those of their most efficient competitor and still earn superior profits. It also provides a margin of safety that reduces the dangers of price increases from suppliers and bargaining from customers. Cost leadership strategies are mostly applicable for large firms with the opportunity to enjoy economies of scale and large production volumes and big market share.

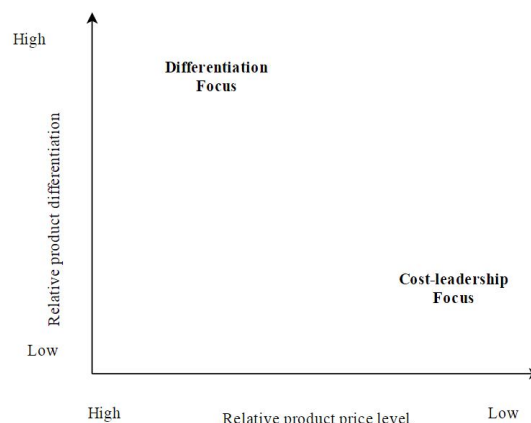


Figure 1: The Porter (1980) Typology of Business Strategy.

Source: Nilsson (2002) Strategy and management control systems: a study of the design and use of management control system the following takeover

Differentiation

According to Porter (1980, 1985), the distinguishing feature of a differentiation strategy is that the business unit differentiates its product offering in respect to product attributes which it finds that purchases strongly appreciate (cited by Nilsson, 2002). In this strategy, differentiate the products and services in the form of design or brand image, technology, features, customer service, dealer network and other dimensions. Achieving differentiation may sometimes preclude gaining a high market share (Porter, 1980).

Many firms differentiate themselves along several dimensions - for instance, by offering high quality and innovative products. In a differentiation strategy, businesses always engage in extensive research, product design, and marketing expenditures. This will usually prevent differentiators from low-cost producers (Miller & Friesen, 1980). A firm following a differentiation strategy wants to be unique in its industry in terms of product design consistent with some dimensions that are widely valued by customers.

B. SMAC (Social, Mobility, Analytics, and Cloud)

The subject of SMAC has been dominating debates across the world over the last 12-24 months (Assocham India Report, 2014). The four pillars of SMAC technologies are social media, mobility, analytics and cloud computing (KPMG^{**}, 2013). In other words, Social, Mobility, Analytics, and Cloud abbreviated SMAC, are separate platforms with technologies that evolved during last few years and have shown enormous enhancement (Verma et al., 2017). Moreover, each SMAC stack technology has an inherently unique quality that differentiates it and also complements other technologies (Assocham India Report, 2014). SMAC is changing the entire business landscape for both small and large businesses, but it is especially dramatic for small companies.

This stack is one of the most recent trends for both consumer and enterprise realization within digital media, communications, applications, content, and commerce. Some experts in the field have predicted that by 2020 SMAC will account for \$5 trillion of the total spending by customers. SMAC is the fifth wave of IT model in the evolution of IT industry (see in Figure 2). SMAC is not only helping develop new software platforms to address numerous diverse issues from revenue generation to providing efficient customer service but also transforming the way business is done (Faruqui et al., 2015).

ASSOCHAM^{} Associated Chambers of Commerce and Industry of India;
KPMG^{**} Klynveld Peat Marwick Goerdeler*

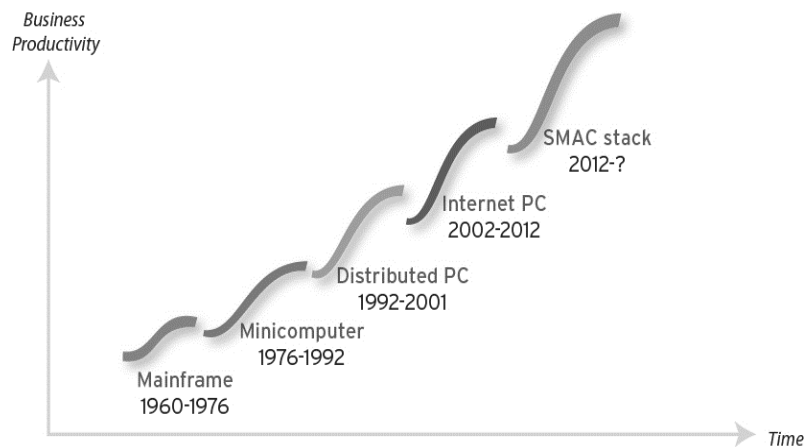


Figure 2: Evolution of SMAC in IT industry

Social Media:

Social media strategy has become a must for all businesses. Social media allows people to connect and interact without any delay and interfaces (Babu et al., 2017). In other words, social media refers to software tool used by people to collaborate, communicate, and build community with their friends online. Social media related software tools such as Facebook, YouTube, Twitter, and Foursquare. In addition, social media can refer to technologies that facilitate social interaction and development of virtual “relationships” (O’leary, 2011). It also enhances the rapid sharing of knowledge, ideas, and information over the social networks that can ultimately conducive to collaboration and information distribution across a business (Capgemini Consulting, 2013).

Mobility:

Mobility refers to communication beyond limitations of physical, static location or devices. The basic goal of the mobile web is to facilitate users to have a closer look to businesses and this gives them opportunities to the businesses to interact with their customers in much more relevant ways (Dewan & Jena, 2014). The growth in smart devices is bringing about an era of ubiquitous connectivity.

Emerging technologies, such as mobile payments, peer-to-peer payments, and mobile apps, are creating a mobile ecosystem. In the technological era, most of the people use mobile devices to complete each and

every regular task with the help of mobile apps etc. Adding on this, according to the survey, the next five years promise to continue mobile trends (Assocham India Report, 2014). Mobility is also helping in fare management, payment solutions, distribution, and logistics.

Analytics:

Business Analytics (BA) refers to the skills, applications, and practices for continuous iterative investigation of past business performance and trends to gain business insight and drive corporate planning (Faruqui et al., 2015). It also refers to the utilization of raw data, inference rules, and analysis models to provide decision makers to perform necessary steps to improve their day-to-day or milestone activities. In addition, analytics (Big Data) helps gain meaningful insights from the information, facilitating informed decision making (Dinodia Capital Advisors, 2013). This Business analytics works based on historical data for developing new insights of business performance. Additionally, analytics is the science of examining data to discover underlying information and patterns. While analytics has been around for a long time under different forms and names such as management information systems, business intelligence, and data warehousing, two events have brought it to the limelight: the rise of mobile and social media. Data analysis lies at the heart of the decision making in all business applications (Cadez & Guilding, 2008).

Big data is another form of analytics. Big Data refers to the volume, variety, and velocity of structured and unstructured data pouring through networks into the processors and storage devices. Moreover, the use of analytics aids a knowledge enterprise by promoting efficiency within an organization, particularly by using analytical methods to provide valuable-decision making knowledge to minimize, operating cost and accurately forecast market trends (Hedgebeth, 2007). The use of analytics vary across sectors and have been highlighted below:

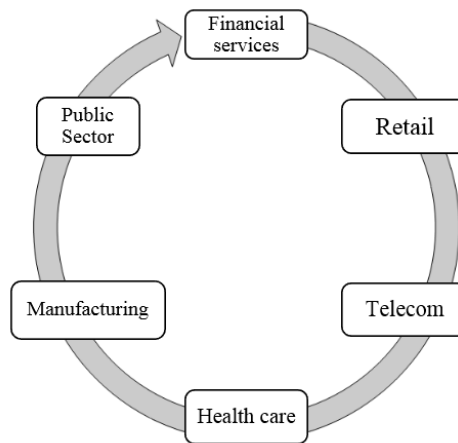


Figure 3: Potential opportunities for Analytics for various sectors

These are the examples of the potential use of analytics application in various areas include (Trkman et al., 2010): In planning: analyzing data to predict market trends of product and services;

In-Sourcing: the use of an agent-based procurement system with a procurement model, search, negotiation and evaluation agents to improve supplier selection, price negotiation, and supplier evaluation;

In Making: the correct production of each inventory item not only in terms of time but also about each production belt and batch; and

In Delivering: various applications of business analytics in logistics management has been made in order to bring products to market more efficiently.

Cloud Computing:

Cloud is a general model for enabling on-demand network and a convenient way to access a pool of computing resources which includes servers, networks, applications, and services. In other words, cloud technologies have enabled all technology resources to be connected through a utility model to run effectively in a cost-optimized manner (Dinodia Capital Advisors, 2013). Moreover, in a cloud computing, there are a collection of remote servers and software networks that allow different kinds of data sources be uploaded for real-time processing to generate computing results without the need to store processed data in the cloud. It can be classified as public, private or hybrid (Aichner & Jacob, 2015).

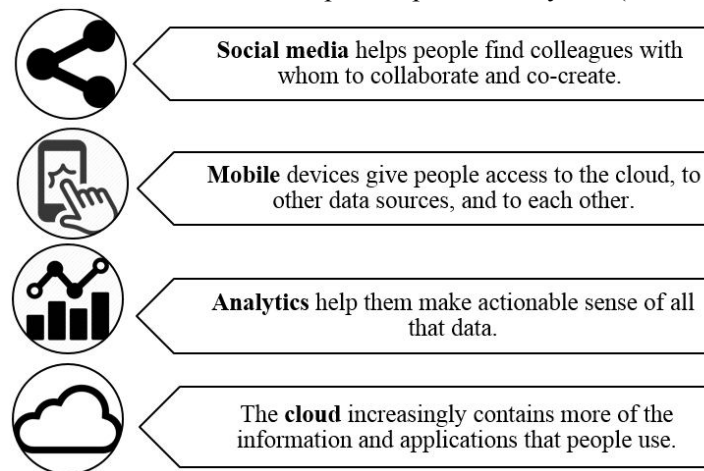


Figure 4: The SMAC Bundle

C. Exploratory/Exploitative Innovation

According to the O'Sullivan and Dooley (2009), innovation is more than the creation of something novel. Innovation also includes the exploitation for benefit by adding value to customers. In the past literature, there are numerous taxonomies of innovation is given by the researchers based on the degree of innovativeness. For instance, two major (conceptual) aspects of innovation can be distinguished by Cooper (1998) and Gopalakrishnan and Damanpour (1997) as - innovation as a process that encourages change (the result of the emphasis on innovation); and innovation as an event, object, or a discrete product, characterized by novelty. Moreover, Bessant and Tidd (2007) distinguish four type of innovation such as production, process, position operation, and paradigm innovation. In Table 1, there is a summary of numerous classification of innovation.

Table 1: Example of classification of innovation types according to the degree of innovativeness

| Authors | Types of innovations |
|--------------------------------|---|
| Mensch (1979) | Improvements → basic innovation → fundamental innovation |
| Freeman (1982) | Improvements → continuous → radical → new technological systems → change of techno-economic paradigms → technological revolutions |
| Kleinschmidt and Cooper (1991) | Low innovativeness → moderate innovativeness → high innovativeness |
| Wheelwright and Clark (1992) | Incremental → new generation → radically new |
| Freeman (1994) | Unrecorded → incremental → minor → major → systemic |

Source: Author's adaptation from Kotsemir et al. (2013)

In this research paper our focus on two categories of innovation i.e. exploratory and exploitative innovation. Exploration and exploitation are fundamental activities of organizations and other adaptive systems (March, 1991). According to the innovation degree and knowledge base, exploratory innovation and exploitative innovation have been classified. Exploratory innovations are associated with search, discovery, and experimentation (March, 1991). According to the Benner & Tushman (2003), exploitative innovations are incremental innovations and designed to serve existing markets whereas exploratory

innovations require the development of new knowledge (Benner & Tushman, 2002; Levinthal & March, 1993). Moreover, exploitative innovation creates value through firms strengthening existing knowledge base and improvement of existing products or processes, whereas exploratory innovation creates value through firms' development of new domains with the goal of adopting or creating new products or services (Ozer & Zhang, 2015).

III. Theoretical framework and propositions

The purpose of this study is to investigate the relationship between analytics, strategy, and innovation.

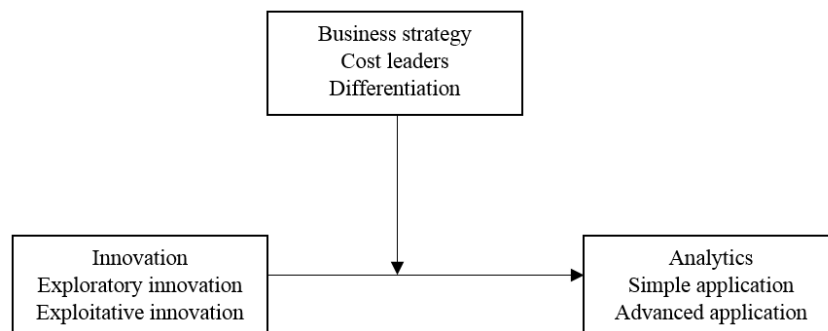


Figure 4: Theoretical Framework

3.2 Relationship between Exploratory/Exploitative Innovation and Analytics application

The 2017 Data & Analytics Report by MIT Sloan Management Review finds that the percentage of companies deriving competitive advantage from analytics increased for the first time in four years (Ransbotham & Kiron, 2017). An analytics application refers to the utilization of raw data, inference rules, and analysis models to provide decision makers to perform necessary steps to improve their day-to-day or milestone activities. In other words, analytics applications that are extract meaningful information from your raw data to deliver great insights and value. Additionally, organizations with strong analytics capabilities use those abilities to innovate not only existing operations but also new processes, products, services, and entire business models (Ransbotham & Kiron, 2017). According to Ransbotham & Kiron (2017), the analytics applications have a positive relationship with business innovation.

Exploratory innovations are radical innovations that are designed to meet the needs of emerging customers or markets, whereas exploitative innovations are incremental innovations and are designed to meet the needs of existing customers or markets (Benner & Tushman, 2003; Danneels, 2002). An organization with exploratory innovations offer new designs, create new market segments, develop new channels of distribution, and supply the services for emerging customers (Benner & Tushman, 2003; Danneels, 2002; Jansen et al., 2005). On the other hand, an organization with exploitative innovations broaden existing knowledge and skills, improve established designs, expand existing products and services, and increase the efficiency of existing distribution channels (Abernathy & Clark, 1987). Moreover, in technological innovations, if firms decide to heavily invest in the exploitation of existing knowledge, i.e., by refining existing commercialization of products and services; it can reduce the firms' possibility of exploring new knowledge development, i.e., development of new expertise and technology (Levinthal & March, 1981; Tushman & Anderson, 1986; Leonard-Barton, 1995).

As we all know that businesses today need to analyze huge amounts of data, including social media activity, weblogs, warranty claims, call center activity, movement of assets with RFID tags, and sensor data. Based on the analyzing huge data, organizations are improving their performance to achieve competitive advantage.

March (1991) defines exploration activities as things captured by terms such as search, variation, risk-taking, experimentation, play, flexibility, and discovery, while exploitation activities include 'such things as refinement, choice, production, efficiency, selection, implementation, and execution' (p. 71). Based on

these activities, we can say that organization with exploration innovations use advanced analytics application because they focus on discovery and experimentation, on the other hand, an organization with exploitation innovation use simple analytics application because they focus on efficiency and execution. Additionally, exploratory innovation is focused on customer & operations analytics, and predictive analytics while exploitative innovation is focused on functional analytics, and social media analytics.

For the organization, it is very hard to understand and analyze the needs of emerging customers or markets as compared to the current customer's needs or markets trends. So, for emerging trends in business needs advanced analytics application i.e. surveys, experiments, and observations; and for current trends in business requires simple analytical applications i.e. industry reports, consumer data and other business data. Consequently, this study compares the level of the two distinct analytical applications with innovations. Thus, we propose the following:

Proposition 1: Exploratory innovation have advanced analytics application.

Proposition 2: Exploitative innovations have simple analytics application.

3.3 Relationship between Strategies (cost leaders and differentiation), Exploratory/Exploitative Innovation, and Analytics application

Porter (1980) holds that cost leadership and differentiation signify two fundamentally different approaches to achieve competitive advantage. Differentiation refers to the development of a unique product or service (Porter, 1985). In other words, differentiation strategy means product development with added advantages or those which are perceived to be unique or different in the industry and offer a greater benefit to consumers. There are many ways and dimensions by which firms can differentiate themselves (Thompson & Strickland, 2008) and their product from rival companies' example through design, brand image, technology, features, customer service, and dealer network. On the other hand, cost leadership strategy is also proposed by Porter (1985), as a successful way to achieve a sustainable competitive advantage by reducing and controlling the costs. Moreover, cost leadership or "low-cost" strategy put emphasis on organizational efficiency. Additionally, this strategy involves the process through which the company is able to produce or distribute goods and services at a lower cost than competitors within the industry (Pulaj et al., 2015).

Cost leadership theory indicates positive relationships with exploitative innovation and simple analytical application. An organization with exploitative innovation focuses on market information and knowledge which has already been obtained and is currently available on the market (March, 1991). Such organization always will help to allocate resources in the best possible way. Additionally, exploitative innovations broaden existing knowledge and skills, improve established designs, short-term task, & benefits, and expand existing products & services. It is emphasizing the best utilization of current knowledge and information within the existing domain of the market and experience; this will lead to cost saving and improved performance (Kim & Atuahene-Gima, 2010). Hence, we can say that cost leadership has a positive relationship with exploitative innovation. Organizations with such kind of innovation lead to transactional and operational efficiency.

March (1991) defines organization with exploratory innovation focuses on search, variation, risk-taking, experimentation, play, flexibility, and discovery. In the same way, an organization with differentiation strategy is always a matter of creating and search new things; and developing products with distinctive & unique characteristic to achieve competitive advantage. In addition, differentiation strategy always involves in process of new product development, and experimentation for these activities organization always needs to the advanced analytical application that focuses on emerging new markets trends and practices.

Analytics applications are the science of examining data to discover underlying information and patterns. In the current scenario, organizations are needs to use an analytics application to achieve a competitive advantage, but these applications are must be aligned with the business type and their strategy. For example, an organization with cost leadership strategy focuses on the aggressive construction of efficient scale facilities and vigorous pursuit of cost reductions through experience, tight cost and overhead control, avoidance of marginal customer accounts, and cost minimization in areas like R&D, service,

sales force, advertising, etc. (Awade, 2014). Consequently, we can say that cost leadership strategy is more inclination towards functional analytics, marketing campaign effectiveness, and social media analytics. On the other hand, differentiation strategy in more focuses towards innovation, experimentation, and risk-taking with unique features of products or services. Consequently, we can say that differentiation strategy is more inclination towards customer & operations analytics and predictive analytics.

Therefore it is proposed that:

Proposition 3: *Cost leadership strategy has a positive relationship with exploitative innovation and demands simple analytics application.*

Proposition 4: *Differentiation strategy has a positive relationship with exploratory innovation and demands advanced analytics application.*

IV. Conclusion

SMAC is emerging as an effective technology for business enterprises for improving their productivity and innovation as well as competitive advantage over their rivals (Verma et al. 2017). The promise of SMAC is that we will be predicting the future (analytics), the result will be available anywhere (mobile), everyone will be networked (social), and at a fraction of the cost (cost). The researcher's results show that the use of analytical applications in strategy and exploratory/exploitative innovation areas can affect an overall organizational performance. In addition, analytical applications affect the businesses to make decisions for improving the productivity and efficiency. Explicitly, our findings indicate that every organization that its own priority for using the applications of analytics as per their needs. Like organization with cost leadership strategy and exploitative innovation demands simple analytical application, and organization with differentiation strategy with exploratory innovation demands advanced analytical application for improving the business performance. Moreover, the analytical capability can better guide the exclusively human decisions and provide automated decisions in some task in organizations. Based on such strong prediction and literature review, we are trying to develop an understanding that how SMAC stack, business strategy, and innovations are related.

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