
Marketing Analytics Capability and ERP Systems Implementation: Theoretical Framework and Case Study

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Abstract

ERP systems implementation through investment in marketing analytics capabilities (MACs) is imperative in Industry 4.0 age. The theoretical framework is developed and utilised for mapping the case study of a nationally well-renowned ERP consultancy strategic business unit (SBU) of FCL. The FCL uses marketing analytics capability for ERP projects' implementation and consultancy around Pakistan. It is one of the few companies that have complete structure for SAP EPR solutions. The Marketing Analytics Capability Framework (MACF) for this case study is composed of Culture Capability (CC), Technology Capability (TC), and People Capability (PC), along with ERP implementation cycle. The team heads and experts, with notable experience, were interviewed, through operationalisation of non-probability purposive sampling. A holistic view of MACs for ERP implementation, through paradigm lens of big data business analytics (BDBA) is presented.

Keywords: *Marketing Analytics Capability Framework (MACF), Marketing analytics, ERP Consultancy, ERP Implementation Projects, Business Analytics, Big Data Analytics*

1. INTRODUCTION

In this world of globally digitalised economy, data analytics is the 'new gold' and its marketing capability is the 'new oil'. Therefore, the market 'invisible hand' is embedded in the plethora of opportunities that have been created by multiple-layered digitalised channels of value for customer engagement (Schadler et al., 2014). The scope of dynamic capabilities and its micro-connectivity with performance enhancers at enterprise level in the context of data analytics has open doors for new value dimensions (Teece, 2007; Teece et al., 1997). The importance of marketing capability in term of big data analytics, especially in high-tech

industries, can traced from the investments being poured for it. Marketers, now a days, are budgeting for long term financial and non-financial commitments for developing marketing analytical capabilities. The business analytics gurus have already depicted that future business leadership depends on quality of data-backed analytics (Davenport & Harris 2007; Teece, 2007). Ramani and Kumar (2008) have observed that the professionals of marketing analytics are directed by the market dynamics to develop organisational marketing analytics capability through optimise marketing investments, action-oriented customer insights, accurate assessment of customer lifetime value and marketing opportunities. So, harnessing of technological capability of marketing analytics has become a strategic initiative. Talking about people and culture capabilities, Tom Davenport, an authority in analytics, has detailed the vitality of setting long term orientation in terms of developing culture and people skills for reaping business rewards from analytics implementation. Therefore, there are no sure shortcuts and the previous experience doesn't work well, as analytics is a paradigm shift. So, top management has to be committed and clear in terms of developing the organisational human-oriented technology culture for integrating the technological interventions and people skills for synergy (Davenport & Harris, 2007). However, there is a clear call for understanding the obstacles in this pathway of marketing analytics capability movement. The understanding of which, clearly projected as being 'first thing first', in terms of implementation. This argument has been presented by the work of Harmon (2002), where the empirical sense for usefulness of enterprise level intelligent systems is imperative for utilisation of marketing opportunities.

The enterprise level intelligent systems have been observed to be the backbone of business analytics, as companies are pushed by the market demand for deployment of updated enterprise systems. In the age of data analytics, one of the main competitive advantage of ERP systems is the seamless provision of real-time data, sourced from multiple data-points across the enterprise. This enables the businesses to gather value extraction capability from the business opportunities at the instant of their occurrence, as one of the ways for capturing the 'lions' share'. Nevertheless, the planning for implementation cycle of ERP systems is one of the key areas to reap the benefits, as stated before (Duff & Jain, 1998; Gupta, 2000). Eventually, the pre-implementation, implementation and post-implementation stages of ERP implementation in terms of the people, technology and culture capabilities can be a game changer in terms of a marketing analytics capability framework. The structure of the article is formulated on the following grounds: Firstly, the link between big data analytics and dynamic capabilities is created. Afterwards, the connection of big data analytics and ERP is projected. Furthermore, the theoretical grinding for the Marketing Analytics Capability Framework (MACF) is detailed in terms of Culture Capability (CC), Technology Capability (TC), and People Capability (PC), along with the ERP pre-implementation, implementation, post-implementation phases. The discussion stage is characterised by the encapsulation of MACF compositions into the three phases of ERP implementation for extracting the holistic view. This would enable the researcher to strive for recording the operationalisation of the MACF at field activities experienced at the company selected.

2. BACKGROUND: BIG DATA ANALYTICS AND ERP-THE DYNAMIC CAPABILITIES CONNECTION

2.1 Big data analytics (BDA) and business market dynamics

The academicians and practitioners are embracing the area of big data analytics for exploring its business value. BDA is fundamentally explained in terms of the rigorous deployment of management, operations and technical capabilities in terms of the famous 5Vs. Additionally, due consideration has to be provided to the extraction of actionable insights from the usage of these capabilities through 5Vs because the competitive edge depends on it (Wamba et al., 2015). Moreover, Manyika et al. (2011) presented it as the 'new normal' in terms of developing innovation capacities, competition nature and productivity dimensions. The reason behind such handsome presentation of BDA in terms of market oriented value is based on the plethora of tools and technologies that are evolving the ways of businesses being operated today. Many things like cloud based enterprise operations have become a normal routine (Kiron, 2013). With this happening, data is being created in gigantic amount and the 5Vs are getting into everything that the businesses hold dear at organisational level. Likely, data backed decision is not a fashion but a practice now and its setting the pace for the gaining competitive edge by the companies (Yiu, 2012). Business value has been sourced by the organisations by making use of BDA for data oriented ways of learning, evolving and embedding innovative process of continuous improvement (Kiron, 2013; Yiu, 2012). Talking about the marketing side, better customer relationship management through managing operations on the basis of real-time data gets the organisations at par from others in creating better competitive advantage (Kiron, 2013). In summation, the big data analytics business capabilities are sourced from the 5Vs in terms of carefully planned investment in developing IT, people, and culture capabilities in terms of marketing perspective mainly. This theoretical development or argumentation leads of big data business analytics (BDBA), which has connections to overall enterprise level resource planning and value maximisation (Tweney, 2013; Bhatt & Grover, 2005; Lin, 2007; Wamba et al. 2017; Haleem, 2021).

2.2 BDBA and Enterprise Resource Planning

The literary synthesis of the academic reservoir depicts, especially from 2015 to 2017, that the benefits of the BDBA are not only observable but seeker of business value and competitive advantage at enterprise level. The research of Wamba et al. (2015) and Amankwah-Amoah (2016) confirms this argument. Whereas, the work of Matthias et al. (2017) strengths it. The enterprise level technological capability of BDBA in the shape of business analytics is apparent. The plethora of tools for analytics, especially for predictive capability, is most notable as the machines could operationalise the algorithms (Oztekin, 2017; Akter et al., 2016) and present better future bigger picture, which was not observable before. There have been several studies where the combination of resources and strategic level has been emphasized for better performance. It has been depicted that the utilisation of BDBA could be done in an efficient manner by coupling the capabilities and associated resources at enterprise level to have a unified and integrated system. All this research led

projections connect the enterprise resource planning with big data business analytics (BDBA) (Akteer et al., 2016; Wang et al., 2016). Furthermore, in the global awakening for mapping societal impact of corporate happening and moving towards environmentally responsive activities that could reap sustainability in a promising manner (Dubey et al., 2019). So, enterprise level has been vital, not only limited to cooperate profits in terms of performance and other indicators but it leads the enterprise to plan for resources in a way and style, which could promote sustainability. Taking the similar literary nurturing way of presentation, Gupta and George (2016) and Gunasekaran et al. 2017 argued about the effect of BDBA, in terms of context-based performance indicators.

Moreover, the initialisation of ERP is based on the decision of the management to implement ERP (Burns & Turnipseed, 1991). Therefore, the implementation phases are crucial in business management sense. This takes the research towards the opinion that the connection between the big data business analytics (BDBA) and Enterprise Resource Planning (ERP) is not only about the operationality in terms of the business arena capability framing on the basis of capabilities. Overall, in the presence of the research studies mentioned earlier, it is viewed that this BDBA-ERP connection is embedding itself in many other avenues of value that are both, system and firm based. This connection can be studied in a number of different ways based on its applicability, but the present study only focuses on the gap it directs in terms of marketing analytics.

Talking about marketing dimension, the advent of digital business and commerce platforms have revolutionarily evolved the application and theoretical reservoir of marketing. The availability of new corporate examples has pushed the subject of information systems, mainly considered as an IT research area, to marketing and now Marketing information systems are not only a subject of academic discussions but part of ERP systems that are one of the core valuables of corporates (Harmon, 2002). The integration of sub-dimensions like branding, sales, consumer behaviour and customer service can further accelerate the performance of marketing orientated enterprise systems. This has been projected by the work of Davenport and Harris (2007) by claiming the managing the analytics capabilities of the organisation are a strategic initiative, where the capabilities of talented people, technologies involved and cultural dimensions concerned have to be taken care of at organisational level while having rigorous adaptation in mind. Wedel and Kannan (2016) projected that in age of digitalised economies globally, the data is the new oil and analytics is the new gold. The combination of these two in term of marketing orientation enables the organisations to flex their capabilities for future orientation of consumer behaviours and market capturing strategies by providing products and services for long term relationship. This argumentation projects the connection between viable business applications that could be possible through ERP systems' implementation. The antecedents set by BDBA can be turned into consequents in the shape of an environment where real-time and actionable insights are available that caption the cross-functional work settings as normal routines (Duff & Jain, 1998). Later, similar presentation of the interlock between ERP implementation and business value was explained by Gupta (2000). Teece, Pisano and Shuen (1997) worked on the similar lines with emphasis on

dynamic capabilities that enable the integration and alignment of organisational analytics-capabilities by following the business sense.

2.3 Big Data Business Analytics (BDBA) to Marketing Analytics

The big data business analytics (BDBA) has emerged as a combination of positive organisational outcomes that are enabled by big data analytics and provision of ERP systems that enable it at the implementation end, which would inculcate the technological, people oriented, and culture concentric capabilities for marketing decision making (Negash, 2008). By combining the understanding of data analysis depicted by various research studies, the outcome in the shape of knowledge-enriched and predictive presentations, which are based on the tools and techniques that the implemented system provides, so that the managers could execute proactive decision making (McFedries, 2013; Norusis, 1997). There are three major directions for marketing managers in this fundamental literary argumentation about data analysis, that starts from inspection of data, integrative reporting of marketing data, and provision of multi-dimensional visualisation for conclusive and actionable insights. Therefore, the capabilities of marketing analytics can be harnessed under the paradigm of BDBA, through the application arm of systematised tools and techniques, ERP. Taking about the defining Marketing analytics (MA), in context to the study, is basically the combination of cultural values, people and technological capabilities that are embedded within organisational system for marketing decision-making (Kohli & Jaworksi, 1990), based on real-time data provisions. Marketing analytics is basically the marketing orientation of business analytics (Narver & Slater 1990; Kohli & Jaworksi, 1990).

3. MARKETING ANALYTICS CAPABILITY FRAMEWORK (MACF)

The framework for Marketing analytics capabilities is developed on the basis of literary development detailed in section 2, where the dynamic capabilities connection between big data analytics and ERP provides way forward for observing the market dynamics. Furthermore, the literary connection of BDBA and Enterprise Resource Planning (ERP) and shift towards marketing orientation for Marketing Analytics (MA) provides the roadmap for MACF.

3.1 Culture Capability

The culture capabilities, as being the first, are intangible in nature and consist of the nonwritten compendium of norms and values that are obvious for the organisational members aligned to the enterprise culture. Cultural capabilities depict the way of data extraction, analysis and dissemination (Leidner & Kayworth, 2006). Davenport and Harris (2007) emphasized on the vitality of cultural capabilities by presenting it to be one of the major yardsticks to assess the successful application of analytics systems for gaining business value. The business organisations are experiencing a dynamic competitive environment and are in need of dynamic capabilities for resource based perspective, where the intangibles are the new explicit resources (Negash, 2008).

3.2 Technology Capability

Being the second capability in the framework, several research studies have emphasised that the bigger picture of the technological capabilities have to be considered for having organisational readiness in terms of business value extraction from the market. This depiction by Bharadwaj (2000) has been supported by Santhanam and Hartono (2003). Moreover, similar argumentation has been built by Bhatt and Grover (2005) as well. Notably, this broadening of canvas means that the technological resources is a paradox. This can be further clarified by the definition of technological capability, which is marked by the organisational capability to “mobilize and deploy IT-based resources in combination or co-present with other...capabilities” (Bharadwaj, 2000). So, the resource based perspective (Santhanam & Hartono, 2003) projects that it is a strategic level issue that has to be managed at enterprise level and demands enterprise system (Zee & Jong, 1999). This notion has been further enriched by Ryu and Lee (2013). Bhatt and Grover (2005) projected that the breeding of technology capability through accumulation of unique IT resources results in achieving competitive advantage. On similar grounds, the work of Chen et al. (2014), based on detailed survey of firms, projected that technological capability has positive connection with organisational performance. The concept of dynamic capability in terms of business process adds to the relationship rigor with the third capability, as Lin (2007) identified that the investment in people and technological capabilities elevates the overall organisational performance.

3.3 People Capability

People capability is sought by harvesting the skillset for the technological systems by projecting the mentality that analytics capabilities is not only about the system and cultural framework, but people have equal and valuable standing in this movement. This has been depicted by Cliffe (1999), Bingi (1999), and detailed in several ways by Davenport et al. (2007). Similarly, the ERP implementation demands long term planning as the organisations need to have enterprise readiness for observing the reengineering, disruption of staff and downfall in productivity “...before the payoff is realized” (Umble & Umble, 2002). Cliffe (1999) argued that the ERP system implementation should be taken as a team based project and not some technical deployment for gaining success. Cameron and Meyer (1998) are of the view that successful ERP implementation involves retaining and attracting the people who are trained and skilled to do the task at hand. Brantley and Coleman (2001) have to be engaged in a manner that they eventually develop their skills and become an asset for the organisation. This can mitigate the turnover rate and employee related costs (Bingi, 1999). The costs associated to system implementation involve training and retaining the employees who are capable enough to operate the system. So, a part of the ERP implementation costing goes to people capability area (Holtsnider & Jaffe, 2001). The perspective of ‘socio-materiality’, binds the three capabilities, as investment in all three is vital for organisations to gain competitive advantage and raise the performance (Kim et al., 2012)

3.4 ERP Implementation Cycle

The ERP implementation is composed of strategic initiatives where the commitment of the top management and alignment of business process as per the requirements of the system of enterprise readiness are pivotal for adaptation process. The management has to prioritise the business processes re-engineering in a way that data analytics backed decision making for business outcomes would be the part of the daily routine. The inculcation of marketing orientation is a must, as suggested by previous research studies (Earl, 1994; Guha et al., 1997; Freeman & Perez, 1988). Discussing the phase wise implementation of the ERP, it mainly done by application at the departments that direly need the data-alignment in terms of system computability. Therefore, the functional areas of production, procurement, supply chain and accounting are streamlined for readiness to promote real-time data provision, which could improve decision making (Holtsnider & Jaffe, 2001; Robinson, 2002). Bysinger and Knight (1996) discussed the viewpoint about preparedness and keeping the post implementation stage in mind while accumulation of resources.

As modelled below, the MACF is adapted from the work of Sun et al., (2017) for linkage between BDBA and enterprise level information systems, Cosic et al. (2015) depicting the framework for business analytics capabilities and sub-dimensions, Motwani et al. (2005) explaining the critical ERP implementation factors through case study method and Ash and Burn (2003) presenting the strategic level framework for ERP implementation cycle.

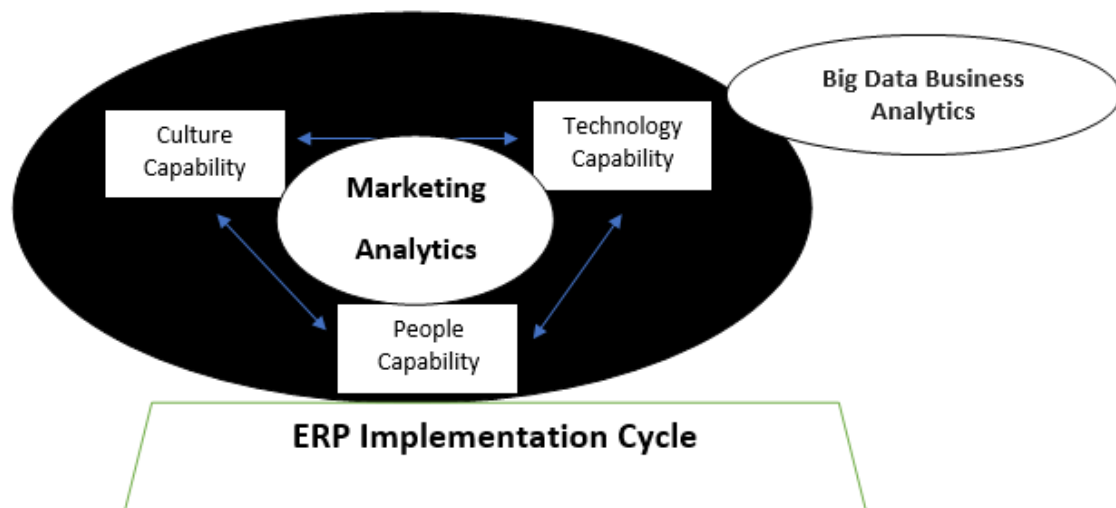


Fig.1. Marketing Analytics Capability Framework (MACF) (adapted from the work of Sun et al. (2017), Cosic et al. (2015), Motwani et al. (2005), and Ash and Burn (2003))

4. METHODOLOGY

The interview guide was primarily made on the literary foundation of the concepts discussed in the MACF. Later, it had been pilot tested to evaluate its application in terms of the understanding by the respondents and depiction of necessary changes, which needed to be

done before the main round of interviews. The order of the questions was based on initialisation of the discussion, for probing the respondent. The proceeding questions were segmented into confirmation and conclusive ones. This was done to trigger the story-like response from the respondents in the first phase, where the experience and historical observations are being explicitly mentioned. Afterwards, the next two sections are based on checking the enrichment of the responses and seeking maturity. The interview sessions were planned in way that inter-departmental and cross-functional checks could be applied. This was challenging as the demand of research area has been a niche in the market because not a handsome number of people in the local market were equipped with the professional experience and knowledge about marketing analytics and its connection ERP. While converting the responses into transcripts, the patterns observed from the interviews reflected the maturity stage of the responses and led to the finalisation of interview sessions stage. Bookkeeping of the observations done during the interview sessions was kept for enrichment of the transcripts. The analysis phase of the transcription commenced by codifying and classification of the finalised transcripts, in order to clarify the patterns that could assist in interpretation.

5. CASE STUDY CONTEXT

With the advent of industry 4.0, countries are moving towards digitalised economic infrastructures. Many companies developed their business analytics muscle for having the capability of predicting the future market dynamics well-before their competitors. The need for ERP solutions elevated in a sense that business organisations started demanding systems based on open innovation for small and medium size companies to application of ERPs sourced from the global giants at financial and non-financial sector. One of the most profitable corporations under a national conglomerate, fertiliser and chemical manufacturing giant with subsidiary and associated network of business organisations, the FCL took this opportunity, notable in the national market, and built its IT services and consultancy muscle for providing ERP solutions and other IT services to the local clients. Different modules of ERP (SAP) were provided to the clients that ranged from procurement to logistics, accounting to business process management, along with consultancy for successful implementation. Luckily, FCL got a skilful team with full-fledged professional experience and credentials, a case noncommon in the local market. So, the strategic business unit of FCL became profitable and business arm. This case study is about analysing their ERP consultancy and implementation services business operations, through the lens of marketing analytics capability framework (MACF).

6. CASE STUDY ANALYSIS AND DISCUSSION

One of the most crucial views about the ERP implementation were that the business clients were mostly inclined to propose their own projected changes, which resulted in problems in post implementation stage. The team head for SAP and others depicted that “many companies did not wanted to accept the fact the rules of the business game change when you are shifting to industry 4.0 working style”, “many managers from client companies would argue for

following their reported requirements”. The main reason behind it was the lack of socio-materiality sense to see that the proceeding three capabilities are interconnected, and overall organisational business value can be extracted by investing in all three of them (Kim et al., 2012). The importance of marketing analytics is clarified by the co-creation of value through the culture, technology and people capabilities that result in successful ERP implementation cycle. One of the top management representatives responded that “the marketing oriented sense of SAP or any other ERP in terms of capabilities is vital for both client and consultancy provider in regard to the local business dynamics”. This confirms the connection literature that emphasizes on the connection of BDBA and ERP implementation in the context of dynamic capabilities (Manyika et al., 2011; Kiron, 2013, Strassmann, 1990, Barua et al., 2004; Germann et al., 2014; Zhou et al. 2014; Akter et al. 2016; Wang et al. 2016; Davenport and Harris, 2007; Bharadwaj, 2000; Kim et al., 2012; Robinson, 2002). Culture capability were termed as the “working norms that have been changed for organisational readiness for ERP implementation success” and “the way of thinking for finding solutions for the ERP implementation problems that sourced from the working environment created at the consultant organisation”. One of the ERP team members responded that technology capability is “all about the tools, techniques and system applications and its implementation”. One of the senior managers discussed about the pivotal-edge provided by people capability by saying that “experienced people made the ERP implementation services business a success as few people in the local market have the professional expertise, so, retaining the talented people is a challenge in itself”.

7. CONCLUSION

In essence, ERP is about investing in culture, technological and people capabilities by unlearning the previous work routines as the experience acquired before the application of ERP could be friend or foe, in terms of resource based view. Through the MACF, the case study presented that marketing analytics capabilities are crucial, have specific challenges, and need detailed long-term oriented planning for companies aspire to be the leaders in ERP consultancy market for successful implementation cycle being possible. Marketing Analytics is a growing area in industry 4.0 and there is need for its understanding by the business managers so that the data science specialist, ERP implementation team and ERP consultancy services business hub could make a synergical impact in the marketing of BDBA muscle of the firm. Companies now are looking for ways to exploit the opportunities attached to industry 4.0 and the MACF provides them a roadmap for major areas of concern for marketing orientation, in order to gain competitive advantage in the new and growing competitive market. This study constricted itself to only the main constructs as there is a lot of overlapping between business analytics and marketing analytics. As being a nascent area, many research dimensions areas are not available, so the induction process was mapped in terms of major research available. In terms of future studies, the literary expansion of the MACF could be done by explaining the issues and challenges at people, culture and technology capabilities level, under the umbrella of BDBA. The ERP three phase implementation (pre-implementation, implementation, and post implementation) can be made

the part of MACF for extension of the framework through emphasis on ERP implementation 360-degree cycle. The sub-dimensions of marketing like branding, consumer behaviour, retailing and alike can be inculcated. Comparison of people, culture and technology capabilities based on countries, system or firm level can be good research gap as well. Ultimately, the scale of MACF could be developed and tested as it is a nascent area and much qualitative and quantitative research studies are clear call for this problem area.

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