**MANAGEMENT CHALLENGES AND INFORMATION SYSTEM REVELOPMENT IN SMEs DUE TO COVID-19 FALLOUT: PRESCRIPTIVE CASE STUDY**

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**Abstract**

In this paper as we draw on the earlier literature of the management issues of the SMEs, we can extend and examine the three types of significant SMEs’ management challenges amid Covid-19 pandemic. We also analyse the role of new information system to revamp SMEs’ operational activities in Covid-19 pandemic fallout. The challenges in SMEs’ managerial perspectives, challenges in leading the SMEs into the strategic direction along with how SMEs can draw up responses to overcome Covid-19 impacts for profitable business operations are analysed for further research in this area. Moreover, as Covid-19 forced business to go online with technology based integrated information system, SMEs also need to follow suit to have a productive integrated information system to support business growth and expansion sustainably.

**Keywords:** Small and Medium size Enterprise (SME), Information System (IS), Business Analytics (BA), Management Information System (MIS), Covid-19

**JEL Classifications**: G40, G41

1. **Introduction**

As the Covid-19 pandemic disrupted the world economy, most of the business are impacted with detrimental effects (Hasan & Shahbaz, 2021). SMEs are no exception to the disruption. SMEs being small to mid-size company have various challenges during and post Covid-19 period (Hasan et al., 2022). The three most significant types of challenges are in the management, leadership, and development responses to Covid-19 (new normal marketplace). Moreover, SME’s business analytics to be exploited to revamp the business operations is significant to investigate tactically to sustainably grow across the potential market.

This paper provides some significant relevant management and operational challenges’ insights for the SMEs in general. Once the challenges are identified, the SMEs can kick-start their profitable and productive operational activities when the pandemic has disrupted the world economy at its worst.

This paper contributes to the management and operation changes adoption for the SMEs that encounter the management and operational challenges during this Covid 19 pandemic. This paper also contributes to an extension of management discipline as to how it should readjust during the time of unprecedented management challenges.

This paper is organised in the following sections. In section 2, we highlight the SMEs management challenges in short to medium term. As for the section 3, we discuss SMEs leadership challenges in short to medium term. In the section 4, we show that how SMEs face challenges in developing responses to ‘New Normal (post-COVID19 work environment)’. In the subsequent section, we discuss as to how SMEs can exploit their business analytics to revamp their business operations. We conclude this paper in section 6.

**2. SME’s management challenges in Covid-19 business environment**

*2.1. Ensuring effective human resources management*

Amid this pandemic, the most significant challenge in SME’s management is ensuring effective human resources management. Employees are not intrinsically or extrinsically motivated (*lower AMO= Ability, Motivation, and Opportunity*) to contribute to the SME’s development due to SME’s top HR managers tend to unproductively control them. A strategic organizational ‘*work relationships of devolution’* is another challenge to be overcome by the SME’s HRM as endorsed by Renwick (2010). Moreover, workplace employee ‘*motivation’* is also imperative as concluded by Caven and Nachmias (2017) for organizational development, therefore, ‘*developing a pro-business HR policy’* for insightful, business economic imperative, compliance, ethics and knowledge-based workforce is the key challenge for SME in short to midterm operations (Laurie J, 2016) in this pandemic business operations.

*2.2. Revamping an integrated and strategic marketing policy*

SMEs tend to face the challenge to revamp an integrated and strategic marketing policy to be used for local and global market expansion profitability (Linstead, Fulop, & Lilley, 2009). Moreover, the findings by the Orlov, et,al., (2016) also supported that coming up with the ‘*effective marketing communication message*’ is the key challenge in creating the effective marketing strategic management. As SMEs marketing managers are encountered by this unforeseen Covid fallout, it is evident that the managers still need to be educated with quality marketing management knowledge as the SMEs drastically failed to exhibit its business sustainability during this pandemic period.

*2.3. Adopting a strategic data management and effective data usages policy*

Adopting a strategic data management and effective data usages policy (Mutch, 2008) is also one of the key challenges for SMEs to analyse SME data along with its effective usages for operational and strategic business expansion. As SMEs have data and information coming from unintegrated offices, they cannot create a harmonious approach for the data and information to be used effectively for SME’s business development. Disintegrated office sites make it difficult for the managers to take up timely actions and plans, thereby, losing to the big market competitors.

*2.4. Flexible and responsive according to the business demand changes*

As there are challenges for SMEs in being flexible and responsive according to the business demand changes, it remains as one of the core managerial challenges for them to carry out the constant analytical development as the top-level managers can rarely be agree on a positive outlook for growth towards a one direction approach. This is a very core operational challenge for toady’s SMEs as emphasized by King and Lawley (2019). SMEs in their short to midterm operational strategy must include that ‘*flexibility and responsiveness’* as they help build the business in a sustainable manner. Business can rarely be rigid in this 21st century business operations. Therefore, the top-level managers must be aware of the challenge related to operational flexibility.

*2.5. Responding to local demand variations*

Challenges in responding to local demand variations in SME’s target markets are increasingly becoming unpredictable. As the Covid-19 pre and post business consumer markets are heavily disrupted by the pandemic, SMEs fail to accommodate the market disruption tactically. Even the challenge to understand the demand variations in the market will trail even after the new normal starts coming into being. Therefore, understanding of the ‘*local demand variations’* is a crucial challenge for SMEs in their short to midterm planning (Zhaohui & Fu, 2018).

*2.6. Establishing an integrated information system*

Due to inadequate infrastructure, SMEs have the challenge to establish an integrated information system. SMEs have unintegrated information systems as they are not interconnected. Building a sustainable integrated system requires a considerable resource. As SMEs fail to exploit an integrated informational system at their disposal, it becomes a major challenge for them to cope up with the 21st century operational management for business growth and digitization to be used in sustainable profit and expansion, which is stressed by Anders and Carsten (2007).

*2.7. Carrying out constant competitors’ analysis*

Carrying out constant competitors’ analysis is a major challenge for any SME as it takes away considerable time and energy as concluded by Boddy (2016). SMEs thus may face the challenge to carry out a constant competitors’ analysis. The task is even tougher if analytical data is not found. Competitors’ analysis gives an extra edge to any organization as they can have market data to improve themselves (Bergen & A. Peteraf, 2002). Therefore, overcoming the challenge is also another challenge for SMEs in the short to midterm strategic planning when covid-19 has already deteriorated the market environment.

**3. Challenges in leading SMEs in Covid-19 business environment**

*3.1. Leadership style*

Adopting an integrated but distributed leadership style is the core leadership challenge for the SMEs as they tend to not have a one direction strategic leadership style. Therefore, any SME’s top leaders currently face stark differences as to how organizational core decisions are to be taken. According to Jonathan (2020), organizational distributed leadership for small or medium sized firm is crucial for ‘*sustainable operation and development’*. But as today’s SMEs are being challenged by the leadership style variations along with the pandemic deteriorating the operational activities, an ideal leadership style can only salvage the SMEs from the detrimental impacts borne out the fallout of the Covid-19.

*3.2 Effective team management*

Lack of effective team management is prone to be vividly evident in the SME’s operations. There might not work-alignment among different departmental teams. Thus, they intensely face the challenge to create a team-based synergy so that the optimal organizational day to day productivity is achieved. SMEs are also facing the lack of high performance work system (HPWS) model application (Srivastava, M. Bartol, & Locke, 2006) in their operational fronts. Team management is an asset for SMEs and innovative approaches must be exploited for encountering the relevant team challenges (Jaravel, Petkova, & Bell, 2018). Therefore, SMEs should do away with the challenges to effective team management during this trying Covid period to sustain.

*3.3. Fundamental issue of growth and expansion*

Management to agree on fundamental issue of growth and expansion is a major challenge in leading SMEs in short to midterm operations. Organizational growth and expansion depend on the uniform understanding of the founders and their uniform actions towards the organization goals and objective (Zhong‐Xing, Zhen, & Su, 2020). But as for SME perspectives, it remains to be seen that the founder(s) cannot agree on the fundamental issues of the operations with the management as they lack proper understanding of the 21st century consumer market and its volatility as affected by the pandemic. Therefore, it is a major challenge to be done away with.

*3.4. Diversifying the business value*

SMEs face the challenges in diversifying the business value (ranging from social value to full commercial value – enriching mission statement for value bases alignment priority). As SMEs do not tend to be strategically full social business nor are they full commercial profitmaking companies, it is a hesitation for the SME employees to think strategically if the SME wants to create profit or it wants to focus on the products’ social values (Ushijima, 2016). Therefore, it is fundamental leadership challenge for SME to turn the company towards one specific direction rather than dangling partially into two different business values. According to Yoshiaki (2020), managing the challenges related to the diversification lies within the top management of the company. Therefore, ‘*value diversification’* as a leadership challenge needs to be taken care of by the SME top managers.

*3.5. Managing CSR and ethical perspectives*

Fifthly, challenges to continue managing CSR and ethical perspectives are another type of leadership hurdle for the SME’s top managers. As SMEs tend to get engaged with community CSR activities, it remains as a big challenge to expand the CSR nationally. As for the ethical aspects, SMEs need to maintain their ethical values upheld during and post- Covid19 pandemic. So, this is a challenge if the leadership can continue maintaining the SME’s ethical practices even after when the company is in managerial and financial strain (Frank G.A, Andreas, & Stefano, 2019).

*3.6. Formulating a strategic green direction*

Last but not least, formulating a strategic green direction for strategic short to midterm sustainable and green business operations which is modern day organizational priority (Simon, 2012) is a new challenge for SME leadership management. As “…. green performance management and green training…”  is imperative for environmentally sustainable green organization (Paillé, Valéau, & Renwick, 2020), SMEs still need to face the oncoming challenge as they grow home and abroad. The ongoing Covid hassles are just one of them.

**4. SME’s most significant challenges in developing responses to *New Normal (post-COVID19 work environment)***

*4.1. Common distinctive perception of the new normal*

Acquiring a common distinctive perception of the new normal (James K, Schmidt, Agrawal, Plowman, & Blue, 2020) being imperative for achieving the strategic goal would be the first challenge to overcome in achieving the new normal work environment. As the SME’s top management tend to be unproductive in reaching a common consensus on what their next priority would be to work on, it evidently shows that acquiring a distinction business operational direction is the primary hurdle to be dealt with in new work environment (Powell, Lovallo, & Fox, 2011).

*4.2. Forward integration or/and partnership*

Establishing post-COVID forward integration or/and partnership with the distributors and direct wholesalers would be the paramount challenge due to technological and logistical support to build such supportive system. As the new normal (Post COVID19) would have a disrupted market to be on the way to becoming normal, forward integration and partnership with the distributor would create a win-win benefits (Vojtěch, Jan, & Marek, 2019). Therefore, it remains a challenge for SMEs as to how they go about managing partnerships with their distributors as the post COVID-19 lets the normalcy return.

*4.3. Backward integration or/and partnership*

Establishing post-COVID backward integration or/and partnership with suppliers and stakeholders will be a major challenge in responses to the new normal marketplace for the SMEs. The challenge comes into being as the COVID disruption made a suppliers’ relationship shift borne out of erratic business in between the SMEs and the suppliers due to erratic market demand. Therefore, the backward integration and partnership remain a significant challenge in the wake of business operations in new normal marketplace as understanding of the insights of the market remains uncertain and volatile whereas hindsight knowledge can only give exact market understanding (Paul, Cadle, Eva, Rollason, & Hunsley, 2020).

*4.4. Attracting investment*

Securing investment for the growth of SMEs is another issue to be dealt with during new normal. If investors did show their interest to invest in SMEs during the pre-COVID, the investors would change their mind as the pandemic began. So, SME top management is in a severe strain as to how they can convince the investors to continue their interest in the company. Therefore, ‘*a fresh and holistic business profile’* to be presented to the investor remains a major SME challenge.

*4.5. Global branding actions*

Challenges in supporting SME’s desire of global branding actions along with co-branding strategy is another aspect of the new normal strategy response. Global banding requires a strategic marketing approach whereas the brand has already created a sustainable product value in the home market (Jan-Benedict E.M, 2020). Therefore, trying to penetrate the international market would pose the significant challenge for SMEs in the post COVID new normal business as the home market is not saturated yet. As for the cobranding, the products need to have a distinctive USP (Griffin, et al., 2013). SMEs need to have their USP firmly established in new normal.

*4.6. Digital marketing platform*

Developing an SME digital marketing platform along with social media influence strategy for reinforcing company’s values, ethos, and mission; the SMEs need to redevelop its digital presence as the COVID has helped create digitization in almost every for-profit organization (Reham Shawky, 2020). Therefore, it remains a challenge for SMEs to manage the excellent digital marketing platform which will in return help the SMEs to grow and expand its business across the target areas.

**5. How SMEs should use business analytics (BA) to support its information system (IS) strategy to kick-start the operations**

As SMEs tend to have disintegrated information systems along with data and information being used in disarray, SMEs need to put its business analytics (data and information) into one direction strategic approach for their desire to support an excellent IS strategy.

Therefore, for SMEs to have a distinctive business growth and operational expansion across their target areas along with global market gradual penetration, they should adopt *a ‘strategic business analytics exploitation approach’* to support their information system strategy (Peijian, Chengde, & Xiaofeng, 2018).

Holistically considered for SMEs, to support its effective and productive IS which in turn supports a profitable and sustainable business operations, SMEs need to use its business analytics in the following most significant 9 strategies and approaches which have been critically analysed with relevant theories.

*5.1. Data Driven Culture*

Business Analytics for SME’s Data Driven Culture and IS Infrastructure: SMEs need to exploit their business analytics for developing a productive ‘organizational culture of data’ which would bring about an effective *information system infrastructure* (Richard, Sarah, & David B., 2017). SMEs should get such a business analytics mechanism that produces analytical data which to be called as a ‘data asset’. This data asset creation would help them measure strategic planning and opportunities along with future business growth and opportunities forecast.

As Marr argued (2015) that *Data Driven Decision making* (*DDDM*) is solely and wholly dependent on data quality and precision, which are stored securely but accessible by most the mid and top level managers. Similarly, SMEs should also have the scopes for measuring the KPI (*Key performance indicator*) in the core department and core people management. Moreover, practising a data driven culture creates an effective data communication for consistency, forecast and growth as endorsed by Hossain, Akterb and Yanamandramb (2020).

*5.2. Strategic Management information system*

Business Analytics for SME’s Strategic MIS: SMEs need to manage an integrated information system which being interconnected throughout SME’s disintegrated offices can produce better *business analytics****,*** thereby, providing the entire IS strategy with a boost in *strategic management information system* (Marina E, Abdullah, & RashmI, 2020). Whereas effective *database management system* (DMS) as concluded by Schroeder and Halsall (2016) plays a major role in supporting the organizational information system strategy. As SMEs tend to have a disintegrated database with each located in different sites, decisions regarding organizational development takes a considerable time, making them an effortful task. This scenario is tantamount to poor organizational performance and employees squander valuable organization time awaiting their top leaders’ strategic decisions coming late. Therefore, a proper *DMS* for SME is an imperative support which can boost SME’s operations effectively and efficiently even after the COVID pandemic finishes.

Gandomi and Haider (2015) stressed that clear distinctions between *data* and *information* to be derived from the day to day SME business operations. The SME’s BA data and information are required to be filtered and analysed for the core, productive and relevant decision-making process. Nevertheless, only a proper IS strategy can help SME managers derive values from the data and information.

*5.3. Exploitation of HR and customer analytics*

HR and Customer Analytics for SME’s IS Strategy Cornerstone: SME’s HR and customer analytics need to be exploited for deriving business values which would help support the SME’s information system strategy in the complimentary way (Holmlund, et al., 2020). Employee and customer information in business play the crucial role in underpinning business values to be reinforced as far as SME’s business analytics and information system strategy are concerned and aligned (Ida, Graeme, & Michael, 2019).

In doing so, SME’s BA are to be critically analysed through the appointment of at least one ‘*business* *analyst’* for each of the department. Similarly, appointing ‘*data* *scientist’* working along with SME IT people would provide the SMEs with 360-degree effective data and information communication for effective IS strategy development and support.

*5.4. Effective business formula application*

SME’s Business Formula for Effective IS Strategy: SME’s BA which is Supported by Business Analytics, is to be used and applied in such a way that can support the following formula for pragmatic and productive operations.

*IS ≈ IT + 3P* (1)

Where, *IS= Information System*, *IT= Information Technology* and *3P = People, Policies, Procedures*.

The symbiotic relationship between IS and IT brings about the productive business strategy. SMEs thus create a business environment so that their information strategy is reflected by the combination of information technology and employees’ professional performance.

Moreover, SME’s inter-departmental strategic alliance and development are crucial as it can only support the strategic alliance when a better and focused IS strategy is implemented throughout their supposedly disintegrated business sites.

As Sunanda (2020) stressed that IT considered in a focused way refers to *technological infrastructure* of any 21st century business organizational operations, SMEs should exploit their BA data and information so as to develop an effective infrastructure for technological support as a strategic part of the entire information system strategy.

SME’s employees (people) are very enthusiastic as they show a keen interest in learning new adaptation as required, it would thus be easier for the company to get people’s support for the effective IS strategy formation. During the pandemic, even though IS does support some of the employees to work from home, it set a precedence that despite challenges employees can perform with the help of the IS put in place effectively. BA plays the role of employees’ data and information especially the retention, turnover and performance along with appraisal reports which help have a proper functionality of the SME’s IS. Thereafter, it can also be called as an effective integrated management information system (MIS) supported by the IS and 3Ps.

*5.5. Business Analytics for SME’s Competitive Advantage borne IS Strategy*

According to Pei-Ju and Po-Chu (2018) in order to exploit SME’s BA to be deployed for gaining a competitive advantage which will indirectly help SMEs shape up and redevelop there IS strategy is evident. The most effective Modern BA tool for competitive advantage which supports IS to be used for the strategic decision-making in SME (Beynon-Davies , 2020) includes ‘*balance scorecard BSC measure*, *digital marketing, scenario planning’-* analyses future possible outcomes (Galliers & Leidner, 2009). As for existing data usage, SME’s need to come up with a ‘*data measurement framework’* which can help create *business values* which in returns give birth to ‘*sustainable technological competitive advantage’* as stated by Cronk and Fitzgerald (M.C & E.P, 1999). This idea therefore can be shown in the following circular process-

Figure 1: SMEs competitive advantage borne out of business analytics

*5.6. Digital marketing BA data for constant IS strategy development*

The 21st century digital marketing data are precious as it can collect reliable marketing data which can be the foremost asset for SMEs in starting their BA overall data and information analyses. As Elliot (2013) put emphasis on ‘digital marketing’ in the 21st century business analytics for modern IS support and strategy within the small or medium sized company, SMEs thus can apply the theory in their operations. The theory application starts from *data collection and data mining* as part of the *Datification* process.

As SMEs have more focus on digital marketing during pandemic and their new normal approach for the post pandemic, BA data from digital marketing should help them create such an IS that supports a *standard business operations cost effectively* as compared to traditional marketing strategy and market research as far as data collections are concerned.

Additionally, as SMEs have a combination of *structured and unstructured data*, they can exploit the data benefits in supporting a quicker-built effective information system which remains integrated in digital marketing BA perspectives. SMEs also need to maintain a ‘*data quality dimension’* (Plotkin, 2014) which supports the entire IS strategy.

*5.7. SME’s integrated IS (forward and backward) strategy*

According to In (2004), SMEs organizational integrated business analytics connected with that of suppliers and distributors vis-a-vis backward and forward BA data respectively works efficiently.

Figure 2: SMEs forward integration information process of business operations.

Figure 3: SMEs backward integration information process with suppliers

Therefore, SME’s business analytics data and information along with suppliers’ and distributors’ data analysis should be carried out to derive a sustainable competitive advantage over their competitors in the local market. Such strategy adoption would provide the company with short to midterm benefit as they start adopting. Gradually, it will be part of the sustainable long-term strategic planning.

*5.8 SME’s Future Business Analytics Data Usages Protocol as Part of IS Strategy*

As Gerard, Martine and Alex (2014) stated that-

*Information = Data + Structure+ Context*  (2)

SMEs also need to focus on the equation to maintain quality business analytics data and information along with the situational context so that the results can support the overall IS strategy to achieve organizational objectives. Therefore, to get hold onto the pandemic and post pandemic BA, the formula protocol must be maintained by the top-level managers for strategic decisions and mid-level managers for operational decisions, both supported by the integrated IS strategy. As SMEs analyse the data, data provides knowledge and knowledge provides competitive advantage source, which eventually provides SMEs with a source of IS strategy base as part of the overall business strategy (Sanjit K, M. S, & Bang, 2020).

Figure 4: SMEs Information System (IS) Pyramid

*5.9. Knowledge management system (KMS)*

An analysis concluded by Liu (2020) corroborated that knowledge management as part of the BA plays the crucial role in building up an informed IS strategy in any type of business organization. As for SME, the knowledge management tends to be barely seen by the HR teams.

For the core *KMS*, SMEs need to follow the following steps as they analyse their BA data which to be turned into knowledge (Rares, 2020).

Figure 5: SMEs knowledge-based information system

Therefore, SMEcreating their knowledge-based database as part of the DMS can support the productive information system and its overall effective IS strategy. As SMEs tend to have a dedicated and enthusiastic young staff who are dedicated to the SME’s business mission and vision, it would be viable for the SMEs to have its KMS well managed for an efficient IS strategy quickly.

**6. Discussion and Conclusion**

SME facing the pre COVID and post COVID challenges are to be critically analysed as the opportunities for growth and development. As the company has its SWOT analysis done, the challenges could come from internally or externally to have them named either as weaknesses or threats. Therefore, SME’s top management and leaders should take their pre-emptive measures to encounter the challenges. The three types of challenges discussed here are to be exploited by the top managers to help the SME redesign its strategic planning lest they fail to overcome the oncoming challenges. The BA discussion to be used for SME’s integrated and effective information system (IS) strategy for their sustainable business operations across the target market and their ambitions to expand into the international markets would be beneficial to SME top level management. The 9 IS strategy methods for SMEs are time-befitting and imperative to be implemented. The strategies corroborated by the relevant theories and would help the top-level management to consider the strategies in their short to midterm planning. As the BA can help the SME’s IS to be in an automate state, the decision-making process will get accelerated. SMEs thus can easily have the business insights with the right and proper data to work with for the best operational and commercial decisions. So, BA in SMEs can help bring about operational efficacy increase with the mentioned 9 information system strategies during this pandemic period when the overall business strategy needs to be revised.

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