

Business Model Canvas within the Uncertainty Context: A Critical Review

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Abstract: When an unprecedented crisis occurs, existing tried and tested business models often need modification to adapt to the new contextual scenario. In this critical review, the researchers discuss the business model canvas, a popular tool for strategic business planning and how its resiliency could be enhanced for when black swan events like the COVID-19 pandemic bring about uncertainty in the regular business landscape.

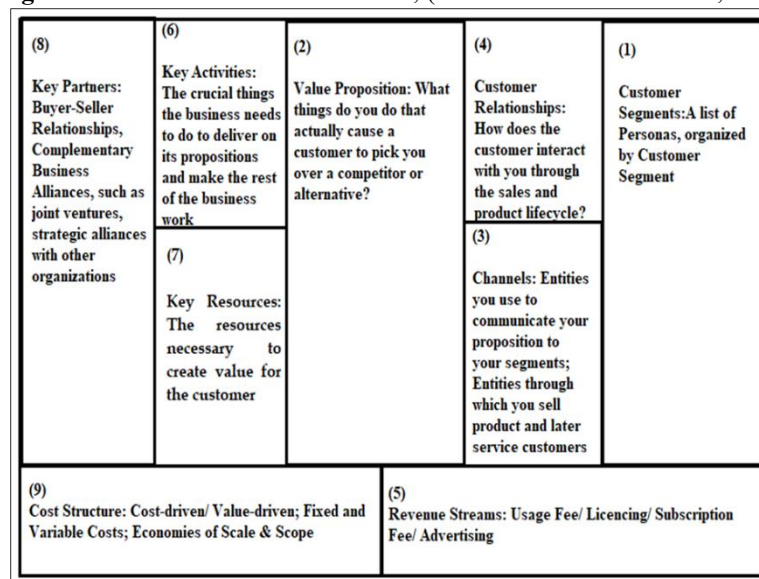
Keywords: Business Model Canvas, Uncertainty, Black Swan Events, Value Proposition, COVID-19, Sustainability, Value Creation

1. Introduction

As said by Jawaharlal Nehru "Crises and deadlocks when they occur have at least this advantage, that they force us to think." When a black swan event like the COVID-19 pandemic happened, businesses agnostic of sector, size or geography had to drastically alter their business models to thrive in their new environmental context. Initially developed in 2005 by Alexander Osterwalder, the Business Model Canvas, available in a web-based software format, has been applied to very many sectors and has evolved therein to suit business situations such as the Lean Start-up. Home-nesting consumers moved towards online channels, distributors preferred the digital and hands-free versions of the supply chain, supply chain disruptions were commonplace, transactions were completely cashless, and regulatory decisions aligned with the COVID-19 protocol as the organizations faced a severe manpower shortage and liquidity crunch. This study delves into how in such uncertain times the nine boxes in the Business Model Canvas (Customer Segments, Value Propositions, Channels, Customer Relationships, Revenue Streams, Key Resources, Key Activities, Key Partnerships, And Cost Structure) could be reviewed to lend much-needed sustainability and credibility to organizations, as they focus on delivering value to the customer.

1.1. THE BUSINESS MODEL CANVAS

The Business Model Canvas is a visual management template that enables the understanding of the creation of value with optimized resources in a structured manner. A visual chart is displayed, depicting the organization's value proposition, customer segments, assisting organizations, and finances. A business model describes how an organization creates value for its stakeholders (Ritter & Pedersen, 2020). The Business Model Canvas (BMC) is a strategic management aid designed as a template by Alexander Osterwalder, to guide the development of a new or redevelopment or documentation of an existent business model, apart from guidance on how to successfully bring a product to market (productplan.com, 2023; Muilwijk, 2022). The BMC guides and documents the practice of value exchange initiated by the organization (Anon & De Villaumbrosia, 2017). The BMC, which is a visual chart describing elements such as the products or organization's value proposition, revenue stream, and customer base is depicted with its 9 parts, marked, and ranked by the order of their consideration (for operational efficiency) in Figure 1.

Figure 1: The Business Model Canvas, (Anon & De Villaumbrosia, 2017)

1.2. THE COVID PANDEMIC AFFECTED THE BUSINESS ORGANIZATIONS

The SARS-CoV-2 virus hit the world in the latter half of 2019 and populaces across the world responded by organized lockdowns to stem the spread of the extremely contagious virus. The virus continued to evolve mutations and attacked with subsequent waves while business organizations saw a plunge in revenue and an interruption in all functions and operations (Boston Consulting Group, 2020). The motivation for the research comes from the consideration that business models and the tested methodology of documenting and reinventing business models would thus be affected as functional and operational efficiency was difficult to achieve with the traditional approach. The adaptability of a business model lends sustainability in a crisis and, post-crisis, in case of unpredictable exigencies and thus, imparts resilience to the model (Ritter & Pedersen, 2020). This research finds out how the nine boxes in the Business Model Canvas (Customer Segments, Value Propositions, Channels, Customer Relationships, Revenue Streams, Key Resources, Key Activities, Key Partnerships, And Cost Structure) could be reviewed to protect and enhance the sustainability and credibility of organizations, as they concentrate on delivering value to the customer, despite black swan disasters such as a pandemic.

2. Methodology

2.1. RESEARCH OBJECTIVE

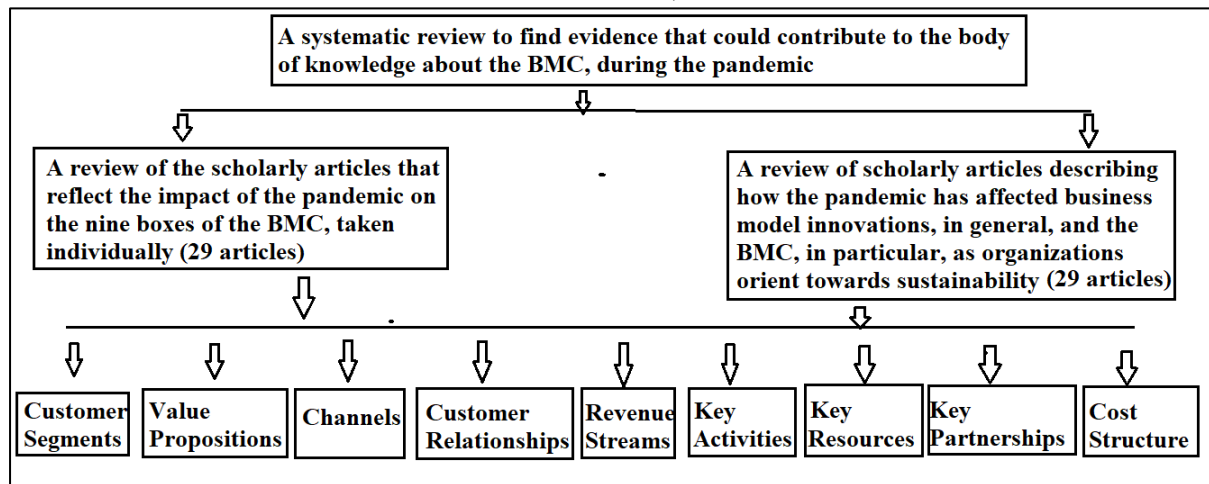
The research proceeds with the objectives of identifying the revisions required to the Business Model Canvas during a pandemic and reviewing the nine boxes of the visual chart of the Business Model Canvas to protect and enhance the efficiency of value delivery of the business organization during a pandemic.

2.2. METHODOLOGY OF RESEARCH

The findings of the research are derived by finding evidence with the help of a critical review of relevant literature, chronologically arranged and belonging to the COVID-19 pandemic era, (2019 – 2022), as shown in Figure 2 below. It may be noted that a large part of the literature is directly related to the BMC and other similar business models, during the recent pandemic, and the rest is related to the nine boxes within the visual chart. Although BMC is often used to organize the operational areas of organizations like a Lean Start-Up, the research results, here, are generic and point to no sector or product or product category. When designing or revising a Sustainable Business Model (SBM), researchers do face the issue of Information Scarcity (secondary, publicly available, and insider information), while an orientation towards a scientific methodology of assimilation of secondary data is required (Alba & Dentchev, 2021). The results, thus, are also limited to the availability of literature, though an effort has been made to access all available relevant secondary data. Also, the research is restricted to the basic infrastructure of the BMC, that is the nine boxes: Customer Segments (CS), Value Propositions (VP), Channels

(Ch), Customer Relationships (CR), Revenue Streams (RS), Key Resources (KR), Key Activities (KA), Key Partnerships (KP), And Cost Structure (CStr). The pandemic-related phases are pre-pandemic, pandemic, and post-pandemic. This research pertains to the pandemic period. Another fact to be noted is that to revise the BMC, we need to view the impact of the pandemic on the business model in generality and study the connection between the elements and the alignment of the model as well. Thus, we could say that the first objective investigates the insertion of resilience in the BMC during a crisis, while the second objective investigates how the BMC could be made more agile in the face of adversity.

Figure 2: An outline of the methodology used to arrive at the findings of the research (Source: Researchers' Contribution)



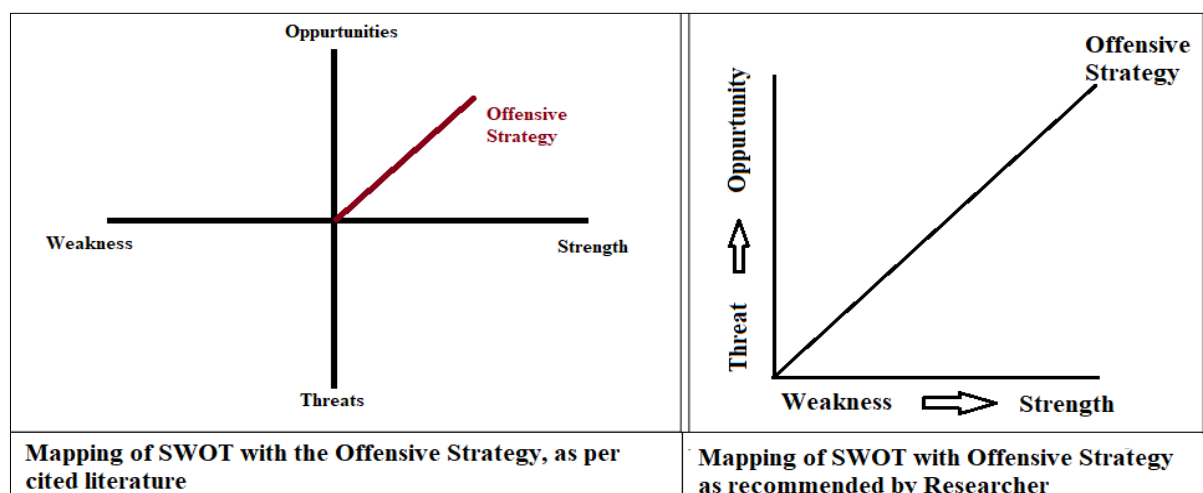
3. Literature Review

3.1. PANDEMIC-RELATED CONTRIBUTIONS TO THE CONCEPT OF A SUSTAINABLE BMC

The BMC yet remains a powerful strategic tool that could guide an organization in a crisis like a pandemic. (Micieta, Fusko, Binasova, & Furmannova, 2020) noted that the BMC enhanced competitiveness in entrepreneurship, which could be viewed as Marketing Competency: VP, CS, Ch, KP; Technical Competency: KR, KA; Financial Competency: CStr, RS; Human Relations Competency: CR (Jamira, Agustiniingsih, & Febriani, 2021) realized that an increasing percentage of students were able to develop an entrepreneurial mindset after being introduced to the BMC. (Le Mauff, 2021) developed a BMC for intellectual property, using contemporary environmental attributes. They emphasized the need to retain the basic infrastructure of the BMC and incorporate the alteration in attributes in the model. (Khan, 2021) created a BMC in a crisis period, first performing a necessary SWOT analysis and then identifying the focus areas. The feasibility of the BMC is determined by KA, KR, and KP. It may be noted that BMC primarily focuses on the economic sustainability of an organization. They represented the BMC as a set of concentric workflow-depicted circles. Key Assets, Key Technology, and Core Competencies formed the inner circle while, offerings, Ch, and KP formed the middle circle, and cost & benefits (Social, Environmental, Psychological) formed the outer part. (Sohl, Vroom, & Fitza, 2020) realized that the importance of business models in the variance of business performance is significant and that value creation and value capture are the most defining activities in a business model. (Lüdeke-Freund, Rauter, Pedersen, & Nielsen, 2020) discussed the concept of Sustainable Value Creation (SVC) by a Sustainable Business Model (SBM). SVC is guided by the questions regarding Value Creation: What-Where from-How-For whom. Value is any asset (tangible or intangible) that the customer requires and could obtain from the organization. Sources of value are resources and capabilities. Resources have value depending on how they can meet customer needs and thus, the usefulness of the offering in an organization is called use-value. Contemporarily, a sustainability orientation will include ecological, social, and economic concerns. A Sustainable Business Model (SBM) considers all stakeholders and not just customers and Value is created when the organization meets society's needs by efficiently providing products and services. (Lüdeke-Freund, Rauter, Pedersen, & Nielsen, 2020) in their research, also discussed the Sustainable Value Proposition Builder to develop and communicate the

VPs to multiple stakeholders. This tool takes into consideration the perceptions of all the stakeholders. Here, we note that environmental contingencies affect business model elements, especially the VP and RS. The potential benefit of the VP made by an organization is measured from the perspective of the customer and is based on the customer's needs. The value created for stakeholder groups are as follows: Customer-Use Value; Network Actors and Key Partners: Transaction Value; Society: Societal Benefits and Impacts; Environment: Environmental Benefits and Impacts. Forms of Environmental Value are Renewable Resources, Low Emissions, Low Waste, and Bio-Diversity; Forms of Social Value: Equality and Diversity, Secure Livelihoods, Community Development, Health, and Safety; Economic Value: Profits, Return-on-Investment, Financial Resilience, Long-Term Viability. An SVC needs Collaborative Value Creation, where multiple stakeholders' roles are acknowledged. An analysis of power relations between KP and other stakeholders must be made preceding the decision on Value Creation and Value Capture. (Mičieta, Biñasová, Kasajová, & Howaniec, 2020) studied BMC within the Industry 4.0 context. They recommended that any revision to a BMC should be preceded by a SWOT (Strength-Weakness-Opportunities-Threat) analysis of the organizational functioning under present pandemic conditions. The BMC would enable, thereafter, crucial clarity of decisions. They plotted the SWOT on a 2-Dimensional Cartesian plane, with the Offensive Strategy in the first quadrant. However, the researchers would recommend the Offensive Strategy be plotted on a separate axis, since the offensive quotient of the strategy may be considered independent of the SWOT axes or its dependence could be measured by the angle between the axes (please refer to Figure 3). (Kesting, 2020) states that repeated iterations of information causing revisions in a business model ensure resilience and stability, as the routinization of processes ensures efficiency. They introduced the term "Status Quo" of an organization as to how it conducts its business at a certain point in time without making any substantial changes. An SBM must connect with the Status Quo of an organization. The business model is mostly an abstract representation of the Status Quo. The Status Quo of an organization is identified by the following attributes: Routine driven, low risk, high efficiency, low resistance, inertia over time, and low effectiveness. This needs to be considered along with modeling insights (including Crisis Management of Operations) to create a business model, that would demonstrate planning, conceptual perspective, observer's perspective, and accuracy. (Panetta, 2020) advises first refining the current business model, identifying, and listing the uncertainties, assessing the impact of each uncertainty, and then designing the changes.

Figure 3: (Source: (Mičieta, Biñasová, Kasajová, & Howaniec, 2020), Researchers' Contribution)

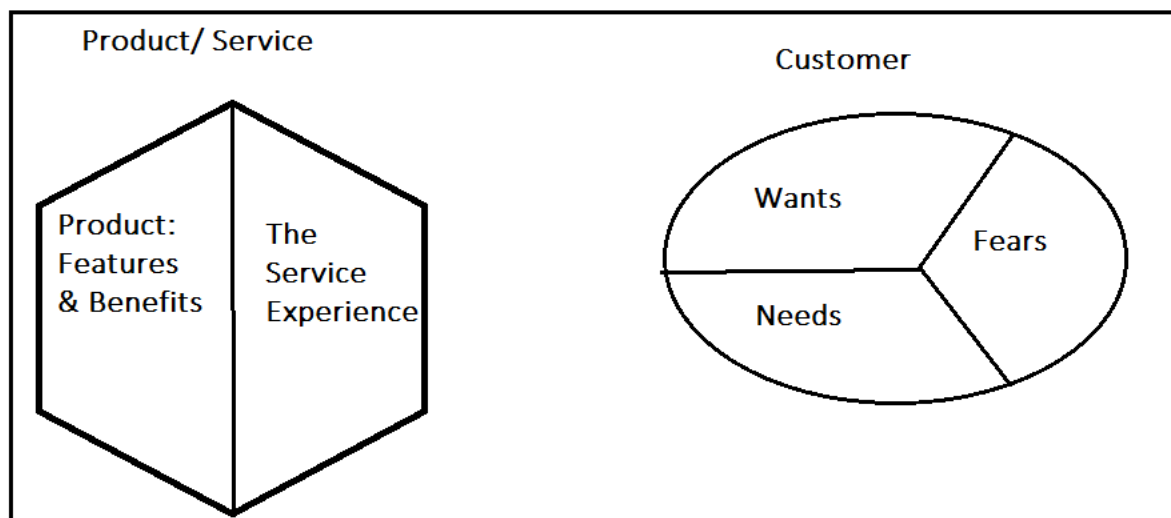


(Kotler, 2020) argues that contemporarily there are 5 types of anti-consumers: Life Simplifiers who are moving towards minimal consumerism, DeGrowth Activists, who feel that too much time is wasted on consumerism, Climate Activists, conscious of the harm that mindless consumerism could do to the environment, Sane Food Choosers, who are vegetarian to reduce the adverse impact on the animal kingdom, Conservation Activists, who would reuse and recycle rather than buy. These anti-consumers will play a major role in the revision of business models toward sustainability. (Bartels, 2021) described an approach where business models can be refined by asking the appropriate relevant questions and recognizing proposals or patterns that can resolve issues. They used

the nine blocks of the BMC and the 55 innovative business model patterns of the Business Model Navigator (BMN) to create the Business Model Matrix (BMM). (Bartels, 2021) also discussed the Business Model Dimensions (BMD), as defined by Stahler: Value Proposition; Architecture of Value Creation -Product or Service Design, Internal Value Creation, External Value Creation; Profit Model. As against the BMC and BMN, the BMM offers 108 possible answers to address 20 questions. (Bagnoli, Mas, Biancuzzi, & Massaro, 2021) quoted 50 paradoxes that need to be taken into consideration post the pandemic, using the Estimate-Feedback-Talk-Estimate (EFTE) approach. They also considered the Political-Economic-Social-Technical-Legal-Environmental (PESTLE) approach when discoursing on the paradoxes and said that the most notable impacts of the pandemic were Economic (the recession followed by the closure of business organizations), Social (Social Distancing enforced protocol, and subsequent alteration in consumer consumption patterns), Technological (Rise in the use of Digital Platforms and the Internet-of-Things (IoT)), Environmental (Environment conscious populaces altered spending habits). Some of the paradoxes that we could take into account are "Keeping what is existing vs experimenting with new solutions", "Coming back to a "new normal" vs strategic transformation", "Digital transformation vs human touch", "Short supply chains vs long supply chains", "Physical offices vs virtual offices", "Local staff vs worldwide talents", "Advertising image vs reassuring truth", "Physical stores vs e-stores", "Safety through innovation vs regulation", "Made-in" push markets vs Covid-19-pull ones", Traditional market segments vs new consumer tribe", "New necessities vs new habits", "Strengthening the culture and corporate identity vs changing to adapt to the new context". The pandemic has enhanced the vulnerability of Global Supply Chains, accelerated digital transformations, and slowed down globalization. (Harms, Alfert, Cheng, & Kraus, 2021) studied the affectations and causes of business model innovation in the gastronomy industry. They spoke about the hedging networkers emphasizing orientation, contingency, control, partnerships, avoidance of loss, and planning. (Breier, Kallmuenzer, Clauss, Gast, & Kraus, 2020) researched how business model innovation could enable a coping mechanism for the business-starved hospitality sector during the pandemic. The organization must make use of digitalization and identify its areas of business model innovations to cope with the pandemic as well as identify and implement small changes. (Gregurec, Furjan, & Tomicic-Pupek, 2021) analyzed how Small and Medium Enterprises (SMEs) were forced to reinvent their business functions, as the pandemic struck. Organizationally Driven Changes affected the KP, KA, and KR. General Social Changes affected KP and CS. Technology Driven Changes affected the VP. Customer Driven Changes affected CR, Ch, and CS. Financially Driven Changes affected the CStr and RS. (Baghiu, 2020) identified 5 business models (using Qualitative Comparative Analysis) with a potential for sustainability for success in an uncertain economy and noted observations regarding the effect of a black swan event such as the Covid-19 pandemic on the sustainability of a business model. They observed the shift in the trust system between employees and customers, the shift from on-site to remote interactions, the shift to a contactless economy, a change in the perceived value creation for customers, and a leaning towards the inclusion of stakeholders as co-creators of value. (Baghiu, 2020) recommended that organizations consider shorter supply chains and the islandization of economies (as opposed to globalization) to combine safety with efficiency. The creation of value and the customer should be at the center of the BMC and the organization should revise its mission to Profit-People-Planet. Data automation and virtual workforce mobility could be considered and the organization could attempt to reskill the employees. (Boroh, 2021) listed certain pandemic strategies for the BMC: revised customer segments and value propositions suiting the requirements of the pandemic market should fetch additional revenue, revising the key partners and key resources, optimizing the key resources so the revenue is maximized and the cost is reduced, thus rewriting the revenue streams and cost structure boxes, and updating customer segments and cost structure to factor in government help such as financing. (Alba & Dentchev, 2021) discussed the need for transdisciplinary knowledge and studies to guide sustainability in business models as complex problems are solved by scientific investigations. To redesign, revise, and develop an SBM, the following are required: engagement of respondents (such as vulnerable entrepreneurs) to overcome short sights in research, flexibility in priorities and studies while engaging in transdisciplinary studies and research, consideration of the overall social context of the entrepreneur in concern, a convergence of ideas generated from diverse theoretical approaches; an unending process of "bouncing" ideas and theories between academic and nonacademic with a continuous feedback loop. (Urmetzer, 2021) has emphasized that to achieve sustainability in business modeling (including the BMC), we need to commit to a value system that is oriented towards sustainability, create and then exploit networks and thus, access intellectual and technological resources, recognize the changing demands of consumers and suppliers, and treat information

as an important asset. A Dedicated Innovative System (DIS), made up of a team from the government, private and academic bodies, could revise business models, after having had access to necessary technological and intellectual resources. (Aagaard & Nielsen, 2021) have thrown insight into the kind of uncertainty the business models face contemporarily: geopolitical instability, climate change, and the "exogenic shock" of the onset of the pandemic. Pharmaceuticals and Fast-Moving Consumer Goods (FMCG) comprised the stable markets during the pandemic. In such exigencies, strategic partnerships can mitigate costs, especially when global supply chains are affected. The pandemic also saw increased traffic on social media and consumers airing concerns therein. Machine Learning (ML), Artificial Intelligence (AI) and Big Data algorithms should be able to decipher data from social media and guide the organization to make VP suit the requirements of the customer. Much information regarding customer wants and needs could be gathered through the Digital Word of Mouth (Digital WoM), brought in by an AI feedback loop. Feedback loops can also give data on advertiser experience and efficient infrastructure in scale. (Katsamakos & Pavlov, 2020) argue to leverage AI feedback loops to increase the resilience of the business model. (Andel, Herman, & Schramme, 2020) discuss artist-run cooperatives, providing insights into business modeling, where the offering was a music or concert performance in the entertainment sector and they mentioned the term: Commoning: which is the collective organization of material resources and intellectual assets into a common pool, thus enabling the lowering of costs. (Tageo, et al., 2020) studied the BMC of a healthcare system and realized that the BMC should be drafted after considering the perceptions of the technical expertise of a KR. He has also suggested that the BMC should indicate possible savings on cost with the help of governments. (Taipale-Erävala, Salmela, & Lampela, 2020) noted a conspicuous limitation of the BMC that it takes no note of competition. He recommended that VP be further analyzed by the VP box, as shown in Figure 4 below. Also, it would be prudent to label producers as prosumers.

Figure 4: The Value Proposition Canvas; Source: (www.peterjthomson.com, 2023)



(Elali, 2021) speaks about Strategic Agility, a management paradigm, defined by the ability of the organization to adapt, demonstrate flexibility, and cope with uncertainty. To promote strategic agility, the organization must have the right mix of resources and partners; Resources with a high level of liquidity and Partners with an understanding of the organizational commitment. (Kemell, et al., 2020) states that to attain sustainability, the BMC must include a Software Start-Up team in its Key Resources. Alternatively, it could be an additional box in the BMC. (Boston Consulting Group, 2020) emphasizes that the Cost Structure should be revised after considering, the new reality, and has recommended a "Demand Lighthouse" to spot demand trends and a "Supply Chain Cockpit" for a Supply Chain, thus suggesting affectations in the Key Partners & Key Resources Boxes. They have quoted examples of a steel player who canceled delivery of non-critical inventory through production planning, a leading FMCG organization that retained discount levels to all suppliers irrespective of purchase volumes, and an apparel brand that postponed automation plans for at least 6 months. Based on a cross-sector study, (Ritter & Pedersen, 2020) observe that though the effect of a black swan event such as the pandemic on organizations is negative, a

sustainable business model would find growth opportunities nonetheless. KR could guide the utility of idle sales time as time used to train the sales force VP must ensure that people are safeguarded and KA should be organized so that goals, rather than deadlines are met. Large projects should remain unaffected however new projects would likely be strategically postponed. (Koswara, Dhewanto, & Nugraha, 2021) describe four kinds of pivot strategies conducted after a necessary SWOT analysis to enable the turn-around of a restaurant during the pandemic. The four pivot strategies considered were: zoom-out strategy - add features to existing products and services, customer-need pivot - change the method of meeting customer needs (in this case, food was delivered instead of the customer having to come to the restaurant), engine-of-growth pivot - a strategy to add new customers, by paid promotions using social media, channel pivot - edit the channel to provide value to the customers. (Endregat & Pennink, 2021) suggest a paradoxical view in business modeling, wherein, organizations may need to continually revise their BMC as opposing goals and demands demonstrate incongruency. The elements in a Traditional Business Model (TBM) include the VP, the process of value creation, and value capture. They have also noted that the BMC should be extended to include: the VP, the supply chain, CR, and a cost-revenue financial model as CStr-RS. A sound SBM describes, analyzes, manages, and creates a company's VP, describes how the value would be created and delivered, and describes how to generate economic value while maintaining the natural, social, and economic capital beyond the organizational boundaries.

3.1.1. PANDEMIC-RELATED CONTRIBUTIONS TO THE INDIVIDUAL COMPARTMENTS OF THE BMC

Literary research articles were analyzed for inputs on the nine boxes of the BMC, and these shall be shown in tabular form below

3.1.1.1. KEY PARTNERS

Table 1: Key Partners

| An observation regarding the Pandemic Effect of BMC element | Methods of resolution of the issue, suggested by Researcher/ Cited | Source |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Global Travel Restrictions adversely affected Supply Chains | Collaborations with relevant partners on digital platforms | (Ritter & Pedersen, 2020) |
| Purchasing has shifted to online channels | Increase activity on digital platforms and revise delivery mechanisms accordingly | (Ritter & Pedersen, 2020; Arora, et al., 2020) |
| Decline in personal meetings and trade show activities, due to travel restrictions and people in organizations did not appreciate non-essential travel | Encourage virtual interaction for the demonstration of Value | (Ritter & Pedersen, 2020) |
| Traditional Marketing Media, such as billboards are not appreciated | Social Media and Influencers Social Media could be used for promotions | (Koswara, Dhewanto, & Nugraha, 2021) |
| On-site purchases are not appreciated | A shift to online delivery of products & services | (Koswara, Dhewanto, & Nugraha, 2021) |
| Travel restrictions expose the weakness in Supply Chains | Reinforce e-commerce capabilities and resort to direct-to-customer sales; Organizations could revise the delivery channel to (temporarily remove retailers) | (Fonseca & Azevedo, 2020) |
| Services (E.g.: Vehicle Repair at the site of the vehicle, Urban Company) that require the movement of the Supplier to the Consumer faced difficulty due to containment rules | Sanitize sufficiently as per government protocol and convince the customer to avail of the services | (Minondo, 2021) |

| | | |
|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Increased Consumer Spending on In House Entertainment (on OTT Platforms) | The promotions of a product or service could be beamed through the OTT platforms of entertainment | (Ho, Kim, & Yamakawa, 2020) |
| Consumers preferred not to buy FMCG and food from the unorganized sector | Emphasize the fact that the product or service is safe and had a minimal human touch | (Singhal & Mahajan, 2021) |
| Consumers prefer to buy local products from the local grocery stores | Promotional strategies must keep the customer's ethnocentric tendency in mind | (Verma & Naveen, 2021; Kohli, Timelin, Fabius, & Veranen, 2020) |
| Consumers prefer domestic brands | Promotional strategies must keep the customer's ethnocentric tendency in mind | (Verma & Naveen, 2021) |
| Consumers have shifted to digital methods in purchase behavior in an unprecedented exponential manner | The organization should, as far as possible, use digitalization to deliver value | (Kohli, Timelin, Fabius, & Veranen, 2020; Lund, Madgavkar, Mischke, & Remes, 2021) |
| Customers tend to nest at home | Delivery (remote and online) should be the norm for any organization | (Kohli, Timelin, Fabius, & Veranen, 2020; Lund, Madgavkar, Mischke, & Remes, 2021) |

3.1.1.2. *KEY ACTIVITIES***Table 2:** Key Activities

| An observation regarding the Pandemic Effect of BMC element | Methods of resolution of the issue, suggested by Researcher/ Cited | Source |
|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Purchasing has shifted to online channels | Increase activity on digital platforms | (Ritter & Pedersen, 2020; Arora, et al., 2020) |
| Customers would be wary of the spread of the virus and would not like to visit physical stores | Consider shifting to entirely contactless operations | (Diebner, Silliman, Ungerman, & Vancauwenberghe, 2020) |
| For continued sustenance, there has to be a post-pandemic business plan. It may also enable organizational resilience during the pandemic | The organization must study the behavior of various stakeholders and identify patterns and divide them into sustained, collapsed, and transformed | (Patnaik, Loret de Mola, & Bates, 2021) |

3.1.1.3. *KEY RESOURCES***Table 3:** Key Resources

| An observation regarding the Pandemic Effect of BMC element | Methods of resolution of the issue, suggested by Researcher/ Cited | Source |
|-------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------|
| Since the channels of value delivery are changed a Word-of-Mouth feedback is not possible | Create an online customer experience record system | (Koswara, Dhewanto, & Nugraha, 2021) |
| A change of the channel of value delivery to online and remote ensures a disconnect with the customer | Digital Customer Records should be maintained as an Intellectual Resource | (Koswara, Dhewanto, & Nugraha, 2021) |
| Travel restrictions expose the weakness in Supply Chains | Leverage AI to have real-time data-driven warehousing, logistics & transport | (Kudtarkar, 2020) |

| | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|----------------------------------|
| The supply chain is adversely due to the non-availability of workers who were forced to leave, following the lockdown | Utilize local delivery agents who can be contacted online | (Singhal & Mahajan, 2021) |
| Supply Chain found it difficult to deliver perishable items such as food | | |
| The presence of Customer Success Management ensures organizational efficiency, even in adversity | The organization must have an exclusive Customer Success Manager | (Eggert, Ulaga, & Gehring, 2020) |
| The incorporation of ML in Customer Relationship Management (CRM) improves organizational performance as well as the capability of the organization to cope with unforeseen emergencies as real-time data processing gives instant predictive results | Utilize ML and incorporate the same in the CRM system | (Singh, Gupta, & Agarwal, 2020) |
| Supply Chains' issues that are relevant during the pandemic: Liquidity Crunch | Maintain Liquidity and Cash-Flow Efficiency | (Ernst & Young, 2020) |
| Supply Chains' issues that are relevant during the pandemic: Labour/ Capacity underutilization | Plan for upskilling of employment | (Ernst & Young, 2020) |

3.1.1.4. *VALUE PROPOSITION***Table 4:** Value Proposition

| An observation regarding the Pandemic Effect of BMC element | Methods of resolution of the issue, suggested by Researcher/ Cited | Source |
|------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| A change of the channel of value delivery to online and remote ensures a disconnect with the customer | Ease of online and remote delivery systems | (Koswara, Dhewanto, & Nugraha, 2021) |
| In the absence of physical stores, the search for a product/ service may be cumbersome | Use digital & social media to connect with the customer, thus reducing search costs | (Sohl, Vroom, & Fitza, 2020) |
| Customers would be wary of the spread of the virus and would not like to visit physical stores | Reduce perceived risk by offering online and remote delivery of products and services | (Sohl, Vroom, & Fitza, 2020; Pillai, Ambekar, & Hudnurkar, 2020) |
| The pandemic has ensured enormous degrowth and a lack of production of products due to the lack of need for them | The organization should consider revision of product-mix to suit the requirements of the changed market | (Schaltegger, 2020) |
| Brick-and-mortar retail outlets had to be closed due to containment protocol | Retail outlets should make online deliveries | (Schaltegger, 2020) |

| | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| Tourism and hospitality sectors have been affected by maximum degrowth due to a lack of traffic due to social distancing | The organizations should introduce Virtual Tourism packages (Cyclists & runners have virtual meets; Connect tourists with native speakers of languages; Focus on home-based experiences) | (Schaltegger, 2020) |
| Services (E.g.: Vehicle Repair at the site of the vehicle, Urban Company) that require the movement of the Supplier to the Consumer faced difficulty due to containment rules | Sanitize sufficiently as per government protocol and convince the customer to avail of the services | (Minondo, 2021) |
| Purchasing power of the consumers has decreased due to the recession brought in by the pandemic. Thus customers tend to be utilitarian in their behavior patterns | Use digital media and CRM to recognize the needs of the customer and customize the offerings | (Yasa, Ekawati, & Rahmayanti, 2021; Arora, et al., 2020) |
| Consumers are more environmentally conscious and desire products & services that are ethical and environmentally safe | Redesign product-mix to incorporate environmental concerns | (Cambefort, 2020) |
| Consumers are more environmentally conscious and desire products & services that are ethical and environmentally safe | Convey the organizational commitment towards health and environmental concerns to the customers | (Cambefort, 2020; Arora, et al., 2020) |
| The pandemic has caused anti-global sentiments among consumers | Redesign product-mix to incorporate local supply chains and convey the same to the customer | (Cambefort, 2020; Arora, et al., 2020) |
| Consumers prefer green brands, fair-traded goods, and local products | Redesign product-mix to incorporate local green products | (Cambefort, 2020) |
| Consumers prefer green brands, fair-traded goods, and local products | Consider Brand Repositioning | (Gregg, Hazan, Kim, Perrey, & Spillecke, 2020) |
| Anti consumerism | Convey the organizational commitment towards organizational ethical behavior to the customers and a sense of social responsibility | (Kotler, 2020) |
| There is a shift in assortment sizes that the customers purchase | The organization must recognize the same and reorganize the assortment of products accordingly | (Kohli, Timelin, Fabius, & Veranen, 2020) |

Table 5: Cost Structure

| An observation regarding the Pandemic Effect of BMC element | Methods of resolution of the issue, suggested by Researcher/ Cited | Source |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| The pandemic has ensured enormous degrowth and a lack of production of products due to the lack of need for them | Make use of economic growth policies offered by governments, specific to the pandemic | (Schaltegger, 2020) |
| Purchasing power of the consumers has decreased due to the recession brought in by the pandemic. Thus customers tend to be utilitarian in their behavior and consumption has decreased | The costs could be revised to reduce prices but not profits | (Yasa, Ekawati, & Rahmayanti, 2021; Arora, et al., 2020) |
| Travel restrictions expose the weakness in Supply Chains | Use lean manufacturing focusing on cutting costs by producing high volumes of products with low variability | (Kudtarkar, 2020) |
| | Incorporate local suppliers and markets at a lower rate (by bargaining) | (Ivanov & Das, 2020) |
| Across the globe, bank loans for businesses have extended generosity by flexible repayment facilities, revision of interest rates, and policy decisions on loan securement | The organization should use the financial help offered by banking organizations to cope with the pandemic | (Song, Du, & Wu, 2021) |
| Supply Chains' issues that are relevant during the pandemic: Weak Demand | Use Pareto's Analysis to improve the economy of scale and the working capital requirement | (Ernst & Young, 2020) |

Table 6: Revenue Streams

| An observation regarding the Pandemic Effect of BMC element | Methods of resolution of the issue, suggested by Researcher/ Cited | Source |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------|
| Purchasing has shifted to online channels | Shift to E Invoices | (Ritter & Pedersen, 2020) |
| Traditional payment systems are not appreciated | Bring flexibility to payment systems | (Ritter & Pedersen, 2020) |
| Purchasing power of the consumers has decreased due to the recession brought in by the pandemic. Thus customers tend to be utilitarian in their behavior patterns | Certain financial products and facilities like credit could be considered | (Yasa, Ekawati, & Rahmayanti, 2021; Arora, et al., 2020) |
| | Consider flexible pricing options (such as Demand Pricing) to optimize revenue | (Gregg, Hazan, Kim, Perrey, & Spillecke, 2020) |

| | | |
|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| Customer Demands have fallen for all sectors, except Healthcare and FMCG, affecting revenue | Employ Revenue Growth Management: Size the Revenue Exposure, Shift to e mode, Make customers a part of the system, Plan Revenue with small Stock Keeping Units (SKUs) | (Land, Lyn, Murphy, Reynders, & Saa-Seoane, 2020) |
|---------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|

3.1.1.7. CUSTOMER RELATIONSHIPS

Table 7: Customer Relationships

| An observation regarding the Pandemic Effect of BMC element | Methods of resolution of the issue, suggested by Researcher/ Cited | Source |
|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Customer Demands have fallen for all sectors, except Healthcare and FMCG | In customer communications, connect with the customer to dispel fears related to purchasing that may have risen from the pandemic | (Ritter & Pedersen, 2020; Arora, et al., 2020) |
| Existing customers need to connect more. New customers are difficult to find | Connect as much as possible with existent customers in a way in which they want it | (Ritter & Pedersen, 2020) |
| The connection with the customer was disrupted due to containment rules | The connection with the customer can be retained by investment in digital technology and social media tools | (Ahmed, 2021) |
| The connection with the customer was disrupted due to containment rules | The organization must invest in a CRM system | (Yasa, Ekawati, & Rahmayanti, 2021; Arora, et al., 2020) |
| Middle-class consumers invested in high-speed internet, and smart gadgets to enable video conferencing | Leverage the engagement in digital hardware and digital platforms to connect with the customer | (Sharma, 2020) |
| Consumers shifted brands for various reasons related to a minimalistic attitude toward purchases | Retain customers by connecting adequately with them | (Sharma, 2020) |
| Some consumers have distanced themselves from brands that failed to act ethically during the pandemic | Convey the organizational commitment towards organizational ethical behavior to the customers and a sense of social responsibility | (Sharma, 2020; Diebner, Silliman, Ungerman, & Vancauwenberghe, 2020) |
| Customers are increasingly sensitive toward the behavior of the organization | Develop a sense of trust and belonging in the customer | (Diebner, Silliman, Ungerman, & Vancauwenberghe, 2020) |
| Customers prefer to be associated with organizations that are committed to employee well being | Convey the organizational commitment towards organizational ethical behavior to the employees | (Diebner, Silliman, Ungerman, & Vancauwenberghe, 2020) |
| Consumers shifted brands for various reasons related to a minimalistic attitude toward purchases | Maintain real-time customer data to note changing customer preferences; Use an efficient CRM | (Diebner, Silliman, Ungerman, & Vancauwenberghe, 2020) |

| | | |
|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Consumers spend increased time on Social Media | Connect with the consumer mostly through Social Media | (Chauhan & Shah, 2020) |
| Anti consumerism | Convey the organizational commitment towards organizational ethical behavior to the customers and a sense of social responsibility | (Kotler, 2020) |
| A high level of Customer Concentration is desirable to enable the organization to focus on coping with the pandemic | Retain the loyal customers | (Chen, Liu, Liu, & Fang, 2021) |
| Customers tend to stay with an organization if it addresses their Covid-19 concerns | Connect with the customers and enquire about their pandemic-related status and if there is a way the organization could help | (Brady, Miller, & Balmuth, 2020) |
| Consumers have shifted to digital methods in purchase behavior in an unprecedented exponential manner | The connection with the consumer should be as much digital as possible | (Kohli, Timelin, Fabius, & Veranen, 2020) |
| Supply Chains' issues that are relevant during the pandemic: Workforce Health | Track and monitor the health status of all stakeholders | (Ernst & Young, 2020) |

3.1.1.8. CUSTOMER SEGMENTS

Table 8: Customer Segments

| An observation regarding the Pandemic Effect of BMC element | Methods of resolution of the issue, suggested by Researcher/ Cited | Source |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Customer Demands have fallen for all sectors, except Healthcare and FMCG | Segment customers repeatedly, as demand fluctuates to map the utilitarian and hedonistic segments | (Ritter & Pedersen, 2020; Arora, et al., 2020) |
| Existing customers need to connect more. New customers are difficult to find | Segment customers based on the length of their association with the organization | (Ritter & Pedersen, 2020) |
| A new customer segment is formed by those who Work-From-Home (WFH) | Digital Customer Records should identify the WFH individuals. This is the new Niche Market | (Koswara, Dhewanto, & Nugraha, 2021; Lund, Madgavkar, Mischke, & Remes, 2021) |
| Purchasing power of the consumers has decreased due to the recession brought in by the pandemic. Thus customers tend to be utilitarian in their behavior patterns | Repeat customer segmentation and redefine the identified segments for the new context | (Yasa, Ekawati, & Rahmayanti, 2021) |
| The shift of consumer sentiment from a materialistic to a minimalistic approach | | (Cambefort, 2020) |
| Consumers have shifted from materialism to spiritualism and prefer to spend only on green essentials | | (Katiyar, 2021) |
| Anti consumerism | | (Kotler, 2020) |

| | | |
|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------------|
| A high level of Customer Concentration is desirable to enable the organization to focus on coping with the pandemic | Segment customers based on their contribution to organizational revenue | (Chen, Liu, Liu, & Fang, 2021) |
|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------------|

3.1.1.9. CHANNELS

Table 9: Channels

| An observation regarding the Pandemic Effect of BMC element | Methods of resolution of the issue, suggested by Researcher/ Cited | Source |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| Global Travel Restrictions adversely affected Supply Chains | Collaborations with relevant partners on digital platforms | (Ritter & Pedersen, 2020) |
| Purchasing has shifted to online channels | Increase activity on digital platforms and revise delivery mechanisms accordingly | (Ritter & Pedersen, 2020; Arora, et al., 2020) |
| Decline in personal meetings and trade show activities, due to travel restrictions and people in organizations did not appreciate non-essential travel | Encourage virtual interaction for the demonstration of Value | (Ritter & Pedersen, 2020) |
| Traditional Marketing Media, such as billboards are not appreciated | Social Media and Influencers Social Media could be used for promotions | (Koswara, Dhewanto, & Nugraha, 2021) |
| On-site purchases are not appreciated | A shift to online delivery of products & services | (Koswara, Dhewanto, & Nugraha, 2021) |
| Travel restrictions expose the weakness in Supply Chains | Reinforce e-commerce capabilities and resort to direct-to-customer sales; Organizations could revise the delivery channel to (temporarily remove retailers) | (Fonseca & Azevedo, 2020) |
| Services (E.g.: Vehicle Repair at the site of the vehicle, Urban Company) that require the movement of the Supplier to the Consumer faced difficulty due to containment rules | Sanitize sufficiently as per government protocol and convince the customer to avail of the services | (Minondo, 2021) |
| Increased Consumer Spending on In House Entertainment (on OTT Platforms) | The promotions of a product or service could be beamed through the OTT platforms of entertainment | (Ho, Kim, & Yamakawa, 2020) |
| Consumers preferred not to buy FMCG and food from the unorganized sector | Emphasize the fact that the product or service is safe and had a minimum human touch | (Singhal & Mahajan, 2021) |
| Consumers prefer to buy local products from the local grocery stores | Promotional strategies must keep the customer's ethnocentric tendency in mind | (Verma & Naveen, 2021; Kohli, Timelin, Fabius, & Veranen, 2020) |
| Consumers prefer domestic brands | Promotional strategies must keep the customer's ethnocentric tendency in mind | (Verma & Naveen, 2021) |

| | | |
|-------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Consumers have shifted to digital methods in purchase behavior in an unprecedented exponential manner | The organization should, as far as possible, use digitalization to deliver value | (Kohli, Timelin, Fabius, & Veranen, 2020; Lund, Madgavkar, Mischke, & Remes, 2021) |
| Customers tend to nest at home | Delivery (remote and online) should be the norm for any organization | (Kohli, Timelin, Fabius, & Veranen, 2020; Lund, Madgavkar, Mischke, & Remes, 2021) |

4. Findings And Conclusions

The initial part of the research explored the applications of a set of innovations to the BMC, in its generality, imparting necessary resilience during a pandemic (and other such black swan events). Before positioning any innovation, the organization must: observe the "Status Quo" and the routinized system. It may be noted that Value Creation and Value Capture are always at the center of any business model, especially the BMC. The organization should identify its anti-consumers. Trans-disciplinary research and a SWOT would enable us to ascertain the drivers of changes, apart from a PESTLE analysis of the environment. The social changes would affect the KP and the CS, thus affecting marketing competency, as also the technologically driven change that affects VP and customer-driven changes affecting CS, Ch. Besides, the revision in any SBM such as the BMC must consider a holistic view of the organizational process as a contributor to environmental and social value as well as economic value. An idea of the revisions required to the BMC is shown in the chart in Figure 5 and the pandemic-related contributions to the individual elements of the BMC are listed in Figure 6. An organization that would like to revise its BMC in the face of the pandemic must: gather information from all stakeholders using various feedback mechanisms such as AI loops and use the information to form a dependable value system (VP), explore KP to mitigate costs, use commoning for KR while also noting its technical expertise and revise CS. BMC should be revised on a continued basis and there needs to be an emphasis on goals rather than deadlines. In a black swan event, during the revision of the BMC, the organization may also realize the need to pivot one or more of its functional areas.

Figure 5: Features of the Pandemic- BMC (Imparting Resilience to the BMC)

| | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Key Partners: Find out how the existent suppliers/ vendors/ supply chain is affected Have digital connect with supply chains Try to connect with local supply chains who deliver quality | Key Activities: Should be oriented towards: 1) Remote/ Online work 2) Data Automation to drive insights on customers and suppliers 3) Design processes that spell safety Key Resources Have access to data automation, AI, ML, Big Data Analytics in order to analyze data on purchases and supply chains; Physical, Intellectual and HR assets Software StartUp | Value Proposition: e Commerce orientation Products and services available online or remotely Customers should be co creators of value Should hint beyond the generation of economic value, towards social and environmental well being | Customer Relationships: The connect with the customer should be virtual During the connect, the organization must emphasize its commitment to safeguard society Channels: The promotionals regarding the offerings should be on digital and social media Sale should be online and e Commerce based | Customer Segments: Re Segment customers based on inputs from data analysis; Know your customers who are digitally proficient and are able to connect with you virtually |
| Cost Structure: Try to use government policies on loans and taxes made to ease difficulties during the pandemic and incorporate the same in the costing | | Revenue Streams: Revise payment systems to digital | | |

Figure 6: Contents of the 9 boxes of the Pandemic-BMC (Imparting Agility to the BMC)

| | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Key Partners: Collaborate on digital platform Local suppliers Diversify suppliers Track and Monitor Health Status | Key Activities: Increase activity on digital platforms Contact-less operations A study of the behaviour of stake-holders and identify patterns Key Resources Online Feedback System, AI, Local Delivery Sourcing, ML, CRM, Customer Success Manager, Liquidity & Cash-in-hand | Value Proposition: Ease of online delivery system Revise product mix to suit the changed market Customize offerings, after noting needs with digital media Ensure hygiene in onsite shopping experiences Convey organizational commitment towards health through offerings Re organize assortments | Customer Relationships: Connect Digitally Reward & retain loyalty Note changing preferences Ask about pandemic status Channels: Use of digital media, virtual platforms, social media for promotions Online, remote and contact-less delivery Ethnocentric tendency (nationalist attitudes): ensuring local delivery channels | Customer Segments: Segment customers repeatedly Identify Work-From-Home individuals Segment customers based on their contribution to organizational revenue, length of association with the organization |
| Cost Structure: Utilize economic growth policies, adopt lean manufacturing, introduce economy of scale or scope | | | Revenue Streams: E Invoices; Flexibility in customer payment systems; Flexible pricing options to optimize revenue | |

5. Implications

There lies a difference between risk and uncertainty: The probability of risk has a defined distribution but the probability of uncertainty cannot fit into a pattern. The pandemic, which falls in the category of "uncertainty" saw global supply chain disruptions, an acceleration in the use of digital technology and altered consumer demands, and a marked change in the environment. Such a crisis or a black swan event is almost always unprecedented, and thus are outside the scope of conventional contingency planning. The BMC, with black swan event centric revisions, will serve as a guide to business organizations to document or reengineer their operations, in the face of adversity. It could also be extrapolated to various affected sectors and organizations.

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