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Evaluating customer orientation in e-commerce: an organization focused technology assessment*

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ABSTRACT

This research focuses on designing a new maturity model to evaluate and plan an organization's customer-centricity. The Hierarchical Decision Model (HDM) is used as the primary methodology to quantify impacting factors and intensity of influence on the ultimate outcome. To demonstrate the proposed model in the real world, a case study is performed in the e-commerce industry, especially B2C online retailer organizations. This research tackles the scarcity of documentation on creating maturity models that are widely accepted and sustainable, demonstrating the innovative use of the HDM methodology. In summary, the study successfully achieves its overarching objective of crafting a comprehensive model for assessing organizational maturity in the customer-centric approach, encouraging the widespread adoption of the proposed methodology across diverse sectors. This study endeavors to introduce an innovative approach for assessing an organization's customer-centricity, incorporating both product and service deliverables, specifically referred to as Product-Service Systems (PSS). The primary objective of this research is to formulate a novel maturity model, enabling organizations to 1) assess their degree of customer-centricity and 2) receive actionable recommendations aimed at enhancing customer orientation and elevating their customer-centricity maturity level..

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Introduction

Customers demand closer relationships and higher investment between partners, as well as cooperation between companies to build supporting technologies for their unique needs (Reibstein and Wittink 2005). The undeniable impact of Artificial Intelligence (AI) and the Internet of Things (IoT) on the value proposition and offerings of firms drive many strategic initiatives in organizations to design solutions that integrate products and services. The customer expectations and behaviours have changed dramatically over the past decade. Organizations are expected to meet customers' needs and expectations at every interaction in return for customer loyalty. The ability to deliver such a flexible solution depends on how customer-centricity is embedded within every person in the business (Bustan et al. 2008). Drucker (1954) wrote in his book, *The Practice of Management*, that 'it is the customer who determines what a business is, what it produces, and whether it will prosper.' Customer-centricity is defined as interaction with the customer through various touchpoints,

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and then aggregating these relationships to create a position for the customer. Each customer has a different need and expectation from the provider or seller, and companies need to be flexible enough to fulfil their needs (Galbraith 2011). One of the reasons organizations invest less in customer experience is that they believe they are already customer-centric organizations (Galbraith 2011). It is important to understand that to create loyal customers and to keep them over the long term, organizations need to build capabilities to be more flexible and agile to provide the unique needs of the customers.

In the twenty-first century, successful companies follow and build customer-centric capabilities to serve their customers better experiences (Galbraith 2011). The products' quality has reached a certain level of saturation in various product lines, and close competition makes the profit margin smaller and smaller every day. Selling products or services without focusing on customer experience and customers' real needs shrinks the companies' profit tremendously (Galbraith 2011). Long-term relationships between providers/sellers and customers are a competitive advantage that is not easy to duplicate, understand, and implement for competitors (Reibstein and Wittink 2005). Gartner predicts that by the year 2020, poor customer experience will destroy 30% of digital businesses in organizations (Is Your Organization Customer Centric? – Smarter With Gartner 2019).

Any customer value can be defined as a sum of product value and service value. The percentage of service value to total customer value is growing (Reim, Parida, and Örtqvist 2015). This creates complexity for the organizations that provide these services and the organizations that develop the products. The two must be aligned to deliver customer value. This co-dependency and integration are critical in emerging technology development (Kamp and Parry 2017; Baines et al. 2017; Coreynen, Matthyssens, and Van Bockhaven 2017; Opresnik and Taisch 2015). In this decade, the companies are challenged by competitors' products and their capability to deliver reliable and robust services. The designers and strategists of Product-Service Systems (PSS) dive into the products' ecosystem with inherently embedded services that exponentially increase the complexity of such systems. In most designs, the Products are the centrepiece, and Services are sub-sided and not efficiently designed or integrated (Cavalieri 2012).

Moreover, the dynamics of customer interaction are changing drastically. The results of a consulting company (Five examples of customer-centric companies – Econsultancy n.d) survey show that 80% of the global population will have access to mobile technologies, and 60% of those will be smartphones or low-cost tablets. There would be 50 billion connected devices globally by 2020, with mobile being their primary Internet connection channel for individuals. More than 60% of the operation leaders believe that customer behaviour will have a disruptive effect on their organization in the next five years. Almost two out of three of responders in the same group state that understanding the customer value drivers are already a challenge for their organization. Just one out of four of the survey responders confirm that their operational capabilities are built to deliver customer value and distinctive experience as of today and over the next three years (PwC n.d).

Literature review

Customer-centricity is defined as interaction with the customer through various touchpoints, and then aggregating these relations to build a position for the customer (Galbraith 2011). Zeithaml, Berry, and Parasuraman (1996) defines customer loyalty simply as 'a consumer's intent to stay with an organization.' The customer commits to purchase more and various products from the same company, and to interact positively toward creating more success for the firm through different tools such as recommending them to other customers (Galbraith 2011). Long-term relationships lead to an increase in client confidence about what they can expect to receive from the firm (Gwinner, Gremler, and Bitner 1998). Different studies reveal that existing loyal customers are the most profitable ones (Reichheld 1996; Seybold and Marshak 1998).

Various studies conducted in-depth research on the main barriers to the transition from product-centric to customer-centric approaches in organizations. The critical success factors and dynamics of internal and external elements that were identified, reviewed, and proposed in current research were

based on the product-centric approaches in organizations and the lack of in-depth analysis of customer centricity approach impact (Reibstein and Wittink 2005; PwC n.d; Shah et al. 2006; Galbraith 2011; Is Your Organization Customer Centric? – Smarter With Gartner 2019; Capgemini 2017; von Wangenheim et al. 2010; Salviano et al. 2009; Maier, Moultrie, and Clarkson 2009).

In other words, the customer commits to purchase more and various products from the same company, and to interact positively toward creating more success for the firm through different tools such as recommending them to other customers (Galbraith 2011). More recently, scholars have begun to consider the importance of managing a firm's customer portfolio as the nature of customer-firm relationships changes (Bell, Auh, and Smalley 2005). The customer relationship has a massive impact on how much an organization can attract investors. Seybold May (2001) believes that the sum of values of a customer relationship is a sign for investors. A customer-centric organization understands the customer's needs and develops capabilities within the company to cover those needs. For instance, a company with a high focus on customer satisfaction uses the expectation of the customer to create products and services that deliver specific value to the customer (Galbraith 2011).

Long term relationships between providers and customers is a competitive advantage that is not easy to duplicate, understand, and implement for competitors (Reibstein and Wittink 2005; Day 2000). This makes customer-centricity a significant competitive advantage that prevents other organizations from entering a specific market or consumers from moving from one company to another. With all the benefits that customer-centricity delivers, it may seem evident that firms would adopt it as soon as they understand the long-term value of such an approach. However, there are multiple challenges with implementing customer-centricity in organizations that prevent an organization's expeditious and effortless evolution from product-centric to customer-centric.

The customers interact with the firms through numerous channels, from brick-and-mortar stores, to online shopping, to social network reviews. The customer journey begins even before they enter the local store or log on to the shopping website, which is a massive change for the companies to cope with. These changes require the firms to take a new initiative to capture, analyse, and deploy the customer requirements and needs, and to provide them with a proper solution, which in most cases is the result of merging different business units and even with external partners (Lemon 2016). The integration of the business functions includes, but is not limited to, marketing, human resources, logistics, IT, and service operations. This integration would also involve the external providers and partners. All of these efforts are undertaken for the design, creation, and delivery of a positive customer experience. Therefore, the firms' level of complexity to contain all these changes has increased tremendously (Edelman and Singer 2015; Rawson, Duncan, and Jones 2013), and they need new tools and processes to adopt this enormous change. The researchers' main focus has been on identifying the customer-company touchpoints and the measurement of experience that is delivered to them through each of these channels (Brakus, Schmitt, and Zarantonello 2009; Puccinelli et al. 2009; Verhoef et al. 2009). And only a handful of empirical work exists in the literature that directly addresses the customer experience and customer journey (Lemon 2016).

Schmitt et al. (Brakus, Schmitt, and Zarantonello 2009) state that every interaction between customer and firm regarding the services result in new customer experiences. This is a very broad definition that includes any customer experience regardless of their nature. It includes all the cognitive, emotional, sensory, social, and spiritual responses to customer and company interaction (Verhoef et al. 2009; Bolton et al. 2014; Gentile, Spiller, and Noci 2007). In an almost similar grouping, Schmitt categorises the customer experiences into sensory (sense), affective (feel), cognitive (think), physical (act), and social-identity (relate) experiences (Schmitt 1999). Verhoef et al. (2009) define customer experience as a holistic nature that involves all of the customer's cognitive, affective, emotional, social, and physical experiences in response to retailer services and products. The table below shows a summarised view of the literature on customer-centricity and maturity models. Brand experience is studied in another research by Brakus, Schmitt, and Zarantonello (2009), which is viewed as a subjective and internal response of the customer to the firm's stimuli. The reactions include all the sensations, feelings, cognitions, and behavioural responses to the brand design. McCarthy and Wright

(2004) suggest four categories of sensual, emotional, compositional, and spatial-temporal as ‘four threads of experience,’ which let us conceptualise the technology as experience.

Google Trend reveals that the ‘Customer Experience’ keyword search has surged almost 400% during the last decade in Business & Industrial Categories. (Search results between March 2010 and April 2019) (Google Trends [n.d.](#)). Some researchers focus on the customer experiences with technology (McCarthy and Wright [2004](#)), and some others research a brand aspect of the offerings (Brakus, Schmitt, and Zarantonello [2009](#)), but overall there is consensus in the academia and industry that customer experience is a multidimensional concept that involves cognitive, emotional, behavioural, sensory, and social components (Schmitt [1999](#); Verhoef et al. [2009](#)). To define customer-centricity, describing the differences with close concepts is beneficial.

The customer expectation has escalated over the last few years. The customers expect organizations to understand and deliver features, products, or services that are not explicitly requested. They anticipate the proactive involvement of the seller to understand their customers’ future needs and requirements (Blocker et al. [2011](#)). The main challenge that organizations face is moving away from existing product-centric approaches, and delivering what customers are demanding. To achieve this goal, firms need to build new capabilities and processes in the organization (Reibstein and Wittink [2005](#)).

Researchers believe that the research community must explore barriers and issues related to customer-centricity in organizations, and to suggest new insights to practitioners and organizations. Shah et al. ([2006](#)) demand the researchers conduct in-depth research on customer-centric organizations’ 4 main barriers: Culture, Processes, Structure, and financial metrics. Re-organizing a firm around the customer is burdensome for the organizations that have succeeded by using product-driven approaches for many years. They need to have concrete evidence for this approach’s weaknesses and how they can move away from them (Shah et al. [2006](#)). Croteau and Li state customer focus is returning to organizations due to the emergence of electronic business, organizational dynamics, and cultural changes (Croteau and Li [2009](#)). To achieve this goal, firms need to build new capabilities and processes in the organization (Reibstein and Wittink [2005](#)). The main challenge in building an enhanced customer experience is that organizations are mostly designed based on business units, functions, and geographical distribution rather than customer segments and needs (Galbraith [2011](#)). One of the reasons organizations invest less in customer experience is that they believe they are already customer-centric (Galbraith [2011](#)).

Current customer-centric maturity models focus mostly on engineering capabilities, strategic planning, and project management. Customer-centricity was not directly considered in the evaluation models. The existing maturity models do not address the measurement of customer-centric maturity level in organizations from a multi-dimensional perspective (von Wangenheim et al. [2010](#); Salviano et al. [2009](#); Röglinger, Pöppelbuß, and Becker [2012](#); de Bruin et al. [2005](#); Scott [2007](#); Gottschalk [2009](#); Shah et al. [2006](#)). After the 2000s, retailing shifted heavily to online and digital transactions, which resulted in more personalised online offerings and marketing approaches, which caused a benefit to both companies and consumers. Most research focus is on the qualitative factors (e.g. CFSs) in achieving a customer-centricity approach in organizations. However, they failed to propose quantitative methods to evaluate the organizations’ maturity models or provide quantified analysis and assessment of the organization’s current and future state concerning customer-centricity approaches (Shah et al. [2006](#); Is Your Organization Customer Centric? – Smarter With Gartner [2019](#); Raber, Winter, and Wortmann [2012](#); Rae, Alexander, and McDermid [2014](#); Lahrmann and Marx [2010](#); Welte and Yukler [1981](#); Jacobs and Trienekens [2002](#)).

This research is defined based on the gaps where we emphasise that is mandatory to move from product centricity to customer centricity. Since, there is a lack of knowledge in quantifying the organization’s customer-centricity through maturity levels and developing a model to provide a guideline to drive an organization from a product-centric approach to a customer-centric approach. It contributes to the technology management body of knowledge by covering this gap and proposing a novel quantitative method to assess customer-centricity maturity. Besides, this research

improves our perception of this discipline and highlights the dynamics of the internal and external factors impacting customer orientation projects in technology management academic research. On the practical and business level, this research's outcomes offer a quantitative tool and step-by-step framework for evaluating the organizational maturity levels and recommendations of the improvements to develop new capabilities. Most challenges in customer-centricity arise from the fact that organizations begin focusing on customer-centricity after a product or service is launched to market. The customer-centricity embeds the customer-centric approach in all products and services from roadmapping and design stages. Therefore, the technology management role becomes critical since all products or services (from Technology assessment and roadmapping to product/service innovation) need to have intrinsic customer orientation. The product-centric organizations ignore the role of customer-centricity in their technology management practices, and this research intends to cover this gap in academia and industry.

Methodology and results

The Hierarchical Decision Model (HDM), developed by Kocaoglu (1983) is a decision-making tool that ranks the alternatives and evaluates those choices to distinguish the best among them (Munkongsujarit et al. 2009). HDM uses a hierarchical disposition model to visually illustrate the impact of perspectives, criteria, and sub-criteria on the ultimate objective (Chen, & D, and Kocaoglu 2008), (Mahmood 2011). HDM is used frequently to capture complex and multi-criteria problems in academia and industry. The method provides a mechanism to illustrate the relationship between different perspectives, criteria, and ultimately decision model factors (Phan 2013). It allows the researcher to collect the subject matter experts' feedback and to build a quantitative model based on a pair-wise comparison of the impacting factors. The relative weight of the factors represents the importance of the factor in decision making and the level of impact in selecting between alternatives (Saaty 2001).

The following tables explain the elements of the model that were derived from the literature (Table 1).

Technology/data perspective

This perspective focuses on technology infrastructure, digital, and data capabilities, which empower the organization to embrace the uncertainty, needs, and flexibility needed for an customer-centric organization (Table 2).

The category of factors related to infrastructure, technology, and data instruments is utilised to deliver, facilitate, or enhance the customer experience. Here are the definitions of each criterion categorised under Technology/Data Perspective:

Customer perspective

This perspective assesses the impact of customers on the organization. It focuses on the awareness (Table 3).

Organization perspective

This perspective is about how different aspects of an organization influence the customer-centricity approach, and what needs to be considered on the organizational level to move away from a product-centric approach. This includes all corporate assets, inputs, resources, culture, and capabilities facilitating the transition from product centricity to customer-centricity (Table 4). Here are the definitions of each criterion categorised under Organization Perspective:

Table 1. Perspectives.

Perspective	Description	References
Technology/ Data	Technology infrastructure, digital and data capabilities empower the organization to embrace the uncertainty, needs, and flexibility needed for a customer-centric organization	(Sohrabi, Haghighi, and Khanlari 2010; Gurău, Ranchhod, and Hackney 2003; Gurău and Ranchhod 2002; Lemon 2016; Bolton et al. 2018; McColl-Kennedy et al. 2019; Roberts and Grover 2012; Shrivastava 2017; Zhu 2004; Brombacher et al. 2012; Grewal, Levy, and Kumar 2009; Spiess et al. 2014; Holmlund et al. 2020; Luczak, Gill, and Sander 2007; Mulvenna, Anand, and Büchner 2000)
Organization	This perspective evaluates various aspects of an organization influencing the customer-centricity approach, and what needs to be considered on the organizational level to move away from a product-centric approach.	(Seybold May 2001; Sohrabi, Haghighi, and Khanlari 2010; Gurău, Ranchhod, and Hackney 2003; Gurău and Ranchhod 2002; Rawson, Duncan, and Jones 2013; Zhu 2004; Rodrigues da Costa and Maria Correia Loureiro 2019; Chesbrough 2011)
Customer	This perspective assesses the impact of customer-centric approaches on the customers. The organizations' staff are stakeholders who directly affect customer experience delivery or decision-making regarding customer-centricity approaches.	(Gurău and Ranchhod 2002; Wiese 2013; Rawson, Duncan, and Jones 2013; McColl-Kennedy et al. 2019; Spiess et al. 2014; Anderson, Fornell, and Mazvancheryl 2004; Majra et al. 2016; Chesbrough 2011; Gruca and Rego 2005; Mithas, Krishnan, and Fornell 2005)
Policy	Organizational accountability regarding the collection, management, and utilisation of customer information, impacts customer-centric approach adoption success	(Chang and Chen 2009; Martin, Borah, and Palmatier 2017; Steel and Fowler 2010)

Policy perspective

In this perspective, organizational accountability in the collection, management, and utilisation of customer information impacts an organization's success in customer-centric approach adoption (Table 5). The perspective focuses on regulatory entities and governing bodies' rules, laws, standard audits, and compliance requirements to protect the stakeholders' assets and rights. Here are the definitions of each criterion categorised under Policy Perspective:

Twenty five experts were selected based on their background as in other HDM studies (Estep, Daim, and Shaygan 2021; Gibson, Daim, and Dabic 2019; Abotah n.d.; Iskin and Daim 2016; Phan 2013; Abbas 2016), our research included eight panels to validate and quantifying our model: 2 for validating the perspectives and criteria, five for quantifying the perspectives and each criteria group and final one for quantifying the desirability curves. Desirability curves presented in the Appendix 1 are used to reflect and calculate the final values. Figure 1 present the final quantified model.

The customer-centricity score is determined by the sum product of the perspective, criteria weights, and desirability values. The mathematical expression for calculating the customer-centricity

Table 2. Technology/data perspective.

Criterion	Details	References
Technology Infrastructure and Integration	Developing the key internal technology platforms for customer-centricity.	(Bolton et al. 2018; Roberts and Grover 2012; Shrivastava 2017)
Data Distribution and Accessibility	Data easily is accessible by the relevant users, and it is distributed freely in the organization	(Puccinelli et al. 2009; Zhu 2004; Brombacher et al. 2012)
Data Collection Robustness	Level of robustness in data collection methods impacted by depth and reliability of the information	(Lemon 2016; Puccinelli et al. 2009; Zhu 2004; Brombacher et al. 2012; Spiess et al. 2014)
Data Metrics Clarity	Clearly defined metrics and measures for evaluating the needs and requests of the customer	(McColl-Kennedy et al. 2019; Zhu 2004; Brombacher et al. 2012; Grewal, Levy, and Kumar 2009)
Data Analytics Capabilities	Access to insightful and actionable information enabled by advanced analytics	(Puccinelli et al. 2009; Zhu 2004; Brombacher et al. 2012; Holmlund et al. 2020)

Table 3. Customer perspective.

Criterion	Details	References
Awareness and Training	Level of familiarity of the customer with products, services, and organization	(Lemon 2016; Majra et al. 2016; Mulder 2001)
Satisfaction	Level of satisfaction of the customer regarding the products and services	(Anderson, Fornell, and Mazvancheryl 2004; Chesbrough 2011; Gruca and Rego 2005; Dimitriades 2006; Hallowell 1996; Mithas, Krishnan, and Fornell 2005; Rawson, Duncan, and Jones 2013)
Expectation	Level of the fulfillment of expectations of customers with the products and services	(McColl-Kennedy et al. 2019; Dimitriades 2006; Hallowell 1996; Spiess et al. 2014)
Loyalty and commitment	Probability of recurring purchases by the customer and referring the products, services, or organization to other prospect customers	(Anderson, Fornell, and Mazvancheryl 2004; Srivastava and Kaul 2016; Chang and Chen 2009; Hallowell 1996; Kangu et al. 2017)

score is presented below:

$$S_{CC} = \sum_{i=1}^m \sum_{j=1}^n (P_j)(C_{ij})(D_{ij})$$

where

S_{CC} is the Customer-centricity Score

P_j is the relative value of perspective j with respect to Customer-centricity Score

where $j = 1, 2, \dots, n$

C_{ij} is the relative value of criteria i under perspective j with respect to Customer-centricity Score

where $j = 1, 2, \dots, n$ AND $i = 1, 2, \dots, m$

D_{ij} is the Desirability value of criteria i under perspective j

where $j = 1, 2, \dots, n$ AND $i = 1, 2, \dots, m$

The Perspective and Criteria weights, as well as Desirability values, were determined by judgment quantifications from the experts. They were used as input to calculate the overall customer-centricity score. The final quantified is provided in Figure 1.

Table 4. Organization perspective.

Criterion	Details	References
Process Robustness	Possession of robust processes	(Zhu 2004; Kandampully, Zhang, and Jaakkola 2018; Rawson, Duncan, and Jones 2013; Jain, Aagja, and Bagdare 2017; Kranzbühler et al. 2018)
Organizational Structure	How the organization builds interdisciplinary teams and the level of flexibility and adaptability to re-organize and embrace uncertainty	(Tallon, Kraemer, and Gurbaxani 2000; Anderson, Fornell, and Mazvancheryl 2004)
Cultural Strength	Strong, sustainable, scalable organizational culture aligned with customer needs a common definition of customer-centricity, clarity and comprehensive communication and a willingness to change	(Tallon, Kraemer, and Gurbaxani 2000; Chen, & D, and Kocaoglu 2016; Rawson, Duncan, and Jones 2013)
Strategy Focus	Customer experience driven product and service roadmaps, and customer data-driven product and service design	(Anderson, Fornell, and Mazvancheryl 2004; Chesbrough 2011)
Staff Expertise	Technical and inter-personal skillsets, and the attitude toward change and flexibility in processes	(Rodrigues da Costa and Maria Correia Loureiro 2019; Kumar and Pansari 2016; Kandampully, Zhang, and Jaakkola 2018)
Leadership Support	Leadership support and sponsorship of change management	(Kumar and Pansari 2016; Gentile, Spiller, and Noci 2007; Tallon, Kraemer, and Gurbaxani 2000; Anderson, Fornell, and Mazvancheryl 2004)

Table 5. Policy perspective.

Criterion	Details	References
Data Privacy Compliance	Compliance with local, regional, and global customer information privacy requirements	(Martin, Borah, and Palmatier 2017; Palmatier and Martin 2019; Martin and Murphy 2017)
Data Security Compliance	Compliance with local, regional, and global customer information security requirements	(Chang and Chen 2009; Martin, Borah, and Palmatier 2017; Palmatier and Martin 2019; Steel and Fowler 2010)
Data Ownership	Level of freedom in the organization for distributing data and analytics collected and generated by the organization	(Palmatier and Martin 2019; Steel and Fowler 2010)
Data Governance	The management of the availability, usability, integrity of data by the organization	(Martin, Borah, and Palmatier 2017; Palmatier and Martin 2019)

Application of the model

The first company, in Case Study, is an SME in the store security products and solutions, which run multiple e-commerce websites to offer their products to the customers. The company was established more than 40 years ago, and the main customers are large electronic businesses that need to secure their devices in the store. The core technologies used in the security devices position them among the top 10 providers in this area. Besides products, this company provides complementary services, which in recent years streamed more or equal levels of revenue compared to product design and manufacturing. The second company in Case Study is a public company in the food and beverage industry. This is a fast-growing company with stores in different United States cities. They also have multiple e-commerce retailer websites, which offer the products of this company.

The case application details are provided in Appendix 2.

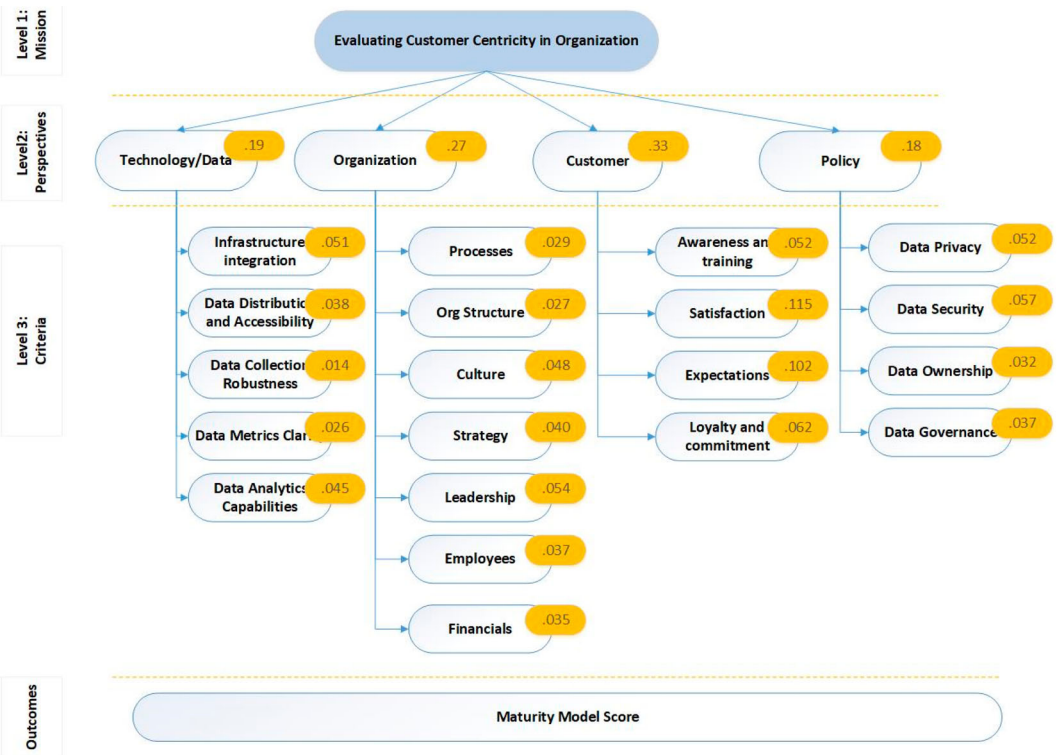


Figure 1. Final HDM model.

Score improvement recommendations

In this section, the researchers provide recommendations to improve the customer-centricity approach in companies C1 and C2 according to the calculated customer-centricity scores.

The case study analysis shows that the customer-centricity score of companies C1 and C2 are 45.2% and 73.2%, respectively. For both companies, there are many opportunities to improve customer-centricity. In the following section, a few of the gaps and improvement opportunities are discussed for each company separately.

Company C1

Company C1 got the lowest score in Data Collection robustness and Data Governance criteria. The organization needs to cover the gaps in data collection methods and design solid processes for data collection, which impacts directly on the metrics clarity and data analytics criteria, and would pull those scores up as well. In addition, the practices and procedures for data governance need to be revised and upgraded since it impacts the data ownership and data privacy at this organization.

For improving the scores under the Organization perspective, the company needs to address two main issues. The focus of the strategy efforts needs to be on customer-centric initiatives, and the employees need to be trained in customer relationship management. Overall, since the company is benefiting from leadership support from customer-oriented approaches, the strategy focus change can be managed smoother.

Finally, Company C1 needs to invest more in customer awareness and training since it directly impacts the expectations and loyalty of current and future customers.

Company C2

Company C2 got the lowest scores in Data Governance and strategy focus criteria. This organization can improve its customer centricity score easily by consolidating the strategy focuses. Although customer-centricity is one of the main drivers of the strategy in this company, the strategy needs to be more focused on processes and products that directly impact customers.

The Data Governance gap needs to be covered by need processes, measures, and monitoring applications. Regarding the scale of this organization, automation of data governance practices and processes is required to improve this score. In other words, besides clarity of the processes, the supporting applications, and systems for data governance play an important role in improving the score in this criterion.

Despite having a robust infrastructure for data collection, data analytics requires more efforts to turn data into insights. There are huge data sources that can be utilised for decision-making inside the organization that are not fully exploited.

Finally, there are some opportunities to meet the customer expectations regarding new trends of food and beverages dietary offerings, which can improve the products of this company.

Conclusions

There are multiple expected contributions and results from this research. The first and foremost purpose of this research is to develop a model for evaluating an organization's degree of maturity concerning the customer-centricity approach. This model includes attributes that are identified through literature review, expert inputs, and the relative impact on the ultimate objective of this model. From the academic perspective, this research's contribution is in fulfilling the research gap found during the initial literature review by developing a multi-criteria-based measuring approach for evaluating the customer-centricity approach. On the other hand, this model assists organizations with self-assessment and continuous improvement in their customer-centric initiatives from a business and practical perspective. Finally, this research also recommends improvements that can facilitate the transition from product-centric to customer-centric.

One recurring challenge in the pursuit of customer-centricity is the tendency for organizations to emphasise it only after launching their products or services. This research takes a proactive

stance, advocating for the integration of customer-centricity from the earliest stages of product and service development. In this endeavour, technology management plays a critical role in embedding intrinsic customer orientation throughout the innovation process. The core objective of this research is to introduce a pioneering method for evaluating an organization's level of customer-centricity, with a focus on Product-Service Systems (PSS) as integrated product and service deliverables. Through the development of a multi-criteria-based model, this research empowers organizations to self-assess and continually enhance their customer-centric initiatives, facilitating the transition from a product-centric to a customer-centric approach. The study addresses four fundamental research questions, providing comprehensive responses, and introduces a hierarchical decision model that quantifies the dynamics influencing customer-centricity. The validation of the proposed maturity model underscores its suitability for assessing an organization's customer-centricity. While the primary focus of this research is the e-commerce industry, its findings and model can be generalised to benefit a wide array of sectors. This research also signifies the innovative application of the Hierarchical Decision Model (HDM) methodology traditionally used for decision models. By pioneering this application for assessing customer orientation, it is poised to stimulate the wider adoption of the HDM methodology across academia and industry.

On the other hand, there are intricate relationships among technology, organization, customer, and policy in terms of customer relations. Technological advancements impact customer experience. For instance, the use of an e-commerce platform or quick access provided by a mobile application can make it easier for customers to reach products and services. Technological tools such as customer support systems and CRM software can help manage customer information more effectively, strengthening customer relationships. Organizational culture and values determine how customers are approached. A customer-centric organization may develop processes and policies focused on customer satisfaction. The organization's structure and internal communication affect its ability to respond quickly and effectively to customer demands. Political decisions, consumer rights, competition policies, and other regulations can establish standards for customer rights and protection, shaping customer relationships. Tax policies and pricing strategies can also impact the services and products offered to customers. Technological innovations can help organizations gain a competitive advantage and comply with policies. For example, cybersecurity policies are related to both technology and organizational security. Political decisions may include regulations related to technological developments and organizational practices. Interactions among these factors can be complex, involving numerous dynamics that influence each other. Careful management and integration of these factors are crucial for establishing successful customer relationships. A robust customer-centric strategy should adopt a balanced approach across technological, organizational, and policy dimensions to ensure effective customer relationship management.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Notes on contributors

Soheil Zarrin just received a PhD in Technology Management from Portland State University.

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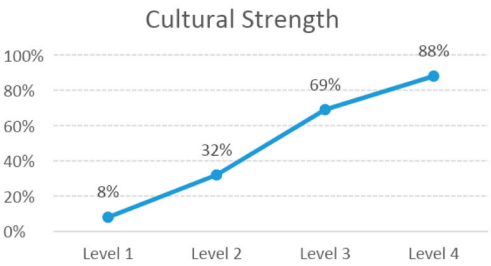
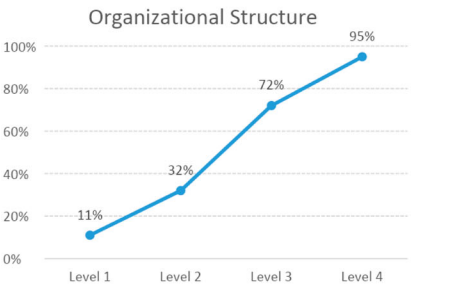
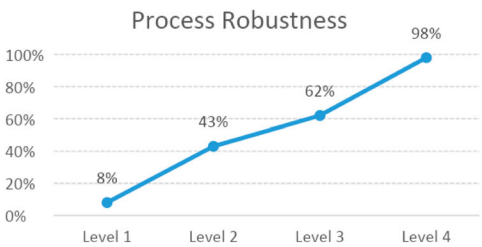
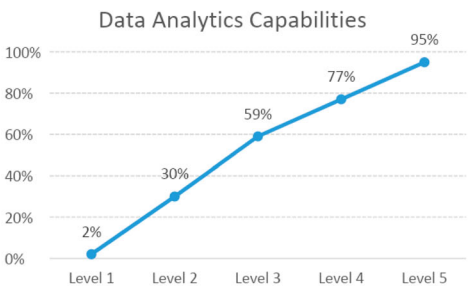
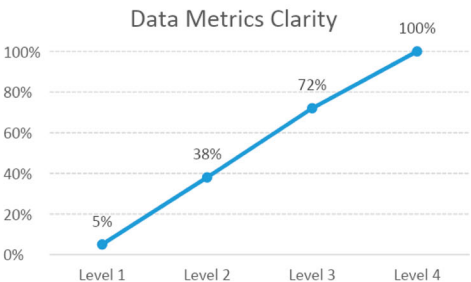
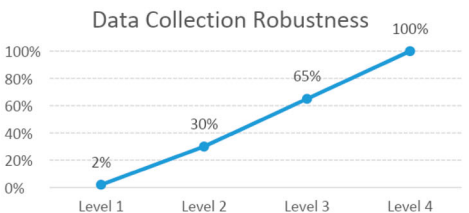
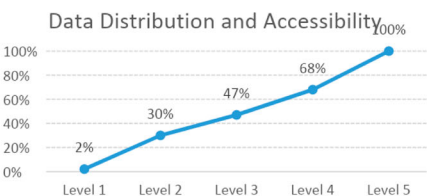
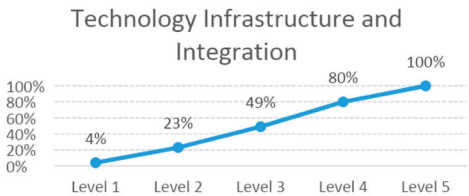
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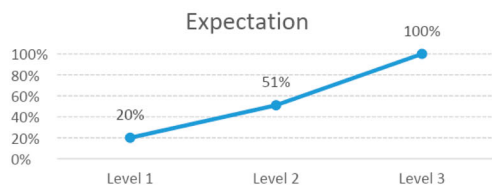
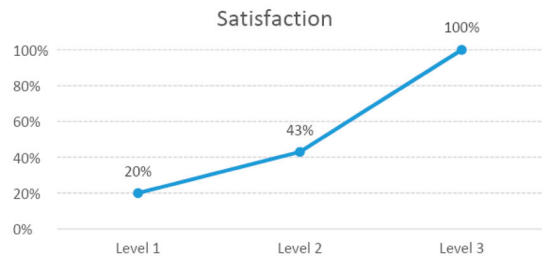
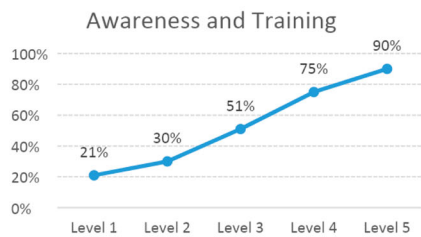
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Appendix

1. Desirability curves





2. Case analysis

Perspective	Criteria	GW	Company C1				Company C2		
			L	DV	GW x DV	L	DV	GW x DV	
Technology/Data	Technology Infrastructure and Integration	5.13%	3	49.00%	2.51%	4	80.00%	4.10%	
	Data Distribution and Accessibility	3.80%	3	47.00%	1.79%	4	68.00%	2.58%	
	Data Collection Robustness	2.66%	2	30.00%	0.80%	4	100.00%	2.66%	
	Data Metrics Clarity	2.66%	2	38.00%	1.01%	3	72.00%	1.92%	
Organization	Data Analytics Capabilities	4.56%	3	59.00%	2.69%	2	30.00%	1.37%	
	Process Robustness	2.97%	3	62.00%	1.84%	4	62.00%	1.84%	
	Organizational Structure	2.70%	3	72.00%	1.94%	4	95.00%	2.57%	
	Cultural Strength	4.86%	3	69.00%	3.35%	4	88.00%	4.28%	
	Strategy Focus	4.05%	2	31.00%	1.26%	2	31.00%	1.26%	
	Staff Expertise	3.78%	2	28.00%	1.06%	3	68.00%	2.57%	
	Leadership Support	5.40%	4	83.00%	4.48%	4	83.00%	4.48%	
	Financial	3.51%	2	34.00%	1.19%	5	100.00%	3.51%	
Customer	Awareness and Training	5.28%	2	30.00%	1.58%	4	75.00%	3.96%	
	Satisfaction	11.55%	2	43.00%	4.97%	3	100.00%	11.55%	
	Expectation	10.23%	1	20.00%	2.05%	2	51.00%	5.22%	
	Loyalty and Commitment	6.27%	2	38.00%	2.38%	3	99.00%	6.21%	
Policy	Data Privacy Compliance	5.22%	2	44.00%	2.30%	3	99.00%	5.17%	
	Data Security Compliance	5.76%	3	100.00%	5.76%	3	100.00%	5.76%	
	Data Ownership	3.24%	2	45.00%	1.46%	2	45.00%	1.46%	
	Data Governance	3.78%	2	21.00%	0.79%	2	21.00%	0.79%	
Customer Centricity Score					45.2%			73.2%	

Note: Global Weights: GW; Level number: L; Desirability Value: DV.