Building engagement with Nokia customers by achieving customer satisfaction

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Abstract:

This thesis work investigates the factors contributing to satisfaction and dissatisfaction of Nokia's private wireless network solution currently. And understand how Nokia can build engagement with their customers in the future. With several financial benefits customer engagement is a desirable state of satisfied customers who not only stick with the brand but also recommend the brand to others. In this context, the literature review focused on variables which has strong influence on overall customer satisfaction such as customer experience, service quality and co-creation of value delivered during customers purchase journey. In addition, literature review also explores the process of building customers' engagement with a brand by delivering to customer expectations and needs. Customer engagement is an iterative process, customers go through several stages starting from interaction, satisfaction, retention, commitment, brand recommendation and engagement. A qualitative approach was taken for this study and in-depth interviews were conducted with six Finnish customers. The study results show that customers current industrial automation needs are met with the solution. However, customers expect to have 5G capabilities in the solution in future. Customers are currently also satisfied with the performance level of the solution but suggested improvements in customer portal, network service quality and communication process in the future to be able to deliver to their expectations. Customer value the opportunity for co-creation and customization of solution to their needs. In addition, customer has strong emotional affiliation and trust with Nokia's brand.

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FOREWORD

This thesis is written in partial fulfillment of the requirements for a Master of International Business Management degree at Arcada University of Applied Sciences, Helsinki, Finland. This research is conducted for Nokia's product targeted towards enterprises seeking industrial automation solutions. For confidentiality reasons, the original product name is not used in the study and is referred as " Nokia's solution" or " Nokia's private wireless solution ". I would like to show my most sincere gratitude to my supervisor Minna Stenius whose continuous guidance and mentoring throughout this research helped me tremendously. I would also like to thank my line manager Outi Niemi who gave me the opportunity to work on this research and provided me with all the necessary support. My special thanks go to my husband Qutab whose continuous support, patience and love has been cornerstone of my success. This thesis work successful completion would not have been possible without his cooperation. I would like to dedicate my thesis work to my parents Shaheen and Irfan whose constant encouragement, support and believe in me has always provided me with a self-believe to overcome any challenge in life. Without a doubt, I owe my achievements to my them. Last but not the least, I would like to thank my daughter Sara Alaina Qutab whose love gives me strength to deliver to the best of my capabilities.

Helsinki, December 2020
Marriam Irfan

Disclaimer

All the views expressed in this study are solely of author's own and the author is currently employed by Nokia.

1 INTRODUCTION

Today, businesses are aware that to have a long-term sustainable competitive advantage companies need to retain and nurture their existing customers. Today most businesses face intense competition, which makes it even harder to differentiate themselves from competition and retain their customers. To counter this challenge, companies have shifted their focus on fostering customer engagement by creating strong connections with customers which drive purchase decisions and customer participation over time Pansari and Kumar, (2017). Customer engagement represents a strategic imperative for generating sales growth and contribute to company performance Neff, (2007). It provides superior competitive advantage, profitability and customer loyalty Rego et al., (2009). Engaged customers also act as partners and contribute in product value-adding process to achieve better product/service quality Sashi, (2012). Having engaged customers has several benefits for the company, they may contribute in new product development Hoyer et al., (2010) and co-creating customer experience which help improve customers overall satisfaction with the solution and services Schmitt et al., (2009), Prahalad and Ramaswamy, (2004). To be profitable companies must consistently satisfy their customer expectations related to the performance of the product/service offered to them Churchill and Surprenant, (1982).

To achieve customer engagement, achieving customer satisfaction is a necessary condition Sashi, (2012). Customer satisfaction helps retain the customers with the firm and contributes to business profitability Bowden, (2009) and Anderson and Sullivan, (1993). Customer engagement can be defined as a systematic process of interaction between sellers and customers. The engagement level of customers represents strength of their relationship with a buyer Brodie et al., (2011). This demands companies to define a customer engagement strategy which is designed to deliver a positive customer experience and satisfy their needs.

Nokia business currently face a situation, where they do not have any customer engagement strategy in place to better understand their customers' satisfaction level or

ways to increase their involvement. More satisfied and engaged customers would offer many benefits to Nokia as they would be able to understand their customer needs and expectations, identify value for customer, identify reasons of customer dissatisfaction, and understand how to turn them into satisfied customer to increase their engagement. At the end of this thesis, Nokia would be better informed of their existing customer satisfaction and what are the reason behind their dissatisfaction. This would give Nokia insights into their customers perceived value of their solution and better equip them to improve their solution to achieve customer satisfaction and suitable engagement strategies for their customers.

1.1 Background

A report by Gallup, (2013) shows a highly substantial relationship exist between customer engagement and business outcomes which includes profitability, business revenue, share of wallet, brand preference and customer attrition in B2B industry. The report survey result shows that fully engaged customers generate 23% more revenue than an average engaged customer. The study confirms that investing company resources in employing customer engagement as a strategic tool can have positive business outcomes. The study conducted a comparison of business units in bottom quartile of B2B customer engagement level with the top quartile organizations in B2B customer engagement – the study results disclosed that highly engaged customers show 50% higher revenue, 63% lower customer churn, 34% high profitability and 55% high share of wallet Gallup, (2013). These figures show that employing customer engagement as a strategic tool can be beneficial for B2B growth and sustainable profitability.

A survey report conducted by Economic Intelligence Unit 2007 found that only 13% of customers are committed to their products and company Economist Intelligence Unit, (2007a). Today, the customers have higher expectations from businesses and their overall experience in addition to good product and services offered to them. To tackle the changing customer requirements, companies have recognized the need to build highly engaging long-term relationship with customers. The results of the report showed that almost 60% of surveyed executives believe that a customer engagement initiative will

have a very strong impact on a company's growth in the next five years Economist Intelligence Unit, (2007b).

The Economic Intelligence Unit respondents in the study identified responsiveness, consistency, and customer satisfaction as key three predictors of customer engagement. According to the surveyed executives, achieving customer engagement would allow companies to take their customers loyalty and satisfaction with their offerings to the next level and provide them with a unique competitive advantage over their competitors. The study confirmed that companies across all industries view achieving high level of customer engagement as a key strategic challenge in the future which requires attention by companies to avoid customer churn rate. The same survey results also suggested that engaged customers recommend products/services to others, make frequent purchases, give feedback and tend to be less price sensitive Economist Intelligence Unit, (2007b).

Above discussion demonstrates that a company striving to achieve customer satisfaction will be able to achieve better business return. However, companies are still hesitant of investing in improving the quality of their services and achieving customer satisfaction. Anderson et al., (1994) conducted a study with 77 firms with majority market share in their industries in Sweden. The study estimated that a one-point increase in customer satisfaction would have a net present value of $7.4 million over five years for a typical firm in Sweden translating into a cumulative increase of 11.5% in income for the firms. This suggests that companies should treat resource allocation to improving service quality and customer satisfaction as long-term investments as satisfied customers are revenue-generating assets for any company. Such companies need to align their processes, resources, performance KPI's and organizational structure with a customer-centric strategic orientation Anderson et al., (1994).

1.2 Aim of the study

The aim of this study is to explore and identify the determinants of Nokia's customers satisfaction and dissatisfaction with the solution. In addition, the study also focuses on identifying customers preferred methods of engagement and value co-creation activities they wish to be involved with.

To meet the set aim for this study following research questions are formalized:

1. What makes Nokia customers satisfied with the solution presently?
2. What makes Nokia customers dissatisfied with the solution presently?
3. How Nokia customers would like to engage with the brand?

1.3 Delimitations of the study

The topic of customer satisfaction and engagement are very wide concepts as many variables influences them which are identified in the academic literature. This research focuses on attributes that impact customer satisfaction and engagement according to past research. Hence, the main variables explored in this research are associated and limited to product and service quality, customer experience, value co-creation, customer satisfaction and customer engagement process. Nokia's current customers are spread globally however, due to time and resource restrictions this thesis scope is limited only to conduct research on Finnish customers.

2 Literature Review

2.1 Customer engagement

From an organizational perspective, customer engagement is defined as a set of activities enabling "repeated interactions that strengthen the emotional, psychological or physical investment a customer has in a brand (product or company)" Sedley, (2010). He further elaborates that customer engagement is not a nirvana that can be reached but rather a process to develop and nurture strong relationship with a customer. Vivek et al., (2012) defines customer engagement as

> "The intensity of an individual's participation and connection with the organization's offerings and activities initiated either by the customer or the organization." Individuals may form connection with the organization based on their experience with the product/service and activities organized by the company. Prospective or current customers may also build relationship with the organization based on their experience through intense participation in company activities Brodie et al., (2011).

Brodie et al., (2011) conceptualizes customer engagement from a broader domain of service relationships and Service-Dominant logic (SD-logic) and defines it as

> "A psychological state that occurs by virtue of interactive, co-creative customer experiences with a focal agent/object (e.g. a brand) in a service relationship. It occurs under specific set of context-dependent conditions generating differing customer engagement levels".

Customer engagement may also be created between a broader network of customers, stakeholders, and other actors with the help of two-way communication in service relationships. Customer's interactive experiences may include human/computer mediated interactions or even interpersonal interactions. Brodie et al., (2011) also defines customer engagement as "a state that occurs within a dynamic and iterative process of service relationships that cocreates value".

S. L. Vargo and Lusch, (2008) also highlight the importance of interactive and co-creative experience processes within an organization to create value. Some of the examples of co-creation of value includes positively perceived communications between a firm and a customer, service delivery or a dialogue that leads to customer loyalty. Customer engagement processes may vary from short to long term, or from relatively stable to highly variable processes which may create variable levels of customer engagement intensity over a period. The iterative nature of customer engagement infers that repeated

interactions with the focal engagement object can resurface customer engagement at different levels over time Brodie et al., (2011).

Brodie et al., (2011) in their study argues that "Customer engagement is a multidimensional concept subject to a context- and/or stakeholder-specific expression of relevant cognitive, emotional and/or behavioral dimensions". The author(s) further elaborate that

> "The relative importance of a particular cognitive, emotional, and/or behavioral customer engagement dimensions varies with the specific customer engagement stakeholders involved (i.e., engagement subject, e.g., customer engagement object, e.g., brand) and/or the set of situational conditions, thus generating distinct customer engagement complexity levels".

Vivek et al., (2012) along similar lines argues that customer engagement is multidimensional maybe manifested in cognitive, affective, behavioral or in social forms. The cognitive and affective elements of customer engagement include customer feelings and experiences, whereas the social and behavioral elements incorporate participation from the customer side in exchange situations.

Customer engagement can also be defined as a measure to evaluate the strength of a company's relationship with customers based on their emotional and rational bond with the company. A research conducted by Alec Appelbaum, (2001) presented their customer engagement metric called CE[11], which measures rational as well as emotional formulations of customer loyalty towards a brand. Rational loyalty formulation includes three key indicators such as overall satisfaction with the brand, repurchase intent and intent for brand recommendation, whereas emotional attachment includes confidence in a brand, belief in its integrity, pride in the brand, and passion for the brand.

van Doorn et al., (2010a p. 2-4) in their study developed a conceptual model of customer engagement behavior antecedents and consequences and defined customer engagement behavior as "the customers' behavioral manifestation towards a brand or firm, beyond purchase (pre- or post-purchase experiences), resulting from motivational drivers".

This study focuses on behavioral component customer engagement which highlights the importance of a relationship between a customer and seller. The author(s) also stated that the customer engagement behavior may also be targeted towards potential or current

customers, supplier, firm employees, or regulators in addition to firm. The research identified blogging, Word-of-Mouth (WOM), helping other customers, writing reviews for a brand or product/service, or even taking legal action as customer engagement behaviors.

van Doorn et al., (2010a p. 4-7) model of customer engagement highlights the antecedents and consequences of customer engagement behavior.

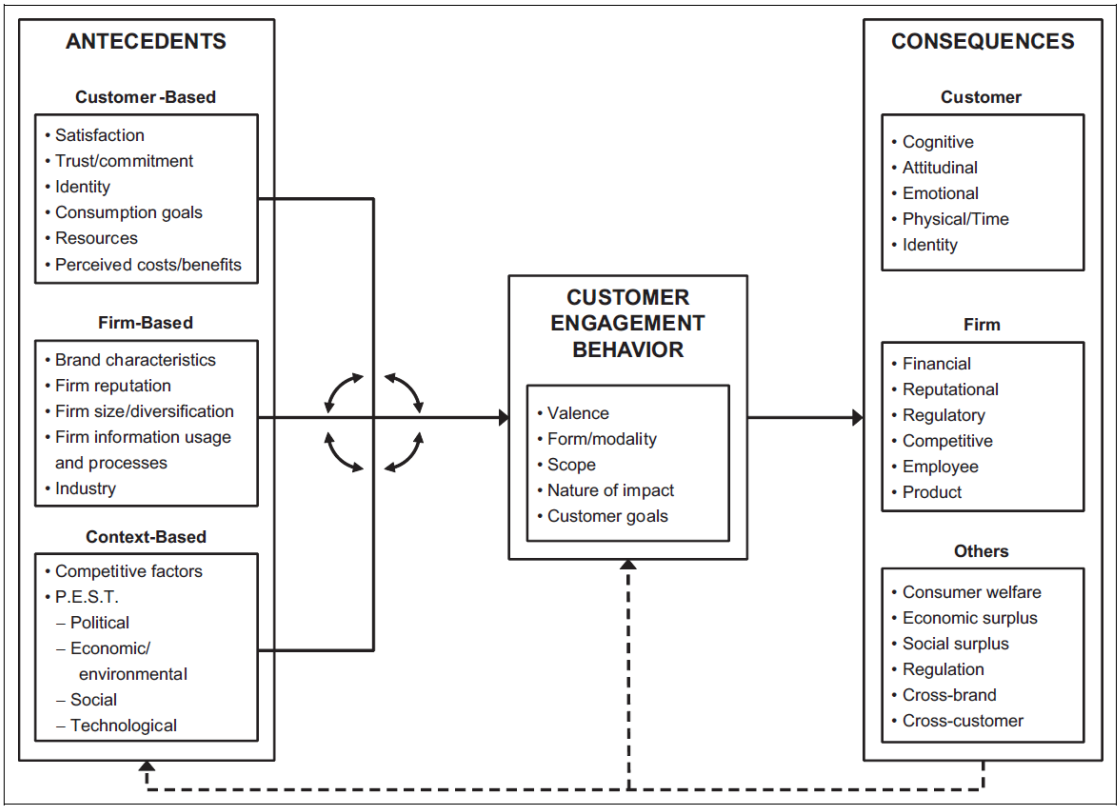

Figure 1. Conceptual model of Customer Engagement Behavior by van Doorn et al., (2010)

Some of the identified customer-based antecedents of customer engagement behavior includes customers' satisfaction from the product and service, customers trust on a brand, brand commitment and attachment, and performance of the brand against customer expectations. Customer engagement behavior is also affected by other factors such as outcome achieved by the customer, customer resources used such as time, money, and effort. The study included firm-based antecedents of customer engagement behavior such as the influence of firm developed process and provided platforms to support various customer activities/actions. These developed processes or technology enabled platforms

by the firm maybe used to enable customer voice regarding their suggestions or complaints or to build customer-to-customer engagement. One of the most important firm-based factors affecting customer engagement behavior is its impact on the company brand. Brands that have high brand equity usually have high levels of positive customer engagement behavior. However, any fallout from the firm side can result into high-level negative customer engagement behavior with adverse effects on brand reputation. Firms with high brand equity generate high brand commitment and attachment which can highly motivate customer to engage with the brand. Customers with higher brand commitment or connection engage more with firm's engagement activities such as events, brand communities etc. Customers may also participate in engagement activities with the firm to improve their own knowledge about the product or service offered by the brand or share their own knowledge with other. Customer engagement has several firm-based consequences which includes financial benefits, customer referrals and word-of-mouth behavior which affect customers purchasing decision. Highly engaged customers can provide and share very important knowledge with other customers or with the firm. They may be willing to help provide feedback for product improvement, share their valuable new ideas related to the design and development of products and services of the firm.

2.1.1 Customer engagement process

The Economist Intelligence Unit report 2007 also proposed that customer engagement is not a fixed point but instead a process that expands and evolves over time. The report defined CE as *"an intimate long-term relationship with the customers"*, it means to build customer engagement companies must consistently interact with customers and engage them in meaning full interactions. Economist Intelligence Unit, (2007b) also referred to engagement as

> "Creation of activities/experiences for customers or stakeholders that allows them to create more meaningful, deeper and sustainable interactions that can lead to build lasting relationship between them".

Sashi, (2012) proposed that customer engagement is an iterative cycle of processes over time. The proposed engagement cycle by the author constitutes of several stages' connection, interaction, satisfaction, retention, commitment, advocacy, and engagement. Figure 2. shows the customer engagement cycle proposed by the author:

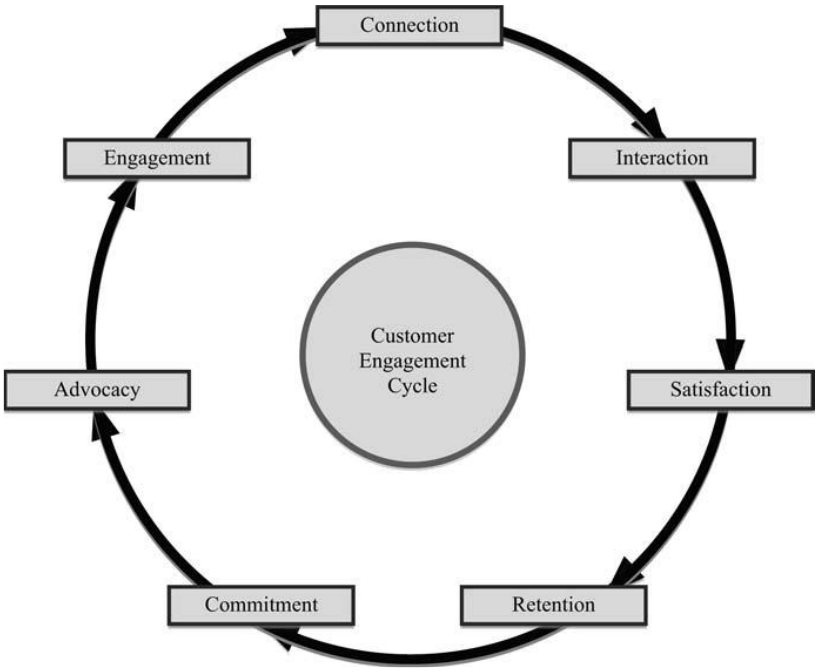

Figure 2. Customer engagement cycle Sashi, (2012)

The first stage, connection is a prerequisite for buyers and sellers to connect with each other to develop a relationship with each other. These connections with the customer can be established either through online channels such as social media or offline channels. Different forms of customer engagement such as cognitive, affective, behavioral or a social engagement can be depicted through the connections between the customer with the seller. Behavioral and social engagement of a customer can be defined as customer's participation in activities organized by a seller, customers or even by the partners, whereas cognitive and affective engagement refers to all the experiences and feelings that a customer has experienced during their interactions. Customers build relationship with sellers through their experiences from active participation in activities Vivek et al., (2012). This implies that organizations need to build engagement with their customers not only through various activities for customers to participate in but also build relationship with them throughout their customer journey.

Customers can communicate with the brand/firm and or interact with each other through online or offline channels. Using web 2.0 tools or social media, sellers can interact with customers in real-time and conduct two-way communication with them to take their valuable feedback, learn about their experience with the product and service or understand their future product expectations Sashi, (2012). Prahalad and Ramaswamy, (2004) referred to interaction as a "locus" of value creation and value extraction between any

seller or customer. These interaction opportunities with the customer or prospective customers are very important for organizations as it helps them to better understand customer needs, develop new solution ideas or co-create value to improve the organization solution.

Third stage is satisfaction, it is a significant stage for progressing towards customer engagement. Sashi, (2012) defined satisfaction as a "necessary condition for customer engagement. But it is not sufficient for customer engagement". Customers' satisfaction from the product may result in repurchase from the seller and customer retention. However, customer satisfaction and retention does not imply that a customer is engaged but directly has an impact on profitability. Customer's dissatisfaction from the solution after the purchase can also result in losing the customer.

Fourth stage in customer engagement cycle is retention, customer retention is formed as customers become satisfied or form positive emotions towards the service brand. Satisfaction of customers with the brand may form over a period with product repurchases and by building long-term relationship with the service brand. Customers may become loyal to a brand with long term retention Sashi, (2012). Pansari and Kumar, (2017) in their study conceptualized customer engagement antecedents and consequences framework, according to the model engagement is formed only after achieving customers' trust and commitment with the service brand by building long-term relationship with the customers. It can be inferred from the above discussion that to build engaged customer base companies have to invest their efforts towards building strong relationship with the customer.

Next stage in customer engagement cycle proposed by Sashi, (2012) is commitment, Gustafsson et al., (2005) in their study finds that retention may have a leading role in development of affective and calculative commitment in customers. Calculative commitment forms with long-term relationship with customer and may also be a result of high switching cost for a customer. It is responsible to initiate a process of engagement for new customers due to its role in development of rational bonds between the seller and customer. New customers have less experience and familiarity with the product/service and have vague expectations towards a service experience with difficulty in assessing a new product Soderlund, (2002). To overcome this challenge, new and inexperienced

customers evaluate a product/service on attribute-level or based on the performance of the product against customer expectations.

Affective commitment is a result of trust building and emotional bonds between the seller and customer. It forms the emotional basis for a purchase which ultimately results into enduring customer loyalty towards the brand. Verhoef et al., (2002) defined affective commitment as "the psychological attachment of an exchange partner to the other and is based on feeling of identification, Loyalty and affiliation". Affective commitment has a significant role in evaluation of a service for repeat customers Bowden, (2009). Affective commitment has a greater impact on customers repurchase intention and recommendation than calculative commitment of repeat customers. Affective commitment is also a better predictor of customer retention and impact on customer loyalty as opposed to other constructs such as calculative commitment, corporate image, price and satisfaction as well Johnson et al., (2001).

Customer loyalty is formed because of customers' calculative commitment towards a brand, whereas customer delight is achieved by attaining customers affective commitment towards a brand/firm. Customer engagement can only be formed by achieving both affective and calculative commitment of a customer Sashi, (2012). He argues that customer commitment indicates their loyalty towards a brand but a loyal customer may not necessarily be committed to the brand/firm. Warrington and Shim, (2000) finds in his study that loyal customer may switch brands but committed customers are less likely to switch brands due to their strong attitudinal beliefs and emotional bonds with a firm/brand. Bowden, (2009) argues that calculative commitment has a higher impact on new customers' intention to repurchase the product and make a recommendation to others than affective commitment.

The sixth stage in the customer engagement cycle is advocacy. Only loyal customers with emotional bonds or delighted customers of a service brand share their experience with others through positive word-of-mouth and become sellers' advocates Walker, (2001). The author finds in his study that customer word-of-mouth has positive relation with affective commitment and no relation exists between calculative commitment and word-of-mouth. It can be concluded from the study findings of Walker, (2001) that if customers only have calculative commitment (long-term relationship) they most likely will not refer

the company product to others through word-of-mouth until the customers have built emotional bonds with the brand/firm. To achieve engagement companies can leverage customer advocacy programs or referral programs etc. Urban, (2004) in his study emphasized that the act of advocacy should also be reciprocated by the sellers to gain customer trust and further strengthen the relationship between the two parties. Sellers must work towards in delivering to best of their capability to customer needs and serve their customers' best interest. Word-of-mouth communication is considered a highly credible source of information Brown et al., (2005). This type of information can help influence other customers beliefs about the company and their product/services and eventually effecting customers' purchase intentions from a company Lutz, (1975) Sheth and Parvatiyar, (1995). Customer satisfaction and dissatisfaction are antecedents of customer word-of-mouth (recommendation). The study results showed that customer experience is the most significant antecedent of customer word-of-mouth and has a stronger relationship than customer satisfaction Yi, (1990).

The last stage of the cycle is customer engagement, Economist Intelligence Unit 2007 report defines customer engagement as an "intimate long-term relationship with the customer". In terms of strategy, Economic Intelligence Unit 2007 report referred to customer engagement as "the creation of experiences that allow companies to build deeper, more meaningful and sustainable interactions between the company and its customers or external stakeholder". The report also proposed that "customer engagement is not a fixed point that can be reached but a process that expands and evolves over time" Economist Intelligence Unit, (2007a). Sashi, (2012) defines that customer engagement concept focuses on customer needs to engage with them. Understanding customer needs through engagement, firm/brand can understand the required value needed to be delivered to customers to fulfil their needs. The author further elaborates that by collecting intelligence on customers current needs and involving them in feedback collection process help companies to better deliver to customer needs and contributes towards customer engagement. The author adds that customer engagement also focuses on delivering higher value to the customers than their competitors to establish customer commitment and trust in the buyer-seller relationship. Engaged customers act as sellers' partners and actively contribute towards value creation process to better satisfy their needs and of other customers as well. Social media offers a great platform to build relationship with the brand/firm with trust and commitment.

Building customer engagement also requires adaptation of different marketing mix at the strategic level by organizations. New tools and latest technologies can be leveraged to build a communication bridge with both new and existing customers. Web 2.0 advent with social media channels provides an opportunity for sellers to have two-way communication with customers. Customers participate in different marketing engagement activities sometimes by becoming seller advocates and influence other potential customers purchase decisions or peer-to-peer interactions. Sashi, (2012)

2.1.2 Customer involvement and trust

Increase in level of customer involvement alongside the increase in level of trust put into the service brand by a repeat customer results into affective or emotional commitment of a customer. The constructs of trust and involvement work in parallel with each other to develop high levels of commitment towards a brand, especially for high involvement to moderate involvement brands Ballester and Munuera-Alemán, (2001). Oliva et al., (1995) argues that involvement creates "stickiness" in customer-brand relationships, the more involved customers are with the brand the more loyal they become to the brand. It can therefore be argued that organizations should involve their customers through various activities with the service brand to have committed customers. Uninvolved and uncommitted customers may regularly switch brands despite being satisfied from the service provider. Warrington and Shim, (2000). Customer involvement also has a role in developing customer retention and repurchase behavior in repeat customers due to their high familiarity with the brand and complex cognitive structures for evaluation of products Soderlund, (2002).

Trust is a necessary condition to develop true customer commitment towards a brand. Development of trust in a customer-seller relationship creates affective commitment, which transforms customers relationship with the brand from truly cognitive towards more emotional attachment, affiliation, and identification Hess and Story, (2005). Customers trust a brand if they have positive experience with the brand. The presence of two primary components of trust signifies its presence in a customer-brand relationship – First, when a brand delivers to customer needs with quality products. Second, is when customer perceives that a seller has their best interest at heart. Based on past research (Bowden, 2009) argues that

"higher the level of customer involvement with the service brand, higher will be the degree of brand trust leading to increased level of customer commitment".

2.1.3 Customer delight

Customer delight can accelerate the development of customer commitment (calculative or affective) and loyalty towards the brand by new customers Bowden, (2009). Oliver et al., (1997) refers to customer delight as a state of heightened positive emotion towards a brand resulting from seller's ability to exceed customer's expectations to a surprising level. Delighted customers may also assist in attracting new customers to sellers' offerings through positive word-of-mouth, in addition customer delight also contributes to repeat purchase and retention with the service brand. Organizations should ensure to maintain active communication and interaction with the customer as Kesavan and Bernacchi, (2004) in their study find that "greater the attention paid to and participation invited from the target customers on every step of the value chain, the greater will be the customer delight.

2.1.4 Customer engagement antecedents and consequences

Pansari and Kumar, (2017) customer engagement antecedents and consequences framework argues that there is a direct relation between customers' purchase experience and customer satisfaction. According to the author(s), a positive customer purchase experience would affect customer's overall satisfaction from the solution positively and help develop positive post purchase emotions with the brand. The study provided ample support for the claim that product referrals, customer influence and participation in providing product feedback are few of the indirect outcomes of post purchase satisfaction and CE with the brand. Engaged customers indirectly influence the behavior of potential buyers on social media Hogan et al., (2003), which ultimately effects company's performance positively. Customers' feedback add value to the company by providing information on customer preferences Joshi and Sharma, (2004) and help to improve their existing product/services. Pansari and Kumar, 2017) in their paper, put forward the claims that CE also has a direct effect on a company's performance, market share and eventually contributes to company revenue.

Engaging customers with a company brand or product provide an opportunity for business to increase customer retention and loyalty. With emotional, social, and financial investment towards a brand, engaged customers show higher commitment towards a brand. (Shiri D. Vivek, 2012) provides evidence in his study that CE increases with active customer participation and involvement, and as a result companies gain customers trust, loyalty, affective commitment, word of mouth (WOM), and brand community involvement. Engaged customers can help build positive word of mouth and customer referrals which contributes to revenue growth. Building an emotional connection is at the heart of customer engagement. "CE is the best measure to of current and future performance, an engaged relationship is probably the best the only guarantee for a return on your organization or your client's objectives" Sedley, (2010).

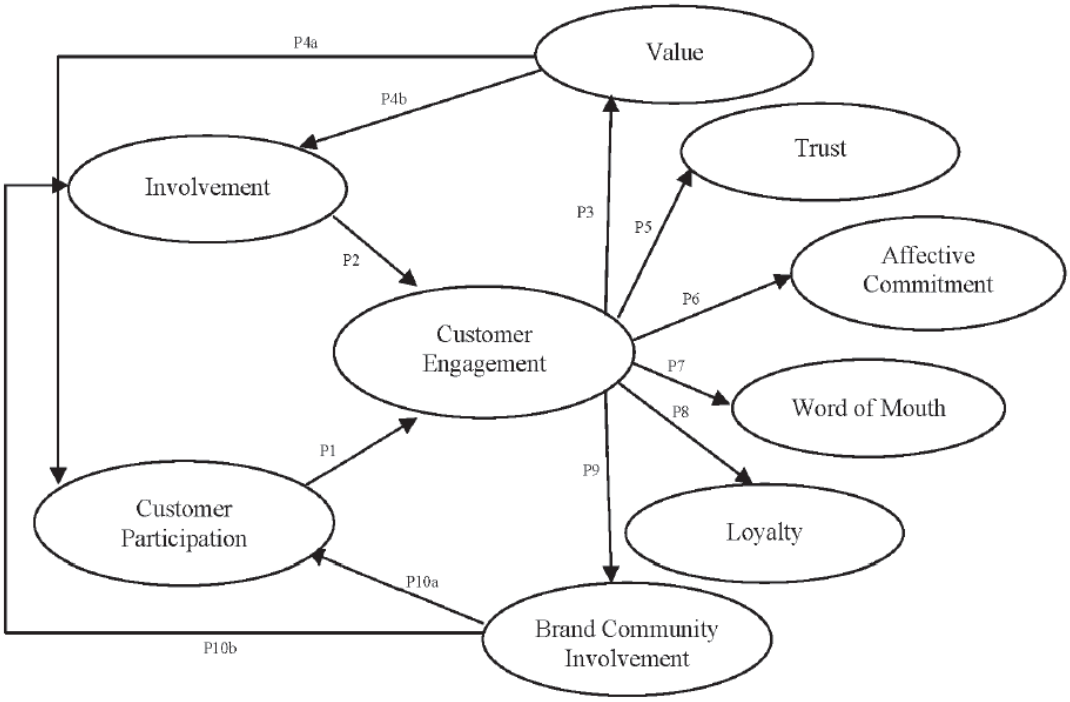

Figure 3. CE Theoretical framework with its antecedents and consequences (Vivek et al., 2012)

Some of the most prominent customer engagement literature show consensus in antecedents for formation of CE and its consequences. Customer participation, involvement and customer interaction are considered necessary to build rational bonds with the customer. In addition, affective commitment, customer loyalty, trust and delight are also necessary conditions to build customer engagement though emotional bonds and customer relationship. Similarly, a strong consensus exist in consequences of customer

engagement, prominent past literature (Sashi, 2012, Bowden, 2009, van Doorn et al., 2010a; Chan et al., 2014; Vivek et al., 2012; Pansari and Kumar, 2017) confirms customer advocacy, word of mouth, customer referral, customer feedback, customer brand community involvement, loyalty, customer repurchase intention and improvement in firm performance as direct and indirect outcomes of customer engagement.

2.2 Customer satisfaction

In this study we investigate the variable of customer satisfaction due its importance of achieving customer engagement. According to (Sashi, 2012), customer satisfaction is a necessary condition to achieve customer engagement. In addition, organizations continuously rely on metrics of satisfaction to assess their customers evaluation of company products and services due its strong relation with customer engagement, customer loyalty, repurchase intention, word-of-mouth, referrals, profitability, market share and return on investment (Sashi, 2012), Allen and Wilburn, (2002), Anderson and Mittal, (2000), Heskett et al., (2008), Keiningham et al., (2001), Mittal et al., (2001), Reichheld, (2003).

Customer engagement concept is established on Expectancy-Disconfirmation Theory (EDT), which focuses on delivering to customer's expectations to achieve their satisfaction Brodie et al., (2011). Numerous studies of the past have used some variant of disconfirmation model to explain the antecedents of customer satisfaction. According to (Churchill and Surprenant, 1982), customers become satisfied if their needs are met and value is transferred to them. According to the disconfirmation model, customers' satisfaction is related to their disconfirmation experience which can be positive or negative depending upon individuals' post-purchase expectations (Churchill and Surprenant, 1982). Figure 4. below shows the model of expectancy of disconfirmation theory.

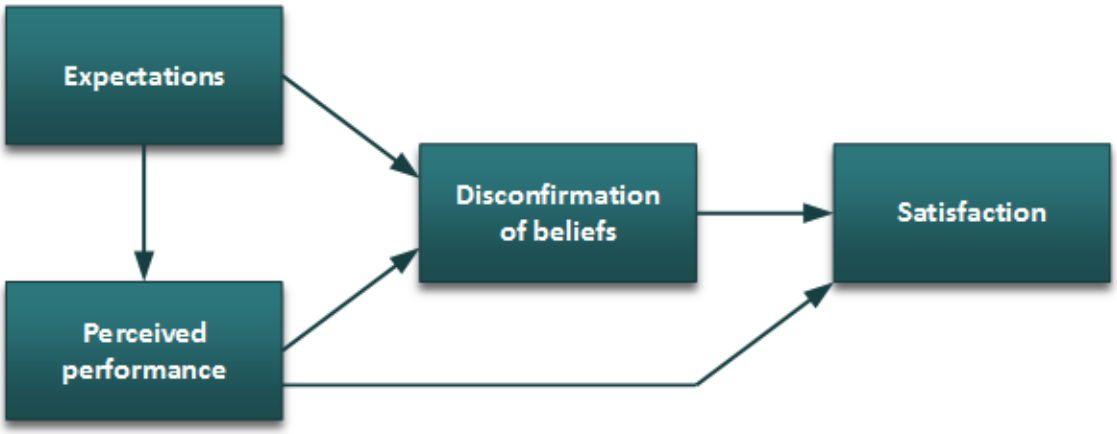

Figure 4. Model of Expectancy of Disconfirmation Theory Oliver, (1977)

The above model shows that customers pre-purchase expectations formulates the post-experience or post-purchase perceptions of a product and service performance. Expectation can be referred as an individual's initial predictions about the attributes or characteristics associated with the product or service prior to its purchase experience. Expectations are also formed from customers various past experiences prior to the purchase such as advertising, word-of-mouth, or media influence to mention the few. Customer expectations are also formed by the promises made by the seller prior to the purchase. The perceived performance of a product or service refers to an individual's perception about the actual performance of a product or service post-purchase. It has a direct effect on disconfirmation of expectation and post-purchase satisfaction (Morgeson, 2012). Oliver, (1977) explained that if the perceived performance of the product exceeds customers' expectations it results in positive disconfirmation which means that the customer will be satisfied. Whereas if the perceived performance of the product falls short of customers' expectations it results into negative disconfirmation or in other words dissatisfied customers. From the preceding discussion it can be concluded that customer expectations initialize the formation of customer satisfaction and set the basis of product performance perceptions. A positive disconfirmation of expectations certainly drives higher satisfaction level in customers whereas negative disconfirmation has a an opposite effect (Morgeson, 2012).

2.2.1 Customer satisfaction and relationship

Studies provide a compelling empirical evidence that customer satisfaction has a strong relation with repurchase intentions Patterson et al., (1997), (Anderson and Sullivan,

1993). Achieving customer satisfaction does not mean that the work for a company is complete, instead it is a beginning of building a strong long-term relationship with customers for achieving long-term business goals. Companies need to achieve their customers satisfaction to build engaged customers, this statement is premised on the assumption that customer satisfaction is a necessary condition to achieve customer loyalty which leads to customer engagement, customers' repurchase behavior and company profitability (Bowden, 2009), (Sashi, 2012), (Anderson and Sullivan, 1993).

With the shift in organizations measure for profitability from customers transactional value to customer retention and repurchase intentions, companies have begun to emphasize in building lasting relationship with their customers to achieve customer satisfaction. Although, several previous studies have linked business profitability with customer satisfaction and loyalty, but recent studies show that achieving customer satisfaction alone is not enough to be profitable. Instead, companies should achieve higher level of satisfaction by building strong emotional and relational bonds with customers. A strong theoretical base from previous studies conclude that companies can create loyal and engaged customers by building a strong customer-brand relationship through continuous interaction and participation in customer or company-initiated activities. (Vivek et al., 2012).

2.2.2 Customer satisfaction and value delivered

In its essence customer engagement focuses on delivering to customer expectations to be able to satisfy their needs and eventually build engagement with customers. Customer engagement also helps to determine the value required to be delivered to meet customer needs (Sashi, 2012). According to (Parasuraman et al., 1985), customer satisfaction is the result of a customer's perception of the value received either in exchange of a transaction or a relationship built between the customer and the seller. Through customer engagement organizations focus is also on satisfying their customers by delivering superior value to them than the competitors and build long-term relationship with them through customer involvement and participation (Sashi, 2012). Parasuraman et al. (1985) argues that customers not only evaluate the quality of a service based on the outcome achieved through the service but also evaluate the quality of service delivery process against their expectations. To retain customer's, companies should regularly track customers

satisfaction to be aware of customers changing expectations and their perceptions about value and performance of a solution Patterson et al., (1997).

2.2.3 Customer satisfaction and loyalty

(Morgan and Hunt,1994) defined loyalty as a lasting desire in a customer to be in a mutually beneficial relationship with the seller. Customer loyalty benefits the organization with repurchases and customer focus more on long-term benefits from the solution. Oliver, (1999) in his study concludes that "*satisfaction is a necessary step in loyalty formation, but it becomes less significant as loyalty begins to set through other mechanisms*". The author supports the argument that achieving customer satisfaction is the foundational ground to build long-term relationship with customers. Customers may become loyal to a brand after several satisfactory encounters with the brand. If companies fail to maintain customers' satisfaction, loyal customers can also take a turn towards dissatisfied customers. Few of the consequences of customer loyalty are increase in revenue, lower cost of customer acquisition and customer repurchase intention Reichheld, (2003).

Previous studies have identified two dimensions of customer loyalty behavior: First, customers build patronage towards the brand and second, customers recommend product to others as they become loyal to the brand. Maintaining customer loyalty results into repeat patronage of customers which leads to customer retention, and customer recommendation results into attracting new customers (Lam et al., 2004). Rahim et al., (2010) study argues that service quality also influences customer loyalty both directly and indirectly through customer satisfaction.

2.2.4 Connection between customer satisfaction and service quality

Customer satisfaction can be achieved by delivering high quality service and the product to customers. Customer satisfaction is also a leading indicator for companies to determine the service quality delivered to their customers (Anderson and Sullivan, 1993). The study conducted by (Anderson and Sullivan, 1993) provides strong evidence of a relationship between delivering to customers' service quality expectations and achieving customer satisfaction. One of the valuable findings of this study was that if companies are unable

to match the customers' expectation of service quality it has a more profound negative effect on customer satisfaction than when firms exceed customer's service quality expectations, this finding is also consistent with Expectancy-Disconfirmation Theory Oliver, (1977). To satisfy customers it is imperative to consistently deliver to their service quality expectations, stay informed of customers' expectations and when needed improve the existing product and services to adjust to customer needs Ganguli and Roy, (2011); Vavra, (1997). (Anderson and Sullivan, 1993) study's managerial implications highlighted that companies with highly satisfied customers would experience less variation in their customers repurchase intentions and will be able to increase profitability. Based on the conclusion drawn from their study, the author(s) also suggested to efficiently handle customer complaints and provide high-quality customer service because it can help the companies to change their dissatisfied customers to become satisfied customers.

2.3 Service quality

In this study the author is elaborating the variable of service quality because of strong evidence in past literature of direct effect of customers' service quality perceptions on their overall satisfaction with the product/service. Anderson et al., (1994) study provides strong evidence that delivering to customers' service quality expectations make customers satisfied with the company which in turn has a positive effect on profitability. In addition, delivering to customers service quality expectations provides a competitive advantage to companies over their competitors. Service quality has strong direct effect on customer satisfaction and loyalty (Parasuraman et al., 1985) (Anderson and Sullivan, 1993) which results in customer retention, profitability and business performance Zeithaml et al., (1996). Another study conducted by Ravichandran et al., (2010) provides substantial evidence that improvement in service quality directly leads to customer satisfaction and results into retention of valued customers.

(Parasuraman et al., 1985) defined service quality as the difference between the customers' expectation of a service and the perceived performance of the service. If the customer expectations are higher than the perceived service performance, then the perceived service quality is negative and customer will be dissatisfied (Parasuraman et al., 1985). In simple words, service quality perceptions are formed by a comparison of customers service quality expectations with the evaluation of delivered service

performance. Service quality evaluation is not merely on outcome of the service delivered but also involve the evaluation of service delivery process by the customer Lehtinen, (1982), Lewis and Booms, (1983).

In the service quality literature, service quality expectations are the needs and wants of a customer, in other words it is the service that customers feel that service provider should provide instead of they would offer. Anderson et al., (1994) argues that in long-term any improvements in service quality and experience of customers has a positive cumulative effect on customer satisfaction. The findings of a study conducted by (Anderson and Sullivan, 1993) argues that disconfirmation of expectations has a weaker effect on cumulative satisfaction of customers than the direct influence of perceived service quality. The author(s) added that the quality which do not deliver up to customer expectations has a greater negative effect on customer satisfaction and retention than quality which exceeds the expectations of customers. This explanation of service quality expectations brilliantly explains the importance of delivering to customers' service standard expectations and highlights the significance of keeping track of customers changing expectations by taking their feedback and strive to deliver to customers changing service quality expectations.

Customer satisfaction can be measured by determining the quality of service delivered to customers and their experience of the service process. SERVQUAL is one of the most commonly used scale to measure the service quality, it was developed by (Parasuraman et al., 1988a, 1985) and can be used to evaluate customer expectations or perceptions of a service quality. Gronroos, (1988) identified two types of service quality: technical quality, which comprises the quality of the actual service outcome received by the customer and functional quality, which involves the quality of the service delivery process. (Cronin et al., 2000) study proposed three dimensions of service quality and stated that "customers form their service quality perceptions based on their evaluation of three primary dimensions: outcome, interaction and environment quality. Lehtinen, (1982) proposed three dimensions of service quality: Physical quality, which includes the physical aspects of the service, corporate quality includes the company's image and profile; and interactive quality which includes the quality derived from interaction between company contacts and other customers as well as between customers.

SERVQUAL is a concise multi- item scale that allows the sellers to evaluate current level of customer satisfaction by better understanding the customers expectation and perceptions to help make needed improvements (Parasuraman et al., 1988a, 1985).

Initially 10 dimensions of quality used in SERVQUAL measurement (reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding and tangibles), which were defined by (Parasuraman et al., 1988) as follows:

- Tangibles: Physical facilities, equipment, and appearance of personnel.
- Reliability: Ability to perform the promised service dependably and consistently.
- Responsiveness: Willingness to help customers and provide prompt service in a timely manner.
- Assurance: Knowledge and courtesy of employees and ability to inspire trust.
- Empathy: Caring and individualized attention that the firm provides to customers.
- Competence: Knowledge of employees and needed competence in the skills required to perform the service.
- Access: It refers to ease of contact and approachability of service provider for the customer.
- Courtesy: Politeness, friendliness, and respect of contact personnel towards the customer.
- Communication: Keeping the customers informed about the product and service. Also, adjusting the language of communication based on the need of customer.
- Credibility: Trustworthiness, honesty, and reputation of company. And having the best interest of the customer at heart.
- Security: It refers to providing customers a service without any risks, danger, or doubts such as confidentiality or financial and physical security.

All these dimensions of service quality are important to meet customer expectations and achieve their satisfaction which results in customer retention and engagement (Bowden, 2009).

2.4 Customer value

Customer value also has a positive effect on customer satisfaction and customer loyalty (Lam et al., 2004). Customer value can be defined as a total benefit received by the customer by total sacrifices made by the customer with the purchase of the product. (Lam et al., 2004) study also found that customer satisfaction has a mediating role in the relationship between customer value and loyalty, greater customer value will lead to greater customer satisfaction and loyalty. In other words, customer satisfaction is the result of customers' perceived value received with the product purchase or in a relationship (Parasuraman et al., 1985). Delivering to customers value expectation means customer needs are also met Heskett et al., (1997). The author(s) also suggest that companies should continuously track their customers' satisfaction score as it effects customer loyalty of the product, and value score of their customers as it affects customer retention.

According to (Lam et al., 2004) customers' switching cost which can be either in the form of psychological investment, time or monetary cost, also helps the seller to retain their customers. Companies that focus on delivering high value to their customers and maintain high switching cost can help them to keep their customers loyal.

2.4.1 Co-creation of value

As the earlier discussed definitions of customer engagement by Brodie et al., (2011) highlights that the foundation of building engagement with customers is embedded in service dominant logic and service relationship concept. According to the author(s) presented theoretical premise, engagement can be created by involving customers in co-creation of experience and value during their interactions with the brand/firm. The concept of customer engagement also incorporates customer value co-creation. According to S. L. Vargo and Lusch, (2008), customer cocreation ''involves the (customer) participation in the creation of the core offering itself". This implies that value co-creation is dependent on customers' participation in customized customer-to-brand experiences. According to the author(s), customer behaviors such as providing feedback and suggestions to improve their consumption experience, and or helping other customers

are all attributes of co-creation, and consequently are the behaviors of customer engagement as well. Vargo and Lusch, (2004) in their study add that according to new service-centered view of marketing conjectures that the effect of customer co-creation experience is critical in evaluation of customer satisfaction. Co-creation of value during the interactions between a customer and a brand/firm is a desirable goal because it can help firms to identify customers point of view as well as improve their front-end processes to better identify customer needs and wants Lusch and Vargo, (2006).

The S-D logic lay the foundation for understanding value creation process Vargo and Lusch, (2004) presented 10 foundational premises of S-D logic that describes the marketing relationships illustrated by customers' co-creative and interactive experiences with the firm as well as with other stakeholders. Few of the foundational premises presented by the author(s) in their article are fundamental in understanding the customer engagement concept S. Vargo and Lusch, (2008). The premise 9 states that in a service relationship with customers ''All social and economic actors are resource integrators,'' which implies that value is created with use of resources made available by the firm and its partners' network. This premise of S-D logic promotes the idea of building interaction of all stakeholders and the firm within their network as well as developing their network to be able to offer best of resources to their customers to create value through their experience with the firm. Vargo and Lusch, (2004) premise 10 states that "Value is always uniquely and phenomenologically determined by the beneficiary." According to Brodie et al., (2011) this premise highlights the experiential, subjective and contextual nature of the value co-creation concept. The author(s) highlighted that this premise has its origin from the earlier concepts such as "experience economy" Pine et al., (1999) and "service encounters" Bitner, (1992). In addition, (Schembri, 2006 p388) suggests in their study that customers usually act as "prosumers" to create their own unique service experience. Customers are not merely recipients nor just co-producers in the creation of value but are equal partners in co-creation of their experience with the service provider. The S-D logic premise 9 states that "A service-centered view is inherently customer oriented and relational," which highlights that the customers service experience is highly personal in nature Merz et al., (2009). During these highly relational and interactive service experiences with the firm the customers seek to generate benefits or "value" through co-creation with the firm and other participating stakeholders in a specific service relationship (Brodie et al 2011). In the value creation process, the supplier delivers

superior value propositions and the customer evaluates the value (benefits) delivered to them once the good or service is consumed Vargo and Lusch, (2004). Prahalad and Ramaswamy, (2004) in their study highlighted that the process of value creation has now evolved and expected to deliver personalized customer experiences to informed, networked, empowered and active customers who are looking for opportunities to co-create value with the seller. Prahalad and Ramaswamy, (2000) in their study elaborated that today customers want to be involved in creating their own experiences and for customers a value is embedded in their personalized experiences contrary to past industry models where value was only created from goods and services delivered. Hence, customers should be created as equal partners to co-create value. The above discussed S-D logic premises forms the foundation for the latest customer engagement concept, according to which the customers want to participate in interactive, co-creative experiences with firms and other stakeholders in the service relationship. According to Vargo et al., (2010), these co-creative customer experiences can be interpreted as an act of engagement. Morgan and Hunt, (1994); Prahalad and Ramaswamy, (2004) highlight the important role of customer engagement in establishing valuable interactive service relationships with customers and co-creation of value.

Vargo and Lusch, (2004) research findings has been used to develop the conceptual framework for co-creation of value developed by Payne et al., (2008). In another study, Lusch and Vargo, (2006) shared five experiential marketing activities or actions for value creation that can be used by companies to create value. First action is based on the premise of customers participating as "co-producers" in a service relationship by Lusch and Vargo, (2006). Payne et al., (2008) emphasizes in building emotional engagement with customers through marketing channels such as advertising and promotional activities. Second action is to provide self-service opportunities to the customer, which means to transfer the labor or effort from the service provider to the customer e.g., the model of self-service used by Swedish retail company Ikea. Third action is that the supplier provides a unique and valuable experience for customers. Fourth action is related to enabling customers to solve a problem by themselves using the processes and tools provided by the supplier. Fifth marketing activity is that the supplier involves the customer in co-creating product designs.

(Payne et al., 2008 p. 3) conceptual model for co-creation of value also defines and elaborate the processes involved in co-creation of value in the model. These processes are based on Vargo and Lusch, (2004) S-D logic as well which emphasizes that the company activities should be a compilation of set of processes and resources utilized by the company to create value preposition for the customer. These processes may include the tasks, interactions, activities, and procedures which assist in value creation. The value creating process proposed by Payne et al., (2008) can be described as the collection of activities performed by the provider and the customer, with in the context, with use of tools and procedures which are partly organized deliberately, and are partly standard or are an intuitive behavior. In addition, during this process the relationship between the buyer and seller evolves overtime and interactive set of experiences are conducted between the buyer and seller.

The suggested process based conceptual framework of value co-creation framework by Payne et al., (2008) consist of three main components are

- Customer value-creating processes
- Supplier value-creating processes
- Encounter value-creating processes

(Payne et al., 2008 pp. 3-4) describes customers value creating processes, it includes the processes, resources, and practices which a customer organization uses to manage its business and its relationship with the suppliers. The process of customers' value creation can be defined as "the series of activities performed by the customer to achieve a particular goal". One key characteristic of customers' ability to create value is the amount of knowledge, skills, and information the customer has access to. This means that if the seller wants to improve its competitiveness, they need to improve their competence and capabilities to be able to offer better resources to the customer to be able to create value. The author adds that to create value company concentrate on creating customer experiences that are more focused on offering "value-in-use" to customers with consumption of the product or service. The value-in-use means the value consumed by the customer from the complete offering.

The supplier value creating processes includes the "processes, resources, and practices that a supplier uses to manage its business and relationship with the customers and the related stakeholders". To create value for the customer, it is necessary for the supplier to have a good understanding of customers' value-creating process. The suppliers can support co-creation of value by implementing and delivering customer relevant experiences and by enabling organizational learning. These experiences include developing co-creation opportunities for the customer, implementing solutions, and managing customer encounters with the seller. Developing co-creation opportunities for the customer offers various strategic options for the seller to create value. Some of the co-creation opportunities includes opportunities provided by new technologies, by changes in industry dynamics or by changes in customer preferences over time. By organizational learning, the author(s) refer to the knowledge a seller has about the customers' value-processes. In addition to keeping record of hard data on customer satisfaction actions, the sellers' knowledge should also include in-depth knowledge of customers' organization processes and understanding of experiences that the customer undergoes during their relationship. Sellers organizations can also capitalize on prescriptive knowledge which includes skills, techniques, and competencies within the company as a competitive advantage (Payne et al., 2008 pp. 6-7).

Third component of value-creation framework is encounter value-creation processes. Payne et al., (2008) defined encounter processes as "the processes and practices of interaction and exchange that take place within customer and supplier relationships and which need to be managed in order to develop successful co-creation opportunities." The customer encounters are referred as touchpoints whether from the company side or the customer side. These encounters involve exchange of resources such as time, products, information, and money between the two parties. Two-way communication can occur between a seller and the customer during these encounters. The author(s) suggest three forms of value co-creation encounters: communication encounters, usage encounters and service encounters. Communication encounter refers to activities that are carried to communicate with customers and to promote dialog between the two-parties. Usage encounter refers to customers' activities for using the product and service of the seller. It also includes the services that facilitate the usage of sellers' product and service. Service encounters includes the customer interactions with the customer service personnel. To effectively manage the encounter during value-creating process it is critical for the

supplier and the customer to set predetermined goals and evaluate continuously how well these goals are achieved. To manage co-creation of value during customer experiences, the seller needs to identify which type and channels of encounters are preferred by the customers. Each customer encounter has a different effect on customers, to have best impact on customer experience the type of customer encounter should be chosen wisely. Some of the categories of encounters are: "emotion supporting encounters—themes, metaphors, stories, analogies, recognition, new possibilities, surprise, design; cognition supporting encounters—scripts, customer promises, value explaining messages, outcomes, references, testimonials, functionality; and behaviour—and action-supporting encounters—trial, know-how communication, and usage of the product.". Only some encounters are necessary for building an engaging customer experience while others may not be as critical in value co-creation. Payne et al., (2008) also suggested to adapt the communication and value propositions delivered to customers during their encounter with the seller based on the history and length of customers relationship with the seller and based on the needs of different customer segments. Communication with customers should be conducted on all relevant channels and each encounter should be used for various communication goals, the seller should identify which encounter supports emotion, cognition, and action-based learning for the customer to modify communication message accordingly.

2.5 Customer experience

Past research highlights that experience of a customer drives customer satisfaction and eventually leads to customer loyalty. Caruana, (2002) determines customer experience as key determinant of customer satisfaction and loyalty. Other studies also suggest that customer experience not only drive satisfaction Anderson and Mittal, (2000) and loyalty Fornell et al., (2006) but also is responsible for word-of-mouth behavior in customers Keiningham et al., (2007). Klaus and Maklan, (2013) reviews of past research have identified that customer experience has more significant effect on customer loyalty and word-of-mouth behavior than customer satisfaction. In addition, the concept of engagement includes the involvement and participation from customers is based on presence of interactive and co-creative customer experiences with the brand and firm Brodie et al., (2011). Customer interactive experiences with the brand/firm not only impacts customer satisfaction but also influences creating engaged customers. Hence, in

this research the author will be exploring variable of customer experience and its impact on customer satisfaction to evaluate the role of variable of customer experience in achieving satisfaction and building engagement.

Verhoef et al., (2009) in their study on customer experience with focus on retail industry defined customer experience as customer's subjective response to all their direct and indirect encounters with the firm, which includes but are not limited to consumption encounter, communication encounter and service encounter. Meyer and Schwager, (2007) explained that direct customer contact mostly occurs during purchase, consumption, and service contacts and are usually initiated by the customer. Indirect contact are unplanned encounters with the sellers' products or services. These encounters often take form of word-of-mouth recommendations or criticisms, advertising, and reviews etc. This conceptualization of customer experience by Verhoef et al., (2009) was later supported by other researchers in their prominent literature on customer experience Lemke et al., (2011), Klaus and Maklan, (2013), Verhoef et al., (2009). Verhoef et al., (2009) further elaborates the construct of customers' experience, the author(s) add that customers' experience comprise of total experience, which means it includes the search, purchase, consumption, and after-sale phases of the experience. The customer experience is not only determined by the elements in control of the retailer (seller), but it also includes the elements which are out of retailers' control. In addition, customer experience construct is holistic in nature which involves customer's emotional, social, cognitive, affective, and physical responses to the seller. The author(s) argue that prior customer experiences have an influence on customers future experiences with the brand/firm. According to Gentile et al., (2007)

> "The customer experience originates from a set of interactions between a customer and a product, a company, or part of its organization, which provoke a reaction. This experience is strictly personal and implies the customer's involvement at different levels (rational, emotional, sensorial, physical, and spiritual)."

Verhoef et al., (2009) conceptual framework for customer experience creation identifies several determinants of customer experience and some of which are customers' social environment, service interface and brand. The author(s) also recognize the fact that customers' experiences in one channel of encounter (e.g., a store) may also be affected by their experiences in other channels of encounter (e.g., the Internet). The Social environment in which the customer is interacting with the firm or other customers also

has an impact on their experience with the seller. Customers can also affect each other's experience with the seller directly or indirectly Bitner, (1992). Customers can not only interact and influence each other's experience in a brick and mortar environment but also communicate with each other online e.g. on company websites (Kozinets, 1999), (Rheingold, 2000). Customers also interact on virtual communities which provides an opportunity for more enriched customer experience and can help build customer loyalty. Virtual communities offer a forum for customers where customers can exchange relevant information and social communication can be nurtured.

Verhoef et al., (2009) further explains the determinants of customer experience creation. According to the author(s), the service interface of customers can be with the seller's service personnel or managed by a self-service technology. Self-service technology has a substantial effect on customers perception of their experience with the seller. More and more customer interactions with the seller or employees of the seller are now moderated by technology. The author(s) explain the third determinant of customer experience i.e., brand. And are in consensus with the past research findings that customer's experience has a significant effect on their perception of the brand.

Klaus and Maklan, (2013) examine in their study that a more suitable measure of customer experience is needed. The author(s) identify from study of past research that most firms use customer satisfaction or its derivative Net Promoter Score to measure customer experiences. They add that service quality measurement scale – SERVQUAL is also not a suitable scale because service quality focuses on service provider and neglects the value consumed by the customer during their interaction with the seller. In this study, author(s) presented a new measurement scale Customer Experience Quality (CXQ) for modern customer experience conceptualization. The study results show that customer experience evaluated based on its contribution to value-in-use and proposes that value-in-use has a mediating effect on customer experience quality as well as relationship outcomes. Customer experience quality measurement scale includes measurement of seller's product and services but also customer-to-customer and supplier encounter experience. The study results showed that B2B customers place great value to firms' conducted actions in understanding and delivering to value-in-use. Maklan and Klaus, (2011) argues that customer experience begins before their encounter with service begins and continues even after the service interactions. The experience of a customer with the

service is measured across all channels of their encounter with the firm. The below figure shows the conceptual model of customer experience quality formulated and validated by Klaus and Maklan, (2013) in their study.

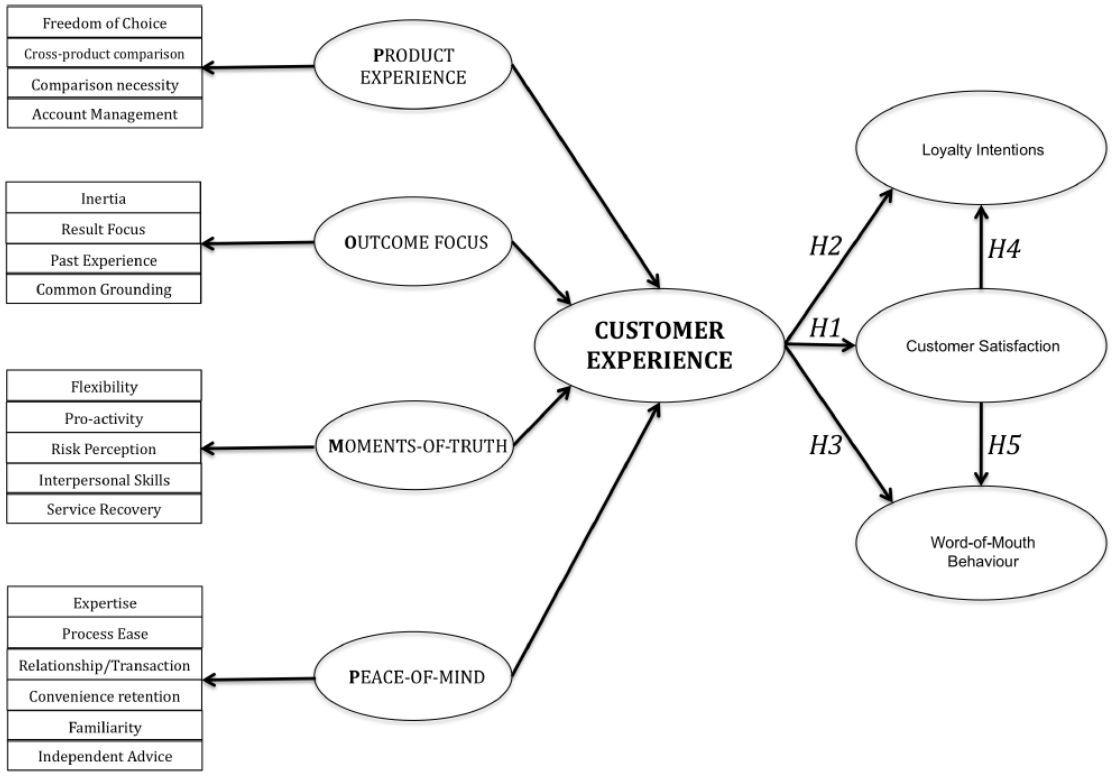

Figure 5. Customer experience quality conceptual framework by (Klaus & Maklan 2013)

The author(s) in their study validated product experience, outcome focus, moments-of-truth, and peace-of-mind as the dimensions of customer experience quality scale. The study finds that all four dimensions have a significant positive impact on customer satisfaction, loyalty and word-of-mouth behavior. Maklan and Klaus, (2011) described Product experience as customers perception about the availability of choice and the ability to compare between different offerings. Outcome focus refers to the importance of delivering goal focused customer experiences. Moments-of-truth refers to importance of sellers' ability to service recovery in situations where customers face any issues. Peace-of-mind is described as the customer's evaluation of all their interactions with the seller before and after the purchase of the product & service.

Klaus and Maklan, (2013) study highlighted that moments-of-truth and peace-of-mind have the highest effect on all three marketing outcomes - customer satisfaction, loyalty, and word-of-mouth behavior. However, *Peace-of-mind* seems to have the highest effect on customer satisfaction and word-of-mouth. Of all the dimensions *Moments-of-truth* had

the highest effect on customer loyalty intentions. The study results also validate Payne et al., (2008) research results that customers evaluate both direct and indirect encounter experiences with the firm which includes all customer touch points after-sales care, advertising, online presence or conducted marketing communications. The study results also showed that customer experience has a significantly higher positive both direct and indirect effect on customers' behavioral loyalty intentions and word-of-mouth than customer satisfaction. In addition, the results highlighted that customer experience has most significant direct effect on customer satisfaction. And customer experience also has a positive effect on customer word-of mouth behavior and loyalty intentions. This study not only highlighted customer experience as a key determinant of consumers behavior intentions and but has also emerged as a critical strategic goal for firms to achieve. Klaus and Maklan, (2013) customer experience quality measurement scale - EXQ can help managers to monitor and evaluate the dimensions of customer experience and their effect on intended marketing outcomes.

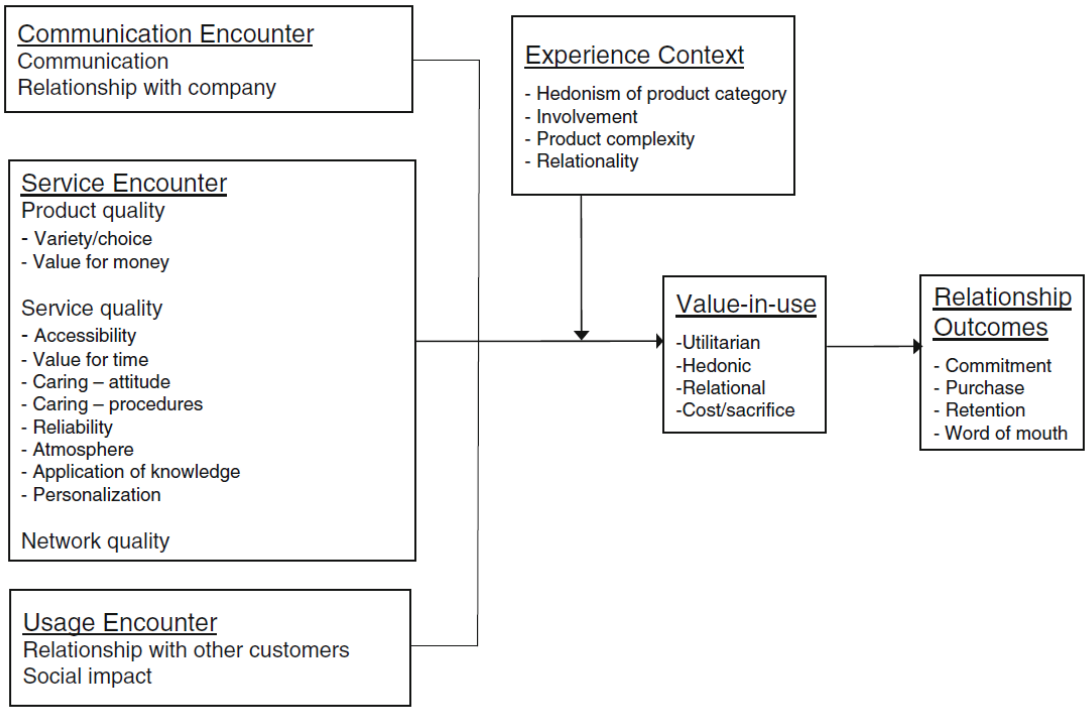

Figure 6. Conceptual model of customer experience quality by (Lemke et al. 2011)

Lemke et al., (2011) in their study has proposed a holistic conceptual model for customer experience quality and its impact on customer relationship outcomes such as customer commitment with the brand, retention, repurchase intention and word-of-mouth. The

conceptualization of customer experience in the study is also based on customers response to all the direct and indirect encounter with the firm. Based on service-dominant logic, the author(s) also argue that customers evaluate their experience based on its perceived contribution to value-in-use, which focuses on achieving customer's hedonic or functional objectives or outcomes, as well as the customer's objectives to be achieved with the use of product & service offered to them. Hence, the authors propose that customer experience quality is also assessed by its impact on value-in-use and presented a proposition that "*Value-in-use mediates between customer experience quality and relationship outcomes such as commitment, purchase, retention and word-of-mouth*" (Lemke et al., 2011 p. 15). The author(s) also add that value-in-use is not just dependent on the quality of product and service but also on customers experience such as peer-to-peer interaction and usage of offered product & service. Lemke et al., (2011) also defines the concept of customer experience quality as a perceived judgement of customers about the excellence or superiority of their overall experience. The author(s) argue that customers evaluate the experience quality throughout their customer journey which includes the evaluation of their encounters termed as communication, usage and service encounter by Payne et al., (2008).

Lemke et al., (2011) identified seven key constructs of customer experience quality for B2B customers which includes extent of personal contact, flexibility, implicit understanding of customers' needs, concern to elicit customer's objectives, proactivity in checking everything is OK, promise fulfilment and knowledge. The study's conceptual model of customer experience quality categories is divided according to Payne et al., (2008) theory into communication encounter, service encounter and usage encounter. Outcome category represents customers evaluation of both perceptual and factual outcome achieved throughout customer experience. Unlike Payne et al., (2008) study assumptions, value-in-use acts as a mediator between customer experience quality and the relationship outcomes.

In the study the communication encounter is divided into two categories. Communication category relates to "*clear, open, responsive, proactive and effective communication with the customer throughout the company and through the transactional customer journey, from initial contact through the purchase process and after purchase*." Whereas the construct of communication also includes the communication conducted within the

supplier organization, the customer also evaluates the company processes and touchpoints. The second category of communication encounter includes relationship with the company. This category refers to quality of the relationship maintained by the supplier over time with the customer and the extent that the seller values the relationship with the customer. Valuing a relationship with the customer means that the seller acknowledges all the benefits received by the firm in the relationship and is also willing to invest in the relationship (Lemke et al., 2011 p. 16).

The service encounter category is divided into product and service quality. The product quality includes variety/choice which refers appropriate variety of products provided by the company to the customers. Product quality also includes the sub-category of value for money which can be defined as "*pricing of products and services that reflects benefits delivered and relationship status*". Zeithaml, (1988) study views value for money as an embedded value in the service and product quality. The service quality is divided into eight sub-categories which are related to SERVQUAL (Parasuraman et al., 1988). Service quality includes caring – attitude, caring – procedures and reliability are closely related to SERVQUAL dimensions empathy, assurance, and reliability, respectively. The category of accessibility is closely related to different items from SERVQUAL. Value for time relates to responsiveness in SERVQUAL. This category emphasizes more on the effect of seller's service on customer's time. Atmosphere category refers to "the extent to which the company enables a pleasant and relaxing environment". Personalization refers to adapting and customizing the solution according to the needs of a customer and dealing with the customers in a personal way. The category of network quality refers to the extent of appropriate competencies that a company can offer to customers from its internal and external network. The study highlighted that customers view seller's capability to source from its suppliers, capability to provide advice when needed to the customer and to provide advice from subject experts as beneficial (Lemke et al., 2011 p. 16).

The usage encounter is represented by two categories - relationship with other customers and social identity. Relationship with other customers refers to "the role of other customers, including their identity and their involvement in value creation". Presence of this category to evaluate customer experience quality implies that customers also evaluate the quality of peer-to-peer encounter as part of their overall experience with the seller. Seller's performance in experience quality is evaluated against peer-to-peer encounter

even if it does not fall under the seller's direct control (Verhoef et al. 2009). Social impact refers "to the impact of products/services on the customer's own image" (Lemke et al., 2011 p. 17).

2.5.1 Relationship outcomes, value-in-use and experience context

The conceptualization of customer experience quality in the study has led to conclusion that it eventually leads to value-in-use and relationship outcomes. The construct of relationship outcome represents whether the customer and supplier relationship has resulted into behavioral outcome of customer's purchase of the product or service. The study has focused on four perceptual and behavioral outcomes of the relationship which includes commitment, initial or cross-buying purchase, retention, and word-of-mouth.

The category of experience context is defined as "*the aspects of the industry, market or product category which may shape expectations of the experience*". The category is divided into four themes – First theme is that the product and service category is inherently hedonic in nature and has a direct relationship with whether the customer seeks hedonic value-in-use in their experience with the product and service. Second is involvement which means that customer service and experience expectations are influenced by their transactional level of investment towards the seller. The higher the transactional investment from customer higher will be the service expectations. Third, the product and service complexity refer to the importance of seller's capabilities in application of knowledge, customization abilities and communication effectiveness to tackle complex product and services. Fourth is the relationality of some product and service categories. It means that some product and services are more relational in nature where the repurchase of the product is regular hence, to maintain high relationship quality for these product & service categories is very important.

Lemke et al., (2011) study also validated that customer seek experience quality and not just product and service quality from a solution. The study results also confirm that role of other customers and other actors in a service relationship also has a role in co-creation of customer experience.

Direct or indirect contact of a customer with the seller prior to product or service purchase includes customer experience with seller's marketing communications, information about other customers experience through word-of-mouth or potential customers encounter with company website or visit to their stores. Indirect contacts of the customer include customers' consumption experience of the product or service to achieve their goals.

3 RESEARCH METHODOLOGY

3.1 Nokia's private wireless network solution

Nokia's solution is a plug & play private wireless network solution with analytics capabilities to boost the digital transformation of any business. It is an end-to-end solution that enables private wireless networking and industrial automation use cases. The solution offers a robust wireless connectivity in remote and harsh industrial environments. It is a private LTE network, powered by latest edge cloud computing technology and micro services framework. It allows low latency wireless communication in a secure and reliable manner to fulfill various performance requirements. It is a combination of hardware and web based self-service portal. It is designed to ensure ease of deployment with plug and play platform in industrial use. The business model is 'Pay-as-you-grow' which allow customers to scale up or down based on their business needs. Businesses can start with a low initial investment and be cost efficient with an optimized network scale. Customers can store data locally and have full control over it. Data can also be shared between cloud networks if needed. In addition, customers can adjust to their network scalability needs of coverage and capacity.

3.2 Qualitative research

This chapter describes the adopted qualitative methodology for this research. This research approach is used to build a deep understanding of the problem under research Thomas and Magilvy, (2011). As the research problem of this study is not theoretical but practical in nature, hence a qualitive research methodology is suitable. It has allowed to gain in-depth insight from Nokia customers on their satisfaction level with the solution

and as well as document their feedback on what dissatisfies them. In addition, the chapter elaborates the adopted method of research and data collection technique of the study.

The purpose of this study is to identify and understand the reasons behind the satisfaction or dissatisfaction of Nokia customers. In addition, the researcher also aims to identify the ways current customers would prefer to engage with the brand and the type of engagement activities they would like to participate in the future.

3.3 Sample selection method

To collect qualitative data, face-to-face in-depth interviews were conducted with existing customers of Nokia in Finland. A sample selection criterion was set to select potential participants for the study. Companies that have already been testing Nokia's private wireless connectivity solution for various use cases for few months, and or have enrolled the solution commercially were targeted to participate in the study. Criteria used for selection of the participants were that one must be a key stakeholder with implementation and governance of Nokia's solution within their company. In addition, the targeted participant should have good technical knowledge of the solution, its performance capabilities, and the processes of Nokia business operations as well as its impact in achieving customers' business goals. Based on the participants accessibility seven customers were contacted after consultation with Nokia's business development team to participate in the study. Six customers from five different industries agreed to participate in the study and represented mining, transportation, maritime, manufacturing and facilities industries whereas one customer belonged to a research institution. With participants from various industries helped to collect industry specific insights.

3.4 Data collection method

In this study, primary data is collected through qualitative data collection method of in-depth interviews. To achieve the aim of this study, it was important for the researcher to collect rich data which can provide deep insights on the opinions and perceptions of the participating customers to understand the reasons within context behind their behavior. In-depth interview technique is mostly used to help generate a large amount of data Neuman, (2006).

The selected participants of the study were approached via email to be informed about the purpose of the study and schedule a face-to-face meeting. The interviews were scheduled for 60 min with each participant in relaxed office environment to ensure the comfort of the participant. Many ethical considerations were taken in account for data collection. Such as a formal written consent was taken from the participants to document their opinions and perceptions about the topic understudy. A consent form was signed between the customer and the researcher prior to the interview. Also, Participants anonymity is maintained in this study and the right to access the collected data is only restricted to the researcher. However, the results of the study will be disclosed within Nokia and published in this research.

Semi-structured interviews were conducted to collect customer responses. Open-ended questions were formalized for the interview guide to help customers share their opinions, experience, and feelings about the solution. Semi-structured interview allows an interviewee to have open discussion with the researcher and even provide information to the interviewer which he/she may not have even considered.

All the interviews were scheduled for Nov 2019 and same interview guide was used for all the participants, see Appendix I. Interview guide was sent to participants 2-5 days prior to the interview. The questions in interview guide were related to the discussed variables in the literature review and targeted to cover the following topics during the interview:

- Customer needs
- Customer satisfaction with Nokia's solution product quality (features & performance), service quality and pricing model
- Customer satisfaction with Nokia's pre- and post-purchase experience
- Customer satisfaction with communication
- Customer dissatisfaction with Nokia's solution product quality (features & performance), service quality and pricing model
- Customer perceived value of Nokia' solution
- Customer perceived value of collaboration with Nokia

- Trust on brand
- Product recommendation
- Customer engagement activities satisfaction

The questions for interview guide were compiled based on the identified determinants of customer satisfaction and customer engagement. The interview guide questions were divided into different sections to evaluate identified variables in theoretical framework section effecting customer satisfaction and engagement. Questions in "Customer satisfaction" section were designed to understand customers current satisfaction level and how well Nokia has been able to deliver to customer expectations and their needs. Following Oliver, (1977)'s model of disconfirmation of beliefs, we know that satisfaction with a product or service is dependent upon customers' positive product performance perception after the purchase experience with relation to their pre-purchase experience. According to the model customers expectation from a product or service is formed by the promises made to the customer or other customer past-experiences such as WOM or ads etc. (Parasuraman et al., 1985) model of customer satisfaction is used to formalize questions related to "Customer value", according to the model customers' satisfaction can be determined based on their perception of value received with purchase of the product and the relationship with the seller.

Service & product quality section questions caters to questions related to customers experience quality, service quality, service delivery quality and product quality as determinants of customer satisfaction. The questions related to this section were formalized based on the variables identified in Lemke et al., (2011)'s conceptual model of customer experience quality shown in Figure. 6 as antecedents of customer experience quality which has a positive effect on customer commitment and retention with the brand. According to Lemke et al., (2011) customer experience quality also leads to customer satisfaction via value-in-use. Value created during customer pre- and post-purchase experience improves the quality of customers experience.

Interview questions formalized in "Customer engagement" were intended to understand customers current engagement level and evaluate their trust in the brand, willingness for brand recommendation, loyalty, and their future intentions of maintaining strong relationship with the Nokia through marketing activities. All these are consequences of

engaged customers according to (Vivek et al., 2012) conceptual model of customer engagement shown in Figure 3.

To maintain the anonymity of the participants, participant names and their company names are kept confidential in this study.

- First interview was conducted with customer I1, Post-doctoral researcher at a technical university. The interview was conducted at customer's office premises in Lappeenranta on 25.11.2019. The interview continued smoothly for 120 mins instead of the earlier agreed 60 mins. The customer consented to continue the interview even after the scheduled time.
- Second interview was conducted with customer I2, a solution architect at a global Finnish company operating in facilities industry. The interview was conducted at Nokia office premises in Espoo on 26.11.2019. The interview was completed in 60 mins and without any interruptions.
- Third interview was conducted with customer I3, Port digitalization manager at a Finnish company operating in maritime industry. The interview was conducted at customer's office premises in Oulu on 28.11.2019. The interview was completed in 90 mins without any interruptions and the participant consented to continue the interview after the scheduled time.
- Fourth interview was conducted with customer I4, Head of excellence and development at a global Finnish company operating in manufacturing industry. The interview was conducted at customer's office premises in Oulu on 28.11. 2019. The interview was completed in 80 mins without any interruptions and the participant consented to continue the interview after the scheduled time.
- Fifth interview was conducted with customer I5, Director of automation research at a global Finnish company operating in transportation industry. The interview was conducted at customer's office premises in Tampere on 29.11.2019. The interview was completed in 90 mins without any interruptions and the participant consented to continue the interview after the scheduled time.
- Sixth interview was conducted with customer I6, Head of Technology sourcing and new product development sourcing at a global company operating in mining industry. The interview was conducted at customer's office premises in Tampere

on 29.11.2019. The interview was completed in 70 mins without any interruptions and the participant consented to continue the interview after the scheduled time.

The customer interviews were recorded and total 450 mins of data was transcribed for analysis. Most of the questions asked from the customer were from interview guide, however some probing questions were also used to get more in-depth understanding of customers responses whenever needed.

3.5 Data analysis method

The purpose of data collection is to organize and elicit meaning of collect data and draw realistic conclusions from them. The approach adapted for content analysis for this study is qualitative and interpretations are drawn from the words and themes that has emerged in the collected data. The analysis of the collected data is conducted as a manifest analysis because the information shared by the research participants was very direct and clear to interpret.

As a first step of data analysis the transcribed interviews were read thoroughly to identify meaning units or words that may contain insights which are useful to answer the research questions. Each meaning units or also called sub-headings represents a similar opinion, perception, or insight from different customers regarding a specific concept or category. A customer response was added to the meaning unit only if 50% of the customers has shared a similar response, however if a customer has any complain, faced a unique problem, or has a unique request in that case a meaning unit was created. The identified meaning units were then coded into a sub-category which represents the most prominent or recurring insights in customer responses. Several different meaning units may have a common sub-category as each meaning unit/sub-heading helps to elaborate and explain variable more in-depth. The collected data was then organized into categories for analysis. Each category is homogenous in nature but comprise of several sub-categories which highlights the customer responses to the variables under study and answer research questions. The data was reviewed three times until no new meaning units were identified and was closed with 8 main categories, 28 sub-categories and several more meaning units/sub-headings. Below is the snippet of analysis of the transcribed data into sub-categories and categories:

Table 1. Categories of transcribed data

Meaning unit	Sub-category/Code	Category
Because this kind of port is really like a process and 24x7 and it must operate all the time and if you stop that kind of operation it is causing a lot of troubles and a lot of costs. So, it is very crucial that it is reliable	continuous business operation Network reliability need	Customer needs
The other topic what we have been doing quite a lot in the research is the latency because we are remote controlling our machines and then you have feedback for the operator is mainly the video screen and so the latency is very important so that you can really control the machine.	Network low-latency for remote controlling machines & video processing	Customer needs
The amount of IoT data is increasing, the current system is heavily relying on WIFI and if you consider the capabilities of WIFI and then you start implementing lot of heavy data intensive product into the process such as lighter image analysis that is a mismatch with WIFI you need something else. You need quicker and more reliable connectivity.	High-capacity networks to manage large IoT data flows Network with high data processing speed network	Customer needs
I think the speed, latency, and bandwidth these are in which we are interested and of course one of our expectation.	High speed network High bandwidth network	Customer needs
we have had separate solution for the safety signals for example separate solution for control administering signals because of the reliability to communication. But now they have seen that there are possibilities in mobile technology and there are quite many ways to guarantee the bandwidth for video signals and safety signals	High bandwidth network needs	Customer needs

have and this were important things why we were interested in this technology.		
we have devices that are remotely controlled or monitoring data remotely and then we gather the data from these devices connected to the solar PV power plants around (customer office premises) and those are then connected. First those were connected to the copper wire connected to the intranet of (Customers company) and then we have the remote cloud system somewhere to servers. The servers are somewhere in Finland, so all the data is gathered there. From that server the data is used for different purposes to monitor. So basically, we can monitor online for instance what is the current solar PV production hour by hour, min by min." (I1)	Remote real-time data analysis and transport of data	Customer needs
My focus is on our end-user and port ecosystem and what kind of data do they want and what kind of data could help them to improve their own operations and what kind of data could be useful for us	Real-time data analysis and transport of data	Customer needs

Below is the complete code list of identified categories. Main categories are shown in **bold,** sub-categories are shown in bullets (•) whereas their sub-headings are shown with lower-level bullets (-):

Table 2. Code list of categories

Sub-category and category codes	Codes description
Customer needs	To satisfy customers it is important to understand their needs and what expectations they have of the performance of the solution. This category highlights customers' current and future need for a private industrial grade wireless network.

• Need for reliable and low-latency network	
• Need for high bandwidth and high-speed network	
• Need for data analysis	
• Future needs of customers	
Customer expectations	This category highlights how Nokia's solution has delivered to their expectations.
Customer promises	This category highlights how Nokia's solution has delivered to their pre-purchase promises.
Customers' satisfaction with Nokia's private wireless connectivity solution	
• Satisfaction with product quality	As explained in the theory and model used to create our interview guide customers satisfaction with the product quality and service quality effects customers satisfaction with the solution. Hence, satisfaction with product quality is one of the sub- categories to understand customer satisfaction with Nokia's solution. However, a product's quality can be evaluated through its performance and features offered in the solution and analyzed in this study as a sub-category of "Satisfaction with product quality".
• Performance of Nokia's solution	
• Satisfaction with product features	The in-depth interviews highlighted various product features of Nokia's solution with which customers are currently satisfied. These product features are listed as sub-headings of "Satisfaction with product features". The sub-headings highlight the features that has delivered to customer expectations.
- Satisfaction with network reliability	
- Satisfaction with network latency	
- Satisfaction with network privacy	

- Satisfaction with network management and configuration	
- Satisfaction with the solution web portal	
• Satisfaction with service quality	Past research provides evidence that the quality of service offered to the customer contributes towards the satisfaction of customer. Satisfaction of service quality is second sub-category of "Customers' satisfaction with Nokia's solution" in addition to product quality. In this study, customers' service quality perception is evaluated against dimensions of SERVQUAL measurement scale.
- Reliability	
- Empathy	
- Accessibility	
- Communication	
• Satisfaction with customer experience	Customer's experience is a key determinant of customer satisfaction and is another sub-category of "Customer satisfaction with Nokia's solution". Total customer experience includes customers' pre-purchase, consumption, and post-purchase stages. In addition, variables such as customers perception of product price, and value-in-use received by the customer are also determinants of customer experience satisfaction. Satisfaction with customer experience has two sub-headings which includes "Satisfaction with post-purchase process", "Satisfaction with product price" and "Customer value"
• Satisfaction with post-purchase process	In this study the author evaluated customers satisfaction with post-purchase process by evaluating customers response to the service delivery process of Nokia which includes network planning, hardware delivery and installation, network coverage performance, as well as network service and maintenance performance. Satisfaction with post-purchase process has few sub-

	headings which are network planning, network installation, and network service and maintenance.
- Network planning	
- Network installation	
- Network service and maintenance	
• Satisfaction with product price	
• Customer value	Positive customer perceived value contributes to positive customer experience and satisfaction of the customer with the solution. Customer value can be evaluated through customers perception of the value co-created through the collaboration and relationship with the seller. In addition, evaluating customers perception of the value delivered by the product itself helps to determine their satisfaction. Customer value has three sub-headings which are "Customer perceived value of business collaboration with Nokia", "Customer perceived value of co-creation with Nokia" and "Customer perceived value of the solution".
- Customer perceived value of business collaboration with Nokia	
- Customer perceived value of co-creation with Nokia	
- Customer perceived value of the solution	
Customers' dissatisfaction with Nokia's solution	This category highlights the causes of customers current dissatisfaction with Nokia's solution and their business operation. And it has below four sub-categories.
• Issue with software updates	
• Improvements in network recovery and fault diagnostic reports	
• Enabling partners for better network service	
• Need for account managers	

• Improvements in network service & maintenance process	This sub-category highlights the improvements in service quality as expected by the customers in future which may also affect their satisfaction with the solution.
• Structure network service and maintenance process	
• Improvements in post-purchase customer communication	This sub-category highlights the improvements in communication process as expected by the customers in future which may also affect their satisfaction with the solution.
- Communication in case of network failure and software updates	
- Mode of communication in crisis/ network failure situations	
- Roadmap visibility	
• Improvements in product quality and performance	This sub-category highlights the improvements in product quality as expected by the customers in future which may also affect their satisfaction with the solution.
- Improving network latency issues	
- Bandwidth limitations of Nokia's solution	
• Introducing new features in the solution	This sub-category highlights the improvements in overall product features requested by the customers in future which may also affect their satisfaction with the solution.
- Run applications on the edge cloud	
- Narrow Band IoT feature	
- Adding API to Nokia's solution web portal	
• Improvements in web portal	This sub-category highlights the improvements in web portal of the solution as expected by the customers in future which may also affect their satisfaction with the solution.
- Network analytics feature	
- Network slicing capability	
- An integrated web portal	

- In-depth view of network and self-diagnostic tools	
Customer engagement	This category highlights the current engagement level of customers and their opinion about Nokia's past engagement activities as well if they would like to increase their participation in Nokia's future engagement activities.
• Customer engagement through promotional activities	
• Customer engagement through marketing content	
• Building engagement through close customer and partner collaborations	
Customers trust on Nokia's brand	Customer trust is a consequence of customer engagement and this variable indicates customers future intention for brand recommendation
Customer recommendation	This category highlights customers response to recommending Nokia's solution to others in future. This category is very important in understanding whether customers are loyal to the brand or not and will they advocate for the brand in future.

4 RESULTS

This section presents the results of a qualitative data analysis with use of content analysis technique. Based on the questions from the interview guide the collected data has been carefully categorized into 8 categories. These categories are used to conceptualize the insights collected in the data. The collected data consisted of many sub-categories for each category which are analyzed below with their interpretations as well.

4.1 Customer needs

To satisfy customers it is important to understand their needs and what expectations they have of the performance of the solution. Brodie et al., (2011) study finds that customer

satisfaction can be achieved by delivering to customer needs and with the transfer of value. Many other studies such as Vavra, (1997), Ganguli and Roy, (2011) provide evidence that it is imperative for sellers to adjust product/services according to customer needs and deliver to their service quality expectations to satisfy the customers. (Sashi, 2012) in his study suggests that it is important for organizations to keep themselves informed of changing customer needs and expectation through continuous customer feedback and engagement.

The qualitative data highlighted some of the common needs of our customers across the industries.

4.1.1 Need for reliable and low-latency network

The need for a low latency and a reliable network is highlighted as one of the most crucial needs in the collected data across all industries. Both network qualities are of high importance for industry specific use cases and in implementation of a private wireless network solution. Customers informed that some of these needs cannot be fulfilled by legacy IT network solutions or even WIFI and hence, they have moved to Nokia's private wireless network solution which cater to their industrial automation network needs. Below are some of the responses of the customers when asked "How does Nokia's solution currently deliver to their needs?".

> "Because this kind of port is really like a process and 24x7 and it must operate all the time and if you stop that kind of operation it is causing alot of troubles and alot of costs." (I5)

The same customer further elaborates on their network needs such as high reliability and low latency to implement their industrial automation use cases.

> "So it is very crucial that it is reliable and the other topic what we have been doing quite alot in the research is the latency because we are remote controlling our machines and then you have feedback for the operator is mainly the video screen and so the latency is very important so that you can really control the machine." (I5)

4.1.2 Need for high bandwidth and high-speed network

A customer from mining industry also highlights the importance of network reliability and its ability to manage large data flows with high bandwidth capacity for their industrial

automation use cases. And refers to Nokia's solution to be their choice to fulfill their need for a reliable and high bandwidth network coverage.

> "The amount of IoT data is increasing, the current system is heavily relying on wifi and if you consider the capabilities of wifi and then you start implementing lot of heavy data intensive product into the process such as lighter image analysis that is a mismatch with wifi you need something else. You need quicker and more reliable connectivity." (I6)

Another customer from facilities industry also shared that Nokia's private wireless network features such as high data processing speed, low-latency and higher bandwidth cater to their needs and is what they expect the solution to deliver to fulfill the promise.

> "I think the speed, latency and bandwidth these are in which we are interested and ofcourse one of our expectation." (I2)

One customer from transportation industry explains that Nokia's solution offers them with best of mobile technology through which they can now fulfill their high bandwidth needs for various use cases. The customer shared that due to data intensive automation use cases such as real-time data analytics it is very critical for their business to have a high bandwidth capacity network that can cater to their large data flow needs.

> "we have had separate solution for the safety signals for example separate solution for control administering signals because of the reliability to communication. But now they have seen that there are possibilities in mobile technology and there are quite many ways to guarantee the bandwidth for video signals and safety signals have and this were really important things why we were interested in this technology." (I5)

4.1.3 Need for data analysis

Customers has a need to transport real-time data on regular basis between the devices and destinations which requires high-capacity network and provide useful data analytics to end users for their industry automation use cases.

> "we have devices that are remotely controlled or monitoring data remotely and then we gather the data from these devices connected to the solar PV power plants around (customer office premises) and those are then connected. First those were connected to the copper wire connected to the intranet of (Customers company) and then we have the remote cloud system somewhere to servers. The servers are somewhere in Finland, so all the data is gathered there. From that server the data is used for different purposes to monitor. So basically, we can monitor online for instance what is the current solar PV production hour by hour, min by min." (I1)

One customer from mining industry highlights that it is critical for them to have a high-capacity network that can fulfill their and the end user's data analysis needs.

> "My focus is on our end-user and port ecosystem and what kind of data do they want and what kind of data could help them to improve their own operations and what kind of data could be useful for us" (I3)

4.1.4 Future needs of customers

Customers also shared few of their future needs in their industry which require even lower latency rates than currently provided by 4G for few of the use cases. Customers plan to adopt the 5G technology for use cases which cannot be run on 4G network due to certain limitations in the 4G LTE standard such as latency and bandwidth capacity to mention a few.

> "For example in smart grids there are protection applications which require very low latency and then there are local solutions or wired solutions if there is some faulty situation then you have to trigger the protection system asap and the latency can be as low as few 10's of ms and in near future the application can require even more lower latency meaning few ms." (I1)

As customers progress in their journey of industrial automation, the capability requirements from mission-critical private wireless networks will be more demanding. Customer use cases require ultra-reliable networks with latency rates way lower than 20ms.

> "Why we started this kind of research analysis in this ultra-reliable low latency communication that is really pointed out in 5G and if you look at those requirements and what kind of things are there (in the standard) they are really promising. And I think in near future we can have that kind of features available." (I5)

The customers shared that for adoption of 5G they first need to test and validate the capabilities of 5G network to evaluate how well the technology can deliver to customer needs and deliver to their expectations from the new standard. However, the customers also emphasized that they still need to further test the capabilities of 4G technology to understand what the limitations are of 4G technology and for which use cases 5G technology will need to be adopted.

> "If and when we want to do something related to 5G and if investing in future some 5G system for instance from Nokia then we would have two system operating in parallel and ofcourse that would give us also better and more flexible platform to do different things because we know that 4G LTE cannot do basically everything and this is obvious that this is written in the standards in 5G. Then again this is the hype that now 5G is coming and everything or new revolution is coming with 5G and you can do this and that with it. But the question is from my perspective what are the real needs? what you can do with 4G LTE and basically you don't need 5G for those and my other questions is what are the limitations of the 4G? How far we can go with LTE and where is the limit and where we need to look for next generation 5G solution." (I1)

4.2 Customer expectations

To satisfy the customers, it is important that not only customer needs are met but also the product/service delivers to their expectations as well. Customer expectations forms the basis of customers satisfaction level. According to Oliver, (1977)'s theory of Expectation confirmation theory the post-purchase satisfaction of customers is influenced by their pre-purchase expectations. Customer expectations directly influence the customers post-purchase perceived performance of any product or service. (Sashi, 2012) study confirms that customer engagement focuses on delivering to customer expectations to build engagement with them.

The customer interviews provided insights on expectations that the customers have from the Nokia's solution and Nokia team in the future. With certain limitations of the 4G technology, customers share that Nokia's solution delivers to many of their expectations but not all of them. The solution has few limitations such as network bandwidth which limits the use of network for few use cases and the design of the network needs to be adjusted to overcome these limitations.

> "Yes, quite many of the expectations from the solution has fulfilled but not all.Tthat's why we are waiting still for the 5G. If you are thinking about the stair carrier it is fulfilling quite well the requirements but not all requirements which are related to the cranes. And so, we have to really optimize what is the bandwidth for the remote control and we have design carefully because there are limitations. But it is fulfilling quite many of those requirements that we are setting to the automation and that is quite good." (I5)

Another customer from facilities industry added that they are satisfied with the solution performance currently but are looking forward to its upgrade to 5G standard in the future.

> "It's going to be upgraded, it has a natural path to 5G, so we are happy as we are today. But we are also happy that there is a road map." (I2)

Another customer from transportation industry adds:

> "Why we started this kind of research was this analysis of ultra-reliable low latency communication that is really pointed out in 5G and if you look at those requirements and what kind of things are there they are really promising and that is really good. And I think in near future we can have that kind of features available." (15)

Another customer from maritime industry shared that they expect guidance and facilitation from Nokia to be able to achieve their goals.

> "Well I expect that the NOKIA'S team are going to be facilitators of what we are trying to do. Because you have spectrum partner who are taking care of the installation and so on. It is NOKIA who are behind the whole thing and so if we are working with them, I am expecting facilitation and advise."

Another manufacturing customer shares their future expectations from Nokia's solution. The customer highlights that to stay competitive Nokia should deliver a cost competitive solution with focus on ease of use for the customers while developing the solution as it is one of its unique features.

> "I think it comes back to those basic stuff it needs to be fairly cost competitive. It needs to provide robust connectivity everywhere. And there needs to be certain ease of use from the user point of view that somethings are just provided to you as a service or that it is kind of taking away some of the complexity and problems that you have with some of the legacy IT stuff. I think those kinds of things that reducing complexity or ease of use." (I4)

4.3 Customer promises

Customer expectations are formed by various factors such as their experience of the product or their initial predictions about the product or service performance and finally the promise of product performance made to the customers Oliver, (1977). Delivering to promises made to the customer contributes to their overall satisfaction.

A customer from facilities industry shared that many of the promises made about the solution performance prior to its purchase were fulfilled. However, few of the unfulfilled promises mentioned in discussions by the customers are introduction of Narrow Band IoT feature in the solution to enable low power and small data transferring devices to be able to connect to the LTE network. Also, the customer was expecting to see a new feature marketed by Nokia to be available in the solution soon which is yet to be delivered.

> "For me it centers around Narrow Band (NB) IoT stuff and network slicing and being able to deploy 500 sensors as we can't get hold of those sensors. Well, that was not Nokia's fault, but the promises have to be made more carefully, I don't think there was promise on the price. It was quite clear. It was one other. It was the edge cloud box was going to be able to support user applications as well. And that still hasn't happened." (I2)

Few of the customers have been conducting and validating the capabilities of Nokia's solution with series of test conducted in different industry use case scenarios. Few of the test results have shown that the solution does not deliver to all the promises made about the capabilities of the solution such as the number of devices that can relate to the solution.

“Going back to our assumption that our latest simulation is that what if we have 50 sim cards. Because in the technical specification NOKIA says that there can be 500 or 600 end devices under one base station, so the question is what if we have 50 sim cards and each of those are doing something so what happens to the network reliability and reach ability of certain device there. What happens to latency we have seen that with three end devices in THE SOLUTION system ok in the case where no prioritizing is applied that it ruins the whole control system like if you want to do low-latency application.” (I1)

Customers in their discussion also mentioned that not having all the promises delivered was a bit frustrating for them but they are optimistic that the solution will improve in the future and with 5G standard release many new features will be introduced in the solution.

“we found out well its 4G and its not MulteFire(A claim made to customer). So that was little frustrating, I am still confused where MulteFire is. Let's see and ofcourse we are not 5G, so the sales pitches are quite big, and promises are quite big. But the timeline is not exactly explained and promises. You go and buy this basic system and you get a private LTE that's fine. You don't get all the Narrow Band IoT capabilities and all sort of things that are pushed in the presentations. So frustrating but not the end of the world because what you do get is excellent.” (I2)

4.4 Customer satisfaction with Nokia’s private wireless solution

Past literature and research highlight several antecedents and determinants of customer satisfaction. Studies have shown that customer satisfaction is affected by the perceived quality of a product or service offered to the customer (Parasuraman et al., 1985). Winder and Judd, (1996) and Chavan, (2003) define product quality as the features and characteristics of a product to deliver to the customer needs. In this study, the researcher has analyzed customers’ perceptions about the product quality to evaluate whether the quality of the product satisfies customers’ expectations or not.

4.4.1 Satisfaction with product quality and performance

Many of the interview participants shared that the performance of NOKIA’S solution is better than the legacy IT and Wi-Fi solution used for wireless communication.
A manufacturing customer explains the performance of Nokia’s solution performance below:

“Comparing with the problems with some of the legacy IT networks I think its performance is on the same level or better.” (I4)

The same customer further adds:

> “Even though I am not pushing aggressively or giving any direction to our production engineers that you cannot use any more wifi you need to use this. But naturally they started to gravitate towards this one because it's reliable it's available everywhere” (I4)

The customer from transportation industry shared their view on performance of the solution as:

> “If you compare the wifi technology with mobile technology to each other, the range is one thing that how many meters you can have and how many access points you can have and what is the design of the network. That is quite good compared to the wifi technology than in mobile technology and then there are quite many other things what are really helping us.” (I5)

4.4.2 Satisfaction with product features

Few of the most appreciated capabilities of the NOKIA’S solution were the low latency, pervasive connectivity, and reliability of the network. These network capabilities are considered crucial for critical wireless communication networks across all industries.

4.4.3 Satisfaction with network reliability

Reliability of the private LTE network technology appears as one of the important reasons for the customer to adopt this technology. The customers shared that the solution offers a better alternative to Wi-Fi for wireless communication use cases in their respective industries.

> “So far, we have been very satisfied because what is important from manufacturing side point of view is that you have reliable, easy to connect connectivity everywhere and we do have that. Even though I am not pushing aggressively or giving any direction to our production engineers that you cannot use any more wifi you need to use this. But naturally they started to gravitate towards this one because it's reliable it's available everywhere” (I4)

Another maritime customer adds that the feature of network reliability allows them to carry out their automation use cases with pervasive connectivity offered by Nokia’s solution.

> “When we are approaching all these real-time digital for example port automation, we know that this kind of features would help us provide the right kind of connectivity for these kinds of solutions.” (I3)

4.4.4 Satisfaction with network latency

Each industry has its unique requirements when it comes to latency of the network but few of the customers have tested that the latency rate of a Nokia private LTE network fulfill their current use case needs.

> "So far for our use the throughputs, the latencies have been covering all needs." (I4)

Another customer from transportation adds:

> "The latency is not exceeding our maximum required value and it is one of our safety functions. We are remote controlling our machines and then you have feedback for the operator is mainly the video screen and so the latency is very important so that you can really control the machine. Latency is not variating alot and latency time is not exceeding the maximum value what we are setting on our requirements" (I5)

4.4.5 Satisfaction with network privacy

Privacy of the network and the security of the data are some of the features of Nokia's private wireless network solution that customers are quite happy with currently. The private network provides them with the needed data privacy and security.

> "One thing that we are quite happy with is that there is a focus have been quite in security quite long time in mobile technology and that is becoming more and more important in the ports" (I3)

A mining customer shares their view on Nokia's solution security and privacy feature.

> "I think data security is one. It's isolated network and then there is operator type of capabilities that you can more or less configure your network according to your needs which is not possible if you are using normal operator-based connectivity in open environment." (I6)

4.4.6 Satisfaction with network management and configuration

Customers also expressed their satisfaction with network management and configuration feature currently available in the solution. Customers see this feature has a positive influence on their day-to-day operation and has influenced their decision to purchase this solution.

A customer from maritime industry highlights that the network management portal interface makes it very easy for a user to view the health of entire network.

> "One thing is that we have learned is for example Nokia has developed this kind of monitoring solution (network management portal) quite alot that you can really see that what is happening in a network and

how well is it functioning and how easy is that user interface for our customers and also for us. And we can really see what the situation and what kind of problems they have." (I3)

A mining customer shares their view on Nokia's solution network configuration capabilities which allows them to configure their network based on different data needs and data communication priorities.

"the capabilities to configure the network and to utilize some of the functionalities for example when we are developing autonomous next generation mining vehicles certain communication is more critical than the others. And this could be then supported by some of the configurations that are built in the network" (I6)

4.4.7 Satisfaction with Nokia's solution web portal

Only few participants shared that they are satisfied with the available features of Nokia's private wireless connectivity solution web portal as it fulfills their basic current needs of network monitoring. However, many of the participants also mentioned that the current features may not be enough for future and few improvements should be made to make it a more useful part of the solution.

One customer from transportation industry shares:

"It is quite ok for us, information is quite limited still and quite basic information but it is helping us and we can see that the network is working and this kind of information it is giving and we are happy with that." (I5)

Another customer from facilities industry shared his delight with the features currently available in the portal:

"The portal is simply good, I think. I don't think there is anything that you need in that portal that isn't there at the moment for your basic needs." (I2)

4.5 Customers satisfaction with service quality

Study of the literature informs us that delivering to customers service quality expectations has a strong effect in achieving customer satisfaction (Anderson and Sullivan, 1993) and customer loyalty (Parasuraman et al., 1985). Evaluating a service quality does not only include the outcomes achieved through the delivered service but also the quality of the service delivery process Gronroos, (1988). Customers perceptions about the service quality is affected by service outcome and their interaction with the service provider (Cronin et al., 2000). Delivering a quality service to your customers means meeting the requirements of your customer on a consistent basis Lewis and Booms, (1983). The study

conducted by author(s) Anderson et al., (1994) provides evidence that perceived service quality of a customer has a stronger influence on customer satisfaction than the disconfirmation of expectations. Hence, maintaining a high service quality and delivering to customers service level expectations would have high impact on cumulative customer satisfaction.

Service quality has a heterogenous characteristics which may bring varying perceptions of customers about the quality of the service. In addition, the expectations of Nokia customers of service quality may differ based on the nature of use cases, size of the network or the industry they are operating in. In this study, customers' service quality perception is evaluated against dimensions of SERVQUAL measurement scale.

4.5.1 Reliability

Some customers expressed their satisfaction with the reliability of service. Reliability of a service relates to the ability of the service provider to deliver to their promise dependably.

> "If anything is gone wrong is somebody in the facilities unplugged one of the base stations and I immediately got a mail from global support team saying that hey one of your base stations is off. How good is that. Quite impressive." (I2)

4.5.2 Empathy

Few customers shared their satisfaction with the care and attention given to their needs and solving their problems. Customer expressed satisfaction with empathy of not just Nokia personnel but also the personnel of Nokia's service partner.

> "Ofcourse I have been happy how active (Personnel from spectrum partner/customer service partner) have been and he has been contacting alot and asking what are our needs and what we need and that has been really positive thing and in some cases you have delays but that is normal thing but if you know what is the delay and what is causing the delay that helps us alot. If you don't know then how to make your own plans if don't know the schedule for example. But overall it has been quite good co-operation." (I5)

4.5.3 Accessibility

Some customers have shared their appreciation towards the ease of access and reachability of their contact persons. The customers shared that they can easily reach the personnel and get the needed assistance by Nokia or their service partner.

> "I think that has been very good as I mentioned very good level. If something wrong I have few contact persons so I can call. And which I haven't have to use maybe just once but basically all the problems we have encountered I just send an email and I get the response almost immediately. So in that sense the service or supporting in operation has been on very good level." (I5)

> "Whenever the issues have been arising, we have had the contacts and we have direct persons to whom we can contact and raise the issues and get things moving forward." (I3)

4.5.4 Communication

A customer from facilities industry who currently has a small network installed and do not have a mission-critical communication use cases under research shared his satisfaction with the mode of communication used for remote software updates.

> "My feeling is that those are not so time critical in a way, so far, I have received those notification (software updates) via email and I think that is good way and sufficient. I will say I check my emails rather frequently. If these emails are received, then I respond to those." (I1)

The same customer also highlights his satisfaction with the communication with the service partner.

> "They (Service partner) have been so good with us. Communication has been perfect on email, timing. Their promises on get us equipment and have it delivered to desk has happened twice now. They are very good."

Another customer from maritime shared that the communication with Nokia has always been open and transparent when it comes to conveying their needs and problems to the team.

> "I think the communication so far is very good. We are open with each other. Even though it was not all so pleasant, but I think that we are improving all side."

4.6 Customer experience satisfaction

Customer's experience is a key determinant of customer satisfaction (Klaus & Maklan 2013). Customer experience includes the total experience of a customer which includes

pre-purchase, consumption and post-purchase phases Verhoef et al., (2009). Few of the determinants of customer experience satisfaction are achieving customer goals, delivering quality of service, price and experience of the solution Verhoef et al., (2009), (van Doorn et al., 2010). The quality of customer experience is also determined based on customer's assessment of value-in-use after the purchase Lemke et al., (2011).
In this study, the author has evaluated customer experience with pre-purchase and post-purchase encounter. In addition, the study also evaluates customers relationship with Nokia, value delivered to customers by their solution and satisfaction with its price.

4.6.1 Satisfaction with post-purchase process

Service delivery process is part of customers post-purchase experience. A positive service delivery experience also contributes towards customers experience quality Lemke et al., (2011). According to the customer experience quality model of Lemke, a positive customer service encounter enhances the value received by the customer which then translates into customers retention.

The service delivery process of customers includes the overall management of planning and commissioning of the network implementation after official contract signing between the parties. During the interview customers were asked to describe their post-purchase process experience with Nokia for example network planning, hardware delivery and installation, network coverage performance, and network service and maintenance performance.

4.6.2 Network planning

Majority of the customers expressed their satisfaction with the network planning phase of the project. Customers were satisfied with the collaboration between the three parties (Nokia, customer, and service partner) and knowledge of Nokia and service partner in developing most suitable network design for their sites. Customers also highlighted that the overall project management and communication at this stage is conducted flawlessly by service partner team. A customer from mining industry shares his view on post purchase experience below:

"I think project model that (Service partner) is using was good one. In my experience, the project manager was very efficient so it was very straight forward and good process. And during the RAMP up and implementation of the project that was very regular meetings, review, follow up, reporting and steering. I think it was governed well and process how it went we have no complains when it comes to that." (I6)

4.6.3 Network installation

Many customers shared their satisfaction with network installation and were also delighted with the expertise of installation personnel from Nokia and service partner. A customer from transportation industry highlighted his satisfaction with the network installation at their site below.

"And then the installation day was just a one-day they completed the installation in one day and that is what the promise was and then we have some problems with the SIM cards the first SIM cards we got. I don't remember did we get the new ones or some fixed from Nokia side I would say that also went rather smoothly." (I5)

A customer from facilities industry shared his delight with the ease of installation and how quick as well as easy it was to get the network live at his site. The customer also commended the expertise of the installation engineers.

"The installation process this was before service partner took over. It was actually (Nokia personnel names) one of them came. However, if you take the concept that just some of the project guys, if you just treat them as installation engineers that came to our site and did the job. It was fantastic they came in put the things in plugged it in run the wire, drilled a hole and done. Booted it up, 2 to 3 mins later we had a system and they set it up and they got the whole thing up and running, so pretty flawless." (I2)

Another customer from mining industry also shared his satisfaction with the implementation of network.

"So we were making the measurements that signal strength were according to the plant limits. So then that's sort of implementation of the network so that was quite intensive, pretty well governed." (I6)

4.6.4 Network service and maintenance

Few of the customers are satisfied with the communication and mode of communication used to schedule and conduct software updates for the system. The customers were usually informed before time and consulted for suitable time for software updates. A

customer mentioned below that they are satisfied with conducted updates, but the process of software update does not have any serious impact on their network operation.

> "If there has been system updates or upgrades, I think from Nokia side and to provide some positive feedback on this all this updates those have been informed us like one day or few days ahead. They ask question what the case is with our system and can they run the update. The utilization of our system is still rather low about the updates information of those are good level but it hasn't been so critical from our side." (I1)

One customer from maritime industry adds that there is still room for improvement in response time of service support. However, most of their service support issues are addressed by Nokia and the service partner.

> **"**We (Nokia and the customer) may have some difference in opinion what is fast enough and things like that but basically the support has been there. We may have some differences in opinion when something may happen, but the thing is we have been able to address the needs and they have been responded generally speaking." (I3)

One customer from facilities industry was very delighted with post-purchase network maintenance service and the communication maintained with the customer to keep them informed. In addition, the customer is very happy with service support provided on a personal level.

> "Well the service support has been pretty seamless once it was installed, I get an email from somebody. And from then on, its been updates which have been announced. Its personal and they contact you and they ask you what a good time and date is to do an update to your private wireless network. And it really is a personal contact service its very good. Like I said one of our access points got down we immediately got an email personal again you know to tell us about warn us about the system. So as far as quality of service goes like the system itself, I don't have any complains." (I2)

4.6.5 Satisfaction with product price

Five out of six participants expressed their satisfaction with the pricing model of the solution. Most customers shared that the overall product and service charges are quite reasonable and competitive with WIFI.

A customer from mining industry shares his opinion:

> "I think its ok. I mean the biggest impact comes from the license of the frequency band. Not much you can do about that. So, you are leasing it by a year. I think that's a good model." (I6)

Another customer from transportation industry adds:

> "I think the pricing is pretty fair at the moment." (I5)

A customer from maritime industry have developed a new price sharing model to share the cost of investment with their customers by selling them network capacity as "Network-as-a-Service".

> "Since we have this model that we sell the capacity. In our case, all these stakeholders get this synergy of this joint investment. If it was one company investing this technology, it would be kind of riskier and more expensive. Since we have this good model that we are sharing the cost, so I think this is perfect model for this kind of ecosystem." (I3)

4.7 Customer value

Customer value is the benefits received by the customer with the purchase of a product and in a relationship with the seller. Greater customer value will lead to greater customer satisfaction (Lam et al., 2004). According to Lemke et al., (2011) conceptual model of customer experience quality, customer's relationship with the company influences the value perceived by the customer.

4.7.1 Customer perceived value of business collaboration with Nokia

Nokia and customer collaboration have its own set of benefits for both parties. According to the customers, the two parties share a common drive to achieve set goals and maintain good relationship of working together.

> "I would describe it almost like one team to be honest. It's very good. It's friendly, personal, professional. It's good." (I2)

> "Think we have had very open communication; we have addressed the issues openly in good spirits…I think there is no problems in relationship when it comes to our collaboration." (I6)

4.7.2 Customer perceived value of co-creation with Nokia

The interaction between the seller and the customer is the locus of value creation for both parties. The customer's ability to co-create value during their experiences is dependent on their access to amount of resources and knowledge around them Payne et al., (2008). Value for customer is created through the value-creation process throughout customer journey and the customers perform series of activities to achieve their goals.

Customers highlighted that they really value the high-quality technology offered in the solution to customers. In addition, customers also value the knowledge and expertise of

Nokia in 4G and 5G mobile technology. A customer from transportation industry shared that the events organized by Nokia has been very informative and valuable for them. In addition, collaboration with Nokia has allowed the customer to develop their knowledge on the technology.

> "It has been something new for us. We did not have that kind of co-operation before and Nokia is a big corporation and we have been in quite many events and we have heard quite many things and it has been this learning journey for us and we have learned quite alot. This is new technology, in my opinion in this Nokia has helped us in this journey to find what is important and what is critical and try to feed our business ideas to Nokia and to understand what the business in this area is. There are always some hiccups in the co-operation, but I guess this has went quite well." (I5)

Through this collaboration customers benefit with a solution that can cater to their unique industry needs and allow them to integrate latest technology to achieve operational excellence and cater to the future demands in their industry. It also helps Nokia customers to position themselves as modern and technologically advanced companies well equipped to meet their customers future needs. Customers also provide their feedback to Nokia and their high involvement implementation of the solution contributes towards improving the solution. Value is created for both parties in this collaboration for example customers participate in promotional activities for Nokia which brings great value for Nokia's business.

> I think there is clear win-win scenario there, we have own operative needs for the connectivity and we have been able to get a real good connectivity for our needs. We want to position our factory as leading edge in terms of utilizing the latest technology. Ofcourse this collaboration is helping me alot in achieving that and on the other hand I think what we are offering to NOKIA'S team is that we have the in-house installation so we can give as a real feedback without this kind of customer vendor interface. We are in the same team and we can basically give open feedback in terms of product. We do get Nokia in-house reference installation. This year alone I have hosted more than 20 customer visits to our site as they want to show Nokia's solution to potential customers that look this what we are doing with our technology. So it is helping with alot of business" (I4)

A customer from manufacturing industry adds that they value the empowerment of their employees with use of Nokia technology, as it helps them to perform more meaningful tasks to improve efficiency. He also shared that Nokia solution has helped them to achieve their business goals by adopting this latest technology to keep up with the fast-changing requirements of digital industries.

> "We don't want to stay still we want that we are always innovating, new trying to do new things and learn. If you stop running the new stuff you are falling backwards. I think these are good opportunities for learning and keep our production development guys and engineers inspired as well and they can also

do something else than the basic stuff what they are doing at the factory. Still bringing value for us as a factory and for Nokia." (I4)

Another customer from mining industry adds that through their collaboration with Nokia they were able to test and identify the unique requirements of a private wireless communication network for their own industry and how they can fulfill their customers future demands with use of 4G technology. Whereas Nokia benefits from learnings through product tests conducted by customers and use in various industries to further develop the solution.

"I think the value of working around this topic is understanding the mining specific requirements. And this hopefully is helping you to further develop the functionality of such communication network into mining vertical. And for us this is to learn that what kind of let's say new products and features and services we could potentially make available for our customers that are relying on such communication technology."

4.7.3 Customer perceived value of Nokia's solution

According to Lemke et al., (2011) customers look for value in the product's quality, their money and time, and the variety or choice offered in the product. The variety of a solution can be evaluated based on the features offered in a solution. When asked about the value received by Nokia wireless connectivity solution, a customer from maritime industry highlights that they value features of Nokia's solution which allows them the flexibility of implementing desired use cases which need reliable wireless connectivity and it was not possible with WIFI or any other legacy IT solutions.

"So obviously we didn't invest in that wifi solution at all. It is possible now for us to plan and build up all these features that are for example those videos cameras and it is also very use full that now when we are having our first video analytics trials for example, for this register plate recognition we can just move the cameras from the gate area to some intersection areas in there and we don't need to worry about the connectivity we just need to get the electricity into that device and there is definitely value that we can remove the cameras and there are no limits for that kind of trials for all these existing devices to try them in different locations." (I3)

Another customer from transportation industry adds that they value the technology behind the Nokia's private wireless connectivity solution that has opened endless possibilities as it allows them to implement various automation use cases with diverse data flow rates and conduct mission-critical communication as well all with a single network. In addition, the customer finds it valuable that their customers can connect range of different devices to the network based on their needs as well integrate.

> "A good thing is that our customers are really interested in this technology. They are really trying to find a new solution and to replace the wifi networks. That's why we have been really interested in this solution and we see possibilities in mobile technologies. One thing is that I have been mentioning quite many times that it is more complex system and technology behind it is quite complex, but it gives you quite many opportunities to do quite many things with one network. Because now at the moment our customers they are utilizing the radio modems, they are utilizing this walkie talky radio phones and they are using mobile phones and wifi systems and there are so many systems in a terminal and if you ever going to have this kind of private network and you can really utilize all your gadgets with that technology that is really helping our customers. That is one really good benefit of this mobile technology." (I3)

Some customers greatly value the time that they can save and peace of mind they have with use of Nokia's solution in comparison to WIFI. Customers peace of mind is one of the dimensions of customer experience quality and directly effects customer's satisfaction and their word of mouth behavior Klaus and Maklan, (2013).

> "It saves me alot of headache and frustration and pain that was normally associated with setting up multiple WiFi networks so setting up. I don't even have to set it up, they (Nokia's team) set it up for me. Just going into the solution and you are connected. Time is a big value here and headaches." (I2)

4.8 Dissatisfaction with network service and maintenance experience:

Customers become dissatisfied if the total value delivered to them do not match their value expectations from a product or service. Customers may remain dissatisfied unless a company understand the customers future expectations from a product or a service. Companies are responsible to keep themselves informed of their customers changing needs.

In this study, the author has identified the reasons of their customers dissatisfaction by investigating where the solution and the service offered to customers has not delivered to their expectations as well as what improvements can be made in the future to make customers happy.

One of the highest criticisms was directed towards customer's experience of network service and maintenance post-purchase. Some of the highlighted issues are as below:

4.8.1 Issue with software updates

A customer from research institute highlighted that with software update the connected devices with the network need to be rebooted which causes huge inconvenience as the number of connected devices is usually high. This issue has occurred a few times during the updates but not always.

> "After some rechecking in some cases Nokia has informed us that there was some problem in the update, and it required booting of devices from our side. So that is one recommendation or criticism in improving the service." (I1)

The same customer adds that although their operations are not yet so critical but still any network down time for software updates has huge impact on their research because it means loss of important data collection during that time. Also, the customer highlights that the total down time of the network are usually long because of the additional time spent on resolving the issues that sometimes arise after update of the software.

> "And then good thing is also that updates itself those updates that are the longest are completed in an hour. That means our system is offline for an hour. After the update with this some error or faulty situations the actual communication blackout has been a bit longer." (I1)

Another customer from maritime industry highlighted that another issue face by customers during software updates. The customer shared that planned or unplanned software updates negatively affect their operations because the network must be shut down for several hours for these updates interrupting with their daily operations.

> "Actually, there was some the system and the software needed some updates and since our operations are critical, they are 24x7 and 365 days a year so it's not that easy for us to inform our clients that you need to close your operations for four hours. It has a very costly effect. It's a very long time but you need to figure out how to update the software without anybody noticing anything." (I3)

4.8.2 Improvements in network recovery and fault diagnostic reports

Customers are currently dissatisfied with the actions taken in response to network recovery after any failure incidents and fault diagnostic reports provided by Nokia. They expect to see improvements in response time of network recovery actions and receive a detailed fault diagnostic report with corrective actions for future to avoid similar problems. Customers also highlighted they wish to have more transparency on network failure reasons and improvement in crisis communication to keep them informed.

A customer from manufacturing industry shares his account on the same issue:

"For example couple of those incidents when we were at the down-time real professional service provider let's say generate corrective actions, preventive actions, root cause analysis and reports and provide transparently those to the customer that this is what went wrong and we have analyzed it and this is how we are going to fix. That provides confidence. It is bit lacking in that on." (I4)

"We were not satisfied with the report that came out. No need to get into that but we weren't satisfied at all with the report that came up with the report that how the process was going on in that particular malfunctioning situation." (I3)

4.8.3 Enabling partners for better network service

Customers provide feedback that Nokia has not enabled their service partner well enough for them to offer the complete service to the customers. The service partner does not have complete network visibility which restricts their capability to always provide the needed support by the customers. Working with two parties (Nokia and service partner) causes confusion in the service delivery process for the customer. A customer from mining industry shares his view on service partner current role in network support and maintenance below:

"Service partner are supposed to have monitoring capabilities to that respective networks that the customers are operating to support with the faulty diagnostics or if you get the errors or they are able to trouble shoot or they get the insight to the network but that capability is not there at the moment. So that's why we have been running more or less in circles in between the three parties trying to figure out sort of where to get that service. Contractually its clear and that's fine. We are totally fine with (Service partner), they are doing a good job but they are just missing the tools and the capabilities to do what they are supposed to do. And going forward, this is the case in Finland but obviously if you go somewhere globally maybe I think some other solutions have to be applied. But here in Finland we are totally happy with the setup. The setup itself is ok. Relying a bit more on Nokia here because bit of lacking capabilities for service partner to take care of the network because they don't really get the view to that network what they should have but they don't at the moment." (I6)

4.8.4 Need for account managers

Customers highlight that some of the past incidents related to lack of their network information and gaps in communication has led to a few problems. To avoid similar cases in the future customers suggest having dedicated contacts within Nokia who have in-depth information about each customer case.

"I would say perhaps there is one finding that should be set is that in a given situation where we are at the moment someone in Nokia should have a big picture and an overview what is happening in our specific network environment so when the next guy comes in and you do something so he knows what is previously been done. So somebody should before service partner has the capability to take care of the network and to access the faulty logs and to make the analysis and diagnostic so this is now falling on Nokia." (I6)

> "We understand that you are a big corporation and you might have internal communication problem. And different parties they don't exactly have the same information and that has happened in the research side and normally you can fix that by having one contact and he knows what is the case and he has the official information and we also have contact points here (customer company) that are sharing the information and that is one way to improve it." (I5)

4.8.5 Improvements in network service & maintenance Process

Customers highlight their dissatisfaction with the current network service & maintenance process. They share that the process of network service is unstructured and distribution of responsibilities for network maintenance between Nokia and service partner are vague. They suggest that Nokia and service partner should develop a standard network service and maintenance process which is communicated to the customers. Special emphasis was made on developing a network failure communication protocol and developing a network recovery action process in network failure situations.

A maritime customer adds her opinion regarding the improvements they wish to see network service and maintenance process of Nokia in the future.

> "These kinds of solutions are pretty new and obviously the service is not at the same level as the technology. So, the service processes need to be improved in order to get the service level at the same level as the technologies……At first, we need some sort of process that everybody knows that what happens and then we need to figure out because we are administrative company so what happens if the alert comes in the middle of the night. But it's our concern, it needs to be formal and agreed in advance." (I3)

The same customer also shared an example of issues faced by them due to ambiguous distribution of responsibilities for network service and maintenance between Nokia and the service partner during network failure situations.

> "Last week I had some discussions with their(Service partner) Managing Director about the fact that they have to have very clean processes with you guys in Nokia so that all the problems don't show to our table. They need to clarify the role and responsibilities between Nokia and (Service partner)……. But it could be clarified more and in better way. Who takes care in what kind of situations and who informs who and what are the roles and responsibilities?" (I3)

A customer from mining industry raises that a network service and maintenance process should also define a clear and transparent crisis response process for the customers to provide a clear picture of actions taken after any network failure. A customer from manufacturing industry shares his view on the need for a structured crisis response process below:

"When we find out something is wrong with the network. I think it remains not a rocket science assuming we are not able to identify or detect a problem by ourselves, so then the first line of support would have to be very clear to whom the operator is contacting. So that our mine automation guys can identify whether this is one person or whether there is an email where is commitment to reply over a certain period of time or when there are some issues, they cannot overcome so what is the backup structure there. I think the target throughout the chain is really to be able to be solving the issues whatever it might be." (I6)

4.9 Improvements in post-purchase customer communications

4.9.1 Communication in case of network failure and software updates

Improvements in customer communication was also highlighted as an area for improvement in the future by customers. Customers expect a prompt message from the service provider in case of any network failure or technical issues to all relevant customer contacts. Communication is considered a necessary part of crisis response process by the customers and they also expect to be regularly informed about the progress made in resolving the issue. A customer from manufacturing industry puts his views on improvement in customer communication during crisis in this way.

"I know that we have 24x7 operation center and we have seen that in some cases reacting to those problems even before we notice not always but the 24x7 mode is there. I think it is still coming back to this proactivity, transparency and communication all and all. Even though we would like to have 100% uptime but we know that is not realistic. Being a factory operation and where the connectivity is mission critical, I think the communication is the key. It would be really helpful if we immediately get some kind of communication from the operations center that we see that there is a problem and we are fixing it and we are expecting it to be done by this time don't worry. But the main thinking from our point of view is that when somebody on the night shift when the connectivity is lost starts immediately thinking should I do something now because there is a problem and if I don't know that someone else is already on to that then it starts to escalate. In that sense it would be improving this kind of simple things that some kind of communication or in this type of incident for the right people letting them know that it's been taken care of and operation center has noticed it." (I5)

Another customer from transportation industry adds:

"If something has not worked properly and we have had those kinds of technical things but that is quite normal with the new technology always. As mentioned, if you know what is the issue behind it and what are the actions and what is the next delivery time that is important then. Time is limited in our environment also that is critical thing."(I5)

Another customer from maritime industry highlighted a need for a 24x7 number or a contact in case of emergency and emphasized on its importance as their business has 24x7 operations which is dependent upon Nokia's private wireless network.

> "We only know 5 guys from (Service partner), and they are not working 24x7. For example, if they are on a plane or any kind that situation and something happens. I would have nobody to call. And these kind of question needs to be sorted out. That who do we call, what number do we call and who is answering 24x7 and is it (Service provider) or is it Nokia." (I3)

Customers would also like to see improvements in communication related to the schedules for the software updates customers and share contingency plans in case of any unexpected delays in the updates and bringing the network live again after completion of software update. Below is the response from a manufacturing customer sharing their communication expectation from Nokia's side during network maintenance activities such as software updates:

> "And to the maintenance side. Sometimes we have had a little bit of these a minor issue something that could be improved. Let's say for some time on purpose we take down the network to do the software upgrade or so. So once again the transparency that ok, we need to know before time that this is the time when it goes off and this is the time when we anticipated going back. What is the let's say plan B or mitigation actions? If something goes bad how do we do the roll back and enable the production again. These are some of the things that we need to ask and request what is the status." (I5)

Overall customers shared their satisfaction with communication conducted by Nokia for scheduling of software updates. However, communication improvement was suggested by a customer from manufacturing industry in post software updates to ensure that the network is operational again for the customer.

> "What I would like to see in the future, after running some updates to the system some kind of rechecking or communication or informing that now the update is done, we have checked and everything should be ok and can you for instance confirm. That is less effort work than that after a while even within the same day we see that there is a problem with the network and then we have to contact back the Nokia now it's not working." (I4)

4.9.2 Mode of communication in network failure situations

Customers also highlighted the need for instant SMS message on mobile devices in network failure situations informing them about the problem. A customer from maritime industry suggested a proposition to better tackle the problem of informing all stakeholders who are potentially affected by the network failure as explained in her below quote:

> "I think the information is on a pretty good level (on the portal) but how do I get it is a problem? They could build up some kind of informing system for example mobile device. Obviously, they need to react on that malfunction themselves but it's very important for me to know before my customers know that the network is not in function. The smart mobile is the one device that should have the information, is it SMS or some kind of notification. I think an email is not even instant enough it should be like a text message so I would be informed immediately. And there could be some kind of interface to give all the phone numbers who are getting this information. So, it can be more flexible for a customer to choose those channels that how do we want that information. I mean it would be useful for us to have some sort of UI to add all the phone numbers who get the alert so that we don't need every time to inform others." (I3)

Another customer from manufacturing industry adds:

> "This is something that needs to be understood that if I am a worker in the production, I am not looking at the web portal I only see machines working or not. And if it's not working, I wouldn't know is it connectivity issue or something else. But maybe this kind of push notifications or SMS could be an option in this kind of adhoc cases."(I4)

4.9.3 Communication related to product roadmaps

Many of the customers shared they wish to have the visibility to future product roadmaps as it helps them to understand what features will be introduced in the product and what direction the solution is taking. Customers wish to see a structured plan of product roadmap towards 5G as well and what expectations they can have from the solution from performance and quality point of view in the future.

> "What is not so clear for us is what is the next release and what we are getting and what kind of features we should expect." (I1)

> "One is the visibility to roadmaps and things like that. We have had few meetings with the Nokia's roadmap guys and they have been opening up what they are planning to do but still it is little bit fussy for us that ok what they are bringing next. Maybe that visibility could be improved a bit." (I3)

A customer from mining industry shared his view on roadmap visibility in the future:

> "I think it pretty much boils down to the software quality, and updates and functionalities and how they are managed. Somewhere you are defining a set of functionalities that this update will do and sometimes features and they sort of gets dropped out and then they are done later this kind of planning. I think important part of quality is to have a clear roadmap when and what. Like we requested a plan which gives us specific plan giving us a good overview what is the timeline we are really getting the final 5G solution. What are the software releases, when the things can be updated towards the 5G solution for example give us the visibility? And visibility has to be more or less is 6 months."

4.10 Improvements in product quality and performance

4.10.1 Improving network latency issues

Few customers highlighted the limitations of the solution such as network latency which has restricted them in achieving their desired goals. A customer from research institution shares their experience of current latency capabilities of the Nokia's solution which do not deliver to 4G standard as well currently:

> "So between two routers and one base stations without any network slicing or prioritization for different applications. Those were applied in the first phase now is the case to include those but then what we find out that what we can reach if we don't load the network the communication network with other traffic we can get delay as low as 23 or 27 millisecond which is according to the standard but if we load the network with for instance with just YouTube on some computer connected to the Nokia's network then without any prioritizing it seems you do get higher latency than this control system which is not the case at least we would like to have.It ruins the control system because the delays were increased drastically up to 250 milliseconds or something like that. So basically that means that the control system didn't function at all as it should be anymore."

4.10.2 Bandwidth limitations of Nokia's solution

There are certain limitations of the current 4G technology standard which also restricts the capabilities of the Nokia's solution such as the network bandwidth. Customers are aware of this limitation and expects from the solution to eventually move to 5G technology to cater to their bandwidth intensive automation use cases.

> "Yes, there has been this uplink direction communication bandwidth and that's the only limitation that we currently have and what is limiting some of our applications because you can control one machine quite easily and two machines is possible. But when you have 50 or 60 machines in a terminal then we have problems. That is a fear we are facing at the moment. But as said, we can operate with that one when we know the limitations and that's the fact at the moment. We are hoping that there will be new releases in 5G or 4G technology still and Ofcourse it is already helping, and it is not mandatory thing that it's 5G. I am hoping that 4G will be fulfilling our requirements someday that is coming even before 5G. (I5)

4.10.3 Introducing new features in the solution

Customers requested few new features in the solution and shared how introduction of new features can help improve the overall performance of the solution. One of the requested features was the ability to run local or third-party applications on the edge cloud. And expects Nokia's solution web portal to become an integrated platform to manage all applications without using edge. Below are few of the requested features by customers.

4.10.4 Run applications on the edge cloud

A customer from manufacturing industry shared that they wish to have an easy to integrate solution web portal that can run third party applications as well:

> "I would say once again coming back to the "running the applications" because I think anyway there is value there and Nokia should provide some kind of platform that here is the connectivity but here is how you can run local applications and this is somehow still missing a bit. And even going further, how third parties can integrate to this network. What I mean by that is that just as an example we have those mobile robots connected to the network they are moving materials in the shop floor. Those are provided by (vendor). Together with (vendor) we decided that we installed take in the use their system called "Fleet Manager" which is kind of a system that gives instructions to those robots and kind of taxi center. Let's say you don't have to fetch material here and go there. This is then the system that we integrated to the Nokia's network but once again if you would do this platform thinking properly and we would be able to run applications maybe this wouldn't require physical hardware like now. Just make this kind of software and we would put it in the running edge cloud and do the same what the fleet manager is now doing but currently we don't have the platform that can run the applications." (I4)

Customer continued and added that by moving the data computation from the edge to the cloud will not only make it more manageable to run third party applications but may also increase the data throughput rate and decrease latency.

> "I see that is yet to come is this cloudification of this different type of computers or assets on the shop floor. The reason why the data rates are fairly low is that alot of computing happening on the shop floor of our factory. If you have the robot, you have industrial PC next to it, which is actually running the applications giving directions to the robot and this is copied everywhere but what if we move all this computing from these industrial PC's to this edge cloud or cloud then the amount of traffic will increase dramatically and then the low latency comes in."

4.10.5 Narrow Band IoT feature

A customer from facilities industry requested to see the Narrow Band IoT feature in the solution to enable connection of wide range of devices to the network soon as promised earlier to them.

> "I would like to see Narrow band IoT in the solution so that we can fill buildings with battery operated sensors, low power sensors and make the experience better." (I1)

4.10.6 Adding API to the solution web portal

A customer from maritime industry shared their wish to have the capability to transfer data from Nokia's solution web portal to their digital twins with use of API. They wish to provide useful data about the network health to their customers who are the end users of Nokia's solution.

> "At this very moment is to have the API so that we get the real-time status information out of the portal. I think it is one very simple and effective and good improvement and feature in our services to our customers." (I3)

The customer wish to have a common user interface for their customers with use of API to provide real-time data from Nokia's private wireless network web portal to their digital twins.

> "We have these user interfaces we are building up these mobile applications. This is one of the main ideas of this whole entity that we have very few actually only two user interfaces for all these listed. It must be common for all these users who are visiting us, who are working at the site or who are working at this office." (I3)

4.11 Improvements in web portal

Several improvements were suggested by Nokia customers in the solution web portal. Few of the customers stated that the information currently provided by the portal is quite limited and they wish to see more in-depth information with analytics related to the network performance level.

4.11.1 Network analytics feature

> "I have been challenging the Nokia's team a bit that I want to see some metrics on the uptime and things like that. The contents are also too high level." (I4)

4.11.2 Network slicing capability

A customer from mining industry shared their wish to have network slicing capability at the web portal, this would allow them to assign mission critical applications with dedicated bandwidth capacity for reliable wireless communication. Capability to slice network at the web portal would eliminate customers reliance on service support for this feature implementation.

> "You can slice your LTE network. I don't have any way to do that through the portal. So, I don't know that I was supposed to contact support to get that done which is not very optimal way of doing things. I can't slice my network from that portal. I would like to slice my network from that portal." (I6)

4.11.3 An integrated Nokia's solution platform

A customer from manufacturing industry stated their wish to see the development of the solution portal as an integrated network control and management platform which in addition to the network health also allows to manage the health of all the connected devices through software.

> "So what we have done by ourselves and we have shared with Nokia's team as well we actually took in the use this road to manufacturers remote management system. If I have 100 machines connected some of the machines share the same routers so maybe I have 50 LTE routers in the shop and those are the critical pieces we need to be able to update firmware's, we need to be able to manage firewalls within those routers and check if they are alive, and how much data is going there. This looks now great and the brand is Teltonika and we have shared that with Nokia's team. So we now have two customer portals for monitoring our system. We have the solution customer portal for the high-level things and let's say for detailed information we are looking from this Teltonika arms portal so maybe there could be some synergies or some learnings that we could have one stop shop for let's say factory, IT or engineering who can check if the entire system is working." (I4)

4.11.4 In-depth view of network and self-diagnostic tools

A customer from mining industry requested to see more self-diagnostic or troubleshooting tools at the web portal to be able to reduce their dependence on Nokia or service partner for identifying the issues related to the network. Having visibility to some information related to the network and connected devices would allow them to locate the cause of the issue and try to quickly push to resolve it.

> "One is a self-diagnostic tool to the network so that we could have competencies enough, we could have a little bit of sneak peek into the system. And trying to figure out as a first thing if something is not right or not working then we would have little bit of capabilities by ourselves to make fault diagnostics." (I6)

A customer from transportation industry shared his view on improvement to Nokia's private wireless solution web portal below:

> "Always there are quite many things that you can add to the user interface but I want to support the idea that keep it simple. Ofcourse there should be that kind of ways that if you have any issue that we can go a bit deeper and we can see what the problem with the signals is or what is happening under the hood." (I5)

Customer engagement provides an opportunity for companies to keep up with the changing needs and expectations of customers through their feedback. Customers can be engaged through their participation and involvement in various promotional activities and or building strong relationships through value co-creating collaborations. Co-creation collaborations with customer and their close connection with the seller positively effects

customers' experience with the brand (Sashi, 2012). Customer recommendation or any form of customer advocacy is a behavioral manifestation of customer's engagement with the brand due to various motivational drivers such as positive customer experience or satisfaction with the product or solution offered (van Doorn et al., 2010). Customer advocacy is another form of customer word-of-mouth and is also one of the most important outcome of customer engagement Walz and Celuch, (2010).

4.12 Customer engagement

4.12.1 Customer engagement through promotional activities

Customers have expressed great interest in participating various Nokia organized events and wish to continue their participation as they find these events to be informative as well as mutually beneficial for both parties. Customers greatly value the opportunity to gain insights related to latest developments and new trends with evolving needs in the digital automation industry from other customers' experience. In addition, customers get an opportunity to network with other company representatives and discuss new industrial automation use cases in their industry.

> "I have been in some events and delivered some presentations and that has been really good. We have heard quite alot about Finnish harbors and ports recently because they are not really big customers for us, they are really small customers for us. Small volumes but they are really interested about new technology and I was surprised that they are really implementing mobile network in Finland to so many ports at the moment and they are really interested about this technology. We have learned quite alot from those customers also that how to make this kind of network to the port and what kind of automation needs they have." (I5)

Many existing customers have been involved in various promotional activities as advocates of Nokia's solution at several industry forums and organized events. They have been involved with Nokia's team in promoting their collaboration with Nokia as well as building new industry collaborations. Customer participation in such events not only provides a publicity opportunity for the customer but also contributes towards technology adoption by the industry.

Some of the other types of engagement activities with which customers have been involved with are keynote speaking and marketing content creation. A customer from

maritime industry shares her experience of participation in various promotional activities organized by Nokia and other ecosystem partners below:

> "I have been speaking in Nokia and Service partner event(customer council). As I mentioned that I have talked to your prospective customers like few times and then we have agreed (Customer and Service partner) on mentioning our company names in different kind of situations. For example, at this very moment (Service partner Managing Director) is in London in a private networks seminar and he is actually using our case as a use case and using our material as well when talking about the solutions that they are providing (with Nokia). And then we have this Oulu collaboration concerning this 5G. As I explained earlier, this private LTE is one solution and we want to bring others around 5G we have lots of collaboration. Basically, with the university, VTT and Nokia is in all of them in all those collaborations that we are doing. So, we have very good local collaboration here in Oulu. I have been too busy with your guys and joint marketing thoughts." (I3)

The customer continues and adds that they also receive publicity through joint promotional activities with Nokia. The customer adds that they see this collaboration mutually beneficial as they can promote proven use cases of Nokia's solution in their industry at various forums.

> "We as a small company get good publicity and I think that because we have these digital infrastructure model for not just the port area but any industrial campus. This kind of data collecting and requirements for connectivity solution they are very similar requirements in all Finland, in ports and industrial campuses but also globally. If we combine this thing that you have the solution for the data transferring and connectivity needs and then we can talk in a very understandable ways about the use cases. So, I think it can be very useful for both of us." (I3)

Some of the most popular promotional activities among customers were Nokia organized customer demos in Nokia Executive Experience center, customer council events and co-participation in various Industry 4.0 forums. All these engagement activities provide an opportunity to learn about new technology and features to be launched by Nokia in the market.

A customer from facilities industry shares his favorite promotional activities which are beneficial for them as well:

> "I rather like these demonstration sessions that they have at the Executive Experience Center. When you go there you get good keynote speakers and you get some customers tell their experience of Nokia's solution. That's pretty good, you get to hear about some of the problem that someone has." (I2)

A customer from transportation industry adds:

> "So many things are happening and that's why it might be really good idea to be in customer council events. Also, I learn few things more in every event and you are listening to other presentations and what they are saying and so on. It's a learning thing also."

Customers view their participation in various engagement activities as part of their business collaboration and are willing to share their resources to help further develop the collaboration in the future. However, it is critical for them to keep these engagement activities to be mutually beneficial with clear set goals to be achieved by both parties.
A customer from mining industry shared his view:

> "I think it is part of the collaboration to sort of utilize or exchange the resources every now and then to share the findings. I think this is all part of the collaboration going forward. But then ofcourse, it is mutual interest that there would have to be clear purpose in doing so." (I6)

Another successful promotional activity organized in collaboration with Nokia customers has been display of Nokia's solution at customer site premises. Nokia benefits from these live and operational demonstration of their solution to visiting potential customers at these customer sites. This activity creates a lot of engagement with potential customers and is only possible due to co-operation of Nokia's existing customers. But this promotional activity must be mutually beneficial and should be set to achieve clear goals to manage customer resources better. A customer from mining industry shares his opinion below:

> "I think what we have been saying from all the way from beginning is what we have here is a test mine and we have approximately 2000 visitors already here. Among which we have largest mining customer coming every year to see what's going to happen in mining in foreseeable future. This is showroom for new mining technologies, and we are demonstrating our new capabilities to our customers there. And obviously when there is now Nokia visible there so obviously that draws attention." (I6)

Few customers shared that they are willing to continue the ongoing collaboration for organizing potential customer visits to their company premises to demonstrate Nokia's solution but for the future they wish to develop and agree upon a more concrete and clear process for this activity to manage the resources and time of both parties efficiently.

> "I think there is genuine intent on both sides to work together, in that sense I think it is good atmosphere to do things together. Somehow on my agenda is that we need to formalize it a bit. And this is (Nokia's potential customer visits to customer facility) something we are working on with (Nokia team member) and those folks that how do we actually do meeting practices, decision making practices jointly. We need to make this more formal and more structured than adhoc. (I6)

A customer from Manufacturing industry state his opinion on the same topic below:

> "I think we also have to in that front to be fine-tuned and agreed further how we do this reference customer visits for example. We have been promoting that and we have been offering to Nokia's team. We are going to do that in the future as well but the number of visits has now exploded that we also need to little bit agree how do we prioritize or schedule those and if a customer team brings a customer here from some part of the world what they can expect from us and what kind of preparations are needed, those are more practical issues." (I4)

A customer from maritime industry shares her view on their participation in various promotional activities as being beneficial for them because success of Nokia's solution would mean better investment in the solution in future which is valuable to them.

> "I think there are several kind of values for both of us by improving this solution and features and the service level and the use cases and how we can tell people and tell in different kind of seminars and other customer perspectives for different kind of operators. Actually, I have now talk to like three possible customers of yours about this solution. And one of the reasons I am willing to do that is that I think that if these kinds of solutions expand and Nokia gets to sell them more, we do get the benefits as well for example in those service matters and this technical feature. Obviously, Nokia is a huge company and we don't want the same problem as with the big mobile operators that we are just one minor customer who has this rare solution that no one wants to update, and you know build up. So, our wish is also that this kind of solution expand, and you get to sell them more." (I3)

4.12.2 Customer engagement through marketing content

Customers shared their satisfaction with the current marketing content created by Nokia in collaboration with customers. Customer engagement can be improved by sharing the marketing content that is informative and educating for the customers. Majority of the customers did not mention marketing content as a preferred channel for engagement.

A customer from mining industry shared their opinion on the topic:

> "I have now just been looking at the recent announcements I think there are good stuff, good releases, good videos and the message to the public I find it very good."

A customer from maritime suggested to publish more customer use cases on Nokia's website would.

> "I think now that you have a website concerning private LTE. For example, customer use cases. It would be nice to hear and know about other similar customers and their cases." (I3)

The same customer shared the need for Nokia to develop some informative educational material to help the customers understand the complex radio technology used in the solution. As not all customers have same level of knowledge about the mobile technology used for private wireless communication, so providing some easy-to-understand content

on the solution features and capabilities for pre-purchase as well as post-purchase customer education.

> "I know very little things about this kind of technology so yes some learning or educating content about this connectivity (solution). We need to be you know more properly informed about the technical issues and I think that for us as Port authorities we are publicly owned small, very small companies. All of us here in Finland we don't have any more than 100 employees, so very little companies who don't have the technology experience or know how. So, it should be very simple and customer friendly solutions that can be explained in a very easy way not in an engineer language. I think that kind of preparations could be very useful". (I3)

4.12.3 Building engagement through close customer and partner collaborations

Nokia has been building valuable industry collaborations with various industry partners, potential customers, and research institutes to help customers to test their latest 4G technology for various use cases across industries. These collaborations have helped Nokia to draw learnings that contributes towards further developing their solution and customers with an opportunity to test the capabilities of the technology and identify the critical requirements to conduct industrial automation use cases in their industry. Nokia have built a collaboration with a research institute and other industry partners; the common goal of such collaborations is to resolve industry problems and conduct research on the capabilities of Nokia's solution to identify the areas for development. Such collaboration relationship benefits Nokia because the research results can be leveraged as a proof of concept for tested use cases in the industry and provide input for further development in the solution. A customer from a Finnish research university adds his view on the topic:

> "Of course, we have ideas and things we want to do research on but then basically those needs come from the industry. The case here and the project we are running are pretty much always related to industry especially in our school of energy systems. In the top level and under we also have electrical engineering, how we run this is that we apply different projects from the industry partners for instance from Business Finland and consortium and the idea is that having industry partners we get the real problems to be solved. And this is pretty much the scheme. And it started from the perspective of research interest." (I1)

Nokia has built mutually beneficial collaborations with prominent companies in various industries to identify a suitable wireless communication network design and its parameters to fulfill their unique connectivity needs. In addition, through these collaborations customers can understand how to design or develop their own products, systems, or business models in the future.

> "We trying to find totally new solutions and looking forward and one example is this 5G communication that we are doing with Nokia for quiet many years already. To understand what the capabilities of the technology are and where the technology is heading what kind of products are coming in near future and of course communication is very important for all machines because quite many of our machines are repertoire machines, the so called free-ranging machines and they are freely driving around the terminal and your only communication can be wireless communication and until now it has been wifi technology quite a lot." (I5)

A customer from mining industry adds:

> "Of course one of our expectation is that this is new technology, so we want to study and understand how to build mining compliant communication networks" (I6)

4.13 Customers' trust on Nokia's brand

Customer engagement can be achieved by developing customers' trust and commitment towards a brand by building a strong relationship with them (Pansari and Kumar, 2017). Customers build the trust on a brand if they have positive experience in a customer-brand relationship.

All the customers stated that they have good trust level in the technology offered by Nokia and are hopeful of a bright future of Nokia as a company. In addition, few of the customers expressed that they see Nokia reinventing itself by developing a new product portfolio. A customer from transportation industry shares his feelings regarding their trust in Nokia brand below:

> "That is really crucial and how do you see the whole co-operation and there are really positive things that I see but there are also some negative things also. I still believe that there will be bright future for Nokia. Because of this kind of mergers and what kind of portfolio Nokia has there are possibilities if you make right decisions, but the competition is really hard. You really have to focus on that one (delivering to customer needs) and our focus is for our customers." (I5)

Another customer from facilities industry shares his feelings:

> "I have always had trust on Nokia and all the through even when everything went completely wrong. I thought they maybe they do something cool again. They may reinvent themselves. I see Nokia's this solution as a good model of reinventing internally. Trust with the team I think it's very good" (I2)

A customer from maritime industry expressed their emotional attachment with Nokia because of its Finnish origin and shared that they have strong confidence in the quality of technology developed by Nokia due to its reputation in creating high-standard products.

"So, it was pretty clear from the start that it would be combination of (Service partner) service and Nokia's products - hardware and software. And obviously that was one of the main reasons why we had the trust for this system. You know that we are Finnish, and we know Nokia is a huge company and even though (Service partner) was a small company and a start-up company and we knew we could rely on this technology because the software and hardware is coming from Nokia." (I3)

The customer also mentioned that they have long-term association and affiliation with the brand of Nokia which builds their trust in the brand.

"Well obviously, Nokia has been existing my whole life. Obviously, Nokia has been the Finnish success story. And all my adult life it's been the main factor in Finnish modern technology ICT business……But I think that overall the brand has very positive image here in Finland and in Oulu." (I3)

A customer from mining industry shared that trust in Nokia brand is influenced by its long history and high brand recognition globally for its quality products.

"I have been using mobile phones from Nokia since I was kid, it is not something that has started now and it has quite a long history which have been building the brand of Nokia and now in networks environment. I think generally speaking Nokia has a good name and that definitely helps to work with someone who is being recognized so we less questions why you are working with Nokia in comparison to a company that nobody knows about so you would have to put efforts into explaining why you work with these guys. But I think the brand speaks for itself...I think Nokia has still a strong brand even there maybe difficulties from time to time but this is applicable for all the companies but from brand point of view Nokia still remains a very strong brand." (I6)

4.14 Customer recommendations

Customers shared that they would recommend the solution to others because of their overall positive experience with the solution and Nokia's team. In addition, the customers highlighted that the solution not only delivers to their current needs but also provides a strong promise for delivering to their future wireless communication needs.

"At the moment yes. We have had good experience and it looks promising and there are possibilities." (I5)

"Yes. Because I believe in it as a future solution because it is upgrade-able and soon to be 5G." (I2)

"From my perspective I would recommend doing collaboration with Nokia. Bureaucracy is what it is but it is very hard to minimize or neglect that part of the scheme. Beside everything has went very smoothly, even when there are some costs in the service and operation and support but I at least I would say that support and good service has been there. At least I don't have a feeling that I or (customer organization) would have paid for nothing. As problem occur people are there to help and also the response times are short and technical personnel who really know the Nokia's technology we have access to them." (I1)

Many of the existing customers have been involved in customer referrals and spreading positive word of mouth about Nokia's solution at various forums. However, some of the customers have few complains related to the solution and would like to see improvements in those areas to be able to continue to recommend Nokia's solution as their own reputation is also at stake. A customer from maritime industry shared that they might not even renew their contract with Nokia if the suggested improvements are not incorporated in the solution.

> "Yes, and we are doing that already. Definitely we would recommend it. I need to be fairly honest with you, I want to make Nokia and their solution successful but if I am talking about my network in manufacturing industry, I don't want to so I am being completely straight forward with you I don't want to bluff those guys. I have been working with some of the other manufacturing companies for years. I want to be trustworthy if I am telling that this solution is good and I am recommending it. I want to be able to back it up. So of course I would recommend it but then just want to be open with soft spots that we already described that this IT integration is something that needs to be done by yourself or it needs to be agreed." (I4)

> "After we do this improvement (shared solution improvements earlier), Yes (I would recommend). And actually, I have been doing that already for example for those Americas or Spain (market) because I am relying on those improvements and it has been promised for us. We have several years of our contract left, it's just the fact that if we don't get these improvements so then the contracts need to end. Something needs to be done and we are willing to improve this process at our part. So basically, I am expecting (Service partner) and Nokia to do the same or otherwise we don't have a business relationship at all anymore. Its very simple". (I3)

> "I think in a way when we are showing up jointly in such events, so we are making some sort of the recommendations already. So those have to be evaluated case by case basis and I think that is a question that ultimately should be decided in a frame for collaboration going forward. For example what is it that we want to do in the marketing area together? I think we would have to structure that to say we are open to talk about these kinds of things, but we would have to build a structure going forward. To define basically, what does (customer company) and Nokia relationship or what is the co-operation all about and there we get sort of framework that we can then apply for different cases will take place." (I6)

5 DISCUSSION

5.1 Changing customer needs

With digitalization of industries, data intensive Industrial Internet of Things (IIoT) application use cases have created a need for pervasive and reliable network connectivity solution to conduct seamless communication between devices, machines, and people. Companies wish to leverage the benefits of mobile technology for critical communication networks, data and IIoT to improve their operational efficiency and offer new services to their own customers. Nokia customers are adopting the new technology for wireless communication to be compliant and capable to deliver to their customer demands.

The study helped in understanding customers current and future needs which is important for Nokia to understand because engagement of customers also starts with understanding and then delivering to customer needs as well as their expectations (Sashi, 2012). Some of the most highlighted needs by the customers for a wireless critical communication networks are a reliable low-latency, high bandwidth, high network speed and robust connectivity. According to the customers, these highlighted capabilities of an industrial grade private wireless network are currently well catered by Nokia's solution. The solution currently only fulfils the 4G capability requirements in a private wireless network however, the future use cases of industrial automation demand even lower latency rates e.g., lower than 20ms for ultra-reliable networks and higher bandwidth capacity to allow larger data flow, as well as a greater number of device connectivity with the network. Customers very well understand the current limitations of 4G technology and have set their expectations from the solution accordingly. However, they do expect the solution to eventually move to 5G technology as promised to ensure a steady progression towards industry 5G use cases to overcome the limitations of 4G technology. To deliver a 5G compatible networks would be essential in the future to keep the customers satisfied. So far Nokia has managed customer expectations quite well and the same attentiveness to customer needs should continue when Nokia's solution moves towards use of 5G technology to keep customers satisfied. As the capabilities of 5G are yet to be tested and validated, setting the right expectations related to the upgrades in the solution performance and addition of new features is very important for customer satisfaction. Transparency in communication and providing a structured roadmap towards 5G adoption can help avoid customer disappointment. In addition, Nokia should be very careful before making any promises that cannot be fulfilled as it can be seen as misleading claims and may affect customer satisfaction negatively.

Use of mobile technology for private wireless networks is still new across all industries, with adoption of 4G technology Nokia customers have started their journey to understand how to build industry compliant communication network with Nokia's solution, and what kind of network configurations, designs or parameters will be suitable for large scale implementation of mission-critical communication networks. Although, the Nokia's solution has some limitations as mentioned due to 4G technology, but the customers are satisfied overall with the results received from both commercial as well as test projects.

According to Nokia's customers the solution delivers great value to their business operations which has proven to be a better alternative to Wi-Fi for wireless communication. This indicates customers satisfaction with the overall value delivered by the solution against their expectations from solution performance (Sashi, 2012).

As use of 4G and 5G technology in private communication networks is still in early stages of adoption, customers expressed that they need assistance in implementing these networks. And expect Nokia as the technology provider as well as the experts on the topic to play a consultative role for the customers even after the purchase. Customers shared that although Nokia team has vast knowledge on technology side, but to some degree still lacks in-depth knowledge of customer's industry specific needs which restricts their ability to foresee the evolution in private wireless network designs and use cases. Nokia can add great value to their customers overall experience by offering post-purchase guidance to customers for best possible approach in resolving their industry specific problems. As Lemke et al., (2011) model of customer experience quality highlights that the quality of customers' experience and their satisfaction with the solution can be improved if customers post-purchase experience is improved and customized solutions are offered to them.

5.2 Customers current satisfaction level with the solution

Customers mainly evaluated Nokia's solution performance on attribute level and has great interest in development of the solution through close participation(co-creation) with Nokia's team. In addition, customers share a good relationship with both Nokia and their service partners as well as share an open communication environment which allows them to provide real feedback. They are quite happy with the current features of the solution such as network prioritization, network configuration and management, data security and privacy of a network. Features such as network slicing are considered highly valuable as it allows customers to configure their network which was not possible with legacy IT solutions. The solution performance meets all current customer needs, and its performance is considered better than Wi-Fi or any other legacy IT networks. Not many alternatives of mobile technology enabled wireless communication networks are available in the market, and this also contributes to the satisfaction of customers with current performance level of Nokia's solution. In addition, customers satisfaction with

the current pricing model is also a contributing factor towards their retention with the solution and provides Nokia a competitive edge. From Klaus and Maklan, (2013) study highlights that a positive customer experience has a significant positive impact on customer experience. Hence, if Nokia continue to deliver value for customers money and time by offering competitive pricing model, maintain a relationship of close collaboration with customers, improve service efficiency and communication responsiveness level Nokia customers will stick with their brand.

5.3 Satisfaction with pre-purchase and post purchase process

Currently, customers are satisfied with post-purchase service, with their close participation in network planning phase as co-creator (prosumers) of the solution delivered to them. Customers value the communication, project management and customized solution delivered to them by the service partner team and Nokia. Satisfaction with their experience can be evaluated based on the value created during the total experience of customers as a co-creator during pre-and post-purchase experience and consumption Verhoef et al., (2009).

5.4 Improvements in solution features

Customers did not mention dissatisfaction with current features offered in the solution however, they wish to see improvements in product performance and features in the future to cater to increasing demands of wireless communication use cases. From customer point of view Nokia's solution caters to 4G use case requirements currently but still needs more development on features and capabilities to become a mature wireless communication solution. Customers do recognize the difficult task for Nokia to fulfill all customer requests and expectations. However, they do expect few of the suggested improvements in the product features that will enable the future 5G use cases and their vision of industrial automation. Discussion with customers have not only highlighted the new feature demands in the solution but also provided insight into the future needs of customers and the role they expect Nokia's solution to play in the industrial automation ecosystem. One of the requested features by a customer is to develop a capability to run user or third-party applications on the edge cloud. This would allow customers to run applications through software integration with the solution's web portal for various use

cases. It would provide an integrated view of the network with the related applications of all the connected devices to the network. In addition, it opens an opportunity for various industrial automation ecosystem players to collaborate with Nokia and offer their add-on services on the solution platform. Currently, the customers use a piece of hardware which runs the application software of the connected machine/device/robot to the network and needs to be integrated manually with Nokia's wireless network. These hardware devices consume a lot of customers time in manual maintenance tasks such as firmware installation and updates. According to a customer, this setup might not be feasible for future 5G use cases due to its scalability restriction where each site would have hundreds of connected devices or machines to the network in contrast to low number of connected devices to Nokia's wireless network today. Need for continuous maintenance of hardware to run user or third-party applications reduce efficiency and adds complexity to management of devices operating on Nokia's network. Introducing the feature would not only allow seamless integration of applications to Nokia's solution web portal but would also make management of all connected devices easier for the customers. Customers would benefit from an integrated and open data exchange platform that can provide all the relevant data from in-use applications and systems. As the current Nokia's solution platform design is not built to integrate third-party applications and accommodating this new feature in the existing infrastructure would require a lot of design changes. Introducing this feature for customers may open new business opportunities for Nokia to collaborate with other ecosystem vendors and improve customer retention in future.

Another feature requested by a customer is to move data computation from edge computers to the cloud. This would eliminate the need to have industrial computers with the machines and IoT devices to run applications and would allow data computation to be transferred from edge computers to the cloud or edge cloud. Another benefit attached to this feature is the increase in data throughput rate which would help decrease the latency as well. Such customer requests are reflective of imminent industry trends. Cloud-based or as-a-service solutions have established themselves as an industry 4.0 standard, with advancements in IT infrastructure customers expect Nokia's solution as a digital automation enabler to have competencies to perform in industry 4.0 framework in the future.

Each industry customer utilizes the generated data on network health and connected devices differently for their automation use cases. It is critical for some customers business operations to provide real-time data to their end users on their own user interfaces. To realize this feature, The solution web portal would need to allow customers to extract data from the platform in real-time to be employed as meaningful information on their user interfaces and help end-users to make informed decisions. Integration of Nokia's solution web portal with API-equipped third-party software would allow the end users to utilize consolidated data on network health and connected devices on the web portal. The customer's request for this feature is driven by their industry need to utilize real-time data for achieving higher operational efficiency with lower cost in the future. With continuous advancements in IT such as 5G and Operational Technology (OT), the demand for interoperable and open data exchange solutions in industrial automation ecosystem is increasing. Providing an API to customers user-interface will be a first step towards development of Nokia's solution as an open data exchange platform than a closed one.

5.5 Improvements in web portal

Customers feel that the current design of Nokia's solution web portal provides very high-level metrics regarding the health of the network. Currently, the web portal serves a very restricted role in the management and in network health diagnostics. Customers wish to see in-depth metrics on the health of network and the connected device on the web portal. In addition, customers wish to have more network self-diagnostic tools on the portal to reduce their dependence on Nokia and service partner for network failure diagnostics. This feature would contribute towards improving customers satisfaction with network maintenance and response actions to resolve network failure cause. Customers are currently dissatisfied with the network configuration features offered in the solution and would like to have access to network configuration capability through the portal in future. The customers wish is to use Nokia's web portal as a central management and control system for all their connected devices applications.

5.6 Improvement in network service support communication

Customer interviews highlighted that customers are currently most dissatisfied with post-purchase service quality. Few of the customers expressed their satisfaction with reliability of service, which means that Nokia and the service partner were able to deliver to service promise dependably. One important consideration to be taken in account here is that customers that are currently satisfied with the network service reliability are in testing or proof of concept phase which makes their current operations as non-critical. However, many of the customers do not view the current service support completely reliable due to the issues they have faced with the service responsiveness and network recovery time. In addition, customers are currently dissatisfied with the communication conducted during network failure situations.

Due to lack of standard service support process in place and failure in clearly communicating service response time in crisis situations has resulted into customer dissatisfaction with overall network service support. However, customers have so far not experienced any major problems with communication conducted for network software updates. But majority of the customers feel that there is a need to develop a structured communication process with defined communication protocols for various network support & maintenance activities. To ensure effective communication, an integrated communication process should be established between Nokia, service partner and the customers. A clear communication process is considered necessary by the customers to keep them and all the involved stakeholders well informed. It would also help to remove any ambiguities related to communication such as whom to contact in crisis-situation. Customers shared their worry about the reachability of direct contacts in network failure during non-working hours or public holidays. The reachability of service support contacts is of most importance in time of crisis, but Nokia currently do not have any 24/7 service support contact number available for customers. The customers use Nokia's wireless network to bring pervasive wireless network connectivity for their 24/7 business operations, any network downtime brings their operation to standstill. This impact all the involved stakeholders, incurs costs to the customers and negatively affect their operational efficiency. Customer expectation is to have 99% of network uptime in the future. Overseeing these customer expectations may lead to high level of customer dissatisfaction and as some customers expressed it may even lead to their exit. To achieve

efficient level of communication with the customers it is important to develop a highly responsive communication process. In network failure scenarios customers expect to be informed of the on-going situation without much delay if not instantly.

From above discussion it can be inferred that currently Nokia is not meeting customers service quality expectations on SERVQUAL service responsiveness and reliability scale. Delivering to identified customers service quality expectations would help Nokia to not only improve customers satisfaction but also make them loyal to the brand (Parasuraman et al., 1985).

5.7 Network service support process improvement

In this research, network service support has emerged as an area for most improvement to be able to deliver to customers expectation and needs. Customer interviews has highlighted that the current service level delivered to them is acceptable because Nokia's business is relatively new with a premature network service process that needs to develop to match the performance level of the technology offered in the solution. In addition, due to restrictive access to the service partner to network data and management tools do not allow them to contribute at their full potential in delivering the expected service support. At present, two different factors are affecting customers service experience. First, is the absence of a structured process to conduct network service-related tasks. The collected customer feedback on this topic indicates that there is a need to have a clear and structured process to be developed by Nokia so that the customers are aware of the standard service protocol followed in each scenario. According to customers view, currently all the network service support and network failure response related tasks are conducted on ad-hoc basis without following any standard procedure which leaves them unsatisfied with the quality of service. The service level provided to customers currently promises to provide 24/7 network monitoring and inform the customer in case of any issues in the network server. Some of the customers have experienced long hours of network server down time which went undetected by the service support team and contributed to customers severe dissatisfaction with network service support. Customers want Nokia to formalize a network recovery process and communication protocol in collaboration with the network service partner to handle such undetected faults. Developing a structure process and informing about the standard actions taken in case of different network

service scenarios would help customers to set right service expectations and understand the measures taken to resolve the network issues in best possible way. The second factor is that the customers do not have a clear information about the distribution of service support responsibilities between Nokia and the service partner. Such ambiguity in distribution of responsibilities leave customers confused and frustrated especially in times of network failure situations because they need to correspond between the two parties to resolve an issue. Existing network service partnership between Nokia and the service partner currently lacks value chain integration which is affecting customers network service experience negatively. In addition, as Nokia's customers business operations are mission-critical and needs 24/7 network availability, so customer expect Nokia to provide a redundant network for customer during maintenance breaks or network failure situations. It is considered part of service support provided for maintenance and network recovery actions. Customers service quality perception is formed based on both the technical quality of the product but also the functional quality of a product such as accessibility to services offered to the customers or performance of service personnel to facilitate customer Gronroos, (1988). Hence, it is critical to address service quality complaints of customers to improve their satisfaction.

5.8 Improvement in software update process

Customers do not have any complaints from existing software update process. However, customers would like to see some improvements to this process in future. A customer wishes to have these software updates to be conducted without taking the network offline. Sometimes, these software updates can take several hours to complete or even in worse scenarios can take longer than planned to be completed before the network can be restored. These long hours of network downtime incur operational cost for customers. The service level demands are expected to be very high in the future as wireless connectivity becomes a building block for industrial automation.

5.9 Fault diagnostic reports

Customers view the actions taken during the network failure situations as inadequate and expects Nokia to provide detailed fault diagnostic report after any network failure incident. The presented fault diagnostics reports were not satisfactory for customers as

they did not contain enough information. Customers expect to receive detailed fault diagnostics reports with corrective actions to be implemented in the future to avoid similar network failure incidents. Customers would like Nokia to be more transparent to customers on network failure reasons and maintain close communication with customers to keep them informed of planned corrective actions.

Currently, the network service and maintenance part of the solution needs most improvement to deliver to customer expectations and future demands. Nokia needs reevaluation of their current network support and maintenance process and need to develop a process after extensive review of industrial customer network service needs. Customers with highly dependent business operations on uninterrupted network connectivity need network availability 99% of the time and needs backup network for maintenance breaks as network downtime has negative impact on the solution. The data clearly establishes the fact that customers are not satisfied with the quality of network support and maintenance services. Nokia needs to allocate more resources to the services until the service partner has the capability to resolve majority of network issues independently. Also, attention needs to be given in formalizing better network services process for network failure situations and developing more defined communication flow with both the service partner and customers.

5.10 Customer engagement and value

The customers have been highly involved with various social engagement activities organized by Nokia. Some of the most popular marketing activities among the customers are industry specific private wireless communication informative client council events, Nokia private wireless technology and its use case demonstration events, and joint participation in industry events. Many of the customers are willing to continue to participate in Nokia promotion activities as their endorsement of the solution but only after above suggested improvements are implemented. Failure to do so may also result in exit of some customers which makes it even more critical. It is important to the customers that a product recommended by them to others in the industry is of highest quality as their own reputation is at stake. Also, they wish to have a more structure approach to their

participation in Nokia promotional activities as it requires investment of time and money from their side.

Customers are willing to continue to participate in Nokia organized engagement activities because they recognize the value delivered to them through such activities. Customers greatly value the knowledge shared on new industry trends, wireless communication technology and learnings from digital automation journey of other customers through these engagement activities. In addition, the customers value the publicity they receive with participation in various engagement activities. Customers view their participation in various engagement activities as part of their business collaboration and are willing to share their resources to help further develop the collaboration in the future. Nokia should continue to encourage customer participation in various promotional activities as it strengthens customers engagement and their emotional as well as physical investment in the brand.

Customers are currently are also engaged through value co-creation activities during their pre- and post-purchase interactions such solution customization according to customer needs and opportunity to collaborate with Nokia team as prosumers to design the solution. Customers are currently satisfied with the co-creation interactions with Nokia which helped them in designing and implementation of a wireless communication network unique to their needs. In addition, customers have been very impressed with the interactive two-way communication maintained through regular steering meetings with Nokia and the service partner throughout the purchase journey which provides an opportunity for customers to provide feedback and share their preferences. These co-creative engagement activities positively effects customers satisfaction with the solution (Lusch and Vargo 2006 & Prahalad and Ramaswamy, 2004).

Currently, the customers evaluate the performance of the solution based on its attributes and has a rational bond with Nokia's solution. However, Nokia itself is a very established brand and customers also have emotional affiliation with the brand due to its long history and global recognition for quality products. All these factors contribute towards their trust in the technology offered in Nokia products. Also, the customers shared that they have a good relationship with the Nokia which is based on open communication. Customers

emotional affiliation and trust with Nokia brand and good relationship with customers all contribute to customer engagement. To achieve customers calculative commitment Nokia should continue to satisfy customer needs and strengthen their relationship with the brand. However, achieving customers affective commitment is dependent upon maintaining their trust on the brand and increase their emotional attachment with the solution by delivering high quality product as well as service beyond their expectations.

Customers currently recommend and endorse Nokia's solution in public events, media and through customer referrals. And are willing to continue to do so only if Nokia delivers to their expectations and make suggested improvements in the future as well. It can be interpreted from the results that currently customers would recommend Nokia to other brands because of their overall satisfaction from the value delivered by the solution and calculative commitment to the solution (Sashi 2012). As customers satisfaction has a mediating role between value delivered and customers loyalty towards a brand hence, customer value should be continuously delivered through out customer journey.

Nokia customers highly value the high-quality technology offered in Nokia products and the knowledge they have on 4G and 5G wireless communication industry. Customers currently share a good relationship with Nokia where both parties work towards achieving a common goal and have open communication relationship which contributes to value perceived by customer from their collaboration with Nokia. Customers are currently satisfied with the value received through their collaboration with Nokia. In addition, customers value the improvement in their employee's efficiency with use of Nokia's solution as they can focus on more meaningful tasks. Customers consider Nokia's solution to have delivered value for their money as it addresses their core needs and delivers to their expectations, however in the future Nokia needs to introduce 5G compliant wireless networks to fulfill customers changing needs and improve their service quality.

Customers are currently satisfied with the solution capabilities and the features offered currently satisfy their needs. However, customers future satisfaction with the solution is dependent upon 5G capabilities offered in the solution in future to fulfill their industrial automation needs. Currently, the customers are most dissatisfied with post-purchase

network service and maintenance of the solution and have not been able to deliver to customer expectations. Nokia needs to reevaluate their current network support and maintenance process and should develop a structured process after extensive review of customers network service and maintenance expectations. Nokia needs to allocate more resources to the network service support until the service partner has the capability to resolve majority of network issues independently. Also, attention needs to be given in formalizing better network communication process with promptness of response in network failure situations as it highly effects customers overall satisfaction with their post-purchase experience quality.

It is crucial for Nokia to make suggested improvements and maintain the quality of their solution to not only satisfy customers but also maintain their trust and commitment with the brand. The focus should remain to strengthen their relationship with customers by delivering value through co-creative experiences such as regular meetings with customers with open communication and offering customized solution for their needs. In addition, providing customers value for their money through price competitiveness and variety in the product features would help customers to stick with the brand. Current engagement activities are perceived mutually beneficial by the customers and should continue however, the customer recommendation activities should have clear goals and structure for customers to evaluate their time and money investment. It is through these engagement activities that Nokia can also maintain their customers involvement with the brand and benefit from engagement outcomes such as customer word-of-mouth and referrals in the future.

6 Recommendations

The fourth industrial technological revolution is responsible for onset of digital transition in the industry which is bringing substantial transformation to companies' operations, processes, business models and the products/ services offered. To keep pace with industry transformation, companies would require making substantial investments to digitize and integrate their products and business operations. Similarly, the technological

advancements in IT, operational technology (OT) and customers need to develop cost-effective business operations to be profitable are all affecting their future expectations from solutions. The insights collected from this research about the determinants of Nokia customers' satisfaction and dissatisfaction is of great significance for the Nokia as the learnings can be used to improve their solution and meet future customer needs and expectations.

The customer expectations and suggested improvements in Nokia's solution as well as their business processes are in line with identified drivers of industry 4.0. PwC International Limited (2014) report on the fourth industrial revolution presented the typical characteristics of business operations digitalization, and the need to have interconnected business models, value chains and the product/services offered by the firms. Similarly, the suggested improvements by the customers in Nokia's business operations and the solution are driven by the expectations developed through ongoing digital transformation of industries.

The new digital business models are based on substantial increase in businesses horizontal value chain collaboration and use of integrated data analysis to help better serve towards customer requirements.

The PwC International Limited (2014) presented a framework of drivers of industry 4.0 which is the based on the most significant drivers of the industry 4.0 as shown below in the Figure. 9 and the suggested recommendation to Nokia are considering learnings from the industry 4.0 framework to successfully deliver to customers highlighted expectations in this study.

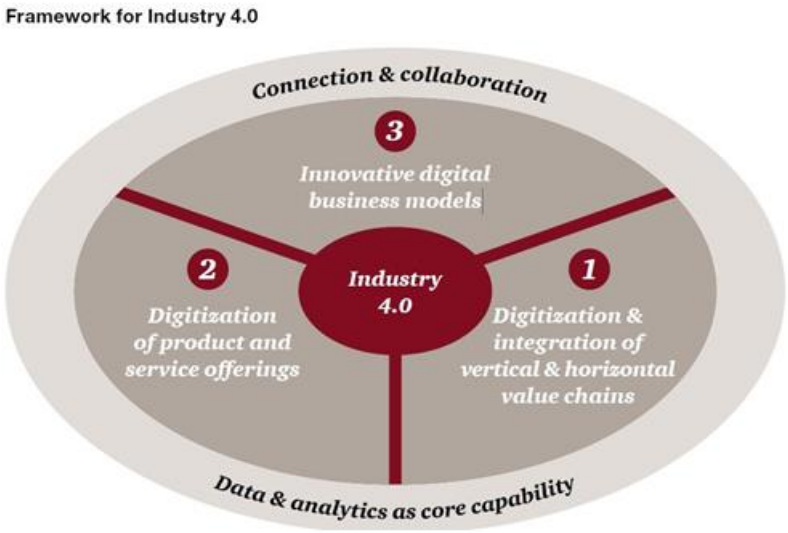

Figure 7. Frame for industry 4.0 (PWC REPORT 2014)

6.1.1 Adopting integration and open data exchange in products/services

Due to intense competition, customers are looking for products and services that can help them improve their efficiency and productivity. Industry 4.0 customers seek solutions that offers connected, automated and data driven services to help customers achieve their business goals.

Currently, Nokia's customers are satisfied with quality of technology offered in the solution. However, the improvements requested in the product features and the solution web portal design are all based on the driver of industry 4.0, which is to develop more integrated solutions that can operate in collaboration with other customer solutions. Interoperability of products and services is essential for companies to implement their unique industrial automation use cases, where different parts of a complete automation solution are provided by multiple vendors from the ecosystem. The requested features by customers such as third-party applications integration or API enabled web portal leads towards a demand for interoperable and open data exchange solutions in the future. Most importantly it will allow Nokia customers to utilize insights from integrated data and analytics to make informed decisions in real-time.

One of the main challenges in achieving open industry 4.0 ecosystem is providing access to company data to others which is necessary to create interoperable solutions. Offering an interoperable and open data exchange solution to the customers would help them reduce complexity in operating Nokia's private wireless network with other industrial automation solutions. Implementation of an open data exchange platform can be achieved through building industry collaborations and driving suitable public policy to protect the data exchanged through these platforms. Offering an integrated platform will reduce the complexity in management of connected devices and machines from The solution platform for the customers and offer many other benefits.

Nokia as one of the leaders in industry 4.0 ecosystem should initiate industry collaborations to build mutually beneficial partnerships to offer integrated and open solution to customers. All the ecosystem players should recognize the future needs of customers for integrated and open data exchange solutions in the future.

6.1.2 Improve customer experience through vertical and horizontal value chain integration

As discussed in the study earlier during the literature review that customers evaluate complete purchase experience and value delivered to them to form their value perceptions about a solution. This indicates that to satisfy customers it is crucial for Nokia to re-evaluate themselves and focus towards delivering a total customer experience which facilitates efficient business processes, delivers value, offers transparent communication and best possible solutions to meet 5G industrial use case requirements. However, delivering to all customer demands is an intensive task and investment but taking first steps in the right direction can gradually help Nokia to satisfy their customers in the future.

The study results have shown that Nokia currently lacks an integrated business process with its partners and customers. Customers' post purchase experience needs most improvement, service support and customer communication process design should be developed on the grounds of open data flow between the parties. Horizontal integration is of importance if Nokia wants to offer connected and automated products and services to their customers. In addition, well integrated solutions would facilitate Nokia's service

partners with uninterrupted access to data and provide expected network service support to customers. With technological advancements, customers expect operational efficiency which can be achieved through highly integrated business processes with their service partners and other ecosystem partners. Improving information flow vertically would provide Nokia with consolidated data on their customer networks and allow them to conduct efficient communication between all business units. In addition, formalizing a better network service support process structure would help to improve customer satisfaction and value delivered during post-purchase experience. Implementing an integrated value chain will have many benefits for Nokia as it will make the processes within the company more coherent, reduce the redundancies of existing process, minimize quality losses in the value chain and improves transparency.

6.1.3 Recommendation for future research

In this study, customers current satisfaction from the solution and its service has been identified including many suggestions for improvement in the solution. Customers future satisfaction is dependent upon how Nokia implement the suggested improvements in the solution. To maintain customer engagement and their satisfaction, it is important to revisit the improvements made by Nokia and document customers opinions on them every year. In addition, it is also important to keep track of customer needs and ensure that customer voice is heard to identify the things they are dissatisfied with as well happy with. To achieve this, Nokia should conduct yearly in-depth interviews of customer feedback which can allow customers to voice their concerns with assurance that customer suggestions would be reviewed, and possible improvements will be implemented. Customer feedback surveys would be a great source to identify customer satisfaction and retention to predict future business incomes. It should also include to get feedback on success or failure of customer engagement activities and identify if customers are willing to participate more in customer advocacy activities. The ultimate return on investment incurred in achieving customer satisfaction and engagement is not only customer loyalty and better revenues but also to have them as your brand advocates which is a superior competitive advantage. Employee engagement is another variable which has a positive effect on customer satisfaction and engagement and can also be included along with customer feedback surveys.

7 LIMITATIONS

Although Nokia have customers globally, however this study was only limited to Finland. As Nokia has different service and spectrum partners globally so the results may vary country to country and hence, the findings of this study cannot be generalized. In addition, the customer in-depth interviews were conducted year ago and as the market of mobile wireless communication technology is evolving at a rapid pace many of the suggested technical improvements in the solution may have already been implemented. Also, with constraints of time and budget only a few customers from Finland participated in the study.

8 CONCLUSION

This study results shows that currently high priority customer needs are met, and they are satisfied with the value delivered by Nokia's solution as well as the current capabilities of the solution. However, they expect the solution to be 5G compliant in the future to meet their future industrial automation needs. This means to satisfy customer in the future Nokia needs to invest in development of high-quality product with 5G capabilities. The perceived performance of customers post-purchase experience is not up to customer expectations. Nokia network service support and maintenance quality and communication quality needs most improvement to be able to deliver to customer expectations. Improvement in product features such as more fault diagnostics tools in customer portal, more network control and management for customers in customer portal and integration of third-party apps would allow to satisfy customers future expectations. By delivering value to the customers throughout their purchase journey and collaborating through various Nokia organized marketing activities will help to keep customers engaged with the brand. Customer value the outcomes their business has achieved through collaboration with Nokia and believe that their solution has provided value for their money. Customer value delivered through co-creative customer experiences such as network planning and customization in network design to adjust to customer needs and positively impacts customers' engagement. However, to strengthen customers engagement with the brand Nokia should build emotional investment with the solution. Customers' participation in various marketing collaboration creates a positive word-of-mouth of Nokia and helps to

promote the solution in the market. However, customer recommendation would only continue if Nokia keeps delivering to their promise and make the suggested improvements to the solution. The end goal of having satisfied and engaged customers is to develop strong customer trust and their willingness to recommend a brand because it helps to attract new customers and retain the existing ones. Keeping customers engaged is of much importance for Nokia because customers can provide their valuable feedback and share preferences which can help Nokia design customer centric products, improve their business processes, and gain a competitive edge in the market. It is imperative to continuously deliver a consistent and high-quality service and post-purchase experience to maintain customers engagement to increase profitability in the future.

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10 APPENDIX I

Interview guide for participants.

Introductory questions:

Can you please share a little background about your work experience and job role in your company?

How have you been involved in Nokia's solution implementation at your organization?

Customer satisfaction:

Can you please explain, how do you currently use Nokia's solution?

How does Nokia's solution currently deliver to your needs?

What is it in the solution that you are happy about?

Is there anything that you are not happy with currently?

Customer value:

How do you perceive the value received from the Nokia's solution?

How does it help in achieving your goals at work?

What do you think of your collaboration with Nokia? (Relationship, co-creation)

What value has this brought to your business?

How do you feel about the pricing model of Nokia's solution? (optional)

Service & product quality:

How would you describe the current performance of Nokia's solution in use cases within your industry?

What are those things you are satisfied with? (Leave if mentioned in the beginning)

What do you think of current features of Nokia's solution?

What other features you would like to see in Nokia's solution in the future?

What limitations do you see in Nokia's solution?

Where would you like to see improvement in the future. (product performance or product features).

How would you describe your pre-purchase process experience with Nokia?
Which processes you are satisfied with?
In which processes you would like to see the improvement in future?
What suggestions you would give to Nokia for improvement in these areas?

How would you describe your post-purchase process experience with Nokia? (communication, payments, operations)
Which processes you are satisfied with?
In which processes you would like to see the improvement in future?
What suggestions you would give Nokia for improvement in these areas?

How would you describe your experience with service delivery process of Nokia's solution?
(NW planning, deployment, Installation and system integration, network maintenance and support) If customer mentions any problems,
Were you able to resolve these issues? Were you satisfied with the support provided by Nokia and our partner to resolve your issue?
In which areas you would like to see improvement in the future?
Do you have suggestions to improve the service delivery process for Nokia or our partner?

How would you describe your experience of communication with Nokia and our partners? (Pre-purchase to post-purchase communication)
What challenges do you currently face in communication with Nokia and our partners?
In which areas you would like to see the improvement? (Tools, mode of communication, frequency of communication)

Customer engagement:
What does Nokia as a brand mean to you? (Trust)
How would you describe your company's relationship with Nokia?

How has your experience been with the activities conducted for promotion of your collaboration with Nokia?
Would you consider being more involved in joint promotion activities with Nokia in future?
Which activities you wish to participate more in the future? (WOM, Blogs, PR's, invitation to events, participation in joint marketing events)

Based on the results you have achieved so far with use of Nokia's solution, would you recommend it to other businesses?
Why wouldn't you recommend it to others?
Why would you recommend it others?

Interview Closing:
You did not mention XYZ during our conversation? What do you think about XYZ?

Is there anything else you would like to add before we close this interview?

Inform about next steps: After completing the interviews, I will be sharing the results in couple of months. This study will be published in my university thesis collection. Do you want me to share the results with you once published?