

The Evolving Customer Experience Management Landscape: A Case Study on the Paper Machine Companies

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Abstract—Customer experience is increasingly the differentiator between successful companies and those who struggle. Currently, customer experiences become more dynamic; and they advance with each interaction between the company and a customer. Every customer conversation and any effort to evolve these conversations would be beneficial and should ultimately result in a positive customer experience. The aim of this paper is to analyze the evolving customer experience management landscape and the relevant challenges and opportunities. A case study on the “paper machine” companies is chosen. Hence, this paper analyzes the challenges and opportunities in customer experience management of paper machine companies for the case of “road to steel”. Road to steel shows the journey of steel from raw material to end product (i.e. paper machine in this paper). ALPHA (Steel company) and BETA (paper machine company), are chosen and their efforts to evolve the customer experiences are investigated. Semi-structured interviews are conducted with experts in those companies to identify the challenges and opportunities of the evolving customer experience management from their point of view. The findings of this paper contribute to the theory and business practices in the realm of the evolving customer experience management landscape.

Keywords—Customer experience management, paper machine risk analysis, value chain management.

I. INTRODUCTION

IN contemporary world, providing low-priced and high-function products and services is not enough to stimulate customer demand; In addition, it is important to provide high quality customer experience as well. While the relationships between a firm and its customers are ever evolving, it delivers opportunities and challenges to connect to other customers and firms through social media and mobile devices. At the same time, increased competition and advances in technology such as IT are reducing barriers to entry, which urge firms to pursue strategies to build a deeper level of engagement with their customers. Thus, customer experience management landscape is evolving to new frontiers. There are plenty of new papers, which study and analyze these new frontiers [7], [8], [11], [12], [19], [27]. Basically, Customer Experience Management (CEM) is a solution that encourages business activities to build a deeper understanding of customers’ needs. It aims at

the realization of an elevated customer experience at different contact points [1], [17]. CEM is designed to first encourage loyalty by identifying key customers who recommend the business and its products and services to other firms (or people), and second to define and remove issues which hinder and discourage pleasant customer experience. The latter objective is done with creating a “customer experience map” [1]. The customer experience map provides an overarching vision to illustrate contact points within which customers interact with the company throughout buying a service or product [1], [17]. However, there are gaps between the theoretical CEM and its implementation. For example, a recent survey conducted within the telecommunication sectors in South Africa indicated a gap between theoretical CEM approaches and their implementation in companies [5]. Therefore, this is highly important to analyze the challenges and opportunities of CEM with empirical cases.

The aim of this paper is to analyze the evolving CEM landscape and the relevant challenges and opportunities. This paper tackles the challenges and opportunities in customer experience management of paper machine companies. The case of “road to steel” in this paper shows the journey of steel from raw material to end product for paper machine. The rest of this paper is outlined as follows. First, we briefly study the importance of CEM and open up a concise background for role of steel in paper machine companies. Second, we describe the aim of the paper and our research questions. Thirdly, we describe our research methodology. After that, we introduce our case study and two target companies, ALPHA (steel company) and BETA (paper machine company) with the particular focus on the China’s business. After that, we present the result of the paper and the opportunities and challenges that we found in our case study. After that, we present the implications of our findings. Finally, we conclude the paper and present some future avenues for further research.

II. LITERATURE REVIEW

Pine and Gilmore [20], [21] were among the first authors who address the notion of the customer experience [3], [9]. In their paper in 1998; “Welcome to the Experience Economy” and their book the following year; The experience economy – Work is theatre and every business a stage, Pine and Gilmore mentioned that as services are becoming more commoditized pioneering firms are competing on experiences. So, the leading firms offer better customer experiences. Customer experience drives from customer’s responses to direct or

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indirect contact with a firm. Direct contact usually happens during the purchasing a service or product, use and etc. by customers. Indirect contact generally drives from unprecedented encounters of a firm's' product or services. These encounters come from word-of-mouth recommendations or criticism, advertisement, news, review and etc. [16].

Since the mid-1990s, customer-oriented approaches in marketing, sales and operations have become increasingly prevalent among firms and they step by step become the norm. In this matter, CEM spreads these approaches to look at the customer experience more holistically by concentrating on experience customers have with the firm at each point along the customer journey [26].

Several authors [17], [18], [20]-[22], [25], [28] have made the point that the customer experience will be the differentiator between successful and unsuccessful companies since it provides new means of competition. Likewise, providing a good experience is significant because it affects customer satisfaction [13], delivers customer loyalty [14], [23], [29] influences expectations [6], encourages confidence [6], promotes the brand [2] and also creates emotional bonds with customers or, conversely, leads to emotional damaging [23]. However, despite these benefits, the limited amount of research in this area suggests that good customer experiences are not prevalent [10]. For example, a survey by Bain & Co. of 362 companies, across several industries and their customers, found that 80% of the senior executives interviewed said they provided a superior customer experience, but just 8% of their customers agreed the same thing [4], [10]. Therefore, implementation of customer experience is facing with some issues. In order to realize these issues, empirical case studies are needed. Specially, through the value chain, managing the customer experience becomes more challenging. Firms should act on improving their CEM to outpace their competitors. This means CEM landscape is ever-evolving.

In this paper, we chose the paper machine industry to evaluate the role of CEM in practice. Steel is very important in paper machine, since most of the parts in paper machine are made from steel (e.g. 500 tons in a paper machine). There are two types of steel in the paper machine from the provider's perspective: "stupid steel" which is still in the machine during production and "clever steel" which is running in the production. We study the case of "the road of the steel" in the value chain from raw material to end product (paper machine) to assess how to communicate customer experience and material specific expertise in the value chain.

III. RESEARCH QUESTIONS AND AIMS

The aim of this paper is to analyze the evolving CEM landscape and the relevant challenges and opportunities. The research questions include: 1- How customer experience can be communicated in the value chain? 2- What are the main customers complains in this regard. 3- How the material specific knowledge "built in" the steel could be transferred by means of guidance, training and managing from one stage to another in the value chain and how they affect CEM?

IV. RESEARCH METHODOLOGY

In this paper, we follow a qualitative research method and precisely conducting interviews. Two Finnish companies, ALPHA (steel company) and BETA (paper machine company), are chosen and their efforts to evolve the customer experiences are investigated.

During the trip to China, we have interviewed different stakeholders from ALPHA, BETA and their end customers of paper machine. The interviews' composition is presented in Table I.

TABLE I
INTERVIEWS' COMPOSITION

Company	Department	Number of interviews
BETA	Production	3
BETA	Quality Control	3
BETA	Procurement	1
BETA	Installation	1
BETA	Sales	1
BETA	Services	3
ALPHA	Customers	2

BETA is a world prominent industrial company serving the mining, aggregates, recycling, oil, gas, pulp, paper and process industries. In the case of paper machine and particularly in Chinese business, BETA's workshop manager describes three categories of spare parts/accessories/components: 1) A-parts are manufactured always by BETA; 2) B-parts (balance parts) are produced by BETA if BETA has the over capacity to produce itself; otherwise, B-parts will be purchased from external subcontractors; 3) C-parts will be always purchased from the designated subcontractors. The quality issue in these three parts is related to either BETA or its subcontractors.

ALPHA is a Finnish company with headquartered in Helsinki, which manufactures and supplies metal-based components and systems to the construction and engineering businesses. ALPHA sells special steels (so called Finnish Steel by some customers) in China. It provides basic services such as warehouse, logistics, cutting and painting. However, customers will most likely do the cutting and painting themselves due to the labour cost differences between ALPHA and customers for the time being. Although ALPHA is not the direct supplier of BETA in China, these two companies have the potentials to cooperate in the near future. Since ALPHA is expanding a common business model in China, that can be used by BETA. ALPHA's customers (including privately-owned and stated-owned) are required to pay 50% in advance to reserve an order and pay full amount money before the delivery of products and services. However, some of their customers (foreign-owned) are allowed to pay after the delivery of products and services due to the mutual trust and BETA's install based customers' growing in China.

In current fierce competition environment in China, the sales of install based paper machine is not that profitable and even losing profit in order to win the install based orders from customers; so the compensated profit is driven from spare parts and after sales services. However, the end customers complained that the price of spare parts is too expensive and

increasing too fast, so they are looking for some local ones to replace it, which will cause a risk in selling spare parts when the technology gap is narrowing.

V. FINDINGS

We categorize our findings in the different parts. We start from innovations that these two companies started in China, after that, we point out to some particular problems which identified from customers complains. Later we discuss about different stakeholders' activities, which is linked to the quality issues from the previous part.

A. Innovations in Service Value Chain

Sales team is the pioneer to get the first hand requirement from customers. The draft documentation from sales is critical for all other stakeholders' activities. Delayed or even incorrect (e.g. missing some key information from customer side) information transfer will lead a gap between customer's expectation and their perceived quality. For example, sometimes sales only make the list of what customer says, but do not get full understanding of what is really required from those customers in China. Design team should be the expert to know the material specific knowledge. The raw material is usually chosen by design team based on the internal knowledge of paper machine's usage and performance. Customer's special requirements have to be considered during the design phase. However, the design bug or mistake does exist due to the missing of customers' full information and misunderstanding of customer's requirement. For example, the location and working environment of the paper machine in customer's site (such as PH value) need to be taken into account before choosing the steel types. Production team is involved in mainly two sides linked to the quality issue. From the human factor perspective on one hand, they normally do not have too much but only basic material specific knowledge. The team in China is not that experienced and their overall technical skill is still relatively low. Some production staff does not follow the rule to process the work but skip few steps to reach the fast end result. They make some changes before full research. One of our interviewees also pointed out the lack of event log during their operations, so it is difficult to track it when the problem happens. From the environment perspective on the other hand, some of BETA's machinery tool (used to produce the components for paper machine) is too old. The construction regarding the quality of cement is not strict enough; and the point of strength is not equal. These cause the shakes of machinery when running and then leading to the quality problem of the products. Furthermore, the moist working environment in Shanghai factory also has the impact to some extent.

B. Quality Issues in China

1) Customer Complaints

Customers complain about both service quality and product quality. Service quality has reached some KPI (key performance indicators) according to the specification, but the overall performance perceived by customers may not meet

their expectation. The reasons are from two sides: The service staff may not have a deep understanding of the customer's practical environment; the customer is demanding too much for a particular service activity.

The quality of paper machine and spare parts in general is decreasing when the manufacturing center moved to China. The common reason for the quality problem in China, first of all, is concerning the raw material (steel) purchasing. The raw material situation in China, such as purchasing standard, is different from EU countries. The requirement of steel standard in China is below the standard in Europe (e.g. purity quotient is lower than European standard); therefore, the overall quality of steel for paper machine is going down a bit along with the reduced cost. Second, the manufacturing centre of Metso in China is still young. The employees' overall technical skills and knowledge for various types of machineries, moved from EU to China need to be improved. Third, Metso's machinery moved from EU to China, which is used to produce the paper machine, may need to be upgraded as well. Some machinery is also purchased locally in China.

2) Specific Problems

Quality problems of the paper machine such as rust, corruption, surface out of flatness, size and welding problem (air hole, crack, undercut) are recognized. Meanwhile, the visual quality problem such as paint shedding and scratch is emphasized as well by our interviewees.

Rust and corruption are usually caused by three reasons: 1) in the design stage, customers are trying to cut the cost by using normal steel instead of the premium one; however, when the rust brings trouble for paper machine's usage, customers start to complain why Metso has not corrected them during the design stage; 2) the communication gap between Metso and customer exists: the design team are not aware of customer's practical working environment, such as temperature, moisture, and location, because of the missing information from customer's side 3) It is also due to the improper use of the paper machine and lack of cleanness in customers' side. The reasons for surface, size and welding problems (air hole, crack, undercut) depend on the components, which are produced by Metso or purchased from subcontractors. The former is due to the own production team's mistake; the latter is caused by the subcontractor but is responsible by Metso's QA (quality assurance) team.

The visual quality is not that problematic and will not cause the quality problem in practice; however, customers are more and more demanding nowadays in China due to the increasing competition. Therefore, top management puts more effort to ask employees to follow the process standard/criterion, in order to improve the visual quality and earn customers' satisfaction. Once, again, the QA (quality assurance) team plays a critical role in this process.

C. Different Stakeholders' Activities (Linked to Quality Issue)

In this part, we list the activities of different stakeholders in the value chain, which is linked to the quality issue in China.

Many of our interviewees mentioned that the origin of most risks come from human factors. Besides the materials, the product quality depends on the production process controlled by the production line's staff. Their attitude and capability is critical for the quality. The local staff prefers to have a short cut but neglect the regulated rules sometimes in China. BETA's shanghai based factory has old state-owned enterprises (SOEs) culture, since the factory has been acquired from a local SOE six years ago.

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BETA's subcontractors in the sourcing project are problematic in China. Sourcing is not that stable comparing to it is in the Europe. It depends on the two criteria according to the local sourcing team: The first one is that the material should be common used in China and Europe; the second one is the low cost. Only few qualified suppliers are available in China. Many suppliers do not follow the process but always wish to have short cut in producing the components (it is regarding how to inspect subcontractor's process). Moreover, some suppliers will not report to BETA even when they detect the problems (they try to hide the problems to avoid the

rework). Although the QA team requires the material specific knowledge, the inspection tools, inspection process as well as the skills from small detail to big picture are more important in practice. Normally they will follow the process to do the inspection via check point in raw material, baiting, welding, processing, size test, etc. QA try to test the "big pieces" before delivery in supplier site and test the "small pieces" after delivery to BETA's Shanghai factory. However, they are still lack of enough personnel resource and inspection tools in China. It causes the difficulties to make the preventive test before delivery from subcontractors.

Installation team plays a critical role in installed base. Too many stakeholders besides BETA are involved in the customer site. BETA can act as a supervisor, but client asks other local workers to participate in the installation in order to reduce the cost. Customers usually will not purchase the whole paper machine package from BETA. They will buy some main sections from BETA, and some other sections from Voith or Andritz for example, and automation system from ABB. Therefore, it is very difficult for the installation managers to coordinate related stakeholder's work, especially when the interface and systems are not compatible sometimes. Even small change from third parties and customers during the installation will cause many unexpected problems. In addition, local transportation (logistics) may also bring some damages due to the unskilled labour force and local package.

Customers' activities cannot be neglected in the value chain. First, Chinese customers change the components for cheap price or from other suppliers who do not have experience in paper machine. For example, some private-owned clients purchase supplementary system for third party, who are unfamiliar with the process and install it by themselves. Price is more important to those customers who also allow a little bad quality, but sometimes they enlarge the problem in order to attract providers' attention. Second, some customers are lack of capability to use the machinery properly even after training, because their employees change job too frequently (this is also the reason why those customers are unwilling to invest on training). Anyhow, they expect to have guidance in Chinese version (not only in English). This also indicates to the customers' demanding for providers to speed up their pace of localization. Third, customers may use new chemicals or change the process of paper production. The machinery working environment in customers' site is moist with extreme heat.

VI. DISCUSSION

In this section, we try to conclude some implications to deal with earlier mentioned problems. First of all, it is important and necessary to maintain a local database in BETA China. This database can mainly contain the information of suppliers, own production and customers. The database of suppliers can include the most frequent problems from suppliers and the process to inspect them. The database of BETA's own production can be used for the internal feedback from production and engineering. The database of customers is important for installed base feedback from customers, for

example, in customers' erection stage. The purpose of the database in these three parts is to share the knowledge among different stakeholders' involved. Therefore, the experience from customers, suppliers and even own productions can be communicated in the value chain. Furthermore, BETA can also educate their suppliers and customers. For example, suppliers and customers come to participate in BETA's seminar and workshop; letters to suppliers and customers for specific topic; inspection of the supplier's process.

Second, internal training is still required and internal communication need to be improved. The database for suppliers, own production and customers can also be used for the internal training and communication purpose. The task of internal training is to enhance staff's material specific knowledge and technical skill. Since the most parts of the paper machine are made from different types of steel, the good knowledge of "steel" help the staff to have a better understanding of their work. Both the technical and communication skills are critical in the project to convince customers and third parties in the customer's installed base. The collaboration with different stakeholders for a couple of times will accumulate the experience s among those parties (people change jobs though).

Third, the quality awareness of BETA's local employees is required to be enhanced. In the production team, a systematic process control (a standard production process) is needed. Quality comes from the capability of production but the formal test works as a tool to inspect it. The internal peer review or QA can use the checkpoint in the process to inspect the production team's work. Implementing the strict rules to be followed by the employees is basic but most important way to increase the quality awareness and ensure the process quality for the final products.

VII. CONCLUSION

This paper shed light on the evolving CEM landscapes. We have briefly studied the ever-increasing importance of customer experience in offering products and services. We studied the case study of paper machine companies and specifically the case of Road to Steel. We conducted interviews in two Finnish companies, which are dealing with CEM in the field of paper machines and steel. Our analysis showed there are plenty of problems emerged from dissonance between customers and companies. We analyzed these problems case by case and we found some implications can be used to resolve these problems. The empirical approach presented in this paper provides further avenues for researches in the field of CEM and particularly for the case of Road to Steel. Further studies can expand the scope of this paper beyond only two Finnish companies and using interviews with other methods and approaches for instance with following quantitative studies and in different countries.

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REFERENCES

- [1] ABeam consulting (2016), "Integration and optimization of customer experience at all contact points", online at https://www.abeam.com/service_lines/SL125_EN.pdf, Retrieved 30 Feb 2017.
- [2] Berry, L. L. & Carbone, L. P. (2007). "Build Loyalty through Experience Management." *Quality Progress* 40(9): 26-32.
- [3] Carbone, L. P. & Haeckel, S. H. (1994). "Engineering Customer Experience." *Marketing Management* 3(3): 8-19.
- [4] Coffman, J. & Stotz, D. (2007). How some banks turn clients into advocates, *American Banker*.
- [5] Du Plessis, L., & De Vries, M. (2016). Towards a holistic customer experience management framework for enterprises. *South African Journal of Industrial Engineering*, 27(3), 23-36.
- [6] Flanagan, P., Johnston, R., and Talbot, D. (2005). "Customer confidence: The development of a "pre-experience" concept." *International Journal of Service Industry Management* 16(4): 373-384.
- [7] Harmeling, C., Moffett, J. W., Arnold, M. J., & Carlson, B. D. (2017). Toward a theory of customer engagement marketing. *Journal of Academy of Marketing Science*, 45(3).
- [8] Homburg, C., Jozić D., & Kuehl, C. (2017). Customer experience management: Toward implementing an evolving marketing concept. *Journal of Academy of Marketing Science*, 45(3).
- [9] Johnston, R. (1999). "Service transaction analysis: Assessing and improving the customer's experience." *Managing Service Quality* 9(2): 102-109.
- [10] Johnston, R., & Kong, X. (2011). The customer experience: a road-map for improvement. *Managing Service Quality: An International Journal*, 21(1), 5-24.
- [11] Kumar, V., Aksoy, L., Donkers, B., Venkatesan, R., Wiesel, T., & Tillmanns, S. (2010). Undervalued or overvalued customers: capturing total customer engagement value. *Journal of Service Research*, 13(3), 297-310.
- [12] Kumar, V., & Pansari, A. (2016). Competitive advantage through engagement. *Journal of Marketing Research*, 15, 497-514.
- [13] Liljander, V. & Strandvik, T. (1997). "Emotions in Service Satisfaction." *International Journal of Service Industry Management* 8(2): 148-160.
- [14] Mascarenhas, O. A., Kesavan, R., and Bernacchi, M. (2006). "Lasting customer loyalty: a total customer experience approach." *Journal of Consumer Marketing* 23(7): 387-405.
- [15] Metso (2017). "what we do" online at <http://www.metso.com/> Retrieved (10 Feb 2017).
- [16] Meyer, C., & Schwager, A. (2007). Customer Experience. *Harvard business review*, 1-11.
- [17] Palmer, A. (2010). Customer experience management: A critical review of an emerging idea. *Journal of Services marketing*, 24(3), 196-208.
- [18] Pandya, S. S., & Venkatesan, R. (2016). French roast: consumer response to international conflict—evidence from supermarket scanner data. *Review of Economics and Statistics*, 98(1), 42-56.
- [19] Pansari, A., & Kumar, V. (2017). Customer engagement: the construct, antecedents, and consequences. *Journal of Academy of Marketing Science*, 45(3). doi:10.1007/s11747-016-0485-6.
- [20] Pine II, B. J. & Gilmore, J. H. (1998). "Welcome to the Experience Economy." *Harvard Business Review* 1998 (July-August): 97-105.
- [21] Pine II, B. J. & Gilmore, J. H. (1999). *The Experience Economy: Work is Theatre and Every Business a Stage*. Cambridge, MA., Harvard Business School Press.
- [22] Prahalad, C. K. and Ramaswamy, V. (2004). *The Future of Competition - Co-Creating Unique Value with Customers*. Boston, Harvard Business School Press.
- [23] Pullman, M. E., & Gross, M. A. (2004). Ability of experience design elements to elicit emotions and loyalty behaviors. *Decision Sciences*, 35(3), 551-578.
- [24] Ruukki (2017). "Roofing products and services" online at <http://www.ruukki.com/> Retrieved 10 Feb 2017.
- [25] Shaw, C. and Ivens, J. (2002). *Building Great Customer Experiences*.

New York, Palgrave MacMillan.

- [26] Smith, S., & Wheeler, J. (2002). *Managing the customer experience: Turning customers into advocates*. Pearson Education.
- [27] Venkatesan, R. (2017). *Executing on a customer engagement strategy*.
- [28] Voss, C. A. (2003). "Rethinking paradigms of service - service in a virtual environment." *International Journal of Operations & Production Management* 23(1): 88-104.
- [29] Yu, Y.-T. & Dean, A. (2001). "The contribution of emotional satisfaction to customer loyalty." *International Journal of Service Industry Management* 12(3): 234-251.