An IS Perspective on Omni-Channel Management along the Customer Journey: Development of an Entity-Relationship-Model and a Linkage Concept

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Abstract. The digital transformation forces organisations to increasingly embed technology to catch up with customer demands. The omni-channel approach is one recent trend that requires taking the customer's perspective and offering a consistent experience across channels and touchpoints. While this development clearly necessitates IT for implementation, past research primarily stems from the marketing domain. In this article, we present an entity-relationship-model and a linkage model that takes an IS perspective and thereby enables communication between marketing and IT.

Keywords: Omni-Channel Management, Entity-Relationship-Model, Customer Experience Management

1   Introduction

Every organisation faces the digital transformation and is challenged by utilizing new technologies in its business [1]. The rapid adoption of these new technologies in broad levels of the population made customers outpace companies. Especially, retailers need to catch up in order to satisfy customer demands and therefore stay competitive [2]. However, historically grown, complex and heterogeneous system landscapes impede substantial changes and make an integrated system very expensive, as changing requirements are mirrored continuously from the customer side.

One recent trend evoked by the digital transformation is "omni-channel retailing" [3]. It is defined as linking all retail channels to provide a superior customer experience (CE) along the customer journey. But while the term is used extensively, in most of the retail companies is no prospect of a realisation since the technological requirements are too ambitious [4]. Marketing experts are required to understand the customer's needs and IT experts have to implement the needed technology, respectively. This cannot be done independently of each other nor subsequently but needs to be a joint effort between the two parties. However, a unified understanding from both perspectives and a basis for communication are missing.

Stemming primarily from the marketing literature, the customer experience is seen as a prime factor influencing the buying decision. As it is seen as a composition of rather soft factors [5], the incorporation of this research stream in technology is

challenging. Even the smart retail domain, which presents industry-specific technical opportunities, mainly focusses on customer acceptance, adoption, and experience [33]. While there are first attempts to facilitate decision support [e.g. 19, 42], missing cross-functional communication is another roadblock for the implementation of these technologies – especially if it comes to the linkage of different channels and touchpoints [9, 10]. It is the raison d'être of the IS discipline to foster the missing exchange of business and IT. Therefore, the goal of this article is to create IT artefacts that foster the communication between the different areas. This article aims to answer the research questions: (1) How can the terms of the customer experience management be structured in order to provide a common understanding about the terms and their relations and (2) how can the interrelation of the terms of customer touchpoint integration be defined to support the understanding and the strategy development.

To come up with the research results, a literature review has been performed according to Webster and Watson [11]. The identification of relevant articles is based on keyword search in the field of marketing, retail and service science. In total, 48 publications have been identified as relevant for the purpose of this article. As a post-processing step related to the keyword search, the main terms regarding the customer experience management (customer experience, customer journey and customer touchpoints) and touchpoint integration (multi-, cross-, and omni-channel integration as well as integration, linkage, and connectivity) have been identified. These build the foundation for answering the research questions by discussing the synonyms and defining the terms and their interrelations resulting in IT artefacts which provide a common understanding for the IS and marketing perspective.

The remainder of this paper is structured as follows. First, in section two the research background is introduced by explaining the underlying concepts of customer experience, the customer journey, as well as channels and touchpoints. Afterwards, in section three the first IT artefact – an entity-relationship-model – is deduced as the first step to structure terms of the domain and their connection to each other. In section four the second IT artefact – an omni-channel (OC) linkage concept – is created. It disambiguates the terms of (cross-/omni) channel and touchpoint integration by making use of the systems thinking theory. Finally, section six concludes the article by summarising the results and giving an outlook.

2 Research Background

2.1 Customer Experience

The importance of experiences in the social and economic sphere have initially been stressed by Pine and Gilmore [12]. More recently, the notion of customer experience has become a buzzword in marketing and its perfection a principal management objective [5]. To enable companies to empathise their customers, it is necessary to adopt a customer-centric view. Furthermore, the service-dominant logic [13] serves as theoretical underpinning, so that goods are merely seen as the vehicle to transport value-creating services to customers. As an experience is always subjective, its unfolding must depend on both the customer's perception, as well as the delivered service by the

company. Hence, CE is co-created between the customer and the company, but the company's services can be designed with respect to CE [14].

The constituents of the CE seen in the academic literature are discussed by Lemon and Verhoef [5], who define CE as "a multidimensional construct focussing on a customer's cognitive, emotional, behavioural, sensorial and social responses to a firm's offering during the customer's entire purchase journey" [5]. The listing emphasises the influence of "soft" factors that are hard to measure and thus hard to manage.

With CE becoming a hegemon in service design, multidisciplinary teams consisting of marketing (business) and IT personnel become necessary for including the right ideas and implementing them, respectively [15]. It has always been the role of the IS discipline to facilitate the cooperation of both parties. While marketing is the prime driver, the feasibility of implementation is mostly ignored. As of now, the literature does not offer a unified view capable of including both parties.

2.2   Customer Journey

CE as a whole is a complex construct. One approach to reduce this complexity is to model CE separately at direct or indirect points of contact between customer and company. This idea is manifested in the notion of the "customer journey" (CJ) (or customer corridor [16], customer decision process, purchase journey [5]). A CJ consists of a series of touchpoints to the customer [17]. While it is admitted that the whole CE is more than the sum of the CE at the touchpoints [18], this simplification realises a process view and attribution of its touchpoint elements. The time-logical sequence around a purchase can be structured into successive stages relating to theories of consumer decision-making [19] or behaviour [20]. Attribution increases the detail level at touchpoints and diminishes abstraction, e.g., by displaying the used channel that shows media disruption while keeping the customer's perspective.

By using personas (i.e., a documented set of archetypal people, who are involved with a product [21]) or empirical data, so-called CJ maps can be created to describe the as-is path of a customer and subsequently improve it. Being named a good communicator and visualiser of business activities, the question arises how such modelling can be conducted. While there are various approaches, especially in grey literature, sound modelling techniques are sparse. The "Multi-Level Service Design" approach [14] is found promising, yet CE itself is not explicitly part of the model. Practitioner's approaches lack a defined syntax and can be summarised as superficial.

2.3   Customer Touchpoints and Channels

A touchpoint (TP) is similar to a service encounter [22] when considering interactions with the company. However, factors outside the company's control also shape CE [23] and hence must be included. Brand-, partner-, customer-owned and external TPs can be distinguished [5]. Consensus exists that the importance of TPs in relation to the overall CE varies, which has been conceptualised in "moments of truth" [24].

TPs belong to a specific channel. Neslin et al. [25] define channels as the medium, through which the customer and the firm interact. Broadening this understanding by

including customer-to-customer interactions builds the working definition for the article. In former times customers were staying in a single channel, but the digital age has transformed their decision-making: Customers may search information through one channel, purchase through another and retrieve the product through a third channel [10, 24]. Thus, the importance shifts from channels to TPs [28], as a TP provides the asked service and channels are only utilised selectively at the respective TPs instead of broadly. TPs need to be connected and integrated for a superior CE.

3 Customer Experience Management Entity-Relationship-Model

Due to several streams of the research being conducted in separate fields, different notions have emerged. While publications in marketing, retail and service science make use of several central notions, the ties between the constructs remain blurry. At most, specific relationships are explained. By analysing these indications, an extended entity-relationship-model (ERM) based on [29], shown in Figure 1, is created. The extension allows specialisation using the triangle element. The model highlights the degree of influence of the marketing and technical view, as well as their intersection. The IS perspective is seen as their union. Observable objects are colour-coded to contrast to theoretical constructs. Entity types are *highlighted* in the following paragraphs.

Fostering a superior CE must be the overall goal of a company to assert itself against its competition. By definition, an experience is subjective so that it cannot be referenced multiple times and every *CJ* has one unique experience. *Customer Experiences* can influence each other and thus are related.

A *journey* entails a *reference object*, which is typically a product or service of the company that satisfies a customer's need. With "customer decision process" [5] being used synonymously to CJ, a time-logical order can be applied, which is seen in different consecutive phases around a customer's purchase. Both academic and practice literature provides a plethora of models [18, 30, 31] that can be aggregated to at least three *customer journey stages*: pre-sales, sales, after-sales.

A TP links theoretical considerations of CE with an actual event so that they are located between the marketing and technical view. A *CJ stage* encompasses *TP classes,* and a *TP class* is always related to a *channel*. By employing the logic of abstract classes and instantiations thereof, the *TP class* is defined to be an abstract interaction interface to the customer. The *TP instance* describes an actual episode of contact and is thus being situated in the *journey* and including an *experience*. Consequently, *TP instances* as chronological events have a sequence. An illustrative example is the Facebook wall of the company as the *TP class* with a customer post as the *TP instance*. This *TP instance* is the successor of a prior *TP instance* in the journey.

A TP class is specialised in four dimensions. First, TP classes can be critical (moments of truth) and non-critical [24]. Second, TP classes can be divided into four distinct types [5]. Additionally, Straker et al. [9] provide a typology, which is adapted into the remaining two specialisations of the TP class entity type: Simplex and duplex TPs signify the direction of communication, while the purpose of each TP is split into being

a functional (comprising a clear objective by a company or customer) or diversion TP (enabling recreational and social activities by customers).
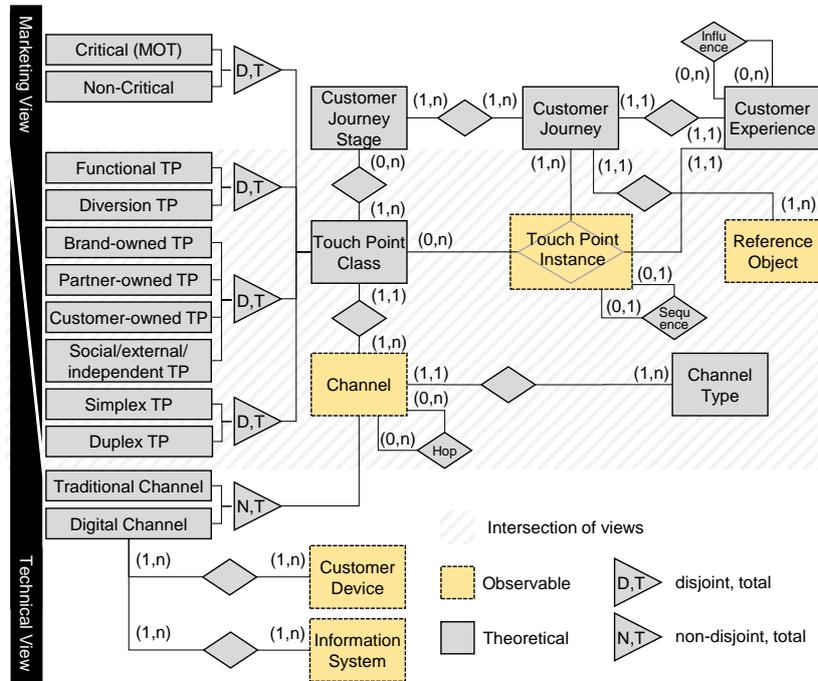

Figure 1. Customer Experience Management Entity-Relationship-Model

The *channel*, which can metaphorically be seen as the shell around TPs, is important from a technical perspective, as all TPs within a channel share technological characteristics that determine service design and issues of integration. Also, a company first needs that shell to establish TPs within. Customers on the other hand principally decide on using a channel before considering specific TPs. While the latter can serve a particular purpose, channels themselves do not. Consider an electronics retailer: First, the decision is made whether to check out the retailer's Facebook presence or a local store (channel) for obtaining product information. Then, after choosing the latter, one walks into the outlet and approaches the service counter or respective department (TP). While it is common in the retail domain to interpret a channel as a sales channel, communication channels are also subsumed here.

The advent of the internet introduced new channels and enabled dynamics so that abstract *channel types* are suitable means to capture fundamental similarities regardless of manifestations: Facebook can be the channel and social media its channel type.

A more technical view is realised through the non-disjoint specialisation of *channels* by putting emphasis on digital technologies. Customers need a *device* (e.g. smartphone) to use a *digital channel,* and the company requires an information system to serve the channel. As a homogenous system landscape fosters an easier channel connectivity, it is desirable to serve multiple channels with the same system.

First and foremost, the utility of this artefact is seen in a structured view on the different notions that arise in the domain. An instantiation of the entities for a specific company can be conducted and then used to define a coherent OC management approach within a digital transformation strategy. While the ERM shows the possible relationships between channels and touchpoints, in reality, these are rarely exploited by systems. The following investigates channel management approaches to get a holistic view of OC management innovation projects.

4 Omni-Channel Linkage Concept

4.1 An Introduction to Multi-, Cross- and Omni-Channel Management

Companies are increasingly introducing new channels and TPs that can be accessed from various devices independent of time and space. In this context, the channel management concepts multi-, cross- and omni-channel have emerged. However, these often have a blurred meaning in academic literature [2, 28]. For this reason, existing literature is first investigated in order to clarify these terms.

Retailers introduce several channels to allow the customer to choose a preferred channel in each stage of the CJ. However, the channels are organised autonomously and managed separately without an overlap or integrated objectives [28, 32]. Multi-channel retailers have silo structures and a lack of strategy [9, 10, 33]. According to Beck & Rygl [2], a multi-channel retailer sells "merchandise or services through more than one channel or all widespread channels, whereby the customer cannot trigger channel interaction and/or the retailer does not control channel integration" [3].

Beck & Rygl [2] consider channel interactions and integration as the distinctive characteristic of a cross-channel environment. They explain that a cross-channel retailer is a multi-channel retailer, who controls the integration of at least two channels or whose customers can trigger the interaction between at least two of these. Channel integration can be understood as technical back-stage connectivity, which enables information exchange between the different channels (e.g. customer, pricing and inventory data). Channel interaction enables new pathways through the CJ across channels such as the possibility to buy online and pick up offline [2]. Besides, a cross-channel retailer establishes managerial channel synergies through well-coordinated channel objectives, design, and deployment that are planned across multiple business functions, which result in benefits for the customer [5, 34]. To reach this, companies need to integrate business functions and collaborate with external partners [5].

This state is sometimes already called an OC environment [28]. Indeed, cross-channel is an inherent part of this environment [32]. However, in an OC setting, the borders between the channels disappear and a seamless channel switch is possible [28]. Besides, the focus is no longer on the channels, but instead on the distinct customer TPs within these channels [28]. Content-wise OC retailers try to establish thematic cohesion and consistency between all TPs. Furthermore, from a technical perspective connectivity and context-sensitivity between TPs are established [35]. Thereby, many variable customer value-adding journeys are enabled [32]. This increases the importance of CE management across multiple TPs [5]. Following Beck & Rygl [2]

and Verhoef et al. [28], OC retailing is defined as: The selling of merchandise or services through all widespread channels, which have been seamlessly linked together from a customer perspective by enabling full interaction between all channels and/or from a retailer perspective by establishing full control of the channel integration. Through the systematic management of TPs and coordination of processes as well as technologies across these, the CE and performance across channels are optimised.

4.2 Understanding Channel Integration

In the context of cross- and omni-channel management, several ways exist how channels can be seamlessly linked. Most of the existing literature discusses these approaches under the terms multi-, cross- or omni- channel integration. While channel integration can be seen from a marketing perspective (i.e. thematic cohesion, consistency and context sensitivity of TPs), there is also a technique perspective (i.e. connectivity), which supports or facilitates the marketing perspective [35]. Therefore, channel integration is defined as: A company's efforts to synchronise its marketing efforts across all channels to optimise the customers seamless shopping experience [34, 36] and to functionally integrate these channels for seamless transition and interchangeability across the different stages of the CJ [34, 37, 38].

Saghiri et al. [32] list seven integration routines, which summarise how channels can be integrated: Integrated promotion, integrated transaction, integrated product information, integrated pricing information, integrated order fulfilment, integrated reverse logistics, and integrated customer service.

By considering these integration routines and by increasing channel information visibility (i.e. exchange of data) across channels and journey stages, a company can enhance towards a fully integrated OC system [32]. Channel integration can result in a stronger sales growth [5, 34], an increase in the "perceived quality of the online channel" [5] and the reduction of service inconsistencies [37]. Additionally, channel integration can achieve synergies such as "improved customer trust, improved customer awareness, consumer risk reduction, and coverage of diverse shopping preferences" [39]. Furthermore, from an operational perspective, it allows companies to actively maintain customer contacts and develop a proactive CE management strategy through increased customer insights [34, 40]. Besides, adaptive digital TPs enable new forms of digital marketing [41]. For example, by introducing firm-initiated mobile TPs, retailers can "provide tailored, time-sensitive, and location-sensitive advertising and promotions in store" [5]. This is further supported by the increased data integration and analysis abilities [34]. Finally, the interconnection of channels makes it harder for competitors to imitate the company. It could increase the customer's value proposition and thus reduces the competitive pressure [33, 37].

4.3 Deduction of an Omni-Channel Linkage Concept

As mentioned in the previous subchapter, there are several possibilities how channels can be linked together. However, in an OC environment, the notion of channel integration can be extended to the broader idea of TP integration [5]. The digitalisation
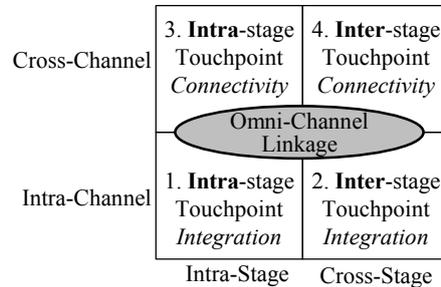
of TPs is an important aspect of reaching full channel integration. However, the topic of TP integration is quite novel. So, what is the difference between the channel and TP integration? When investigating these terms, it becomes apparent, that the term *integration* is used without a clear concept in multi-, cross- and omni-channel literature.
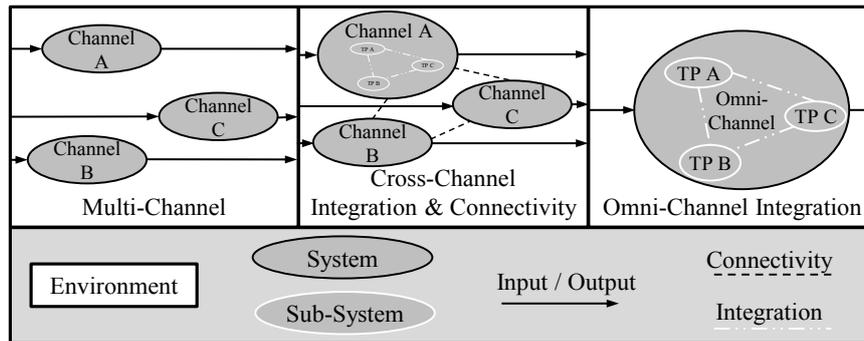
Figure 2. Multi-, Cross- and Omni-Channel from a System Thinking Perspective

According to the systems thinking theory, integration is the connection of components within a system. On the other hand, connectivity is the connection of components across different systems [42]. Figure 2 explains this idea in the context of channel management. In multi- and cross-channel environments, the channels itself can be seen as systems. While neither integration nor connectivity exists in a multi-channel environment, cross-channel integrations discussed in literature should be considered as channel connectivity instead. Only if this idea is extended to TPs, the connection of those within a certain channel should be considered as TP integration. This is in line with Homburg et al. [35] who explains that connectivity of TPs is the functional integration of "multiple touchpoints across online and offline environments for seamless transitions between one and another". However, moving forward to an OC environment, one could argue that the concept of channels does not exist anymore as the channel borders disappear [28]. In this case, only one OC system exists that consists of several TPs. If TPs are seamlessly linked in this environment, it could be considered as TP or OC integration.

To get around the ambiguity of the term *integration* and get a holistic idea of how TPs can be integrated and connected within an OC environment, the concept of OC linkage is deducted. Based on the idea of horizontal (i.e. "over time" [43]) and vertical integration (i.e. "coherence within each stage" [43]) and through the analysis of the touchpoints of a top 25 retailer by revenue worldwide [44], four different forms of OC linkage are identified along two dimensions. While the first deals with cross-stage integration, the second deals with the previously mentioned cross-channel connectivity (see Figure 3).

	Intra-Stage	Cross-Stage
Cross-Channel	3. **Intra**-stage Touchpoint *Connectivity*	4. **Inter**-stage Touchpoint *Connectivity*
	Omni-Channel Linkage	
Intra-Channel	1. **Intra**-stage Touchpoint *Integration*	2. **Inter**-stage Touchpoint *Integration*

Figure 3. Omni-Channel Linkage Concept

1. Channel- and stage-internal *integration* is the first form of linkage in an OC environment. This type of integration deals with TP from a single channel that provide complementary information, are integrated from a process perspective and are aware of the interaction with others or itself historically within a specific stage. One example would be the possibility to add products to an online shopping cart from a digital cooking recipe. With smart retailing, this type of integration is also enabled in an offline channel and improves the in-store organisation [6, 45]. One example would be the usage of beacons and smartphones to enable context- or location-sensitivity [5, 8, 35]. Thus, this type of integration puts more emphasis on each single TP.

2. Channel-internal and stage-crossing *integration* is the second form of OC linkage. Saghiri et al. [32] explain that integration among channel stages ensures a smoother CE through context awareness that is passed on between stages. This type of integration is already quite common in online environments, where data is stored in user profiles and is analysed in order to provide i.e. product recommendations based on previous purchases. An easier example would be a service hotline that gives advice to the customer, places an order and, once the product arrives, offers after-sales support. Using smart retail technology, this could be transferred to an offline environment as well. E.g. smart shelf technology could be used to enable special promotions based on the customer's previous offline purchases [8].

3. Channel-crossing and stage-internal *connectivity* happen when TPs of different channels are connected to each other within a stage of the CJ in a cross-channel environment. Here, TPs of other channels provide complementary information for the same stage and are aware of each other. Furthermore, channels may be interchangeable and therefore allow a seamless switch [32]. One example would be the purchase of goods via an app and the pick-up in a local store (i.e. integrated order fulfilment).

4. Channel- and stage-crossing *connectivity* is the last form of OC linkage and combines the last two types of linkage. One example would be that a call centre agent first consults a customer and then adds products to his online shopping cart. The customer can then complete the purchase in the online store. Another example in a smart retail environment would be the provisioning of product recommendations at an arbitrary online TP after interacting with a specific offline TP.

The presented linkage concept does not only enable a consistent understanding of the terms involved in the digitalisation and integration of customer touchpoints but also delivers a holistic view of the technical possibilities for strategy development.

5   Conclusion and Outlook

Research on OC management is just starting to emerge [28]. The goal has been to contribute to the body of knowledge by shifting the view away from marketing concepts and viewing OC management from an IS perspective that combines marketing and technical views. The developed ERM provides a solid ground for future research by embedding constructs of the domain that are currently used frivolously. Furthermore, through the clear differentiation of TP integration and connectivity and by having a closer look at the directions in which TPs can be linked, IT and marketing gain another instrument to better facilitate their communication.

The ongoing research should evaluate and refine the presented artefacts through expert interviews and establishes a starting point for further research. Following the BPM life-cycle [46], it is planned to develop further IT artefacts. First, for the *design* of OC services, a modelling language will be created that covers a marketing and a technical perspective supporting cross-functional communication. Second, by having a closer look at the socio-technical characteristics, the business requirements have to be analysed that are necessary to implement (i.e. *model*) the proposed services (i.e. strategy, structure, culture, processes). Furthermore, the impacts of digitalised TPs on the operations of a retailer will be investigated. Based on the results, it is expected to deliver tangible structures and measures to facilitate decision-making. Third, implementing an IT artefact for the analysis, and presentation of process related information gathered at the different TPs would support the *execution* of the OC services. This requires the embedding of logging and monitoring mechanisms into digitalised TPs. Finally, these can drive the *monitoring* and *optimisation* of the CJ.

6   Acknowledgements

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