# Components of a Visual Language for Service Design

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## Abstract

The increasing interest in service design implies the need for more formal approaches to the analysis, conceptualization, and implementation of services. In particular, this is critical when multiple actors, such as designers, developers, and managers are to apply a service design approach for a customer centric transformation of the organization and its service offerings. In this paper, we present key components of a formal language for the modelling of customer journeys. The language is developed, in particular, to support customer journey analysis and design; its formal character is meant to facilitate an unambiguous communication of a customer journey throughout a service organization, and to bridge the current gap between fuzzy front-end service design and service implementation. Application of the language is illustrated through case studies from a large web-based service provider and a power company.

KEYWORDS: visual language, customer journey, touchpoint, CJML

## Introduction

In recent years, we have witnessed a tremendous increase in the interest in service design. This increase is in part due to a general servitization trend (Baines et al., 2009) where product providers add services to their products or present their products as part of a service offering. Also, the increasing availability of channels for service delivery (van Dijket al., 2007), and service delivery through the integration of multiple service providers (Saco & Goncalves, 2008; Tax et al., 2013), have made service offerings ever more complex both to the customer and to the service provider.

A key driver in service design is the understanding of customer experience as a differentiator in competitive markets (Mascarenhas et al., 2006), which in turn motivates a customer-centric approach to the design and management of services (Polaine et al., 2013). Designing for experience and managing the experience associated with a service is challenging (Zomerdijk & Voss, 2010), in particular due to the number of actors and service channels involved in the service delivery process and the need to match lofty aims for improved customer centricity with down to earth challenges associated with legacy infrastructure and

organizational barriers. Key challenges for service providers are related to gaps in the service offerings. In the service development process, there is a gap between fuzzy front end service concepts and implemented services (Bitner et al., 2008). In service implementation, there is a gap between involved actors' understanding of the service process, and between service providers' and customers' assessment of services (Bitner et al., 2010). To close these gaps, we depend on precise, unambiguous descriptions of service delivery processes. In short, we need a common language for service design. Such a language will facilitate analysis and implementation of services, as the involved actors, such as designers, developers, and managers, are given the terminology to precisely model services and support a common service understanding. In this paper, we argue the need for a visual language for service design and present components for the part of service design that concerns the customers' journey. We will also exemplify the usefulness of such a language by presenting results from two case studies.

## Background

To describe and visualize service delivery processes, today's field of service design (Blomkvist et al., 2010) draws heavily on the pioneering work of Shostack (1982) in developing the service blueprinting technique. Service blueprinting allows modelling of the onstage and backstage processes to facilitate a common understanding across the different stakeholders involved in service development and delivery. The method has evolved significantly in recent years to become more customer focused (Bitner et al., 2008), and to account for the multi-channel nature of service delivery (Patrício et al., 2008).

In contrast to service blueprinting, the service journey (Parker & Heapy, 2006) or customer journey approach (Zomerdijk & Voss, 2010) only concern the customer's perspective of the service delivery process. Service blueprinting has introduced some of the needed formalization and precision in service design (Bitner et al., 2008). However, the formalism of service blueprinting does not adequately capture important aspects of the customer journey; in particular, the distinction between journeys as they are expected by the service provider, and journeys as they are actually experienced by the customers. Though the customer journey approach is widespread in service design (Segelström & Holmlid, 2009), there is an apparent lack of rigor or formalism in the visualizations of such journeys (Følstad et al., 2013). Moreover, service design as a discipline lacks a common language and description format (Jonas et al., 2009) and the terms are often vague (Hume et al., 2006). A formal approach for precise modelling of services from the customer perspective would therefore be beneficial, in particular for implementation of service concepts within the framework of existing infrastructure and service portfolio (Moritz, 2005). As argued by Bitner et al. (2008), such an approach should be visual to facilitate cross-departmental communication.

We aim to develop a visual language that supports a translation of static service concepts into dynamic representations in the form of customer journeys. Also, the language should support analysis and maintenance of existing services. By using such a language we expect to facilitate cross-departmental communication and collaboration between different stakeholders involved. In this paper we present components of such a language for service design, and demonstrate how it can be applied in two industry sectors.

## Introducing the Customer Journey Modelling Language (CJML)

The development of CJML is based on existing knowledge and practices spanning several related domains, like service design, HCI and service management. Central terms and visualisation techniques have been identified through relevant research articles, whitepapers, books, and web resources. An explorative research approach has been adopted in developing the visual notation. In the next sections we introduce the key terms and the visual notation.

### *Terminology*

In the literature, customer journeys are interpreted in different ways, like "an engaging story" about user's interaction with a service (Stickdorn et al., 2011) or a collection of touchpoints and interactions between a service provider and customer (Gloppen, 2009). A recent literature review has revealed that customer journeys generally are understood as the process a customer goes through to achieve a specific goal, involving one or more service providers (Følstad et al., 2013). When modelling a customer journey, we need to restrict our scope to key elements. In CJML, a customer journey is modelled as a sequence of *touchpoints* and *actions* involved for a customer to achieve a specific goal, see Table 1. CJML distinguishes between expected and actual customer journeys.

| Term | Definition & attributes |
|---|---|
| Touchpoint | Definition (dynamic touchpoint):<br>Instance of communication or interaction between a customer and a service provider<br><br>Definition (static touchpoint):<br>A potential point of communication or interaction between a customer and a service provider<br><br>Attributes:<br>Type: expected or ad-hoc<br>Initiator: customer, service provider or subcontractor<br>Times: T1 (originated) T2 (available) T3 (consumed)<br>Channel: carries/mediates touchpoint (e-mail, SMS, letter, etc.)<br>Status : completed, missing or failing |
| Action | Definition:<br>An event or activity conducted by a customer or service provider as part of a customer journey |
| Customer journey (expected and actual) | Definition:<br>A sequence of touchpoints and actions involved for a customer to achieve a specific goal. An expected journey is the journey as anticipated by the service provider, while an actual journey is the real journey as experienced by a customer.<br><br>Attributes:<br>Status: in progress, completed or aborted |

**Table 1 Definitions and attributes for modelling of customer journeys**

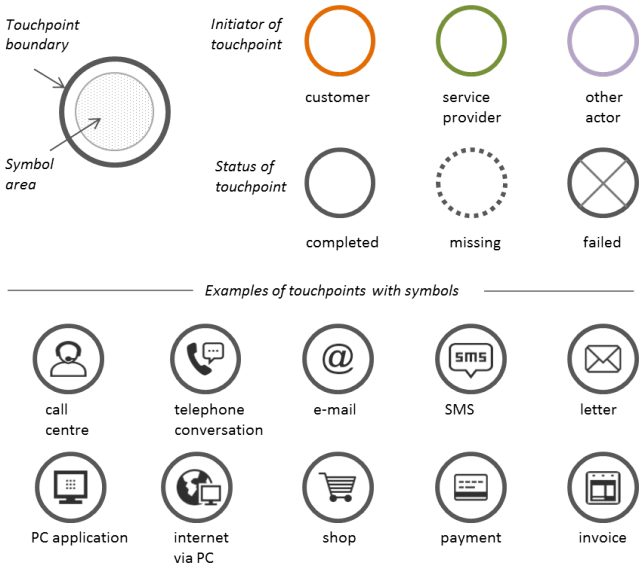
The term touchpoint has become an umbrella term for service encounters (Howard, 2007). Meyer and Schwager (2007) defined it as an instance of direct contact, either with the product or service itself, or with representations of it by the company or some third party. Jonas et al. (2009), defined touchpoint as the point of contact between the user and the service. CJML concerns service delivery both as expected by the service provider and as experienced by the customer. Therefore, we have introduced a static and a dynamic mode

for touchpoints. The static mode signifies the intended or hypothetical encounter. In contrast, the dynamic mode represents the execution of the touchpoint. In CJML, touchpoints have the following attributes: type, initiator, time, channel and status.

Other important terms in CJML are *customer*, *service provider, actor* and *channel*. The *customer* is a person or organisation receiving the outcome of the service (Edvardsson & Olsson, 1996). A *service provider* is a company or organisation that provides services to customers, customer groups or organizations. An *actor* is any person (or entity) who is involved in service delivery or service consumption, including both customers and service providers. A *channel* is a service provider's means of communicating or interacting with its customers (Osterwalder, 2004).

### *Visual syntax and visualisation modes*

An explorative approach was used for developing the visual notation. An early modelling of services as a chain of interconnected circular elements is described by Gustafsson & Johnson (2003) in an analysis of airline travel experiences. By supplementing the circular elements with symbols and means for encoding of touchpoint attributes, Halvorsrud & Kvale (2014) developed a framework for visualisation of customer journeys. The CJML notation shares some of these basic principles, but offers more expressiveness in terms of symbols and attributes. The inner area of the touchpoint is reserved for a symbol while the boundary itself carries information about the actor and the status of the touchpoint, see Figure 1. The symbol area of the touchpoint carries information about the channel or the device that is used. The actor who initiates the touchpoint is encoded in the colour of the boundary: customer (orange) and service provider (green). Additional colours may be introduced to distinguish additional actors. A solid boundary style indicates a touchpoint that is completed, while a touchpoint that is missing is indicated by a dashed outline pattern. A touchpoint that




fails, like an unsuccessful attempt to reach a call centre, is marked with a cross.

**Figure 1 Visualisation of touchpoints**

An effort was made to develop simple and intuitive symbols. Preliminary evaluations suggest that consistent use of symbols may compensate for symbol clarity. The diagram elements of

CJML are outlined in Figure 2. The basic elements of a customer journey are touchpoints and actions, and special symbols are used to indicate the start and end of the journey.

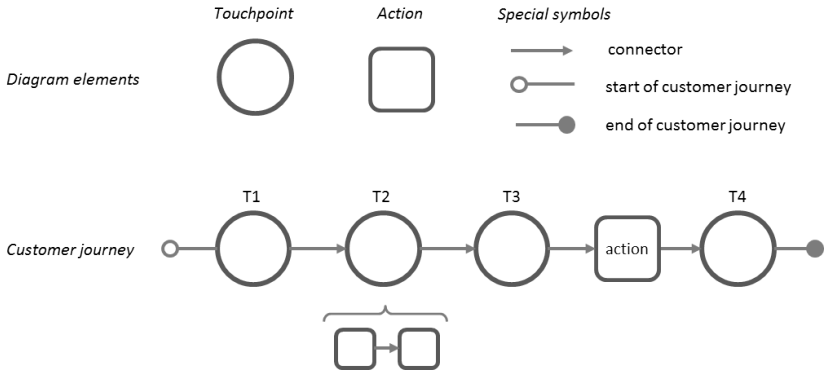



**Figure 2 Diagram elements involved in visualisations of a customer journey**

The touchpoints are labelled consecutively with unique identifiers (T1, T2, T3, etc.) for easy referral. However, when dealing with actual journeys, it can be useful to introduce labels indicating whether the touchpoint was expected (E) or ad-hoc (A). Touchpoints can also be labelled according to their status: completed (T), missing (M) or failing (F). When convenient, a customer journey can be divided into phases, corresponding to service moments in Koivisto (2009), which are temporal sub-units of the journey.

The visual notation of CJML comprises three visualisation alternatives:

» Plain sequential view
» Concurrency view
» Deviation view

The customer journey in Figure 2 exemplifies the plain sequential view. In this 'basic mode', the touchpoints are represented as they (would) appear. A horizontal time axis with suitable units (hours, days) may be added to emphasize the timing of individual touchpoints. A visual notation for concurrency is provided to account for touchpoints that occur at the same time. The deviation view can be used when comparing an actual journey to an expected sequence of touchpoints, as it is often the case with transactional journeys. The visualisation alternatives will be demonstrated in the next sections through the case studies.

## Application of the visual language

CJML has been tested and evaluated during a service design workshop with 26 librarians at the Norwegian University Library (Lee & Karahasanovic, 2013), and when analysing existing services in two Norwegian organizations. In both organizations, an insight research approach was applied, where the purpose is to generate large amounts of insight based on qualitative data from a small number of customers (Polaine et al., 2013). In the following sections, we will elaborate on how CJML was used to identify and analyse service offerings in an eMarket company and an energy company.

*Case study: researching sales journeys in an eMarket company*

A case study was carried out in the eMarket company with the aim of researching and mapping the company's current customer journey for new sales in the B2B market. The process was known to be handled manually by sales personnel, involving many instances of phone calls and e-mail exchange between customer and service provider. A redesign of the resource-demanding journey was the ultimate goal of the eMarket company. The case study was designed with two main research activities. Mystery shopping contributed first-hand experience and an overview of the touchpoints. This was supplemented with co-listening and observation of phone calls and e-mail exchange between customers and sales personnel. The co-listening sessions resulted in the mapping of 16 customer journeys. Figure 3 shows an actual customer journey visualised using a plain sequential view. The first action describes parts of the customer's decision-making process, in which the customer browses information and decides to become a customer. The customer journey includes two phone conversations (T1 and T3) and three e-mails (T2, T4, and T5).

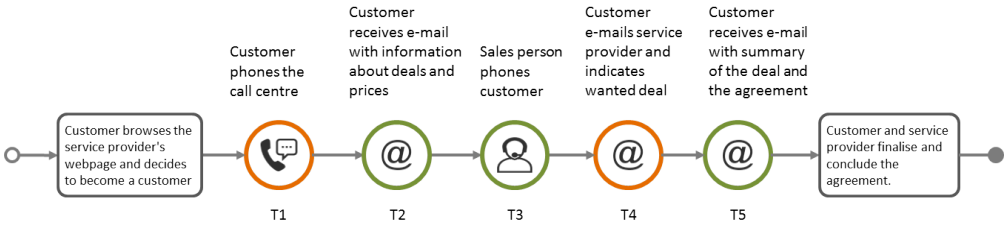



**Figure 3 Visualisation of an actual customer journey using the plain sequential view**

The plain sequential view is particularly useful for mapping journeys without comparing it to an expected outcome; for instance when a company does not have a generic way of delivering the service, or large variations in customer preferences exists. Anyway, mapping the journey using the plain sequential view may reveal strengths and weaknesses of a service, and contribute useful input to redesign of the service.

When researching the eMarket services, it became evident that a touchpoint could occur while another one was being carried out. For such situations we developed the concurrency notation. Figure 4 shows a customer journey where two touchpoints (T3 and T4) occur within an on-going phone conversation (T2). While the customer is talking to the sales person, he receives information (action) and there is an e-mail exchange. Here, T2 is visualised with two touchpoint symbols where half the boundary is dashed to emphasize the on-going status. The actions and touchpoint that occur during the conversation are depicted below the time indicators.

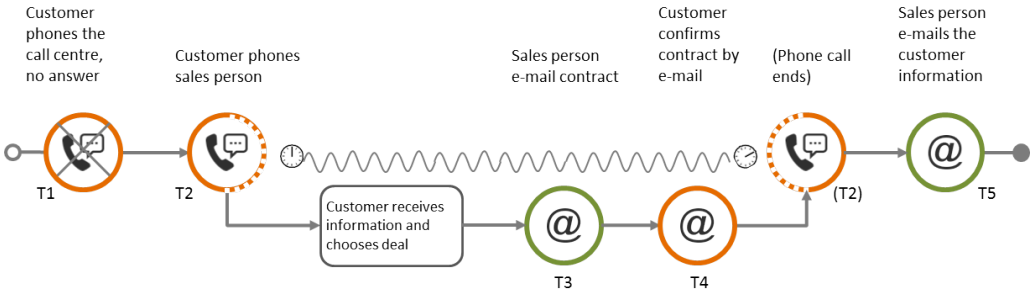


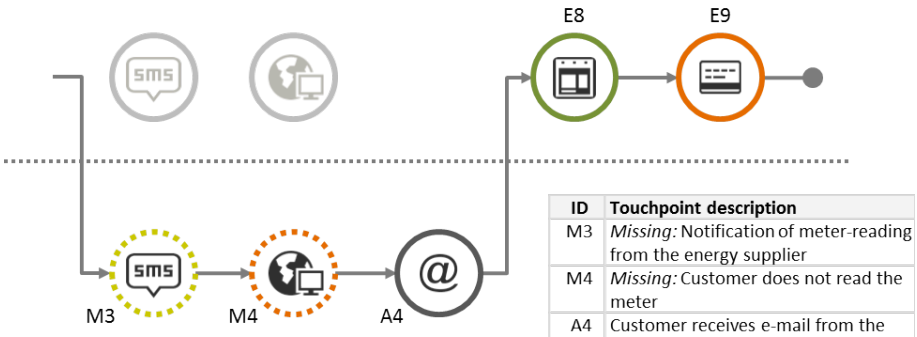
**Figure 4 Visualisation of an actual customer journey using the concurrency notation**

In the eMarket sales process, concurrency of touchpoints occurs frequently through the conversation between customers and sales personnel. Concurrency notations can be useful in providing a detailed mapping and visualisation of the timing of touchpoints and activities. It provides an opportunity to review procedures concerning documentation and closing of agreements with digital signature during the conversation. Visualisation of concurrency can also be applied to redesign of the journey, particularly in structuring the information exchange and the formalities associated with the sales process.

### *Case study: researching the customer on-boarding journey in an energy company*

The purpose of the energy company case study was to investigate the expected and actual customer journeys associated with on-boarding of new customers. This journey was to a large extent characterised by automated touchpoints from the company's IT-systems. However, it also involved touchpoints with human intervention. In this case study, quite a few different expected journeys was identified due to the multi-channel nature of the service delivery systems. A customer could choose different ways of getting in touch with the company, and their journeys depended on their explicit channel preferences stated during the initial touchpoint. In this section we will demonstrate the deviation view of CJML as the service delivery has a transactional and deterministic nature.

The process of becoming a customer may last for several weeks, and we chose to approach the actual journeys through interviews in combination with a customer diary. Customers were recruited through interviews shortly after they contacted the energy company, and were asked to document their experiences in a paper diary until receiving the first invoice. Follow-up interviews were conducted with the purpose of reviewing the touchpoints and associated experience. Figure 5 shows part of a customer's journey involving notification of meter-reading and payment. In the deviation view, a horizontal line separates the expected touchpoints from ad-hoc touchpoints, being depicted above and below the line, respectively. Expected touchpoints that are missing in the journey are shown using a light grey colour. In this example, the SMS from the energy company notifying the customer of meter-reading is missing, in addition to the touchpoint where the customer was supposed to submit the meter. It is not unusual that actual journeys are missing some touchpoints. Figure 5 also exemplifies the presence of external actors like a bank (A4) as part of the journey.




| ID | Touchpoint description |
|---|---|
| M3 | *Missing:* Notification of meter-reading from the energy supplier |
| M4 | *Missing:* Customer does not read the meter |
| A4 | Customer receives e-mail from the bank informing about new invoice from energy supplier |
| E8 | Customer receives invoice |
| E9 | Customer pays the invoice |

**Figure 5 Visualisation of an actual customer journey using the deviation view**

A customer journey analysis often reveals subtleties in the customer experience that are not readily available to the company. The deviation view is a way for service providers to identify gaps in their service offerings by comparing actual journeys with the expected journeys. However, it is important to bear in mind that deviations from the expected journey do not necessarily imply an unfortunate customer experience. Furthermore, a mapping that includes external actors can be useful in providing an overview of all the touchpoints that forms the customer's service experience. Customers seldom distinguish between the different actors of a journey, thus actors that initially are not a part of a service are experienced as if they were.

## Discussion

We have introduced components of a visual language for service design and demonstrated how it can be applied to identify and analyse service experiences in two industry sectors. Although a formal evaluation of the language has not yet been conducted, we have collected feedback from workshops with our case partners, through e-mail questionnaires, and through a workshop at a public library site (Lee & Karahasanovic, 2013). This provided valuable information about how CJML were perceived and understood, and the potential usefulness of such a language as seen from a service provider's point of view.

For the most part, the feedback relates to the visual notation of CJML, and less to the terminology per se. In general, employees of the case providers (referred to as 'users') reported that the visual representation of customer journeys was clear and easy to understand, offering a comprehensive and valuable overview of what the customer went through. The language was perceived as useful in pinpointing parts of the customer journey that needed improvements. Most of the symbols were perceived as intuitive and easy to understand. However, some of the symbols, such as the symbol for payment, were argued not to be sufficiently suited to the particular sector of the case. Furthermore, some users called for additional symbols that were specific for their industry sector. Several users from the energy company found the coding of the boundary colour problematic when more than three different actors were involved. They suggested repeating the colour coding in each diagram. One user suggested a computerized tool with the possibility of personalized colour coding. Yet another suggestion was to superimpose a company logo onto the touchpoints initiated by the company, or to visually express the responsible department within a company. Finally, when working at the concept level of a new service, it was suggested to extend the visual notation to facilitate swim-lane diagrams when many actors are involved.

In the eMarket company, the CJML toolbox has been distributed internally across several groups and product teams, and is seen as a potential platform for cross-departmental communication around service design. The language has been perceived as valuable for understanding the end-to-end customer journey and the associated experience. In particular, CJML has been used for redesign of services; for conceptualization, drafting, and scenario generation, and for communicating new ideas within the company. In the future, the eMarket company wishes to use CJML to increase awareness about the total customer journeys within the organization, and to ease communication across departments.

The energy company found CJML valuable in specifying the expected customer journeys, as well for identifying the customer processes. In particular, the case study results have been used for customer-orientation purposes through disseminating the customers' experiences with the on-boarding journey. They expressed several possibilities when asked how CJML could be used in the future. First, the language could be useful in clarifying responsibility

areas between departments, which in turn could lead to a common understanding of the customer journey. Secondly, the company found CJML beneficial for valuating current customer journeys, for making improvements, and for designing new services. However, many pointed out that these issues would require internal alignment and a common focus, which is not easy to achieve. Finally, they pointed out the need for robust visualisation tools in order to adopt CJML across their organisation.

## Conclusion and future work

In this paper we have introduced components of a visual language, and preliminary evaluations suggest that CJML can support service providers both in developing new services, and for maintenance of existing services. The visual representations were perceived as useful for increasing the general awareness about customer experience associated with service delivery. The visual language will be further developed, and the visual notation will be systematically evaluated in annual cycles through case studies with industrial partners. Future developments will serve to extend the vocabulary, to increase the visual expressiveness, and to conduct systematic assessment of the visual components. For more practical and easy use of the language, efforts will be made to develop a computerized application for CJML.

## Acknowledgement

The presented work is part of the VISUAL project, funded partially by the Research Council of Norway (project number 219606). The authors would like to thank Amela Karahasanovic for all her help and suggestions on the manuscript. Also, thanks to members of the VISUAL project for valuable discussions and engagement, in particular Øystein Haugen, Stefan Holmlid, Jonathan Romm, Johan Blomkvist and Jan Håvard Skjetne. A special thanks to our industry partners for their arrangements and assistance when investigating their services.

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