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Evaluation of a modelling language for customer journeys

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***Abstract*— We report on an evaluation of the Customer Journey Modelling Language (CJML) for documenting and visualizing a service process from the customer's perspective. The target group is employees in service organizations. We present a modelling toolkit and a scenario-based procedure that was used during the experiment with 48 target users. The purpose was to assess the applicability of CJML when introduced to new users. The participants were able to utilize CJML in a collaborative setting after a short training session. Overall, CJML was perceived as intuitive and useful by a large majority of the participants. A high precision level was obtained in more than 50% of the models produced during the experiment. Still, the analysis reveals the need for better guidance on delineation of process steps. We discuss validity of the results, and further work required to improve CJML.**

Keywords—CJML; customer journey; touchpoint; modelling; toolkit; evaluation

I. INTRODUCTION

The services sector dominates economic activity in most economies worldwide, and contributes to more than 2/3 of GDP in industrial countries [1]. In the transition to the service economy we have witnessed a "servitization" of manufacturing firms in adding services to their products or presenting their products as part of a service offering [2]. Yet a common theoretical basis for design, management and operation of services in industry and government are characterized as rudimentary [3]. It is well established that quality services and satisfied customers correlate with financial impact for companies [4]. Nevertheless, the ability to deliver satisfying customer experiences has not increased [5].

Service design is an emerging field that seeks to innovate or improve services to make them more useful and desirable for consumers and efficient and effective for organizations. A recent book on service design emphasizes that the expectation of customers, consumers, and citizens are increasing [6]. Enhanced service quality and service experiences are also identified as a priority area for service research [7].

Service offerings have become more complex in recent years, partly due to technological advances and the increase in channels used for service delivery [8]. Furthermore, service delivery often involve a network of multiple service providers responsible for separate parts of a service [9]. In a service company, delivery, support and maintenance of services involves heterogeneous groups of employee residing in different parts of the organization [10]. It is thus challenging and resource demanding to obtain an overview of the end-to-end service experience and mitigate failure and deviations in their service processes.

Service blueprinting [11] is a commonly used approach in service design. It is based on a flowchart that visually separates the customer's steps from the back-end processes. However, the formalism of service blueprinting does not adequately address the customer's point of view. More recently, customer journeys have emerged as a tool to emphasize the customer's point of view. Customer journey is one of the most frequently used methods for design and redesign of services [12]. Customer journeys represent a wide range of approaches and have been used extensively in recent years in the design of public and commercial services. Although customer journey mapping is a commonly used method within service design, challenges do exist. The lack of a common approach and a formal language has been pointed out [13, 14], and the lack of consistency among the different approaches is emphasized in Ref. [15]: “[...] it is hard to find any publications focusing on customer journeys and the evolution of the technique seems to be based on inspiration and adaptation of other’s customer journeys rather than guided efforts”. A recent literature review on customer journeys also confirms the diverse and fragmented approaches [16]. A formal, visual language for precise modelling of a service process, as seen from the customer's perspective would thus be beneficial to support unambiguous communication across the various groups involved in the design, operation and support of services.

The Business Process Model and Notation (BPMN) and the Unified Modeling Language (UML) are two well-established languages that could be used to model customer journeys. UML activity diagrams may represent a majority of computational and

organizational workflows, but the language is therefore generic and complex. BPMN is advisable for representing business processes, although it is not necessarily simpler than UML [17].

A. *Purpose and organization of this paper*

In this paper, we report on an evaluation of the Customer Journey Modelling Language (CJML), a domain specific language for customer journeys. CJML is designed for a wide target group and does not require prior knowledge on modeling languages. CJML is a language for modelling and visualizing service delivery from the *customer's* perspective [18]. CJML aims to be intuitive, and adopts terms from the service design domain.

The purpose of the study was to assess the applicability of CJML when introduced to new users, and evaluate its usefulness and general applicability in the context of service management. The evaluation took place as part of the Yggdrasil conference in Norway in April 2015. This conference gathered around 400 participants from the industry, consulting and academia around the themes of digital user experience and interaction design.

The next section introduces the main concepts of CJML and the visual notation. This is followed by a presentation of the toolkit and the evaluation procedure. The results section reports on the modelling efforts of the participant, the precision obtained, perceived usefulness and other feedback. Finally, we discuss the results, threats to validity, and future work.

II. The Customer Journey Modelling Language

CJML is a visual language for modelling of customer journeys. The language aims to appeal to a broad user group through a simple and intuitive form. The main target group is service organization employees involved in design, development and maintenance of service processes, or involved in customer centricity and customer experience management across a company. It also targets consultancy agencies offering service design expertise. In contrast to the rich and often anecdotic description format of other customer journey approaches [16], CJML relies on commonalities in a service process in terms of actions and communication events. CJML aims to provide a detailed and unambiguous specification of a service delivery process from the perspective of the customer, and to enhance the communication between organizational units responsible for development, operation, and support of the service delivery.

Touchpoints form the basic units of customer journeys in CJML. Customer journeys in CJML are visualized as sequences of circular touchpoints. For the current study, we focus on touchpoints in the form of communication events between a customer and a service provider in line with the Shannon-Weaver model [19]. Touchpoints are represented as circles, where the boundary color

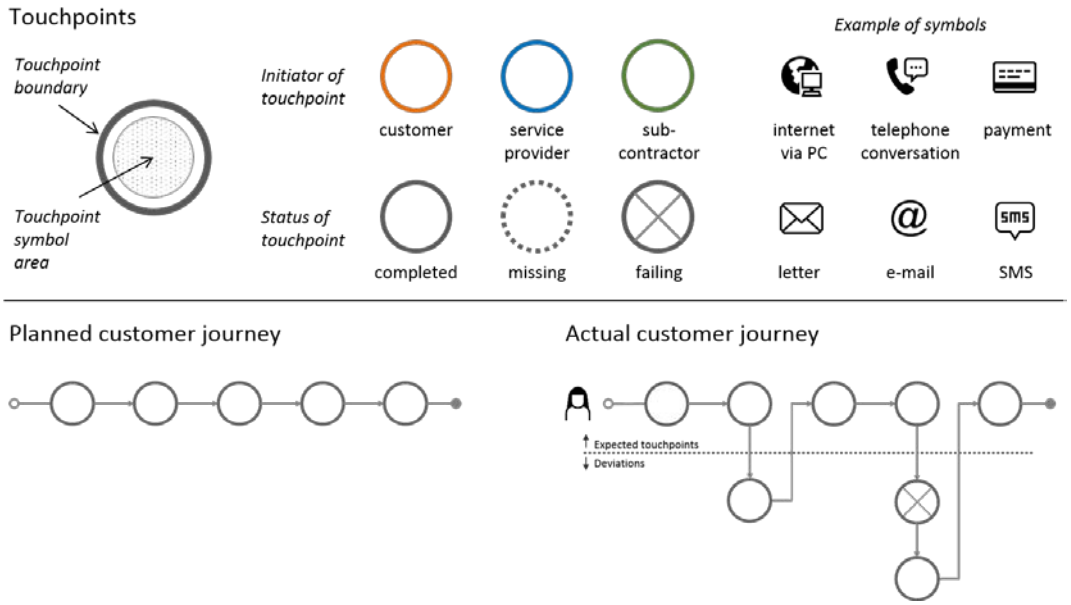

Fig. 1. Visual representation of touchpoints and customer journeys.

signify the initiator of the communication. The symbol inside a touchpoint represents the channel that mediates the message. The visual notation of CJML is exemplified in Fig. 1. CJML describes a service process both in its hypothetical state, as intended by the service provider, and as it is experienced in a real context by an individual customer. These states are reflected in the planned and actual customer journey, respectively.

Development of CJML has been driven by empirical case studies with industry partners from various sectors: a supplier of eHealth services to hospitals, an electricity supplier, and an eMarket company offering a digital platform for consumer-to-consumer services. Common for these partners is their transactional and technology-driven service delivery processes [20]. Requirements and features of the industry partners' service delivery systems have driven the development of CJML, and the expressiveness and visual notation have been extended in iterations. Results from case studies suggest that CJML can support service providers in documenting the service delivery processes, identifying customer pain points, re-designing services, and for designing new services [18, 21].

The case studies were conducted by a research team in collaboration with the industry partners. The research questions that motivated the current evaluation was: Is CJML applicable for new users in the target group? What precision level can be obtained in the models? What is the perceived usefulness of CJML? Several challenges on the practical side remain to be resolved. Development and maintenance of services require collaboration among heterogeneous groups in a service organization [22], and involves participatory design activities. For more efficient use of CJML, supporting tools are needed. A computer-based tool for creating diagrams has been developed, but such a tool does not support the use of CJML in a collaborative setting.

CJML has been used by the research team in collaboration with industry partners. However, these service organizations have been part of developing the language. In this paper, the hypothesis we want to test is whether new users in a service organization can apply CJML without prior knowledge.

III. Development of the Toolkit and Evaluation Procedure

A whiteboard was identified as a feasible and practical medium for modelling of customer journeys, being easily accessible in most office premises. Its magnetic property enables easy positioning and re-positioning of CJML's graphical elements. Circular magnets in two different colors were chosen to represent touchpoints initiated by the customer (white) and the service provider (blue). The symbols were printed on self-adhesive material that easily sticks to the magnets. We used off-the-shelf transportable whiteboards of size 35cm x 50cm and a whiteboard pen for writing comments, drawing connectors etc. For the purpose of the evaluation, the symbols were provided separately from the magnets to let the participants reflect and choose the appropriate touchpoint color and symbol, see Fig. 2. A reference guide with an overview of CJML's definitions and visual elements was provided during the modelling sessions.

The workshop methodology was designed for a 2 hours session targeting participants with backgrounds in service provisioning, service design, or service innovation. No prior experience with CJML or any other modelling language was required.

The workshop was organized as three consecutive sessions that alternated between plenary sessions and group work. The two last sessions involved the whiteboard toolkit:

- Session 1: General introduction to the field of services and customer journeys, CJML and warm-up exercises
- Session 2: Modelling of a planned customer journey based on a business scenario
- Session 3: Modelling of an actual customer journey based on a user scenario

In Session 1 basic concepts and methods in the field of service management were introduced, followed by a 15 minutes walk-through of CJML's terminology and visual notation. The session was concluded with individual text-based exercises aiming to drill the participants in identifying key concepts of CJML. One exercise focused on separating communicative events from non-communicative events, and another focused on distinguishing subjective descriptions (customer experience) from objective statements.

For Session 2, we used a fictive business scenario for on-boarding new customers on an alarm service. It was described from the service provider's perspective, reflecting the planned customer journey. For session 3, a user scenario was constructed based on the business scenario. It describes a fictive customer and her interactions and experiences during the on-boarding process. The participants worked in groups of 2-3 persons in translating the scenarios into physical models of planned and actual customer journeys. The correct solution was presented in between the two modelling sessions to obtain a common reference base for modelling of the actual journey.

The workshop was concluded by handing out a written evaluation form, where the participants could provide feedback and suggestions regarding the various components of the visual language, the perceived usefulness of the approach, and the workshop method in general.

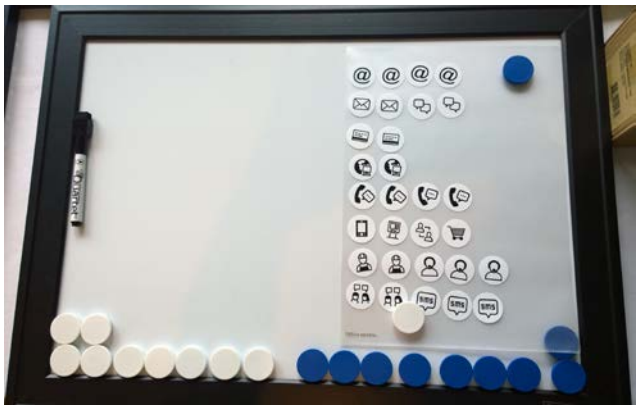

Fig. 2. Whiteboard toolkit for modelling of customer journeys.

A. Scenario for the planned customer journey

We used a service archetype approach [23] to construct a business scenario. Some simplifications were made to reduce the variability in order to compare the resulting modelling efforts of the participants. The scenario involved one sales channel only, and we assumed that the primary service provider supported all parts of the customer journey, including payment services. The following scenario was used:

The security company Safe@home offers installation and maintenance of alarm systems targeting the private market. The company has invested considerable resources in designing an online shop for self-service. A nation-wide marketing campaign will be launched to attract prospective customers in placing their orders through the online shop. Striving for a smooth and consistent customer experience, the company has decided to map the customer journey for on-boarding new customers on house alarm systems through the online shop. The scope of the customer journey is set from a customer places an order through the online shop, throughout installation and until payment of the first invoice. Immediately after placing the order in the online shop the customer receives an e-mail that confirms the purchase and provides additional information about the process ahead. A technician from Safe@home will carry out the necessary installation in the customer's home. After about two days the customer will receive an SMS with the date for the technician's home visit. On the day of installation, the

Fig. 3. The planned customer journey.

technician will call the customer about 1 hour upon arrival, to ensure that the customer is at home. The installation procedure will normally take less than an hour. A few days after installation, the customer will receive a letter from Safe@home with additional information about the alarm system and an invoice for the first quarter of the subscription.

Fig. 3 shows the resulting customer journey, as modelled by CJML.

B. Scenario for the actual customer journey

A user scenario was developed, providing a detailed account of a fictitious customer's interaction and experience with the service. Here, we emphasize the instrumental properties of her experience above subjective accounts. Modelling of self-reported, subjective experience is described in ref. [21]. The following user scenario was developed for the actual customer journey:

Tina needs a burglar alarm in her home and decides to go for a service offered by Safe@Home Inc. Using her laptop she orders an alarm service from the company's online shop. Everything seems to work fine, and Tina is very satisfied with the online shopping experience. A few minutes later she receives an e-mail confirming the details of the order. She is also informed that a technician will take care of the installation of hardware in her home, and that she will receive an appointment date for the home visit. A few days later Tina receives an SMS from Safe@Home with the time and date for installation. She finds that the suggested date does not suit her plans, as she will be on a business travel at the time for the home visit. Tina calls the support centre but of reasons unknown the connection is broken. She has to leave for an appointment with a friend, and decides to call back later. The following day she is able to reach the call centre. A new date is settled for the home visit, and immediately after the telephone conversation, she receives a confirming SMS. The following week, on the day of the installation, the technician calls her from his car, telling her he is on his way. The technician installs the alarm system without any problems. After a couple of days, Tina receives a letter containing tips and information. It also includes an invoice concerning the first period. The bill contains elements and accounts that Tina is not able to recognize from the marketing campaign. She therefore sends an e-mail to get an explanation. Tina gets an answer per e-mail during the same evening explaining the details of the invoice. Being a considerate customer, Tina pays the invoice through her internet bank the same evening.

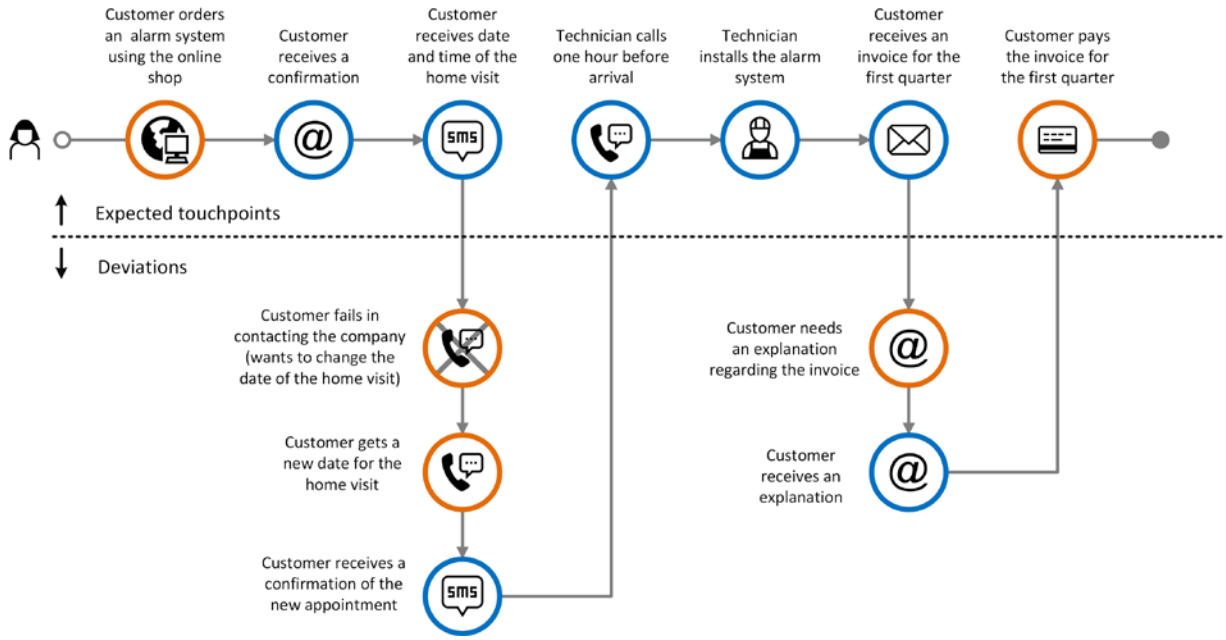

Fig. 4. The actual customer journey.

Fig. 4 shows the actual journey matching this scenario. Note that the planned journey can be recognized in the upper part of the diagram. Deviations from the planned journey are shown below the dashed line.

C. Recruitment, data collection and evaluation criteria

The recruitment process was non-random, carried out as self-selection sampling [24] consisting of participants having signed up for the workshop arranged as part of the Yggdrasil conference. Through the questionnaires, we verified that all the participants were representative for CJML's target group.

Three researchers familiar with CJML facilitated the workshop and observed the participants during their modelling efforts. The scenarios were handed out on paper. The participants were instructed to identify touchpoints from the text and produce a CJML representation using the whiteboard toolkit. The resulting models were photographed for the purpose of documentation and subsequent analysis of conformance. A set of success criteria was developed for this purpose:

- C_1: Identification of the initiator of a touchpoint
- C_2: The use of appropriate symbol for the channel
- C_3: Status of the touchpoint (for actual journeys only)
- C_4: Correct sequence of touchpoints in a journey
- C_5: No missing touchpoints (all identified)
- C_6: No occurrence of excess touchpoints
- C_7: Appropriate positioning of deviations as vertical displacement of touchpoints (actual journeys only)

Criteria C_1-C_5 were found essential for a purposeful modelling with CJML, and is referred to as high conformance. Full conformance is obtained when all the criteria are fulfilled.

D. Analysis of the participants' feedback

We conducted a thematic content analysis [25] to identify categories of common themes. To address validity of the categories, two researchers independently identified categories for each question. A comparison revealed that the categories corresponded to a large degree. A few discrepancies were found. These were discussed and a consensus was obtained. We merged categories with statements of similar meanings as far as possible. Each free text answer was coded into one or more categories (not mutually exclusive) based on their content. Prior to the full data set being coded, we conducted a pilot coding where two researchers independently coded one set of questions. The pilot coding resulted in an inter-rater reliability Cohen's kappa of 0.89, corresponding to an "almost perfect" agreement [26]. The remaining data was coded by one of the researchers.

IV. Results

A. The participants

In all, 48 individuals participated actively in the exercises and evaluation session. The average age was 37 years, and about 2/3 were women. In terms of employment, a majority of the participant represented a service provider, while roughly 40% represented a consultancy company. When asked about their most prominent role in their work with services, about half (22) contributed with design competence, 11 with leadership, 10 with business development, and only a few with software development or other roles. A majority of the participants (30) were used to methods and tools for service design. Storytelling and customer journeys were most frequently used (20 and 16 participants, respectively). Only six participants had experience with service blueprints, and three participants with diagrammatic methods like UML or BPMN. When asked about prior acquaintance with CJML, five participants

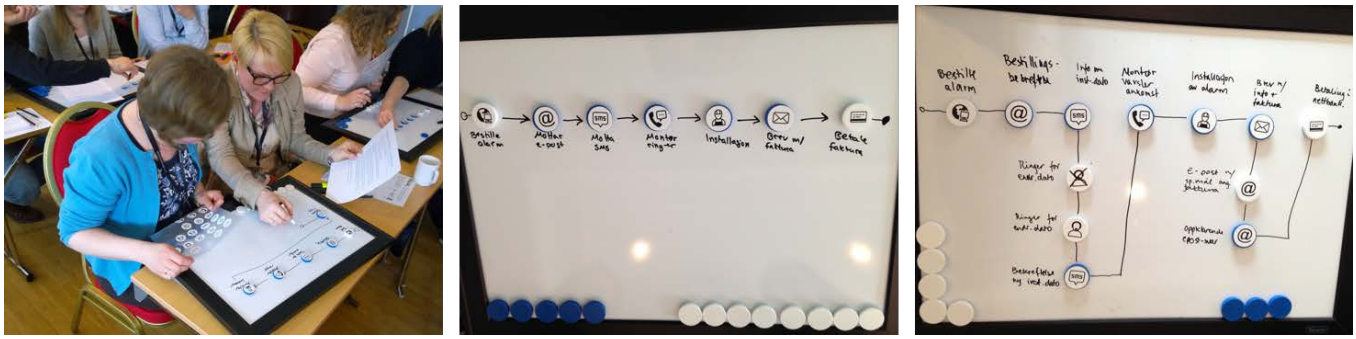

Fig. 5. Left: Two participants collaborating in interpreting a business case and modelling the planned customer journey. Middle: Example model of a planned customer journey. Right: Example model of an actual customer journey.

had seen it before, but only one participant had experience in using it.

B. Working with the whiteboard toolkit

During the workshop, the participants worked in groups of two or three. They seemed to have no problems in handling the whiteboard toolkit with magnets and stickers. Two patterns of collaboration were observed: 1. one person taking responsibility for

interpreting the text, dictating the touchpoint sequence to the partner handling the toolkit; 2. both participants involved in interpreting text and handling the toolkit. Fig. 5 (left) shows a group who shared the responsibility for both tasks. The pattern of collaboration was not studied systematically nor correlated with any outcome of the modelling sessions.

C. Modelling of customer journeys

A total of 20 journey models were produced among the 48 participants in each of the modelling sessions. The data was stored and sorted using a spreadsheet for further analysis and calculation of conformance.

The analysis revealed that the participants had very few problems with identification of the touchpoints, their initiators, and application of appropriate symbols, see Table 1.

TABLE I. KEY RESULTS FROM THE MODELLING SESSIONS

	Planned journeys	***Actual journeys***
Identification of touchpoints	139/140 touchpoints 19/20 models correct	236/240 touchpoints 17/20 models correct
Initiator of touchpoint	OK for all touchpoints	One erroneous initiator in one model
Communication channel	OK in 19/20 models	OK in 19/20 models
Touchpoint excess	Extra touchpoint in 8 of 20 models	Extra touchpoint in 4 of 20 models
Status of failing touchpoint	n/a	Correct in 16 of 20 models
High conformance	19/20 models	13/20 models
Full conformance	11/20 models	10/20 models

In the case of planned customer journey, the participants recognized the touchpoints from the scenario with only one exception. All the models had correct initiators of the touchpoints. With only one exception, an appropriate symbol was used for the communication channel. However, as many as 8 planned journeys contained excess touchpoints. A majority of these included an extra shopping cart symbol after the first interaction with the company web site. One model contained three duplicated touchpoints as both initiator and receiver were represented as separate touchpoints. In all, 19 of 20 planned journeys can be characterized as successful in terms of high conformance, fulfilling criteria C_1-C_5. Full conformance was achieved in 11 of 29 models, fulfilling all the success criteria.

In the actual journey exercise, fewer models (17 of 20) were successful in identified all the touchpoints, resulting in a reduced conformance. Two models missed one touchpoint, and one model was missing two touchpoints. However, the actual journeys were more successful in terms of touchpoints excess, as compared to the planned journey (4 compared to 8, respectively). Ad-hoc touchpoints (deviations) in the actual journeys should be vertically displaced in the models. In all, 12 of 20 models succeeded in this matter. Typical mistakes were ad-hoc touchpoints positioned in line with the planned touchpoints. Most of the models (16 of 20) succeeded in assigning a correct status to the failing touchpoint in Fig. 4. In all, 13 of the 20 actual journeys had high conformance, and 10 of 20 had full conformance.

Variation was found among the models regarding the elements that depended on pen: connectors, start/end symbols text labels and the deviation line. These elements were provided using the pen. Most of the models had lines or arrows connecting the touchpoints. Start and end points were also present in most of the models. As the presence of magnets on the whiteboard could easily obstruct the writing hand of a participant, these elements were not considered for calculating conformance.

TABLE II. "HOW WAS YOUR EXPERIENCE IN USING CJML TO VISUALIZE THE (ACTUAL) CUSTOMER JOURNEY?" (N=41)

Categories	***Count***	***Example statements***
Generally positive	21	*"Nice", "Good", "OK", etc.* The vast majority of answers in this category were also coded in other categories.
Simple, easy, straight forward	16	*"A simple and low-threshold approach."*
Clear, intuitive and logical	10	*"Very good! Easy to understand and intuitive."* *"Very good and intuitive, easy and clear overview of the chain of events."* *"A clean and clear method."*

Fast, efficient and useful	8	*"Useful to visualize the process with deviations."* *"Useful to visualize the user/customer journey to clarify challenges and be able to assess improvements."*
Fun and educative	4	*"Effective, easy, and fun."* *"Very useful, fun, and educational."*
Issues	5	*"Good, but is difficult to visualize deviations along with time because deviations appear downwards [in the diagram]."* *"One gets a clear overview of all steps in the process. It's a bit challenging to know whether to use one symbol or the other, and whether an activity is an action or a touchpoint."*

D. Perceived ease-of-use, usefulness and challenges

The response rate for the questions ranged from 14 to 41, with a mean of 32. A majority of the participants found the modelling language and the toolkit easy to use. When asked to rate the ease-of-use on a five-point Likert scale (very difficult/ difficult/neither/easy/very easy), 25 persons rated it “easy”, and 9 persons rated it “very easy”. None of the 37 respondents rated it as "very difficult" or "difficult", and only three persons rated “neither”. Ease-of-use was also mentioned frequently in the free text answers, see Table 2. Here, 16 of 41 comments included statements confirming this. Ten also commented on the language being clear, intuitive and logical, and 8 characterized it as fast and efficient. For example, one participant stated that this was “a simple and intuitive way to get an overview of a sequence of events”.

We also asked the participants to rate the usefulness of the CJML approach using a five-point Likert scale (useless/not very useful/neither/useful/very useful). From a total of 33 ratings, 17 rated it as “useful”, 12 as “very useful”, and 4 persons rated “neither”. They were also asked to specifically comment on *how* CJML could be useful in their work, see Table 3. Out of 39 responses, 17 comments referred to using CJML for communication and shared understanding, while 12 referred to using the modelling language to visualize data in a process format to gain a better customer and market understanding.

TABLE III. "HOW CAN CJML BE USEFUL IN YOUR WORK?" (N=39)

Categories	***Count***	***Example statements***
Shared understanding and communication	17	*"Neat and clear visualization of the customer journey, within our jungle of old databases and different types of forms. Creates awareness among departments and management that don't work with communication, and makes visible how important first line is!"* *"A common language between UX specialists within large organizations."* *"It's easy to use the tool, and fast to visualize a customer journey, so I think it can be an effective tool when, for example, mapping the customer journey together with customers."*
Customer and market understanding	12	*"I hope to be able to use it within my organization for increased customer and market understanding."* *"We deliver many services. VISUAL can help us put ourselves in the customer's shoes. We get a better understanding of how the different parts of the service are interrelated."*
Visualization and modelling of process	9	*"[...] To outline internal processes, e.g. user stories, specifications for development, and implementation."*
Identification of deviations and complexity	4	*"Useful for illustrating how a planned journey or experience is compared to the actual. Especially when presenting this to others."*
Other	4	*"Standardization."*
General	5	*"Useful."*
Not useful/unsure	1	*"Unsure if we get use of this."*

When focusing on challenges with CJML, more than half (18 of 31) of the participants mentioned factors regarding the symbols, see Table 4. These challenges regarded choice and differentiation between symbols, as one participant stated: "Understanding the symbols, e.g. the difference between [the symbols] 'phone call' and 'customer service via telephone'." Another participant highlighted that it was "a bit difficult to differentiate the symbols, but this will probably be easier with practical use."

Symbols were also highlighted when participants were asked for suggestions to further develop of the CJML. The suggestions were in line with the challenges of Table 4. Interestingly, several suggestions addressed features that already are part of CJML but not introduced due to time limitations. The suggestions included features such as a timeline, support for adding customer experience,

journey phases and swim lane diagrams. The fact that the language already accounts for many of the suggestions participants brought forward indicates that the language, even in its current state, includes relevant features.

TABLE IV. "WHAT WAS CHALLENGING IN USING CJML?" (N=31)

Categories	*Count*	*Example statements*
Symbols	18	*"Understanding the symbols; the difference between phone call and customer service via telephone." (ID5)* *"A bit difficult to differentiate the symbols, but this will probably be easier with practical use." (ID8)*
Visualization of experience	2	*"Where to place symbols for customer experience." (ID47)* *"Unclear how to include emotions."(ID1)*
Other	6	*"Unclear how to include backend systems." (ID1)*
No problems	2	*"I didn't think it was challenging, CJML made it easy." (ID2)*

V. DISCUSSION

Through the use of a simple toolkit, we were able to confirm our hypothesis that target users without prior knowledge to CJML may adopt it rather quickly to represent hypothetical and real customer journeys with a satisfactory precision level. A high conformance with CJML was observed in as many as 19 of 20 models for planned journeys. For the more complex scenario of an actual journey with several deviations, a high conformance was obtained in 13 of 20 models. Full conformance with CJML was achieved in about half the cases.

From the feedback session, it was evident that the participants found it challenging to choose appropriate symbols for certain situations. This implies the need to improve the semiotic clarity of the symbols, and provide a better balance between symbol redundancy and flexibility [27]. Interestingly, the occurrence of excess touchpoints was more frequent in participants' models than missing touchpoints. This may reflect a potential problem in the definition of a touchpoint itself, or a need for improved guidance on delineation of process steps.

The feedback from the participants supports earlier findings [18, 21] that CJML can support service companies in documenting and researching their service delivery processes. Recent publications points to the importance of considering a customer's end-to-end journey instead of single touchpoints [14, 28] in optimizing service quality and increasing customer satisfaction. CJML constitutes a new approach to customer journeys, allowing a systematic modelling of individual journeys in a way that emphasizes deviations that are potential pain points for the customer.

A. Limitations of the study and threats to validity

The evaluation presented in this paper was based only on the basic part of CJML. Furthermore, the evaluation was based on interpretation of pre-made text scenarios for the modelling of planned and actual journeys. A weakness of this method is that the scenario might emphasize the touchpoints in an obvious way, as compared to a scenario made by externals. There is obviously a trade-off between the needed level of detail and realism. On the other hand, the presented method makes it easy to evaluate the models against each other. The following factors may also represent threats to validity:

- Several simplifications were assumed for the scenarios, like neglecting subcontractors and alternative sales channels. This may represent a threat to construct validity.
- Configuration of the toolkit might have influenced the participants' choice of symbols. For practical reasons, only a subset of the full symbol collection was made available.
- The evaluation was conducted in a workshop setting where the participants were co-located, working in parallel and seated next to each other. Mutual influence between groups and coordination of results may occur in such a setting.

VI. CONCLUSION AND FUTURE WORK

We have presented a formal modelling language for customer journeys, and an evaluation procedure used in an experiment with 48 target users. Through a simple and low-cost toolkit, we have confirmed that new users can apply CJML with a high precision, and that they find it useful for their professional work in a service context. Their feedback has provided us with valuable insight and ideas for improvements and further development of CJML and its supporting tools. We have improved several of the symbols, such as the e-mail and letter symbols. Furthermore, we are developing a typology of touchpoints that emphasize the distinction between

communicative and non-communicative events. Finally, we plan to conduct a new study to evaluate the visual language in a more realistic setting, where the participants apply the language to a service context which is relevant to them.

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