From UX Design Methods to Service Design Methods: Is it just a Matter of Scalability?

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Abstract

UX Design and Service Design share certain theoretical roots in core psychological concepts, including aesthetic quality perception, cognitive appraisal, and emotional experience. While UX Design typically focuses on an individual interacting with a product/service in a specific setting as a touchpoint, Service Design addresses multiple touchpoints. As a corollary, one can infer that scaling up the established methods used in the former should be applicable in the latter. Examples like multiple personas, prolonged UX and automatic data logging are discussed. Such a scaling approach may work for simple cases. However, its underlying assumption about the uniformity and additivity of individual touchpoints is fragile. The key challenge is to identity approaches to harmonize similarities and differences across touchpoints. Whether this is another challenge that can be resolved by the recent advances in Machine Learning methods is open to debate.

Author Keywords

UX Design, Service Design, Touchpoints, Persona, Logging, Machine Learning

Introduction

While User Experience (UX) Design and Service Design share certain theoretical roots, they branch off to grow differently to address specific people's needs and contextual constraints. The fruits so borne can be as

different as between oranges and apples or as similar as between peaches and nectarines, although in essence the fruits need to be tasty for consumers and make them feel good. Growing quality fruits entails quality methods, techniques and tools, and such methods should have a strong theoretical basis. The concomitant questions are: Whether different fruits need different methods while they are grounded in the same roots? Are Service Design methods simply the scaled-up or augmented version of UX Design methods? Are existing HCI design and evaluation methods sufficient for Service Design or new methods are needed? In this workshop paper, we explore these questions.

Theoretical roots

The theoretical roots that UX Design and Service Design shared are some core psychological concepts, including:

- *Perception*: It pertains to visceral reactions to the aesthetic quality of products [1] as well as sensory and motoric reactions when interacting with products/services;
- *Cognition*: Key concepts include attention, memory, mental model, learning, motivation, and appraisal, are highly relevant to both design and evaluation of the quality of interactive products/services;
- *Emotion*: The six basic affective states (e.g. happy, sad, surprise) [2], which are arguably better represented as dimensional values (i.e. valence, arousal) [3], are widely used as manifestation of psychophysiological responses to emotion-eliciting stimuli, digital as well as non-digital.

- *Experience*: The temporality of experiential responses – before, during and after [4] - leads to ongoing debates on the relative importance of the momentary and retrospective approach to designing for and evaluating emotions [5].

Clearly, the depth and breadth of these four areas are much deeper and wider than listed above. Here we just present a snapshot to illustrate some elements of this rich substrate on which UX Design and Service Design are planted. In ensuing text, we will draw on some of these elements to support our arguments.

Working definitions

While we do not aim to delve into the definitional issues on the closely related concepts - UX Design, Service Design and Multi-touchpoint Design, we present the working definitions of these three from our previous work [6] and the definition of 'touchpoint' from Wikipedia[1] to facilitate the communication of our ideas pertaining to the methodological issues.

- *UX Design*: Focus on positive user experience while interacting with a product.
- *Service Design*: Focus on smooth customer journey through several touchpoints
- *Multi-touchpoint Experience Design*: Aims to build a harmonious experience journey through the touchpoints.
- *Touchpoint:* Any way a consumer can interact with a business, whether it be person-to-person, through a website, an app or any form of communication.

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[1] https://en.wikipedia.org/wiki/Touchpoint

Figure 1a: train transit (upper), Figure 1b: door button (middle), Figure 1c: platform 0

Scalability of UX Design Methods

With the above premises on the shared theoretical roots and working definitions, a proposition that UX Design and Service Design are *not* different in nature but only vary in scale can be derived. The variations lie in terms of the following attributes:

- Number of touchpoints and context switches
- Number and composition of stakeholders
- Range of values and needs of stakeholders
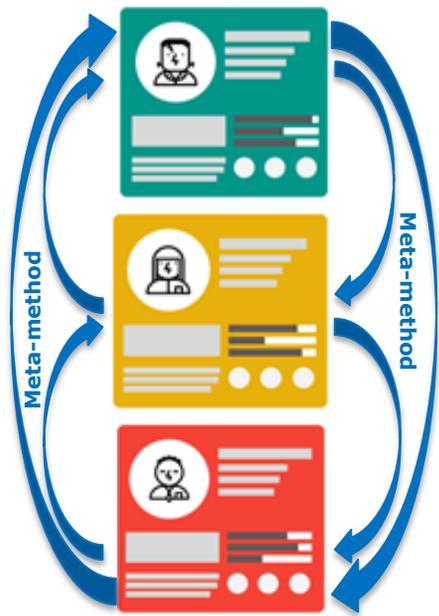- Duration of interaction trajectory

A corollary of the proposition is that scaling up UX Design methods by a factor of n (= the ratio of the number of touchpoints in Service Design to that in UX Design) would inform or even become Service Design methods. Note that we define two types of method scalability: (a) applying the same UX design and evaluation methods multiple times – scaling in terms of time and effort; (b) augmenting existing UX design methods with their core principles and techniques being intact but extending the scope of data to be captured – scaling in terms of connection and continuity (on top of time and effort).

Nonetheless, the proposition, with its underlying assumption about the uniformity as well as additivity of individual touchpoints, can be applied to simple cases where the series of touchpoints along a customer journey are highly similar. One example scenario is taking a train ride with several transits from the North to the South in the UK. Many of the train stations in this country are structured in a similar manner, different transits share touchpoint invariants [7]), including: waiting till the door open button blinks, pressing it, getting off the train, looking up the digital display (or own smartphone) to find the platform for the next connecting train, moving up and down the elevators, and getting on the train to continue the

journey (Figure 1a). With reference to some of the aforementioned elements of the psychological concepts, the UX Design of individual touchpoint involves:

(i) the aesthetic and minimalist design of the door open button (Figure 1b) (fore/background colour contrast, alignment, proximity)

(ii) the responsiveness of the button; often the latency between the train having stopped and the button lighting up and between pressing the button and the door opening causes frustration in passengers, especially those who are in a hurry to catch the next train;

(iii) the mental model of the relation between the numbering and location of a train platform (NB: some may be counterintuitive such as Platform 0, Figure 1c)

(iv) the dis-ambiguity of the transit information; often more than one train have the same departure time and, even worse, only the respective final stops are given without displaying the list of intermediate stops one of which is the passenger's destination.

The above design ideas can be captured through ethnographic observations and surveys at individual touchpoints (i.e. train stations); the same approaches are applied several times. Similarly, to evaluate the user experience at individual touchpoint, the same set of Emotion Sampling Methods (ESM) [8] (e.g. a self-reported questionnaire pushed to a user at randomly selected time through a mobile app) can be employed. While the first touchpoint (i.e. leaving the origin) and the last one (i.e. reaching the destination) with additional features (e.g. inserting a ticket in a turnstile) carry more weights for evaluating the entire journey, the shared characteristics make the above proposition on the simple type (a) method scalability plausible.

Source: (the middle column)
https://www.mightybytes.com/blog/how-to-design-a-website-for-multiple-audiences/

Figure 2. Connecting User Persona of individual touchpoints through a 'meta-method'

Admittedly, this case is oversimplified, given its linearity and neatly-defined as well as stable goal. A variant of this case, say, travelling by train, airplane, and bus instead of a train-only itinerary involves a different set of touchpoints with specific attributes. Nevertheless, the goal of reaching the final destination remains clear and steady in this variant. The case becomes more complicated when the travel is only part of a holiday package, the Service Design needs to be extended to cover a customer's user experience of using a digital tour guide to explore the destination city; this kind of exploration goal tends to be highly dynamic, making it very challenging to identify or predict the user journey.

The question then becomes whether the type (b) method scalability mentioned above – extending the scope of data and building the data connection as well as continuity – is applicable. We select three methods, which are of ever-increasing use for UX Design, to discuss: User persona, Longitudinal UX, and Automatic logging.

User Persona: It is one of the widely used approaches in the User-centred Design (UCD) methodology. It involves creating a fictional character that represents a hypothesized user group with specific values, skillsets, behavioural patterns, attitudes, and goals. The creation of personas is typically based on synthesizing data collected from user research (e.g. interviews) [9]. The resulting description (normally one-page long) delineates how the character acts, thinks and feels in a certain situation in which a new product/service is to be embedded. The scenario thus constructed becomes the focus of the design of the product/service. Whereas the traditional user persona approach focuses on one character that aligns with UX Design, the recent work on multiple user personas [10] and Design Fiction [11] can be seen as its extension that can potentially support Service Design. Scenarios built upon different

characters and contextual features typical of individual touchpoints are a rich mix of facts and fictitious imaginations. The major challenge then lies in how to weave these scenarios into a coherent narrative, UX at one touchpoint can contribute to sustain (or improve) user expectation about the next touchpoint(s) and in turn also influences how one retrospectively evaluates the preceding touchpoint (Figure 2). The knowledge and skill for developing User Persona may not be sufficient for developing a chained narrative that connects touchpoint-specific scenarios to induce the sense of continuity in users. The gap is related to the competence of identifying shared and unique features of the touchpoints of the customer journey and linking them as a confluent stream of user experience. We do not yet have an answer how to characterise such a "meta-method", which presumably entails an in-depth understanding of the intricate relationship between human memory and emotion, considering the well-recognised notion of "experiencing self vs. remembering self" by Kahnemann [12].

Longitudinal UX: Methodologically, a major difference between usability and UX work is that the former typically relies on data collected from short-term user studies and the latter from longer-term studies, when the reality allows them to be conducted. This emphasis on the temporality of UX has led to the emergence of tools and techniques such as iScale [13] and UX Curve [14], tracking the changes of users' experiences over a period of time through self-reported textual description as well as graphical representation of emotional responses. Furthermore, a rather common approach is to ask users to complete a battery of (standardized) questionnaires repeatedly over time, and to analyse repeated measures with advanced statistical methods such as multilevel analysis [15].

Given the emphasis on longitudinal evaluation, the migration from UX Design to Service Design seems
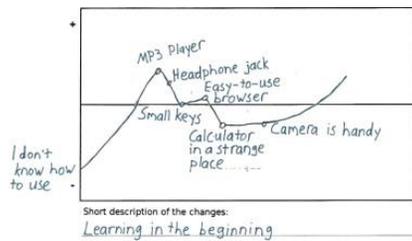
Figure 3. UX Curve for longitudinal UX study [14]

logically is to prolong the usage of such an approach. However, the critical issue, as already observed in the related longitudinal UX studies ([14] [15]), is how to sustain users' motivation to engage in the long-term process. The problem of user attrition causes data loss and thus lack of insights into the iterative development of Service Design. Similar to the discussion on User Persona, the scaling up of the method is not simply expanding the number of users/characters in constructing scenarios, it entails one level higher up to develop a meta-method for harmonising and connecting data points to inform the service design, thereby eliciting a sense of continuity in users to experience smooth transition across touchpoints.

Automatic Logging: With the recent advances of sensor-based technologies and ubiquitous computing [16], it is increasingly prevalent to track users' activities (i.e. moving, talking, seeing, thinking) to derive their emotional experiences through psychophysiological measures such as voice, gaze, heart rate, and galvanic skin response. As compared with longitudinal UX studies which rely on users' self-reports, automatic logging may be less prone to the risk of declining motivation of users, who need not do much extra other than letting the trackers run. In principle, the scaling up of this UX Design method is to extend the duration of data tracking. Nonetheless, two critical concerns, which also affect most empirical studies with an extended period of deploying sensing technologies, are privacy (ethics) and analysis of massive volume of data (i.e. big data). The former entails the identification of effective approaches for data protection and safeguarding users' rights whereas the latter requires the development of effective algorithms for machine learning methods.

More than Scaling-up
The whole is greater than the sum of its parts. The proposition that Service Design methods can be derived by scaling up existing UX Design methods may be viable to a limited extent when individual touchpoints along a user journey are highly similar. Nonetheless, in reality, the uniformity, additivity, linearity of different touchpoints and the stability of user goal across them are hard to establish. The fragility of these conditions makes the simple scaling-up approach by applying the same (set of) methods to different touchpoints contestable. Alternatively, scaling up a method can imply augmenting the method to capture a larger scope of data that can eventually be connected and rendered meaningful and useful. The analyses of the three prevailing UX Design methods, albeit brief, suggest that some kinds of "meta-method" to harmonise data and insights gained from different touchpoints are required.

A potential 'meta-method' of particular interest is Machine Learning (ML) techniques [17]. In today's world, the volume of user and contextual data we can capture and utilize is growing at a relentlessly rapid pace. One can apply ML to derive models how users' behavioural and attitudinal patterns as well as emotional experiences are related to changes of a host of contextual factors. Results thereof can support Service Design professionals to explain and predict whether certain features of artefacts are desirable or effective. Above all, irrespective of UX Design or Service Design methods we are applying, it is imperative for us to be aware of their ethical implications [18].

Concluding Remarks

Service Design is a relatively new area as compared with its older cousin UX Design. While established methods of UX Design can be scaled-up and adapted to support Service Design, new methods are called forth. Some attempts such as Experience Mapping [19] have been undertaken, but more need to be done. In Service Design, the focus is shared almost equally between service users and service providers. Nonetheless, customer experience is often seen as the core of service design (e.g., [20]). This paper focuses on the methods that investigate customer experience (CX) rather than service providers. In our future work, we will explore methods relevant to the latter. Overall, this young research area is still facing the basic definitional issue such as the demarcation between UX and CX. For Service Design to reach the next level of maturity, there are still quite some challenges to tackle.

References

1. Norman, D. A. (2004). Emotional design: Why we love (or hate) everyday things. Basic Civitas Books.

2. Ekman, P. (1992). An argument for basic emotions. Cognition & emotion, 6(3-4), 169-200.Morton L.

3. Russell, J. A. (2003). Core affect and the psychological construction of emotion. Psychological review, 110(1), 145.

4. Roto, V., Law, E., Vermereen, A., & Hoonhout, J. (2011). User experience white paper—bringing clarity to the concept of user experience available on line: http://www. allaboutux. org/files. *UX-WhitePaper. pdf*.

5. Hassenzahl, M., & Ullrich, D. (2007). To do or not to do: Differences in user experience and retrospective judgments depending on the presence or absence of instrumental goals. Interacting with computers, 19(4), 429-437.

6. Roto, V., Väätäjä, H., Law, E., & Powers, R. (2016, October). Experience design for multiple customer touchpoints. In *Proceedings of the 9th Nordic Conference on Human-Computer Interaction* (p. 146). ACM.

7. Rodrigues, V., & Holmlid, S. (2016). Multi-service touchpoint experience: Variation at single-point of entry. In *Experience Design for Multiple Customer Touchpoints, workshop in conjunction with NordiCHI'16, October 23-27, 2016, Gothenburg*.

8. Csikszentmihalyi, M., & Larson, R. (2014). Validity and reliability of the experience-sampling method. In *Flow and the foundations of positive psychology* (pp. 35-54). Springer Netherlands.

9. Nielsen, L., & Storgaard Hansen, K. (2014, April). Personas is applicable: a study on the use of personas in Denmark. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 1665-1674). ACM.

10. Goh, C. H., Kulathuramaiyer, N., & Zaman, T. (2017, May). Riding Waves of Change: A Review of Personas Research Landscape Based on the Three Waves of HCI. In International Conference on Social Implications of Computers in Developing Countries (pp. 605-616). Springer, Cham.

11. Blythe, M. (2014, April). Research through design fiction: narrative in real and imaginary abstracts. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (pp. 703-712). ACM.

12. Kahneman, D. (2011). *Thinking, fast and slow*. Macmillan.

13. Karapanos, E., Martens, J. B., & Hassenzahl, M. (2012). Reconstructing experiences with iScale. International Journal of Human-Computer Studies, 70(11), 849-865.

14. Kujala, S., Roto, V., Väänänen-Vainio-Mattila, K., Karapanos, E., & Sinnelä, A. (2011). UX Curve: A method for evaluating long-term user

experience. *Interacting with Computers*, *23*(5), 473-483.

15. Harbich, S., & Hassenzahl, M. (2016). User Experience in the Work Domain: A Longitudinal Field Study. *Interacting with Computers, 29*(3), 306-324.

16. Gurrin, C., Smeaton, A. F., & Doherty, A. R. (2014). Lifelogging: Personal big data. *Foundations and Trends in Information Retrieval*, *8*(1), 1-125.

17. Witten, I. H., Frank, E., Hall, M. A., & Pal, C. J. (2016). *Data Mining: Practical machine learning tools and techniques*. Morgan Kaufmann.

18. Vallor, S. (2016). *Technology and the virtues: A philosophical guide to a future worth wanting*. Oxford University Press.

19. McColl-Kennedy, J. R., Cheung, L., & Ferrier, E. (2015). Co-creating service experience practices. *Journal of Service Management*, *26*(2), 249-275.

20. Zomerdijk, L. G., & Voss, C. A. (2010). Service design for experience-centric services. *Journal of Service Research*, *13*(1), 67-82.