Exploring the use of EEG and Eye Tracking in Understanding Customer Experiences for Service Design

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ABSTRACT

Current customer journeys only rely on qualitative data. The aim of this paper is to introduce quantitative measures of customer experiences for Service Design. An EEG and eye tracker to measure attention levels and eye behaviour were used in a case study to compare two scenarios of a customer journey. Although more research needs to be conducted, the quantitative data showed differences in attention level patterns between touchpoints for the two scenarios. This data is expected to lead to a better understanding of customers’ experiences throughout the service, new customer journey visualization methods and improvements in service design deliverables.

Author Keywords
Eye Tracking, Electroencephalography, Customer Journey, Service Design.

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION

An explicit design and marketing goal is highlighting the creation of memorable customer experiences. A widely accepted design tool to map experiences is the customer journey, a sequential visualization of all possible touchpoints of a service with customers [6]. Touchpoints consist of tangible artifacts and intangible activities that happen in a physical space involving a frontstage, a backstage and several lines of visibility [7]. The customer journey map, only represents the activities of the frontstage, visible to the customer and therefore critical in forming the customer experience. Currently, customer journeys only rely on qualitative, largely anecdotal data, thus lacking an estimation of the weight that designers should attribute to each encountered experience. Kahneman et al. [3] illustrated several heuristics that people use when judging the relevance or probability of an event as a possible future outcome; for instance, rare responses from users tend to receive greater weight in memory and may thus be more dominant in design discussions, despite them being less representative of the average user response (known as the availability bias; see [4]). The goal of this study is to augment customer journey maps with quantitative measures of customer experiences by looking at attention levels derived from brain signals and eye behaviour metrics. Brainwaves seem to reveal a certain profile, exhibiting implicit human awareness during the experience of a service [9]. Eye behaviour not only inform about customers’ interests, previous studies have also indicated the relevance of eye blink duration and frequency to inform about workload levels [1, 2]. Hence, these measurements are expected to provide insights into customers’ cognitive and affective states, offering service designers richer information and empirically grounded decision-making.

A CASE STUDY

Two participants went through two customer journey scenarios at the canteen of the University of Madeira. In the first scenario, customers went straight to the canteen to do their orders and payments (non-advance ticket condition). In the second scenario, the ticket for a fixed menu is bought in advance at a counter outside the canteen (advance ticket condition). Later in the canteen, customers get their lunch in a separate section. In both conditions, before entering the canteen, participants were asked to use two bio-sensing devices, a Tobii glasses mobile eye tracker [8] and a Neurosky MindWave wearable EEG [5]. The EEG provides two (on a 0 to 100 scale) state outputs, ‘attention’ and ‘meditation’, operating at 1Hz. The eye tracker collects eye gaze, fixations, and eye blink frequency among others. Each scenario was divided into three touchpoints (waiting line, food collection and having the lunch). For each touchpoint the mean of attention level, meditation level and the number of eye blinks per minute were calculated (figure 1 and 2). Findings show a different attention level pattern between the two scenarios; attention levels were lower during the second touchpoint in the ‘advance ticket’
scenario in comparison to the ‘non-advance ticket’ scenario for both participants.

This paper proposes to enrich the traditional customer journey with EEG and eye tracking data. The use of EEG and eye tracking data is expected to have implications on Service Design. It quantifies customers’ experiences directly, providing the ability to infer customers’ implicit awareness throughout a customer journey. Results from the case study, for instance, revealed low attention levels during food collection only in the ‘advance ticket’ scenario, which could be explained by the fact that students get a fixed menu and are just following a fixed set of behaviours, an autonomous part of the service. High attention and low meditation levels during the first touchpoint could be explained by students’ curiosity in what they are getting or because of catching up with friends while waiting in line.

Hence, EEG and Eye tracking allow for mapping quantitative differences between touchpoints throughout the customer journey, which are expected to inform service designers about customer experiences in a more complete fashion than subjective data alone. An augmented customer journey with improved visualizations could inspire better communication across designers and ground design decisions based on quantitative data. In addition, an eye tracker allows designers to look into exact gaze behaviour and video streams of customers’ visual field, providing rich insights in the perceptual and cognitive processing of the service (figure 3). Shifting across levels of data representation is seen as crucial to design activity [4].

This study has limitations and challenges. For statistical analyses more participants need to be recruited. There are also confounding effects from using these mobile devices in natural settings from both the participant side as well as the environment. A future goal will be the implementation of a platform for experience monitoring, as well as the exploration of various visualization techniques of eye and EEG data. The ultimate aim is to impact the SD community by validating the relevance of an augmented customer journey map.

REFERENCES