Channel Shift - using data analysis to improve service delivery at the City of Edinburgh Council

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Abstract

This doctoral thesis will present the results of my work into the reanimation of lifeless human tissues.

Acknowledgements

Many thanks to my mummy for the numerous packed lunches; and of course to Igor, my faithful lab assistant.

Declaration

I declare that this thesis was composed by myself, that the work contained herein is my own except where explicitly stated otherwise in the text, and that this work has not been submitted for any other degree or professional qualification except as specified.

(*Michal Wasilewski*)

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Chapter 1

Introduction

Bibliography

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Over the last few years, the School of Informatics has been collaborating with the City of Edinburgh Council in the area of open data in initiatives such as the Smart Data Hack and the Council's EdinburghApps hackathons. In the context of Edinburgh Living Lab, this relationship has broadened into investigating other areas of data science, and new kinds of collaboration. My MSc project is taking place within this context, and is focussing on bringing analytic techniques to bear on Customer Relationship Management (CRM) data that has been collected by the Council over the last year.

1.1 Context

As one of the fastest growing local authority areas in Scotland, Edinburgh is facing an ever increasing demand for Council services, outstripping the funds available to meet this demand. There are a number of projects on-going in the Council that try to address the resulting challenges, one of which aims to improve the way that Council interacts with residents, particularly in terms of dealing with complaints and reports of problems. At the moment, citizens can communicate with the Council using multiple 'channels': email, web forms, mobile apps, phone, post and face-to-face conversation. So-called "Channel Shift" is the policy of encouraging residents to use web forms in preference to other communication channels. Some other objectives include informed design of interfaces and web-forms, increase in the use of digital channels and decrease in traditional channels for selected transactions. The Council has been recently building capacity to collect data and use sophisticated tools for managing and integrating it. This project is hoping to contribute to internal resources for extracting business insights from analysing this data. More broadly, I hope that my research will help the Council to ensure that transactions initiated via digital channels are dealt with effectively, as well as contribute to creating success stories and know-how within the Council.

1.2 Objective of the project

Using analysis of CRM data provide insights about the delivery of CEC services to the residents of Edinburgh. These insights should serve as guidelines for improvement of existing interactions between the Council and citizens as well as help in implementation of transactions for services which are not supported over digital channels yet.

1.3 Thesis structure

The first part of this thesis is devoted to providing a theoretical background to the work undertaken. User Centred Design is a concept in design that has played a major role in building interfaces to computational systems over the last three decades. It is described providing a historical context and modern developments in related fields. Data-driven design is a practice of designing with the use of data driven rather than human driven (ethnographical) methods. Double Diamond methodology is a model of practicing design (conducting design related activities) which is claimed to be describing a universal

framework for a design process, not limited to any particular field.

The second part is describing the work undertaken and is divided into 4 phases in accordance to the Double Diamond model.

The last two parts are dedicated to evaluating the project and drawing conclusions.

Chapter 2

Background

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2.1 User Centred Design

2.1.1 Introduction to User Centred Design

User Centred Design (UCD) is a broad term that describes both a philosophy and a set of tools used during the design process (Norman and Draper, 1986; Norman, 2013).

At its core, it gives central role to the needs and limitations of the user. The level of involvement of the user in the design process may vary, but the fundamental difference compared to other approaches is that decisions are driven by a very deep understanding of users needs (or even by users themselves). It is not limited to interface optimisation and often means working closely with users already at definition stage where they help in the problem identification. Fundamentally, UCD tries to focus on usability throughout the entire development process and further throughout the system life cycle (Gulliksen et al., 2003).

The term User Centred Design was coined and popularized by Donald Normans research group in the 1980s. Two influential books were published in that time which he co-authored: User centered system design (Norman and Draper, 1986) and The psychology of everyday things (Norman, 1988).

User Centred Design is sometimes referred to as User Centred System Design (UCSD). This ambiguity comes from the definition of UCD not being agreed upon for many years (Gulliksen et al., 2003).

Concepts behind UCD did not arise in vacuum. The need for people oriented computers was already recognized in the early days of computers (Ritter et al., 2014; Nickerson, 1969). Voices of concern were raised that product development methods used at the time were more suitable for big, labour intensive projects and were failing with sophisticated devices which focus on usability (Greenbaum, 1993; Robert, 1965). In 1960s and 1970s there were a number of fields in academia concerned with designing more human friendly devices and processes, but they were applied with varied success. What made UCD so effective was that it focused on the needs of the user, on activity/task analysis as well as a general requirements analysis, carrying out early testing and evaluation, and designing iteratively. (Ritter et al., 2014). It also emphasized the involvement of the user in the design process instead of treating him purely as a consumer of the product. This has been a paradigm shift that was particularly uncomfortable for managers in the United States who were reluctant to hand over the decision making power (Greenbaum, 1993).

UCD has changed over the years. Initially UCD was focused on command-line tools, but as computers got more widespread and their interfaces became more sophisticated, it started growing in importance and played a different role. With Graphical User Interfaces (GUI) it was focused on layouts and optimisation and with nowadays proliferation of computational systems, UCD design is considering things like personal preferences or social and cultural impact of the device (Ritter et al., 2014).

2.1.2 Human Centred Design

Human Centred Design (HCD) is a broader term that puts humans at the centre (Ritter et al., 2014; Earthy et al., 2001; ISO, 1999; Kurosu, 2011). This means taking into consideration the entire context of the situation in which the product will be used and the human aspects of it. It is considered more interdisciplinary than UCD and is described in many standards (Bevan, 2001) such as ISO 13407:1999 (ISO, 1999) and more recently 9241-210: 2010 (DIS, 2009). UCD is considered by some as being too much focused on solving a goal-directed, technological problem and limited by considering people solely as users of the system without looking at the organisational goal or counteracting possible adverse effects of use on human health, safety and performance (Gasson, 2003; Gill, 1996; Bevan, 2001). UCD and HCD are not synonyms and HCD does not necessarily imply using UCD methods (Earthy et al., 2001; Maguire, 2001; Kurosu, 2011; Ritter et al., 2014).

2.1.3 Design Driven Innovation

A recent perspective that is broadening the definition of design to include a reconstructionist (Chan and Mauborgne, 2005) or social-constructionist (Prahalad and Ramaswamy, 2000) view of the market is Design Driven Innovation (Liem and Sanders, 2011; Verganti, 2013).

In his book Design driven innovation: changing the rules of competition by radically innovating what things mean Roberto Verganti introduces the concept of Design Driven Innovation (Verganti, 2013). In his opinion, most organisations understand and use design in two ways: making things beautiful and stylish and having a profound (and thus accurate) understanding of user needs. Innovations coming from these two, beauty of the product and user needs (which is an embodiment of User Centred Design), are in his opinion insufficient for market differentiation and have become so common that they are a norm rather than exception. Verganti argues that what is needed (together with the first two) is a third use for design which is a radical innovation in meaning.

His research reveals that recent management literature focuses on technological innovation and what effect it has on an industry. What is also very well covered is looking beyond features and understanding the meanings behind them - what emotions drive people to buy products. However, the silent assumption is, he continues, that meanings are not a subject of innovation. He proposes a third strategy for design which is innovation in what meaning things can carry.

The author brings and analyses dozens of examples to help better understand design-driven innovation such as:

- Artemide, Italian lamp manufacturer, created a lamp that is no longer a source of light, but an object that has influence on peoples mood. Effectively, by providing a device that can change intensity and colour of the light you are enabling people to control their mood and the product becomes an element of well-being.
- The MP3 players were present before iTunes, but it was a change in how to think about music brought by Steve Jobs that revolutionised the industry. Many executives and lobbing groups stubbornly focused on enforcing copy-protection, whereas Apple enabled users to buy a single song instead of an entire album, taste and mix music, create personal playlists.
- Anthropomorphism in the shape of kitchen appliances brought by Alessi, turned equipment into objects of affection, things you bond with, teddy bears for adults (Verganti, 2013).
- Apples move to release a notebook without an optical drive was considered a bold one, but Steve Job had an understanding of what cloud computing and wireless connectivity meant constant access to vast amounts of data and thus no use for CDs/DVDs.

The author also provides a structured framework for thinking about innovation in meaning and deploying it in an organisation. Design Driven Innovation extends beyond User Centred Design, but does not discredit it.

2.2 Data-driven design

Data-driven design is an emerging field of study that gained popularity with the digitization of our world and in particular with what is known as big data. The premise of data-driven design is an additional layer of perception provided by data collection and processing, previously unavailable to humans. Although the practices of data-driven design are far from being well established, more and more voices are being raised that consider it a very viable tool when used properly with other methods (Neirotti et al., 2014).

2.2.1 What would a cup say if it could speak?

2.2.1.1 What is big data?

adf

2.3 Double Diamond

Chapter 3

Description of the work undertaken

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3.1 Discover

3.2 Define

3.3 Develop

3.4 Deliver

Chapter 4

Analysis and evaluation

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4.1 Evaluation of the tools used

4.1.1 CRM data

4.1.2 IBM Cognos

4.2 Evaluation of the work undertaken

4.2.1 Report 1

4.2.2 Report 2

4.2.3 Report 3

4.3 Evaluation of methodology used

The double diamond approach seems to reflect very well the dynamism of real life projects. The model describes a rhythm of activities that comes naturally. It includes a very open, exploratory first stage which leaves space for flexibility in adapting to what would be useful to the client.

The Discovery phase was extremely helpful in understanding the context of the problem and establishing ground before the next phases. Having such an open attitude requires a lot of persistence. The responsibility for the entire project rests on the designer and this causes a creative stress. In the early stages, it is desired to not be limited by having a concrete idea of what to do in the project (which is not synonym with not having a path of action). The designer is exposing himself to the unknown and at many points the project could completely change direction or a path could be closed unexpectedly. It is critical to maintain composure, agility and be able to quickly adjust to the new conditions. It is also important to mention that it exposes the project to the will of people across the entire organisation. The more the involved people are open and willing to help the better the outcome of the project will be. In terms of this particular project, the Council employees were very helpful and open-minded and their support has helped tremendously.

The three objectives that came from the Define phase (design brief) were developed in close cooperation with the beneficiaries (and at the same time the requesting party).

The Develop phase managed to address all questions from the previous stage. Having clear, measurable objectives, which were thought through, helped in planning the

rest of the process and designing the technical aspects of it. The extent to which implementations were able to solve those problems was described in sections above (Evaluation of work undertaken).

The key outcome of Deliver stage was feedback from clients. It was very helpful to understand the extent to which it addressed actual needs and whether it succeeded in contributing to the on-going efforts in the Council (being in line with the current ICT strategy at the Council).

Appendix A

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