



DESIGN ELEMENTS OF DIGITAL NUDGES
AND EFFECTS ON CONSUMER BEHAVIOR:
A LITERATURE REVIEW

Seminar Thesis
of

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24. March 2019

Matriculation Number

1585571

Submitted at the Chair of Enterprise Systems
University of Mannheim

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List of Abbreviations

UI	User Interface
UX	User Experience

Abstract

1 Introduction

In the last ten years, our lives became more and more digitized. We buy products in online shops, book our next trip and holidays on digital hotel platforms and even manage our finances with the help of our smartphones (Schneider et al. 2018). All those digital environments have one thing in common. Choices. All the time users are faced with choices they have to take, even if people do not perceive it directly. There are a lot of things digital (and also non-digital) environments that frame the whole choice process and therefore influence the decision-making through certain biases and heuristics (Tversky and Kahneman 1974).

Johnson et al. 2012 states that "what is chosen often depends on the representation." This representation describes as the term of choice architecture, which should "alter people's behavior in a predictable way" (Thaler and Sunstein 2009). In the age of digital transformation, digital environments are powerful tools where the choice architecture can be controlled in detail and therefore provide opportunities to influence user behavior in several ways with the help of user-interface design elements. This process is called "digital nudging" (Weinmann et al. 2016).

One example of such a digital nudge is present on the online travel platform *booking.com*. Here users typically search for travel accommodations. The result page lists several hotel rooms. With the description of the room and the price comes a piece of information that this hotel was booked several times in the last 12 hours and that there are only a specific number of rooms available. In bright, red color this should create a scarcity in the mind of the user, to perceive the good as more valuable. Through this digital nudge, the likelihood of reservation in this particular hotel is increased¹.

Digital nudging and the design of online choice architecture have recently gained interest in different research areas. Because of the complexity behind this concept, it is significant to understand how such nudges influence the decision-making of the user and how the cognitive biases behind this process are working. Especially in consumer choices, there are good and bad patterns of nudging when it comes to an ethical point of view (Sunstein 2015). To get a better understanding of how digital nudges influence consumer choice this paper presents a systematic literature review from the last ten years in a scientific manner.

The goals of this paper are versatile. The primary aim is to provide an overview of dif-

¹A screenshot of the web page can be found in the appendix on figure 1

ferent research streams within the topic of digital nudges. The author focuses here on digital nudges in the area of consumer choice and their specific design elements. Literature in this domain shall be gathered, reviewed and analyzed. Secondary, a recommendation for future research is derived from the analysis to advance research in this particular subject. Because of the multidisciplinary assortment of digital nudged, this paper contributes to several scientific domains. First of all, it is major implications for the area of information systems by showing areas with little research. Furthermore, the paper holds implications for the areas of marketing and consumer research as well as psychology and behavioral economics with regards to digital environments

2 Conceptual Background

2.1 Birth of Nudges

With the release of the book "Nudge" in 2009, Thaler and Sunstein have laid the foundation stone for the concept of nudging. This concept was primarily a subject of research in behavioral economics. Because of the multifaceted meaning of the word *nudging*, a consistent understanding is essential. Further on, this paper uses the central definition of nudges from Thaler and Sunstein 2009:

"A nudge [...] is any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives."

One central aspect of this definition is economic incentive of the consumer, which should not be changed. This fundamental thought is the basis of a concept called *libertarian paternalism*. In this concept choices are influenced in a way to make them easy for people and aligning them with their interests. One example for that would be "putting the fruit at eye level". But banning the food would not be a nudge. (Thaler and Sunstein 2009). This principle is the foundation of nudges for a good reason. Influencing people's behavior can simply be exploited. So, the ethical viewpoint on nudges should always be kept in mind when implementing and using them to guide customer choices (Sunstein 2015).

The underlying foundation for nudging cognitive limitation of human brains. Because the human brain only has a limited capacity to store and process information, consumer often feel subconsciously overloaded. This results in greater difficulty and complexity when it comes to decisions and cognitive demanding tasks (Broniarczyk and Griffin 2014). Therefore "many decisions are based on beliefs concerning the likelihood of uncertain events (Tversky and Kahneman 1974). Based on this assumption Tversky and Kahneman 1974 formulated three heuristics and several biases that build the underlying foundation of human decision making. Those heuristics and biases can also be found acting as a guideline in the world of digital nudges.

Besides the cognitive foundation of decision making, also the principles of nudges play a major role regarding their application and implementation. Overall, there are five general principles of nudging (based on Thaler et al. 2010)

Incentive

Understanding mapping

Defaults

Giving Feedback

Expecting Error

Structure complex choices

2.2 Online Choice Architectures

The concept of nudges builds on the assumption that decisions are made in choice architectures, which are designed by choice architects (Thaler and Sunstein 2009). In this case, the parallel to a "real" architect of a building is not far-fetched. Johnson et al. 2012 describes the power of such choice architects and how choice architects guide people's choices like other architects guide behavior through the design of the "placement of doors, hallways, staircases and bathrooms.

2.3 Nudging became digital

Digital nudges have the same underlying concepts as "offline" nudges. One major difference is the structure of them. Definition... - digital nudging - types of choices - Offline focus – but more and more adoption in IS fields - Forms of Digital Nudging (weinmann / thaler 2010 => Tabelle)

2.4 Nudging versus Persuasion ?

Quotes - More and more of the choices we make involve the use of some form of information technology. This technology may be introduced to assist in the choice task (Johnson 2012 - Digital nudging is the use of user-interface design elements to guide people's behaviors in digital choice environments - Choice Architects can make major improvements

to the lives of others by designing user-friendly environments. - As in offline environments, online environments offer no neutral way to present choices. Any user interface from organizational website to mobile app, can thus be viewed as a digital choice environment (Schneider 2018) - Advances in technology and the use of the Internet also provide consumers new ways of finding, creating and exchanging information for choice (Broniarczyk 2014) - Sources of decision difficulty: Task complexity, Information load, Information uncertainty, Conflict, emotional difficulty, preference uncertainty (Broniarczyk 2014) - There is no neutral architecture (Johnson 2012) → Even defaults effect user choice → Square example by Weinmann 2016

3 Methodology

The methodology section aims to present the research approach to the reader. Here different aspects of the research will be introduced and explained in detail. This includes: - Overall search strategy - Identification of relevant journals and why they're used - Used keywords, queries and terms for the search - Classification and patterns of papers

4 Results

The presentation of the literature review's results is the main part of this seminar thesis. Identified concepts, research types, use cases and more will be presented and discussed step by step. The goal of this chapter is to provide a detailed explanation of the underlying concepts and insights of the examined literature. This could include sub chapters like: - General information (number of articles, year of publishing, domain of journal) - Research type (empirical, non-empirical, qualitative, quantitative) - Field of use (IS Field, use case) - Nudging principles and concepts (used biases, choices, design elements)

5 Conclusion

In the end of the thesis all results will be summarized and critically discussed. The goal is to identify a research gap and to give recommendations for future research that would advance the topic.

5.1 Summary of Findings

5.2 Limitations

5.3 Recommendations for future research

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Appendix

Booking.com € [List Your Property](#) [Register](#) [Sign in](#)

[Accommodations](#) [Flights](#) [Flight + Hotel](#) [Car Rentals](#) [Airport Taxis](#)

Search
Destination/Property Name:

Check-in Date
 Monday, April 22, 2019
Check-out Date
 Sunday, April 28, 2019
6-night stay
2 adults
No children 1 room
☐ I'm traveling for work
[Search](#)

Bali: 6,417 properties found – including 1629 with great value today!
3 reasons to visit: relaxation, beaches & food [Map View](#)

[Our Top Picks](#) [Price \(lowest first\)](#) [Review Score & Price](#) [Stars](#) [Star rating and price](#) [Top Reviewed](#)

Dewangga Bungalow ★★
Downtown Ubud, Ubud - [Show on map](#)
3 people are looking right now
Booked 3 times in the last 12 hours on our site
Double or Twin Cottage
Only 7 rooms left on our site!
Risk Free: You can cancel later, so lock in this great price today!

Excellent **8.7**
759 reviews
Location **9.5**

Price for 6 nights
€282
includes taxes and charges
FREE cancellation
No prepayment needed
[See availability >](#)

Figure 1: Digital nudging example - booking.com

Affidavit

I hereby declare that I have developed and written the enclosed seminar thesis entirely on my own and have not used outside sources without declaration in the text. Any concepts or quotations applicable to these sources are clearly attributed to them.

This seminar thesis has not been submitted in the same or substantially similar version, not even in part, to any other authority for grading and has not been published elsewhere. I am aware of the fact that a misstatement may have serious legal consequences.

Mannheim, 24. March 2019

Marvin Messenzehl