

BUCHAREST UNIVERSITY OF ECONOMIC STUDIES

Doctoral School
of Economics I



DOCTORAL THESIS

Presented publicly by the author:

MARIA A. CRACIUN

Title of doctoral thesis:

BEHAVIOURAL ECONOMICS IN TECHNOLOGY INNOVATION:
BUILDING AND SCALING DIGITAL PRODUCTS

Ph.D. Advisor: Prof. univ. dr. MONICA DUDIAN

Bucharest, June 2025

Table of Contents

Title Page.....	1
-----------------	---

Rezumat.....	8
Abstract.....	10
Keywords.....	11
Acknowledgments.....	12
List of Tables.....	8
List of Figures.....	9
1. Introduction.....	13
1.1 Importance and Scientific Relevance.....	13
1.2 Structure of the Thesis.....	15
1.3 Research Questions.....	15
1.4 Limitations of this Research.....	16
1.5 Definition of Terms.....	17
2. Literature Review.....	19
2.1 Behavioural Economics: Past, Present and Future.....	19
2.2 Designing Online Decision-Making Environments.....	32
2.3 Shaping Consumer Behavior.....	37
2.4 Product Development Lifecycle.....	43

2.5 Behavioural Economics in Software Product Development.....	53
3. Research Design.....	56
3.1 Methodology Approach.....	56
3.2 Data Collection.....	58
3.2.1 Literature Review Data Collection.....	58
3.2.2 Survey Data Collection.....	59
3.2.3 Case Study Data Collection.....	64
3.2.4 Research Phases and Timeline.....	65
4. Findings.....	68
4.1 Competitive Market Analysis.....	70
4.2 Organizational Survey.....	75
4.3 Case Studies.....	90
5. Discussion.....	96
5.1 Efficacy of Behavioural Economics Principles.....	97
5.2 Behaviour-Driven Product Development Framework.....	99
5.3 Predictive Model for Behavioural Data Impact.....	105
6. Conclusion and Recommendations.....	109

References.....	113
-----------------	-----

Annex.....	125
------------	-----

List of Tables

Table 2.1.1 Prospect Theory (1979) vs. Utility Theory (1738).....	21
---	----

Table 2.1.2 Core Behaviour Economics Concepts Throughout Time.....	25
--	----

Table 2.2.1 Principles of Choice Architecture.....	29
--	----

Table 2.4.1 Technology Companies with Specialized Economists' Role.....	40
---	----

Table 2.4.2 Components of the SOR Model.....	42
--	----

Table 3.2.2.1 Survey Structure: Usage of Behavioral Data.....	53
---	----

Table 3.2.4.1 Research Phases and Data Collection Timeline.....	55
---	----

Table 4.2.1 Reported Frequency of Behavioral Data Usage.....	65
--	----

Table 4.2.2 Perceived Impact Across Product Dimensions.....	66
---	----

Table 4.2.3 Perceived Impact Scores Between Usage Groups.....	67
---	----

Table 4.2.4 Methodological Approach for Ordinal Logistics Regression.....	68
---	----

Table 4.2.5 Results of the Ordinal Logistics Regression.....	69
--	----

Table 4.3.1 Data Extraction Method by Platform.....	71
---	----

Table 4.3.2 Key Behavioural Economics Principles by Platform.....	73
---	----

Table 5.2.1 Pillars of Behaviour-Driven Product Development.....	84
Table 5.2.2 Guiding Principles for Behaviour-Driven Development.....	85
Table 5.2.3 Stages of Behavioural Driven Development Lifecycle.....	88

List of Figures

Figure 2.3.1 Mapping Online Consumer Behaviour.....	35
Figure 2.4.1 Product Development Lifecycle.....	38
Figure 2.5.1 Behaviour Driven Product Development Lifecycle.....	45
Figure 4.1 An Illustration of the Methodology.....	58
Figure 4.1.1 Technology Adoption.....	59
Figure 4.1.2 Product and Brand Discovery Platforms.....	60
Figure 4.1.3 App Engagement Patterns.....	61
Figure 4.2.1 Distribution of Organization Sizes.....	64
Figure 4.2.3 Distribution of Roles.....	65
Figure 4.2.4 Types of Behavioral Data Collected by Sector.....	66
Figure 4.2.5 Frequency of Behavioral Data Use.....	67
Figure 4.2.6 Collaboration with Behavioral Scientists and Analysts.....	68
Figure 4.2.7 Organizational Approach to Behavioral Data.....	69

Figure 4.2.8 Collaboration with Behavioral Scientists/Data Analysts.....69

Figure 4.2.9 Perceived Value of Behavioral Data.....70

Figure 4.2.10 Impact of Behavioral Data on Outcomes.....70

Figure 4.2.11 Impact by Frequency of Data Usage.....71

Figure 4.2.12 Predicted Engagement Impact by Data Use.....71

Figure 5.2.1 Behavioral-Driven Product Lifecycle.....84

LIST OF TABLES

- **Table 2.1.1** Prospect Theory (1979) vs. Utility Theory (1738) 21
- **Table 2.1.2** Core Behaviour Economics Concepts Throughout Time 25
- **Table 2.2.1** Principles of Choice Architecture 33
- **Table 2.4.1** Technology Companies with Specialized Economists' Role 47
- **Table 2.4.2** Components of the SOR Model 51
- **Table 3.2.2.1** Survey Structure: Usage of Behavioral Data in Building and Scaling Technology Products 60
- **Table 3.2.4.1** Research Phases and Data Collection Methods Timeline 65
- **Table 4.2.1** Reported Frequency of Behavioral Data Usage 83
- **Table 4.2.2** Perceived Impact Across Product Dimensions 83
- **Table 4.2.3** Perceived Impact Scores Between Usage Groups 84
- **Table 4.2.4** Methodological Approach for Ordinal Logistics Regression 87
- **Table 4.2.5** Results of the Ordinal Logistics Regression 88
- **Table 4.3.1** Data Extraction Method by Platform 91
- **Table 4.3.2** Key Behavioural Economics Principles Identified by Platform 93
- **Table 5.2.1** The Pillars of Behaviour-Driven Product Development 100
- **Table 5.2.2** Guiding Principles for Behaviour-Driven Product Development 102
- **Table 5.2.3** The Stages of Behavioural Driven Product Development Lifecycle .. 103

LIST OF FIGURES

• Figure 2.3.1 Conceptual Framework: Mapping Online Consumer Behaviour to Data-Science Themes	39
• Figure 2.4.1 Product Development Lifecycle	50
• Figure 2.5.1 Behaviour Driven Product Development Lifecycle	53
• Figure 4.1 An Illustration of the Methodology	69
• Figure 4.1.1 Technology Adoption	71
• Figure 4.1.2 Product and Brand Discovery Platforms	72
• Figure 4.1.3 App Engagement Patterns	73
• Figure 4.2.1 Distribution of Organization Sizes	76
• Figure 4.2.3 Distribution of Roles	77
• Figure 4.2.4 Types of Behavioral Data Collected by Industry Sector	78
• Figure 4.2.5 Frequency of Behavioral Data Use in Product Development	79
• Figure 4.2.6 Frequency of Collaboration with Behavioral Scientists and Data Analysts	79
• Figure 4.2.7 Organizational Approach to Behavioral Data	80
• Figure 4.2.8 Frequency of Collaboration with Behavioral Scientists/Data Analysts	81
• Figure 4.2.9 Perceived Value of Behavioral Data for Product Decisions	82
• Figure 4.2.10 Perceived Impact of Behavioral Data on Key Product Outcomes ..	82
• Figure 4.2.11 Perceived Impact by Frequency of Behavioral Data Usage	86
• Figure 4.2.12 Predicted Probability of User Engagement Impact by Frequency of Behavioral Data Use	89
• Figure 5.2.1 The Behavioral-Driven Product Lifecycle	101

REZUMAT Într-o lume din ce în ce mai dominată de platforme digitale, capacitatea de a influența în mod voit comportamentul consumatorilor a devenit un domeniu esențial de cercetare în domeniul economiei. Această teză doctorală se focusează pe cercetarea modalității în care principiile economiei comportamentale pot fi aplicate dezvoltării și creșterii produselor digitale, explicând potențialul acestora de a răspunde provocărilor în societate, în timp ce navighează limitele etice. Economia comportamentală, un domeniu care integrează perspective psihologice în procesul economic, contestă noțiunea tradițională conform căreia oamenii sunt agenți raționali, demonstrând cum anumite preferințe influențează alegerile noastre. În contextul produselor digitale, aceste principii sunt utilizate pentru a crea „impulsuri” (nudges) care ghidează comportamentul consumatorilor într-un

mod subtil, dar cu impact, de la promovarea obiceiurilor sănătoase și creșterea nivelului de educație financiară, până la încurajarea petrecerii unui timp mai îndelungat pe platformele sociale. Cercetarea începe prin poziționarea acestor “nudges” digitale în cadrul mai larg al economiei comportamentale, subliniind relevanța acestora în proiectarea interfețelor utilizator (UI) și a modului în care se iau deciziile. Utilizând o metodologie de cercetare mixtă, revizuiind literatura de specialitate, studii de caz și date empirice, această teză explorează mecanismele prin care mediile digitale influențează procesul decizional. Fenomene psihologice cheie precum încadrarea deciziilor, preferința pentru opțiunea implicită și dorința apartenenței la societate sunt analizate în ceea ce privește eficiența lor în ghidarea comportamentului consumatorului. Mai mult, studiul prezentat în această cercetare examinează modul în care aceste intervenții pot fi personalizate prin metode bazate pe date, marindu-le impactul, dar ridicând în același timp întrebări esențiale importante legate de manipulare datelor și autonomia consumatorilor. Implicațiile sociale ale acestei cercetări pot fi considerabile. Pe măsură ce produsele digitale devin interfețe esențiale pentru accesul la educație, sănătate și servicii financiare, înțelegerea modului în care funcționează impulsurile comportamentale poate duce la inovații ce promovează bunăstarea și reduc inegalitățile în societate. De exemplu, aplicațiile care încurajează consumul sustenabil, îmbunătățesc starea de sănătate sau susțin învățarea continuă demonstrează potențialul transformator al designului comportamental. Cu toate acestea, acest potențial este însoțit de riscuri, inclusiv dependența excesivă de metrice de angajament, comercializarea atenției consumatorului și consecințele neintenționate ale unui design prea convingător. Prin abordarea acestor provocări, această teză își propune să contribuie la un viitor în care inovația digitală este aliniată cu valorile etice și acționează în interesul consumatorului. Dintr-o perspectivă științifică, această lucrare avansează domeniul economiei comportamentale prin extinderea aplicațiilor sale în contextul complex și bazat pe date al designului de produse digitale și al dezvoltării de software. Concluziile nu doar contribuie la discursul academic, ci oferă și recomandări concrete pentru dezvoltarea produselor digitale, factorii de decizie politică și liderii tehnologici interesați să creeze soluții centrate pe utilizator, cu impact pozitiv asupra societății. Pe măsură ce tehnologia continuă să modeleze comportamentul uman, înțelegerea și valorificarea științei comportamentale vor fi esențiale pentru proiectarea unor sisteme și platforme digitale care să servească într-un mod pozitiv atât societatea, cât și consumatorul.

ABSTRACT

In a world increasingly dominated by digital platforms, the ability to influence consumer behavior intentionally has emerged as a pivotal area of study. This doctoral thesis investigates how principles of behavioral economics can be applied to the development and scaling of digital products, explaining their potential to address societal challenges while navigating ethical boundaries. Behavioral economics, a field that integrates psychological insights into economic decision-making, challenges the traditional notion of humans as purely rational individuals by demonstrating how biases and heuristics shape our choices. In the context of digital products, these principles are used to create "nudges" that guide

consumer behavior in subtle yet impactful ways, ranging from promoting healthier habits to increasing financial literacy to spending more time on social platforms. The research begins by positioning digital nudging within the broader framework of behavioral economics, emphasizing its relevance in the design of user interfaces (UI) and choice architectures. Using a mixed research methodology and reviewing existing literature and case studies as well as empirical data, this thesis explores the mechanisms by which digital environments influence decision-making. Key psychological phenomena such as framing, default bias, and social proof are analyzed for their effectiveness in guiding consumer behavior. Furthermore, the study employed in this research examines how these interventions can be personalized using data-driven approaches, enhancing their impact while raising important ethical questions about manipulation and autonomy.

The modern societal implications of this research could be very impactful. As digital products mediate access to education, healthcare, and financial services, understanding how behavioral nudges operate can lead to innovations that promote well-being and reduce inequality. For instance, apps that encourage sustainable consumption, improve health outcomes, or foster lifelong learning demonstrate the transformative potential of behavioral design. However, this potential is accompanied by risks, including over-reliance on engagement metrics, the commodification of consumer attention, and the unintended consequences of compelling design. By addressing these challenges, this thesis aims to contribute to a future where digital innovation aligns with ethical values and works in the favor of the consumer. From a scientific perspective, this work advances the field of behavioral economics by extending its application to the complex, data-driven environment of digital product design and software development. Employing mixed-methods research, it provides both theoretical insights and a practical framework for implementing behavioral interventions at scale. The findings not only inform the academic discourse but also offer actionable guidelines for product designers, policymakers, and technology leaders seeking to create user-centered solutions that benefit society at large. In conclusion, this thesis underscores the significance of integrating behavioral economics into the design and scaling of digital products to amplify positive societal outcomes while safeguarding ethical principles. As technology continues to shape human behavior, understanding and leveraging the science of decision-making will be crucial for designing digital systems and platforms that serve the greater good.

Keywords: behavioral economics, nudges, choice architecture, technology, innovation