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Planul Național
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Mapping Cognitive Biases in Digital Technology Acquisition and Adoption in Eastern European SMEs

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Cognitive bias and decision making (B8 2.2)
Milan, Italy, 13-18.06.2025

Agenda



1. Introduction



2. Theoretical Background



3. Methodology



4. Preliminary Results



5. Discussion

Introduction

Problem

- Eastern European SMEs have a lower digital technology adoption rate than their Western counterparts.

Context

- Digital technology is crucial for SME success, but Eastern European firms face unique challenges (*limited capital, slower digital infrastructure development, lower digital skills*), all leading to low adoption rates.

Research focus / gap

- The impact of *cognitive biases on managerial decision-making* regarding digital technology acquisition and adoption in Eastern European SMEs.

Research objectives

1. Identify key cognitive biases and heuristics influencing technology acquisition and adoption.
2. Explore their effects on managerial choices and organizational outcomes.
3. Propose practical interventions to mitigate these biases.

Theoretical Background: Behavioral Decision Theory (BDT)

Overview of BDT

- Since it is rationally bounded, human decision-making is swayed by cognitive biases (systematic errors) and heuristics (mental shortcuts), not solely by rational analysis.

How biases can hinder rational decision-making in technology acquisition?

1. **Confirmation bias:** Prioritizing information that aligns with existing beliefs, leading to suboptimal solutions.
2. **Anchoring bias:** Fixating on initial information (e.g., vendor's price), causing overpayment or missed opportunities.
3. **Recency bias:** Overemphasizing recent experiences, ignoring longer-term data.
4. **Loss aversion:** Fearing losses more than valuing equivalent gains, leading to retention of outdated systems.
5. **Sunk cost fallacy:** ex. Continuing to invest in failing technologies due to past investments.

How heuristics distort decision-making

1. **Availability heuristic:** Relying on familiar or recent information (e.g., colleague's review) instead of thorough research.
2. **Representativeness heuristic:** Assessing technology potential by its resemblance to past successful experiences, even if context differs.

Biases that encourage technology adoption (but with risks)

1. **Optimism bias:** Overestimating benefits and downplaying risks/challenges.
2. **Bandwagon effect:** Adopting technologies solely because others are doing so, potentially misaligning with specific needs.
3. **Overconfidence bias:** Overrating ability to implement complex technologies, leading to wasted resources.

Impact: Deviations from rational decision models can affect acquisition efficiency, technology integration, and competitiveness.

Step 1: Onboarding questionnaire

- Distributed to decision-makers in Romanian SMEs (convenience sampling).
- Gathered information on roles, industry, acquisition practices, and decision standardization.
- Aim: Identify the most diverse pool for interviews.

Sample distribution

Company Size (n=90):

- Micro (70%), Small (21.11%), Medium (6.67%), Large (2.22%).

Industry:

- Rural Economy & Natural Resources (70%), Industry & Productive Infrastructure (21.11%), Commercial & Logistical Services (6.67%), Advanced & Digital Services (2.22%), Human Capital & Social Inclusion (2.22%).

Formalization/Centralization of tech acquisition:

- Low (12.22%), Moderate/Medium (37.78%), High (50%)

Step 2: In-depth interviews

- Selected 15 decision-makers based on questionnaire responses, prioritizing diversity across industry, company size, and formalization/centralization of tech acquisition.
- Focused on decision-making processes for procuring digital technologies, selection criteria, influence of personal experiences/peers, and adoption challenges.
- Conducted in native languages, audio-recorded, and transcribed, processed with NVIVO.

Qualitative analysis process

1. Thematic approach with deductive coding, guided by existing literature on cognitive biases.
2. Two-step coding procedure (primary and second coder) for validity and reliability, resolving discrepancies collaboratively (consensus coding).
3. Data saturation appeared to be reached with 15 interviews, prioritizing depth over statistical representativeness.
4. Limitations: Limited generalizability beyond Romanian SMEs; valuable regional specificity but may not fully represent other Eastern European contexts.

Preliminary Results

We identified 17 distinct cognitive biases and heuristics.

Most frequently observed biases / heuristics

1. **Availability heuristic:** 23 instances (15.13%) – decisions based on easily accessible/memorable information
2. **Anchoring bias:** 16 instances (10.53%) – decisions heavily influenced by initial information/impressions
3. **Status Quo bias:** 15 instances (9.87%) – resistance to change, favoring existing solutions
4. **Bandwagon effect:** 12 instances (7.89%) – adopting technologies because others are doing so
5. **Affect heuristic** – 10 instances (6,58%) – basing decisions on emotional response

Biases and heuristics in the 'Other' category

- Negativity bias, recognition heuristic, hindsight bias, choice overload, primacy effect, present bias, mental accounting, simplicity bias, self-serving bias

Code	Count	Frequency
Availability heuristic	23	15.13%
Anchoring bias	16	10.53%
Status quo bias	15	9.87%
Bandwagon effect	12	7.89%
Affect heuristic	10	6.58%
Confirmation bias	9	5.92%
Loss aversion	8	5.26%
Recency bias	8	5.26%
Representativeness heuristic	6	3.95%
Overconfidence bias	6	3.95%
Sunk cost fallacy	6	3.95%
Satisficing	4	2.63%
Framing effect	4	2.63%
Risk aversion	4	2.63%
Optimism bias	4	2.63%
Other	17	11.18%
Total	152	100.00%

Preliminary Results

Availability heuristic

"The truth is that, for the most part, I think we explicitly rely on searches, just internet searches."
~ Z.B., CTO of a software development company

Anchoring bias

"The price, that's the first thing, the price, even before we understand what it can actually offer."
~ A. B., CEO, marketing agency

Status quo bias

"Everyone protects their position; everyone comes up with six reasons why the old system is good just to keep their position. Because of this, changes are very difficult."
~ L. V., COO, agricultural and food industry company

Bandwagon effect

"It helped us in the decision that a familiar company (already) uses the same solution."
~ A. B., CEO, marketing agency

Discussion

1. Cognitive biases and heuristics do have a substantial influence on managerial decision-making regarding digital technology acquisition;
2. Biases rarely operate in isolation, forming self-reinforcing networks (emotional judgments, social influences, risk aversion);
3. The bandwagon effect, while encouraging adoption, can lead to strategically misaligned decisions.
4. Less common biases like optimism bias can lead to underestimating risks.
5. These findings so far align with extant research, highlighting the systemic effects of biases.

Conclusion and Further Steps

Key takeaways

- The identified biases / heuristics (e.g. availability heuristic, anchoring bias, status quo bias, bandwagon effect, affect heuristic) contribute to subjective / suboptimal decision-making and, in some cases to resistance to change;
- Interconnected nature of biases highlights complexity.

Practical recommendations for SMEs

1. Bias awareness training programs.
2. Structured decision-making frameworks for objective assessments.
3. Fostering a culture of critical thinking to counter social and emotional influences.

Future research directions

- To uncover the underlying meanings and gain deeper insights from the research material.
- To validate findings across broader contexts, to elaborate on the proposed interventions, and to assess their effectiveness.
- Conducting experiments based on our insights.

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Thank you for your attention!

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Appendix

Appendix 1: Semi-Structured Interview Questions

Semi-Structured Interview Guide

General information about the company and respondent

Name of the company:

Industry:

Respondent position:

Respondent work experience:

Implemented technology:

Introduction

- Welcome and Consent Confirmation:

Thank you for agreeing to participate in this interview. Before we begin, I want to confirm that you have read and understood the consent form provided with the onboarding questionnaire and that you agree to proceed with this interview.

- Confidentiality Assurance:

I assure you that this interview is for research purposes only. We will not be discussing sensitive or personal information, and your responses will be treated with the utmost confidentiality. The information you provide will not pose any risk to your company's reputation.

Background Information

1. Role and Experience:

Could you please describe your role in the company and your experience with technology procurement?

2. Company's Technology Landscape:

Can you give an overview of the current digital technologies used in your company for collaboration, workflow, and service process optimization?

Appendix 1: Semi-Structured Interview Questions

Decision-Making Process

3. Initial Consideration:

When you first consider acquiring new digital technology, what are the key factors that you take into account?

4. Information Gathering:

Describe how you typically gather information about potential technologies. How do you ensure that you have a comprehensive understanding of the options available?

5. Evaluation Criteria:

What criteria do you use to evaluate the digital technologies you are considering for procurement?

Heuristics and Biases

6. Time Constraints:

Can you recall a situation where time constraints affected your decision-making process for technology procurement? How did you handle it?

7. Information Overload:

Have you ever felt overwhelmed by the amount of information available when choosing a technology? How did you manage to make a decision in such a scenario?

8. Past Experiences:

How do past experiences with technology influence your current decision-making? Can you provide an example?

9. Predictability and Unpredictability:

How do you deal with the predictability or unpredictability of technology performance during the decision-making process?

10. Memory Constraints:

Are there instances where you had to rely on memory for important information about technologies? How did you ensure the accuracy of your recollections?

Appendix 1: Semi-Structured Interview Questions

Specific Biases

11. Availability Heuristic:

When making decisions, how do you ensure that your most recent experiences or readily available information do not disproportionately influence your judgment?

12. Anchoring Bias:

Can you describe a time when the first piece of information you received about a technology significantly shaped your subsequent decision? How did you recognize and adjust for this bias, if at all?

13. Seeking Diverse Perspectives:

How do you incorporate different viewpoints or opinions to avoid biases in your decision-making process?

14. Decision Reflection:

Looking back at your technology procurement decisions, can you identify any that may have been influenced more by heuristics or biases than by objective analysis?

Impact of Individual Decisions

15. Individual Influence:

In what ways do you believe your individual decisions have impacted the technology procurement process at your company?

16. Delimiting Organizational and Individual Effects:

When considering technology acquisition, how would you describe the interplay between your organization's culture, norms, and decision-making processes and your own personal experiences, knowledge, and leadership style in shaping the final technology procurement decision?

Closing

- Final Thoughts:

Would you like to share anything else about your experience with technology procurement and decision-making that we haven't covered?

- Thank You: