

UNICORN VYSOKÁ ŠKOLA S.R.O.

MASTER'S THESIS

2024

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Softwarový vývoj



MASTER'S THESIS

Cashless festival data analysis and analytical dashboard development

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Prague 2024

Statutory Declaration

I hereby declare that I have written my Master's Thesis on the topic of *Cashless festival data analysis and analytical dashboard development* by myself, under the guidance of my thesis supervisor, using only the technical publications and other information sources which are all quoted in the thesis and listed in the bibliography.

I declare that artificial intelligence tools have been used only for support activities and in accordance with the principle of academic ethics.

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Furthermore, I hereby declare that the submitted hard copy of this Master's Thesis is identical to the electronic version I have submitted.

In on

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Acknowledgements

I would like to express my sincere gratitude to my supervisor, Mgr. Václav Alt, for his guidance, support, and valuable advice throughout the process of writing this thesis. I would also like to thank my family and friends for their encouragement and understanding.



**Cashless festival data analysis
and analytical dashboard
development**

Analýza dat bezhotovostního festivalu
a vývoj analytického dashboardu



Abstract

TODO

Keywords: TODO

Abstrakt

TODO

Klíčová slova: TODO

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Introduction

Background and Motivation

- Need to dig into trends showing data analysis impact on festivals - maybe start with recent industry shift
- Add quick overview of our NFCtron system and what makes it unique
- Include basic stats about Vysočina Fest 2025 - attendance growth would be good here

Problem Statement

- Data analysis gap in festival management - organizers need better insights
- Current methods aren't giving actionable data - expand on this pain point

Objectives of the Work

- Main goal: Payment data analysis + build that dashboard for organizers
- Key things to tackle:
 - Get through all seven questions from the brief
 - Turn data into actual useful recommendations
 - Build web dashboard that makes sense of it all

Scope of the Study

- Remember to list exact dataset contents from Vysočina 2025
- Note data limitations and what we can't do with it

1 Methodology

1.1 Research Design

- Write up approach - going with exploratory + descriptive analysis
- Add reasoning behind this choice - fits festival data structure

1.2 Data Overview

- Outline schema from NFCtron database - get full table list
- Map out which tables matter for which analysis pieces

1.3 Data Preprocessing

- Document cleaning steps taken - especially timestamp fixes

1.4 Analytical Methods

- List out methods for each question:
 - Basic stats work needed
 - Time series stuff for patterns
 - Customer grouping approach
 - Correlation tests to run

- Note down tools used - Python, SQL queries / PostgreSQL, etc.

1.5 Ethical Considerations

- Used data based on organizer consent
- Document anonymization process used

2 Data Analysis and Results

Need to make this the meatiest chapter - all core analysis goes here

2.1 Attendee Check-In Patterns and Participation

- Analysis Approach:
 - Pull together dataset details + document analysis steps
- Results:
 - Add those check-in trend graphs - hourly patterns look interesting
- Interpretation:
 - Connect patterns to operational stuff - queue management etc

2.2 Top-Up Behavior and Cash Flow Implications

- Analysis Approach:
 - Write up how I analyzed top-up frequency + amounts
- Results:
 - Need charts showing when/how much people top up
- Interpretation:

- Link findings to cash management recommendations

2.3 Event Cash Flow and Revenue Sources

- Analysis Approach:
 - Detail how I built the cash flow model
- Results:
 - Add Sankey diagram + break down where money came from
- Interpretation:
 - Note key findings about revenue streams and performance

2.4 Customer Spending and Behavior Across Segments

- Analysis Approach:
 - Document customer segmentation method used
- Results:
 - Show spending patterns for different groups
- Interpretation:
 - List opportunities for targeted marketing + improvements

2.5 Correlation Between Event Programming and Sales

- Analysis Approach:
 - Note method for matching sales to event schedule
- Results:

- Add findings about performance impact on sales
- Interpretation:
 - List ideas for schedule optimization

2.6 Beverage Consumption and Attendee Preferences

- Analysis Approach:
 - Write up how I calculated drink volumes
- Results:
 - Add charts showing what people drank when
- Interpretation:
 - Note insights for drink stock and preferences

2.7 Consumption Trends Based on Attendee Stay Duration

- Analysis Approach:
 - Document how I compared one-day vs multi-day visitors
- Results:
 - Add spending patterns based on length of stay
- Interpretation:
 - List ways to improve experience + keep people longer

2.8 Summary of Findings

- Pull together main takeaways from each analysis
- Show how everything connects to research goals

3 Implementation of the Analytical Dashboard

3.1 Dashboard Design and Features

- Document dashboard design process steps
- List out viz choices and interaction features added

3.2 Technical Architecture

- Write up tech stack details
- Document how data sources connect together

3.3 Development Process

- Note down build and deployment steps
- List problems hit and how we fixed them

3.4 User Testing and Feedback

- Compile feedback from organizers
- Note changes made based on testing

3.5 Final Dashboard Features

- List out main dashboard functions
- Add screenshots of key interface parts

3.6 Limitations and Future Enhancements

- Note current dashboard limitations
- List potential features for next version

3.7 Conclusion

- Summarize what we built and how it turned out
- Note impact on festival management process

4 Discussion

4.1 Interpretation of Results

- Compile all analysis insights here
- Connect back to lit review stuff
- Note down practical uses for festival planning

4.2 Challenges and Limitations

- List out data quality issues faced
- Note limitations in analysis methods

4.3 Recommendations

- Write up concrete suggestions from findings
- Add ideas for future research directions

5 Conclusion

5.1 Summary of Work

- Recap main objectives + how we hit them
- Note key contributions - both research side and practical stuff

5.2 Reflections

- Write up personal learnings from the project
- Add thoughts on how this could change festival operations

5.3 Future Directions

- List potential dashboard improvements + analysis extensions
- Note upcoming industry changes that could affect next steps

List of Figures

Note: Unless stated otherwise, all figures are the author's own work.

List of Tables

List of Source Codes

List of Acronyms

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Appendix A Source code of the application