

A stylized illustration on a purple background. A large white profile of a human head is the central element. Inside the head, there are several interlocking gears of different sizes. Three people are interacting with these gears: one person is standing on the top of the head, another is standing on the side, and a third is at the bottom. There are also lightbulbs, a paper airplane, and a server rack in the scene.

APPLIED RESEARCH DOCUMENT

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INTRODUCTION

Purpose of the document

The recommendation engines are commonly used in nowadays applications and their popularity rapidly grows due to the customized delightful recreational user experience which they provide. The purpose of this research document is to determine which is the most suitable recommendation algorithm for a music streaming web application as the following aspects are taken into consideration: simple and not overly time-consuming establishment of the system, content-based model of recommendations, mechanism which doesn't hinder the application but still ensures good quality of the final results. For justifying the finest and most satisfactory outcomes of this research, during the process several of the DOT framework research methods will be implemented. The main focus of this research will be spread over all of the five research strategies: library, field, lab, showroom and workshop.

DOT Framework

Good structure and unyielding rationale are characteristics which have vital importance regarding the inditement of any successful research. Having mentioned that, I find the DOT Framework for a great research methodology which perfectly matches my needs. The framework provides an exhaustive overview of the available research strategies and methods thus it facilitates the first steps of the process. Another benefit of the framework is that it can be refracted through a wide range of needs including gaining knowledge about stakeholders, usefulness of tools and frameworks, quality levels of products. Besides providing inspiration and clear guideline, the DOT framework also helps to achieve complete certainty and unambiguous justification of the main research problem.

Scope definition

This research will be conducted in favor of my university individual track project which represents a music streaming web application. The software system contains of a back-end and a front-end application which use an additional library to access an external streaming service. This applied research aims to find the most suitable recommendation engine which can be established for searching through the data provided by the external system.

PROBLEM STATEMENT

Currently, there is no recommendation engine serving my music streaming web application therefore the quality of the user experience is significantly reduced. To provide seamless and engrossing comfort of use, the system needs an uncomplicated a tool which based on the user music preferences (favorite artists, music genres) will deliver precisely chosen music recommendations. Commonly used practices for solving issues from such aspect often include either the implementation of a sophisticated algorithm or a modified search engine. Taking into account the project scope and the most popular techniques, I believe that the insertion of an algorithm into the software system will contribute to a customized flawless user experience and the outcomes will completely satisfy the needs of my project. The fix of this particular problem would lead to significant improvement of the general product quality and the interaction between the users and the application.

MAIN QUESTION

Which type of a recommendation engine is most suitable for a music streaming web application and requires the least amount of resources, while it still provides both reliable and satisfying suggestions for the user without duplicating recommendations or slowing down the software system?

Sub-questions

- What are the commonly used recommendation systems and algorithms?
- Which algorithm is the most user-friendly?
- Which algorithm is the most sparing regarding execution speed of the product?
- What are their pros and cons regarding costs, time-consuming criteria and results quality?
- Which recommendation system is the most suitable for a minor project with fewer resources?
- What does already exist in the field? Are there any suitable time-saving tools for the development of the recommendations system?
- Are there any crucial downsides of the system's arrangement? Are there any consistent problems within the algorithm? Can they be prevented?
- How can the reliability of the algorithm be reassured?

RESEARCH METHODS AND STRATEGIES

What are the commonly used recommendation systems and algorithms?

In order to determine the most suitable recommendation engine for a music streaming web application, a crucial role for the research has the performing of an available product analysis which will provide the necessary data regarding the already existing algorithms, based on which further comparison and elaboration for achieving the most relevant results will be fulfilled. Furthermore, since this is the first sub-question the performing of a problem analysis is mandatory as it is going to help with creating a better understanding of the main question and it will assist me to stay in the right track in accordance to the scope limitations during the research process. For a vast overview of the components and their performance regarding the relation between the input and the output I consider for an ideal match of my needs the component test method.

Library

Available product analysis

Field

Problem analysis

Lab

Component test

Which algorithm is the most user-friendly?

For this sub-question I decided to rely on the competitive analysis method due to the detail list of already-existing tools which it can provide. Hereupon, I will be able to observe the pros and cons of each tool and put additional attention to aspects such as quality of the application flow, level of user satisfaction etc. A nice way to get the most accurate and complete insight of the users' likings is to perform a survey. Implementing this research method from the field strategy is not only inexpensive but it's also the most optimal option for getting familiar with people's preferences without engaging a significant amount of the participants' time.

Library

Competitive analysis

Field

Survey

Which algorithm is the most sparing regarding execution speed of the product?

When it comes to comparing the execution speed of different tools and researching their strengths and weaknesses, the data analytics is one of the most creditable methods as it performs analysis over collected data and there is not more authentic comparison parameter than numbers. For further justification of my research outcomes, I will use the guideline conformity analysis which will review the best practices and standards related to the product's speed. Combining both of these methods will guarantee the implementation of the triangulation principle based on which the best-matching results will be determined.

Lab

Data analytics

Showroom

Guideline conformity analysis

What are their pros and cons regarding costs, time-consuming criteria and results quality?

Investigating the best good and bad practices will create a solid base for the solution of the problem of this research as it will be able to gain experience from already proven sources. This method will give me an insight of what difficulties did other stakeholders faced regarding a variety of factors such as quality level, time expenses and resource costs. Additionally, a great supplement to the solution of this sub-question will be the implementation of the multi-criteria decision-making method. This method from the workshop strategy will give me the opportunity to prioritize the multiple aspects which I need to observe in order to find an answer to the problem. Having an initial general prioritization will simplify the comparison of the sub-aspects of the different criteria involved in the research.

Library

Best good and bad practices

Workshop

Multi-criteria decision making

Which recommendation system is the most suitable for a minor project with fewer resources?

To find the best-matching recommendation engine for a minor project the stakeholder interests should be investigated first in order to determine the importance of the different characteristics of the system. This will describe the significance of all of the qualities of the project and will provide an overview of which aspects with lower-importance can be left out or implemented with fewer resources.

Field

Stakeholder analysis

Library

Available product analysis

Design pattern research

What does already exist in the field? Are there any suitable time-saving tools for the development of the recommendations system?

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Field

Observation

Library

Competitive analysis

Are there any crucial downsides of the system's arrangement? Are there any consistent problems within the algorithm? Can they be prevented?

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Lab

System tests

Showroom

Product review

How can the reliability of the algorithm be reassured?

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Lab

Usability tests

A/B testing

Workshop

Prototyping

