**FilmFinity**

**Students: Alshikh Sulaiman Lujain**

**Avram Otilia-Maria**

**Dumitrache Elena**

1. **Problem Definition**

We chose the theme, **Movie picker suggestion** because we have come to the conclusion that all of us have in common the passion for movies. In addition, we realized the amount of time that we waste searching for the perfect movie. We thought that an algorithm that will give us movies suggestions based on our already watched movies will be useful and we hoped that we can improve along the way this application.

**2. Project Scope**

The scope of the project is to develop an algorithm that will generate movies based on the user’s taste. We will improve our existent application which requires you to register or log in, in order to see the schedule of all the cinemas in Bucharest. You can also rate a movie after you have watched it. After the implementation of the movie picker suggestion, the films will be organized in 5 categories: drama, action, comedy, SF and horror.

**3. State-of-the-art**

# Machine learning, data from its users, and algorithms already provide some solutions to our desired functionalities so the question remains whether to improve the existing devices or build another ones from scratch.

We thoght that one good example is how Netflix's recommendation system works. The company's primary business is its subscription-based [streaming service](https://en.wikipedia.org/wiki/Streaming_service) which offers online streaming of a library of films and television programs, including those produced in-house. As of April 2019, Netflix had over 148 million paid subscriptions worldwide, including 60 million in the United States, and over 154 million subscriptions total including free trials.[[8]](https://en.wikipedia.org/wiki/Netflix#cite_note-NFLX_Q1_2019-8) It is available worldwide except in mainland China (due to local restrictions), Syria, North Korea, and Crimea (due to US sanctions).

The question is, with thousands of TV shows and movies on [Netflix](https://uxplanet.org/netflix-binging-on-the-algorithm-a3a74a6c1f59), how do you chose what to watch? The simple answer is that Netflix offers you a hand-picked selection right to your screen.

But this belies a complex interplay of user data, machine learning, and clever algorithms that drive the process behind the scenes. And, they are certainly not starved of user data. That's a lot of data, and with over **80%** of TV shows being watched on the platform, it has its work cut out, to keep people engaged. But it doesn't have to do all the hard work.

[Netflix](https://interestingengineering.com/will-apple-tv-beat-netflix-and-amazon-prime-video) effectively outsources some of the processes to you. Information on how you use the platform, how you rate content, and what you search for are all harvested and analysed by Netflix to better improve your user experience.

[Netflix](https://interestingengineering.com/netflix-stirs-controversy-by-calling-out-53-users-whove-watched-a-film-repeatedly) uses a combination of machine learning, data from its users, and algorithms to rank order its content and decide what to show you on your account. If you want to know how, Netflix offers a [helpful overview of their system](https://help.netflix.com/en/node/100639) on their website.

In an [interview with Wired](https://www.wired.co.uk/article/how-do-netflixs-algorithms-work-machine-learning-helps-to-predict-what-viewers-will-like), Todd Yellin (Netflix's Vice President of Production Innovation) explained that you can think of their system as something of a three-legged stool.

"The three legs of this stool would be Netflix members; taggers who understand everything about the content; and our machine learning algorithms that take all of the data and put things together," he said.

"Whenever you access the Netflix service, our recommendations system strives to help you find a show or movie to enjoy with minimal effort. We estimate the likelihood that you will watch a particular title in our catalog..." - [Netflix](https://help.netflix.com/en/node/100639).

It does this by using a variety of factors. These include:

- how you interact with their service (like your viewing history, search queries, and personal ratings of content);

- data collected from other members on the site with similar interests to your own; and,

- linking all that to information about the titles, such as their genre, categories, actors, release year, etc. over their content.

The whole personalized recommendations process begins when you first open your account or add a new profile to it. At this point, you are asked to choose a few titles that you like.

Netflix uses these choices to "jump start" the recommendation process. If you avoid this step, the algorithm takes a little longer to "learn" about your personal preferences.

"We take all of these tags and the user behavior data and then we use very sophisticated machine learning algorithms that figure out what’s most important - what should we weigh," Yellin says.

Netflix also takes note of other watchers' habits, like the time of day you tend to watch, which devices you use, and how long you watch particular content. According to their website, it does not take demographics (**age and gender, etc!!!!**) into account.

**Another question** that many people ask is how relevant it is if a consumer watched something yesterday compare to what they watched a whole year ago or watched ten minutes of content and abandoned it or they binged through it in two nights. That’s where machine learning comes in. What those three things create for us is ‘taste communities’ around the world. It’s about people who watch the same kind of things that you watch. All of this information is then fed through their own in-house algorithms to provide, to the best of their ability, a highly personalized recommendation list to you.

## How do you rate Netflix movies?

[Rating movies, or TV shows](https://www.imore.com/how-rate-movie-or-tv-show-netflix-ios) for that matter, on Netflix, is actually pretty straight forward. It's also a pretty useful thing for you to do so Netflix can better tailor their recommendations to your actual tastes and likes.

**4. Stakeholders and their needs:**

The aim of this research is to adapt our product to account for the differences in perception of the stakeholders involved and to do so, we first have to identify who these are. The first factor that should be taken into consideration when dealing with this kind of application is age, as it has many effects on technology acceptance and a form to be filled with previous ranked movies.

Customers are actually stakeholders of a business in that they are impacted by the quality of service and its value. For our application the feedback received from the users is the best way of generating the most fitted movies for them. Also from this feedback we receive new ideas for improving the algorithm and the database.

**5. System requirements**

**General description:**

The application is consisted of three entities:

**User**: - represents the part that will interact with the interface of the application

- it will initiate a connection with the database using the interface and the server

**Server** - represents the connection between the movie database and the user requests

- it will also allow the intercation of the employee with the database for regular updates

**Database** - represents the collection of the data about the movies and the users

- can be updated using MySql Workbench

**Functional requirements:**

User Profiles

There is only one user profile: the user, who may perform the following:

● register

● login

● logout

● select genre

● rate movie

● comment on movies

● mark movies as watched

● customize account(optional)

Unregistered User

An unregistered user can perform the following actions:

● display popular movies(in descending order of rating)

● display trending movies(in descending order of number of views)

**Non-functional requirments:**

* **Accessibility**: The application should be very easy to use.
* **Maintainability**: The employees working on the application should find it easy easy to maintain modular parts.
* **Cost**: The application does not require any fees.
* **Response time**: Real time response
* **Extensiability**: In function of number of users, the application can have some updates.
* **Availability**: 24/7
* **Performance**: The app can be used on any browser from either mobile phone or desktop.

**6. Planned Approach:**

For this project we used the following System Engineering methods:

* **WBS**
* **Gantt Chart**
* **Requirements Table**
* **Risk Management Plan**

At first we started by creating the WBS so we can be aware of how many tasks we have. After that we proceeded with the creation of the Gantt Chart and Resource Planner and by doing this we were able to identify all the tasks and provide a timeframe and assign them. The next step was to create a Requirement Table to understand exactly how we should do our assignments and the last step was to create the Risk Management Plan. Please see all of these attached in annexes section

For the application development we used GlassFish for the connection between database and code(??????), MySql Workbench for database and NetBeans for the code.

For tables and diagrams we used VisualParadigm, EXCEL, PlanHammer, GanttPro.

For the logo we used PlacedIt.net

**7. Challenges and issues**

**7.1 Security, Safety and Privacy**

Due to the fact that out application is web based it is really important to be secured.

* **Process Safety**

Unsafe applications negatively impact devices or the environment in a way which is not foreseen by the developer and must be predicted to ensure process safety.

* **Confidentiality**

Information of the system should not be visible to anyone except for a defined group of

people.

* **Authentication and Authorization**

Enabling confidentiality requires fine grained authentication and authorization mechanisms to access processes, devices and services.

**Miscellaneous**

This category contains all requirements that do not match the other categories.

**A solution could be that** every account will be protected by a password chosen when it is created. To ensure that the users confidentiality is protected this password should contain at least 8 characters. This will not guarantee a user that his account couldn’t be hacked but will reduce by a great deal this chance.

**7.2 Concurrency and Scalability**

Our application will keep up with the market, the possibility of movies ranked will always be increasing.

**8. Quality assurance plan:**

Quality Assurance can be integrated into the app development process as follows:

1. **Coding** – developer writes the code, QA specialist writes automated tests.
2. **Pull Request**– developer tells others about a new part of the code.
3. **Execution of automated tests**– automatic tests which check whether new changes didn’t break any already implemented functionalities. It consists of:
   * **Static Code Analysis** – a code is checked by a special program (Lint, Sonar), which verify if the code meets the good standards set by our development team.
   * **Executing Unit Tests** – automated tests which validate if each unit of the software performs as designed.
   * **Executing UI Integration Tests** – automated tests that check if the app components are correctly integrated.
   * **Virtual Device Testing** – we use it to find crashes in Android apps. It simulates a real app user.
4. **Code Review**– every piece of code written by one developer is approved at least by 1 another dev.
5. **Deployment**– the latest alpha/beta release is delivered to the client and testers.
6. **Manual Tests** – manual testing of the app based on specified use cases. Made by QA specialists.
7. **The feature is done**

**9. Conclusion**

From Amazon to Netflix, Google to Goodreads, recommendation engines are one of the most widely used applications of [machine learning techniques](https://courses.analyticsvidhya.com/courses/introduction-to-data-science-2?utm_source=blog&utm_medium=RecommendationEnginesfromScratcharticle). Till recently, people generally tended to buy products recommended to them by their friends or the people they trust. This used to be the primary method of purchase when there was any doubt about the product. But with the advent of the digital age, that circle has expanded to include online sites that utilize some sort of recommendation engine.

A recommendation engine filters the data using different algorithms and recommends the most relevant items to users. It first captures the past behavior of a customer and based on that, recommends products which the users might be likely to buy.