**OUTLINE TESIS**

**CONTEXT BASED ALGORITHM FOR RECOMMENDATION SYSTEM**



**RESEARCH PAPER**

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1. **Background**

According to Merriam Webster, recommendation is the act of saying that someone or something is good and deserves to be chosen. As for in our Information Technology society, we define a system that give a recommendation to people is called a Recommender system (RS). This system has become more and more popular in our society and implemented in various application. The most popular ones are probably to recommend movies, music, news, books, research articles, search queries, social tags, and products for people.

The reason we implement RS in our society are, to create a predictive perspective for the user. The RS will create an output just as like we are the wizard who know what the customer wants. For example, the Last.fm create a station which contains recommended songs by calculating the user behavior towards the system. The system will play the song which are not in the user library but played by other people who has similar taste to the music. Next is to create an interactive perspective, to give the user a good feeling seeing the item that RS has recommend and persuade them to buy or use the service. Finally, conversion perspective which helps the company to grow. Such as, increase hit rate, optimize sales and profits margin, and many more. (Jannach, D). Recommendation also helps the company to plan what is the best item or move to be offered to the customer when selling their product or service. As for in IT terms, this tools can be seen in many applications for helping the customer making their next decision. For example, Amazon website, as the user can see several option after they bought or see several items in the website. It said the recommendation tool helps the market gain almost 35% of the profit rates.

The logic behind RS is quite simple, first we define the specific item to denote what the system will generate useful and effective suggestions for that specific type of item. There also a different type of RS in the terms of its result output. The first is personalized RS, which took each user as a unique entity to determine what item will suit that type of user. This kind of RS use context as their foundation for determining characteristic of the user. For example, Amazon took the user preference or wish list as the context for determining the possible item that user will buy. The other one is the non-personalized RS which easier to implement since it has no relation within the context. The example for this type of RS is the top 10 book bought in Amazon (Francesco Ricci and Lior Rokach and Bracha Shapira, Introduction to Recommender Systems Handbook, Recommender Systems Handbook, Springer, 2011, pp. 1-35).

The RS has several algorithms in order to produce the result. Firstly, The Collaborative Filtering (CF), the algorithm took some amount of users and items, then each user has a different opinion regarding each items on the list. The active user become the core of predicting the other user which has the similarity choices. This methodology chosen by some of people for some reason, one of them is the minimal knowledge of engineering efforts. However, these methods require a lot of data input in order to create a good prediction. The next methodology is the Content Based Filtering (CBF), this system focus on the item rather than the user. The system tries to recommend the similar item that the current user already approve or like in the pass. So compare with the CF which took the user rating or wish list as the input, the CBF took the description of an item as the context comparison, such as music genre, movie artist, and many more. The pro’s for this algorithm is a no need data from other user and being able to recommend an unpopular item to the society. Moreover, hybrid technique is created to increase the capability of both methods (CF and CBF). According to Cotter and Smyth (2000), a hybrid approach can be done by creating a ranked list of recommendations and combine them to create a list that compatible with the user.

There are several other methodology regarding RS, but the most common algorithm was CBF. According to research conducted by Joeran Beel (2015), from 62 reviewed approaches, 34 used CBF (55%). From these CBF approaches, the majority utilized plain terms contained in the documents. However, there are some fascinating algorithm which can be used to the RS. The Natural Algorithm is an algorithm that mimic an animal or plant behavior to the system. Janusz Sobecki (2014) found that there are several natural algorithms that can be applied towards the RS. One of them is PSO (Particle Swarm Organization), this algorithm was invented in 1995 by Eberhart and Kennedy. This algorithm was based on several things which are, position, velocity and acceleration, and the movement of the particle around space. PSO can be referred as the school of fish, which each fish has their acceleration, coordinate, speed.

1. **Existing Problem**

Recommendation System has proven to bring great benefits towards human society. For example, it has become the tool for a company to attract more customer by giving them list of item that might interested. Not only it benefits the customer by giving them a less price or targeted item, but also benefits the company by giving them a loyal customer and profits. In these recent day, we can see many variables which can be put to the recommendation system which can be related to the RS. A context, which defined by Merriam Webster as the interrelated conditions in which something exists or occurs can play a big part in a recommendation system. For instance, a location is a context which can be putted to a RS to create a recommendation to people near that location. The author believes, that by implementing the context to the RS will bring a great impact or improvement towards the accuracy to the RS.

1. **Aims and Benefits**

The Goal of this project can be defined in below

1. To implement context based for CF and CBF Algorithm
2. Creating an automation system or platform
3. Produce a recommendation dataset for PT. XYZ with the platform

The benefits of this thesis are

1. Help the current company to gain more customer and profits
2. The result of this thesis can become the foundation for other people when developing the next recommendation system
3. As the base foundation for the author to create a recommendation platform with the same or similar data in the future
4. **Scope**

The scope of this thesis are:

1. To identify which algorithm that produce the best result for the PT XYZ. The author will use Content Based Filtering and Collaborative Filtering as the basic recommendation algorithm to use in this thesis
2. The data sample will be collected from the PT XYZ and other source
3. Creating a platform of machine learning in order to process the data
4. The recommendation data will be shown in the company application which is in IOS Applications
5. **References**

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