



Faculty of Computer Science and Information Technology

***A Recommendation System of Training Plan to Accelerate Workforce
Competency for Oil & Gas Company in Bintulu***

NURSYAHIRA BINTI SUHIB

**Bachelor of Computer Science with Honours
(Information System)**

2020

UNIVERSITI MALAYSIA SARAWAK

THESIS STATUS ENDORSEMENT FORM

TITLE: A RECOMMENDATION SYSTEM OF TRAINING PLAN TO ACCELERATE WORKFORCE COMPETENCY FOR OIL & GAS COMPANY IN BINTULU

ACADEMIC SESSION: 2019/2020

NURSYAHIRA BINTI SUHIB

hereby agree that this Thesis* shall be kept at the Centre for Academic Information Services, Universiti Malaysia Sarawak, subject to the following terms and conditions:

1. The Thesis is solely owned by Universiti Malaysia Sarawak
2. The Centre for Academic Information Services is given full rights to produce copies for educational purposes only
3. The Centre for Academic Information Services is given full rights to do digitization in order to develop local content database
4. The Centre for Academic Information Services is given full rights to produce copies of this Thesis as part of its exchange item program between Higher Learning Institutions [or for the purpose of interlibrary loan between HLI]
5. ** Please tick (√)

CONFIDENTIAL (Contains classified information bounded by the OFFICIAL SECRETS ACT 1972)

RESTRICTED (Contains restricted information as dictated by the body or organization where the research was conducted)

UNRESTRICTED

Nursyahira Binti Suhib

(AUTHOR'S SIGNATURE)

Permanent Address
Nursyahira Binti Suhib
JS1E 199/5, Lorong 2, Jalan Abang Man,
ABF Housing, Tanjung Kidurong, 97000
Bintulu, Sarawak

Date: 12th August 2020

Validated by

Dra. Sahifa Saee
Dra. Sahifa Saee
Lecturer (Information Systems Programme)
Faculty of Computer Science and Information Technology
UNIVERSITI MALAYSIA SARAWAK

(SUPERVISOR'S SIGNATURE)

Date: 13th August 2020

A Recommendation System of Training Plan to Accelerate Workforce Competency for Oil & Gas Company in Bintulu

NURSYAHIRA BINTI SUHIB

This project is submitted in partial fulfilment of the
requirements for the degree of
Bachelor of Computer Science with Honors

Faculty of Computer Science and Information Technology
UNIVERSITI MALAYSIA SARAWAK

2020

DECLARATION

I hereby declare that this project together with all its content are no other than those of my own work except for some information taken and extracted from other resources that have been quoted respectively.

.....

NURSYAHIRA BINTI SUHIB

57464

ACKNOWLEDGEMENT

First and foremost, praise to Allah SWT for granting me the ability to complete my Final Year Project. I would also like to express my gratitude to all of people and party who have been involved directly or indirectly in my Final Year Project.

I cannot express enough thanks for my Final Year Project supervisor, Dr Suhaila Binti Sae for her endless patience, guidance, suggestions, encouragement, and supervision in my Final Year Project. Her piece of advice gave me a lot of ideas to include in my Final Year Project.

I would like to thank my examiner, Dr Phang Piau for his utmost understanding, criticism, suggestion, and time to ensure that my project is fully completed. Dr Phang was really understanding in assisting me to complete my project.

The completion of my project could not have been accomplished without the support and prompt response from my client, Manager of AIN Technical Capability. His response allowed me to have a better understanding on what he expected from the system therefore allowing me to achieve that in this project. Thank you for being such a sport to a humble student.

Next appreciation goes to my university, Universiti Malaysia Sarawak (UNIMAS) for providing me with a chance to gain knowledge and stand a chance to learn many things. The following appreciation goes to my faculty, Faculty of Computer Science and Information Technology for giving me with a chance to experience challenges in my Final Year Project by providing lots of knowledge before heading to real work experience in the future.

To my friends, thank you for sticking by my side in the same path of completing the Final Year Project. Thank you for the guidance. I would be helpless if I were on the journey alone.

Finally special thanks to my parents and family, Mamak, Bapak, Kakwa, Kakngah, Diba, Afni, Waniya, Aatifah, Fadhil and Amjad who have supported me mentally during the tough times. Their encouragement when the times got rough are much appreciated. It gave me great comfort knowing that my family have faith in me to complete my Final Year Project. My heartfelt thanks.

ABSTRACT

To upskill each of the staff based on their respective specialties, superiors in Petronas MLNG decides what most suitable trainings are for the subordinate staffs. However, this process is time consuming as superior must decide the training based on each of the staff's competency gap. To date, there has not been a solution that would ease the superior's task in making decision faster. In this project, a collaborative-based recommendation system is developed in a web-based system to produce a list of training based for the staff. The main feature of this prototype is to recommend training for each of the staffs. The functional testing has been done to identify any error during system testing while a non-functional testing which was the survey method was done to get a constructive feedback from users. In conclusion, the recommendation system features allows better training management in the company. The future works for the system enhancement can overcome the identified limitations of the proposed system. Hopefully with this final year project (FYP2) proposing a recommendation system, the importance of suggestions in the daily life becomes more recognized.

ABSTRAK

Bagi meningkatkan kualiti kerja setiap pekerja berdasarkan kemahiran masing-masing, ketua staf di Petronas MLNG akan menentukan latihan yang paling sesuai bagi setiap pekerja. Walau bagaimanapun, proses ini memakan masa yang lama kerana ketua staf perlu menentukan latihan mengikut tahap kecekapan yang berbeza bagi setiap pekerja. Sehingga hari ini, tiada penyelesaian yang dapat meringankan tugas ketua staf untuk membuat keputusan dalam masa yang singkat. Oleh itu, projek ini akan menggabungkan knowledge-based recommendation system ke dalam sistem berasaskan web yang akan menghasilkan senarai latihan berdasarkan tahap kecekapan pekerja tersebut. Collaborative-based recommendation system telah dibina dalam sistem berasaskan web untuk menghasilkan senarai latihan yang ditawarkan untuk pekerja tersebut. Fungsi utama untuk prototaip ini adalah untuk mengesyorkan latihan untuk setiap pekerja. Ujian fungsi telah dilakukan bagi mengenalpasti sebarang kesilapan sistem sementara ujian tidak fungsi iaitu proses tinjauan telah dilaksanakan untuk mendapatkan kritikan membina dari pengguna. Sebagai rumusan, fungsi recommendation system membenarkan pengurusan latihan yang lebih baik di dalam syarikat. Kerja akan datang untuk menaiktaraf sistem akan mengatasi batasan sistem ini. Semoga dengan projek tahun akhir (FYP2) mengesyorkan 'recommendation system' dapat menunjukkan kepentingan system cadangan di dalam kehidupan seharian.

TABLE OF CONTENTS

DECLARATION	4
ACKNOWLEDGEMENT	5
ABSTRACT	6
ABSTRAK	7
TABLE OF CONTENTS	8
LIST OF TABLES	12
LIST OF FIGURES	11
CHAPTER 1	14
INTRODUCTION	14
1.1 Background	14
1.2 Problem statements	14
1.3 Aim & objectives	15
1.4 Scope	15
1.5 Brief methodology	16
1.6 Significance of the project.....	17
1.7 Expected outcome	17
1.8 Project schedule	17
1.9 Thesis outline	17
CHAPTER 2	19
LITERATURE REVIEW	19
2.1 Review of existing system	19
2.1.1 Database Management System Support for Collaborative Filtering Recommender Systems (Sarwat, 2014).....	19
2.1.2 College Library Personalized Recommendation System Based on Hybrid Recommendation Algorithm (Tian, Zheng, Wang, Zhang, & Wu, 2019).....	20
2.1.3 Conventional System: Competency Management System at Petronas MLNG.....	21
2.1.4 TrainingNow®.....	23
2.2 Comparison of features between Existing Applications	24
2.3 Review of Tools and Technologies of Existing System	26
2.4 Proposed Application	27
CHAPTER 3	29
REQUIREMENT ANALYSIS AND DESIGN	29

3.1 Introduction.....	29
3.2 Methodology	29
3.2.1 Phases in Rapid Application Development (RAD).....	30
3.2.1.2 Analysis of Interview Answer by Client.....	31
3.2.2 UML Behavioural Models (Design for Application).....	32
3.3 Database Design (Class Diagram)	53
3.4 Mock-up Design.....	54
CHAPTER 4.....	61
IMPLEMENTATION	61
4.1 Introduction.....	61
4.2 Installation and Configuration of System Components	61
4.2.1 Sublime Text.....	61
4.2.2 XAMPP Control Panel.....	62
4.3 MLNG Competency Management System	63
4.3.1 User Login Page.....	63
4.4 Superior Staff (Manager) Page.....	64
4.4.1 Training List Page.....	64
4.4.2 Staff List Page.....	65
4.4.3 Training Records Page.....	65
4.5 Subordinate Staff Page.....	66
4.5.1 Training List Page.....	66
4.5.2 Upload Certificate Page.....	67
4.5.2.1 Choose Files to Upload.....	67
4.5.2.2 Edit Image Details.....	68
4.6 Admin Page.....	69
4.6.1 Training List Page.....	69
4.6.1.1 Add New Training Page.....	70
4.6.1.2 View Training Page.....	70
4.6.1.3 Update Training Page.....	71
4.6.1.4 Delete Training Page.....	72
4.6.2 Staff List Page.....	72
4.6.2.1 Add New Staff Page.....	73
4.6.2.2 View Staff Page.....	74
4.6.2.3 Update Staff Page.....	74
4.6.2.4 Delete Staff Page.....	75

4.6.3 Add Records Page.....	75
4.6 Summary	76
CHAPTER 5.....	77
TESTING.....	77
5.1 Introduction.....	77
5.2 Functional Testing.....	77
5.2.1 Unit Testing.....	78
5.2.1.1 Unit Testing on Superior Staff Module.....	79
5.2.1.2 Unit Testing on Subordinate Staff Module.....	82
5.2.1.2 Unit Testing on Administrator Module.....	85
5.3 Non-Functional Testing	88
5.3.1 Usability and Developer Testing.....	88
5.4 Summary	91
CHAPTER 6.....	92
CONCLUSION AND FUTURE WORK	92
6.1 Introduction.....	92
6.2 Achievement of Objectives	92
6.3 Limitations	93
6.4 Future Work	93
6.5 Conclusion	94
REFERENCES.....	95
APPENDICES	96
Appendix A:.....	96
Appendix B: Interview Answer.....	97
Appendix C: Survey Form.....	99
Appendix D: Response for Survey Form.....	102

LIST OF TABLES

Table 2. 1: Table of Comparisons between Existing Applications.....	25
Table 2. 2: Review of Tools and Technologies of Existing System.....	27
Table 3. 1: Description of Login Function.....	43
Table 3. 2: Description of Forgot Password Function.....	43
Table 3. 3: Description of View Records Function.....	44
Table 3. 4: Description of Update Training Records Function.....	44
Table 3. 5: Description of Upload Certificates Function.....	45
Table 3. 6: Description of View Training List Function.....	45
Table 3. 7: Description of Update Training List Function.....	46
Table 3. 8: Description of View Staff List Function.....	46
Table 3. 9: Description of Update Staff List Function.....	46
Table 3. 10: Description of View Recommendation Function.....	47
Table 3. 11: Description of Approve Recommendation Function.....	47
Table 3. 12: Description of View Training Plan Function.....	48
Table 5.3: Login Page Testing.....	79
Table 5.4: Training List Page Testing.....	80
Table 5.3: Staff List Page Testing.....	81
Table 5.4: Training Records Page Testing.....	81
Table 5.5: Login Page Testing.....	82
Table 5.6: Training List Page Testing.....	83
Table 5.7: Upload Certificates Page Testing.....	83
Table 5.8: Login Page Testing.....	85
Table 5.9: Training List Page Testing.....	86
Table 5.10: Staff List Page Testing.....	87
Table 5.11: Add Records Page Testing.....	88
Table 6.1: Table of Objectives Achievement.....	92

LIST OF FIGURES

Figure 1.1: Rapid Application Development Methodology Diagram.....	16
Figure 2. 1: Improved Collaborative Filtering Flow Chart (Tian et al., 2019).....	20
Figure 2. 2: Architecture of Hybrid Recommendation System (Tian et al., 2019).....	21
Figure 2. 3: Executive Competency Management System.....	22
Figure 2. 4: NET Competency Management System.....	23
Figure 2. 5: TrainingNow®.....	23
Figure 3. 1: RAD Methodology.....	29
Figure 3. 2: Workflow Diagram of Current System.....	32
Figure 3. 3: Flowchart of Executive Competency Management System.....	34
Figure 3. 4: Flowchart of Non-Executive Technician Competency Management System.....	36
Figure 3. 5: Flowchart of Proposed System.....	38
Figure 3. 6: Recommendation System Flowchart.....	40
Figure 3. 7: Collaborative Filtering Recommendation System.....	40
Figure 3. 8: Use Case Diagram of Proposed System.....	42
Figure 3. 9: Activity Diagram for Admin.....	49
Figure 3. 10: Activity Diagram for Subordinate Staff.....	50
Figure 3. 11: Activity Diagram for Superior Staff.....	51
Figure 3. 12: UML Sequence Diagram of Proposed System.....	52
Figure 3. 13: Class Diagram of Proposed System.....	53
Figure 3. 14: Login Page.....	54
Figure 3. 15: Staff List.....	55
Figure 3. 16: Training List.....	56
Figure 3. 17: Training Records.....	57
Figure 3. 18: Staff Training Record.....	58
Figure 3. 19: Recommended Training.....	59
Figure 3. 20: Training Plan.....	60
Figure 4.1: Sublime Text Interface.....	61
Figure 4.2: XAMPP Control Panel.....	62
Figure 4.3: User Login Page.....	63
Figure 4.4: Training List Page.....	64
Figure 4.5: Staff List Page.....	65
Figure 4.6: Training Records Page.....	65

Figure 4.7: Training List Page.....	66
Figure 4.8: Upload Certificate Page.....	67
Figure 4.9: Choose Files to Upload Page.....	67
Figure 4.10: Edit Image Details Page.....	68
Figure 4.11: Admin Training List Page.....	69
Figure 4.12: Create Training Page.....	70
Figure 4.13: View Training Page.....	70
Figure 4.14: Update Training Page.....	71
Figure 4.15: Delete Training Page.....	72
Figure 4.16: Admin Staff List Page.....	72
Figure 4.17: Add Staff Page.....	73
Figure 4.18: View Staff List Page.....	74
Figure 4.19: Update Staff List Page.....	74
Figure 4.20: Delete Staff Page.....	75
Figure 4.21: Add Records Page.....	75
Figure 5.1: Analysis on Website Navigation.....	89
Figure 5.2: Analysis on Feedback on Appearance of the Website.....	89
Figure 5.3: Analysis on Website Functionalities.....	90
Figure 5.1: Analysis on System Components.....	91

CHAPTER 1

INTRODUCTION

1.1 Background

Malaysia LNG (MLNG) is a subsidiary company of Petronas located in Bintulu. MLNG journey began on 14 June 1978, when PETRONAS, Shell BV and Mitsubishi secured a partnership agreement to undertake Malaysia's first LNG project. This momentous collaboration led to the birth of Malaysia LNG Sdn. Bhd. (MLNG). To increase staffs' work performance, Petronas MLNG Bintulu has been sending their employees to different training to enhance their work performance based on their competency gap. Currently, the company is using a competency management system in Microsoft Access to handle the competency management. The systems are only accessible by Asset Integrity 7 (AIN7) which is the department in charge of the competency management to avoid data corruption.

However, for each of the staff there are different competency gap. This competency gap is identified through each individual's job assessment. To decide the suitable training, superior have to check all of his subordinates competency gap one-by-one resulting in a slow decision making process as the superior need to make decision of training plan for each subordinates manually. A recommendation system of training plan is proposed to overcome the problem. Recommendation system is a software tools and techniques providing suggestions for items to be of use to a user. Thus, a recommendation system of training plan can provide function of recommending suitable training to the superior without making it time consuming. Another problem identified is the limited access of multiple roles of users at one time. In the current system, Microsoft Access only allow one user to edit the data at one time therefore created limitation for other user to use the system at the same time. By using a web-based system, a create, read, update, and delete (CRUD) function will allow multiple roles of users to use the system at the same time.

Therefore, the existing problem in the current competency management system should be resolved in the web-based recommendation system. The web-based recommendation system main features is to assist the role of superior in decision making by recommending the suitable training and must be accessible for more users at the same time to edit the data without risking the data corruption.

1.2 Problem statements

- a) MLNG were involved in every aspect of the project in Bintulu – from the plant, jetty and infrastructure construction to the acquisition of LNG carriers and training of human resource. To upskill each of the

staff in their respective specialties, MLNG provides different types of training for all staff. However, the training must be decided by the superior in charge based on the competency gap of the staff. Superior need to decide the suitable training based on the available training matrix and the subordinate's competency gap in the job assessment. The process was time consuming as there were different competency gaps for everyone, and the superior need to check and decide the suitability of the training one by one. To overcome the problem, a possible solution is by adding a recommendation system to the web-based system to provide recommendation of suitable training to superior.

- b) In the current competency management system that MLNG use which is Microsoft Access, the main problem is the drawback from the limited access of multiple roles of user at one time. As one user update the database, it is locked for rest of the user to edit and will be unlocked once the user is done.

1.3 Aim & objectives

The aim of the project is to enhance the web-based training plan by recommending the suitable training for each subordinate. The objectives of the project are as follows:

- a) to transform the current competency management system in Microsoft Access to a web-based system
- b) to recommend a suitable training to the superior by using collaborative-based recommendation system for a quick decision making
- c) to provide create-read-update-delete (CRUD) functions for multiple roles of users at the same time

1.4 Scope

The proposed system will have multiple roles of user. There are three identified user who will be using the knowledge based system:

- a) Admin : to manage the training plan and attendance into the system
: able to create-read-update-delete (CRUD) data in the system
- b) Subordinate Staff : to view own records, the training plan and which session to attend
: able to only read (CRUD) data in the system
- c) Superior staff : to approve or disapprove recommended training for subordinate
: to view the training plan of subordinate
: able to read-update (CRUD) data in the system

1.5 Brief methodology

The methodology chosen to be adapted for this project is the rapid application development (RAD). RAD is a form of agile software development methodology. It focuses more on user feedback and a frequent requirement testing.

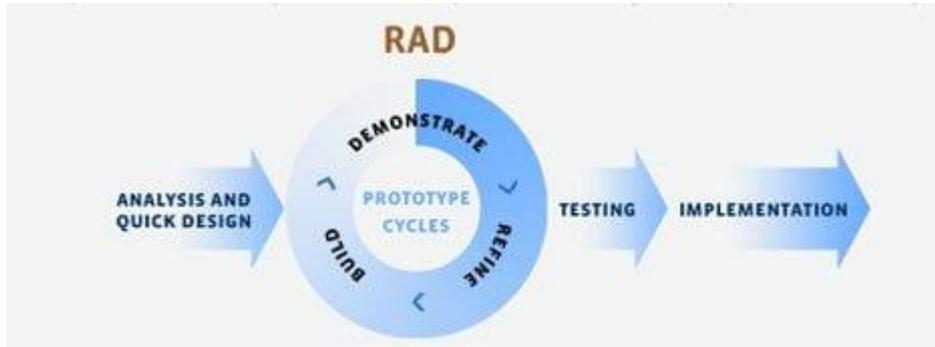


Figure 1.1 Rapid Application Development Methodology Diagram

Since RAD is working over strict planning, the first phase which is the analysis and quick design start by deciding the purpose of the system being builds, therefore coming up with the requirements and estimated project timeline.

Next are the processes involved during the prototype cycles. System designer proceed working on building functional models. Since RAD highly prioritizes user feedback, the process of development should involve user so they can always provide feedback for improvement. Then the process of developing the system by adding more requirements and getting a user feedback should be repeated until all the requirements are met.

Then, the testing phase began. The system will be tested through different scenarios to make sure the system are able to produce the correct output.

After a successful system testing, the system is ready to be implemented and open for next update.

There are a few advantages that made RAD the most suitable methodology for this project. Firstly, the project can be broken down into smaller tasks therefore allowing the developer to focus better in completing tasks. Since the project can be started right away after identifying the requirements, the project is constantly progressing therefore the project can be finished within the estimated project timeline. Constant progress also means always having something to show user in order to get feedback and to implement any changes required by user. The system output will be exactly what the user want at the start of the project.

1.6 Significance of the project

The recommendation system will allow multiple roles of user to edit the data in the system at the same time without having the data locked for only one user to edit. In addition, the recommendation system will provide suggestion of suitable training for the staff to the superior for a quick decision making without the superior need to check on the competency gap and the training matrix. The staff should be able to enter the system and check their own list of training records and upcoming decided training to be attended. The recommendation systems enable the organization to manage the training data more efficiently.

1.7 Expected outcome

In expected outcome, the recommendation system will assist the role of superior in deciding the suitable training for subordinate staff. Therefore, the time consumed by the superior for decision making is less therefore more time to do their other roles. Another outcome expected is more users are expected to enter the system and update the data at the same time.

1.8 Project schedule

Refer to Appendix A.

1.9 Thesis outline

Chapter 1: Introduction

In chapter one, all the important information is clarified so the purpose of the project is clear. The problem statement is identified based on the current system used which leads to identifying the objectives that have to be met during the completion of the project.

Chapter 2: Literature Review

Chapter two is focused on the literature review. The existing system is discussed to come up with the need of the proposed project. The proposed project must have advantages over the existing system.

Chapter 3: Requirement Analysis and Design

Chapter three will discuss thoroughly about the chosen methodology. Every detail of the method is described. The rapid application development will be used throughout the project. This phase will explain more on the Data Flow Diagram and the Entity Relationship Diagram.

Chapter 4: Implementation

For chapter four is implementing all the design based on the previous phase. The structure of the system will be described in more detail by including screenshots of the interface of the system.

Chapter 5: Testing

Chapter five is focused on the project outcome. Once the project is fully completed, it will be tested with various scenarios as to prepare it for possible real life situations.

Chapter 6: Conclusion and Future Work

Chapter five is for the conclusion of the project. It includes the project findings and any future improvement that can be done to the project.

CHAPTER 2

LITERATURE REVIEW

The purpose of this chapter is to review the existing system with the proposed system for their purpose and available features. The explanation includes review of existing system followed by comparison of the existing system with the proposed system. Based on the review, good feature from existing system can be implemented in the proposed system.

2.1 Review of existing system

Existing system was reviewed and discussed in this chapter to support the production of the proposed system. The proposed system will be compared to existing system and published study/journal. The comparison will be with a journal titled Database Management System Support for Collaborative Filtering Recommender Systems, College Library Personalized Recommendation System Based on Hybrid Recommendation Algorithm, TrainingNow® and Competency Management System by Petronas MLNG. These existing system and journal were selected as they fit most of the criteria of the proposed system.

2.1.1 Database Management System Support for Collaborative Filtering Recommender Systems (Sarwat, 2014)

The main objective of the system is to incorporate the recommendation functionality inside the core engine of a database management system. According to Sarwat (2014), DBMS was not employed in the existing recommender system architectures or only uses it as a data store while the recommendation logic is executed in-full outside the database engine. DBMS does not provide in-house support for recommendation applications (Sarwat, 2014). The benefit of incorporating recommendation functionalities inside the DBMS kernel are:

- a) Structured data were taken as input as they can be sufficiently stored and accessed using a database management system. Many popular recommendation methods can be expressed with conventional SQL.
- b) The In-DBMS approach allows recommendation functionality and typical database operations side-by-side
- c) The recommendation application takes advantage of the DBMS inherent features

Sarwat (2014) said the approach was designed to improve the database system’s power in indexing, query processing, and optimization. By using collaborative filtering, the process was broken into two phases, offline model generation phase that creates a model storing correlations between items or users, and an online recommendation generation phase that uses the model to generate recommended items. The offline model generation phase uses several methods which was item-item collaborative filtering, user-user collaborative filtering, and matrix factorization recommenders. While for the online recommendation generation, the methods used were item-based collaborative filtering, user-based collaborative filtering, and matrix factorization recommenders. DBMS-based collaborative filtering was also used.

Based on the research conducted by Sarwat (2014), recommender system aims at suggesting interesting items to users based on their history of preferences and content. The scalability of current recommender systems was evaluated a testbed was provided to the community to evaluate new recommender system implementations.

2.1.2 College Library Personalized Recommendation System Based on Hybrid Recommendation Algorithm (Tian, Zheng, Wang, Zhang, & Wu, 2019)

The objective of the system is to automatically recommend books to the users. The large number of books in the library leads to the waste of library resources also known as “information overload” (Yanchao & Fengxia, 2015). Therefore user have a hard time to select the desired book. User also tend to spent more time to look for books because of the large number of books.

Hybrid recommendation system which combined collaborative filtering and content-based filtering was chosen as approach as it could be more effective. The combination of the methods can also be used to overcome some common problems in recommender systems such as cold start and data sparsity (Tian et al., 2019).

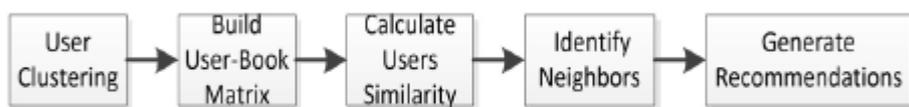


Figure 2. 1 Improved Collaborative Filtering Flow Chart (Tian et al., 2019)

Firstly, a collaborative filtering algorithm was made based on university users. It was divided into three steps, the establishment of user model, find the nearest neighbour set and generate recommendations. To reduce the sparsity of data in collaborative filtering, K-means clustering were used before calculating the similarity. For the content- based filtering methods, it was based on a description of the book and a profile of

the user's preference (Balabanovicm & Shohamy, 1997). Books recommended are similar to the ones user liked in the past.

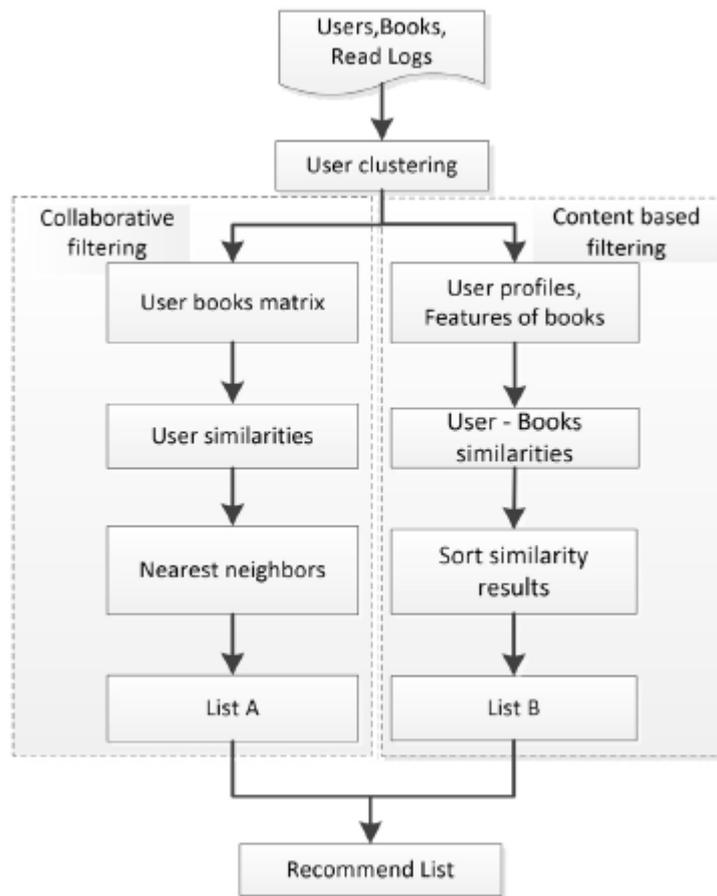


Figure 2. 2 Architecture of Hybrid Recommendation System (Tian et al., 2019)

Lastly was the hybrid approaches, making content-based and collaborative-based predictions separately and combining them could be more effective in books recommender systems. In conclusion, hybrid methods can provide more accurate recommendations than pure approaches (Tian et al., 2019).

2.1.3 Conventional System: Competency Management System at Petronas MLNG

Petronas MLNG Bintulu has been sending their employees to different training to enhance their work performance based on their competency gap to increase staffs' work performance. Currently, the company is using a competency management system in Microsoft Access to handle the competency management. The system are only accessible by Asset Integrity 7 (AIN7) which is the department in charge of the competency management to avoid data corruption.

Currently there are two separate system for the staffs as the training fell into different categories from each other which was for the Executive and NET (Non-Executive Technician). Even the main form looks different as they have different function. The system requires one system admin to always update the database as the staffs frequently changes area, and if new staff comes in.

The system offers many useful features designed according to the needs of each user, such as displaying a list of training plan for technicians under one superintendents. While for the rest of the superiors, they can search for any engineers to know their training records and training plan. The problem with the system was when the staff need to be decided on which training to go next. This decision was made by supervisor, and as one supervisor has many subordinates under him, he or she have a hard time keeping up with the competency gap of each subordinates thus making it hard to decide which training is more better to go compared to the rest for each of the subordinates.

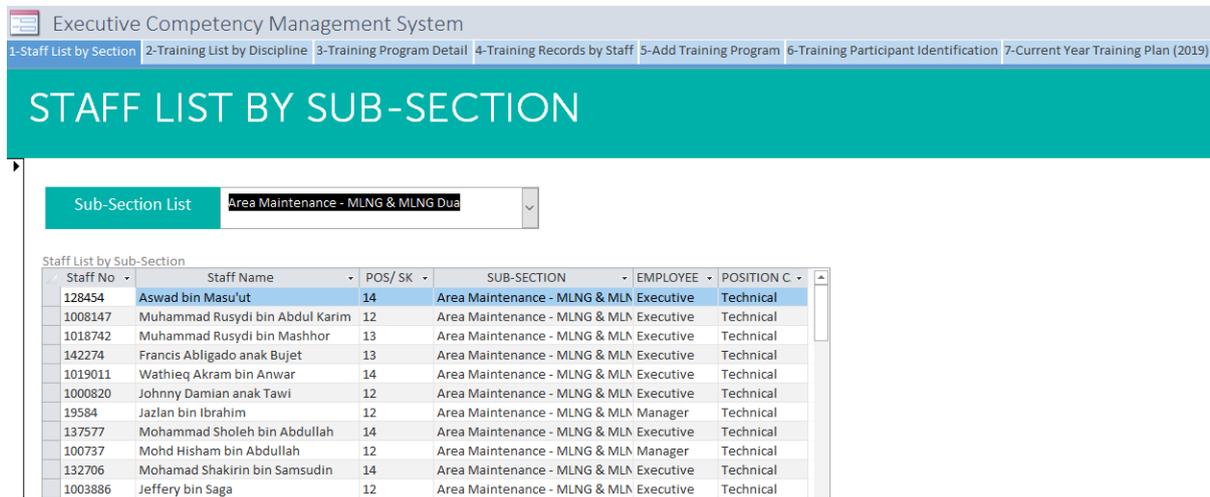


Figure 2. 3: Executive Competency Management System

Based on the figure 2.3 above, executive competency management system offers seven features for superiors. For the first features as displayed on the figure above, user can get a list of engineers under each sub-section. The rest of the features provides a list of specific training for each discipline, the details of the training, and training records for all engineers, adding or editing any training program by system admin, a list of attendees for each training available, and lastly a set of list for the current year training plan.

NET Competency Management System

1 - Staff List by Work Center 2 - Training List by Discipline 3 - NET Training Program Detail 4 - Staff Training Records 5 - Training Records 6 - Add Training Status 7 - Training Participant Identification 8 - Current Year Training Plan

STAFF LIST BY WORK CENTER

WORK CENTER

Electrical MLNG Tiga

Work Center Query subform

Staff No	NAME	POSITION ID	SUB-SECTION	POS/ SK
1004559	Khairul Fathurrahman bin Mazela	2146113	Area Maintenance - MLNG Tiga & T9	413
134794	Razis bin Zaini	2146118	Area Maintenance - MLNG Tiga & T9	413
142010	Daniel Vicki anak James Ningkan	2146112	Area Maintenance - MLNG Tiga & T9	413
129691	Mohamad Zain bin Johari	2146111	Area Maintenance - MLNG Tiga & T9	413
120312	Bahtiar bin Ibrahim	2146116	Area Maintenance - MLNG Tiga & T9	413
120313	Boniface anak Tunek	2146115	Area Maintenance - MLNG Tiga & T9	413
130227	Azamchah bin Shahminan	2146117	Area Maintenance - MLNG Tiga & T9	413

Figure 2. 4: NET Competency Management System

Based on the figure 2.4 above, NET competency management system offers eight features for superiors or in this case for the superintendents. The figure above shows the first feature of the system, providing a list of technicians for every work center. Next feature display a specific training by each discipline, and the rest of the features are similar to executive competency management system.

2.1.4 TrainingNow®

TRAININGNOW. TRAININGNOW FEATURES BECAUSE TRAININGNOW PRICES CONTACTS PARTNERSHIPS

🇮🇩 🇸🇦 🇮🇹 🇬🇧

TrainingNow®

The ideal software for your training excellence!

[GET DEMO](#) [BUY ONE](#) [REQUEST A QUOTE](#)

Figure 2.5: TrainingNow®

TrainingNow® is a software of training management system available on the Internet. TrainingNow® provides an integrated and complete set of features that substitute Excel spreadsheets and mechanize training management activities resulting in the increase of efficiency and effectiveness of the training management processes. Among the rich set of features that TrainingNow® offers are the ability to organize and manage all types of training sessions and view them on calendar. There are also a teacher, student and partner online portal to facilitate access to each services and improve communication. From the financial aspect, company can monitor income, costs and budgets related to training activities.

There are a lot of advantages by TrainingNow®. Company can choose TrainingNow® as a cloud service or install and use it directly in the office. It also allows company to supervise and control all training management activities through customizable control panels and analyzes. The modules are also customizable according to needs. And most importantly, TrainingNow® offers multi language user interface with international settings support.

2.2 Comparison of features between Existing Applications

After reviewing some of the existing system and journal that is related to the proposed system, a recommendation system is very effective to be implemented into the management system. It is advantageous to execute a recommender into the system as it helps by providing suggestions without having to look at the long list therefore leads to quick decision making. These have been proven based on the articles by Sarwat (2014). Since the articles implement the recommendation system, some of the methods used may be adopted in the proposed application. In the proposed application, a recommendation system method was chosen to be implemented.

Based on the existing system, both competency management system by Petronas MLNG and TrainingNow® provides many useful features to user. Besides that, they also provides an intuitive user interface.