

The Entering International Occupation Management Model Using Business Intelligence System

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บทคัดย่อ—การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อการพัฒนาแบบ
การบริหารจัดการการก้าวสู่อาชีพอย่างสากลโดยใช้ระบบธุรกิจ
อัจฉริยะสำหรับนักศึกษามหาวิทยาลัยเทคโนโลยีราชมงคล วิธี
ดำเนินงานวิจัยแบ่งออกเป็น 2 ระยะ คือ 1) การพัฒนาแบบ
การบริหารจัดการการก้าวสู่อาชีพอย่างสากลโดยใช้ระบบธุรกิจ
อัจฉริยะ และ 2) การประเมินความเหมาะสมของรูปแบบ
เครื่องมือที่ใช้ในการวิจัยประกอบด้วย รูปแบบการบริหาร
จัดการการก้าวสู่อาชีพอย่างสากลโดยใช้ระบบธุรกิจอัจฉริยะ
และแบบประเมินความเหมาะสมของรูปแบบ กลุ่มตัวอย่างที่ใช้
ในการวิจัยครั้งนี้เป็นผู้เชี่ยวชาญจำนวน 12 คน ผลการวิจัยพบว่า
องค์ประกอบของรูปแบบการบริหารจัดการด้วยระบบธุรกิจ
อัจฉริยะประกอบด้วย 3 ส่วน คือ ส่วนที่ 1 เป็นการกำหนด
แหล่งข้อมูลเป็นส่วนของข้อมูลหลักในการนำเข้าสู่ระบบธุรกิจ
อัจฉริยะ ซึ่งได้แก่ข้อมูลที่มีความเกี่ยวข้องกับ สมรรถนะด้าน
ภาษาอังกฤษ สมรรถนะด้านไอซีที และสมรรถนะด้านวิชาชีพ
ในสาขาวิชาที่ศึกษา ซึ่งส่งผลต่อการก้าวสู่อาชีพอย่างสากลของ
นักศึกษา ส่วนที่ 2 เป็นส่วนของกระบวนการระบบธุรกิจ
อัจฉริยะ และส่วนสุดท้ายเป็นส่วนของการนำเสนอรายงาน
แนวโน้มน่าต่างๆ จากกระบวนการของระบบธุรกิจอัจฉริยะ
นำเสนอต่อผู้บริหารของมหาวิทยาลัยเทคโนโลยีราชมงคล โดย
ผู้เชี่ยวชาญประเมินรับรองว่ารูปแบบที่พัฒนาขึ้นมีความ
เหมาะสมในระดับมาก (\bar{x} =4.48, S.D.= .21)

คำสำคัญ: ธุรกิจอัจฉริยะ, การก้าวสู่อาชีพอย่างสากล, การ
จัดการ, มหาวิทยาลัยเทคโนโลยีราชมงคล

Abstract— The objective of the research study was to
develop a model of management using business
intelligence system for entering international occupation
of Rajamangala University of Technology (RMUT)
students. The study was divided into two phases. 1)
development of the management model 2) evaluation of
the appropriateness of the model. The research
instruments were the developed model and the evaluation
form of entering the international occupation for the
RMUT students, and the questionnaire for the experts to
evaluate the appropriateness of the model. The samples
were comprised of twelve experts selected by the
purposive sampling method. The research result found
that the management model using the business
intelligence system was consisted of three parts. The first
part is the data sources, which includes English
Competencies, ICT competencies, and Occupational
Competencies in the fields students studying which
affects the enter to students' international occupation.
The second part is the business intelligence process. The
third part is the display of the reports and the tenor
presented to the RMUT executive. The evaluation result
of appropriateness of the management model by the
specialists is averagely in high level (\bar{x} =4.48, S.D.= .21).

Keywords- *Business Intelligence, Occupation,
Management, Rajamangala University of Technology*

I. INTRODUCTION

Presently, universities in Thailand are a kind of
organizations which is operated in highly competitive
atmosphere. It is because there are a lot of universities
while the number of students who want to enter to the
university is decreased. Moreover, many universities
become autonomous universities and receive less amount
of government support in terms of budget; universities,
hence, have a high competition rate in various fields.
Therefore, the university administrators have to use ICT as
an instrument or contribution in management and decision
making which is accurate, fast and effective. According to
the National Education Act of 1999 [1], Section 5
discussing about the administration and management of
education in Article 36, paragraph 2 states that educational
institutions can be run freely and develop self-management

and performance individually. Similarly, the Information and Communication Technology Master Plan for Education, Ministry of Education (2014-2016) addressing the development of ICT systems to support the management and services in mission-4 and strategic-4 [2]. Thus, by having an efficient management, the university administrators in different levels will be able to make accurate and fast decisions. This will lead to effective internal management in university. One of the most utilized and productive in business organization for supporting the decision-making is the Business Intelligence (BI) which is a system that helps to collect, connect and present the information in diverse dimensions, so it will provide the answers derived from data analysis and show the tendency that leads to the accurate and fast decision-making opportunities [3,4]. One of the important goals for every university is to produce the graduates who get jobs after their graduation and have international occupational capabilities because they can be referred as qualified products accepted by their workplaces with good cooperation skills in international level.

To enter international occupation for students means the students' potential capabilities in different disciplines that let them access their professions and work internationally while not counting the academic knowledge and capabilities in their fields such as foreign linguistic skills, information technology skills, the standardized professional skills in specific areas of study, etc. This research uses Rajamangala University of Technology (RMUT) in Thailand as a case study. RMUT is an organization that produces a graduate student to a variety of organizations and the labor market [5,6], so to develop capabilities in diverse areas within students before their graduation in order to enter the international occupation. Therefore, the administrators, professors, and other stakeholders should realize the factors or issues in any field that the university has to develop or improve within the students of RMUT in order to enter the international occupation.

II. RESEARCH OBJECTIVE

To develop management model using Business Intelligence system for entering international occupation of RMUT students.

III. HYPOTHESIS

To develop management model using Business Intelligence system for entering international occupation of RMUT students is highly appropriate.

IV. SCOPE OF THE RESEARCH

A. Variables using in the Research

- Independent variable is management model using Business Intelligence system for entering international occupation of RMUT students.
- Dependent variable is the appropriateness of the management model using Business Intelligence

system for entering international occupation of RMUT students.

B. Population and Samples

In this research, Rajamangala University of Technology of Thailand is used as a case study. The population is administrators, professors in RMUT, specialists in information and communication technology, and specialists in educational administration.

The samples are consisted of these following:

- Five administrators of RMUT who have experiences in management in RMUT for more than four years, two professors of RMUT who have experiences in teaching for more than five years, two specialists in information and communication technology, and three specialists in educational administration who have experiences in related fields for at least five years chosen by the purposive sampling .

V. RESEARCH METHODOLOGY

The development of the conceptual framework of management model using Business Intelligence system for entering international occupation of RMUT students can be separated into two phases as follows:

A. Phase 1 The development of management model using Business Intelligence system for entering international occupation of RMUT students has steps as below:

- Study, analyze and synthesize documents and researches related to the Business Intelligence system [7,8,9,10] and information system for decision-making [11,12,13] and studying the structure of the internal and external information systems in order to enter international occupation for students in RMUT [14].
- Develop the management model using Business Intelligence system for entering international occupation of RMUT students from the study, analysis and synthesis of the related documents and researches.
- Propose the management model using Business Intelligence system for entering international occupation of RMUT students to the advisor for examination and revision.
- Create an instrument for evaluating the appropriateness of the management model using Business Intelligence system for entering international occupation of RMUT students.

B. Phase 2 The evaluation of the management model using Business Intelligence system for entering international occupation of RMUT students is comprised of two steps as follows:

- Propose the management model using Business Intelligence system for entering international

occupation of RMUT students to the administrators and professors in RMUT, the specialists in information and communication technology, and the specialists in educational administration.

- Analyze the data by using the suitable criteria of the management model using Business Intelligence system for entering international occupation of RMUT students according to the evaluation criteria.

VI. RESEARCH RESULTS

The research process presents the results into two sections as follows:

A. Section 1:

The development of the management model using Business Intelligence system for entering international occupation of RMUT students derived from the analysis and synthesis of the research documents shown in the Fig.1 as detailed as below:

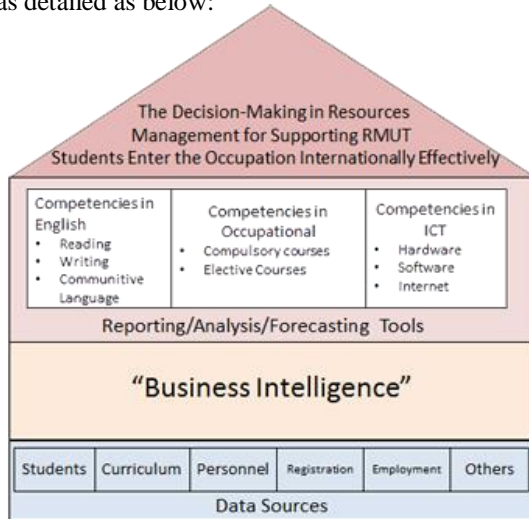


Figure 1. The management model using Business Intelligence system for entering international occupation of RMUT students.

1) The source of data:

The source of data is a part of the main information for accessing the Business Intelligence system which is included of the information about students, programs, personnel, registration, and employment that are internal information in RMUT and other internal and external supportive information of RMUT.

2) The process of Business Intelligence system.

a) Identify the data source that is consisted of the data from information system related to the access of international occupation of the students in RMUT that has been used within the university as well as the external information such as statistics from other educational institutions, information from other information system's projects, reviews and academic writings. Data source has

to be conformed to the expected results that specify the data source according to article 1).

b) The next step is Data Warehouse design in developing the Business Intelligence system which primarily requires some data source from the data warehouse. The Star Schema data warehouse design or the Multidimensional Schema data warehouse design's data sources can be modified to be suitable and compliant with the pattern of Star Schema data in order to insert the data into data warehouse by using the ETL (Extract Transform Load) process.

c) Then, there is the documentation that will be stored in Star Schema data warehouse in the form of Multidimensional Model or Cube. This model creates diverse dimensions within the information before being used for creating reports in various patterns according to the design that uses the instrument of the Business Intelligence system in order to be proposed to the administrators and professors of RMUT to further consider.

3) Factors affecting the access of international occupation of the students in RMUT

By analyzing and synthesizing literatures, and evaluating the comments of specialists, it is shown that factors affecting the access of international occupation of the students in RMUT includes English language competencies, ICT competencies, and occupational competencies in the fields students studying. The Business Intelligence system will analyze, present or show the tendency of information related to the development of those three areas of students' capabilities in the various formats of the reports of student that will be proposed to administrators, professors and other stakeholders for assisting the decision-making in resources management; this will support the access of in RMUT students' international occupation of student in university effectively in the future.

B. Section 2:

The evaluation result of suitability of the management model using Business Intelligence system for entering international occupation of RMUT students

The evaluation of the effectiveness of the management model using Business Intelligence system for entering international occupation of RMUT students which is conducted by ten specialists has the interpretation criteria as follows [15].

- 4.50 – 5.00 means highest suitable
- 3.50 – 4.49 is highly suitable
- 3.49 – 2.50 is moderately suitable
- 2.49 – 1.50 is less suitable
- 1.49 – 1.00 is least suitable

The evaluation results are outlined in the following table:

TABLE I. THE EVALUATION RESULT OF THE MANAGEMENT MODEL USING BUSINESS INTELLIGENCE SYSTEM FOR ENTERING INTERNATIONAL OCCUPATION OF RMUT STUDENTS

Elements of the Model	\bar{X}	S.D.	Suitability Level
The principle and the idea used as the basis of the development of the management model using Business Intelligence system for entering international occupation of RMUT students	4.41	.51	High
The purpose of the management model using Business Intelligence system for entering international occupation of RMUT students	4.58	.66	Highest
The process of Business Intelligence system which is consisted of 4 steps: 1) identifying the related data source, 2) data warehouse's design and implementation, 3) data storage in data warehouse in the multi-dimensional form, and 4) creating the report that will be proposed to administrators, professors, and other stakeholders.	4.75	.45	Highest
The access of international occupation consisted of the students' competencies in 3 sections which are 1) English language(reading, writing and communitive language) 2) information and communication technology(hardware, software and internet) 3) academic and professional in their educational field(compulsory courses and elective courses).	4.16	.71	High
Total	4.47	.45	High

TABLE II. THE EVALUATION RESULT OF APPROPRIATENESS OF THE BUSINESS INTELLIGENCE SYSTEM PROCESSING FOR ENTERING INTERNATIONAL OCCUPATION OF RMUT STUDENTS

Process	\bar{X}	S.D.	Suitability Level
1. The preparation of related information which influences factors affecting the enter to international occupation for RMUT Students in three sections: 1) English language, 2) information and communication technology, and 3) academic and professional in the studied fields is consisted of:			
1.1 Students' information	4.91	.28	Highest
1.2 Programs' information	4.33	.49	High
1.3 Personnel's information	4.16	.38	High
1.4 Registration's information	4.91	.28	Highest
1.5 Employment' information	4.66	.49	Highest
1.6 Other related information, for example, the information about international professional qualification certificate's examination	4.41	.51	High
2. The process of Business Intelligence system			
2.1 The process of information preparation for inserting data to data warehouse by using ETL (Extract Transform Load) process	4.58	.51	Highest
2.2 The process of data warehouse designed for using Star Schema data warehouse	4.66	.49	Highest
2.3 The process of information modification stored in data warehouse to be in multidimensional (Cube) form	4.58	.51	Highest
2.4 The process of information presentation for decision-making on resources management in order to entrance to students' international occupation based on the information presentation from a variety of instruments derived from the Business Intelligence system's which is consisted of:			
2.4.1 Reporting Tools	4.66	.49	Highest
2.4.2 Analysis Tools	4.83	.38	Highest
2.4.3 Forecasting Tools	4.91	.28	Highest
Total	4.63	.28	Highest

Table I shows that the elements of the management model using Business Intelligence system for entering international occupation of RMUT students is appropriate in high level ($\bar{x} = 4.47$, S.D.= .45).

Table II shows that the overall evaluation result of appropriateness of the business intelligence system processing for entering international occupation of RMUT students is appropriate in the highest level ($\bar{x} = 4.63$, S.D.= .28).

TABLE III. THE EVALUATION RESULT OF THE UTILIZATION OF THE MANAGEMENT MODEL USING BUSINESS INTELLIGENCE SYSTEM FOR ENTERING INTERNATIONAL OCCUPATION OF RMUT STUDENTS

Utilization of the Business Intelligence System	\bar{X}	S.D.	Suitability Level
The management model using business intelligence system for entering international occupation of RMUT students is suitable for data analysis concerning with the enter to international occupations	4.25	.45	High
The process of management model using Business Intelligence system for entering international occupation of RMUT students	4.66	.49	Highest
The developed management model using Business Intelligence system for entering international occupation of RMUT students is possibly used for enhancing the management and decision-making over resources in order to support students' enter to international occupation genuinely.	4.08	.28	High
Total	4.33	.28	High

Table III shows that the evaluation result of the utilization of the management model using business intelligence system for entering international occupation of RMUT students is appropriate in high level ($\bar{x} = 4.33$, S.D.= .28).

TABLE IV. THE CONCLUSION OF THE EVALUATION RESULT OF THE MANAGEMENT MODEL USING BUSINESS INTELLIGENCE SYSTEM FOR ENTERING INTERNATIONAL OCCUPATION OF RMUT STUDENTS

Evaluation List	\bar{X}	S.D.	Suitability Level
1.Elements of the management model using business intelligence system for entering international occupation of RMUT students	4.47	.45	High
2.The process of the Business Intelligence system for entering international occupation of RMUT students	4.63	.28	Highest
3.The suitability of using business intelligence entering international occupation of RMUT students	4.36	.30	High
Total	4.48	.21	High

Table IV shows that the overall development of the management model using business intelligence system for entering international occupation of RMUT students is highly appropriate ($\bar{x} = 4.48$, S.D.= .21). When considering each part independently, we will see that the process of the Business Intelligence system for entering international occupation of RMUT students is the most suitable ($\bar{x} = 4.63$, S.D.= .28). The second and third highest are the elements of the management model using business intelligence system for entering international

occupation of RMUT students which is highly suitable (\bar{x} =4.47, S.D.= .45), and the suitability of using business intelligence system for entering international occupation of RMUT students (\bar{x} =4.36, S.D.= .30) respectively.

VII. RESEARCH DISCUSSION

The evaluation result of appropriateness of the management model using Business Intelligence system for entering international occupation of RMUT students by the specialists is averagely in high level (\bar{x} =4.48, S.D.= .21). The development of the management model using Business Intelligence system for entering international occupation of RMUT students is consisted of three sections: 1) Identifying the data source as a part of main data source that will be inserted in Business Intelligence system such as information related to English language competencies, information and communication technology competencies, occupational competencies in the fields students studying which affects the enter to students' international occupation. 2) Inputting the analyzed information which is a factor affecting the access to students' international occupation into the process of Business Intelligence system. 3) Reporting the tendencies derived from the process of Business Intelligence system to the university administrators in order to support the management and decision-making over resources management and promote students' enter to international occupation.

VIII. CONCLUSION

The results of the development of the management model using Business Intelligence system for entering international occupation of RMUT students, there are the management model which develop and decision in resource management within university for supporting the students toward effective International Occupation. The development of the management model also improve and encourage the knowledge and skill sets of students toward effective International Occupation, increasingly.

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