Development of Student Status Reports of a Faculty in University Using Interactive Microsoft Power BI for Effective Academic Administration

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Abstract

The student status report is generally designed for academic administration to get information to analyze the learning progress. For the case study at the Faculty of Industrial Education and Technology (FIET), King Mongkut's University of Technology Thonburi, there are 8 undergraduate programs, 7 master's programs, and 1 doctoral program. There are average number of 755 students per academic year for all undergraduate students, graduate students, and PhD students. The big data of FIET students could be retrieved from the Academic Information System (New ACIS) which shows the information of student admission, students' history, enrollment, request, study timetable, grades, etc. To support the student admission and academic administration, the data of student status was summarized to be an interactive report using Microsoft Power BI. The system has been continuously improvement from the academic year of 2012 to 2021. The online report included of 3 items: (i) current students registered in the system, (ii) graduated students, and (iii) students who dropped out. In addition, it also showed the grades before admission, current grades, category of application, education history, etc. This developed system could be conveniently reported via online to the administrators for planning and decision-making. The satisfaction of 10 users was evaluated with online questionnaire of 5-scale on 4 topics: ease of viewing, sufficient of data, benefits and outcomes, suitability of report, showing that the average score was >4. Moreover, there was suggestion to develop the system linkage between the faculty and programs to follow-up and analyze the progress of student learning.

Keywords: Information System, Student Status Report, Microsoft Power BI

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Introduction

Currently, the Faculty of Industrial Education and Technology at King Mongkut's University of Technology Thonburi manages its teaching and learning activities through 8 units, comprising 7 departments and 1 central unit, offering a total of 16 programs. These programs are divided into 8 undergraduate, 7 master's, and 1 doctoral degree programs. The faculty has established a vision for development: "Developing innovators and creators at the global level." The primary clients of the faculty are students, each with different qualifications based on the program level.

Student status is crucial information that the faculty needs for planning and operations in various aspects, such as student recruitment and selection, curriculum development, student tracking, and assistance. Currently, the information is collected from various university information systems to compile student status reports. However, the existing reporting methods have limitations, such as using paper-based or traditional information systems, which are not versatile in reporting student status data in various formats. The data may be outdated and not suitable for efficient decision-making and planning by the faculty management [1].

Previously, reporting the performance of the educational service unit involved document-based reports with extensive textual information, lacking interactivity and responsiveness to the needs of meeting participants and faculty administrators. During regular faculty committee meetings at the end of each semester and academic year, the "Student Status" report was presented by extracting data from the Educational Management Information System (NewAcis) in the form of Excel files. This report aimed to provide the faculty committee with an overview of student status in each department, such as academic probation for undergraduate students with a GPA below 2.00 and for graduate students with a GPA below 3.00, as well as dropout and dismissal status for students with a GPA below 1.50 or voluntary withdrawal.

The manual reporting process consumed significant committee time in evaluating student status during each reporting period, prompting the researcher to identify the causes and problems in the reporting process. To address these issues, the researcher developed an information system to generate easily interpretable and convenient student status reports for the faculty committee. This system utilized an interactive presentation format under Microsoft Power BI, covering various aspects of student information, such as recruitment channels, year levels, program levels, and academic performance. The developed information system aims to provide a comprehensive and user-friendly overview of student status for efficient analysis and decision-making by faculty administrators [2].

Objectives

This research has 2 for objectives Development of Student Status Reports of a Faculty in University Using Interactive Microsoft Power BI for Effective Academic Administration.
1. To develop database to interactive report
2. To analyst big data base on student status

Methodology

Step 1: Study the Requirements of Executives or Customers and Current Information Through the SIPOC System

Utilize the SIPOC model (Supplier, Input, Process, Output, Customer) to analyze and understand the current data processes. The desired outcome is to generate information reports requested by the executives of the Faculty Industry of Education and Technology (FIET). The SIPOC model serves as a tool for analysis, aiding in the identification of relationships between the producer, input data, process, output, and customers. This helps in obtaining insights into the functioning of the system. The executives aim to receive information that is informative and aligned with the system's operational requirements [3].

Step 2: Study Standardized Information Reporting Systems

The researchers investigated information reporting systems that adhere to standards and are efficient in presenting flexible reports. Systems capable of analyzing large-scale data were explored, and Microsoft Power BI emerged as the supported software within the organization.

Step 3: Design and Plan Existing Data for Reporting System Integration

Designing and planning existing data involves considering user requirements and organizing data systems to efficiently support reporting. This includes structuring data to enhance its usability within the reporting framework, utilizing the university's information system database (NewAcis) [4].
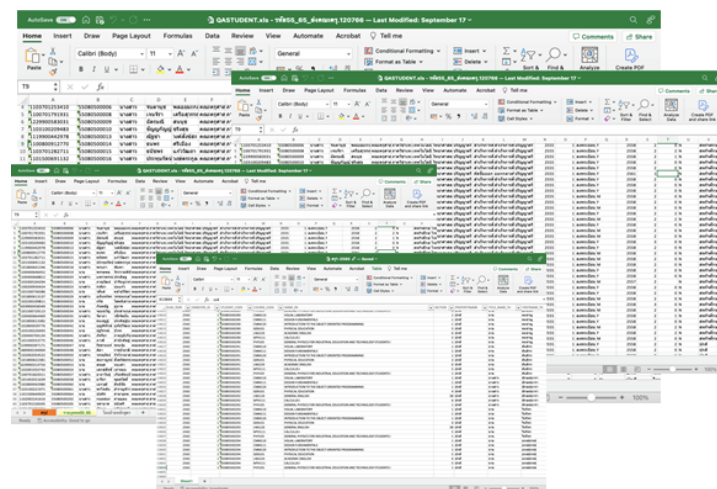

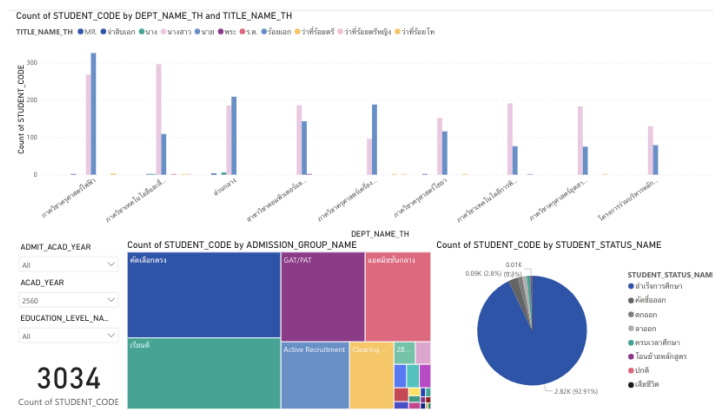Figure 1: Database before Management with Microsoft Power BI

Figure 2: Data Management with Microsoft Power BI

Step 4: Database Management and Data Integration With Microsoft Power BI

Initiate database cleaning, administer database management as shown in Figure1, and design report presentations categorized by student status, such as status, completion status, and dropout status. Ensure clarity and ease of understanding in report design. Integrate the database with Microsoft Power BI for efficient and responsive reporting that effectively meets user requirements was shown in Figure 2.

Step 5: Evaluate User Satisfaction With the System

Present the new reporting system and products to users to assess their satisfaction and gather their feedback. This evaluation can be conducted through surveys or feedback activities to facilitate continuous improvement of the system and future reporting. Listening to user suggestions is crucial in developing and enhancing the system to meet the organization's needs.

The key aspects to consider are as follows:
1. Ease of data selection
2. Adequate data quantity to meet needs
3. Benefits and insights gained from system usage
4. Analyzability for planning student development
5. Suitability for reporting purposes

Results

The research revealed that the Student Status Information System developed using Power BI had the capability to present student status data comprehensively and understandably. User satisfaction with the system was at a high level of 5 (Very Satisfied), with an average rating of 4.71 and a standard deviation of 0.47 (N=14), indicating a considerable level of satisfaction with the system.

Users of the Student Status Information System express satisfaction in various aspects:

Convenience in Data Selection (4.44):
Users report that the system allows for convenient data selection, demonstrating progress and ease of use.

Adequate Data Quantity for Needs (4.22):
The system provides enough data that meets users' needs without exceeding or falling short.

Benefits and Gains from Usage (4.55):
Users feel that the system is beneficial and provides what they need adequately.

Capability for Further Analysis and Student Development Planning (4.44):
The system can be used for analysis, contributing to effective student development planning.

Suitability for Reporting (4.33):
The system is considered suitable for reporting data in line with user requirements.

Conclusion

The research findings demonstrate that the Student Status Information System utilizing Power BI was effective in providing timely information and receives high user satisfaction. The system's user-friendliness and progress in data selection contribute to a sense of convenience for users. Additionally, the system proved beneficial and suitable for analysis, supporting student development planning. This signifies a significant success in developing a system that meets the needs of the current educational environment.

Suggestions

1. Enhance the Feature for Comparing Data Between Academic Years:
Adding the capability to compare data between academic years will make it easier for users to examine trends and changes in data. This is beneficial for academic planning and decision-making.

2. Display Individual-Level Analysis Based on OBEM:
Importing a feature that displays individual-level analysis based on the Outcome-Based Education Model (OBEM) will assist in immediate improvements in areas that require development. Additionally, students and staff can gain an overview of the system's success in teaching and learning.

3. Link Analysis Results to Competency Levels in the Curriculum:
Linking analysis results to competency levels in the curriculum being studied or completed would be highly beneficial for generating reports summarizing students' development in a semester-wise format.

4. Establish Connections With Student Admission Information:
Developing connections with student admission data will aid in tracking and analyzing the effectiveness of students throughout their academic journey.

5. Increase Connectivity With Soft Skill Data:
Adding information about non-professional skills (Soft Skills) will contribute to creating a comprehensive overview of students' overall skill development. This is advantageous for preparing students for the workforce.

6. *Establishing Policies for Student Care and Reducing Future Student Dropout Rates:*
Develop and implement policies aimed at student care with the objective of reducing the likelihood of future student dropouts. These policies should encompass proactive measures to support students in both academic and non-academic aspects, fostering a positive and inclusive learning environment. Regular assessment and adjustments to these policies are essential to effectively care for students and minimize the potential for future dropout incidents.

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