DEVELOPMENT OF AN INTERACTIVE INSIGHTS DASHBOARD FOR COOPERATIVE EDUCATION MANAGEMENT IN UNDERGRADUATE DATA SCIENCE PROGRAM

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ABSTRACT

This research presents the development of an interactive analytical dashboard and integrated data storage system designed to enhance co-operative (co-op) education data management for the undergraduate Data Science program, Faculty of Science, Chiang Mai University. The research methodology consists of four phases as follows, data collection from academic years 2566–2569 B.E., data cleaning and integration, establishing classification criteria for company business sectors and project title-based work categories and an interactive dashboard using Looker Studio connected to Google Sheets. The dashboard provides interactive visualization components including pivot tables, scorecards, and charts with filtering and cross-filtering capabilities. The Developments were designed for scalability, enabling integration of new semester data.

INTRODUCTION

The undergraduate Data Science program, Faculty of Science, Chiang Mai University, recognizes the importance of gaining insights from co-operative education data to support program evaluation and curriculum development aligned with labor market demands. However, current data are scattered across multiple Microsoft Excel files separated by academic year, lacking standardized recording formats essential for analytical purposes such as trend analysis of industry partnerships and data science competencies applied in the field. Therefore, this research aims to address these challenges.

OBJECTIVES

- Develop an integrated data storage system.
- Develop an interactive analytical dashboard.

METHODOLOGY

PROCESS

1 DATA COLLECTION

- Collected co-op data from academic years 2566–2568 B.E. across multiple Excel files, combine into 121 records on Google Sheets including student name/ID, company details, advisor assigments and student's project title.
- Advisor details were scraped from the university website using BeautifulSoup running on Google Colab.

2 DATA CLEANING & INTEGRATION

- Standardized data formats such as column name.
- Cleaned inconsistencies, incorrected and outdated values in records.
- Created reference tables for companies details, advisors details, and advisor pairings to support the dashboard and enable dropdown validation for future data entry.

3 CLASSIFICATION CRITERIA

- Established 2 classification criteria.
  - 14 company sector categories based on business types
  - 7 project categories based on work characteristics identified from project titles
- Both were added as reference tables for standardized data entry and dashboard trend analysis.

4 DASHBOARD DEVELOPMENT

- Developed interactive dashboard on Looker Studio using data blending feature to create relationships between main storage and reference tables. Features include pivot tables, scorecards, and charts with filtering and cross-filtering capabilities.

TOOLS

Google Colaboratory · Google Sheets · Google Sheets · Google Sheets · Google Sheets · Looker

RESULT



DISCUSSION

- The overview panel includes a semester slider for filtering by academic year range, student distribution by academic year and year level pivot table, co-op placement locations across Thailand and summary statistics scorecards.
- The top 5 companies chart displays the top 5 partner companies while the project categories chart shows all work categories across semesters. Both charts show values within the latest 5 semesters on default state.
- The advisor panel enables filtering by main and co-advisor with pairings based on historical assignments, linked to student table displaying full name, and project title dropdown.
- The company sector insights show the most popular sector is Digital Consulting. The project category trends reveal that ML/DL & Predictive Analytics was highly popular in semester 2566 but declined in following years, while Business Intelligence & Dashboards shows steady growth across semesters.
- The insights help program administrators identify which industry sectors actively hire data science students and which types of work are most demanded in the field. The dashboard is optimized for desktop viewing.

CONCLUSION

This research successfully developed an integrated data storage system and interactive analytical dashboard for co-operative education data management. The system combines 121 co-op records from 50 companies across 3 academic years into a structured Google Sheets repository with standardized classification criteria. The established storage format enables data entry for future semesters. The Looker Studio dashboard allows program administrators to explore trends in company partnerships and project work categories through interactive visualizations, supporting curriculum improvement. Future work may extend to real-time tracking of co-op activities during the semester such as submissions and milestones, and integrating current student enrollment data to identify students not following the planned academic term schedule.

SCAN TO VIEW DASHBOARD

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