A Business Intelligence Project-Oriented Course
A Breast Cancer Research Case

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ABSTRACT

The Business Intelligence Project-Oriented Course has been taught in the department of Industrial Engineering and Management since 2016. In this course, the students learn to build websites and business intelligence systems which enable to perform data analysis and research in order to get valuable business insights and to retrieve specific business information. The article is devoted to BI course implementation in the Department of Industrial Engineering and Management of Sami Shamoon College of Engineering (SCE).

KEYWORDS

Business Intelligence, Data Dashboards, Data Mining, Data Visualization

INTRODUCTION

Project-oriented course is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging, and complex question, problem, or challenge.

In project-oriented course students work on a project over a semester - that engages them in solving a real-world problem or answering a complex question by building web-based system. They demonstrate their knowledge and skills by developing a web-based internet public product that will led to online presentation for a real audience. As a result, students develop deep content knowledge as well as critical thinking, creativity, and communication skills in the context of doing an authentic, meaningful project.

BACKGROUND

A project-oriented course normally comprises a range of processes, each of which contains certain stages, steps, or phases; as such, this kind of course can be seen as a project. Each phase comprises various activities, which are components of the work performed in the phase (Heick, 2013). A project-oriented course can therefore be divided into different time periods, often corresponding to the same phases as the generic project life cycle. The project life cycle defines the phases that connect the beginning of the

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project to its end. These phases make the project more measurable and manageable, which presents the following five phases: project definition, project planning, project execution, project completion, and project evaluation. Project-oriented education includes skills training, in which students improve their skills while completing the activities in the processes that are part of the course’s project phases. These skills can be categorized as one of two types, depending on the decisions made about what activity to do and how to do it (Knoll, 2014). This is also an important issue in industrial projects, such as those concerning global product development. Key considerations in project-oriented course include how teaching methods, project environment, and student learning backgrounds predict the quality of learning outcomes. Learning outcomes can be used when designing the course and completing course work. In Business Intelligence course context these outcomes are very important because student researches and develops on-line web system which contains data, analytical and user interface functionalities.

MAIN BI PO COURSE IMPLEMENTATION

The proposed project-oriented (PO) business intelligence (BI) course consists of seven frontal lectures and seven personal meetings with students. Specifically, during the first lecture, the course instructor teaches and helps the students to set a project domain and to build relevant data warehouse (Sleeper, 2018). Then, in the second lecture, the course instructor teaches the students to design the project’s web site and to configure site pages for future BI system dashboards (Anoshin, Matic, Bogdanovic, Lincoln, & Shirokov, 2019). In the third and fourth lectures, the course instructor teaches the students how to build a business intelligence system in the cloud (Milligan, 2016). In the fifth lecture, the course instructor teaches students how to embed the previously built BI system into the project’s website. In the sixth lecture, the students are taught how to test the system in order to recognize security and systems bugs and fix them (Steffine, 2015). In the seventh lecture, the instructor explains to the students how to publish their BI web system on the Internet, open it for public use and participate in the course Hakathon in order to get overall project rating which is a part of the final grade in the course. From the technical point of view, the students gain the following practical skills during the course:

1. Web Data Connectors design and setup
2. BI System Data Warehouse modelling and construction
3. BI System Data Cubes modelling and construction
4. BI System Dashboards modelling and construction
5. BI System design and implementation
6. Bi System setup and construction
7. BI System testing and maintenance

The remaining seven lectures are devoted to personal mentoring, answering of questions and collaboration with the student teams. The students work independently with help of internet resources and/or college library books in field of BI.

In our opinion, all implemented projects are of high practical and research importance for students. During each project, a data warehouse is collected and designed BI system dashboards are opened for public access on the Web. It means that everyone who has access to the project’s website, is able to view and download the collected data, analyze the data and get in-depth knowledge from the data with the aid of the previously constructed BI dashboards. This approach allows to easily embed the project results in journal/conference research papers which can serve as a public arena for professional discussion and collaboration.

The course is supported with a vast amount of Moodle materials and specially designed educational SCE BI YouTube videos which assist the students with finding correct solutions of technical problems.
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