

Tangible and Beneficial Course Objective and Teaching Materials Proposed For Management- and Information Science-Oriented Students (Part 2)¹⁾

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1. Introduction

We present innovative approaches in teaching software application development to the students who major management and information sciences in undergraduate schools, and the students who major information systems in graduate schools.

Conventional lectures and practices for those students are apt to have either "programming technique-biased", "information technique-biased" or "management-biased" tendencies, depending on the lectures' majors themselves. In other words the teaching methods in software development courses have been relied on neither on the proper characteristics of software development per se nor the socio-technical needs of software from clients and society. The students should be able to deal with both business model construction and management information system development equally well. What do the efficient and effective teaching methods look like to get the students to understand how to make a business model that meets a company's strategy and requirement systematically, efficiently, fast and within a limited period of time and a limited budget?

To this end, we make full use of methodology both in business model construction and in management information system development. We have selected NetBeans IDE (Integrated Development Environment) in Java platform for software development and UML (Unified Modeling Language) for business modeling. The characteristic feature of NetBeans and UML are their visualizing capability of the model structure and the system architecture, and their operability based on their object-oriented programming concept and its methodology. As the objects on such a platform could we design screens and their sequences modularly and visually that deal with those data and procedures pertaining to and

traversing to organizational sections in business models.

2. Basic Concepts

Software development is carried out with the knowledge of programming and business management. The former requires a lot of rigorous and logical thinking, whereas the latter deals with the complexity of the underlying business concerned. In order to facilitate those knowledge and skills, we need to vividly show the students the depth and rigor of abstract thinking and complex logic, and the importance of a lot of practices. The core of our innovative teaching is "design abstraction and complexity." Design is to visualize managing complexity and those works require a lot of practices.

In practical situations, however, such as in our class rooms and in our laboratories, it is extremely difficult for the students to deal with software development problems mentioned above. Still it should be possible with our proper and patient guidance that the students move to higher levels of abstraction by practicing and experiencing design problems as comprised of subdivided pieces, if necessary, yet visual and self-contained and concrete systems that they build by themselves.

In our courses we exploit our tools that deal with the basic components of our business model and our system architecture where we manipulate designing screens and their sequences modularly and visually as objects. Our visual work is carried out with NetBeans IDE (Integrated Development Environment) on Java platform. One of the good frameworks to facilitate the visual modeling is UML (Unified Modeling Language).

3. Course Objectives

We present the case studies of the courses of the Undergraduate School, Department of

Management and Information, School of Economics, that the present author is in charge of:

◇ Undergraduate Schools

Department of Management and Information,
School of Economics,
Hokusei Gakuen University.

Courses (2013-2014)

■ Application II (Senior: 2nd semester)

■ Seminar II (2014)

< Objective >

Web application on Java Platform with Unified Modeling Language (UML) plugged in' which employs the Java EE (Enterprise Edition) category and the Enterprise Java Beans (EJB) technique with the JSF(Java Server Faces), JSP(Java Server Pages) frameworks along with the MVC (Model-View-Controller) design pattern in its contents.

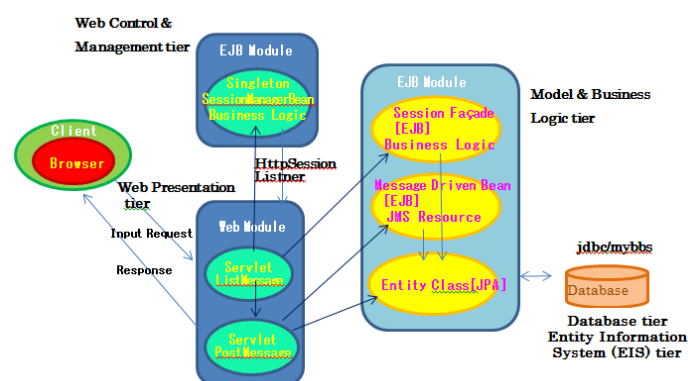
4. Contents and Teaching Material

We set forth the “Bulletin Board System (BBS)” construction as its teaching materials in several steps each of which has its own theme based on the course objectives. We present the Lab assignments, the subjects or functions of BBS and their methods and techniques.

Displayed below is the conceptual framework of the “BulletinBoardApp” Web application with the Model-View-Controller [MVC] Pattern: Web Presentation tier, Web Control & Management tier, and Model & Business Logic tier and Database tier. The latter two tiers might well be called the Enterprise tier consisting of Enterprise Java Beans (EJB) and JPA. The Web application can perform the database-related operations supported by JPA using Session Bean as a Façade. Servlets, JSP, JSF are responsible for contents representation but do not have transaction management and/or persistent functionality. Session Managed Bean is responsible for management in Web tier.

the prototype of our User Management System, where we design screens and manipulate their sequences corresponding to user management processes.

Lab Assignment	Functions of BBS	Methods and Techniques
Lab 1	Creation of databases in MySQL / Java DB	MySQL / Java DB Server, SQL, JSTL Code, JDBC Technology, SQL Language
Lab 2	Initial Menu	Enterprise Application, JSF, Facelets, EJB module, Web Archive (WAR) module, Managed Bean, JSP, GlassFish Server
Lab 3	Send Email from BBS	jMail, JavaMail API, sendMail(), Simple Mail Transfer Protocol (SMTP)
Lab 4	User Account and Password	
Lab 5	User Login and User Authentication	
Lab 6	File Uploading	HTML form, POST
Lab 7	Bulletin Board (Sending Messages)	JSF, Facelet, EJB module, Entity class, Message-Driven Bean, Session Façade, Web module, Singleton Session Bean, Servlet, JMS Resources
Lab 8	Logout	
Lab 9	MVC Design and Java Means	MVC design pattern



[1] H.NOTO,Hokusei Review, The School of Economics (Hokusei Gakuen University), Vol.54, No.2, March 2015 (to be published).