Web Service and Analysis on XBRL in Advanced Programming Course

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ACDM9, 3:08 - 3:30 p.m. Wednesday - Room: Liffey Meeting Room 2.
• Building programming experience for XBRL is important in the era of an information network society.

• Last academic year, the advanced programming course including web service and financial analysis for XBRL was opened in the Japanese university.

• This course provides an introduction to JavaScript programming language, and exposes students to practical programming techniques combined with internet web services.

• This presentation will discuss the way of teaching programming with XBRL for effective financial analysis, and its extension to university information analysis.
Programming Course

Advanced Programming (Programming B)

Masaaki Ida

Lectures or computer practice Labs, 2 sessions/week for 15 weeks, 1.5 hour/session, 4 credit course

Advanced course for Junior and Senior undergraduates, Departments of Accounting and Marketing

Texts: no required texts. Readings and sample codes are distributed or available online.
Course Description (1/2)

- This course is an introductory course to the JavaScript programming language for developing web sites.

- It is intended for those with little programming background (for social sciences).

- This course introduces the student to fundamental JavaScript programming concepts:

  - (contents) variables and data, functions, controlling program flow, JavaScript object model (window, document, image, ...), and JavaScript language objects (String, Array, Date, and Math objects).
Course Description (2/2)

• This course also addresses the development of internet web programming and its application to XBRL financial analysis.
  • RSS
  • XBRL and Financial Analysis

• **OBJECTIVE:**

• By the end of this course, student should be able to:
  • Utilize the basic programming technique of JavaScript,
  • Understand and use advanced web programming (Web API)
  • and Write small-scale Financial Analysis programs using the above skills
Assessment and Grading

- **Projects**
  - There will be two programming projects:
    - RSS reader
    - Financial analysis tool (using XBRL Instance)
  - Students are encouraged to collaborate, but any code and must be own.

- **Grading**
  - Assigned based on the following weights (No Exam):
    - Projects: 70%
    - Attendance and class-participation: 30%
Introducing programming

- Client and server
- Building web pages
- Contents, style, programming
- HTML, tags, CSS

JavaScript

- Adding JavaScript to web page
- Operators and expressions
- Arrays, loops, conditions
- Functions, input, returning values
- Selection: if-then-else, loops, arrays
- File reading, writing
- Form, browser, window, frame
- DOM
- jQuery (rendering: multicolumn, accordion, jqPlot, ...)
- Coding, debugging
Course Schedule (2/2)

Internet and Web service programming

- XML, JSON
- Ajax
- Web service (Web API)
- Internet and programming 1: RSS

Business and programming

- Financial report
- XBRL
- Instance, Taxonomy
- Financial analysis
- JSONP
- Internet and programming 2: XBRL and financial analysis
Project Results

• Students reports
  • Difficulty for social science students (not computer science)

• Coding Environment:
  • Development of RESTful API (callback function), JSONP data providing system
  • integrated development environment

• Examples
Programming Environment

- XBRL Instance, EDINET, Japan (Taxonomy)
- JSONP
- Other Web APIs
  - REST Type
  - WebAPI

- RSS (with API)
- Mashup Web Services (BI tools)
  - JavaScript (callback function, JSON)
  - Visualization (Reports, Comparative Analysis)

- developed system
University Information

- **Mashup** with other Web APIs
  - institution information
  - Nonprofit organization
  - higher education
  - ......

Example of university survey analysis for financial information (Total salary on sections)

Example of university survey data analysis (Annual expenditure of three national universities in Japan)
Conclusion

• (XBRL) advanced programming course
  • including web service and financial analysis on XBRL (practical programming)

• There remains issues:
  • Motivation (students: social science)
  • Brief description of XBRL in programming class
    • Instance, taxonomy, ...
  • Source internet data (XBRL Web API)
    • Development of RESTful Web API (callback function), JSONP data providing system
  • Textbook and sample programs (XBRL and computer programming)
  • Mashup with other information (university data, institution data)