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Reflections on Service-Learning Projects in Information Systems Project Management and Implementation Course

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Abstract

The paper presents an overview of previous research on service-learning in Information Systems. It extends on existing frameworks for implementing such courses. Reflections on five implementations of a service-learning Project Management course are summarized with the hope of enabling wider spread of service-learning in Information Systems education.

Keywords: service- learning, project management, Information Systems education.

INTRODUCTION

Service-learning is increasingly applied in business disciplines (Andrews, 2007:19). It is gradually developing a cumulative tradition in Information Systems (IS). Several papers appearing at the start of the last decade (see Lazar & Lidtke (2002), Hoxmeyer & Lenk (2003), Saulnier (2004)) pointed the relevance of service-learning in IS and the opportunities for practicing it. Service-learning is particularly applicable in the information systems and technology management (IS&TM) field, which continues to grow in complexity and hence the demand for experience (Wei, Siow & Burley, 2007). According to Hoxmeier & Lenk (2003:92), "IS service-learning projects can be introductory to advance in nature, with examples such as: documenting office hardware, software, and peripherals; documenting IS staff activities, analyzing system requirements and user acceptance; designing logical and/or physical solutions; training/surveying staff on new applications; and developing databases, spreadsheets, active web pages or other information system solutions" and these IS services can be

provided to government agencies and non-profit organizations.

Service-learning in Information Systems is treated broadly in the literature – from the traditional provision of an opportunity to the students to get practical experience to a way for increasing enrollment in IS programs (see Lawler & Joseph (2009)) or to the integration of service-learning experiences of IS students with liberal arts education (see Citurs (2009)). Critical success factors for service-learning in IS courses have been identified by Wilcox & Zigurs (2003) and Lawler (2011).

Andrews (2007) points to the strong tradition of service-learning in the United States and the growth of it between the late 1980s when Campus Compact was started to more than 1,000 institutions involved in 2006. According to the same author, theoretical research can be related to institutional characteristics, instructional methods, personal development, or academic outcomes in service-learning. Table 1 categorizes the sources that I have chosen as representative of service-learning research in Information Systems into these categories. Relatively little research is done in the first

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category but it is of little concern for the research that is reported here and will not be discussed further. Typical personal development characteristics that are aligned with Kolb's research on learning are presented in Hoxmeier & Lenk (2003). The difficulties of dealing with real projects, real clients and their diversity are well presented in Reinicke & Janicki (2010).

The general outcomes of service-learning and its characteristics are discussed in Lazar & Lidtke (2003). They list among the outcomes community service structured to relate to course material; immediate application of the material learned in the classroom; opportunity to strengthen their civic responsibility (Lazar & Lidtke (2003:2). The possible student learning outcomes in service-learning are discussed also in Preiser-Houy & Navarrete (2006) and in Hoxmeier & Lenk (2003).

Table 1. Topics in IS Service-learning and some representative sources in the IS literature

Major topic according to Andrews (2007)	Some relevant sources that fit the topic
Institutional characteristics	Hall & Johnson (2011), Lawler (2011)
Instructional methods	McCoy and Wymer (2010), Wei, Siow & Burley (2007);
Personal development	Hoxmeier & Lenk (2003), Reinicke & Janicki (2010)
Academic outcomes in service-learning	Lazar & Lidtke (2003), Preiser-Houy & Navarrete (2006); Hoxmeier & Lenk (2003)

This paper presents research in progress that deals more with the issues related to instructional methods and implementation of service-learning in the context of a senior course on IS Project Management and Implementation that has been taught by the author almost for a decade at a Northeast State University. There are relatively only a few papers dealing with IS project management in a service-learning context and the only one explicitly discussing instructional methods in such a course is the one by McCoy and Wymer (2010); however without a strictly defined methodology.

The contribution of this paper is that it combines the methodology for conducting service-learning projects identified by Wilcox and Zigurs (2003) for a general IS course the one defined by Wei, Siow & Burley (2007) for a course on IS professionalism and adapts a simplified version of both for the needs of a project management course. Another contribution is that it provides practical reflections on three more recent cases of applying the methodology in practice. The purpose of the paper is thus to provide the proposed framework for implementing service-learning in an IS Project Management and Implementation in an undergraduate IS program and reflections on its implementation over the last few years.

2. METHODOLOGY

McCoy and Wymer (2010) present their reflection on a service-learning IS project management course grouped around three issues: formation of student groups, assignment of projects and project management. Their work as well as that of Wei, Siow & Burley (2007) is guided in general by the critical success factors for implementing service-learning in IS projects identified by Wilcox and Zigurs (2003): necessary reflection or feedback, reflection by all stakeholders, grading on actual learning, careful project selection, relevance of the project to the intended academic program, partnership between stakeholders, optional involvement, balanced interests of all stakeholders, and careful selection of stakeholders.

A project management course is suitable for service-learning according to Lazar & Lidtke (2002). The specifics of our course involved not only service-learning but a rigorous coverage of IS project management and implementation theory which stresses the need for balancing of the service-learning goals of the course with its technical content learning goals. The way our service-learning project is organized is closer to the implementation model of Wei, Siow & Burley (2007) and can be summarized as follows:
1. Identification of clients and projects: Approaching prospective clients, Identifying appropriate projects, Developing project frameworks with clients.
2. Assembling of student project teams
3. Project conduct during the semester.

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The above is broadly linked to the model for implementing service-learning projects proposed by Wilcox and Zigurs (2003):

1. Project investigation.
2. Project initiation and analysis.
3. The DEW loop: Dedicate goals, Execute and Weigh feedback.
4. Final reflections.

The approach that is proposed here and is followed in our service-learning IS Project Management and Implementation course is a synthesis of the above models:

1. Coverage of Information Systems Project Management fundamentals.
2. Project identification, development of project scope and initial analysis.
3. Formation of student teams.
4. Execution of the project in parallel by every team independently.
5. Evaluation of feedback from the client and selection of the best project whose industrial implementation is taking place after the end of the semester.
6. Project assessment and reflections.

The above steps in our model will be illustrated through reflections on five mini cases representing recent implementations of our IS Project Management and Implementation course. The next section will describe briefly the academic course of concern and how it evolved into a service-learning course.

3. ON THE NATURE OF OUR INFORMATION SYSTEMS PROJECT MANAGEMENT AND IMPLEMENTATION COURSE AND ITS IPLEMENTATION INVOLVING SERVICE-LEARNING

One essential difference in the project management course of concern here from other work reported by Wei, Siow &Burley (2007), McCoy and Wymer (2010), Wilcox & Zigurs (2003), Citurs (2009) and others is the fact that we allocate the same project topic to all project teams in the class. Thus we promote excellence through competition in a real world environment and involvement of the client in the selection of the best design that is to be implemented in practice. The following paragraphs summarize the course experiences over the last few years and generate reflections and conclusions based on those experiences.

Brief Description of the Course and the Service-Learning Project

Systems Implementation and Project Management is a course that was developed in 2003-2004 by the Department of Management Information Systems as a result of a thorough program assessment in order to fulfill the need for better understanding of the theory and practice of Project Management. It also provides an opportunity for the students to go beyond the scope of the traditional Systems Analysis and Design course by implementation of an Information System developed by them. The course is offered once a year. There are three prerequisites for the course: Contemporary Application Development, Databases, and Systems Analysis and Design. As in many other Information Systems courses a major part of the course is the completion of a team project.

The students are required to develop and implement an Information System. Their activities must be planned and coordinated in a team setting. They use knowledge and skills from the previous Information Systems courses as well as Project Management knowledge, obtained throughout the semester. The deliverables of the project are: project management documentation, systems analysis and design documentation, system implementation documentation and the main artifact, the completed system.

During the first several years of running of the course, the developed system was based on a case description. The case used in the project was the same as the one used in the Systems Analysis and Design course. It was considered that such a practice would spare the students the time already spent on requirements analysis, modeling, and logical design and they can concentrate better on the physical design, development and implementation. The teams were permitted to peruse the outcomes of their Systems Analysis and Design project. However, this approach had some logistical problems. More importantly, most of the students were bored with the same case, used in both courses. A decision of the University management for increased community outreach provided a hint for a solution for the existing situation. In the following years, the student teams worked with real local clients: two nonprofit organizations and three small local businesses. One project was identified for each course run and the students were developing competing designs

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from which the best one was chosen at the end for final implementation. This service-learning opportunity provided different, much more rewarding experience, which will be discussed next.

Project Identification, Development of Project Scope and Initial Analysis

The contacts with the two nonprofit organizations were facilitated by the Community Outreach office of the University. They are described below.

Middlesex Chapter of the Red Cross Web Site: The new manager of the Middlesex Red Cross Chapter in Connecticut needed an improved web site with better interactivity, contemporary design and easy access for update of the content. The Chapter web site had to be coordinated with the main web site of the American Red Cross and to provide similar functionality without using the same server.

Hartford Courant Children's Camp: The manageress of one of the biggest urban summer camps in the country sponsored by the largest newspaper in our state needed a new web site with interactive features and contemporary design.

The contacts with the small local businesses on the other hand were facilitated by the Institute of Hospitality and Tourism of the School of Business.

Middle-East Restaurant: The owners of a newly opened ethnic food restaurant close to campus requested a web site with limited functionality, but required to be placed high in the search engines.

Floral Shop: The owner of a floral shop needed a new improved web site with better design, improved functionality permitting new business services, easy content management and cheaper hosting.

Scrap Metal Business: The Public Relations manager of a local business required improvements of an existing web site.

Formation of Student Teams

The average number of students enrolled in the class is between 20-24 students. They work in teams of four members. Prior to the selection of the teams, the students are asked by the instructor to complete a Myers-Briggs like personality test. When forming the teams, an attempt is made to put in every team one leading personality and at least one student with a nurturing/ balance seeking personality. The technical and business background of the students is also taken into account, given the fact that some of them have considerable part-time or full time IT experience. The purpose of this is to create a team environment as close as possible to real life. A week after the formation of the teams, a team leader is selected by the teams.

Execution of the Project in Parallel by Every Team Independently

In the first week of the semester the nine Project Management knowledge areas are briefly introduced to the students, followed by detailed study of Project Communication Management. The teams are formed then and the first task of every team is to create a project communication management plan. Part of the communication management is also the creation of a file sharing site. The purpose of such activity is not only to facilitate the file sharing and communication between the team members, but also to provide the instructor with the opportunity to observe the communication processes and the group dynamics within the team.

In the third week of the semester, the class is visited by the client. The client shares with the team's organizational and business information, past experiences and problems related to the project and answers any questions that come from the teams. This visit is recorded and placed in a shared folder.

Following the outline of the course, the teams continue with completing of a business case, project team contract, project charter, project scope, Gant chart, cost-benefit analysis, resource allocation, risk analysis and other project management planning related activities.

Next step in the work on the project is to prepare the system analysis documentation. Although already specified briefly in the project charter and the project scope, the functional and non-functional requirements are detailed now by the teams and relevant functional and data models are prepared and verified with the clients.

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The web sites are prototyped and hosting availability analyzed in the next set of activities. With the approval of the client, a choice is made for a host. Testing and implementation plans are drown up. After the implementation of the site, training manuals and instructional manuals for updating and using of the site are prepared.

Evaluation of Feedback from the Client and Selection of the Best Project

Finally at the end of the semester, the presentation of the projects takes place. The presentations have both a technical nature and include a sales pitch as they try to present the best functionality and design in order to impress the client by demonstrating the system. The clients make their choice of the best project a week after the demonstrations.

Together with the completed system and all supporting project management and system documentation, the teams also submit a Team Lessons Learned report, and each student submits individual reflections on the project. Finally there is a peer evaluation confidential form to be completed by each team member.

As seen from the above brief descriptions all cases were similar, involving the development of a web site with a database in the backend, but at the same time there were a lot of differences regarding the requirements as well the interactions between the teams and the clients.

Both nonprofit organizations were very clear in their requirements. After the initial meetings, they provided the teams with additional information and materials (text and pictures) in a very confident and timely manner. In order to minimize the time of the clients spent with the teams, all information – mission statement, goals, history of the organization, pictures etc, were placed in shared folders and were accessible to all teams. According to the team leaders, it was easy to schedule meetings and to obtain additional information when needed. The work on the Children's camp web site was somewhat complicated because the manageress insisted the hosting to be kept the same as their previous web site. Another interesting requirement was that Microsoft Office FrontPage should be used in spite of our suggestions for more contemporary tools to be used.

The interactions of the teams with the small business owners were more difficult. With the exception of the floral shop owner, the other two business representatives did not have clear idea of what they want. Some of their requirements were contradictory. It was not easy to schedule additional meetings after the first initial visit to the class.

Project Assessment and Reflections

Several components were evaluated and included in the final grade for the project, namely project management documentation, system documentation, completed system with respect to functionality and design, group dynamics (as observed by the instructor throughout the duration of the project), project presentation, team lessons learned and individual reflections. Peer evaluations also influenced the final project grade.

The lessons learned reports as well as the individual students' reflections clearly indicated that the interactions with the clients and the opportunity to work on a real life project have a very positive impact on the whole project management experience. The service-learning projects did allow the students to apply directly in a practical way what they learned in the course.

4. CONCLUSIONS

The opportunity to observe the impact of their work on the operation of a non-profit organization or a small business provided the students with a sense of pride with their civic engagement. The competition among student teams striving to develop the winning project was part of their preparation for the future work environment. Many students used the completed system as part of their electronic portfolios assisting them in the search for a job. Those important additional impacts of service- learning projects are further reinforcing student experiences in the project management and implementation course.

Service-learning projects provide the students with opportunities for gaining practical skills and abilities to apply the theoretical knowledge in real life. It is however not an easy path in practice as is outlined in Reinicke and Janicki (2010). The identification of suitable projects requires time and attention by the instructor in order to avoid infeasible projects within the constraints of the student expertise and the semester time limitations. The extra effort is usually over the standard duties of an instructor.

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Sometimes it is not easy to find such projects. However the benefits for the students listed in the previous section and the moral satisfaction from seeing the projects to successful completion in the local community justify the effort.

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