Faith Intregration Through Service-Learning in the Information Sciences

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1. Introduction

The mission of Messiah College is to "educate men and women toward maturity of intellect, character and Christian faith in preparation for lives of service, leadership and reconciliation in church and society." The incorporation of the service-learning model into the course curriculum can greatly activate this mission. Even though there is a sound biblical basis for service-learning, this does not always translate into practical application -- especially in the Information Sciences\(^2\) discipline. The Information Sciences discipline, however, offers significant opportunities for engagement with non-profit organizations (NPOs). Such organizations often lack the expertise, resources and time to leverage information technology to improve operational efficiency, effectiveness and value. Furthermore, students in this discipline are in high demand and often command significant salaries in the commercial sector upon graduation (Ellis, 2006). By exposing students to the opportunities and rewards of using their Information Sciences skills for the benefit of NPOs, students will be more open to pursuing such opportunities upon graduation, either vocationally or as part of community citizenship.

The purpose of this paper is to demonstrate that the Information Sciences discipline offers significant opportunities for meaningful service-learning engagement. Furthermore, this paper introduces a comprehensive service-learning taxonomy which currently does not exist for the Information Sciences arena. This taxonomy outlines the breadth and depth of service-learning

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\(^1\) The author wishes to acknowledge the support he received from the Lilly Foundation, World Vision and the Messiah College Collaboratory for Strategic Partnerships & Applied Research.

\(^2\) The Information Sciences discipline at Messiah College spans computer engineering, computer science and business information systems.
opportunities available within the Information Sciences discipline. A secondary purpose of this paper is to document a biblical basis for service-learning in the Information Sciences discipline.

2. **Background and Related Work**

   Historically, service-learning in the academy has focused predominantly outside of the Information Sciences (Droge, 1996). However, service-learning projects in the Information Sciences are beginning to emerge. Most of these efforts focus on the development of custom software to meet the specific needs of an NPO. For example, a recent service-learning project at Trinity College (Ellis, 2007) involved students developing a disaster management system for managing disaster relief for an NPO. Other service-learning projects focus on providing information technology (IT) support for school districts (Christensen, 2006). Another recent project (Rosmaita, 2007) focused on the development of a course outline that incorporated service-learning into a Computer Science course. Similarly, another institution outlined a capstone project in Information Systems that focuses on community-based projects (Leidig, 2006). Finally, a recent panel session (Ferguson, 2006) outlined the opportunities and challenges for service-learning in the Information Sciences. This review of the related work proved invaluable in the creation of the service-learning taxonomy defined in Section 5 of this paper. Consequently, each of the projects identified in the literature can be positioned in the taxonomy.

   While the recent activity in service-learning in the Information Sciences discipline is encouraging, it is still substantially disproportionate to such projects in fields outside of Information Sciences. Furthermore, no known service-learning taxonomy exists for the Information Sciences that outlines the breadth and depth of service-learning opportunities available to the discipline.
The author and others at Messiah College have been actively involved in service-learning projects in the Information Sciences for the past several years. The Appendix of this paper summarizes the wide range of service-learning projects being done in the Information Sciences at Messiah College. In addition, the author participated in a multi-year task force funded by the Lilly Foundation involving an interdisciplinary team of faculty focused on the definition of a service-learning taxonomy. This project was informative regarding the essence of service-learning as practiced in disciplines other than the Information Sciences. Collectively, these service-learning project experiences, as well as the interdisciplinary service-learning task force the author participated in, provide the basis for the Information Sciences Service-Learning Taxonomy defined herein.

3. What is Service-Learning in the Information Sciences?

At Messiah College, “service-learning is a pedagogical model which intentionally integrates academic learning with community service in a credit bearing academic course. Students participate in an authentic service activity which meets needs identified by the community (designed within the framework of a mutually beneficial relationship), and critically reflect on that activity. Thus, students gain a deep understanding of course content, a commitment to socially responsible citizenship, and develop skills and understandings needed to contribute to civic well-being.” (italics added) (Messiah, 2007)

The critical elements of service-learning are content, service and reflection (Messiah, 2007). In the context of the Information Sciences, the author’s experience is that content should be focused on readings, visuals and class discussion that specifically relate service to the course objectives. A reading example could include excerpts from Bryant Myers’ book, Walking with the Poor (Myers, 1999). Visuals could include video, photographs or experiences that offer the students an opportunity to learn more about the communities they will serve and how their work
can potentially impact the communities. Class discussion is used to amplify the relevance of service to the course in discipline-specific ways. The author’s experience is that *service* in the Information Sciences should be oriented towards specific assignments that address significant information technology needs of NPOs. Such needs cover a wide range of activities spanning the development of information systems to the installation of a computer network (see Appendix). The range of service opportunities in the Information Sciences is discussed further in Section 5 of this paper. The author’s experience is that *reflection* in the Information Sciences should focus on guided journaling done by the students on topics that relate the student’s service experience to Christian vocation, their personal faith journey, community outreach and responsible stewardship with the resources which God has entrusted to them. Samples of student reflections appear in Section 6 of this paper.

The author’s experience points to several key student benefits of service-learning in the Information Sciences. Student reflection journals confirmed the significant benefits that service-learning offered them. A summary of the key student benefits follow:

- **Applied experience:** Many students in the Information Sciences long to engage in the process of solving practical problems with information technology (IT). Service-learning experiences allow students to practice problem solving with an actual customer and organization. Such experiences also provide students the chance to apply the technology they have learned about in theory, but have not had the chance to apply in practice.

- **Ethics:** Service-learning experiences also allow students to address ethical issues such as software licensing, pricing and vendor claims of product functionality and performance. In addition, such experiences offer the opportunity for students to practice clear and honest communication with a customer.
• Professionalism: Students performing service-learning projects get to practice professionalism in the form of meeting planning, presentation development, project deadlines and trade-off analysis.

• Teams: Students are given the opportunity to work in teams as they perform service-learning projects. This is a critical skill that students must develop as they transition from college into the workplace.

• Project management: Service-learning projects allow students to practice and develop project management skills related to project planning, estimation and scheduling as well as communication and coordination. In general, such projects allow for the development of key interpersonal skills students will need to succeed in the workplace.

• Diversity: Students often get to experience and see diversity as they work with NPOs. Diversity occurs as students interact with people that are different from themselves in terms of socio-economic status, race, ethnicity and location around the world.

• Adversity: Students can also come to appreciate the adversity that comes with being poor, disabled or uneducated as they work with the NPOs that minister to people from such groups.

• Vocational exploration: Service-learning projects offer students the opportunity to explore their vocation, both in terms of the different types of organizations and the functional roles they would like to play within an organization.

• Culminating experience: Students often look at service-learning projects as the culminating or capstone project of their educational experience. These projects are often referenced to employers and others as a “rite of passage” into the workplace.

The author’s experience also indicates that NPOs also benefit from service-learning in the Information Sciences. Such projects improve the overall efficiency, effectiveness and value of
NPOs. These projects lead to improved marketing, fund raising, communications, service quality and increased capacity.

4. A Biblical Basis for Service Learning in the Information Sciences

It is important for students in the Information Sciences to understand the biblical emphasis on service as it relates to their discipline. From the author’s experience, many students in the Information Sciences have the distinct impression that service happens in other disciplines, not in the Information Sciences. Some students have decided against entering the Information Sciences discipline, even though they were gifted in that area, because they felt that serving God was more readily done through a major outside of the Information Sciences. A proper biblical view of service via the Information Sciences can have a transformative impact on faculty and students as they begin to see their technology skills as part of God’s provision to serve Him.

A biblical basis for service-learning and service in the Information Sciences follows. In particular, God calls us to:

- *Minister globally to those in need*: God calls us to minister globally to those in need, whether they are around the corner or around the world (Matthew 28:19-20). Isaiah 58:10 (NIV) states that “if you spend yourselves in behalf of the hungry and satisfy the needs of the oppressed, then your light will rise in the darkness, and your night will become like the noonday.” Matthew 25:34-40 also calls us to minister to the physically and spiritually hungry, thirsty, lonely, unclothed, imprisoned and sick. Scripture says that “… whatever you did for one of the least of these brothers of mine, you did for me.” Matthew 25:40 (NIV). Scripture also implores us to remember the poor (Galatians 2:10) and to carry each other’s burdens (Galatians 6:2, James 1:27). Service-learning projects with NPOs in the Information Sciences provide an excellent opportunity for students to directly minister to those in need. In addition, projects in the Information Sciences indirectly contribute to those in need as such
projects often lead to improved administrative efficiencies, improved organizational capacity and improved fund-raising capabilities. This is strategic, as many NPOs spend a disproportional amount of time on administrative matters when they could be ministering to those in need. For example, World Vision International has found that 50% of frontline staff time is devoted to satisfying administrative requirements (World Vision, 2007). Thus, by developing information systems for NPOs, staff personnel are freed up to further minister to their constituents.

• Focus on the eternal: Degrees in the Information Sciences are among the most lucrative of all college degrees (Ellis, 2006). Students in such disciplines need to take heed to scripture that encourages us to focus on the eternal and not to “… store up for yourselves treasures on earth, where moth and rust destroy, and where thieves break in and steal.” Matthew 6:19 (NIV). Scripture instructs us that “… where your treasure is, there your heart will be also.” Matthew 6:21 (NIV). An eternal focus means that we should “… become all things to all men so that by all possible means I might save some.” 1 Corinthians 9:22 (NIV). 1 Timothy 6:18 (NIV) also commands the Christian to “… do good, to be rich in good deeds, and to be generous and willing to share.” By doing so, we “… will lay up treasures for [our]selves …” 1 Timothy 6:19 (NIV). Service-learning projects in the Information Sciences offer students the unique opportunity to experience using their gifts for a purpose beyond themselves and to explore the issues related to the stewardship of their talents as it relates to eternity.

• Work diligently and show love as unto the Lord: God calls us to present ourselves as approved workers (2 Timothy 2:15). 1 Peter 4:10 (NIV) states that “Each one should use whatever gift he has received to serve others, faithfully administering God’s grace in its various forms.” Similarly, Romans 12:3-8 instructs us to serve Him with our talents. Ephesians 4:28 (NIV) says that we are to do something useful with our own hands “… that we may have something to share with those in need.” God calls us to use our gifts as an act
of service to the Lord and to “share with God’s people who are in need …” Romans 12:13 (NIV). In Matthew 22:36-40, God calls us to love our neighbors as ourselves. Colossians 3:23-24 (NIV) instructs us that “Whatever you do, work at it with all your heart, as working for the Lord, not for men, since you know that you will receive an inheritance from the Lord as a reward. It is the Lord Christ you are serving.” Finally, Acts 20:35 (NIV) states that “our hard work … must help the weak, remembering the word of the Lord Jesus himself: ‘It is more blessed to give than to receive.’” Students in the Information Sciences should be encouraged to work diligently and share their gifts with those in need as if doing so for the Lord.

- Serve as an act of obedience: Once students are exposed to the biblical call to minister globally to those in need, to focus on the eternal, to work diligently and to show love as unto the Lord, they should be encouraged to see service to others as an act of obedience to God. As Christians, James 1:22-25 calls us to be doers of the word and not merely listeners. James 2:14-24 informs the Christian that faith and action go hand-in-hand. That is, as James 2:20 (NIV) says “… faith without deeds is useless.” Students in the Information Sciences should be encouraged to see service as a proper response to what God has done for them and as an act of obedience and love to Jesus Christ.

A biblical view of service-learning should serve to motivate educators and students in their desire to serve God through their discipline. It should also inform students as they write their journal reflections on service in the Information Sciences as part of their service-learning experience.

5. A Service-Learning Taxonomy for the Information Sciences

Having established a biblical basis for service-learning in the Information Sciences, a framework for service-learning in the context of the Information Sciences is needed. Many
disciplines in the academy have embraced service-learning for some time (Droge, 1996 and Heffner, 2002). Several generic frameworks have been developed to help inform the academy about the forms of service-learning. For example, Musil developed a service-learning taxonomy and maturity model around levels of engagement and authenticity (Musil, 2003). As discussed in Section 2 of this paper, service-learning in the Information Sciences is beginning to emerge. However, service-learning projects in the Information Sciences are still in their infancy and are still substantially disproportionate to such projects in fields outside of Information Sciences. Furthermore, no known service-learning taxonomy exists for the Information Sciences.

The service-learning taxonomy for the Information Sciences discipline defined in this paper should serve to inform those in the discipline about the range of opportunities available to engage in service-learning. This is an important contribution in a discipline where such a taxonomy has yet to emerge and relatively little service-learning engagement occurs. A service-learning taxonomy that delineates opportunities for service in the Information Sciences will serve to broaden the scope of service within the discipline as faculty and students become more aware of the vast array of possibilities for service-learning.

The Information Sciences service-learning taxonomy defined herein is based on actual service-learning experiences (see Appendix) performed in the Information Sciences discipline at Messiah College. The taxonomy itself is a two-dimensional space. The first dimension of the taxonomy is the activity type. An activity type defines a functional unit work to be performed in the context of a service-learning engagement. The second dimension of the taxonomy is scope. Scope defines the span of tasks completed in the context of a service-learning engagement.

Examples of activity types include training, professional services and custom software development. Table 1 follows and defines the activity types for service-learning in the Information Sciences. For each activity type, the table:
• defines the focus or nature of the activity type,

• outlines the level of engagement typically required on the part of faculty-student teams to perform this activity type,

• describes the key skills required to perform the activity type,

• provides an example of the activity type.
Table 1: Information Sciences Service-Learning Activity Types

<table>
<thead>
<tr>
<th>Activity Type</th>
<th>Focus</th>
<th>Engagement Level</th>
<th>Key Skills</th>
<th>Example</th>
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</thead>
<tbody>
<tr>
<td>Training</td>
<td>Focuses on imparting knowledge or skill needed by the staff of NPO(s).</td>
<td>Low</td>
<td>Subject matter expertise (SME), training development</td>
<td>Microsoft Office training for NPOs</td>
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<tr>
<td>Professional Services</td>
<td>Focuses on providing expert advice on Information Sciences issues facing an NPO.</td>
<td>Medium</td>
<td>Problem solving, SME</td>
<td>Strategic IT Advisory Board for a NPO</td>
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<tr>
<td>Systems Selection</td>
<td>Focuses on defining the system needs of an NPO, identifying candidate solutions, evaluating identified solutions, recommending a solution and transitioning the solution to an NPO.</td>
<td>High</td>
<td>Problem solving, consulting, product research and evaluation, product installation.</td>
<td>System analysis, selection and installation of donor mgt. system for an NPO</td>
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<tr>
<td>Support/Help Desk</td>
<td>Focuses on providing customer support related to an application or system for NPO(s).</td>
<td>Medium</td>
<td>SME, listening, trouble-shooting.</td>
<td>Providing support for local area network for NPOs</td>
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<tr>
<td>Custom Development Projects</td>
<td>Focuses on the full life cycle development of a custom application for an NPO.</td>
<td>High</td>
<td>Software development, project management</td>
<td>Integration of bar code system with asset mgt. system</td>
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<tr>
<td>Product Development Projects</td>
<td>Focuses on the full life cycle development of a product application that is common to several NPO(s).</td>
<td>High</td>
<td>Software development, project and product management</td>
<td>Impact Assessment portal for NPOs</td>
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Examples of scope include research, analysis and design. Table 2 defines the scope for service-learning.

Table 2: Information Sciences Service-Learning Scope

<table>
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<tr>
<th>Scope</th>
<th>Description</th>
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<tr>
<td>Research</td>
<td>Spans the tasks of problem identification and concept definition.</td>
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<tr>
<td>Analysis</td>
<td>Spans the tasks of requirements discovery, documentation and validation of a business process or system.</td>
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<tr>
<td>Design</td>
<td>Spans the tasks of architecture, database design, user interface design, communications design, workflow design and report design.</td>
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<td>Implementation</td>
<td>Spans the tasks of detailed design and implementation of a system.</td>
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<td>Test</td>
<td>Spans the tasks of integration, system and user acceptance test of a system.</td>
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<tr>
<td>Transition</td>
<td>Spans the tasks of installing a system and migrating from the old system to the new system.</td>
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<tr>
<td>Assessment</td>
<td>Spans the tasks of performance, usability, efficiency, effectiveness and value/impact assessment of a system.</td>
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Structurally, the service-learning taxonomy forms a matrix where the rows of the matrix are the activity types, the columns of the matrix define the range of scope and a specific service-learning engagement is placed in one or more cells of the matrix. Table 3 follows and depicts the full Information Sciences Service-Learning Taxonomy. It has been populated with representative projects completed at Messiah College over the past several years. The specific projects listed in Table 3 are further described in the Appendix of this paper.
<table>
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<tr>
<th>Activity Type</th>
<th>Scope</th>
<th>Research</th>
<th>Analysis</th>
<th>Design</th>
<th>Implement</th>
<th>Test</th>
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<th>Assessment</th>
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<td>Training</td>
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<td>MS-Office Training for Area NPOs</td>
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<td>Professional Services</td>
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<td>Install LAN for CAPC</td>
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<td>Systems Selection</td>
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<td>Research/Select Mgt. Information System for CAPC</td>
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<td>Donor &amp; Member Management System for MC Collaboratory</td>
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<td>Support/Help Desk</td>
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<td>Custom Development Projects</td>
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<td>World Vision LEAP Impact Assessment Application</td>
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<td>CURE Intl. Inventory Barcode System</td>
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<td>Upper Allen Fire Dept. Purchase Order System</td>
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<td>MC Summer Basketball Camp MIS</td>
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<td>Product Development Projects</td>
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<td>Explore Impact Assessment Product</td>
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6. **Student Reflections on the Significance of Service-Learning in the Information Sciences**

Perhaps the significance of service-learning in the Information Sciences can best be summarized by reading sample reflections from student journals from the World Vision LEAP project. One student wrote: “It still boggles me to think that I could participate in mission and humanitarian work by doing something I like to do: writing computer software.” Another student wrote: “So not only is this a project I had fun working on, it’s something that will be useful for spreading Christian love. This has really been an eye-opener to me, since I always had a hard time trying to reconcile my calling as a Christian with my passion for computer programming.” The student continued: “… I realize more as time goes on that the experience has helped me mature in a profound way.”

Some of the student reflections are deeply personal and demonstrate the spiritual impact of service-learning on students. One student wrote: “Sharing my time and energy on this project has really been about sharing my heart and soul with the poor in Africa and around the world. When I look at it from that perspective, it becomes one of the most important things I have ever been involved in.” Still another student wrote: “This project is not just a graded assignment or a critical thinking exercise or a piece of software to add to someone’s bottom line. It is an expression of love; of the love I share with Christ for those who have been abandoned by this world. I feel that God has called each and every one of us, computer scientists [alike], to use our skills and talents in creative ways as conduits for his love on this broken earth.”

7. **Conclusions and Future Directions**

The Information Sciences discipline affords numerous and unique opportunities for students to apply their gifts, skills and knowledge via service-learning. Although the application of service-learning is emerging within the Information Sciences discipline, the taxonomy defined
in this paper serves as a critical tool to encourage faculty to broaden the scope of service-learning within the discipline. It outlines the types of activities that can be pursued as service-learning such as training, professional services, systems selection, support/help desk, custom development projects and product development projects. Furthermore, it outlines the scope of tasks that can be completed: research, analysis, design, implementation, test, transition and assessment.

This paper demonstrates a sound biblical basis for service-learning. Namely, that God calls us to: (1) minister globally to those in need, (2) focus on the eternal, (3) work diligently and show love as unto the Lord and (4) serve as an act of obedience. This biblical basis should motivate faculty and students of faith to seriously engage in such acts of service.

There are a number of important future directions for this work. First, the Information Sciences community would be well-served by a published collection of recent papers that document specific service-learning projects across the defined taxonomy. Secondly, it would be useful to develop specific models for promoting the practice of service-learning across local and global NPOs. This would include soliciting projects, assessing their feasibility, performing such projects and transitioning the results of such projects to organizations. Thirdly, more research needs to be done on the best way to develop products that serve the needs of multiple organizations in a service-learning setting. Such products offer enormous potential leverage as they may be useful to many organizations. In addition, more research needs to be done on models for the sustainability of projects and products developed in a service-learning context. Finally, research needs to be done on how to best measure the impact of service-learning in the Information Sciences on both the students and the organizations they serve.

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3 The term “sustainability” refers to the long-term ability of faculty-student teams and NPO staff to maintain, evolve and support the software and systems initially developed in a service-learning context over time.
Appendix: Case Study Applications of the Service-Learning Taxonomy

Table 3 serves the dual purpose of depicting the overall service-learning taxonomy and listing sample service-learning projects completed by Messiah College faculty and students. This Appendix briefly describes each of the projects listed in Table 3.

- MS-Office Training for Area NPOs: This semi-annual event offers the staff of Central Pennsylvania NPOs the opportunity to receive training on Microsoft Office™. This project happens in BIS 230 (Computer Applications) under the direction of a faculty member. Students, however, design and deliver the training and NPO participants complete a feedback questionnaire at the end of the training.

- Install LAN for CAPC: This project involved a student-faculty team performing the professional service of designing, implementing and testing a local area network (LAN) for the Capital Area Pregnancy Center (CAPC) (www.capchelp.org). The team also transitioned the LAN to CAPC personnel so they could administer the LAN.

- Research/Select Management Information System for CAPC: This project occurred in the 2006 Spring semester of BIS 412 (Systems Analysis & Design Applications); the BIS major capstone course. CAPC had a need for a web-based distributed scheduling system to replace their manual scheduling method. The students formed a team under the direction of a faculty member and managed the complete life cycle spanning research through to testing and transitioning the application to CAPC staff. After extensive research and evaluation, the team selected the eKyros (www.eKyros.com) application, a web-based pregnancy center management information system that included functionality far beyond distributed scheduling (client management, donor management, reporting, etc). The students also raised $2,000 so that CAPC could purchase the software. CAPC is fully operational with eKyros. The project is chronicled at http://joshuaeverhart.com/bis412/. Students completed reflection papers that demonstrated the significant impact the project had on them.
• Donor and Member Management System for Messiah College Collaboratory: The Messiah College Collaboratory for Strategic Partnerships and Applied Research had a need for a management information system to manage donors, volunteers and members. This project was done in the 2007 Spring semester of BIS 412. The students formed a team under the direction of a faculty member and managed the complete life cycle spanning research through to testing and transitioning the application to Collaboratory staff. After extensive research and evaluation, the team selected the CiviCRM open source application (www.civicrm.org), a web-based constituent relationship management system designed specifically for NPOs. The project is chronicled at http://collaboratory.messiah.edu/wiki/index.php/BIS-412.

• World Vision LEAP Impact Assessment Application: World Vision International (www.wvi.org) is the world’s largest Christian relief and humanitarian organization with over 25,000 employees in 100+ countries. World Vision had a need for a web-based application for planning, designing, monitoring and tracking the impact of field ministry activities. World Vision developed a formalized approach to field ministry known as LEAP (Learning through Evaluation with Accountability and Planning). World Vision provided a grant to Messiah College for faculty and students to develop a prototype system to support the LEAP framework. This project has been ongoing since 2005 in CSC 333 (Database Applications) under the direction of a faculty member, where students form teams and research and develop new features of the LEAP system every year. In addition, the World Vision grant provides funding for faculty and work-study student stipends so that work can continue on the project during the summer months. The funding also provides support for travel to Africa and related computer equipment. The project is chronicled at www.leapmanager.org.
- CURE International Inventory Barcode System: CURE International (www.curenetcomm.org) is a Christian organization that provides medical equipment and related services to needy areas of the world. The organization had a database of all of its medical equipment, but lacked the ability to track the equipment as it traveled throughout the world. In the 2004 Spring semester of CSC 333, a four-person student team under the direction of a faculty member, researched, designed, implemented, tested and transitioned the integration of a barcode tracking system from Symbol Technologies into the CURE International medical equipment database. The project is chronicled at http://home.messiah.edu/~bnejmeh/CSC33304/cure/DbApps/index.htm.

- Upper Allen Fire Department Purchase Order System: A local volunteer fire department desired a purchase order system to better manage and track purchase orders. In the 2003 Spring semester of CSC 333, a student-led team under the direction of a faculty member developed a Microsoft Access-based purchase order system custom application. This system has been utilized by the Upper Allen, PA Volunteer Fire Department since 2003. The project is chronicled at www.home.messiah.edu/~bnejmeh/csc333b/bb1176/.

- Messiah College Summer Basketball Camp MIS: Messiah College runs a significant summer basketball camp program for several hundred young people. The director of the camp desired a system to manage the complete camp from registration through to team assignment and bank account management. In the 2003 Spring semester of CSC333, a student-led team under the direction of a faculty member developed a Microsoft Access-based basketball camp management system. The system has been in use by the camp since 2003. The project is chronicled at www.home.messiah.edu/~bnejmeh/csc333a/nr1157/index.html.

- Explore Impact Assessment Product: Several non-government organizations (NGOs) have expressed interest in a web-based field ministry impact assessment system similar to the
World Vision LEAP system described above. A team of faculty and students are beginning to research and explore how the existing LEAP system could be generalized into a product so that multiple NPOs could use the same software.
References


