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Purdue

West Lafayette, Indiana



College of Technology

Packaged applications software systems: Learning outcomes

In partial fulfillment of the requirements for the Degree of Master of Science in Technology

> A Directed Project Blake Haan

August 15th, 2010

Committee Member

Kevin Dittman, Chair

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Approval Signature

Date

10-8-10

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College of Technology **Graduate Studies**

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Title of Directed Project: Packaged applications software systems: Learning outcomes

For the degree of

Master of Science

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CHAPTER 1. INTRODUCTION

1.1. Objective

The question I am answered is: what course materials can I develop within the current Purdue Computer and Information Technology curriculum in order to increase the exposure undergraduates have to the benefits, challenges, and scope of packaged software systems?

1.2. Significance

One of the largest issues facing technical curricula at universities is keeping pace with the changing landscape of computer systems within organizations. This directed project's scope involves developing an undergraduate course that exposes students to the benefits, challenges, and breadth of the large packaged software systems that many companies implement. The researcher feels that this is a large gap in the curriculum at many universities, but this project will be focused on Purdue University, because many of Purdue Computer and Information Technology undergraduates will work on these systems with very limited experience. This directed project's output is a newly developed course in which undergraduates will gain an intimate knowledge of packaged systems including analysis, benefits, disadvantages and shortcomings, and the integration of these systems within current business platforms.

1.3. Scope

Within this directed project, an undergraduate, three-credit hour course was developed. The deliverables for this project include the following items. Additional deliverables may be included into this project in order to meet any applicable accreditations.

A syllabus was prepared outlining the overall goals, requirements, and objectives of the course. This syllabus was made in accordance with the Purdue University Computer and Information Technology (C&IT) program syllabus template. Included in this syllabus are sections titled Course Description, Meeting Times, Keywords, Textbooks and Materials, Audience, Objectives, Requirements, Grading, and Policies. Additionally, a course model was created for this course. The course model follows the current Purdue C&IT standards.

An outline of the course schedule was prepared. This outline contains the topics for each lecture and the timing of the assessments, examinations, and group project. This outline provides the day-to-day activities of the course.

One or multiple textbooks were evaluated and selected based upon the established themes and objectives of the course. In addition to the textbook, other materials such as journal articles, white papers, or presentations may be required to provide students with the proper literature needed.

Key lectures were outlined and developed for this course. With these outlines, PowerPoint presentations can be developed with the intention of being used to facilitate the lecture and discussion of a given topic. These lectures all begin by highlighting the themes and objectives of the individual lecture and end with a recap of what was covered.

In order to promote detailed learning student collaboration, course assessments were developed. These assessments encompass the main themes and objectives of the course. In addition, these assessments should provide a valuable tool for students to gather hands-on experience in synthesizing the knowledge gained during this course.

Evaluation of this course material and the methods to deploy this material was performed by Purdue University faculty as they incorporate these materials into the current curriculum.

1.4. Definitions

This study assumes the following definitions:

- Acquisition The set of activities performed to procure, develop, and maintain a system (Meyers & Oberndorf, 2001).
- Bolt-on A smaller packaged component which provides an extension of functionality from a larger packaged software system.
- Build versus Buy The decision an organization must make regarding any software change. Build is defined by internal development. Buy is defined by the procurement of an externally developed product.
- Business Process Redesign/Reengineering The fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service, and speed (Hammer & Champy, 1993).
- Change management (CM) A framework for managing the effect of new business processes, changes in organizational structure or cultural changes within an enterprise.
- Configuration The changing of modifiable settings within a packaged software application in order to satisfy a business requirement so that the organization can gain or retain a competitive advantage.

- COTS Commercial off-the-shelf software packages (Meyers & Oberndorf, 2001).
- Critical Success Factor (CSF) To avoid such costly failures, much effort
 has been expended to identify the key factors necessary for successful
 implementations (Wang, Shih, Jiang & Klein, 2008)
- Customization Replacing packaged software components or processes
 with proprietary code or processes in order to satisfy a business
 requirement so that the organization can gain or retain a competitive
 advantage.
- Enterprise Resource Planning (ERP) Enterprise Resource Planning system is an enterprise-wide information system designed to coordinate all the resources, information, and activities needed to complete business processes (Esteves & Pastor, 2007).
- Functionality The existence of a set of functions and their specified
 properties to satisfy stated or implied needs (Meyers & Oberndorf, 2001).
- Governance the leadership and organizational structures and processes that ensure that the organization's IT sustains and extends the organization's strategies and objectives (IGI, 2003).
- Packaged Software Software components which are purchased from a vendor. Packaged Software is also known as COTS software.

- Packaged software analysis The cross-referencing of the business requirements of an organization with the evaluation and selection of a packaged software system.
- Performance Indicator (PI) A performance evaluator necessary to align the production status with the implementation objectives and to highlight the effectiveness of the system (Wei, 2008).
- Request for Proposal (RFP) A document that explicitly defines the elements expected in proposals that contractors submit to bid on a given contract (Meyers & Oberndorf, 2001).
- Systems Development Lifecycle (SDLC) A system development life cycle is a logical process by which developers and end-users build information systems to solve business problems and needs.
- Total Quality Management (TQM) Total Quality Management is a philosophy with a system science point of view that focuses on continuous improvement within the organization so as to provide superior value to customers. The central theme of TQM stresses three principles, i.e. customer satisfaction, employee involvement, and process improvement (Li, Markowskia, Xua & Markowskia, 2008).
- Top Management Any manger to whom a project manager reports directly; typically a CIO or vice president within an organization.

1.5. Assumptions

The assumptions for this study include:

- Principles of ERP system lifecycles can be applied to most packaged software system lifecycles.
- The feedback received from all parties is honest and complete.
- The studies used in references are accurate, ethical, and complete.
- Organizations have a need for individuals to be trained on analyzing and working with packaged software systems.

1.6. Limitations

The limitations for this study include:

- The materials created by this project will comprise topics relevant to packaged software systems only.
- The materials created by this project will not show bias towards any specific packaged software.
- The materials created by this project will provide a methodology to be used in the selection analysis, design, and implementation of packaged software systems.
- The materials created will be enough to form a complete three credit hour course at Purdue University.
- The materials created will be in conjunction with the Purdue University Computer and Information Technology curriculum.

1.7. Delimitations

The delimitations for this study include:

 This project will focus on ERP systems as COTS examples but not limit applicability the deliverables of this project to ERP systems.

- This project will not study project management as applied to packaged software implementations in depth.
- This project will not cover individual technical skills such as coding, database administration, etc.
- This project will not cover de-commissioning a legacy system in depth except for when discussing a system cutover.
- This project will not produce any deliverables outside of the scope of this document.

1.8. Summary

In order to answer the question posed by the researcher of this directed project, an undergraduate, three-credit hour course was developed. A syllabus, outline, key lectures, course assessments and other materials were created in order to facilitate the learning of these materials. This directed project should help to enable current students in their knowledge of packaged software systems and provide greater advantages for these students in their post-graduation careers.

CHAPTER 2. REVIEW OF LITERATURE

2.1. Approach to This Review

The purpose of this literature review was to create an overall understanding on the benefits, challenges, and scope of a packaged software system. This review is focused around several key areas of the system lifecycle of such a system. The review of this literature will provide important insight into the advantages, challenges, and general scope of these lifecycle stages. General themes in this review are the success factors for a packaged software implementation, fit between the needs of different organizations involved in the implementation, and the management of a packaged software implementation. These materials were collected with the final goal of presenting these themes within an undergraduate course on packaged software systems. It is important to note that many materials will be specific to ERP systems but that their lessons can be transferred to almost any packaged software application system.

2.2. Build Versus Buy

Traditionally, the main question for any information technology project which involves software is "to build or to buy?" Many organizations have felt that they could develop software which covers all of their requirements in a cheaper manner than buying a packaged software system which might have only covered most requirements. Due to the increased integration between business processes and the software used for these processes, it has become apparent that building a robust software solution would be extremely difficult for any project with any discernable scope. Weir and Mickool (2003) argue that no organization

"has the processes, retainable skills, or investment capability to build "industrial strength" production software on a scale comparable to its needs" (p. 6).

Due to this increased integration, Wier and Mickool further argue that the main software question is not "build or buy" anymore, but rather how to assemble the software that the organization has either built or bought. Meyers & Oberndorf (2001) support this new paradigm by saying that the increased buying, or acquisition of packaged software systems, has changed the philosophies of organizations from the traditional design, develop, and implement lifecycle to an indentify, purchase, and integrate lifecycle (page 8).

2.3. Packaged Software System Benefits and Challenges

Packaged systems are powerful tools for creating efficiency in business processes. These systems are highly popular due to their ability to provide improvements in operational efficiency (Chou & Chang, 2008). For example, ERP systems provide companies with greater task efficiency in almost every area of the business, whether it is supply chain management, human resource management, or accounting and financial management. Because these systems provide such a breadth of business process support, they are extremely costly investments for organizations, yet ERP's can provide great value to an organization. Due to the high risk nature of these investments, it is very important for one to be aware of the challenges facing implementation teams. One of the primary challenges facing these teams and their managers is management of the costs of implementation (Plaza & Rohlf, 2008). Two major internal areas where costs can be greatly variable are the identification of success factors for an organization and the customization of the product. Other factors which can influence costs dramatically include the vendor selection, the corporate culture, and the change management practices of the project.

2.4. Packaged Software Selection

As noted earlier in this research, the lifecycle for packaged software implementation takes more of a "indentify, purchase, and integrate" approach (Meyers & Oberndorf, 2001) than the traditional "design, develop, and implement" approach. The phases of packaged software selection will focus on the identification and purchase of a packaged software system.

2.4.1. Critical Success Factors

The primary metric used in measuring the success and value of a packaged software implementation is the critical success factor. These factors provide the business and implementation team with the basis for setting project requirements. Wang, Jiang, and Klein (2008) argue that businesses that match both internal and external critical success factors must be aligned to increase the chance of an implementation success. Several others including Ehie and Madsen (2005) support this argument by showing that up to eighty-six percent of variances in ERP implementation can be attributed to eight critical success factors as seen in figure 2.1.

It is important to note that these success factors require resources from both the internal, or Information Technology (IT) departments and the external, or business, side of the project. This process of aligning the objectives from the internal and external project perspectives is commonly referred to as IT project governance and this will be covered in greater detail in the section on fit.

2.4.2. Gap Analysis

Gap analysis is loosely defined as the difference between an organization's processes "as-is" and the processes that are desired, or "to-be". While these processes are often completely re-evaluated during a packaged software implementation, it is important in the gap analysis stage of a project to

identify which aspects of these processes can be enhanced by or affected by a packaged software implementation. Because methodologies such as TQM are utilized by organizations to ensure that the overall business processes are both efficient and provide steps to reduce the risk of error, there is a need to gather project requirements that are in concurrency with the value adding processes established in an organization (Li, Markowskia, Xua, & Markowskia, 2008) while also identifying the opportunities for adding value.

The gap analysis stage is often the first real introduction users have to the new system and the first impression that these sessions create can go a very long way towards overall system acceptance. Chou and Chang (2008) state that "the high failure rate of ERP implementations might be attributed to the difference in interests between customer organizations that aim to provide the optimum solutions for business problems and ERP vendors who prefer a generic solution applicable to a broader market" (p. 149). This perception also is persuaded by the support of upper management, which will be outlined in the project management section.

2.4.3. Total Cost of Ownership

Because ERP systems provide such a breadth of business process support, they are extremely costly investments for organizations. Nevertheless, they can provide great value to an organization. The initial price tag for an implementation should include the total cost of ownership of this application. As noted earlier, Chou and Chang (2008) show that firms with greater customization have a higher rate of coordination and task efficiency to their company, but impacts could include a future scenario in which the packaged software system forces a business to use the over-customized solution. Plaza and Rohlf (2008) have noted that a highly-trained IT staff can reduce the need for consulting help, but the changing business objectives will always provide a demand for changes to a packaged software system after go-live. These changes and the annual

maintenance associated with system upkeep combine to form the total cost of ownership.

2.4.4. Return on Investment

Total cost of ownership is one factor that weighs heavily on the return on investment (ROI) calculation. Return on investment is typically an upfront calculation for an information technology product. There are other calculations such as rate of return or time to recoup costs, but return on investment is the primary driver for green-lighting a project. Packaged software systems often come with a vendor's estimated return on investment figure, but each implementation is different. Brandel (2006) points out that many companies fall into the trap of never checking the return on investment after the completion of a project. She argues that by circling back, companies can discover other ways in which a software system adds value, even after the official project has been completed.

2.4.5. Request for Proposal and Evaluation of Vendor

With the shift in approach from a traditional "design, develop, and implement" approach to a "indentify, purchase, and integrate" approach there also has been a shift in the RFP process. The RFP must be written so that the prospective vendors understand that there is a balance between the business requirements and the requirements for having a packaged software system. Meyers & Oberndorf (2001) state that this balancing act requires both parties to make trade-offs in order to reach the ideal total cost of ownership for the organization. The organization must realize that no software solution will satisfy every requirement right out of the box. The RFP document needs to outline the priorities of the goals of the project and what trade-offs are acceptable.

With a shift to a more packaged software-based approach there has also been a shift in the desired vendor qualifications. The vendors must realize that a

proposal which highlights skills such as integration, flexibility, and specific packaged software experience will be preferred to robust development skills. Miller and Yeoh (2006) take this a step further with their VERPRO (Vendor Economics and Risk Profiler) model. This model extends the usual taxonomy of evaluating vendors on cost and product to include evaluations on product leadership, financial strengths, and business risks. One important point of these vendor evaluation methodologies is that an organization can never overlook the references for a vendor, either primary or secondary.

2.5. Management

Ehie and Madsen's (2005) chart in figure 2.1 shows the importance of project management on the overall success of an ERP implementation (p. 553). Their research shows that project management principles and top management support are, respectively, the first and fifth most influencing factors on packaged software implementation success. While it has been shown that there must be governance in place to regulate the fit between internal and external success factors, it is also important to note that a "sound and thorough understanding of project management principles and their applications are critically linked to successful ERP implementation" (p. 555).

In addition to the project managers, top-level managers also play a critical role in the success of an implementation. Ehie and Madsen (2005) also note that "lip service or lukewarm support from top management is the 'kiss of death' for an ERP implementation" (p. 555). A lack of top-level support undermines the credibility of the solution and provides a basis for end users to begin to resist the changes the implementation will bring. Top management must be the initiator for the implementation and a constant champion of this cause.

2.5.1. Project Preparation

Because of the potential high-risk nature of a packaged software installation, especially an ERP, it is extremely important to have a thorough and attainable project plan. Project preparation should result in a flexible architecture that facilitates a smooth and successful implementation. There are three factors that must be in place before an implementation can begin. As noted prior, there must be a way to determine the fit between the internal and external critical success factors. In addition, a methodology that provides a basis for best practices must be established and employees must be trained in this process (Li, Markowskia, Xua, & Markowskia, 2008). Finally, implementation staff members, both functional and technical, must be trained in their respective functions (Plaza & Rohlf, 2008).

2.5.2. Governance

IT governance has become a hot topic due to the increasing pressure to integrate IT solutions into business processes. IT governance refers to the alignment of strategic business objectives with the alignment of the project objectives. A misalignment between these two strategies can result in a final product that does not meet the implementation critical success factors, thus causing a project failure or a large overrun in cost. McBride (2008) states that project management, either individual managers or the project management office (PMO) must constantly be monitoring the project to ensure that the implementation plans can be quickly adjusted to meet the constantly shifting business objectives. It is important that these employees are fully aware of the interaction between the internal and external critical success factors, which Wang, Shih, Jiang, and Klein (2008) place importance on in their study. It should be noted that the governance of an IT project should be proportional to the scope of the project in order to reduce the change of a cost or timeline overrun.

2.6. Customization

Another factor which largely impacts both the benefits and costs of an implementation is the required customization of the packaged software. Chou and Chang (2008) show that firms with greater customization have a higher rate of coordination and task efficiency within their organization.

Factor	Item	1	2	3	4	5	6	7	8
Project management principles (1)	19	0.67	0.37	0.36	0.21	0.35	0.15	0.15	0.13
	25	0.72	0.27	0.30	0.20	0.10	0.17	0.19	0.06
	26	0.80	0.14	0.17	0.19	0.18	0.14	0.29	0.12
	27	0.78	0.37	0.26	0.22	-0.12	-0.16	-0.01	0.12
	28	0.83	-0.18	0.08	-0.24	0.09	0.09	0.20	0.33
	30	0.85	0.17	0.02	0.18	-0.04	0.21	0.12	0.30
	31	0.83	0.08	0.30	0.17	0.28	0.13	0.01	0.01
Feasibility/evaluation of ERP project (2)	24	0.23	0.86	0.03	0.06	0.31	0.09	0.05	-0.02
	25	0.09	0.84	0.19	0.04	0.07	0.24	0.02	0.21
	26	0.47	0.49	0.34	0.20	0.28	0.18	0.11	0.28
	27	0.15	0.83	0.34	0.17	0.11	0.01	0.13	0.27
Human resource development (3)	8	0.53	-0.09	0.61	0.36	0.11	0.12	0.21	-0.17
	16	0.45	0.34	0.65	0.06	0.10	0.12	0.23	0.12
	17	0.30	0.35	0.71	0.15	0.18	0.21	-0.16	-0.02
	18	0.16	0.47	0.54	0.20	0.34	0.26	0.25	0.10
Process re-engineering (4)	1	0.25	-0.04	0.12	0.79	0.00	0.20	0.23	0.20
	5	-0.07	-0.09	0.34	0.49	0.18	-0.03	0.31	038
	7	0.44	0.24	-0.01	0.58	0.26	0.16	-0.16	0.27
	9	-0.11	0.33	0.22	0.41	0.51	0.23	0.33	0.24
	10	0.02	0.30	0.06	0.51	0.46	0.22	0.44	-0.21
	15	0.60	0.06	0.29	0.60	0.35	0.08	0.10	0.04
	28	0.21	0.35	0.17	0.75	-0.21	0.06	0.02	0.06
Top management support (5)	11	0.44	0.36	0.12	0.05	0.75	-0.10	0.13	-0.03
	12	0.19	0.15	0.26	-0.04	0.82	0.06	-0.13	0.23
	14	0.36	0.35	0.25	0.27	0.50	-0.15	0.42	0.10
Cost/budget (6)	20	0.21	0.18	0.17	0.18	-0.12	0.79	0.20	-0.02
_	21	-0.03	0.59	0.03	0.11	-0.04	0.69	0.35	0.02
	22	0.21	0.03	0.30	0.07	0.18	0.79	0.02	0.29
	23	0.56	0.28	0.41	0.24	0.12	0.42	0.24	0.06
IT infrastructure (7)	3	0.28	0.02	0.10	0.04	0.03	0.20	0.85	0.10
(,)	4	0.63	0.07	-0.07	0.13	-0.05	0.19	0.55	0.17
Consulting services (8)	33	0.30	0.22	0.40	0.16	-0.53	0.11	0.02	0.49
	34	0.45	0.34	0.22	0.14	-0.03	0.25	0.10	0.62
	35	0.41	0.11	0.11	0.11	0.01	0.50	0.27	0.64
Eigenvalue		430	3.396	3.252	2.630	2.744	2.104	3.364	2.832
Percentage variance		20.950	12.808	10.085	9.483	8.599	8.276	8.073	8.030
Cumulative variance		20.950	33.759	43.844	53.327	61.926	70.202	78.275	86.305

Figure 2.1. Varimax Rotation of the critical factors of ERP implementation (Ehie & Madsen, 2005).

Customization of a packaged software solution is a double-edged sword though as many companies have faced greater cost overruns due to overcustomizing, which is caused by a lack of fit between implementation success factors and the actual process of implementing. Software providers, such as SAP, often will not provide support to over-customized objects and this may

cause the organization to require consultant aid to correct defects. Customization can provide an immediate impact on task efficiency, but these impacts are degraded over the entire life of the system. This degradation can impact the total cost of ownership of the software package dramatically over the lifespan of the software package.

2.7. Internal Staff Training

Any packaged software installations require a high amount of employee involvement and due to this, there is a need to re-train employees on the new systems before the beginning of the design and development phases. Due to the historically high costs of re-training individuals, it is important to assess and consider the current skill-sets of key employees when performing software selection. Plaza & Rohlf (2008) state that "training is the most beneficial means for an organization to minimize the cost of consulting and this training should be strategized during the project planning phase" (p. 83). These training strategies which they propose show that performance and training should be at a certain point before the design and development stage in order to reduce the variability of project success and project timeline accuracy. The training curve is shown in figure 2.2.

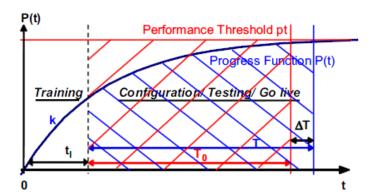


Figure 2.2. Illustration of the ERPCC model parameters (Plaza & Rohlf, 2008).

To further emphasize the importance of having a highly-trained staff on a successful ERP implementation, Infinedo and Nahar (2009) validated that there is "a positive relationship between the IT assets and resources of an organization and the ERP success rate" (p. 130). While they only found moderate support for their hypothesis concerning the general IT skill sets of the end users, they did find that there was a strong positive relationship between the success of an ERP installation and the assets of the IT department. The same can be said for any packaged software implementation.

2.8. User Satisfaction

A common perception is that high satisfaction with the legacy system can cause an unsuccessful packaged software implementation due to reluctance for change in an organization. Infinedo and Nahar (2009) found that legacy system satisfaction does not have a positive relationship with implementation success, but they did not cover satisfaction with legacy processes.

In order to build on the impact that the organization's capacity and culture regarding change has on a packaged software implementation, one must against revisit the fit between internal and external critical success factors. While this is usually managed by the top level management of the organization, it is also important that lower-level employees manage the difference between the as-is and to-be models of the system. Wang, Shih, Jiang, and Klein (2008) show the importance of the awareness of this contrast in requirements critical success factors that key employees, such as architects, project managers, and even consultants must have in order to negotiate the best solution between the vendor and the business.

2.9. Critical Issues

Throughout the entire project lifecycle, there will be issues with the implementation. While Li et al. (2008) would argue that there should be a

process in place to ensure that issues are handled according to a TQM process defined by the business; there also must be a facility by which the project management can adapt and manage changes in objectives and scope. McBride (2008) finds that there are a variety of tools and methodologies available to project managers to track the progress of the project. These tools include solutions that can re-adjust project plans based upon the scope and complexity of these issues.

2.10. <u>Design and Development</u>

System design and development is often perceived as the most tangible and important part of a packaged software implementation. While many have argued that the project planning is the most critical part of an implementation, this opinion varies greatly among organizations. In addition from the technical aspects, such as the coding and testing of the objects, there should be an equal importance placed on the requirements gathering, issue resolution, documentation, and training aspects of the solution (Plaza & Rohlf, 2008; Scott, 2008). It should be noted again that this design and development must be balanced with the business goals of using a packaged software solution.

2.11. <u>Documentation and Training</u>

Scott's (2008) hypothesis stating "the usability of the documentation affects the effectiveness of training and could result in a faster payback on the ERP investment" (p. 121) should not be overlooked by project management. Often in ERP implementations, timeline and budget constraints force documentation down the prioritization ladder for the project. The processes for creating documentation on IT projects are often defined in a TQM solution, but oversight of these processes is critical (McBride, 2008). Scott finds that there can be a great cost savings in documentation in several areas of system usability, such as navigation, presentation, and support as figure 2.4 shows.

While Scott (2008) proves that companies can save on support costs by having accurate and complete documentation, she further enhances her documentation argument by showing that the quality of the documentation has a positive impact on the perceived usability of the system.

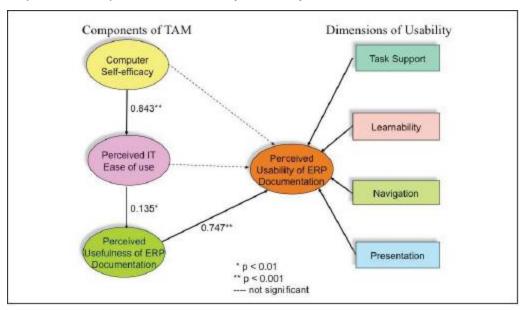


Figure 2.4. Impacts to technology assessment (Scott, 2008).

One of the key points Scott makes is that documentation which outlines the business reasons and justification for changing a process during an ERP implementation will actually go great lengths towards creating user acceptance of the system.

2.12. Change Management

Along with documentation and training, organizational change management is a very influential non-technical contributor to the return on investment for an ERP implementation. Organizational change management has been shown by many as essential to the packaged software implementation process. This disconnect between the organization's people and technology has contributed more to the failure of Implementations than any other factor (Kling

and Lamb, 2000). The three aspects of organizational change management which need to be focused on are the organizational structure, organizational culture, and the adequacy of the employee skill sets (Gale, 2005). The management of the change that a packaged system will have on these three aspects is arguably more important to the success of an implementation than any other factor.

2.13. Evaluation of the Solution

Because the ERP system is now an asset to the organization, it must be constantly evaluated to make sure that continual operation is of the best interests of the organization. Wei (2008) proposes a framework which will help an organization in this evaluation process.

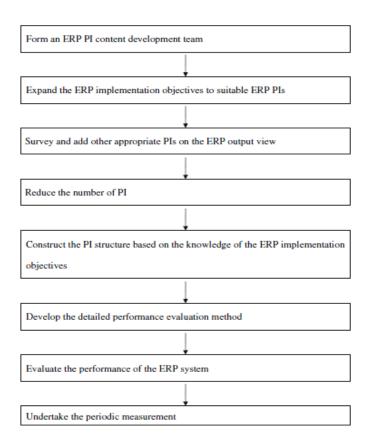


Figure 2.3. ERP system performance evaluation framework (Wei, 2008).

One point Wei makes is that this framework must include a team which gathers the performance indicators (Pl's) which the business demands and then to assess the system in order to make sure these Pl's are met. Wei's process is outlined in figure 2.3.

2.14. Total Quality Management

Most organizations, most notably large defense contractors, have adopted some form of Total Quality Management (TQM). These methodologies are utilized by organizations to ensure that the overall business processes are both efficient and provide steps to reduce the risk of error. Li, Markowskia, Xua, and Markowskia state that "a focus of TQM in employee involvement, customer focus, and business process reengineering paves the way for an ERP implementation" (p. 577). This statement shows the importance of having a TQM or similar system in place prior to implementation. Methodologies such as these provide an important backbone for both the project teams and the end users of a solution.

Another critical reason that necessitates the need for a TQM solution is the efficiency degradation that can be caused by over customization of an ERP. Even though Chou and Chang (2008) show that firms with greater customization have a higher rate of coordination and task efficiency to their company, there are still long-term impacts brought on by this improvement in task efficiency. These impacts include a future scenario in which the ERP forces a business to use the over-customized solution even when a business process reengineering study provides a case for greater efficiency with a more flexible or vanilla solution.

2.15. Summary

As shown in this section, there is a great deal of recent literature that can be leveraged to support the objectives outlined in section 1.1. This literature encompasses all phases of a packaged system lifecycle, such as gap analysis,

vendor selection, training, conversion, integration, go-live, and continuing support. This literature also provides a very wide range of situations in which these phases have been studied, such as different industries, types of systems, and organizational structures.

CHAPTER 3. STUDY DESIGN, UNIT, AND SAMPLING

3.1. Question, Scope, and Significance

One of the largest issues facing technical curricula development at universities is keeping pace with the changing landscape of computer systems within organizations. This directed project's scope involved developing an undergraduate course that exposes students to the benefits, challenges, and breadth of the large packaged software systems that many companies implement.

In order to answer the question proposed in section 1.1 of this document, the researcher created and refined project deliverables including a syllabus, a course outline, textbook and article recommendations, key lectures and their PowerPoint presentations, and course assessment plans. Evaluation of these course materials and the method for delivering these materials was performed from both a student and instructor perspective. The course materials were shared with some C&IT faculty who provided detailed feedback concerning the fit within the current curriculum. Evaluation of these materials was performed as the content is blended into the curriculum. The evaluation of the methods for delivering these materials takes place concurrently with the evaluation of the course materials.

3.2. Methodology

Final evaluation of this course material was performed by Purdue
University faculty as they worked on incorporating this material into the current
curriculum. This research was primarily qualitative. Due to the nature of the

main deliverables of the course, it was very important not only to get verbal and written feedback on the deliverables, but it was also important to know how important the members of the faculty feel the issues in the deliverables were.

The development of course materials was executed by following the Task-Based Team Learning didactical model of Van Weert and Pilot (2003). This model emphasizes the use of team-oriented practices that are both relevant to real-life scenarios and build towards a larger goal like an end of semester project.

This directed project additionally utilized the Minimalist theory of J.M. Carroll (1998) as a methodology for designing course materials. This theory suggests that course materials should be developed following guidelines that result in tasks that are self-contained, realistic, self-directed, and also offer the opportunity for the realization of error as well as an apparent link between this work and a real-life scenario.

3.2.1. Hypothesis

If this course is successfully created, then it will provide students with an in-depth knowledge of the assessment, selection, implementation, and support of packaged software systems.

3.3. Deliverables

This directed project resulted in several deliverables. Along with this document, the deliverables are the primary outputs of the entire project. These deliverables were intended to be the foundation for the course in packaged systems analysis. These deliverables are attached to this final directed project in appendices.

3.3.1. Course description and syllabus

The course description serves as the published definition of the course that is available to prospective students of the course. This description includes the overview, goals, and rationale behind this course's offering. Also included in this description is the reasoning behind why this course is beneficial to a C&IT student.

The course syllabus provides a more detailed explanation of the goals and objectives of this course. In addition, it outlines the grading policies, expected workload, and other logistical and ethical standards for the course.

3.3.2. Course timeline

The course timeline provides the schedule of course topics and assignments to the student. This timeline also integrates the lecture notes and the textbook chapter readings.

3.3.3. Course textbook

The course textbook was selected based upon fit of the course objectives and the existing literature on the topics to be covered.

3.3.4. Course lectures and presentations

The course lectures and presentations are used to provide the most granular-level detail of the course information to the students. This directed project produced 10 course unit lectures and the outlines of each presentation. Each lecture includes an outline of the goals and objectives for each lecture, the fit of these goals and objectives into the course syllabus, and a re-cap of each topic covered.

3.3.5. Course assessment plan

The course assessment plan is an overview of the topics that the researcher recommends to be assessed at certain points in order to re-enforce the course lecture material. This plan also includes the theory and rationale behind the timing and nature of the assessments. The course assessment is an integral link between the information presented and the knowledge retained.

3.3.6. Course model

The course model was developed in order to detail the course goals, prerequisites, learning objectives, learning outcomes, and assessment mechanisms. It takes the existing degree learning outcomes from the Purdue University C&IT department and displays how the proposed materials satisfy those outcomes. Additionally, the assessment mechanisms which measure the progress towards the learning outcomes were noted.

3.3.7. Course group project

The course group project is a large, group-based activity that focuses on both the course objectives and teamwork. This group project includes selection of a software package based upon business needs, a sample implementation plan, a proposal outlining the rationale and methodology behind creation of these deliverables, and a presentation of the entire project to the rest of the class given in a manner as if the students were responding to a request for proposal document.

3.4. Bias

By nature, qualitative studies will have bias due to the necessity of researcher involvement. These biases cannot be eliminated, but they can be mitigated if the researcher is aware they exist. I see biases such as my personal interest in this topic, my thought of a need for this course, my involvement with the materials, my pride in the deliverables I am presenting to the faculty, and my thoughts on the accuracy of the focus group evaluations as existing.

3.5. <u>Institutional Review Board</u>

The research being executed for this directed project did not involve human subjects, so it was not subject to Purdue University Institutional Review Board (IRB) standards.

3.6. Summary

The preceding sections outline the scope, timeline, and methodology for completing the deliverables associated with this directed project. Additionally, the timelines for this directed project as subject to change due to researcher availability or the availability of faculty.

CHAPTER 4. COURSE COMPOSITION

4.1. Methodology

The development of course materials was executed by following the Task-Based Team Learning didactical model of Van Weert and Pilot (2003). This model emphasizes the use of team-oriented practices that are both relevant to real-life scenarios and build towards a larger goal like an end of semester project. The appendices of this document show that the course assessments are based on these real-life scenarios and that the end of semester project is a combination of most topics covered during the course term.

This course composition additionally utilized the Minimalist theory of J.M. Carroll (1998) as a methodology for designing course materials. This theory suggests that course materials should be developed following guidelines that result in tasks that are self-contained, realistic, self-directed, and also offer the opportunity for the realization of error as well as an apparent link between this work and a real-life scenario. Additionally, the practice of setting very clear expectations at the start of each lecture was utilized within developing the course lecture outlines.

4.2. Syllabus

The course syllabus provides a more detailed explanation of the goals and objectives of this course. In addition, it outlines the grading policies, expected workload, and other logistical and ethical standards for the course. The syllabus can be found in Appendix C.

The syllabus has two main sets of goals: student objectives and instructor objectives. The student who successfully completes this course must gain an intimate knowledge of packaged systems, their purpose, their evaluation, and their lifecycle. This knowledge will include the benefits of leveraging packaged software components, disadvantages of using packaged software components, and shortcomings of systems comprised of packaged components. Additionally, students will be required to be able to analyze and discuss the integration of packaged systems within current business platforms in intelligent conversation, be able to perform a basic gap analysis, show an understanding of the vendor selection process, including but not limited to requests for proposals, vendor product evaluation and vendor selection., and appreciate the importance of good packaged software integration skills.

The instructor objective is to maximize the educational experience of those students who bring an appropriate and sincere effort and serious interest in the subject matter to the classroom.

4.3. Schedule

The schedule is comprised of the course mission statement and a grid showing the lecture topics and critical assessment dates for the course. The schedule can be seen in Appendix A of this document.

4.4. Units and Assignments

Units are organized in the order in which they would be encountered by the students in a packaged software project. This serves the purpose of placing a logical order into the student mind on a process, but also allows the group project to be able to be worked on concurrently to the lectures.

Every unit will begin with the learning expectations. These are not necessarily the expectations of the student by the lecturer, but rather the expectations that the student should have for his or herself. The outlines of the

slides for these units can be found in Appendix D and the assignment handouts can be found in Appendix E.

4.4.1. Unit 1 – Total Cost of Ownership and Return on Investment
The first unit of the course is typically the foundation for the entire course.
Part of this foundation is the procedural documentation. Within the first lecture, the syllabus, schedule, meeting times, expectations, and other course-related materials will be shared with the students and covered in enough detail so that the information is understood by all. After this boilerplate, the knowledge portion of the course foundation will be presented.

The first unit begins with Brynjolfsson's productivity paradox (1993). This paradox is theorized around the discrepancy between the productivity of industry and workers and the rapid evolution and power of technology. It can be summed by amusingly, unless you are an IT manager, with the quote by Robert Solow that one "can see the computer age everywhere but in the productivity statistics." The lecturer will ask students if they agree with this paradox. After a short discussion, the students will be asked to come up with some reasons for the paradox. Four key reasons – mismeasurement, mismanagement, time lag, and redistribution of value – will be discussed in detail. Mismanagement will be discussed in greater detail, specifically in the aspect of software procurement.

As part of this discussion on Mismanagement, the traditional main question for any information technology project which involves software, to build or to buy, is introduced. Many organizations have felt that they could develop software which covers all of their requirements in a cheaper manner than buying a packaged software system which might have only covered most requirements. Due to the increased integration between business processes and the software used for these processes, it has become apparent that building a robust software solution would be extremely difficult for any project with any discernable scope. Weir and Mickool (2003) argue that no organization "has the processes,"

retainable skills, or investment capability to build "industrial strength" production software on a scale comparable to its needs" (p. 6). As part of this lecture, the pros and cons of building and buying will be discussed.

Since it only takes a few years for an IT concept or product to become obsolete, it shouldn't be of any surprise that the question of "build or buy" has been replaced. Wier and Mickool further argue that the main software question is not "build or buy" anymore, but rather how to assemble the software that the organization has either built or bought. Meyers & Oberndorf (2001) support this new paradigm by saying that the increased buying, or acquisition of packaged software systems, has changed the philosophies of organizations from the traditional design, develop, and implement lifecycle to an indentify, purchase, and integrate lifecycle (page 8). After this new paradigm is introduced, a discussion on the reasons behind this shift will occur. Additionally, the lecturer will provide some impacts of this paradigm shift, such as the loss of control over the software by the organizations that are procuring and the increased integration which is driving this shift.

If everyone uses the same software and the same processes, then how does a company set itself apart? This question will be proposed to students to make them think about the issues with integrating software designed for all within a company with an industry-leading best practice. Additionally, the definition and rationale for performing a gap analysis will be introduced.

The rest of this unit will be focused on the value of an information technology decision, with an emphasis on software. The most widely-used calculations are Total Cost of Ownership (TCO) and Return on Investment (ROI). Return on investment is typically an upfront calculation for an information technology product. There are other calculations such as rate of return or time to recoup costs, but return on investment is the primary driver for green-lighting a project. ROI will be defined to the students first. Within this portion of the lecture, the students will be asked to identify the ROI elements which they consider to be important. After a list of factors has been compiled, the class will

brainstorm on how to measure each of these factors and how to calculate the ROI. Finally, a short discussion on how these factors can shift during the course of a project will occur. Total Cost of Ownership will then be discussed in a similar fashion, looking at the factors, how to measure the factors, and how the factors can change. An important aspect of this discussion will be to introduce the students to the factors of TCO which are not usually considered, such as change management, culture change, company perception shifts, and other indirect aspects of TCO.

Brandel (2006) points out that many companies fall into the trap of never checking the ROI or TCO, after the completion of a project. She argues that by circling back, companies can discover other ways in which a software system adds value, even after the official project has been completed. The students should be aware that tracking these items is an overhead expense, but it might prevent them from missing (or ruining) an opportunity in their life.

The lecture will conclude with some slides which will encourage some brainstorming how building, buying, utilizing Software as a Service (SaaS), and open-source software could change the ROI and TCO of a project. This will set the stage for the introduction of the first assignment, but also build a foundation for the group project and the lectures for the remainder of the course.

4.4.2. Assignment 1 – Build vs. Acquire

This assignment assesses the student understanding of the 'Build vs. Buy' question in information technology. The assignment will have the student research and evaluate four different commercial options and a homegrown system. This assignment will require student research to find information on the functionality, price, human resource needs, implementation complexity, integration capabilities, and other student-established metrics of each software solution. The students will be asked to include a graphic or matrix if they see it fit

to support their arguments. This can be modeled off of a matrix used in the lecture slides.

4.4.3. Unit 2 – Packaged Software System Benefits and Challenges This unit focuses on packaged software system benefits and challenges and packaged software selection. After the objectives for the lecture are discussed, the lecturer will go into a definition of a packaged software system. Along with the broad definition, students will be asked to name other packaged software applications and systems. Most students should have no issue listing hundreds of software packages.

There are two foci of this lecture. One is the benefits and drawbacks of packaged software systems. The second is the packaged software selection process. For the first focus, a mostly-inclusive list of benefits from packaged software will be presented to the students. After this, other options will be solicited from the class. Benefits showing how packaged systems can be powerful tools for creating efficiency in business processes will be demonstrated. Additionally, it will be shown that these systems are highly popular due to their ability to provide improvements in operational efficiency (Chou & Chang, 2008). For example, ERP systems provide companies with greater task efficiency in almost every area of the business, whether it is supply chain management, human resource management, or accounting and financial management. Other benefits, such as integration standardization, less development time, less testing, support contracts, and established processes will be discussed.

The drawbacks of a packaged software system will most likely arise from the discussion on the benefits. Primarily, cost will be a major overtone in the discussion. Because these systems provide such a breadth of business process support, they are extremely costly investments for organizations, yet ERP's can provide great value to an organization. Due to the high risk nature of these investments, it is very important for one to be aware of the challenges facing

implementation teams. One of the primary challenges facing these teams and their managers is management of the costs of implementation (Plaza & Rohlf, 2008). Two major internal areas where costs can be greatly variable are the identification of success factors for an organization and the customization of the product. Other factors which can influence costs dramatically include the vendor selection, the corporate culture, and the change management practices of the project. Other drawbacks such as non-flexible timelines, loss of some business practices and a loss of control over new functionality schedules will be discussed.

Knowing the types of packaged software that are available is going to be important to the students as they enter their careers. A basic, but necessary, discussion on the types of packaged software is required to establish a foundation of terms for the class and to engage the thought process in regards to evaluating packaged software. First, desktop solutions, such as Microsoft Office, will be talked about. These packaged software systems often are the most value-adding. Next, ERP systems and their associated bolt-on components will be discussed. Primarily, the two ERP giants, SAP and Oracle, will be discussed. Other types of packaged software like "best of breed" software which takes on a specific business process, Tier 2 software packages, Open Source software packages and Software as a Service (SaaS) packages will be discussed with highlighted benefits and drawbacks of each.

As mentioned earlier, there will be two foci for this discussion. The second focus will be on packaged software selection and implementation. This focus will evolve into a primary theme for the entire course, so it is very important that the lecturer emphasize the importance of this topic. Before the software selection activities can begin, it is critical that the person or persons making the software decision are aware of the current state. They need to have answers to questions regarding the type of organization they are, the type of IT organization they are, the culture of the company, and the types of customers they have.

Another set of points that decision makers must be aware of is the industry they are in, where they fit in among their peers, and what types of

software are available for their industry. Going along with this, the decision makers must know what they want. It is critical to point out that this is not the step at which one solicits the functional and technical requirements of the project, but rather the step where the decision makers provide the mission, vision, and highest-level goals for the project. This step is a good check point to ensure that the software selection project is in line with the organization's mission and vision and that the "big-picture" for the organization is not compromised by the software decision.

The final few topics for decision-maker introspection will be to understand the difference between the organization's history, culture, and what a best practice actually is. Often, an organization considers a well-establish practice to be "best" simply because they are so efficient at this process. Analysis on which processes add value and create a separation between the organization and the competition must be done to understand what is a best practice and what will require some change management work.

After the discussion on introspection, a lecture on the high-level packaged software lifecycle will begin. As noted earlier in this research, the lifecycle for packaged software implementation takes more of a "indentify, purchase, and integrate" approach (Meyers & Oberndorf, 2001) than the traditional "design, develop, and implement" approach. There will be several slides showing how the shift of work has gone from design and develop to identify and purchase. Additionally, the integration piece will show the importance of understanding business processes when it comes to applying a new packaged software component. Planning, gap analysis, and change management will be briefly touched upon.

4.4.4. Unit 3 – Critical Success Factors and Gap Analysis

After the primary objectives of this unit are discussed, the lecturer will ask the students how they know if something worked. Eventually, the conversation

will come to defining a critical success factor. The primary metric used in measuring the success and value of a packaged software implementation is the critical success factor. These factors provide the business and implementation team with the basis for setting project requirements. Wang, Jiang, and Klein (2008) argue that businesses that match both internal and external critical success factors must be aligned to increase the chance of an implementation success. Several others including Ehie and Madsen (2005) support this argument by showing that up to eighty-six percent of variances in ERP implementation can be attributed to eight critical success factors.

It is important to note that these success factors require resources from both the internal, or Information Technology (IT) departments and the external, or business, side of the project. This process of aligning the objectives from the internal and external project perspectives is commonly referred to as IT project governance and this will be covered in greater detail in the section on fit.

As this discussion evolves, examples of critical success factors will arise. Some examples of types of CSF's are in table 4.1

Table 4.1.
Critical Success Criteria

Criterion	Definition	
Cost	Costs of software purchase or cost to build	
	software	
Return	Return on Investment	
Hardware	Costs of any equipment needed for the upgrade	
Support	Yearly costs for licenses and/or support	
Consultancy	Costs of hiring external consultants for system	
	implementation/support work	
Training	Costs of training users, both for the	
	implementation and end users	

Table 4.1. (continued)

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With each of these discussed CSF types, the lecturer will provide example CSF's for the class. After listing several critical success factors, the lecturer will then revisit the list and discuss how to measure each of these things within a project. Finally, a discussion on the importance of continually evaluating the critical success factors during a packaged software project will occur. Hopefully, the link between critical success factors and the ROI of a project will become apparent.

The second portion of this unit will revolve around the gaps which are created during a packaged software implementation. After a definition of what a gap is, the lecturer will begin to present materials on the benefits of doing a gap analysis.

Gap analysis is loosely defined as the difference between an organization's processes "as-is" and the processes that are desired, or "to-be". While these processes are often completely re-evaluated during a packaged software implementation, it is important in the gap analysis stage of a project to identify which aspects of these processes can be enhanced by or affected by a packaged software implementation. Because methodologies such as TQM are utilized by organizations to ensure that the overall business processes are both efficient and provide steps to reduce the risk of error, there is a need to gather project requirements that are in concurrency with the value adding processes established in an organization (Li, Markowskia, Xua, & Markowskia, 2008) while also identifying the opportunities for adding value.

The gap analysis stage is often the first real introduction users have to the new system and the first impression that these sessions create can go a very long way towards overall system acceptance. Chou and Chang (2008) state that "the high failure rate of ERP implementations might be attributed to the difference in interests between customer organizations that aim to provide the optimum solutions for business problems and ERP vendors who prefer a generic solution applicable to a broader market" (p. 149). This perception also is persuaded by

the support of upper management, which will be outlined in the project management section.

Methodologies and tools for performing a gap analysis will then be discussed. During the discussion, a few key points must be made, such as performing as-is and to-be models, performing more than a cursory investigation in order to establish the as-is process, beginning to lay the foundation for change, and to use consistent tools in diagramming the as-is and to-be so that the differences, and hopefully the values, are clear. An example process will then be evaluated by small groups in class. Following this exercise, assignment two on gap analysis will be introduced.

4.4.5. Assignment 2 – Gap Analysis

This assignment will require the student to perform a gap analysis on a hypothetical system. They will be given a company, some background on this company, and the as-is of the process and have to develop and support the reasons for the developed to-be processes. Other helpful pieces of information like the company culture, the current landscape, and the mission and vision of the company will be included. Also, students will be required to show the current pain points, gaps, and overlaps.

4.4.6. Unit 4 – Request for Proposal and Vendor Evaluation

This unit will focus on the request for proposal (RFP) process and the subsequent vendor evaluations. During this unit, the objectives will be discussed and a sample RFP will be distributed. This sample will help students see how the previously lectured material fits into the RFP documents, so they can understand the importance of selecting the correct vendor and software package.

With the shift in approach from a traditional "design, develop, and implement" approach to a "indentify, purchase, and integrate" approach there also has been a shift in the RFP process. The RFP must be written so that the

prospective vendors understand that there is a balance between the business requirements and the requirements for having a packaged software system. Meyers & Oberndorf (2001) state that this balancing act requires both parties to make trade-offs in order to reach the ideal total cost of ownership for the organization. The organization must realize that no software solution will satisfy every requirement right out of the box. The RFP document needs to outline the priorities of the goals of the project and what trade-offs are acceptable.

After the RFP is defined, it is broken down by piece. First is the administrative section which has the high-level overview, the reference information, the confidentiality, proprietary notice, intent to bid, separation of duties, and contacts. Additionally, procedures, questions, bids, contacts, and other requirements are outlined. Students must be aware of the importance of these sections, especially in a setting where there could be legal implications.

The second section of the RFP will have the technical objectives. Part of this objective will include the as-is and potentially the to-be for the environment. These portions of the RFP will come from the gap analysis. Also included in these objectives will be the supplier's scope for the environment, and any constraints which the vendors should be aware of.

The business objectives portion of the document will be discussed. This portion will serve as a foundation for later units on the project management, structure, timeline, and roles. Plans, schedules, responsibilities, and details even down to location of desks should be in this portion of the document if they are necessary. Additionally, requirements around delivery, installation, acceptance testing, change control, training, support, and other concerns should noted and outlined. Students should be aware that most project issues between vendor and customer come from not having business objectives fully outlined. A discussion on failed projects with a few classic examples should take place at this point.

The supplier qualifications and references make up the next section. The importance of the references will be discussed greater during the vendor

evaluation portion of this unit. After this, the RFP should provide a section for suppliers to provide any information which they feel would be a benefit to obtaining the work or to benefit the requester. A section on pricing should follow, with breakdowns for different cost units, management expenses, and a grid to show the price over time.

There should be a section which states the issuing organization's methodology for evaluating proposals. It is important that the process be as transparent as it needs to be to the vendors, so that relationships are not damaged or legal action is not needed. Finally, all forms and documents should be placed in the subsequent appendices.

There needs to be a discussion the responding process at this point. Even though it is rarely brought up, things such as the timing of releasing an RFP do matter, especially in cases of short timelines. It seems, from the researcher's experience, that RFP's seem to usually be released on Friday afternoon with a Monday deadline. Later in this unit, ethics will be discussed as part of this RFP process. This discussion will center on what to disclose, from both a vendor and requester perspective, how to operate a fair process, and how to ensure that there are no breaches of trust.

The evaluation of vendor proposals might be the most integral lecture of this course. Proposals must be evaluated on several fronts. The ones to be discussed in this lecture are cost, fit, functionality, references, timelines, methodologies, experience, working relationships, and presentation. These topics will be discussed in detail with different scenarios being formed in the student mind. Additionally, the mission and vision of the organization and the project will be revisited.

An additional topic of lecture will be the relationship between requester and vendor. This topic will outline how an organization should work with its vendors, how not to treat a vendor, and how the RFP process can lay a foundation for a smooth partnership or a very rocky project failure. After this, assignment three, which is an open letter built off of student research to

University Administration regarding creating a RFP and evaluating proposals will be discussed and assigned.

4.4.7. Assignment 3 – Request for Proposal and Vendor Evaluation
Students will be given a hypothetical – or perhaps a real – software
decision and asked to write a letter to the critical decision makers stating critical
success factors, functional requirements, implementation schedule requirements,
and any other items which should be contained in the RFP. Also, the students
will be required to include several researched best practices and methodologies
for vendor selection which the organization should utilize.

4.4.8. Unit 5 – Project Planning and Management

This unit will begin with a previously assigned topic of research to find an example of a project that fails. The students will be asked to discuss reasons why projects fail and what constitutes a failure. Hopefully this discussion will lead to a realization that the technology is rarely the cause of failure. Several of the main reasons for failure will surely be project management.

Ehie and Madsen's (2005) article shows the importance of project management on the overall success of an ERP implementation (p. 553). Their research shows that project management principles and top management support are, respectively, the first and fifth most influencing factors on packaged software implementation success. While it has been shown that there must be governance in place to regulate the fit between internal and external success factors, it is also important to note that a "sound and thorough understanding of project management principles and their applications are critically linked to successful ERP implementation" (p. 555).

Ehie and Madsen provided several likely points of failure in their article. In this discussion, the lecturer will point out how a manager must be aware of costs – for hardware, software, people, and overhead, and schedule. Additionally, the

topics of process redesign, change management, human performance, attrition, vendor relationship, and other non-technical concepts which came from the opening discussion will be presented.

The lecturer will then look at the higher-level management issues which can aid a project in succeeding or failing. In addition to the project managers, top-level managers also play a critical role in the success of an implementation. Ehie and Madsen (2005) also note that "lip service or lukewarm support from top management is the 'kiss of death' for an ERP implementation" (p. 555). A lack of top-level support undermines the credibility of the solution and provides a basis for end users to begin to resist the changes the implementation will bring. Top management must be the initiator for the implementation and a constant champion of this cause. A case study or two showing how a lack of top-level support can kill a project will be presented to the class and discussed.

The lecturer will then move into a discussion on the more detailed aspects of project management. First, project planning will be discussed. Because of the potential high-risk nature of a packaged software installation, especially an ERP, it is extremely important to have a thorough and attainable project plan. Project preparation should result in a flexible architecture that facilitates a smooth and successful implementation. There are three factors that must be in place before an implementation can begin. As noted prior, there must be a way to determine the fit between the internal and external critical success factors. In addition, a methodology that provides a basis for best practices must be established and employees must be trained in this process (Li, Markowskia, Xua, & Markowskia, 2008). Finally, implementation staff members, both functional and technical, must be trained in their respective functions (Plaza & Rohlf, 2008).

Hopefully, the students will not need to be reminded that most of these topics were already addressed in the request for proposal (RFP) document. Certain aspects, such as a methodology to use, the structure of the project team, and if the level of consultancy and sub-contractors is acceptable will be in this document. One major thing that a project manager must remember is that the

vendor is usually the expert in installing the system which was purchased, so the vendor's methodology usually is more adept and producing results than the more generic, in-house methodology, should one exist.

4.4.9. Unit 6 – Change Management and Process Redesign

As the course moves into the second half of the semester, the focus shifts from buying packaged software to implementing what has been procured. Before an organization unwraps any packages and starts installing the software, it is important that an analysis is done to ensure that the chance of a successful return on investment is maximized. First, the cost of quality will be discussed. Within this discussion, the costs of when a mistake is discovered, how prevention is the cheapest way to reduce quality costs, and other quality based items will be touched upon. Quality will be a focus of a later unit, but this is an important foundation to the main memes of this unit.

The lecturer will move into the topic of process redesign. A definition of a process as well as some examples will be solicited from the students. Within this lecture, the students will learn the importance of redesigning processes to fit the packaged solution. Often, process redesign and automation are synonymous in the student minds, so it is important to break this correlation early. The BreakPoint methodology from the Lybrand Consulting firm will then be introduced. This methodology has three stages: Discover, Redesign, and Realize. These phases will be discussed in detail.

After the introduction of this methodology, some tools for performing an adequate process analysis and redesign will be presented. These tools include an analysis on adding – or removing – value, flowcharting a process, and showing a distribution of work and any gaps and overlaps. A brief exercise may be used to discuss a process in need of redesign and where value is added. The lecturer will again bring up the definition of value and customer, so that the student can think of this analysis from a business-wide perspective.

Change management will then be discussed, as it is a complimentary topic with process redesign. Along with documentation and training, organizational change management is a very influential non-technical contributor to the return on investment for an ERP implementation. Organizational change management has been shown by many as essential to the packaged software implementation process. This disconnect between the organization's people and technology has contributed more to the failure of Implementations than any other factor (Kling and Lamb, 2000). The three aspects of organizational change management which need to be focused on are the organizational structure, organizational culture, and the adequacy of the employee skill sets (Gale, 2005). The management of the change that a packaged system will have on these three aspects is arguably more important to the success of an implementation than any other factor.

The final discussion will be regarding management of expectations. This discussion will present how a change in project scope usually means that the expectations have shifted and therefore must be managed. Such cliché, but true, topics will include the concept of perception equaling reality. Methods and tools such as charter documents, requirements statements, and change control boards and policies will be discussed.

4.4.10. Unit 7 – Governance and Customization

This unit opens with a definition on IT governance, which has become a hot topic due to the increasing pressure to integrate IT solutions into business processes. IT governance refers to the alignment of strategic business objectives with the alignment of the project objectives. A misalignment between these two strategies can result in a final product that does not meet the implementation critical success factors, thus causing a project failure or a large overrun in cost.

Perhaps the most important piece of governance is the alignment of the day-to-day project activities with the constantly evolving business needs. McBride (2008) states that project management, either individual managers or the project management office (PMO) must constantly be monitoring the project to ensure that the implementation plans can be quickly adjusted to meet the constantly shifting business objectives. The definition of this PMO will be lectured on, as this is probably a foreign concept to the students. Along with this definition and discussion on roles and responsibilities of a PMO, a list of who should and should not be on the project PMO will be drafted and discussed.

The responsibilities of the PMO, such as monitoring the methodologies, ensuring communication, and monitoring the success factors, must be stressed within this lecture. It is important that these students are fully aware of the interaction between the internal and external critical success factors, which Wang, Shih, Jiang, and Klein (2008) place importance on in their study.

Additionally, the benefits of having an established change control process will be discussed. The importance of ensuring that part of the project does not overwrite or disable another is critical in an integrated environment. There also needs to be an acceptable level of project customization of a packaged software solution. The PMO and the change control membership should agree on this level.

Finally, it should be noted that the level of governance of an IT project should be proportional to the scope of the project in order to reduce the change of a cost or timeline overrun. A three week project most likely will not need a PMO or a change control board like an ERP installation will, but there still needs to be some sort of governance.

Within the discussion on the acceptable level of customization for a project, the students may feel that they need more context. This will be provided during the second half of this unit. The lecturer will present that customization is a factor which largely impacts both the benefits and costs of a packaged software implementation. Chou and Chang (2008) show that firms with greater

customization have a higher rate of coordination and task efficiency within their organization. This task efficiency may be misleading though, as the project most likely would have a goal of total process efficiency, not an individual task.

The areas within a packaged software solution where customization can occur will be discussed. Items such as user-exits, interfaces, enhancement spots, core code modifications, and custom items such as reports will be talked about. When each of these items are discussed, reasons for customization will be solicited by the lecturer. Hopefully, the prevailing concept of gaining or keeping a business advantage will come to the forefront of the discussion. While this is the single most important reason for customization, the lecturer must ensure that the students understand that customizing a packaged software system for the purposes of keeping a poor, but existing inefficient process is a bad project mistake.

Customization of a packaged software solution is a double-edged sword though as many companies have faced greater cost overruns due to overcustomizing, which is caused by a lack of fit between implementation success factors and the actual process of implementing. Software providers, such as SAP, often will not provide support to over-customized objects and this may cause the organization to require consultant aid to correct defects. Customization can provide an immediate impact on task efficiency, but these impacts are degraded over the entire life of the system. This degradation can impact the total cost of ownership of the software package dramatically over the lifespan of the software package. New features and functionality delivered through system upgrades often will break or be useless due to customization.

Finally, customization must be discussed from a cultural standpoint.

Customizing a packaged software system is perhaps the greatest IT representation of a slippery slope. Organizations have been known to completely change a packaged software system to be just like the legacy model, only because this technical change is easier to do than changing the culture or the existing processes. Students will be made aware of the importance of

change management and how good change management up front can prevent a major customization effort.

4.4.11. Unit 8 – Issue Management, Design, and Development
This unit has three parts, first is user satisfaction second is issues
management, and the third is a discussion on design and development. First, a
definition of user satisfaction will be collectively created by the students and then
refined by the lecturer. After this, the students will be broken into small groups
with the tasks of coming up with ways to measure user satisfaction. The
students will continue to stay in these groups throughout this portion of the
lecture.

Many examples of why user satisfaction can be low and therefore damage the success potential of a packaged software solution will be given. For example, a common perception is that high satisfaction with the legacy system can cause an unsuccessful packaged software implementation due to reluctance for change in an organization. Infinedo and Nahar (2009) found that legacy system satisfaction does not have a positive relationship with implementation success, but they did not cover satisfaction with legacy processes.

It will be important for the students to recognize the difference between user satisfaction and customer satisfaction. The groups will be re-assembled and ask to come up with situations where user and customer satisfaction can cause conflict and come up with good change and project management strategies that can be used to resolve these issues. Also, the groups will have to answer the question "why do we need user satisfaction?"

In order to build on the impact that the organization's capacity and culture regarding change has on a packaged software implementation, one must against revisit the fit between internal and external critical success factors. While this is usually managed by the top level management of the organization, it is also important that lower-level employees manage the difference between the as-is

and to-be models of the system. Wang, Shih, Jiang, and Klein (2008) show the importance of the awareness of this contrast in requirements critical success factors that key employees, such as architects, project managers, and even consultants must have in order to negotiate the best solution between the vendor and the business.

The next portion of this unit will deal with the issues that arise from the packaged software implementation project. Throughout the entire project lifecycle, there will be issues with the implementation. While Li et al. (2008) would argue that there should be a process in place to ensure that issues are handled according to a TQM process defined by the business; there also must be a facility by which the project management can adapt and manage changes in objectives and scope. McBride (2008) finds that there are a variety of tools and methodologies available to project managers to track the progress of the project. These tools include solutions that can re-adjust project plans based upon the scope and complexity of these issues.

The lecturer should not overlook discussion issue escalation. The students will need to know when, why, and how to report issues to a PMO, a steering committee, a CIO, et cetera. The students should have an understanding of which methods to use to communicate issues to certain levels of management and situations where issues might not need to be escalated.

Issues usually arise from all areas, but a major area for discovering issues lies within system integration. These issues cause for a need for the project team to be aware that even a packaged software system will require design and development. System design and development is often perceived as the most tangible and important part of a packaged software implementation. While many have argued that the project planning is the most critical part of an implementation, this opinion varies greatly among organizations. In addition from the technical aspects, such as the coding and testing of the objects, there should be an equal importance placed on the requirements gathering, issue resolution,

documentation, and training aspects of the solution (Plaza & Rohlf, 2008; Scott, 2008).

It should be noted again that this design and development must be balanced with the business goals of using a packaged software solution. This ending portion of the lecture will build on two themes from the course — customization and change management. The students will need to be aware that it is easier in the short term to customize a packaged application than it is to change the people, culture, or process. The students will also be asked to provide possible long term issues which could arise from customization and how to find a balance between code changes and process changes.

4.4.12. Unit 9 – Training and Documentation

This unit will focus on two of the most overlooked project portions, training and documentation. Many projects historically have cut these functions out of the lifecycle for budgetary or timeline reasons, but the future costs of these actions have always shown up as a negative impact on the total cost of ownership.

All packaged software installations require a high amount of employee involvement and due to this, there is a need to re-train employees on the new systems before the beginning of the design and development phases. Due to the historically high costs of re-training individuals, it is important to assess and consider the current skill-sets of key employees when performing software selection. Plaza & Rohlf (2008) state that "training is the most beneficial means for an organization to minimize the cost of consulting and this training should be strategized during the project planning phase" (p. 83). These training strategies which they propose show that performance and training should be at a certain point before the design and development stage in order to reduce the variability of project success and project timeline accuracy.

Two major factors that must be balanced within a project is when to train and who to train. Many companies will train project team members heavily at the start of a project, then users at the end. While this seems to be an obvious strategy, often it can lead to an overwhelmed user community. Training end users throughout the project can help with acceptance, buy-in, and also user skills.

The costs of training can prove to be very large. Vendors often will provide as much training as needed to an organization, for a price, and some basic materials. There are countless third party companies who specialize in employee training. Most major IT organizations have a training department. The materials, classrooms, travel, and time away from work can turn training into a very expensive endeavor. Organizations sometimes will look to within to train, where they will send one person to training and then have this person in turn train many people. Other ways in which training costs can be reduced is through quick reference cards, a shared knowledge database, and frequent reinforcing sessions.

To further emphasize the importance of having a highly-trained staff on a successful ERP implementation, Infinedo and Nahar (2009) validated that there is "a positive relationship between the IT assets and resources of an organization and the ERP success rate" (p. 130). While they only found moderate support for their hypothesis concerning the general IT skill sets of the end users, they did find that there was a strong positive relationship between the success of an ERP installation and the assets of the IT department. The same can be said for any packaged software implementation.

One topic of discussion which the lecturer will delve into is the generational differences in training. It has been shown that different age groups need different materials in order to feel adequately trained. For example, Generation Y employees might just require access and a "play-pen" environment so they can self-train. Other generations might need a manual, binders, and three books on the software.

Like training, documentation can be a very large overhead expense. While many have argued that documentation is a meaningless activity during a project, these materials can prevent many small issues from becoming larger issues. Documentation historically is very strong at the beginning of a project, but fades off once more tangible work, such as coding or configuration, becomes available.

There are a few best practices to be discussed for having adequate, yet cost-effective documentation. First, a single repository should be used. This ensures that there is no duplication of effort, that many materials can be shared, copied, and pasted, and that there is a common language between interested parties. The organization of the documentation is another way to ensure these items. Haphazardly organized artifacts are just as useless as missing artifacts to the user.

Documentation is very important in filling personnel gaps created by the project. There are two main gaps that arise during and after a project. First, vendors and consultants usually are only necessary for the implementation of a project. Once they leave, all knowledge they have leaves with them. There should be checks in place from the RFP document and contract that ensure vendors document what, why, and how they changed configuration and code in your system. Next, after employees learn a new package software system, they immediately become more marketable to other organizations. Many employees have learned a new skill and left, leaving behind all knowledge of the system. Documentation can defray the costs of backfilling these losses. These skipped practices from the project which lead to missing documentation could negatively impact the total cost of ownership.

Good and accurate documentation can also help user acceptance. Scott's (2008) hypothesis stating "the usability of the documentation affects the effectiveness of training and could result in a faster payback on the ERP investment" (p. 121) should not be overlooked by project management. Often in ERP implementations, timeline and budget constraints force documentation

down the prioritization ladder for the project. The processes for creating documentation on IT projects are often defined in a TQM solution, but oversight of these processes is critical (McBride, 2008). Scott finds that there can be a great cost savings in documentation in several areas of system usability, such as navigation, presentation, and support. While Scott (2008) proves that companies can save on support costs by having accurate and complete documentation, she further enhances her documentation argument by showing that the quality. One of the key points Scott makes is that documentation which outlines the business reasons and justification for changing a process during an ERP implementation will actually go great lengths towards creating user acceptance of the system.

Finally, the depth and breadth of documentation and training both need to be considered when planning these activities. Like governance and many other project functions, over-documenting and over-training can lead to unnecessary costs, so it is important to document for value, not to fill in a template and to train for value, not to check off a task. These are a few ways to positively impact the total cost of ownership at the front-end of a project.

4.4.13. Unit 10 – Solution Evaluation

This unit looks at the solution after implementation. Because the packaged software system is now an asset to the organization, it must be constantly evaluated to make sure that continual operation is of the best interests of the organization. Wei (2008) proposes a framework which will help an organization in this evaluation process. One point Wei makes is that this framework must include a team which gathers the performance indicators (Pl's) which the business demands and then to assess the system in order to make sure these Pl's are met.

Many organizations make the mistake of not fully – or even partially – evaluating a solution after go-live. This statement should make the students recall the return on investment (ROI) discussion from earlier in the year.

Questions should arise, such as do ROl's even matter and what is the benefit of calculating the ROI to see if your implementation delivered what you expected.

It will be important to stress that after evaluating the entire packaged software solution, an organization should also evaluate each component. Vendors, software, hardware, consultants, internal staff and processes all need to be evaluated to aid the organization in making future decisions. Additionally, re-visiting the critical success factors and goals from the request for proposal document will show an organization if they really accomplished their goal.

Outside of evaluations, Total Quality Management, Six Sigma, and other quality-based strategies will be discussed. Since the total cost of ownership factors in the entire life of a packaged software solution, it would logically follow that continuing to improve this solution would drive down your total costs of owning it. This is where these strategies and methodologies come into play. After a brief discussion on the differences, the reasons and best practices for quality management will be discussed.

Most organizations, most notably large defense contractors, have adopted some form of Total Quality Management (TQM). These methodologies are utilized by organizations to ensure that the overall business processes are both efficient and provide steps to reduce the risk of error. Li, Markowskia, Xua, and Markowskia state that "a focus of TQM in employee involvement, customer focus, and business process reengineering paves the way for an ERP implementation" (p. 577). This statement shows the importance of having a TQM or similar system in place prior to implementation. Methodologies such as these provide an important backbone for both the project teams and the end users of a solution.

Another critical reason that necessitates the need for a TQM solution is the efficiency degradation that can be caused by over customization of an ERP. Even though Chou and Chang (2008) show that firms with greater customization have a higher rate of coordination and task efficiency to their company, there are still long-term impacts brought on by this improvement in task efficiency. These

impacts include a future scenario in which the ERP forces a business to use the over-customized solution even when a business process reengineering study provides a case for greater efficiency with a more flexible or vanilla solution.

4.5. Group Project

The course group project is a large, group-based activity that focuses on both the course objectives and teamwork. This group project includes selection of a software package based upon business needs described in a request for proposal (RFP) document, a sample implementation plan, a proposal outlining the rationale and methodology behind creation of these deliverables, and a presentation of the entire project to the rest of the class, delivered as if it were an actual response to the RFP document. This group project is based upon the RFP document in Appendix F of this document.

4.6. Course Model

The course model was developed in order to detail the course goals, prerequisites, learning objectives, learning outcomes, and assessment mechanisms.
It takes the existing degree learning outcomes from the Purdue University C&IT
department and displays how the proposed materials satisfy those outcomes.
Additionally, the assessment mechanisms which measure the progress towards
the learning outcomes were noted. The course model can be found in Appendix
B of this document.

CHAPTER 5. DISCUSSION

5.1. Conclusions

As stated in the scope and significance of this project, one of the largest issues facing technical curricula at universities is keeping pace with the changing landscape of computer systems within organizations. This directed project's outputs of a nearly-complete undergraduate course that exposes students to the benefits, challenges, and breadth of the large packaged software systems hopefully will help universities bridge this gap. Several of the key topics of this course will provide integration points into the rest of the Purdue CNIT course curricula, while also going into more depth and providing a different viewpoint than the core CNIT courses. This course should provide students with the knowledge that most software is purchased and gap analysis, software procurement and software integration skills will be transferable to any organization.

5.2. Future Work

Due to the constantly changing information technology landscape, there will obviously be future work on this course. Keeping the course material current will be a challenge and also a great opportunity to incorporate new themes into the course materials. In addition, certain lectures might need more detailed information, case studies and examples. Also, there should be a continuous

evaluation of the course with focus groups comprised of faculty, students, and an alumni/industry panel.

One course improvement that might be a good addition would be installing and having the students work with analyzing and configuring a working packaged system. This could be very helpful hands-on experience. Also, there is great potential to integrate guest speakers from both a vendor and a software procurement director side.

Another improvement could be an additional unit on appliances, or the packaged hardware and software combinations offered. These appliances include purchasing not only the software system, but also a pre-loaded and distinctly configured suite of hardware.

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APPENDIX A - COURSE SCHEUDLE

CNIT xxx – Packaged Software Project Systems

Primary Mission:

This undergraduate course will expose students to the benefits, challenges, and breadth of the large packaged software systems that many companies implement. This course is pertinent because many of Purdue Computer and Information Technology undergraduates will work on these systems with very limited experience. This course will help students gain an intimate knowledge of packaged systems including analysis, benefits, disadvantages and shortcomings, and the integration of these systems within current business platforms.

WEEK	TUESDAY TOPIC	THURSDAY TOPIC
1	Total Cost of Ownership	Return on Investment
		Group Project Discussion/Team
		Formation
2	Build Versus Buy	Packaged Software System Benefits and
		Challenges
	Introduce Assignment 1 (Make or	
	Buy)	
3	Packaged Software Selection	Critical Success Factors
		Assignment 1 due
4	Gap Analysis	Gap Analysis (cont.) / Requests for
		Proposals
	Introduce Assignment 2	

(Gap Analysis)	
Request for Proposal (cont.)	Vendor Evaluation
	Assignment 2 due
Group project Pre-Proposal	Packaged Software Management
Conference	
	Group Project Status due
Exam 1	
Project Preparation	Business Process Redesign
Introduce Assignment 2	
,	Change Management (cont.)
Change Management	Change Management (cont.)
	Assignment 3 due
Governance / Customization	User Satisfaction / Design
	Group Project Status due + last day for
	formal RFP questions
Development / Testing / Critical Issue	Internal Staff Training
Handling	
Documentation	Training
Evaluation of the solution	Continuous Improvement
	Croup Project due
	Group Project due
	(Vendor Selection, and Implementation
	Plan – including BPR strategies)
Exam 2	Group Project Presentations
	Request for Proposal (cont.) Group project Pre-Proposal Conference Exam 1 Project Preparation Introduce Assignment 3 (RFP & Vendor Evaluation) Change Management Governance / Customization Development / Testing / Critical Issue Handling Documentation

APPENDIX B - COURSE MODEL

CNIT xxx COURSE MODEL
(Subject to improvement and approval by the CNIT Systems Integration SIG)

Last Updated: 7/14/2010 1:46 PM

By: Blake Haan

Course Number	CNIT xxx	Course Title	Packaged Applications
			Software Systems
Catalog Desc	ription		

Class 3, Lab 0, PSO 0 cr. 3. Prerequisite: 280 & xxx. Co-requisite: None. Credit by examination: n/a. Offered at WL, SB, KOK, COL

This undergraduate course will expose students to the benefits, challenges, and breadth of the large packaged software systems that many companies implement. This course is pertinent because many of Purdue Computer and Information Technology undergraduates will work on these systems with very limited experience. This course will help students gain an intimate knowledge of packaged systems including analysis, benefits, disadvantages and shortcomings, and the integration of these systems within current business platforms.

Course Goal

After successfully completing this course, you should be able to:

Have an intimate knowledge of packaged systems, their purpose, their evaluation, and their lifecycle. This knowledge will include the benefits of leveraging packaged software components, the disadvantages of using packaged software components, and the shortcomings of systems comprised of packaged components.

Be able to analyze and discuss the integration of packaged systems within current business platforms in

intelligent conversation.

Be able to perform a basic gap analysis.

Show an understanding of the vendor selection process, including but not limited to requests for proposals, vendor product evaluation and vendor selection.

Appreciate the importance of good packaged software integration skills:

Share his/her own examples of good and bad software integration

Use knowledge and skills developed in this class in other settings

Course Prerequisites

PREREQUISITE KNOWLEDGE	CNIT COURSE	ASSESSMENT
OR SKILL		OR REVIEW
Understanding of the object-oriented systems	CNIT 280 Systems Analysis and Design	
and database development life cycle /	Methods	
methodology.		

Learning Objectives

CNIT DEGREE	CNIT xxx	LA area	CNIT xxx
LEARNING OUTCOMES	LEARNING OUTCOMES		ASSESSMENT MECHANISMS

A.S. AND B.S. DEGREES N COMPUTER TECHNOLOGY Students successfully completing the associate and baccalaureate programs in Computer Technology will be prepared for sheir first position in the information systems or information technology field, and be prepared for continued education and life-broad first inside the insi	CNIT DEGREE	CNIT xxx	LA area	CNIT xxx
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A semester project (team- oriented) will be used to				reinforce problem solving
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integrate course concepts,				oriented) will be used to
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techniques, and technology to a				techniques, and technology to a
moderately sized, relatively				moderately sized, relatively
unstructured problem solving				unstructured problem solving
situation.				situation.
1,0 Computer Application Objectives 1.0 Computer Application Objectives 1.0 Computer Application	1,0 Computer Application Objectives	1.0 Computer Application Objectives		1.0 Computer Application
Objectives				Objectives

CNIT DEGREE	CNIT xxx	LA area	CNIT xxx
LEARNING OUTCOMES	LEARNING OUTCOMES		ASSESSMENT MECHANISMS
1.1 Describe the purpose and	Experience applying packaged software	С	A semester team project will
organization of common business	approaches, tools and techniques for		require students to
functions and processes, and	different business scenarios and		demonstrate an
opportunities for automation and	industries.		understanding of the purpose
information services.			and organization of common
			business functions and
			processes, and opportunities
			for automation and
			information services.
1.2 Describe characteristics of and apply	Differentiate between information	С	A semester team project will
information system solutions to personal,	systems, approaches, and people		require students to
workgroup, enterprise and inter-	involved in developing systems that		demonstrate an
enterprise problems and opportunities.	support:		understanding by designing a
	Individuals		solution based on the
	Work groups or departments		organization's requirements
	Organizations		presented in a large detailed
	Functions		case study based on actual
	Cross Functions		examples.
	Multiple organizations		
1.3 Describe characteristics of and apply	Identify the strategic impacts a packaged		As part of a semester team
information system solutions to	system can have on an organization's		project, students will be
transactional, operational, managerial,	mission and vision.		expected to identify the
and executive problems and			alignment betw een a
opportunities.			packaged system and the
			mission and vision of an
			organization
2.0 Information Technology and Tools	2.0 Information Technology and Tools		2.0 Information Technology
Objectives	Objectives		and Tools Objectives
2.1 Describe the functions, components,	Identify alternative hardware and	С	As part of a semester team
and architecture of computers,	software solutions to support an		project, students will be
peripherals, and networks.	information system.		expected to identify,
			research, and evaluate
			alternative technologies as
			considerations for a
			computer-based solution.

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LEARNING OUTCOMES	LEARNING OUTCOMES		ASSESSMENT MECHANISMS
2.2 Evaluate, recommend, install, and integrate purchased technology or solutions.	Evaluate alternative computer-based solutions to select the "best" overall solution. Evaluation involves a feasibility analysis using the following criteria: Operational Technical Schedule Economic Perform a gap analysis between what the purchased technology delivers and the needs of the customer	С	On an examination, students will be expected to demonstrate an understanding of the different feasibility analysis criteria, including "technical". As part of a semester team project, students will be expected to identify, research, and evaluate alternative technologies as considerations for a computer-based solution then apply the best choice for the system requirements. On an examination, students will be expected to demonstrate an understanding of how to conduct a gap analysis.
2.3 Apply appropriate hardware and software tools for business solutions.	Apply the appropriate tools for packaged software selection	С	A semester team project will require the students to use packaged software selection tools to identify a best-fit solution for the organization.
2.4 Select and apply high-level tools for	Identify and apply appropriate tools for	С	A semester team project
system, application, database, and network development.	modeling and implementing various systems aspects.		will require the students to use packaged software selection documents and gap analysis tools to identify a best-fit solution for the organization.
2.5 Manage applications and technology	Prepare a systems requirements	С	A semester team project
with high-level tools and methodologies.	document. Develop a proposed packaged software systems project plan. Prepare a systems gap analysis document.		will require students to develop a requirements document, proposed project plan using project management software, and gap analysis document.

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LEARNING OUTCOMES	LEARNING OUTCOMES		ASSESSMENT MECHANISMS
2.6 Identify and evaluate current and	Review emerging technologies and apply	С	A semester team project
emerging technologies and assess their	the appropriate ones for a packaged		will require the students to
applicability to address the users' needs.	software project.		review emerging technologies
			and suggest possible
			solutions to satisfy business
			requirements within time,
			cost, and scope goals.
3.0 System Theory and Concepts	3.0 System Theory and Concepts		3.0 System Theory and
Objectives	Objectives		Concepts Objectives
3.1 Apply system representations and life	Demonstrate an understanding of the	С	An examination will require
cycle concepts.	packaged systems procurement and		students to demonstrate an
	installation process.		understanding of packaged
			system lifecycle concepts.
			A semester team project will
			require students to step
			through a packaged system
			selection and implementation.
3.2 Represent business and technical	Apply object modeling using clear and	С	A semester project will
dimensions of data, processes, and	concise communication to a packaged		require students to develop
networks using formal frameworks,	systems project.		various models (such as UML
methods, and models.			Use Case Models, Class
			Diagrams, Interaction
			Diagrams, Activity Diagrams,
			Component diagrams and
			Deployment diagrams to
			represent their business
			system and the makeup of
			packaged components in the
			business system.
			In-class exercises or
			homew ork will require
			students to develop individual
			models from a narrative
			description of a packaged
			system.

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LEARNING OUTCOMES	LEARNING OUTCOMES		ASSESSMENT MECHANISMS
3.3 Identify boundaries, interfaces, and components of problems.	Identify, evaluate, and model system boundaries and interfaces for a packaged system.	С	A semester team project will require students to develop various models that identify boundaries, interfaces, and components of problems for their packaged system integration.
3.4 Apply problem and solution checking and reality testing mechanisms.	Identify and analyze problems and opportunities for an existing information system.	С	A semester team project will require students to identify and analyze problems and opportunities then prototype a solution.
4.0 Problem Solving Objectives	4.0 Problem Solving Objectives		4.0 Problem Solving Objectives
4.1 Recognize the need for the application of analytical methods and critical thinking	Understand analytical problem solving approaches to packaged software selection.	С	In-class case study discussion or exercise will test the student's understanding of potential project failures associated with poor analytical development methods.
4.2 Apply system theory and concepts, and problem solving approaches to the definition and solution of problems.	Apply systems theory and concepts, and problem solving approaches to an information systems project.	С	A semester team project with require students to apply systems theory and concepts, and problem solving approaches to deliver a solution.
4.3 Devise questions that will identify and evaluate problems, opportunities, constraints, and alternative solutions.	Use requirements gathering and vendor evaluation sessions for packaged systems analysis and overall system design.	С	An examination will require students to demonstrate an understanding of packaged systems integration concepts.
4.4 Formulate creative solutions to simple and complex problems	Develop a system concept based on a given set of system requirements.	С	A semester team project will require students to analyze, select and implement a solution to a number of business problems.
5.0 System Development Methodologies Objectives	5.0 System Development Methodologies Objectives		5.0 System Development Methodologies Objectives

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LEARNING OUTCOMES	LEARNING OUTCOMES		ASSESSMENT MECHANISMS
5.1 Understand "make versus buy"	Understand the concept of "make versus	С	In-class case study
alternatives, criteria, and implications.	buy" and apply those principles when		discussion or exercise will
	producing the system prototype.		test the student's
			understanding of "make
			versus buy."
			A semester project will test
			the student's ability to
			recognize alternatives, and
			then develop, "make versus
			buy" decisions and implement
			them.
			An examination will require
			students to demonstrate an
			understanding of "make
			versus buy" concepts.
5.2 Select and utilize appropriate system	Recognize the existence of alternative	С	An examination will test the
development and system integration	systems procurement tools, techniques,		students understanding of
methodologies.	and approaches.		alternative packaged systems
			procurement methodologies
			and their primary tools and
			emphasis.
5.3 Use appropriate tools and techniques	Apply systems selection and	С	A semester team project will
to solicit user requirements, and plan,	implementation tools and techniques		require the students to apply
analyze, design, and construct	during packaged software		appropriate tools and
information systems, computer	implementations.		techniques to develop
applications, and networks.			artifacts for an information
			system.
			In-class exercises or
			homew ork assignments will
			require the students to apply
			appropriate tools and
			techniques to develop
			packaged software analysis &
			integration artifacts.
5.4 Assess feasibility and riskfor	Apply feasibility analysis techniques to a	С	An examination will test the
projects.	packaged systems project, including		students understanding of
	measuring: operational, technical,		feasibility analysis and risk
	economic, and schedule feasibility		analysis.
	analysis.		

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LEARNING OUTCOMES	LEARNING OUTCOMES		ASSESSMENT MECHANISMS
5.5 Apply analytic and design methodologies compatible with organizational settings.	Understand the business reasons and differences between methodologies for packaged system selection and implementations.	С	An examination will test the student's comprehension of these packaged software methodologies.
6.0 Communication Objectives	6.0 Communication Objectives		6.0 Communication Objectives
6.1 Organize and write business and technical memos, reports, and documentation.	Write memos, reports, and documentation appropriate during systems development project experience.	С	A semester team project will require the student to complete one or more technical reports (complete with documentation). In-class exercises or homew ork assignments will require the students to apply appropriate tools and techniques to develop system documentation
6.2 Organize and make business and technical presentations to audiences of technical and non-technical backgrounds.	Understand the need and importance of oral presentations to non-technical audiences during a systems development project.	С	(optional) A semester team project will require the student to participate in a formal presentation of project deliverables.
6.3 Plan and conduct surveys, sampling, and interviews for the purpose of fact finding, problem analysis, or requirements determination.	Develop a fact-finding strategy for use in sessions to solicit requirements for packaged systems.	С	A semester team project will require the student to select and apply fact-finding techniques throughout the packaged systems procurement and implementation project.
6.4 Plan, organize, and facilitate group meetings and joint application development sessions.	Understand how to plan, organize, and facilitate group for a packaged systems procurement and implementation project.	С	A semester team project will require students to plan, organize, and facilitate group meetings.
6.5 Accurately observe, note, and explain observation of events.	Identify the advantages and disadvantages of using observation as a fact-finding strategy during packaged systems procurement and	С	(Optional) A semester project will require students to accurately observe, note, and explain observation of events.
7.0 Interpersonal Relationships	implementation processes. 7.0 Interpersonal Relationships		7.0 Interpersonal

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LEARNING OUTCOMES	LEARNING OUTCOMES		ASSESSMENT MECHANISMS
7.1 Work effectively as a member of teams.	Identify various people and their roles in systems development and the need to establish software selection teams.	С	A semester team project will require students to work effectively with fellow teammates. An in-class exercise or homew ork assignment will require students to work in teams to solve a small business need
7.2 Effectively work with people of	Recognize packaged systems analysis	С	A semester team project will
diverse backgrounds.	as requiring strong interpersonal skills for working with people of diverse backgrounds.		require students to work effectively with fellow teammates having diverse backgrounds.
7.3 Effectively work with people at all	Differentiate between different	С	An examination will test the
corporate levels.	know ledge workers and their needs.		students understanding of different knowledgeworkers and goals, objectives, and information needs.
7.4 Develop "win-win" approaches for	Understand how "win win" approaches	С	A semester team project will
conflict resolution.	can be used to resolve conflict resolution on a systems development project.		expose the students to the need to apply conflict resolution on a packaged systems implementation project. In-class exercises will test the students' interpersonal skills and ability to recommend conflict resolutions.
7.5 Empathetically listen and seek	Emphatically listen and seek synergistic	С	A semester team project will
synergistic solutions.	information systems solutions.		require students to listen and seek a synergistic information system solution.
8.0 Management Objectives	8.0 Management Objectives		8.0 Management Objectives
8.1 Establish project goals consistent with organizational goals.	Establish packaged systems implementation goals consistent with organizational goals.	С	A semester team project will require the student to identify and specify project goals that are consistent with an organization's goals.

CNIT DEGREE	CNIT xxx	LA area	CNIT xxx
LEARNING OUTCOMES	LEARNING OUTCOMES		ASSESSMENT MECHANISMS
8.2 Plan, specify, gather, deploy,	Develop a project plan for a packaged	С	A semester team project will
monitor, and direct resources and	systems analysis and implementation		require the student to plan
activities.	project.		specify, gather, deploy,
			monitor, and direct resources
			for packaged systems
			analysis activities.
			An examination will test the
			students understanding of the
			roles and responsibilities of a
			project manager during a
			packaged systems analysis
			and implementation project.
8.3 Understand the need for, and	Recognize the need to manage change,	С	A semester team project will
techniques for management of change,	expectations, and conflict during		require the student to
expectations, and conflict.	packaged systems analysis and		recognize the need for, and
	implementation projects.		techniques for management
			of change, expectations, and
			conflict during packaged
			systems analysis and
			implementation projects.
8.4 Create and implement effective	Develop effective project plans to deliver	С	A semester team project will
project plans.	a system that meets customer		require the student to create
	expectations for function and cost		and effectively execute a
			project plan.
8.5 Apply concepts of total quality	Understand the need for user	С	An examination will test the
management and continuous quality	involvement and requirements		students understanding of the
improvement.	verification, systems testing and user		need to involve users in
	feedback mechanisms.		systems requirements
			gathering and
			vendor/software selection.
			An in class exercise will
			require students to apply
			TQM principles in the
			packaged system lifecycle.
9.0 Professional Objectives	9.0 Professional Objectives		9.0 Professional Objectives

CNIT DEGREE	CNIT xxx	LA area	CNIT xxx
LEARNING OUTCOMES	LEARNING OUTCOMES		ASSESSMENT MECHANISMS
9.1 Develop a sense of personal responsibility and accountability for one's individual actions and performance.	Develop a sense of personal responsibility and accountability for one's individual actions and performance.	С	Throughout the course, students will be held strictly accountable for meeting due dates and quality standards. Penalties for nonconformance will be strictly enforced to reinforce learning outcome. A semester team project will require the students to evaluate each teammate's performance on the project that could lead to a lower grade for non-performance
9.2 Apply personal goal setting and time management concepts.	Apply personal goal setting and time management concepts in a packaged software systems setting.	С	Throughout the course, students will be held strictly accountable for meeting due dates and quality standards. Penalties for nonconformance will be strictly enforced to reinforce learning outcome.
9.3 Apply personal decision making skills.	Apply personal decision making skills in a packaged software systems setting.	С	The semester team project will require students to apply decision-making skills. In-class exercises will test the students' personal decision making skills in a packaged software systems context
9.4 Articulate a personal position and respect the opinions of others.	Articulate a personal position and respect the opinions of others.	С	In-class exercises or semester project will require students to express their opinions and build group consensus in solving problems.
9.5 Understand and adhere to high ethical standards of society, academe, and business.	Understand the ethical issues of systems analysis and vendor selection and adhere to ethical standards.	С	Students will be held accountable for violation of the course cheating policy. An examination will test the students understanding of the role of ethics in the information systems industry.

CNIT DEGREE	CNIT xxx	LA area	CNIT xxx
LEARNING OUTCOMES	LEARNING OUTCOMES		ASSESSMENT MECHANISMS
9.6 Assess organizational and societal	Assess organizational and societal	С	A quiz or an examination will
impacts of information systems.	impacts of a particular information		test the students
	system.		understanding of the
			organizational and societal
			impacts of particular
			information systems.
9.7 Actively employ best practices in	Become familiar with and use resources	С	The semester team project
information technology.	available to discover and research new		will require students to
	best practices for technology.		research and employ best
			practices in information
			technology.
9.8 Recognize the need for continued	Understand the need for continued	С	In-class exercise or
learning.	learning and the correlation between this		homew ork will require
	and job performance		students to recognize the
			need for continued learning.

Enabling Technologies

	SITE	ASSESSMENT
REQUIRED	WL	
Microsoft's WORD word-processing software		
Microsoft's EXCEL spreadsheet software		
Microsoft's PowerPoint presentation software		
OPTIONAL		
Microsoft's PROJECT project management software		

APPENDIX C - COURSE SYLLABUS

CNIT xxx Packaged Applications Project Systems (last updated August 2, 2010)

Catalog Description: This undergraduate course will expose students to the benefits, challenges, and breadth of the large packaged software systems that many companies implement. This course is pertinent because many of Purdue Computer and Information Technology undergraduates will work on these systems with very limited experience. This course will help students gain an intimate knowledge of packaged systems including analysis, benefits, disadvantages and shortcomings, and the integration of these systems within current business platforms.

Organization and Schedule: Lecture 3, Credit 3

Semester	Meeting Type	Days	Time	Location
XX	Lecture 01	TTH	TBD	TBD
	EXAM 1	TBD	TBD	TBD
	FINAL EXAM	TBD	TBD	TBD
	Test out	none a		
	Help sessions	to be a		
	Last day to add	XXX		
	Last day to drop	XXX		
	Last day to drop	XX	with a	grade

Prerequisites:

Required - Junior Level Standing in CIT or by permission of instructor

Course Description and/or Theme

The primary mission of this course is to provide students a rich and robust learning experience of the approaches, techniques, and tools considered by industry as "best practices" in terms of Packaged Applications Software Systems. The major learning outcomes of this class are (1) Discuss, in intelligent conversation, the techniques and tools used for packaged software analysis, selection, and implementation (2) Apply the packaged software systems methodology to real life business problems. (3) Be able to create and interpret packaged software gap analysis models. (4) Apply techniques for clear communication in creating Requests for Proposals. (5) Apply techniques for client communication to gather requirements for packaged software system. (6) Apply the techniques for Business Process Redesign in order to extract value from a packaged software system. The course is structured to follow a project life-cycle meaning; material will be covered in class in the same sequence, as it would be needed in an actual live project. The class will use actual business case study examples to get hands on experience evaluating software, vendors, and business requirements.

Information Technology Used In This Course

Microsoft Windows

Microsoft Word, Excel, Visio (for homework assignments)

Course Audience

This is a core course for CIT baccalaureate majors. The instructor normally does not permit course audits.

Course Instructor

Name Office Phone Email Address Office Hours

tbd tbd tbd@purdue.edu

Office hours: See schedule end of this document.

Required Textbooks, Lab Manuals, and Supplies

Meyers, B., & Oberndorf, P. (2001). Managing software acquisition: Open systems and COTS products. New York City, NY: Addison-Wesley. ISBN 0-201-70454-4

Student Objectives

The student who successfully completes this course must:

Gain an intimate knowledge of packaged systems, their purpose, their evaluation, and their lifecycle. This knowledge will include the:

Benefits of leveraging packaged software components.

Disadvantages of using packaged software components.

Shortcomings of systems comprised of packaged components.

Be able to analyze and discuss the integration of packaged systems within current business platforms in intelligent conversation.

Be able to perform a basic gap analysis.

Show an understanding of the vendor selection process, including but not limited to requests for proposals, vendor product evaluation and vendor selection.

Appreciate the importance of good packaged software integration skills:

Share his/her own examples of good and bad software integration Use knowledge and skills developed in this class in other settings

Instructor Objectives

Your instructor's goal is to maximize the educational experience of those students who bring an appropriate and sincere effort and serious interest in the subject matter to the classroom.

Course Requirements and Learning Assessment

Knowledge

Students are expected to demonstrate an understanding of packaged software systems concepts that exceeds rote memorization and mechanical application. Examinations and quizzes will be used to assess this level of learning.

Techniques

Students are expected to demonstrate the ability to work with packaged software systems evaluation methodology. Homework problems will be used to assess this level of learning.

Application

Students are expected to be able to apply concepts and techniques to the solution of a highly unstructured business problem. A case study approach will be used to assess this level of learning.

General Course Outline

Week 1	Total Cost of Ownership/Return on Investment	Week 7	Packaged Software Projects
Week 2	Build vs. Buy benefits and drawbacks	Week 8	Business Process Redesign
Week 3	Packaged Software Selection	Week 9	Governance and Customization
Week 4	Gap Analysis	Week 10	Development and Testing
Week 5	Requests for Proposal	Week 11	Training and Documentation
Week 6	Vendor Evaluation	Week 12	Evaluation of Solution/Continuous Improvement

How Final Grades will be Determined (subject to change with notice)

Points and/or Weights

Assessment Mechanism	Total Points	Weighting
Lecture Quizzes	50 – 80 points	not applicable
Examinations	300 points	not applicable
Homework	200 – 300 points	not applicable

Grading Scale

Scale	Notes or Prior Term's Distribution
90 - 100 %	% of total points possible
80 - 89 %	% of total points possible
70 - 79 %	% of total points possible
60 - 69 %	% of total points possible
	90 - 100 % 80 - 89 % 70 - 79 %

F 0 - 59 % % of total points possible

I See policy.

W/WF See policy.

Miscellaneous Notes and Comments

Receiving 89.4% of the total points is not an A you will receive a grade of B. The final course grades are rounded up to two decimal places. For example, 89.5% will be granted an A.

Incompletes will only be given under (1) extenuating circumstances that caused the student to be absent for an extended period of time, or (2) failure to complete the semester project. Extended absences must be documented through the Dean of Students Office and will be validated by the instructor. Project-based incompletes will be penalized a minimum of one letter grade for the course.

Course Policies

Attendance, Preparation, and Courtesy Expectations and Policies

You are expected to be present for every meeting of the course. Your success in the course will heavily depend on your attendance and participation in the classroom. The instructor or his secretary must be notified in advance for an excused absence. Even if the absence is excused, you are fully responsible for any homework or lessons that were assigned or covered in the missed classes.

In the event of an extended absence (usually five days or longer), you should contact the Dean of Students Office to report the absence and receive advice on how to proceed. Upon your return to campus, you must promptly contact your instructor to determine if and how missed work will be made up.

In the event of an excused or unexcused absence, you alone are responsible for promptly discovering what you missed.

Handouts will be distributed only in class. Students who notify the instructor of an absence prior to class can receive handouts from the Professor. Remaining copies of handouts are promptly recycled.

Add/Drop Expectations and Policies

According to CIT educational policy, this course may not be added to any student's academic schedule after the third week of a Fall or Spring semester (or equivalent for a Summer semester) except under very extenuating circumstances to be approved by the Assistant Department Head of Computer Technology.

According to CIT educational policy, no independent study course can be substituted for this course.

You may drop this course without a failing grade so long as you do so before the published University deadline for dropping the course.

Quiz and Exam Policies

Quizzes will be unannounced.

There are no makeups for quizzes regardless of an excused absence. The lowest quiz score will be dropped from the student's final score at the end of the semester.

Makeup examinations will only be given under extenuating and unavoidable circumstances. The burden of proof of said circumstances is on the student. Makeup examinations will usually differ from the original exam, and may be essay or oral.

The graded final examination will not be returned. The department for possible future use in test outs is retaining it. However, you may review your final examination results by making an appointment with your instructor.

Homework Policies and Quality Expectations

Homework is due by 4:30 PM on the assigned due date unless otherwise notified. All homework assignments, by default, are to be treated as an individual effort unless otherwise stated.

All homework submissions must include the completed, computerized version of the CIT Office Submission Form template.

Homework and projects must be submitted for grading to the CIT Main Office in Knoy 255. All submissions will be dated and time-stamped. The office closes promptly at 5:00 PM; therefore all materials must be submitted by 4:30 PM to be considered "on time." The instructor will not accept homework in class or in his office. Multiple page assignments must be stapled.

LATE WORK: Late homework will be penalized 50% per day, excluding weekends, University holidays, and University vacation periods.

Always check your assignments for spelling and grammar. Points will be subtracted for mistakes.

Points will be subtracted for submitting poorly or improperly organized work, or for not following instructions.

To protect your privacy, graded materials will never be passed around the classroom or placed outside of an instructor's office door. Homework is returned during PSO or you will need to come during office hours to the Professor's office.

All material submitted for credit (homework, project submissions, exams) will be evaluated using the Microsoft Word Standard United States English dictionary. Points will be subtracted for misspelled words or misused words.

Re-Grading Policies

Any student wishing to appeal any score must return his or her paper, quiz, or exam with a written statement explaining the appeal. An appeal must be submitted no later than one week after the original scores were returned.

Any work submitted for re-grade may be totally re-graded. Do not assume the instructor will only re-grade those portions that the student wishes to be re-graded.

According to University regulations, only final course grades can be "appealed." There is a formal College of Technology and University timetable and process for grade appeals. It must be followed exactly! Questions about grade appeals should be directed to the Assistant Department Head of Computer and Information Technology or the Chair of the College of Technology Grade Appeals Committee.

Lab Policies and Expectations

If you use CIT laboratories, you are responsible for any and all laboratory policies – including the security policies that govern your account. Policies do change from time to time; therefore, you should review the CITnet and Laboratory Policies at the beginning of each semester. Accounts can be temporarily or permanently suspended for policy violations.

In the event that your account is suspended for any laboratory or network policy violation, this course will not extend deadlines or eliminate late penalties for assignments that could not be completed because of the suspension.

Academic Dishonesty ("Cheating") Policies

Is it worth the risk to be suspended from school for one or more semesters at this late date in your academic career? Don't Cheat!

Any form of cheating on any examination in the course may result in an "F" grade for the course, and the case will be forwarded to the Office of the Dean of Students for appropriate disciplinary action.

Any form of cheating on a homework or project submission will result in both a zero score for the assignment, and a one-letter grade penalty in the course. Also, the case will be forwarded to the Office of the Dean of Students for appropriate disciplinary action. Any form of cheating on a quiz will result in a zero score for that quiz, and the case will be forwarded to the Office of the Dean of Students for appropriate disciplinary action. Cheating, or helping another student to cheat, are considered equal cases of academic dishonesty and will be dealt with as noted above.

Giving another student access to your computer account, or negligently permitting another student to access your computer account constitutes cheating on your part if that other student copies any files that become implicated in a cheating case. Protect your account as if your academic career depends on it!

Disabling Conditions

Any student who, because of a disabling condition, may require special arrangements in order to meet course requirements should contact the instructor by the third week of class in order to make necessary accommodations. Students who do not contact the instructor by the third week of class, or as soon as they know they have a disabling condition, forfeit their rights to special accommodations. Students must work with the Dean of Students Office in order to receive special accommodations for this class.

APPENDIX D - UNIT LECTURE OUTLINE

- Packaged Software Systems
 - About this course
 - Reasoning
 - Name some software... how much is home grown?
 - Packaged software is everywhere!
 - o Increased integration means increased need for integration skills
 - o Custom development is dying off
- At the end of this lecture you should be able to:
 - Explain the Productivity Paradox
 - Explain Build vs. Buy
 - o Explain the NewParadigm
 - Explain why interfaces are increasingly important
 - o Explain Return on Investment
 - Explain Total Cost of Ownership
- ◆ What is productivity?
- Productivity Paradox
 - The relationship between information technology (IT) and productivity is widely discussed and little understood. Delivered computing-power in the US economy has increased by more than two orders of magnitude since 1970 yet productivity, especially in the service sector, seems to have stagnated (Brynjolfsson, 1993).
- Productivity Paradox
 - You can see the computer age everywhere but in the productivity statistics - Robert Solow
 - Why do you think this is?
- Productivity Paradox
 - o Reasons
 - Mismeasurement: the gains are real, but our current measures miss them;
 - Redistribution: there are private gains, but they come at the expense of other firms and individuals, leaving little net gain;
- Productivity Paradox
 - Reasons:
 - Time lags: the gains take a long time to show up; and

- Mismanagement: there are no gains because of the unusual difficulties in managing IT or information itself.
- Productivity Paradox
 - What does mismanagement mean?
- Build vs. Buy
 - o Why Build?
 - o Why not Build?
 - o Why Buy?
 - o Why not Buy?
- ◆ The new paradigm
 - What to buy
 - Build the gaps in your system
 - How to buy
 - How to work with vendors
 - What information to request
 - Don't paint yourself into a corner
- Integration and Interfaces
- ◆ Return on Investment Definition
- ◆ Return On Investment (ROI)
 - o Howmuch do you make/lose on what you've spent?
 - Howmuch did you spend?
 - Howdo you measure it?
 - o Howmuch did you make/lose/save?
 - o Howdo you measure this?
- Total Cost of Ownership
- ◆ TCO Definition
 - Howdo you think it is calculated?
- Possible factors
- ◆ TCO
 - Factors you might not have thought about
- So why the paradox?
- Missing TCO factors?
- Build, Buy, Rent, or Borrow
 - Build
 - o Buy
 - Software as a Service
 - Open Source

- ◆ At the end of this lecture you should be able to:
 - Define a package software system
 - List the benefits of a packaged software system
 - List the drawbacks of a packaged software system
 - Outline the differences between types of packaged software systems
 - Understand the packaged software selection fundamental questions
 - Understand the packaged software project lifecycle
- What is packaged software?
- Packaged software
 - o Definitions
 - Examples (broad)
 - Examples (students
 - o Benefits
 - Drawbacks
- Types of packaged software
 - Desktop components
 - o ERP
 - Best of Breed
 - o Tier II
 - Open source
 - Software as a Service (SaaS)
- Packaged Software Selection
 - Know who you are
 - Knowyour industry
 - o Know what you want
 - Don't confuse history and best practice
 - Do your homework
 - Promises promises
 - Expectations and reality
 - Don't forget the big picture (vision)
- Packaged Software Lifecycle
 - Not design, develop, test, implement
 - Identify
 - o Purchase
 - Integrate

- ◆ At the end of this lecture you should be able to:
 - Define, create, and measure a Critical Success Factor
 - Explain the link between CSF's and ROI
 - Define a "Gap"
 - Explain the benefits of performing a Gap Analysis
 - Discuss a sample methodology for doing a Gap Analysis
- Critical Success Factors (CSF)
 - Definitions
 - Why are CSF's needed
- ◆ Types of CSF's
 - Internal
 - External
- ◆ Examples
 - Cost
 - o Return
 - Hardware
 - Support
 - Consultancy
 - Training
 - Cultural Fit
 - Core Practices
 - Risk (short term)
 - Fit with the current vision
 - Future Expansion
 - Risk (long term)
 - Satisfaction
 - o Implementation Ease
 - Leverage Existing Solutions (CRM)
 - Reporting
- Measuring
 - Internal
 - External
- Following Up
 - Internal
 - External
- Link with ROI
 - o Internal
 - External
- Gaps and Gap Analysis
 - o What is a gap?
- ◆ Gap Analysis
 - o What is it?
 - Benefits of a Gap Analysis
- Methodologies

- Tools for performing a gap analysisBest Practices
- o As-Is
- o To-Be
- Example small groups- solution

- ◆ At the end of this lecture you should be able to:
 - Discuss the need for Requests for Proposals
 - o Discuss a basic RFP creation process
 - Create an RFP document
 - Evaluate proposals from vendors
 - Discuss difficulties with evaluate vendor proposals
- ◆ Request for Proposal (RFP)
 - Purpose of RFP
 - Set expectations
 - Legal requirements
- Pieces of a RFP
 - ADMINISTRATIVE SECTION
 - RFP Overview
 - Supplier and Supplier Reference Information
 - Company Confidential Information
 - Intent to Bid
 - Proprietary Information Notice
 - Supplier Confidential Information
 - Subcontracting
 - RFP Contacts
 - RFP Questions and Answers
 - Responding to Supplier Questions
 - RFP Schedule
 - Pre-Proposal Conference
 - Proposal Format Requirements
 - Cover Letter
 - Required Executive Summary
 - Pricing Section
 - Best and Final Offer
 - Compliance Matrix
 - TECHNICAL OBJECTIVES
 - Current Business Environment
 - Current Technical Environment
 - Proposed Technical Environment
 - Application Environments Supplier Scope
 - Constraints
 - BUSINESS OBJECTIVES
 - Project Plan
 - Project Schedule
 - Site Preparation Plan
 - Project Staffing Requirements
 - Roles and Responsibilities
 - Design, Development, and Implementation
 - Project Change Control

- Delivery and Installation
- Testing
- System Maintenance and Support
- Training
- Knowledge Transfer
- Documentation
- Cutover
- Supplier Issues and Concerns
- BUSINESS OBJECTIVES examples of failed projects due to business objectives
- SUPPLIER QUALIFICATIONS AND REFERENCES
 - Supplier Qualifications and References
- SUPPLIER'S SECTION
 - Additional Information not in Scope of this RFP
- PRICING
 - Introduction
 - Technical
 - Management
 - Pricing Grids
- EVALUATION
 - Evaluation of Proposals
 - APPENDIX A SUPPLIER INFORMATION
 - APPENDIX B NON DISCLOSURE AGREEMENT
 - APPENDIX C NOTICE OF INTENT TO BID
 - APPENDIX D PROPRIETARY NOTICE
 - APPENDIX E COMPLIANCE MATRIX
 - APPENDIX F PRELIMINARY EVALUATION CHECKLIST
- Sending out an RFP (when and how)
- Vendor Proposals
 - Responding to a RFP
 - Do you want to?
 - What to put in your proposal
 - Answer questions
 - Maybe not everything
 - Price it correctly
- Evaluating Vendor Proposals
 - o Fit
 - Functionality
 - Cost!!!
- ♠ References
 - Primary
 - Secondary
- Do your homework!
- Methodologies
- Timelines

- Ethics
- Not about the software, about the relationship Don't forget CSF's and mission/vision Assignment 3

- ◆ At the end of this lecture you should be able to:
 - o Discuss the importance of project management
 - Discuss the human aspect of a packaged software implementation
 - o Discuss the role that all levels of managers play in an implementation
 - Explain structure of a project team
 - o Explain the link between the RFP document and project management
- Project Management
- Research on top reason for ERP failure
 - Costs
 - Schedule
 - o People
 - Change management
 - Attrition
 - Performance
- Vendor Relationships
- ◆ Top Level Management
 - o Breath of life
 - Kiss of death
 - Support and Buy-in (trickle down)
- Project Preparation
- ♦ Best Practices
 - Leverage the RFP
 - Leverage the Vendor experience
 - Project Team Structure
 - o Train, Consult, or both?
 - Secure the resources
 - Remember it is a partnership

- At the end of this lecture you should be able to:
 - Discuss the costs of quality for the short and long term
 - Explain the importance of process redesign during packaged software projects
 - Explain the three stages of process redesign
 - Explain the importance of change management
 - Understand tools used to manage expectations
- Process Redesign
 - Costs of Quality
 - Upfront
 - After the fact
 - Costs of Prevention
- ♦ Buying more than the packaged software
 - Getting a packaged process
- ♦ Importance of process redesign
- Breakpoint (Lybrand Consulting)
 - Discover
 - Redesign
 - o Realize
- ♦ BPR Tools
 - Value Analysis (and non-value)
 - Flowcharting
 - Work Distribution
- Change Management
 - Bi-Modal success
 - Same software
 - People are still important
 - Org Structure
 - Org Culture
 - o Skill Sets
- ◆ Key Change mgmt points
 - Executive down process changes
 - From Manager personal impacts
- ◆ Build awareness
- Effective communications
- Involved employees
- Committed leadership
- OCM is not just for IT projects
- Managing Expectations
 - Expectations scope + rumors
 - Expectations = reality
 - Control expectations with RFP
 - Control expectations with project charter
 - Control expectations with communication (and listening to rumors)

o Control expectations with change control

- ◆ At the end of this lecture you should be able to:
 - o Define IT Governance
 - Discuss the reasons for IT Governance
 - Explain the purpose of a PMO and a change control group
 - o Show the link between customization and greater "task efficiency"
 - Show the link between over-customization and an increasing total cost of ownership
- ◆ IT Governance
 - Definition of governance
- Why is it important
 - o Systems integration
 - Don't break the downstream
 - Alignment of project to mission/vision
 - Ensure the project is staying on course
 - Leverage the internal and external CSF's
- Project Management Office (PMO)
 - What it is
 - Why it is important
 - o Who is on it?
- Methodologies and the PMO
- ◆ PMO Monitoring
 - Constantly monitor
- Mid-level decisions
- Customization
 - Defining customization
- Where can customization happen?
- Why customize
 - To get/keep a business advantage
 - To think you are keeping a business advantage
- Risks of customization
 - Cost of support
 - Loss of vendor support
 - Vendor relationships
- Risks of customization
 - Must now test custom code with upgrades
 - Maybe can't leverage new functionality
 - Becoming addicted to customization
 - Main impacts of customization
 - Must be aware of the TCO
 - Must be aware of the overall business process

- At the end of this lecture you should be able to:
 - Discuss howuser satisfaction is measured
 - Explain the link between change management and user satisfaction
 - o Explain the difference between a user and a customer
 - Describe a basic issue resolution process
 - Explain the balance of design and development needed in a packaged software project
- User Satisfaction
 - o What is it?
 - Why do you care?
 - NOT customer satisfaction
- Howdo you measure?
 - Examples
- Reasons for non-acceptance
 - Legacy system satisfaction
 - Link to change management
- ◆ Project Issues
 - o What are they?
- ◆ Need for a formalized process/way to track and manage
 - Escalation process
 - Adapting and changing the project
 - PMO
 - When where and how to report "up the chain"
- System Design and Development
 - Wait a minute, this is packaged software
 - Level of planned resources for design vs. A build project
 - o Integration
- Design and development on OTHER systems
- ◆ Remember it is easier for technology to change than people (Hammer)
- Customization and change management link

- ◆ At the end of this lecture you should be able to:
 - Explain why training is important
 - Discuss several training strategies
 - Explain the costs and benefits of training
 - Explain why documentation can cause greater user acceptance
 - o Explain the link between documentation and total cost of ownership
- Training
 - o Why do you need training?
 - Newsystem
- Link between training and project success
 - Who to train
 - When to train
 - Train on the process
 - o Train on the GUI
- Costs of training
- Training strategies
 - Vendor training
 - Project team
 - o End users
 - 3rd party training
- ♦ Project team
- ♦ End users
- Training the trainer
 - Project team
 - End users
- Other tools
 - o QRC's
 - o SME's
 - Examples
- Remember when training
 - Generational issues
 - Y vs. X vs. older people
- ◆ Documentation
 - Supporting your solution costs money
 - Make it cost less
- Documentation curve
 - o Good at start, missing until over, then hastily done
 - Vendor's documentation
 - Consultant's documentation
- People do leave
 - Vendors
 - Employee attrition
- Link between documentation and user acceptance
- ◆ Tools

- Single repository
 Forms
 Build your subject matter experts in-house

- Quality and Evaluation
- At the end of this lecture you should be able to:
 - Understand the importance of evaluating the solution at the end of a project
 - Understand the importance of evaluating the project itself at the end of a project
 - o Be able to explain why quality management never ends
 - o Define Total Quality Management
 - Discuss the differences between TQM, Six Sigma, and other quality management practices
- Quality Management
 - What is quality?
 - o Howdo you measure?
 - o Why do you measure it?
 - Howdo you know you had a ROI?
- Revisit the CSF's
- Revisit the RFP
- Evaluate things independently
 - Software
 - Hardware
 - Consultants
 - Vendors
 - Employees
 - o Processes
- Quality Management
- ◆ Total Quality management
- ♦ Six Sigma
- Continuous Improvement never stops
- ◆ When to do TQM
 - Having the TQM mindset before a project is best
- Always monitor quality
 - Revisit the CSF's
 - See the results of your customization

APPENDIX E - ASSIGNMENT HANDOUTS

Assignment 1 – Make, rent, or acquire?

You own a successful tool and hardware company and your current order to cash IT system is holding you back. Research 4 commercial options and a homegrown option. Provide a 1-2 page total write up (APA formatted) on the strengths, weaknesses, opportunities, and costs of these 5 options. Include a matrix or graph to support your argument if you wish. There isn't much need to directly compare the products to each other. Evaluate on: functionality, price, resource needs (people), complexity of implementation, and integration capabilities. Add in additional criteria to evaluate as you see fit.

Assignment 2 – Gap Analysis

Bierck Manufacturing is a small to medium enterprise (SME) consisting of 3300 employees spread over four sites. Bierck produces hydraulically powered equipment such as lifts, jacks, and pieces for hydraulic functions on large pieces of equipments like front-loaders, cranes or dump trucks.

Bierck has been told by multiple major suppliers that handling orders and invoices through paper-based processes is unacceptable and that Bierck's costs will increase if there is not a modernization of activities. Currently, Bierck operates on a mainframe which is older than half of its employees. The company has a long history of getting by with a minimal IT staff and therefore is not driven by enterprise technology, but is very slow to adopt changes in the workplace, with the exception of an industry-leading customer relationship management (CRM) solution which is web-based and provided by a major CRM vendor. Bierck considers the integration and maturity of this solution to be what sets them apart from their competition. The company is slow to change their ways, but there is also growing unrest due to the organization's current state.

Note: As-is model will be created based upon course discussions and instructor discretion.

Create a To-Be model of Bierck's order and invoicing process. Also, conduct a basic gap analysis to show the current pain points, gaps, and overlaps.

Assignment 3 – RFP and Vendor Evaluation

You think Purdue should buy a new student software package to replace MyPurdue. Write a letter to administration stating critical success factors, functional requirements, implementation schedule requirements, and any other items which should be contained in Purdue's RFP. Also, include several researched best practices and methodologies for vendor selection which the Purdue administration should use.

3-5 pages APA formatted

APPENDIX F - GROUP PROJECT RFP DOCUMENT

Group Project – Proposal

Your group has received the following request for proposal. Write up a proposal and sell your solution at the presentation meeting.

The following schedule will be adhered to regarding this RFP:

Deadline for Intent to Bid	Week 2
Form, NDA, and	
Proprietary Information	
submission	
Pre-proposal conference	Week 6
Last day for questions to	Week 9
be submitted	
Posting of all answers to	Week 10
last questions	
Proposal due date	Prior to final

University of Mulberry

Request for Proposal

RFP #01-001

Student Recruitment and Retention Project

Response Due:

April xxx, 20xx

For Information Contact:

Blake Haan

IT Procurement Director
123 University Street
Mulberry, IN 46058
765-414-xxxx (Phone)
765-414-xxxy (Fax)
BEHAAN@PURDUE.EDU

Administrative Section

RFP Overview

University Overview

The University of Mulberry ("The University" or "UM") is a private college founded in 1900 in Mulberry, IN. The University offers undergraduate and graduate degree programs for a student population of 8,500 undergraduates and 1,500 graduate students. UM has 4,500 full and part-time employees, including student workers, and is one of the largest employers in the greater Mulberry area. Our University mission statement is: "The University of Mulberry will provide an environment which fosters excellence in learning and research while also serving the community." The University operates on a fiscal year of July 1 to June 30th.

Problem Statement

The University of Mulberry is submitting this request for proposal (RFP) for the implementation of a comprehensive Student Recruitment and Retention Project. Currently, the University's computer system has no way of tracking which materials have been sent to which prospective student. Additionally, the University's computer system cannot produce any relevant data output based upon the attributes of applicants, so materials cannot be sent in a more targeted fashion, e.g. recruiting materials showcasing the University's recent award for a graphics design student to all students interested in applying to that program. Another area of concern is the retention of current students using a similar data analysis and targeted communication strategy. The University has a tentative plan to convert this project which runs from May 15th, 20xx to August 31st, 20xx.

RFP Focus

This RFP will focus on the following functions which the University requires suppliers to fulfill:

- Become proficient in business uses and needs for data which is to be collected and analyzed
- Select and assist in the implementation an integrated solution
- Recommend hardware required for this solution
- Assist in analysis and redesign of business processes through go-live
- Design and implement a repeatable process to utilize this data on a continuous basis

- Provide Knowledge Transfer for all affected business processes
- The University expects suppliers to provide a comprehensive solution which at minimum meets all stated requirements within this RFP. The University also expects a single supplier to assume primary responsibility for the proposed system, although subcontracting is permissible.

Roles and Responsibilities

The following table illustrates the roles and responsibilities associated with the implementation of the proposed system.

Role/Responsibility	Supplier	UM	Comments
Provide access to all systems require for the		Χ	
project			
Provide access to employees who are		Χ	
subject matter experts with the current			
business environment			
Provide overhead items such as office		Χ	
spaces, printers, copiers, faxes, and office			
supplies			
Become proficient in business uses and	Х		
needs for data which is to be collected and			
analyzed			
Design, Develop, Test, and Implement the	X		
software solution			
Recommend software for student	X		
recruitment and retention platform			
Purchase software		Χ	
Recommend hardware required for the	X		
student recruitment and retention platform			
Purchase hardware		Χ	
Design, develop, and support affected	Х	Χ	
processes through go-live			
Design and implement a repeatable process	Х		
to utilize data on a continuous basis			
Provide Knowledge Transfer for this	Х		
repeatable process			
Provide access to employees who are to be		Х	

power users in the proposed system		

Supplier and Supplier Reference Information

Overview

Suppliers who wish to be considered for this contract must submit the required information which is outlined in Appendix A. Suppliers who do not adhere to this format may not be considered for the contract.

Suppliers must submit a list of three similar system implementations from organizations which are similar in size to UM. The University will contact these organizations to inquire about technical abilities, project conversion skills and the business relationship which the supplier has created. The reference information layout is outlined in Appendix A.

Company Confidential Information

Overview

This RFP may contain information which is confidential to the University. The University holds the expectation that confidential information is will be treated as valuable property of the University. The supplier shall not, without prior consent, disclose, authorize, or assist any other party in utilizing this confidential information. The Non-Disclosure Agreement (NDA) form in Appendix B must be signed and returned to the University along with the Intent to Bid statement within the deadline established in the RFP timeline.

Intent to Bid

Overview

Suppliers who receive this RFP will complete and return the Intent to Bid form located in Appendix C within the deadline established in the RFP timeline. Suppliers who do not complete and return this form will be disqualified from contract participation. The University asks that this form be completed in the case of suppliers choosing to bid and also not to bid on this project.

Proprietary Information Notice

Overview

This RFP contains proprietary information of the University of Mulberry. The University requires that all suppliers agree and adhere to the Proprietary and Confidential Information Notice in Appendix D of this document.

Supplier Confidential Information

Overview

Any information in a submitted proposal which the supplier deems confidential or proprietary needs to be marked as such. The University of Mulberry will honor and comply with any policy concerning any such information.

Subcontracting

Overview

The supplier selected shall be solely responsible for contractual performance and management of all subcontract relationships. This contract allows subcontracting assignments; however, suppliers assume all responsibility for work quality, delivery, installation, maintenance, and any supporting services required by a subcontractor.

RFP Contacts

Overview

All requests, questions, and other comments about this RFP must be submitted in email to the University. The contact below will be the supplier's only point of contact with the University and he will facilitate all questions and answers regarding this RFP. Any requests made without contacting the RFP contact will go unanswered and could possibly disqualify the vendor for the contract.

Blake Haan
IT Procurement Director
123 University Street
Mulberry, IN 46058
765-414-xxxx (Phone)
765-414-xxxy (Fax)
BEHAAN@PURDUE.EDU

RFP Questions and Answers

Overview

The University will allow written requests for clarification of this RFP. All questions received will be consolidated into a single response set and emailed by 3:00pm on X Date. At each supplier's request, we will withhold the name of the supplier asking each question.

Format

The below format will be required for all supplier questions:

Section Number

Paragraph Number

Page Number

Text being questioned

Question

Responding to Supplier Questions

Overview

The University will respond to all received supplier questions by X date + 3 days. These responses will be communicated to all suppliers, regardless of which supplier submitted the question.

RFP Schedule

Schedule

The following schedule will be adhered to regarding this RFP:

Deadline for Intent to Bid	Week 2
Form, NDA, and	
Proprietary Information	
submission	
Pre-proposal conference	Week 6
Last day for questions to	Week 9
be submitted	
Posting of all answers to	Week 10
last questions	
Proposal due date	Prior to final

<u>Disclaimer</u>

The University reserves the right to alter this schedule at any time. Any changes will be communicated to all suppliers who have submitted an Intent to Bid form.

Pre-Proposal Conference

Overview

The pre-proposal conference will be held on Y Date. All supplier questions submitted prior to the conference will be answered during the conference add communicated to all suppliers immediately after the conference. Questions asked during the conference will be answered during the conference and also communicated to all suppliers after the conference. Suppliers may still submit written questions after the conference according to the normal procedure.

Proposal Format Requirements

Overview

All proposals submitted shall conform to the following format requirements. Deviation from these requirements may disqualify a supplier from the competition. A transmittal letter signed by a person authorized to engage your company in a contract shall accompany your proposal. All proposals shall be submitted via hard copy in a three ring binder.

Layout

The proposal shall be divided into sections and tabbed as followed:

Section 1: Cover letter

Section 2: Proposal executive summary

Section 3: Technical solution and description

Section 4: Project management description

Section 5: Supplier section for additional information

Section 6: Pricing section

Appendix A: Supplier references and qualifications

Appendix B: Supplier financial qualifications and financial reports

Appendix C: Supplier purchase contract

Appendix D: Supplier software license agreements

Cover Letter

Overview

The cover letter will serve as a letter of transmittal formally accepting the requirements of this RFP and shall be signed by a representative of your company who is authorized to commit your company to a contract.

Required Executive Summary

Overview

Suppliers shall provide an executive summary to familiarize UM administration with the key elements of their proposal. Also, this summary should briefly describe how the supplier will implement this project.

Layout

At a minimum, the executive summary shall contain the following: Summarization of the overall approach

Describe the business features and benefits of your solution

Discuss any risks and concerns from this RFP

Explain what is needed on our side to begin the project

Provided a summarized budget including:

Pricing summary
Pricing methodology
Pricing constraints
Hidden or related costs not covered in this RFP

Pricing Section

Overview

Suppliers shall provide the University with pricing information both in writing and electronically via Microsoft Excel. Suppliers shall break down their prices according to the pricing layout in Section 6 of this proposal.

Best and Final Offers

Overview

After the potential list of suppliers has been narrowed down to two, the University may ask the suppliers to submit a best and final offer. This offer will serve as a forum for suppliers to modify any prices or parts of their proposal. All changes to the original offer must be clearly marked and commented on by the supplier.

Compliance Matrix

Overview

Suppliers are required to complete the compliance matrix in Appendix E and return this as part of their proposal.

Technical Objectives

Current Business Environment

Overview

The University of Mulberry would like to procure a Student Recruitment and Retention system in order to recruit and retain the best and brightest students.

The University has the following initiatives which have led to the creation of this request for proposal. These requirements must be met in order for project success.

- BR1 Functional system which is accessible from anywhere
- BR2 Capability for automated business processes
- BR3 Increased staff efficiency
- BR4 Increased communication efficiency and accuracy
- BR5 Integration with existing SunGard Banner system
- BR6 Conformance to university branding standards

Current Technical Environment

Requirements

The current infrastructure at the University consists of Windows XP operating systems linked to the University servers via a T-1 network. The SunGard system sits on an Oracle database. The University also does not have the necessary free database space required for any major packaged software component. All University databases are Oracle based.

Proposed Technical Environment

Technical Requirements

The University has the following technical requirements for the system:

- TR1 Accessible from any web-enabled device at most (99%+ availability) times
- TR2 Real time interaction through a single source for students to come to us
- TR3 100% Web-based components for student facing pages
- TR4 Intuitive user interface
- TR5 Multiple language capability
- TR6 Interface-capable with existing Cognos data analysis system
- TR7 Lets the student pick their communication preference mail, email, text, etc.

TR8 - Able to make Web 2.0 connections to students via social networking capabilities

TR9 - Reporting capability

TR10 - Capability for automated business processes

The University does not require the following, but would be interesting in entertaining proposals that also include this item:

TRY- A "parents only" section of the web portal

TRZ - Online chat features that can hook into several campus departments depending on the question.

Application Environments – Supplier Scope

Overview

Requirement	Comments
Become proficient in business	
processes uses	
Design, Develop, Test, and Implement	
a Student Recruitment and Retention	
solution	
Recommend software for Student	
Recruitment and Retention system	
Recommend hardware required to	
support Student Recruitment and	
Retention system	
Support system and affected business	
process through go-live	
Provide Knowledge Transfer for all	
project activities	

Constraints

Overview

All University databases are Oracle based and any new databases must also be Oracle based.

The project must be finished by 8/31/20xx at the very latest

The project will be overlapping with the fiscal year close. On account of this, certain individuals may become unavailable to the project during the time of fiscal year close.

Business Objectives

Project Plan

<u>Overview</u>

The supplier shall include a plan for implementing the project required by this RFP. This plan will be thorough enough to scope and detail to purvey the supplier's ability to successfully manage and implement this project. This plan will include milestone dates, success metrics, measuring methods, and staffing levels.

Project Schedule

Overview

The supplier shall provide a project schedule with their proposal which includes start and completion date for the project. The completion date must factor in total project conversion time and also account for any holidays which occur during the project. The completion date shall be evaluated after the initial assessment of the RFP requirements which is performed after the supplier has been selected.

Tentative University Plan

The University has a tentative plan to convert this project between May 15th, 20xx and August 31st, 20xx. The following shows start dates of each project phase:

May 15th, 20xx – Kick Off

May 1st, 20xx – Integration test

June 1st, 20xx – Cutover

August 1st, 20xx – Go-live date

Site Preparation Plan

Overview

The work area which is available to project staff has enough space and connections to accommodate 100 individuals. In the Universities server room, we have 42 square feet of space available with all power, cooling, and network components in place. The University does not anticipate space being an issue with this project. The University expects suppliers to provide notification of any site issues which will need to be addressed before the project start date.

Project Staffing Requirements

Supplier Overview

Suppliers are expected to provide an organizational diagram structure which shows the primary leadership positions which the supplier or the supplier's subcontractors will occupy. The supplier is expected to provide resumes for the individuals who will occupy these positions. The supplier is also required to provide, in detail, the personnel which they anticipate using, the skill sets of these personnel, and whether they are supplier-employed or subcontracting. The University is to be immediately notified of any change to these personnel assignments.

Roles and Responsibilities

Overview

The supplier is also required to identify the staffing personnel, skill sets, and levels which they will require from the University for a successful project conversion. The University will appoint a project manager who will work closely with the supplier's project manager. All other project roles will be determined by the supplier and shall contain either supplier team members or University employees.

Design, Development, and Implementation

Overview

The supplier will provide an overview of the methodology they will use for the stages of this project's lifecycle. This overview will include all processes, steps, tasks, and methods which will be used in the project lifecycle. The Design,

Development, and Implementation section will include as a minimum:

Project management methodology to be used

Process and example deliverables for validation of RFP requirements

Process and example deliverables for design based upon RFP requirements

Process and example deliverables, as well as testing methods, for development

Process and example deliverables for prototype testing

Process and example deliverables for integration testing

Process and example deliverables for user acceptance testing

Process and example deliverables for cutover

Process and example deliverables for development of a contingency plan

Process and example deliverables for issue resolution during any project phase

Project Change Control

Overview

Suppliers will provide a plan on how they will handle all defect resolution, change requests, and scope changes during the implementation phases of this project. The University currently has access to the Remedy production support system and can set this up to handle project-based tasks if necessary. The supplier will report on open items on a weekly basis, unless the priority of the change or defect necessitates otherwise.

Delivery and Installation

Overview

Suppliers shall install all hardware and software components for the project. Suppliers will provide for the installation and delivery times in their project schedule.

Testing

Work Unit Testing

Upon completion of each work item, the supplier will perform a basic test which ensures that the work item satisfies each of the requirements which it was specified to. This testing will be done in accordance with the testing methodology provided by the supplier. The test script will be created by the supplier and the actual testing will be done by the supplier and the subject matter expect for the work item.

Functional User Testing

Before any work item is moved from the development (DEV) system into our quality assurance (QA) system, it must undergo functional user testing. This test ensures that the work item performs exactly as the user has anticipated. By completing this test, the scope for the individual work item is completed defined and established. Any changes to the layout, functionality, or business rules of this object must now go through the change control process. The test script for this is to be created by the supplier and executed by the designated end user.

Integration Testing

Before a work item can be considered for the University's production system, it must undergo integration testing to ensure that there are no impacts on other modules which may be dependent on the work item in question. This test will be done by the subject matter experts of each module which is integrated with the work item being proposed for production. The test scripts for these tests are to be created by the supplier.

User Acceptance Testing

After the completion of all Integration tests, the end users will perform a final User Acceptance test on all items which were testing in the Integration Testing phase. These tests are to ensure that all requirements are satisfied with no adverse effects to any existing system. These tests will be performed by the user and will be a key factor in determining if a work item is ready for production. The scripts for these tests will be created by the supplier and executed by the end users for each respective module.

Regression Testing

The University requires that a Regression Test occur in the case of any existing work item being changed. These work items include those which were created new for this project and are modified in any stage of the project. These tests will include re-executing the Work Unit, Functional User, Integration, and User Acceptance tests which were originally executed, but with a focus on any modifications to the work item.

System Maintenance and Support

Overview

System maintenance and support is required by the supplier for the duration of the project. Regular maintenance must be performed on the components of the system so that they do not interfere with the day to day operations of the University. Because the nature of this project does not have any line-of-business impact, nightly support is not necessary, except for when there is an impact of the Universities production system. The supplier is expected to provide day-to-day support of the software and hardware for the project. This includes answering and resolving operational issues and questions. This support is

expected to continue until the post-go-live stabilization metrics are met by the project.

Training

Overview

The University requires that the supplier provide the necessary training to for all personnel to operate any hardware or software which has been implemented as part of this project. This training is to be completed before the software or hardware is approved into the production system. The University will furnish the room, laptops, and office supplies need to successfully train all users.

Knowledge Transfer

<u>Overview</u>

The supplier is to provide a comprehensive knowledge transfer to the University staff. This knowledge transfer will include a discussion of all deliverables of the development lifecycle, the integration of the components implemented during the project, and a discussion on issue resolution. This knowledge transfer is to take place before the system is implemented in production. As the project nears the end of the post-go-live stabilization period, the supplier will hold a final knowledge transfer session to answer any questions which the users have developed since the go-live.

Documentation

Overview

The supplier is required to provide comprehensive documentation which covers every aspect of this project. This documentation will cover all software and hardware components associated with this project. This documentation will be stored on the University's file sharing network. Any change to this documentation will be clearly dated and marked. All documents created for this project will be property of the University of Mulberry, regardless of the individual it was created by.

Cutover

Overview

The University requires that the supplier creates an approved cutover plan for the system. This plan must ensure data integrity and business continuity of the system. This plan will also include all contingencies and estimated down times surrounding the installation and implementation of all hardware and software.

Supplier Issues and Concerns

Overview

The University invites suppliers to comment on any aspects of this RFP and project which they feel are incomplete or missing. The University takes great pride in continuously improving their business and greatly values all inputs.

Supplier Qualifications and References Supplier Qualifications and References Overview

The University requires suppliers to provide information about their company as part of this proposal. The University will evaluate the supplier's experience, financial situation, and references as part of making a determination on the contract.

Specifically, the University requires the following information:
Qualifications and Experience
Company Information
Current Customer Base and User Groups
Business and Market Focus
Company Research and Development

Appendix A outlines the specific format which the University would like to receive this information.

Supplier's Section

Additional Information not in Scope of this RFP

Overview

The University encourages suppliers to submit an additional section of their proposal which contains information which the supplier feels is relevant to project success, but also outside of the scope of this document. The University highly values the experience which the suppliers hold and is grateful for input received in this section.

This section is to contain any features on products which are outside of the scope of this RFP, requirements which the supplier feels is missing from this RFP, or possible situations which the University has not anticipated in this document. The University will use this section to sculpt the final scope of this project.

Pricing

Introduction

<u>Overview</u>

Suppliers shall provide prices and installation costs for all hardware and software components of this project. These costs will include initial startup costs and also all recurring and non-recurring costs which will be borne by the University.

Technical

Hardware

This section is to include all servers, network storage devices, workstations, or any other networking or hardware component.

System Software

This section is to include all operating software on any servers or networking devices.

Application Software

This section is to include all software which the University will purchase specifically for this project.

Also to be included in this section is any software which the supplier requires for project conversion, such as testing software or an issue tracking software.

Management

<u>Overview</u>

This section is to include all project costs not directly associated within the above sections. The University requests that suppliers provide pricing to be submitted in the following buckets within their proposal:

Project Implementation and Management Maintenance and Support Training Documentation
Other Costs not Specifically Requested
Travel Costs
Staffing Costs

Pricing Grids

<u>Overview</u>

The University requires suppliers to submit the following pricing structure. Any additional pricing items should be submitted outside of this structure.

Summary Level Project Costs

Product Description	Price	Annual	Annual
		Maintenance	License
System Hardware			
System Software			
Application Software			
Application Development			
Project Management			
Project Integration			
Project Training			
Documentation			
Testing			
Shipping			
Taxes			
Other costs (Please provide			
a detailed description of			
these)			
Total			

Evaluation

Evaluation of Proposals

Overview

The University is interesting in obtaining the most complete solution possible. To ensure this, the University will objectively evaluate all proposals. The University has created a set of metrics to objectively evaluate all proposals. Included in this process is room for additional points based upon supplier coverage of items not in this RFP.

The proposals will be evaluated on the following basis:

Technical Compliance – 100 points Management Evaluation – 100 points Price Evaluation – 100 points Supplier Qualifications – 100 points

The University will evaluate all proposals to determine if the basic technical and administrative requirements have been met. Proposals maybe eliminated for being incomplete, late, or inadequately prepared.

A further breakdown of the evaluation procedures is located in Appendix F of this document.

<u>Appendix A – Supplier Information</u>

Please adhere to the following format for the Supplier Information Section of your company's proposal:

Financial Qualifications

Suppliers must submit financial information for their company all proposed subcontracting companies. This information will include annual reports, balance sheets, income statements, and any other relevant financial information. This information is to be reviewed by a certified public accountant auditor.

Company information

This section is to include:

Company name

Year business started

State and Country of incorporation

US Corporate status

Tax Identification Number

Brief company history

Corporate overview

Location of company headquarters

Number of employees

Number of client engagements

Any pending or current litigation which could result in a change to the company's status to fulfill the requirements in this document

Any other relevant information

Customer Information

This section is to include:

Total number customers using the products which are being proposed for this project

Total number of implementation which the company has implemented this product

Any other relevant information

Business and Market Focus

This section is to include:

The current business focus of the company

The current percentage of revenue from different company offerings

Which markets the company currently operates in

Which best-practices consortiums which the company participates in

Any other relevant information

Company Research and Development

This section is to include:

Any research, development, and benchmarking which the company is performing in the areas concerning this RFP

Any other relevant information

References

This section is to include the following information concerning references which the University will contact:

Customer Name

Project Name

Street Address

Contact Name and title

Contact Telephone

Contact Email address

Any relevant project details

<u>Appendix B – Non Disclosure Agreement</u>

The University or the supplier may find it necessary or desirable to disclose to the other party (whether in writing, orally, through physical observation or otherwise) certain confidential information.

Both the University and the Supplier recognize that confidential information is valuable proprietary information of the entity to which it belongs. The parties shall not, without the prior written consent of the other party, disclose, authorize, or assist anyone else to disclose or make known for themselves or another's benefit any confidential information to any person, firm or corporation; nor will either party use, authorize, or assist anyone else in using any confidential information, except that the Supplier may share Confidential Information with their employees, business partners, Suppliers or value added resellers as necessary to prepare Supplier's proposal and complete Supplier's obligations under any agreement resulting from this RFP. The committee may disseminate information to others whom the committee deems, in its sole discretion, to have an interest in the proposal. In no event shall the committee, individually or collectively, be liable for any breach of confidentiality. All materials submitted, with the exception of any materials that both the Supplier and committee agree in writing are proprietary (and so marked by the Supplier) will become property of the University. Supplier pricing shall not be considered confidential information. Supplier shall take all steps reasonably necessary to ensure compliance with this RFP and any agreement resulting here from by their employees, business partners, Suppliers, subcontractors, value added resellers or associates who receive confidential information, as if such confidential information were their own information.

NOTE: Any submitted information deemed "confidential" to a Supplier's company must be clearly marked with the words "CONFIDENTIAL—for Review Committee Only". The University will be the final party to determine what is confidential. The University shall have no obligation to maintain as confidential any information not marked confidential. The University will have the right to use all ideas, or adaptations of those ideas, contained in any proposal received in response to this RFP. Selection or rejection of the proposal will not affect this right. Additionally, the University has no obligation to safeguard the information contained in any proposal. All proposals become the property of the University. Those parts of the successful proposal deemed acceptable to the University will be incorporated into the resulting contract by express reference.

Signed:		
Name		

Title			
Date			

Appendix C - Notice of Intent to Bid

Will you be responding to this RFP? YES NO
Company Name:
Name:
Title:
Address:
Telephone:
Fax:
Email:
If not responding, reasons for doing so:

Appendix D – Proprietary Notice

Supplier acknowledges that, in the course of this project, it will have access to proprietary and/or confidential information of the University. Supplier agrees to keep such information in the strictest confidence. All information that Supplier has access to in the performance of this Agreement shall be considered the confidential property of the University. Supplier shall take all necessary steps to safeguard the confidentiality of and avoid disclosure of the University's information. In the event that it becomes apparent to the University that Supplier has breached or may in the future breach this confidentiality provision, the University may obtain injunctive relief to prevent disclosure of its information; Supplier agrees that such injunctive relief will not pose undue burden on his business. The University reserves the right to seek any and all remedies under law and equity to enforce this confidentiality provision. This confidentiality provision shall survive the termination of this Agreement

Singed:		
Name		
Title	 	
 Date	 	

Appendix E - Compliance Matrix

<u>Business</u>

Req	Requirement	Fully Compliant	Partially Compliant	Not Compliant	Comments
BR1	Functional system which is				
	accessible from anywhere				
BR2	Capability for automated business				
	processes				
BR3	Increased staff efficiency				
BR4	Increased communication				
	efficiency and accuracy				
BR5	Integration with existing SunGard				
	Banner system				
BR6	Conformance to university				
	branding standards				

<u>Initiative</u>

Req	Requirement	Fully Compliant	Partially Compliant	Not Compliant	Comments
IR1	Increase user productivity	•	•	•	
IR2	Increase user satisfaction				
IR3	Increase overall system				
	performance				
IR4	Reduce overhead and				
	operating costs				

Technical

Req	Requirement	Fully	Partially	Not	Comments
		Compliant	Compliant	Compliant	
TR1	Accessible from any web-				
	enabled device at most				
	(99%+ availability) times				
TR2	Real time interaction				
	through a single source for				
	students to come to us				
TR3	100% Web-based				
	components for student				

	facing pages		
TR4	Intuitive user interface		
TR5	Multiple language		
	capability		
TR6	Interface-capable with		
	existing Cognos data		
	analysis system		
TR7	Lets the student pick their		
	communication preference		
	- email, email, text, etc.		
TR8	Able to make Web 2.0		
	connections to students via		
	social networking		
	capabilities		
TR9	Reporting capability		
TR10	Capability for automated		
	business processes		
TRY	A "parents only" section of		
	the web portal		
TRZ	Online chat features that		
	can hook into several		
	campus departments		
	depending on the question.		

Appendix F – Preliminary Evaluation Checklist

<u>Note:</u> The University reserves the right to change this checklist at any time without prior notice

Overall Scorecard

Section	Possible	Total	Comments
	Points	Points	
Cover Letter	10		
Executive Summary	25		
Technical Solution	100+15		
Project Management	100+10		
Supplier Additional Information	0+25		
Pricing	100		
References and Qualifications	50		
Financial Qualifications and	15		
Financial Reports			
Total	400+50		

Cover Letter - 10 points

Requirement	Possible Points	Points Received	Comments
Acceptance of RFP Requirements	10		
Total	10		

<u>Proposal Executive Summary - 25 points</u>

Requirement	Possible	Points	Comments
	Points	Received	
Summarization of the overall	5		
approach			
Describe the business features	5		
and benefits of your solution			
Discuss any risks and concerns	5		
from this RFP			
Explain what is needed on our	5		
side to begin the project			
Provided a summarized budget			
including:			
Pricing summary	2		
Pricing methodology	1		

Pricing constraints	1	
Hidden or related costs not	1	
covered in this RFP		
Total	25	

Technical solution and description- 100 points

Technical Requirements - 60 points

Requirement	Possible	Points	Comments
	Points	Received	
Accessible from any web-enabled	5		
device at most (99%+ availability)			
times			
Real time interaction through a	5		
single source for students to			
come to us			
100% Web-based components	10		
for student facing pages			
Intuitive user interface	15		
Multiple language capability	3		
Interface-capable with existing	10		
Cognos data analysis system			
Lets the student pick their	3		
communication preference -			
email, email, text, etc.			
Able to make Web 2.0	3		
connections to students via social			
networking capabilities			
Reporting capability	3		
Capability for automated	3		
business processes			
A "parents only" section of the	5 bonus		
web portal			
Online chat features that can	3 bonus		
hook into several campus			
departments depending on the			
question.			
Additional Technical Insights	10 bonus		
Total	60		

Supplier Scope - 40 points

Requirement	Possible Points	Points Received	Comments
Functional system which is accessible from anywhere	10	Received	
Capability for automated business processes	10		
Increased staff efficiency	5		
Increased communication efficiency and accuracy	5		
Integration with existing SunGard Banner system	5		
Conformance to university branding standards	5		
Total	40		

Project management - 100 points

Requirement	Possible	Points	Comments
	Points	Received	
Project Plan	10		
Project Schedule	5		
Site Preparation Plan	5		
Project Staffing Requirements	10		
Roles and Responsibilities	10		
Design, Development, and	15		
Implementation			
Project Change Control	5		
Delivery and Installation	5		
Testing	10		
System Maintenance and	5		

Support		
Training	5	
Knowledge Transfer	5	
Documentation	5	
Cutover	5	
Supplier Issues and Concerns	10 bonus	
Total	100	

Supplier section for additional information - +25 points

Requirement	Possible Points	Points Received	Comments
Additional Information	25 bonus		
Total	0		

Pricing - 100 points

Hardware - 25 points

Requirement	Possible	Points	Comments
	Points	Received	
Hardware-Application Servers	10		
Hardware-Database Servers	10		
Hardware-Networking	5		
Components			
Total	25		

Software - 25 points

Requirement	Possible Points	Points Received	Comments
Software-Server Operating	5		
Systems			
Software	20		
Software-Project Management	0		
Software-Issue Management	0		
Software-Testing Management	0		
Total	25		

PMO - 50 points

Requirement	Possible	Points	Comments
	Points	Received	
Project Implementation and	13		
Management			
Maintenance and Support	5		
Training	2		
Documentation	3		
Other Costs not Specifically	2		
Requested			
Project Implementation and	10		
Management			
Travel Costs	5		
Staffing Costs	10		
Total	50		

Supplier Qualifications and References- 50 points

Qualifications - 25 points

Requirement	Possible	Points	Comments
	Points	Received	
Qualifications with similar projects	15		
Qualifications with products being	10		
proposed			
Total	25		

References

Requirement	Possible	Points	Comments
	Points	Received	
Similar project references	15		
Similar client references	10		
Total	25		

Supplier financial qualifications and financial reports - 15 points

Requirement	Possible	Points	Comments
	Points	Received	
Financial Qualifications	10		
Financial Reports	5		
Total	15		