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# Synapse Software Technologies: A Search for the Next Top Model

## Introduction

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Randy Bandiola, proprietor of Synapse Software Technologies, sat in his office with several of his system development team members discussing the best systems design model to use with the companies first ever international client, Trade Systems Inc. (TRADI).<sup>i</sup> TRADI is an outsourcing company that developed a variety of software services for hospitals, banking, and manufacturing resource planning systems. Bandiola had bid on and won a subcontract from TRADI to computerize their enterprise resource planning (ERP). The opportunity was exciting, but it also came at a cost for Bandiola. He was responsible for deciding what system design approach best fit the TRADI subcontract requirements. Bandiola was aware that the TRADI project had a different set of requirements, limitations, challenges, and opportunities as compared to Synapse's past projects. Factors that Bandiola had to consider while choosing a design model included functionality, usability, maintainability, agility, technical scalability, and expandability.<sup>1</sup> To add to the complexity of the contract, Bandiola only had one week to decide on a system design method before presenting a Gantt chart<sup>ii,2</sup> to TRADI based on the chosen approach and methodology.

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<sup>i</sup> For the purposes of this case study, TRADI is a fictitious company developed to portray a scenario of an outsourcing company for class discussion.

<sup>ii</sup> Gantt Chart, developed by Henry L. Gantt in 1917, is the most commonly used project scheduling and progress evaluation tool. It consists of a simple horizontal bar chart that depicts project tasks against a calendar. Each bar represents a named project task.

## Outsourcing

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Outsourcing referred to subcontracting a process, like that of product design, to a third party.<sup>3</sup> Outsourcing had a significant impact on services such as effectiveness and efficiency of business processes and was often used incorrectly as an interchangeable word for offshoring.<sup>4</sup> Offshore outsourcing referred to an important small subset of an outsourcing function.<sup>5</sup> Offshoring happened when a company outsourced services to a third party in a country where neither the parent or client company were based.<sup>6</sup> Outsourcing offshore occurred to take advantage of lower labor costs than that found in the domestic market.<sup>7</sup> Among the many outsourcing models highly emphasized, comprehensiveness and selectiveness in the licensing and contracting activities were the top considerations. See **Appendix A**.

Further, business process outsourcing (BPO) was the outsourcing of a specific business process task, such as payroll, accounting, and human resources, to name a few. BPO was often divided into two categories: back office outsourcing, which included internal business functions such as billing or purchasing, and front office outsourcing, which included customer related services such as marketing or technical support. Information technology outsourcing, like software development, therefore, was a subset of BPO.<sup>8</sup> According to Tholon's 2013 survey, Manila, the capital of Philippines, ranked 3rd on list of the world's top BPO destinations.<sup>9</sup> Cited in the Philippine news, "Tholon's also acknowledged the efforts the Philippine IT-BPO industry has been exerting to maintain its global leadership in voice BPO services while also expanding into other outsourcing sectors – including software development and IT outsourcing, animation and game development, and healthcare information management (HIM) outsourcing – and looking to penetrate markets outside the US."<sup>10</sup>

## Synapse Software Technologies<sup>iii</sup>

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Synapse Software Technologies started in 2000 as an offshoot of Algorithm Computer Services, a computer hardware sales and service company that was also owned by Bandiola. Synapse was located in Daro, Dumaguete City, Negros Oriental, Philippines (See **Exhibit 1**). As a software developer, Bandiola saw the value of integrating software and information technology (IT) solutions with business processes. Thus, he established Synapse Software Technologies with an aim of providing software development services to local businesses in Dumaguete City. Synapse offered software development services for educational and sales related systems.

Synapse currently used an iterative systems development approach with a prototyping approach for most of its projects. Iterative software development was like a multidisciplinary project or parallel development because of its emphasis on communication between the software developers and project stakeholders.<sup>11</sup> Bandiola believed that prototyping was effective due to the nature of Synapse's projects and human resource capacity. On average, Synapse delivered a completed system in a span of 3-6 months. Synapse had produced and developed 10 system software projects in Negros Oriental province to 11 different clients as of 2014.

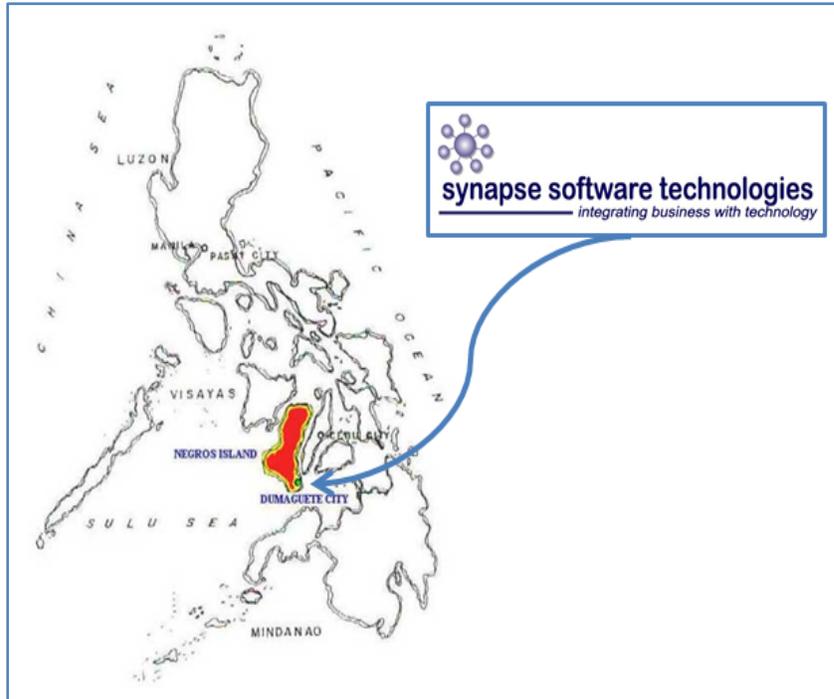
Synapse employed 6 personnel, 3 of which were in administrative operations, while the other 3 were members of the development team. The development team was made up of a fresh IT graduate and two seasoned veterans that had been connected with Synapse since its inception. Synapse also accepted 2 to 3 interns for the development team on a five month basis. Hiring interns was done twice a year.

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<sup>iii</sup> This section contains information fictionalized for the purposes of exemplifying a scenario.

**Exhibit 1**

**Location of Synapse Software Technologies**



*This exhibit was created in part by the author using the source: "The Philippine Map" AsiaTravel. AT Reservation Network Pte Ltd, n.d. Web. 10 Sep. 2014. <[http://www.asiatravel.com/gifs/phil\\_map.jpg](http://www.asiatravel.com/gifs/phil_map.jpg)>.*

**TRADI<sup>iv</sup>**

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TRADI was a software development outsourcing company located in Silicon Valley, home to many of the world's largest technology corporations, as well as thousands of small startups. TRADI had been in the software development industry for 13 years and was cited as one of the top and fastest growing IT outsourcing providers worldwide. TRADI had development facilities in Ireland, Australia, and Singapore. It provided a full cycle of software services and built advanced enterprise solutions for businesses of all sizes. It developed large scale software systems and provided domestic subcontract opportunities for small to medium sized software development companies in India and the Philippines.

Moreover, TRADI used a variety of system development methodology and design models. The design system used depended on the scope of the outsourced project like those of the iterative and incremental models. Just prior to the subcontract with Synapse, TRADI received an award as the most disciplined outsourcing company for delivering large scale projects on time, on budget, and on value.

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<sup>iv</sup> The information in this section was fictionalized to represent a scenario for class discussion.

**Exhibit 2**  
**The ERP Systems**



*Source: Leon, Alexis. ERP: Demystified. Tata McGraw-Hill Publishing Company Limited, 2000. Print.*

## ERP

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ERP was a software application that packaged all business functions into one centralized and systematic transaction. Hoffer, George, and Valacich described ERP systems as “systems that integrate[d] individual traditional business functions into a series of modules so that a single transaction occur[red] seamlessly within [a] single [piece of] information rather than [in] several separate systems.”<sup>12</sup> Likewise, Whitten, Bentley, and Dittman described ERP as “software application that fully integrates information systems that span most or all of the basic, core business functions including transaction processing and management information for those business functions.”<sup>13</sup> See **Exhibit 2** for a typical ERP model and **Appendix B** for a basic dynamic ERP software implementation.

## Contract Criteria

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The subcontract between Synapse and TRADI provisioned the development of an ERP system for a manufacturing firm in China. The deliverables of the subcontract was divided into four phases, meaning that each output had to be delivered and presented to TRADI every quarter. All business functions were to be served by one system that supported all the necessary activities performed by the different departments of the Chinese manufacturing firm. The system was also required to support chain management; however, business analytics was not part of the subcontract agreement. The analytics component of the project was subcontracted to another BPO in India because of its established track record in analytics. Business analytics was “the practice of iterative, methodical exploration of an organization’s data with an emphasis on statistical analysis.”<sup>14</sup> Business analytics was implemented with organizations using data driven decision making.<sup>15</sup>

The TRADI contract deliverables were the architecture, inputs, outputs, and control of the system. See **Appendix C** for a detailed systems design particularly relevant with commercial off the shelf software solutions. Prior to the subcontract with TRADI, Synapse used a prototyping approach. A prototyping approach was an iterative process involving a close working relationship between the designer of the system and the end user. However, prototyping had disadvantages or pitfalls, as Bandiola knew. Prototyping encouraged ill-advised shortcuts through the systems design life cycle.

## Determining a Design Model<sup>16</sup>

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Bandiola called his friend Norman Delfin, a systems design expert, asking for suggestions and advice on how to proceed with the TRADI subcontract. Delfin presented several theoretical and practical points for Bandiola to consider. Delfin explained that systems development methodology came in two forms: traditional (sequential) and iterative (incremental). Delfin cited that the sequential strategy, often called a “waterfall development” process, required that each process be completed in chronological order before starting the following step.<sup>17</sup> On the other hand, Delfin explained that an “iterative development process required completing enough analysis, design, and implementation as was necessary to fully develop a part of the new system and place it into operation as quickly as possible.”<sup>18</sup> As to the system design approach, Delfin suggested object-oriented design (OOD). Delfin explained that OOD was used to specify software solutions in terms of joining objects, its attributes, and methods.<sup>19</sup> **Appendix D** shows the object-oriented analysis model.

After seeking the advice of Delfin, Bandiola held a meeting with his development team and asked their opinion on which approach Synapse should use to fulfill the TRADI contract. One team member stated that a modern structured design was the best approach because it decomposed the system processes into smaller and more manageable components. Another added that modern structured design was synonymous to top-down program design and structured programming. Bandiola considered how a modern structured design might work with this project because of the process-oriented technique used to break up a large program into a hierarchy of modules, resulting in a computer program that was easier to implement and maintain. He further pondered that a modern structured design was a model-driven and data-centered system, which might not match the needs of the project with TRADI. See **Appendix E**.

A veteran employee reiterated to Bandiola that a modern structured design approach had not been used by Synapse before, but an information engineering approach had been used with a client in 2011. Bandiola recalled that information engineering worked well because it was a process-sensitive technique for planning, analyzing, and designing information systems. Information engineering involved conducting an analysis of business area requirements from which information system applications were carved out and prioritized.

Another option discussed was the use of a joint application development (JAD) system. JAD was a technique that complemented other systems analysis and design techniques. It emphasized participative development among system owners, users, designers, and builders. Bandiola knew that if JAD was used, someone would have to take on the role of facilitator, likely the systems designer, which meant days intended for development would be used to address different design issues and deliverables with the client. It didn't help that Synapse was already working with limited staffing and the added responsibility of communications seemed likely to be too time consuming for Synapse's workforce capabilities.

The final option to consider was rapid application development (RAD). RAD merged structured techniques, prototyping techniques, and JAD techniques to accelerate a systems development. RAD called for the integrative use of structured techniques and prototyping to define users' requirements and design the final system. However, RAD required highly developed technical skills,<sup>20</sup> something that Bandiola was not sure all his team members had. To end the meeting, Bandiola disclosed that Synapse needed to be careful in the decision of picking a design system because a wrong choice could result in the loss of a client.

## Conclusion

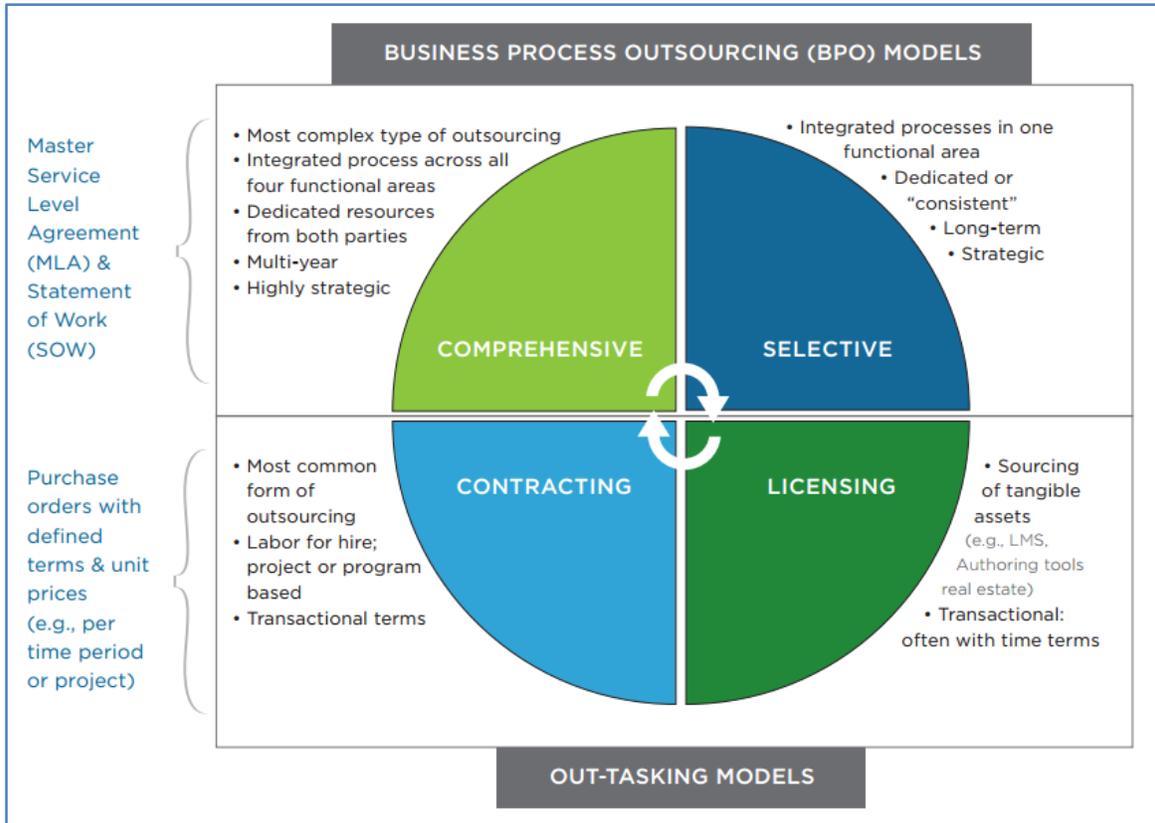
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Bandiola was excited about the subcontract with TRADI, but the short timeframe to decide which systems design model would be most appropriate for the project daunted. The model chosen had to be adaptable, scalable, and ensure business continuity with Synapse. Bandiola was aware that system design techniques could be used in combination with one another and that systems design was driven by the technical capabilities and skills of Synapse's system designers. Bandiola needed to decide on the best system design model to use for the TRADI contract. He looked out the window as he thought about the various ideas his team suggested, weighing the benefits and shortcomings of each possible model.

Appendices

Appendix A

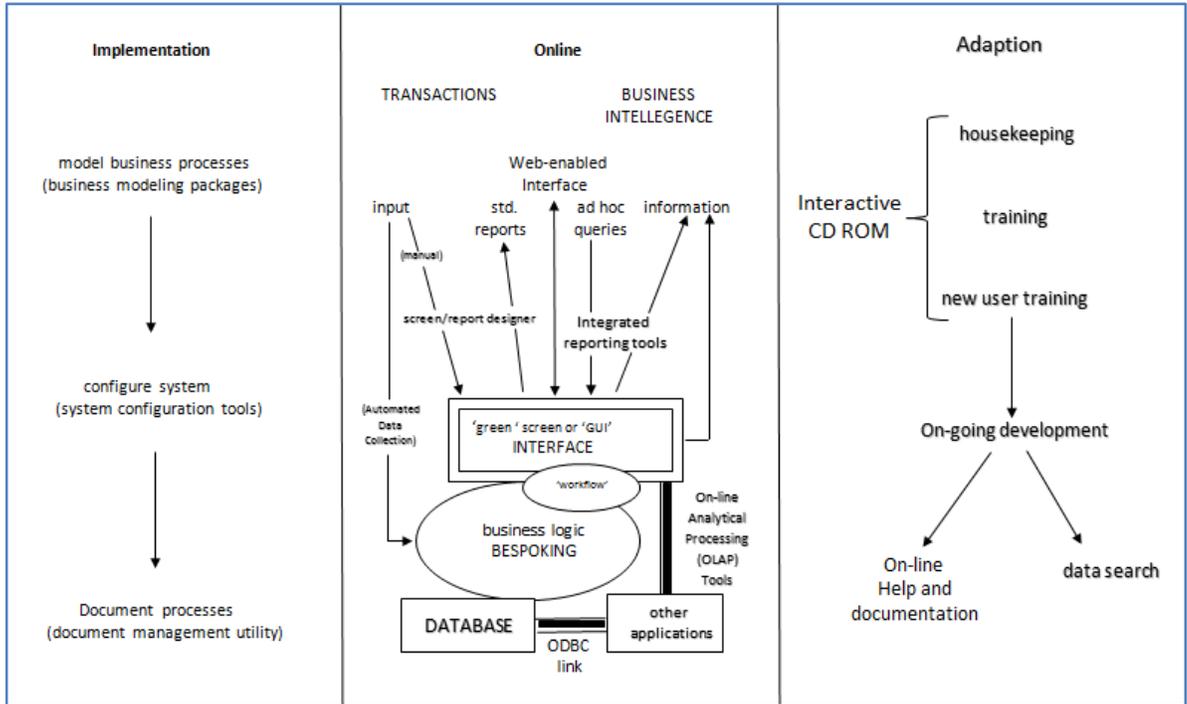
Business Outsourcing Model



Source: "Sourcing Models." Training Industry. Training Industry, Inc., n.d. Web. 2014. <[http://www.trainingindustry.com/media/17105749/sourcing\\_models\\_chart.pdf](http://www.trainingindustry.com/media/17105749/sourcing_models_chart.pdf)>.

## Appendix B

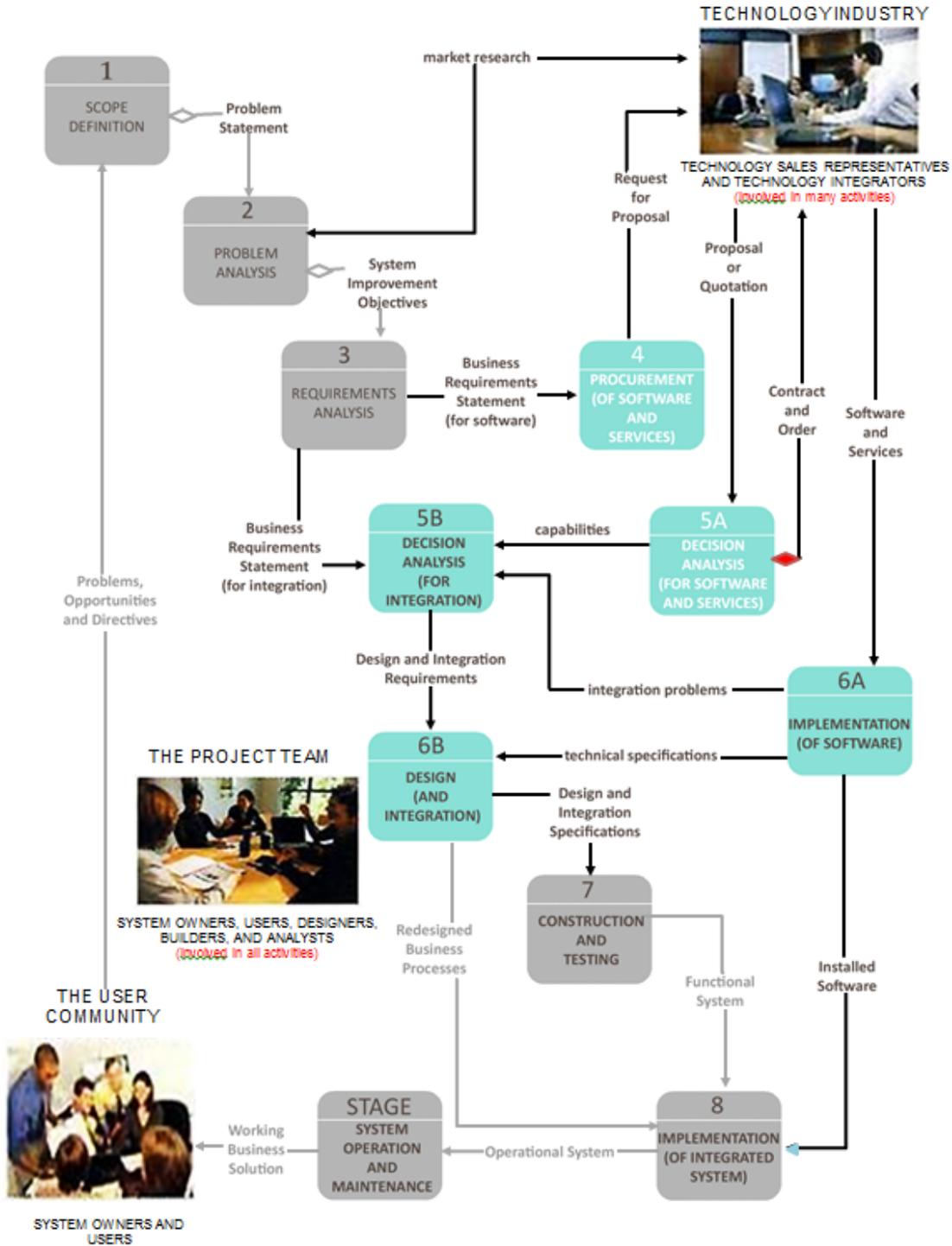
### The Multiple Views of ERP Software



Source: Harwood, Stephen. *ERP: The Implementation Cycle*. Burlington: Butterworth-Heinemann, 2003. Print.

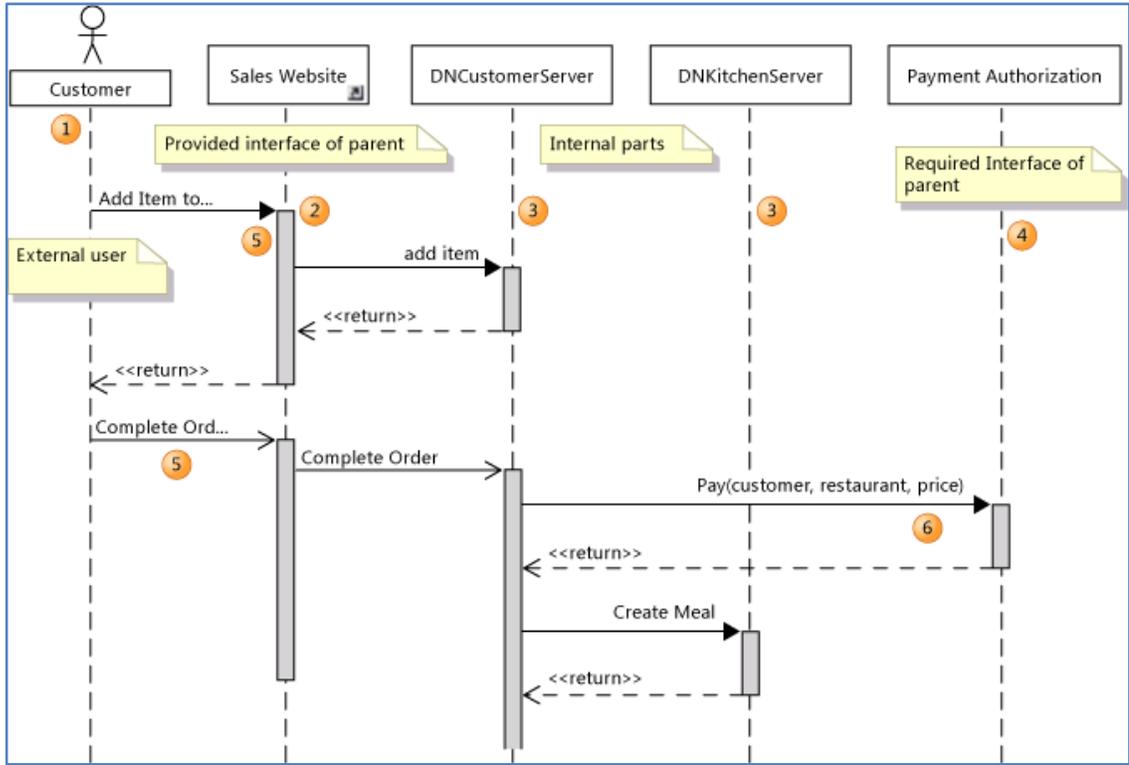
Appendix C

The Context of Systems Design for Commercial Off-the-Shelf Software Solution



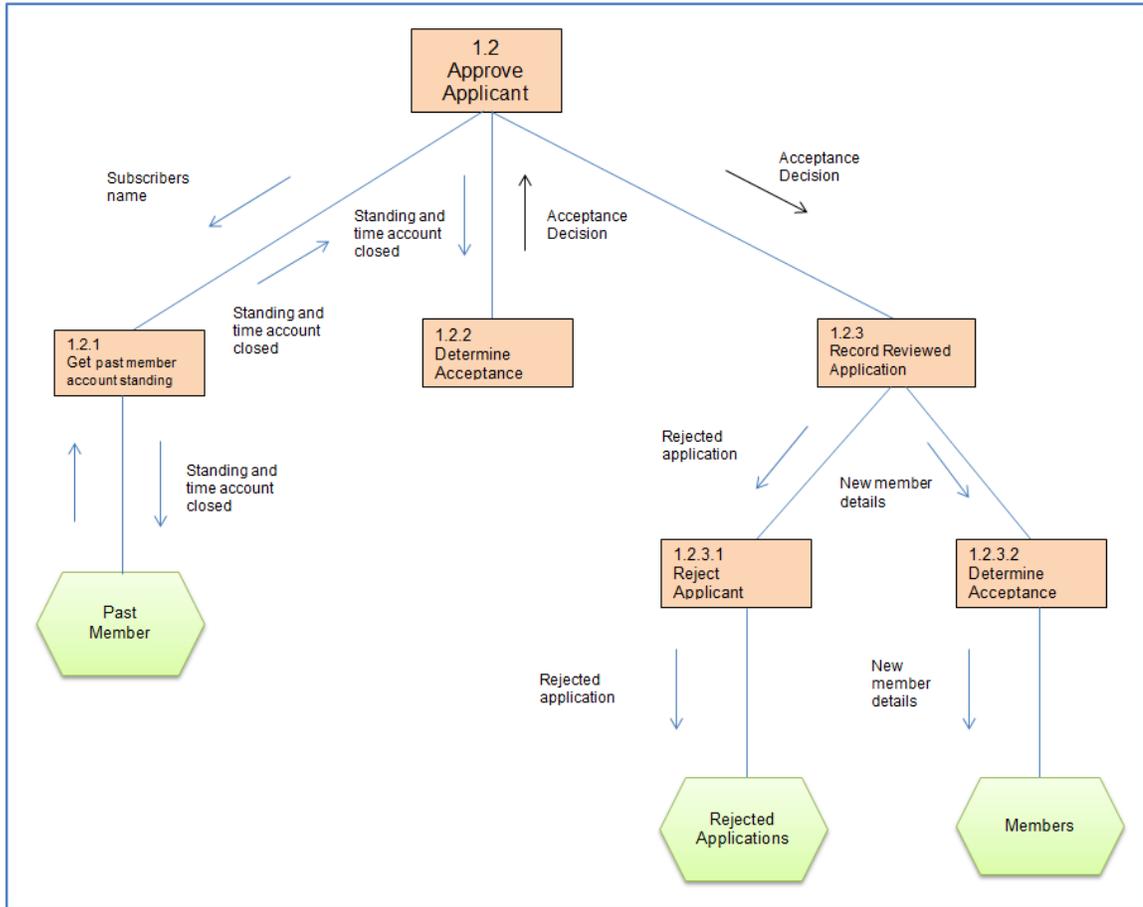
Source: Whitten, Jeffrey, Lonnie Bentley, and Kevin Dittman. *Systems Analysis and Design Method*. New York: Irwin/McGraw-Hill, 2004. Print.

### Appendix D Sample Object-Oriented Design Model



Source: "Sample Object-Oriented Design Model." Microsoft. Microsoft, n.d. Web 15 July 2014.  
<<http://i.msdn.microsoft.com/dynimg/IC267827.png>>.

### Appendix E The End Product of Structured Design



Source: Whitten, Jeffrey, Lonnie Bentley, and Kevin Dittman. *Systems Analysis and Design Method*. New York: Irwin/McGraw-Hill, 2004. Print.

## Endnotes

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- <sup>1</sup> Berman, Adam. "System Design Factors in the Implementation Lifecycle." Sparta Systems Blog. Sparta Systems, Inc., 1 Oct. 2010. Web. 2014 <<http://blog.spartasystems.com/system-design-factors-in-the-implementation-lifecycle/>>.
- <sup>2</sup> The source for footer ii is: Whitten, Jeffrey, Lonnie Bentley, and Kevin Dittman. *Systems Analysis and Design Method*. New York: Irwin/McGraw-Hill, 2004. Print.
- <sup>3</sup> "EMS Industry Terms and Definitions." Venture Outsource. VentureOutsource.com, n.d. Web. 2014. <<https://www.ventureoutsource.com/contract-manufacturing/information-center/terms-and-definitions/3/>>.
- <sup>4</sup> Bardhan, Ashok, and Kroll, Cynthia. "The New Wave of Outsourcing." Social Science Research Network. Social Science Electronic Publishing, Inc., 5 Jun. 2007. Web. 2014. <<http://dx.doi.org/10.2139/ssrn.985741>>.
- <sup>5</sup> Overby, Stephanie. "Outsourcing Definition and Solutions." CIO. CXO Media Inc., 9 Mar. 2007. Web. 2014. <<http://www.cio.com/article/2439495/outsourcing/outsourcing-definition-and-solutions.html>>.
- <sup>6</sup> Ibid.
- <sup>7</sup> Ibid.
- <sup>8</sup> Ibid.
- <sup>9</sup> Agcaoili, Lawrence. "Mla, Cebu Improve Rankings in Outsourcing Destination." The Philippine Star. Philstar.com, 1 Feb. 2013. Web. 2014. <<http://www.philstar.com/business/2013/02/01/903358/mla-cebu-improve-rankings-outsourcing-destination>>.
- <sup>10</sup> Ibid.
- <sup>11</sup> Information in this paragraph was gathered from the source: Cardozo, Eric. "The Seven Habits of Effective Iterative Development." Developer Works. IBM, 15 Jun. 2012. Web. 2014. <<http://www.ibm.com/developerworks/rational/library/1742.html#footnotes>>.
- <sup>12</sup> Hoffer, Jeffrey, Joseph George, and Joe Valacich. *Modern Systems Analysis and Design*. New Jersey: Pearson Education, Inc., 2010. Print.
- <sup>13</sup> Whitten, Jeffrey.
- <sup>14</sup> Rouse, Margaret. "Business Analytics (BA)." TechTarget. TechTarget, Aug. 2010. Web. 2014. <<http://searchbusinessanalytics.techtarget.com/definition/business-analytics-BA>>.
- <sup>15</sup> Ibid.
- <sup>16</sup> Information in this section was gathered from the source: Whitten, Jeffrey.
- <sup>17</sup> Whitten, Jeffrey.
- <sup>18</sup> Ibid.
- <sup>19</sup> Ibid.
- <sup>20</sup> de Sousa, Susan. "The Advantages and Disadvantages of RAD Software Development." Susan de Sousa's My PM Expert. My-Project-Management-Expert.com, n.d. Web. 2014. <<http://www.my-project-management-expert.com/the-advantages-and-disadvantages-of-rad-software-development.html>>.