A SYSTEM ANALYSIS, DESIGN, AND DEVELOPMENT
CASE STUDY: XTREME ADVENTURE TOURS
RESERVATION SYSTEM

TEACHING NOTES

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CASE DESCRIPTION

The primary purpose of this case study is for Systems Analysis and Design, Systems Development, and Database courses. Students examine realistic dialog and Interview Notes, as well as existing documents. For Systems Analysis and Design courses, the students should be able to follow this realistic case study of a small business which arranges “adventure-style” tours and conduct the planning, analysis, and design phases of the System Development Life Cycle (SDLC), using either a traditional or object-oriented approach. Deliverables would include process and data diagrams and modeling, and user interface designs, and should require approximately 12-15 hours to complete, outside normal class time. In System Development courses, e.g., capstone courses for a computer information systems major, students can use this case study to not only analyze and design a solution, but actually develop the solution using various windows or web-based tools. This solution could be Windows, web or mobile-based, although the recommended solution is for a Windows environment. The entire project should require approximately 20-25 hours to develop a working system. For Database courses, this case could be used to illustrate database design techniques, resulting in the creation of appropriate data models and physical database designs. This should require approximately 10-12 hours to complete. The case study is of moderate difficulty – ranging from a three to five on the GJBP difficulty scale, and is designed for junior and senior level students, but could also be used in similar graduate courses.

CASE SYNOPSIS

Dr. Thomas Waggoner, an information systems professor at the local university, wants to book a camping and kayaking adventure tour for his family through a local tour agency. In the course of the conversation, he realizes that the tour agency could greatly benefit by using a computerized system to track customer reservations. He discusses the idea with the students in his classes. Dr. Waggoner’s students interview the tour agency’s owner and develop a list of the requirements for this new system.

CASE PURPOSE/OBJECTIVES

The purpose of this case study is to provide an opportunity for information systems students to apply data modeling, process modeling, and user interface design skills to a semi-realistic scenario. Additionally, students in database courses can apply their knowledge and skills to design the class diagram/entity relationship diagram, as well as create a physical database based on the
information requirements in this case. Furthermore, students in system development/capstone courses can use this case as a comprehensive project, proceeding through the system development life cycle and develop a working tour reservation system for Xtreme Adventure Tours. The interview notes and supporting documents help add a sense of reality.

METHODOLOGY

This case is based on the author’s own experiences and has been modified to be more applicable to a classroom setting. The names and specific details have been changed. This case study presents a realistic opportunity for students to analyze, design, and develop a tour reservation system for a small “adventure-type” tour business. The scenario should be reasonably understandable to most students. This case study has been used by the author in a systems analysis and design course with great interest and success and the author has incorporated suggestions from his students to enhance the case.

TEACHING SUGGESTIONS

This case is designed to be used as a major project in either a systems analysis and design course, a database course, or a systems development/capstone course. In my systems analysis and design courses, I generally have students work in teams of 3-4 to complete a project of this size. I introduce the project approximately halfway through the semester, after we have finished discussing the planning and analysis phases of the system development life cycle. The students are able to begin work on the planning (e.g., system proposal) and analysis requirements (e.g., process modeling, data modeling) while we begin discussing the design phase during class. As the students are completing the analysis work, they can then begin working on the design requirements (e.g., user interface design). The case is to be completed by the last week of the semester. The case is most appropriate at the undergraduate level, but could be used in graduate-level systems analysis and design, database, and system development courses.

To incorporate the practice of project management, an additional requirement, particularly in a systems development/capstone course, could be added to develop a work breakdown structure, schedule, and budget using a tool such as Microsoft Project. The students should then keep track of their actual time worked and examine variances, illustrating the difficulty in developing time estimates on system development projects. A discussion of the variances could be included in the pre-implementation review (for systems analysis and design) or post-implementation review (for system development/capstone). The pre(post)-implementation review is an excellent technique to allow the students to reflect on their project, identifying what went well, and also what did not go well. The review often touches on topics such as tools used, scheduling issues, group dynamics, etc.

As the instructor for the course in which this case is used, you will need to have both good technical skills and project management ability. Most likely the different groups in your class will be working on a variety of case studies and projects, and you will need to help them stay focused, e.g., with milestone deadlines, as well as help solve their technical issues.

Requirements for Systems Analysis and Design Students:

1. Prepare a system proposal that includes an executive summary, the requirements of the system, and identification of your team members.
2. Develop appropriate process models (Use Case Descriptions/Diagram or Data Flow Diagrams – context level, level 0, level 1) per your professor’s instructions.

3. Develop the appropriate data model (Class Diagram or Entity-Relationship Diagram) per your professor’s instructions.

4. Develop preliminary screen and report designs for each user interface identified above.

5. Prepare a one-page “pre-implementation review” outlining lessons learned - what went right and what went wrong on this project.

**Requirements for Systems Development Students:**

1. Complete the above requirements, or refer to the packet of materials provided by your professor.

2. Using Microsoft Access, Visual Basic, or other appropriate development tool, develop a comprehensive, user-friendly, working system that will meet the requirements of Xtreme Adventure Tours.

3. Prepare a user manual describing how to use the system.

4. Prepare a one-page “post-implementation review” outlining lessons learned – what went right and what went wrong on this project.

**PROPOSED SOLUTION**

The suggested solution as shown in the appendices is based on an object-oriented approach and includes a use case diagram (see Appendix 1) and class diagram (see Appendix 2), but the case can certainly be conducted using a traditional approach, wherein the students would develop data flow diagrams and entity relationship diagrams. In addition, example user interface designs for screens (see Appendix 3) and reports (see Appendix 4) are provided.

**CONCLUSION**

This case study offers students an opportunity to apply concepts and techniques learned in their systems analysis and design, database, and systems development/capstone classes. The case is realistic, reasonably-sized for a major project in a semester-long course, and the scenario should be readily understandable to the students.
APPENDIX 1

Use Case Diagram
APPENDIX 2

Class Diagram

Customers
- Customer Number {PK}
- Customer First Name
- Customer Last Name
- Customer Street Address
- Customer City
- Customer State
- Customer ZIP
- Customer Phone Number
- Customer eMail Address

Reservations
- Reservation Number {PK}
- Customer Number {FK}
- AdventureNumber {FK}
- Reservation Date
- Number in Party

Tours
- Tour Number {PK}
- Tour Name
- Tour Duration
- Tour Price

TourAdventures
- Adventure Number {PK}
- Tour Number {FK}
- Adventure Start Date

1..1
0..*
APPENDIX 3

Customer Data Entry Screen (example)

Tours Entry Screen (example)
APPENDIX 3, continued

Tour Reservation Data Entry Screen (example)

Make Reservation

Reservation #: 1174  
Customer #: 1221  
Toby Barlow

Reservation Date: 9/29/2017  
Number In Party: 5

Adventure:

<table>
<thead>
<tr>
<th>No.</th>
<th>Start Date</th>
<th>Tour No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>105</td>
<td>11/10/2017</td>
<td>3WW12</td>
</tr>
<tr>
<td>106</td>
<td>11/17/2017</td>
<td>3WW12</td>
</tr>
<tr>
<td>107</td>
<td>10/26/2017</td>
<td>5WW12</td>
</tr>
</tbody>
</table>

Tour Name: Class 1-2 Whitewater Rafting/Camping

Tour Duration (Days): 3  
Tour Price (per Person): $100.00

Adventure Start Date: 11/17/2017  
Total Adventure Price: $500.00

Add Reservation  
Find Reservation  
Main Menu
APPENDIX 4

Tour Confirmation (example)

Departure: Xtreme Adventures

Reservation Confirmation

Reservation No. 1174  Reservation Date 9/29/2017

Customer No. 1221  Toby Barlow

# in Party 5  Adventure Num. 106

Tour: 3WW12  Class 1-2 Whitewater Rafting/Camping

Tour Duration (in Days) 3  Tour Price per person $100.00

Start Date 11/17/2017

Total Adventure Price $500.00
APPENDIX 4, continued

Upcoming Tours Report (example)

<table>
<thead>
<tr>
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<th>Tour Duration</th>
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<th>No.</th>
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<td>104</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Customer Name</td>
<td>Number In Party</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Brandon Brown</td>
<td>4</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Hailey Garcia</td>
<td>2</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Total people for this Adventure:</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Friday, November 10, 2017</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Customer Name</td>
<td>Number In Party</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Toby Barlow</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total people for this Adventure:</td>
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<td></td>
<td>Friday, November 17, 2017</td>
<td>106</td>
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<td></td>
<td></td>
<td>Customer Name</td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marla Morales</td>
<td>6</td>
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<td></td>
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<td>110</td>
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</tr>
<tr>
<td></td>
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<td></td>
<td>Marla Morales</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total people for this Adventure:</td>
<td>6</td>
</tr>
</tbody>
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