ABSTRACT

The work in progress study is a continuation/extension of a previous ERP Simulation study focused on outcomes for student learning and engagement. One of the new factors in this new implementation is the use of virtual teams where MBA students collaborate remotely by using communication tools. Study objectives include:

- Identify the business strategies implemented by the teams with regards to cost estimation, pricing across products/distribution channels, marketing/advertising, forecasting and replenishment, production scheduling/timing/production campaigns/production release sequence, product sales/product variety, and inventory management.
- Identify the different collaboration strategies implemented with regards to coordination, including taking turns during the day, assigning specific roles to team members/ rotating roles, and/or dividing the tasks.

ERP SIMULATIONS

ERP Simulations are experimental approaches used to explore business transactions in academic or training environments. Prior research indicates ERP simulations are beneficial to participants in forms of learning and salary increases (Cronan & Douglas, 2012). Participants obtain the understanding and skills needed to successfully using the system by continuous and experimental use.

The work in progress study is a continuation/extension of a previous ERP Simulation study focused on outcomes for student learning and engagement. One of the new factors in this new implementation is the use of virtual teams where MBA students collaborate remotely by using communication tools. Teams used a mobile ERP interface and a business intelligence dashboard. The study used Liquid UI, which provides both a web and mobile interface for SAP transactional data access. Participants were provided downloading instructions for both web and mobile to access the SAP GUI with a smartphone or tablet. The primary mission for this strategy was to give participants access to the environment around their busy work schedules.

The paper seeks to address the following important variables: the ease of use of the user interface, the level of interest and competition during the simulation, increase in knowledge of SAP software and increase in knowledge of business processes.
Figure 1: Sample ERPsim mobile screen

Lessons Learned Report

Teams submit a report at the end of the game rounds. The report is a journal of student experiences playing the ERPSIM game. Every student prepares an individual report, but some of the information in the report can be shared with other team members, for example, the description of the strategies. Other data, like the logs, is tracked on an individual basis.

The first section of the report describes strategies for preparing for the game by watching the tutorial videos, reading the book, and practicing with the system. Also, the learning management system keeps track of students when they read the book or watched the videos. The next section of the report describes the different business strategies with regards to:

- Cost estimation
- Pricing across products/distribution channels
- Marketing/Advertising
- Forecasting and Replenishment
- Inventory Management
- Production Scheduling/Timing/Production Campaigns/Production Release Sequence
- Product Sales/Product Variety
- Discipline Knowledge (concentrating on Enterprise Application Integration)

For each implemented strategy (both successful and unsuccessful) teams describe the outcomes and the lessons learned. In this course, understanding the consequences of implemented strategies is more important than winning the game. Teams also include sample screens from the dashboard or SAP reports to explain strategies and outcomes.
The next section of the report describes the different business strategies implemented with regards to coordination. Some of these strategies include: taking turns during the day, assigning specific roles to team members/rotating roles, and dividing the tasks. For each implemented coordination strategy (both successful and unsuccessful) teams explain the outcomes and the lessons learned. The next section of the report describes frequency, advantages, disadvantages of the use of the dashboard and suggestions for improvement. Teams keep a log of communications that includes calls, e-mails or text messages.

Table 1: Sample Team Communication Log

<table>
<thead>
<tr>
<th>DATE</th>
<th>START TIME</th>
<th>END TIME</th>
<th>MEMBER</th>
<th>METHOD</th>
<th>PURPOSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/21/2015</td>
<td>7:15:00 AM</td>
<td>7:52:00 AM</td>
<td>I2, I4</td>
<td>TEXT</td>
<td>SET MARKETING, AND PRICING. CHECKED INVENTORIES.</td>
</tr>
<tr>
<td>12:14:00 PM</td>
<td>12:30:00 PM</td>
<td>I2, I4, I5</td>
<td>TEXT</td>
<td></td>
<td>LOWERED PRICING, ADJUSTED MARKETING, INCREASED INVENTORY.</td>
</tr>
<tr>
<td>6:00:00 PM</td>
<td>8:00:00 PM</td>
<td>I2, I4, I5</td>
<td>TEXT</td>
<td></td>
<td>COMMUNICATED DURING THE IN CLASS GAME. 3 PARTICIPANTS MANAGED PRICING, MARKETING, PURCHASE ORDERS, AND INVENTORIES.</td>
</tr>
</tbody>
</table>
The last section of the report is the overall conclusion and self-assessment of learning. Students provide a concluding statement regarding their experience with the game. Teams compare and contrast experiences playing the regular version of the game (during class time for about one hour) versus the extended version of the game (during three consecutive days). Students provide additional suggestions in regards to the ease of use of the user interface, the level of interest and competition.

Those students using a mobile device include an additional section in the report. They have the option to use the Liquid mobile app, or use the HTML SAP interface in a browser or use the Tableau dashboards on a mobile device. Students describe implementation issues, installation/licensing issues, advantages of the use of the app, the level of satisfaction with the functionality, ease of use of the app, disadvantages of mobile access and provide suggestions for improvement.

This study expands on previous research by conducting a pre and post survey to measure overall perceptions. The use of a pre and post survey is used to track perception entering the simulations and experience using simulations.

**Preliminary Results**

Those students using a mobile device include an additional section in the report. They have the option to use the Liquid mobile app, or use the HTML SAP interface in a browser or use the Tableau dashboards on a mobile device. Students describe implementation issues, installation/licensing issues, advantages of the app, the level of satisfaction with the functionality, ease of use of the app, disadvantages of mobile access and provide suggestions for improvement.

The ERPSIM simulation was implemented in courses with two different class formats: hybrid and Hyflex. In a Hyflex environment, students have the choice to attended class onsite, synchronous through Adobe Connection, and/or asynchronous with online access to the recorded sessions. In a hybrid environment, students attend the classroom 50% of the sessions and complete the rest of the instruction on Blackboard.

The ANOVA analysis shows a significant difference between hybrid sections and Hyflex sections. Hyflex sections had lower scores for the questions “ERP Simulations improved my collaboration with other team members?” and “The dashboard stimulated discussions and helped us brainstorm new ideas”. However, Hyflex students spent more time preparing.

**Figure 3: Hybrid vs. Hyflex Mean Comparison**
The HEC ERPsim Distribution and Manufacturing games were used for this research. Some sections used the Distribution version of the game and other the more complex Manufacturing version. Sections playing the Manufacturing game had lower scores for the questions “ERP Simulations improved my collaboration with other team members significantly?” and “The dashboard stimulated discussions and helped us brainstorm new ideas”, but they spent more time preparing. A potential explanation is that the manufacturing game is more complex than the distribution game.

![Figure 4: Distribution vs. Manufacturing Mean Comparison](image)

**CONCLUSION AND FUTURE STEPS**

This study also analyzes the use of communication methods for virtual team collaboration during the simulation activity to assess the impact on team effectiveness and performance. This assessment is based on the content analysis of the log of team communications recorded during the simulation. The content analysis is performed using the NVIVO software program.

**REFERENCES**
