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## RUNNING AN SAP SIMULATION GAME ONLINE

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### Abstract:

This paper describes the introduction of a simulation game into an online Information Systems (IS) class for graduate business students, not majoring in IS. The intention was to give the students experience in business processes and to demonstrate the importance of all components of an information system in providing information for business decision making. The students found the game enjoyable and (surprisingly to many) relatively easy to use. They gained an appreciation of ERP capabilities and learned how they might use such systems in their workplaces. In addition to the enjoyment, they also observed some of the implications of not following procedures or team members' not completing their assigned tasks. The students strongly supported its inclusion in the course in future years. However the deployment of the game was not without its problems – the paper aims to share the experience and provide advice and guidance for those wishing to incorporate the game into their online classes.

**Keywords:** SAP, Simulation-Game, Teaching, Online, Information Systems

## I. INTRODUCTION

As technology continues to play an increasingly large role in education and as more and more classes are offered “online” many schools are attempting to ensure that the educational experience in online classes matches that offered in the traditional classroom. This comes with some constraints. Online enrollment might be defined (or at least perceived) as asynchronous and there could be an expectation that such enrollment does not permit a requirement to attend campus for any of the course. Some schools charge extra fees for online classes and make such provisions a part of the fee levy. Nevertheless, the argument that a component seen as beneficial and contributing to desired learning outcomes in a face to face section of the class, should be available to the online section, is a strong one. This paper reports on efforts to take the SAP Simulation Games into the online class environment. These games are from the ERPSimLab at HEC Montreal and may be found at [www.erpsim.hec.ca](http://www.erpsim.hec.ca).

In a graduate program at Georgia Southern University (GSU) the course Enterprise Information Systems is required and is offered both online and face to face. A central component of the course is to ensure students are familiar with the five components comprising information systems – *hardware, software, data, procedures* and *people* – each needs to function satisfactorily for the Information System (IS) to be successful. An important aspect of the course is to get the students thinking about business processes and how IS are an integral part of those processes. In addition the course aims to introduce students to the elements of business intelligence, particularly using data analysis of ERP generated data. In common with many graduate courses some students taking the class have limited work experience, some extensive. However many of the students taking this class have limited work experience in business and what they do have is often limited to data input or taking action on reports produced by the system without any real understanding of the business processes involved. Some also have little experience in working in teams in a decision-making environment. In this course, the learning outcomes require that the students gain some familiarity with integrated business processes using ERP systems.

Over the past few years the IS Department at GSU has integrated the SAP Simulation Game into many of its courses, although by and large this integration has been restricted to face to face sections. Recently it has attempted to offer the games to the online classes to ensure similar opportunities and learning experiences are offered to both. The department has a strong ERP emphasis area – students, especially Business students, opt to enroll in the Department's Enterprise Systems minor. The Department is a long standing member of the SAP University Alliance. Among the benefits of participating in the ERP courses, students become eligible to attend a SAP industry certification course on ERP Integration (TERP10). It was decided to give the graduate students an opportunity to gain some exposure to business decision making and business processes by having them engage in the SAP Simulation Game (ERPSim Distribution) as part of their online class experience, using the business process focus of the games to demonstrate the desired course content. In addition the students were required to download the data generated during the game and conduct business analytics on it, in their teams. In previous use of these games in the face to face classes, it was noted that the students took ownership of the data and saw the simulation data much more realistic than data that might be provided to them via a case study or instructor-produced spreadsheet file. Words such as "our team", "our best customer", and "our best-selling products" were frequently used by the students and overall they were extremely appreciative of what the exercise brought to the classroom. This paper reports on the procedures adopted in the moving the game to the online environment and attempts to address the following questions:

1. Was this a valuable exercise, outweighing the difficulty of setting it up and getting it to work for the students?
2. Did it demonstrate the use of information systems in business?
3. Would students be comfortable in using similar software in their future professions?

## II. The SAP simlaton game

The ERPSim exercise provides a practical application of using information for decision making. It also gives examples of standard business processes and hands-on experience in the use of information to make tactical managerial decisions. Students were placed in teams (about 4 to a team) for this exercise and were provided with a Job Aid (a .pdf file of procedures to follow) so that they could familiarize themselves with the exercise prior to the first day of the event.

The exercise consisted of ordering and distributing various bottled water products into 3 regions of a European country. Each product was defined uniquely with a material number and each team sold the same 6 products – therefore, initially the playing field was level and no one team had any advantage over another. They competed against other teams in class as to which team could make the most profit. Students were able to make decisions about pricing (per product) and how much to spend on marketing (product per region). Initially, all teams were provided with the same inventory of each product so they could simply begin by selling that stock.

The game is played over 3 business quarters of 20 simulated days each quarter. When running the simulation, the software simulates 20 days in about 20 minutes. This means business happened rather quickly, so students had to be prepared to respond accordingly to changes in the business environment. Extra complexity is added in the form of lead times for customers and suppliers. With regards to customers, it takes 1-3 simulated days for the product to reach the customer and 10 days before the customer will pay. On the supplier side, replenishment of products also takes 1-3 simulated days. For the first round of the game (quarter 1) the students are provided with stock already in the warehouse and are only required to make pricing and marketing (advertising expenditure) decisions. The second third rounds (quarters 2 and 3) has the students creating sales forecasts and ordering replacement stocks. The game complexity increases significantly between rounds 1 and 2.

As mentioned above, the game provides a job aid (a set of procedures) that details these three key processes that lead to decisions – the sales process (the key decisions are pricing and marketing expense) – the planning process (what markets to concentrate on and how much to order) and the procurement process (sending purchase orders to the vendor for replenishment). The quantities in the purchase order resulted from the planning process. These decisions are made by the individual teams and then entered into the SAP system.

The system provides the following reports for use in the decision making:

1. Purchase order tracking
2. Inventory
3. Financial statements
4. Sales orders
5. Market information (available every 5 days and provides an overview of the entire market)

The above reports are used by team members in their decision making and in game analysis of the market and their own team's performance. At the end of each quarter (the full three quarters fitted into a three hour class, with the first half of the class being occupied by getting started explanations, instructions and first quarter simulation and the second half covering the second two quarters and final results. Team standings were presented periodically and teams encouraged to revise their strategy if necessary. A review of the whole exercise was conducted the following week.

### III. Preparing for the game

To play the game the students need to download a Graphical User Interface application and install it on their PC with which they will play the game. The file is quite large, (over 100 mb) and after installation the system requires the student to choose the server they will be working on and change passwords etc. Students were then asked to contact their (randomly assigned) team-members, familiarize themselves with the reports available and take some actions to set prices and marketing expenditure. An added complication is that the SAP interface is rather different to the more familiar Microsoft Windows. A detailed, step-by-step set of instructions was prepared and tested by asking two students to work through them, making a note of any difficulties or ambiguity encountered.

Due to the complexities expected to be encountered in running the game online, it was decided to let the students experiment prior to the start of the game. This would enable them to become familiar with the interface, identify key tasks and be aware of reports and feedback offered. Students were allocated to teams and Round One of the game was made available to them to be run over two days as a practice (each "day" went by in a little over an hour). It was not intended that they be present the whole time, but could come in and out as their time permitted. To prepare for this the students were encouraged to set up team communications by whatever collaborative communication tool appealed – Skype, Facetime, telephone, or text messages, etc. The principal objective of the practice game was to ensure that all students had the software loaded and could interact with it and with each other. Only the first part of the game was offered for the practice (the sales section in Fig 2 above).

The game itself, including replaying Round One, was played the following week. Due to an internal regulation to not require students to be present at a particular time, the game was played twice (two different nights in the same week) and students offered a choice as to which they attend. Most did not care, but for a few a particular date and time would have been problematic; in the event all were available for one of the times offered. One contributing factor is that the games were scheduled in the syllabus and all students asked to choose and record a time to play the game at the start of term. The games were played with each "day" going by in one minute in the simulation, as they were in the face to face classes.

The students were also asked to install Adobe Connect (a web conferencing software) so that the instructor could communicate with them during the game and share his screen, showing progress and results.

### IV. Problems Encountered

Most students were able to complete the setup and play the games with minimal problems, but issues were encountered by some. Although few of the problems encountered were major, significant or could not be resolved fairly easily, it is worthy of note that even small problems are frustrating to the student and can affect the perception of the game.

*Technological* - several students met problems downloading the GUI – the file size meant that it took a very long time to download over slow connections, and company firewalls prohibited it being loaded on some computers at the workplace. One student was unable to load and install the GUI at all, despite many emails and phone calls, until the intervention of the university's technology support group.

*Interface* – despite being reminded several times that “SAP is not Microsoft” and that the interface was different, several students ran into difficulty, meaning they missed opportunities to vary prices, order product etc., resulting in less than optimal team performance.

*Instructional* – preparing step-by-step instructions for the students to download the GUI and set up the game did not turn out to be a trivial task. Some degree of ambiguity or confusion crept in and the instructor is indebted to the two students who tested the instructions and provided feedback. Readers might find some amusement in the results reported – one student report “all worked fine for me, game loaded” the other came back with about four suggestions for improvement and details of how she had had to develop work-arounds for deficient instructions.

*Students will be students* – one student forgot to take his laptop on a trip and only realized at the commencement of the game it was not going to be available on the friend’s computer he intended using. Despite requests not to do so, several students left the installation of Adobe Connect until the commencement of the game, and some were unable to get it installed before the game finished.

*Instructor time* – as mentioned above, in order to give all students the opportunity of playing the game, it was run twice, requiring the instructor to devote an extra evening to the class.

None of the above problems proved insurmountable (except perhaps for the student who forgot to take his laptop) but were compounded by the distance involved in online classes. Almost all of the above are easily resolved in classroom with the instructor available to answer questions and students at the neighboring workstations willing and able to help out. However when there is no one nearby to turn to and the student is isolated, small issues become big issues.

## V. Part 2 of the exercise

Once the students had completed the game, they were asked, in the same teams, to use the data generated to conduct a data analytics exercise and produce a narrated PowerPoint presentation giving the results. Sample questions the students were asked to address were:

1. In round 1, who were your best customers?
2. On which product did you make the highest gross profit in Round 1?
3. In Round 3, which products (and in which periods) did you sell above the market average?
4. Produce a graph of sales of one product over one of the rounds

In many ways the questions they were asked reflected typical managerial questions and the students immediately saw the benefits of this task. They were allowed to choose the analytical tools to use – either the built in SAP tools or Excel Pivot Tables. The data tables generated by the game were not huge, but large enough to prevent eyeballing the data to determine the answers. The students were encouraged to relate this exercise to their own workplace decision making wherever possible. A particular benefit of the using the game-generated data meant that the students saw the data, as somehow real and took personal ownership of it – far more than if data for analysis had been provided to them in a file from a case study.

## VI. Reflection

As part of the exercise the students were asked to reflect on the whole task. They posted their thoughts on a discussion board, but were also given the opportunity to send them directly to the instructor if they wished. Overall, the students saw the game and the subsequent analysis as extremely worthwhile. The comments given below are drawn from the student reflections and give some idea of their feelings about the task.

*“I thoroughly enjoyed the SAP game, and feel it was a very beneficial experience. It provided a much more hands-on, purpose-based opportunity to explore the SAP system compared to my experience in my prior ERP courses. While I understand that it is very important to be able to adapt to a fast-paced business environment, the SAP game seemed a little TOO fast-paced at one minute per day. I would recommend adjusting the pace to 3-4 minutes per day for increased efficiency and success.*”

*My team was able to communicate via conference call and I can't imagine any other method would have been more convenient. We "met" on a call the week prior to the real SAP game and assigned duties/created a strategy for our teamwork during the game. The stress of the game was certainly minimized since we all understood our responsibilities. In addition, engaging in a call during the game allowed us to communicate quickly and remain on the same page as the game progressed. We were able to re-strategize as necessary and discuss actions that needed to be taken in order to be more competitive in the market.*

*I also appreciated the assignment after the game as it allowed us to analyze and study our performance and consider strategy that may have increased success."*

*"I had a better feeling going into the game after having played the practice game. I was in the role of setting and adjusting the prices. I never realized how much go into setting prices for products for sale. Playing this game just makes you realize how much communication amongst all players in every role is Key to the success of making a profit. Each person's role was needed for the other person to make an informed decision. It was really fast paced. You had to think quickly. This game gave a true meaning to the phrase "Time is money". You either were losing money or making money in a matter of minutes. We had to view market reports, inventory, sales reports, and make the decision whether to adjust our prices up or down all in a single day/round to be able to forecast correct and be ready for the next day. I have a new respect for relying on team mates and how store owners set prices for their products to make money."*

*"Overall, I really enjoyed the SAP Game! While it was fast-paced, I liked the challenge of making these business decisions (pricing, marketing/advertising, and purchasing) in a "high stress" environment to have the most positive outcome (highest net income). Working remotely didn't prove to be too much of an issue for our team; we had an initial conference call to discuss game day strategy and then utilized a conference line during the game to stay in constant communication. I would say that communication is key in the game to make these real-time decisions. Because of my accounting background, I really liked the analysis and discussion after the game to go through our data and put together the presentation.*

*"I really enjoyed the SAP simulation game! There were many objectives I learned throughout the practice round and the real game. I love watching how all the parts of a company have to work together in order to be successful. The fast paced speed of the game is just like real life because some decisions we make on the job will have to be made in a haste matter so the company can out perform competition."*

*"For clarity's sake, the game could have been improved upon if the re-ordering process was a bit more clear (maybe the opportunity to restock after the simulation just to get the steps down before the game?) Communication is key. We were very fortunate to have three out of our four team members in one location using two computers, so if that it is at all possible, I'd recommend it"*

*"The only other thing I would change if this exercise were to run again is the timing. I enjoyed the fast pace but I think one minute per day is entirely too quick for a remote team to react when a product is selling out or stalling. I think 3 minutes per day gives a team enough time to evaluate performance, order more products, change marketing expense, and change prices. Since it can take several days for products to be replenished, you can easily lose a couple of days of sales while you discuss replenishment levels and navigate the screens to set up the orders"*

*"I was really nervous at the start of the SAP Game. I wasn't sure what to expect and was pleasantly surprised at how much fun it really was. My team did a good job at communicating to each other times to meet and discuss the game. I really enjoyed working with the ladies on my team. When it came time for*

*the actual game, we got into a great routine. As the game progressed things got a little hectic and didn't quite go as we thought it would in terms of how fast we thought our inventory would sell at the price we had set it at. And I had lost internet connection right during our 1st break and freaked out a little, but my team was there for me to take over my duties if needed. Thankfully, I got my internet up and running right before the 2nd round started."*

### **TECHNOLOGY FAMILIARITY**

At the beginning of the exercise many students were apprehensive about using what they saw as a complex and unfamiliar technology. This is reflected in both the final comment above and in the Adobe Connect chat room transcripts; it no doubt also contributes to the words "fun" and "enjoy" above – the game was a lot better than they expected. Early on, they saw the exercise as highly technical and that it would be a challenge to the skills they possessed.

### **THE VALUE OF THE EXERCISE**

The students endorsed the value of the exercise very strongly with almost 100% agreeing or strongly agreeing that it was a good demonstration of business decision making and that it was a great example of using information systems in business. There was no one disagreeing with these statements. All teams completed both parts of the exercise, participating in the business processes for the length of the game and then using the generated data to assess a series of business intelligence scenarios such as identifying best customers, products sold above the market average or profitability by region. They were also able to identify factors that contributed to a less than optimal game performance.

### **TEAMWORK**

Perhaps surprisingly for students with a degree of work experience teamwork was seen as one of the most beneficial and important aspects of the game. By and large they were working with people they did not know or had not worked with before and the good students (the first comment above is an example) put considerable effort into facilitating teamwork, illustrating the essentiality of the *people* component.

## **VII. Concluding remarks**

The ERPSim Game seems to have been a success in that it gave the students practical experience of business processes and underlined the essentiality of all components of an information system. Moreover, the students enjoyed playing it and considered it as providing a useful base for using similar systems in business. The comments made were largely very favorable with suggestions for improvement being in the areas of more time and a more detailed explanation, possibly related to their performance in the competition.

While it is always possible to lead a horse to water, making it drink can be difficult. For the instructor the key lessons here are:

- Start early – perhaps set as a deliverable due two weeks before the game a screen shot of the game set up on the student's computer
- Put some effort to writing detailed instructions and have them tested
- Ensure that all students participate in the practice session – perhaps by having screen shots as deliverables again.
- Set up and use Adobe Connect (or similar) before the game
- The game could be slowed down a little – perhaps 90 seconds per day?

Nevertheless, the game is considered to be a very beneficial addition to the online course and justifies the effort involved.