

# **Teaching Tip**

## **An Introduction to the Business Game “Flowers for the World”**

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### **ABSTRACT**

The aim of this paper is to provide sufficient detail that other members of the IS community can incorporate the business game “Flowers for the World” (or FFTW for short) into their IS teaching portfolio. The game promotes experiential (active) learning and has been used to support discussions or project work in such diverse subjects as analysis and design, database development, and advanced programming, as well as Masters-level courses on the strategic use of information systems. Examples of how experiences from the game can be used to support later learning and discussion is provided.

**Keywords:** Business game, Experiential learning & education, Simulation, Game-based learning

### **1. INTRODUCTION**

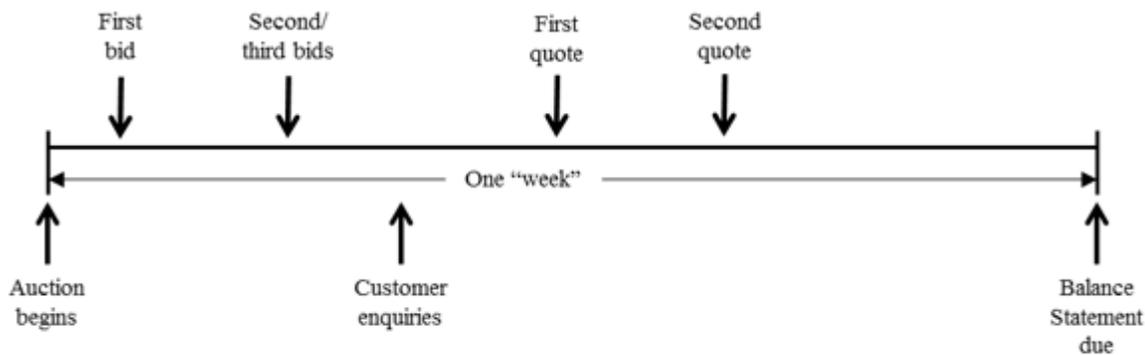
There is a proverb in the Xunzi (Knoblock, 1990, p. 86) that is often summarized as: Tell me and I’ll forget; Show me and I may remember; Involve me and I will understand. In short, of all the pedagogical methods at our disposal, there is nothing better than having a student engage in the problem about which we wish to teach. Business games are probably the most effective means of introducing this type of experiential learning into the classroom which allow the student to confront the key issues surrounding a business problem, and where the life of a company over many years – and thus, the consequences of decisions made – can be simulated in the matter of a few hours.

Despite the success of business games in other disciplines (Faria et al., 2009), there are few (if any) business games that specifically demonstrate the basic principles of information systems. This is a serious problem because IS students are expected to understand the social and technical intricacies of supporting people in organizations using IS/IT. While a certain amount of didactic/rote learning is required in order to learn the terms and concepts of IS, we are an active discipline and teach technical subjects such as programming, web development, and systems analysis and design, by actually programming, developing a web page, and conducting an analysis and design project. But systems are typically developed because of a clear business need. Where do the meaning and purpose of the projects we assign in our classes come from? Case studies can provide the context for making business decisions, but they fall short of experiential learning by not being able to provide feedback

or allow students an active role in the problem-solving process (McCarthy and McCarthy, 2006).

The purpose of this paper, therefore, will be to complete the pedagogical spectrum and present a business game called “Flowers for the World” (or FFTW, for short). The game is very active – students often end up running around the classroom – and has been used across a wide range of IS courses as a means of demonstrating how information flows through an organization and the role of an information system in supporting business decisions. The aim here is to provide sufficient detail so that the game can be adopted by others to provide a different approach to teaching IS concepts. (NOTE: Game materials are available from the author at <http://faculty.baruch.cuny.edu/tmoores/fftw.htm>.)

This game is not designed to solve a specific problem for a particular class. Rather, we offer the game as a general platform for providing students with the kind of active, high-energy experiential learning that can be used across a wide range of classes. Similarly, we do not adopt a particular experiential learning theory, but take the general view that business games must be designed to motivate and actively engage students in the learning process (Fink, 2013; Kapp, 2012). Feedback must be immediate and mistakes made in a risk-free setting. Evidence of the value of the game will be provided in terms of demonstrating the richness of the learning experience, student feedback, and the range of IS courses that can be supported.



**Figure 1. Timeline of Activities**

## 2. OVERVIEW OF THE GAME

A game is defined as an activity that has a goal, rules, a feedback system, and voluntary participation (McGonigall, 2011). A goal is some specific outcome, while rules determine which actions the players may (or may not) use to achieve the goal. The feedback system evaluates performance, while voluntary participation involves accepting the basic principles (goal, rules, feedback system) of the game. To be a business game, the game must involve some managerial learning within a business setting, such as managing a company (Marco, Baldissin, and Nonino, 2013).

In this case, the game is paper-based, and involves buying and selling a product. The goal for each group is to buy enough product at auction to satisfy customer demand, maximizing profit as they do so. The rules of the game involve a time dependency in which the buying and selling must be performed within a set amount of time (called a “week”). At the end of each week, a balance sheet is required that gives their current status, including profit/loss for the week. The fall or rise in the profit/loss is the key measure of performance feedback.

The nature of the product is unimportant, but flowers are useful because the degradable nature of the product allows for a more complex accounting of inventory. The heart of the game involves each group establishing a paper-based information system so they can track prices, orders, and inventory. Thus, it is essential that students have some basic understanding of what the term “information system” means before playing the game. This would allow students to understand what they are trying to do as they play. It is not necessary for a detailed explanation. The experience of playing the game can itself be used to delve deeper into the idea of information flow.

No computers (laptops, tablets, or even phones) are allowed to be used. Everything must be paper-based. This IT-poor environment is designed to force students to focus on what information is needed to perform their duties, and hence, what needs to be written down, who is responsible for writing it down, and who should have access to that information. In short, the group must organize their own paper-based information system that focusses on the nature and flow of information between group members. Explaining these issues to the class before playing the game will enhance voluntary participation.

### 2.1 How to Play the Game

Divide the class into groups of four. They can decide for themselves which of four roles they will adopt: CEO, Purchasing Manager, Sales Manager, and Finance Manager. It should be made clear that each group is an instance of FFTW and not in direct competition with each other, so one group buying or selling a flower does not prevent another group buying or selling the same flowers. As such, each group will encounter the same set of supply and demand issues. The best group will be the one with the highest final balance at the end of the game because of the quality of the decisions made throughout the game.

Briefly explain the nature of the game: Flowers are bought at auction at the beginning of each week and then sold to customers that own flower shops (see Figure 1). Each group needs to record the details of each transaction so they can make smart decisions about which products to buy and how much to charge customers in order to make a profit. There are three types of product (Roses, Irises, and Daffodils) and two customers (C1 and C2). The instructor plays the role of the auctioneer and customers.

<b>(a). Auction Details.</b>						
Week	Auction					
	Roses		Irises		Daffodils	
	Lots	MWB	Lots	MWB	Lots	MWB
1	5	100	4	90	5	80
2	6	100	4	100	5	80
3	6	110	4	110	5	80
4	7	100	3	100	6	90
5	7	90	5	90	7	90
6	5	100	6	80	7	100
7	4	90	7	70	8	90
8	3	100	5	80	8	80
9	6	110	5	90	6	70
10	7	120	6	100	4	60

MWB = Minimum winning bid (in whole dollars). Groups must *meet or exceed this price* at auction to win the number of lots available for that type of flower.

<b>(b). Customer Enquiries.</b>									
Week	Customer Enquiries								
	Roses			Irises			Daffodils		
	C1	C2	PPF	C1	C2	PPF	C1	C2	PPF
1	622	309	100	22	31	50	481	251	60
2	577	333	110	49	44	50	388	288	60
3	401	455	120	16	43	50	333	300	50
4	663	499	130	22	47	50	299	274	40
5	322	535	140	53	31	50	345	283	40
6	222	333	150	28	32	40	422	328	50
7	199	311	140	33	43	30	399	366	60
8	822	519	130	21	37	20	323	246	70
9	555	389	120	27	34	10	389	219	80
10	489	299	110	41	25	10	321	166	90

C1 = Customer 1.  
C2 = Customer 2.  
PPF = Price per flower (in whole cents). Groups *cannot exceed this price* in order to win the customer order for that type of flower.

Table 1. Sample Game Configuration: (a) Auction Details, and (b) Customer Enquiries



Figure 2. Example Slide Showing Lots Available At Auction

Each round (called a “week”) begins with an auction. Use a PowerPoint slide to show the number of lots of flowers available (e.g., see Figure 2). Each lot is 100 flowers. The

Purchasing Manager must present the Auctioneer (instructor) with a bid for the flower(s) they wish to purchase. The instructor has a secret minimum winning bids (MWBs) the group **must meet or exceed** in order to win the auction (e.g., see Table 1a). If the bid is too low, put an ‘X’ next to the bid, otherwise put a tick to indicate a successful purchase. Once a bid is successful the flowers are added to inventory, but a group cannot return to try another (perhaps lower) price.

For each type of flower, the Purchasing Manager has three chances to bid. Each bid is for all the flowers, so, for instance, if there are nine lots of Roses the bid is for all nine, and a bid cannot be entered for, say, 3 or 4 lots. If more than one Purchasing Manager approaches the auctioneer, each person must queue up, have their bids checked, and then move to the back of the line before entering another bid. This ensures other groups have a chance to bid.

If flowers were purchased at the auction, the group must give the auctioneer a Payment Slip before the end of the week, which is simply a piece of paper with the Group number, Week number, and details of what was purchased at the auction (type of flowers, number of lots, and winning bid). Failure to submit a Payment Slip before the end of the

week results in a cancellation of the purchase and the flowers are deleted from inventory.

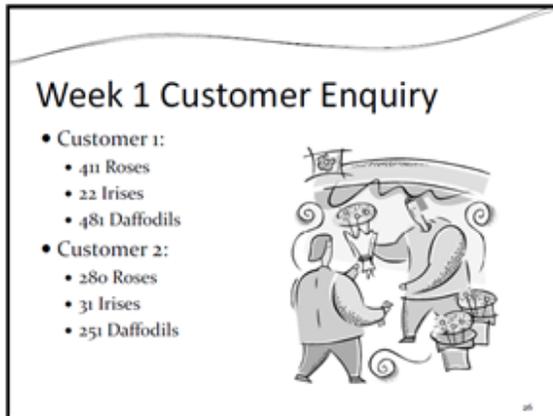


Figure 3. Example Slide Showing Enquiries From Two Customers

Once the auction is over, use a PowerPoint slide to show the Customer Enquiries (e.g., see Figure 3). A customer enquiry is a request for a number of flowers. While auctions deal in bids of whole dollars for sets of 100 flowers, customer enquiries are almost random numbers of flowers and quoted as price per flower in cents. So, a quote of 100 for Roses means 100 cents (\$1) per flower. This difference adds complexity to the process of calculating inventory.

The Sales Manager approaches the instructor with a Customer Quote for any or all of the enquiries. That is, a group can provide a quote for Roses for Customer 1 and Irises for Customer 2 only, or any combination. Effectively, the 2x3 table should be treated as six separate enquiries. The instructor has a secret maximum price per flower (PPF) the group **must not exceed** in order to win the order (e.g., see Table 1b). If the quote is too high, put an 'X' next to the quote, otherwise put a tick to indicate a confirmed sale. Once a sale is confirmed, a group cannot return and try another (perhaps higher) price. For each enquiry, the Sales Manager has two chances to provide a quote. Again, if there is a queue, the Sales Manager must go to the back of the queue before submitting another quote, so other groups have a chance to submit a quote.

For each confirmed order, the group must deliver the whole number of flowers (no partial deliveries) within two weeks. So, an order from Week 1 must be delivered by Week 3. In Week 4, the order is cancelled. Flowers are delivered by giving the instructor a Delivery Note, which contains the Week number of delivery, the Week number the order was made, the agreed type, number, and price per flower. Once a group hands the instructor the Delivery Note, the money for the order is assumed to be automatically deposited in the group's bank account.

The groups must also calculate fixed and variable costs and produce a Balance Statement to be handed to the instructor at the beginning of each week (beginning in Week 2). Fixed costs are \$25 each week for advertising. Variable costs are \$25 for 100 flowers or part thereof to pay for refrigerated units that keep the flowers fresh. An inventory of, say, 80 flowers requires one unit and costs \$25. An

inventory of 110 flowers requires two units and costs \$50. Once flowers become 4 weeks old, however, they must be discarded. The age of a flower is calculated by the number of weeks since they were purchased. For instance, Roses bought in Week 1 will be one week old at the beginning of Week 2, and so on.

The Balance Statement is the responsibility of the Finance Manager, and contains the group number, week number, opening balance, total number of flower on hand, fixed and variable costs, sales, and closing balance. The Balance Statement in Week 2 should document the financial position of the group at the end of Week 1, and so on. Failure to deliver the Balance Statement within the required week results in a fine of \$250. Once submitted, groups are not allowed to double-check the numbers on the balance statement, which means they must maintain their own copy of the balance statement.

The role of the CEO is supposed to be to observe the working of the group and to mediate problems and suggest improvements to the way the group works. However, the CEO often ends up being a co-Financial manager, or becomes the *de facto* Warehouse manager by keeping track of the flower inventory. Both roles tend to be the busiest in the game.

## 2.2 Game Management

To begin the game, provide the groups with the current market data which involves the winning bid for each type of flower at auction (e.g., \$100) and the maximum price per flower (e.g., 100 cents). Also, inform them that the winning bid at auction will not change by more than \$10 each week. So, if Roses were \$100 last week, the winning bid this week will be between \$90 and \$110. The number of lots is irrelevant. Similarly, the price per flower will not change by more than 10 cents. So, if Roses were 100 cents per flower last week, the price per flower this week will be between 90 and 110 cents. Each group begins with 100 of each type of flower and an opening account balance of \$1,000. Adjusting the starting price, rate of change, number of lots available, and number of flowers requested by customers allows for an almost infinite variation in playing the game.

Allow 30 minutes for the first round as groups come to grips with the demands of the game, reducing the time per week as the game progresses. For instance, a 7-week game might involve 1x30, 2x20, 2x15, 1x10, and 1x5 minute rounds. Most groups can easily handle 20-minute rounds by Week 3, but any failing in group structure or information processing ability becomes clear when rounds are reduced to 10 minutes or less. The auction should take up about a third of the week, with the rest of the time devoted to customer enquiries. About 7 weeks is needed for differences between groups to become apparent, while 10-12 weeks allows for the full range of triumphs and disasters to be encountered.

## 2.3 Reflection Paper

At the end of the game, each student must complete a reflection paper. Typically, give a 1-page handout containing three questions to be completed in 20-30 minutes. If time permits, the paper should be completed in-class while the experience is fresh. The questions are: (1) "What role did you play?"; (2) "If you only had enough money to acquire one

system out of Purchasing, Sales, Warehousing, and Finance, which one would it be?"; and (3) "Justify your answer to the previous question, and say why the other systems are lower priority." These questions are designed to get the students to think about what they did and to start thinking about the potential solutions to the problems they encountered.

#### **2.4 Evaluation**

The purpose of the game is to provide an experiential learning element to understanding IS concepts. In particular, the game enables an understanding of how information flows throughout an organization (the group), and the importance of a high-quality information system to capture, store, and process information for managerial decision-making. Initial student feedback was gained by adding further questions to the reflection paper. Students were asked to list two things they liked about the game and two things they didn't like about the game (Moore, 2010). The most common positive comments described the game as "exciting and challenging." One comment in particular recognized the experiential aspect of the game, stating: "[The game] was really amusing and exciting and at the same time it made us understand important things just by experiencing them. I think it had a more profound effect than what a common class could have had." The most common negative comments related to difficulties understanding the point of the game at the beginning or the game was too long. It is clearly important to pace the game to suit the class. Other comments included making the game more challenging and complaints that it was too easy to cheat. One student commented: "It's a little disappointing that our results are not verified and checked. I think we were a little too much free to do what we wanted (even cheating)." These issues, of course, can form the basis of further discussion.

Although the comments were positive overall, an assessment of the success of the game needs to separate the appreciation the student has of the efficacy of the game from their own personal performance. After all, a group that fell apart as the weeks became shorter will have a richer experience of information failure but likely did not enjoy the experience of that failure. To overcome this problem, a final question was asked in the third-person, "Playing the game would be a useful exercise for other students to understand the importance of IS/IT in organizational decision-making." On a scale of 1-Strongly Disagree to 5-Strongly Agree, the mean response (N=27) was 4.16 (Agree). More importantly, there were no negative responses. This suggests that students would recommend the FFTW game as a means to learn IS concepts.

### **3. DEBRIEFING**

In the next class the debriefing can begin. A summary of the thoughts and solutions suggested by their reflection papers should be presented and discussed. Developing a level 0 data-flow diagram (DFD) is often useful, as students will recognize the external entities (Auction, Customer, Government), and the flow of data into and out of the company (FFTW). Students can match their experience of bidding at auction, providing quotes to customers, and submitting balance statements to the representation in the

DFD of arrows labelled "Auction Details," "Auction Bid," "Customer Enquiry," "Customer Quote," and "Balance Sheet." The critical nature of inventory and how the role of Warehouse manager was handled can also be raised.

After completing the DFD, depending on the class, we can then discuss (if it's an analysis and design course) how to develop a more detailed description of how each group played, or (if it's a database class) how many groups developed their own forms, and if they did, what they look like, and to what extent it made playing the game easier. The structure of the forms can then become the basis for designing the structure of the database. For an advanced programming class, the goal would be to develop a system that can support playing the game. For a fully integrated curriculum, the output from one class (analysis and design) could be used as the input to the following (database, programming).

If the game is played at the graduate level, the reflection papers provide the basis for a deeper discussion of the nature of the problems encountered and potential solutions. Which system should be built first: Purchasing, Sales, Warehousing, or Finance? Why one rather than another? Do managers tend to favor systems that support their own particular area? What criteria should we use to justify our choices? Are we being strategic, or led by our particular beliefs about what is the most important area of business? The Sales and Finance systems usually have the strongest support, but, as the discussion continues, students begin to realize that all four are basic systems that any business similar to FFTW must have. So how do we decide? The importance of alignment with business strategy can be made at this point.

The game usually throws up a number of other talking points. At a minimum, ask the groups to consider how sure they are that their final balance sheet is 100% accurate. Would they worry if they were going to be audited and any discrepancies would lead to a deduction of marks? No deduction is needed, but the point would be made. Most groups are not comfortable with their final paperwork. How easy would it be to cheat? How easy would it be to get caught? The point to make here is that as the game time reduces some groups try to submit an out-of-date Payment Slip, Delivery Note, or Balance Sheet. How likely is it that a business in the real world would also do something unethical, or possibly illegal, because they are under pressure?

### **4. CONCLUSIONS**

A business game has been described with sufficient detail that anyone can adopt the game into their teaching portfolio. The key parameters of the game can be manipulated to mimic a range of business scenarios such as the impact of disruptive technologies where the market for a dominant product (Roses) collapses in favor of a new product (Irises). I invite others to develop and share new configurations demonstrating additional interesting aspects of business and IS/IT. But most of all, my hope in presenting this game to the IS community is that others will implement the game in their own courses, removing the reputation that intro-IS courses are dry and conceptual, and increasing the interest level among all business students towards IS. There is also

the possibility the game can form the foundation of an integrated curriculum, where core courses in IS are tied together, in which the product (output) of one class is the starting point (input) to another.

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