

# BSBA AY 2015-2016 Assessment

## *Phase 1: Assessment Plan*

### Learning Outcome assessed:

#### **BSBA Learning Outcome 4: Quantitative and Qualitative Information**

Create, analyze and integrate relevant quantitative and qualitative information to develop and evaluate management decisions.

### Assessment Method:

Selected Exam Questions in BUS 308

### Targeted performance, based on rubrics:

80% of the students should meet or exceed expectations on the rubric's two criteria assessing this learning outcome.

### Evaluation Process:

A final exam (worth 10% of the student's grade) was given to students during "finals week." Two questions on the exam were used to assess BSBA Learning Outcome #4 – Quantitative and Qualitative Information: Create, analyze and integrate relevant quantitative and qualitative information to develop and evaluate management decisions.

The first question assessed was based on two simulations that the students had participated in during the semester. Demand data was changed from the simulations and the students had to analyze the new data within the parameters of the simulation and make recommendations on whether or not to build factories and/or warehouses.

To answer the second question, students read a short case study and then developed an analysis that required them to sift through the case and find relevant information, analyze it, and make a recommendation as to whether or not management's decisions in the case were warranted by the data.

In order to understand the relevance of the two questions assessed on the final exam, some background of the course is provided:

During the spring semester of 2016, 72 students from two sections of the core business course Systems in Organizations were put into teams of three or four students and participated in three case studies and four simulations. Early in the semester, the students' knowledge and understanding was scaffolded with three case studies focused on three foundational course concepts: forecasting, inventory planning, and process analysis.

The simulations in the course were designed to be experiential learning activities that incorporated the course's three foundational concepts. After being on one team for the first three case studies, students were placed into new teams for the first two simulations. (The first two simulations were based on a factory model – "Littlefield Technologies" by Responsive Learning Technologies of San

Jose, CA). Pedagogical learning activities included guided instruction – prior to playing the first simulation the students were asked to complete 16 questions that helped in understanding the game and laying out a strategy. Teams were tasked with creating an optimal strategy, one that would ‘beat’ the other teams in the class. Students were highly motivated to ‘win’ (end up with the most money) as the top teams earned more points towards their grades; pride and ego were involved; and business students are, by and large, highly competitive and want to win.

After the first simulation, which was fairly simplistic and primarily designed to help the students orient themselves to the simulation and lessen cognitive load for the next simulation, the same teams participated in a second simulation. The second simulation was related to the first, but incorporated more parameters that the students needed to consider. Parameters the students needed to understand included demand, utilization rates, queues, lead times, revenue – all of which were needed to perform a process analysis within the simulation. The simulations challenged the students to create proper forecasts and delve into inventory planning, reinforcing the earlier exposure and learning of the foundational concepts. It was important to integrate all of the relevant quantitative information to develop and evaluate their management decisions. Decisions during the first two simulations included when to buy and sell machines, create proper reorder points and economic order quantity levels, plan for inventory so that their factory would not run out of raw material, and change contract pricing based on lowering lead times to increase revenue.

After completing the first two simulations and turning in a report on each one (the written reports were used for assessment purposes), the students were put into new teams for the third and fourth simulations. The second set of simulations were superficially very different from the first two – instead of a factory floor, the students needed to optimize a supply chain involving factories and warehouses. (The second set of simulations were part of “The Supply Chain Game,” also by Responsive Learning Technologies in San Jose, CA.) But students still needed to incorporate the course’s foundational concepts: forecasting, inventory planning, and process analysis which were used to help understand supply chains.

Again, the first of the two Supply Chain Game simulations was designed to introduce the students to a new simulation and to lower the cognitive load on the final simulation of the course. Guided instruction was again used: the students were asked to answer 36 questions prior to playing the first Supply Chain simulation, and 40 questions prior to playing the final simulation. The questions were to help students understand not only the game, but to provide a roadmap to an optimal strategy. Essentially, the students needed to understand which data were relevant information and which were not, in essence, ‘connecting the dots’ that the questions provided. Again, the simulations challenged the students to create proper forecasts and delve into inventory planning, reinforcing the earlier exposure and learning of the foundational concepts. It was important to integrate all of the relevant quantitative information to develop and evaluate their management decisions. Decisions included items such as where to build factories and warehouses and how much capacity to install in each factory. As for all of the simulations, the students were highly motivated to ‘win,’ that is, teams wanted to end the simulation with the most money, as grades, pride, and ego were involved. At the conclusion of each simulation, the teams submitted a write-up.

The final exam, on which this assessment was based, continued the process of analyzing and integrating relevant quantitative and qualitative information to develop and evaluate management decisions.

**Rubrics:**

	Accomplished	Meets Expectations	Below Expectations	Novice
<b>Use Information Effectively to Accomplish a Specific Purpose</b>	Communicates, organizes and synthesizes information from sources to fully achieve a specific purpose, with clarity and depth	Communicates, organizes and synthesizes information from sources. Intended purpose is achieved.	Communicates and organizes information from sources. The information is not yet synthesized, so the intended purpose is not fully achieved.	Communicates information from sources. The information is fragmented and/or used inappropriately (misquoted, taken out of context, or incorrectly paraphrased, etc.), so the intended purpose is not achieved.
<b>Propose Solutions/ Hypotheses</b>	Proposes one or more solutions/ hypotheses that indicates a deep comprehension of the problem. Solution/ hypotheses are sensitive to contextual factors.	Proposes one or more solutions/ hypotheses that indicates comprehension of the problem. Solutions/ hypotheses are sensitive to contextual factors	Proposes one solution/ hypothesis that is “off the shelf ” rather than individually designed to address the specific contextual factors of the problem.	Proposes a solution/ hypothesis that is difficult to evaluate because it is vague or only indirectly addresses the problem statement.
<b>Evaluate Potential Solutions</b>	Evaluation of solutions is deep and elegant (for example, contains thorough and insightful explanation) and includes, deeply and thoroughly, all of the following: reviews logic/ reasoning, examines feasibility of solution, and weighs impacts of solution.	Evaluation of solutions is adequate (for example, contains thorough explanation) and includes the following: reviews logic/ reasoning, examines feasibility of solution, and weighs impacts of solution.	Evaluation of solutions is brief (for example, explanation lacks depth) and includes the following: reviews logic/ reasoning, examines feasibility of solution, and weighs impacts of solution.	Evaluation of solutions is superficial (for example, contains cursory, surface level explanation) and includes the following: reviews logic/ reasoning, examines feasibility of solution, and weighs impacts of solution.

<p>■ 9.1.3 - Analyze &amp; Frame Problems <small>view longer description threshold: 8.0 pts</small></p>	<p>Exceeds Expectations: The analysis of information gaps was perceptive, and the team engaged in active information gathering, delving deeply into the materials provided. A comprehensive review of relevancy resulted, incorporating a wide variety of sources, leading to a professional quality analysis that draws clearly on personal and professional experience. 10.0 pts</p>	<p>Meets Expectations: Relevant information gaps were identified. The team successfully engaged in information gathering based on that review and found additional materials that were relevant to filling the identified gaps. At least two different types of sources were used. The analysis was on target. It is evident that the team has limited professional experience upon which to draw. 8.0 pts</p>	<p>Below Expectations: At least one gap in information was identified. The team found additional information to fill the gap, but it was limited in its scope. The search strategies used were inadequate to yield a thorough coverage of what was needed. The team may not have looked beyond one type of information. The analysis was shallow but still correct, ready for expansion and refinement. 6.0 pts</p>	<p>Does Not Meet Expectations: Information was taken at face value, without benefit of active questioning. As a result, gaps in the information were not identified or were incorrect. No apparent systematic search strategy was used. The resulting analysis was off base in one or more significant ways. 4.0 pts</p>	<p>10.0 pts</p>
<p>■ 9.1.8 - Application of knowledge <small>view longer description threshold: 16.0 pts</small></p>	<p>Exceeds Expectations: The student has translated the results of the data analysis into an appropriate set of recommendations, conclusions, or solutions for the company that will enhance its operation. 20.0 pts</p>	<p>Meets Expectations: The student has translated the results of the data analysis into a recommendation or solution that should prove helpful for the company's operation. 16.0 pts</p>	<p>Below Expectations: The student has translated the results of the data analysis into a recommendation or solution, but it is not likely to resolve or may heighten the problem. 14.0 pts</p>	<p>Does Not Meet Expectations: The student's decision does not make sense and could harm the company. 6.0 pts</p>	<p>20.0 pts</p>

**Courses where learning outcome was assessed:**

BUS 308 Systems in Organizations

**Evaluator(s):**

Stephen Morris

**Phase 2: Results Assessment and Planned Action**

**Results:**

- 34.7% of the students (25/72) met or exceeded expectations by correctly analyzing and integrating information properly on both questions.
- 47.2% of the students (34/72) met or exceeded expectations on one of the questions, but not both.
- 18.1% of the students (13/72) failed to properly analyze either question.

Student Performance	Question 1 Correct	Question 2 Correct	Exceeds Expectations Both Questions Correct	Meets Expectations One Question Correct	Unprepared Neither Question Correct	% Students Meeting or Exceeding Expectations
Students	34	51	25	34	13	82%
% of Class	47%	71%	35%	47%	18%	

**What did we learn about student learning?**

The critical thinking and analytical skills of our business students need to improve. Within BUS 308, course improvements would include requiring the students to rewrite the case analyses and simulation write-ups.

There is ample evidence in educational research that indicates rewriting is perhaps the most salient aspect of developing and honing critical thinking and analytical skills.

**Suggested Action:**

In the broader framework of the BSBA program, it is necessary to have rubrics that assess the critical thinking and analytical skills of the students as they wend their way through the entire program. Cases may already be assigned in many courses, but faculty need to understand the importance of assessing critical thinking and analytical skills for assignments, as well as be trained on how to do so. These skills not only align with AACSB standards 9.1.3 – Analyze and Frame Problems and 9.1.8 – Application of Knowledge, but also with the WSCUC core competency of Critical Thinking.

**Closing the Loop:**

## Addendum: Exam used in this evaluation

For the following question, **assume the same parameters as in the supply chain game EXCEPT AS NOTED IN THE QUESTION.**

Assume batch size (order quantity) of **200 drums**

Assume shipping by truck

Revenue: \$1,450/drum  
 Material Cost: \$1,000/drum  
 Misc. costs (batch & holding) \$10/drum

**Assume 10% interest rate per year on all cash held.**

Truck – Factory and warehouse in same region (7 days to ship): \$15,000  
 Truck – Factory and warehouse in different regions (7 days to ship)  
 (both on continent): \$20,000  
 Truck – Factory on continent and warehouse on Fardo (14 days to ship): \$45,000  
 (assume trucks can hold 200 drums)

Mail to customer:  
 Warehouse and customer in same region: \$150/drum  
 Warehouse and customer in different regions (both on continent): \$200/drum  
 Warehouse on continent, customer on Fardo: \$400/drum

Factory cost (without capacity): \$500,000 90 days to come online  
 Capacity cost (per unit): \$50,000 90 days to come online  
 Warehouse cost: \$100,000 60 days to come online

1. **FOR THIS PROBLEM ONLY:** Assume *initially* that you have an existing factory and warehouse on Calopeia. Assume the factory on Calopeia has a capacity of 70 drums/day. Assume Calopeia has an average daily demand of 50. Assume for this problem **ONLY** that Calopeia and Fardo are the only two regions of the game.

The demand for Fardo for the first 90 days of demand is 900 units (from days 641-730). The average demand is expected to remain constant, with no upward or downward trend. It is now day 730 and you have until day 1430 in which to sell to customers. **What should you do to maximize profits? Show all calculations on the NEXT page (you can also use the back).**

**Show all work. For question 1 (after doing the calculations) circle the BEST answer of the five options (that is, which is MOST profitable).**

You are to determine what strategy to implement on Fardo (the island in the supply chain game). There are five options:

- a. ignore selling to any customers on Fardo;
- b. sell to customers on Fardo from the warehouse in Calopeia;
- c. build a warehouse on Fardo, ship from the factory in Calopeia;
- d. build a factory on Fardo
- e. build a factory and warehouse on Fardo

## SUPPLY CHAIN CHALLENGES AT LEAPFROG

### Introduction

Early in the morning on Monday, August 11, 2003, toy executive Kevin Carlson checked his nationwide weekend sales numbers and got a surprising glimpse of Christmas future. Stores had sold 360 of his company's LittleTouch LeapPads in the product's introductory weekend. Parents hunting for an educational toy for infants and toddlers were reaching for the new gadget, which makes noises when a child touches parts of an illustrated book. That small number had huge implications. Forecasting software told Mr. Carlson that he would need about 700,000 units to meet projected holiday demand—twice as many as he had planned to ship.

So his company, LeapFrog Enterprises Inc., did something unusual. At a time when other toy companies were unloading their final Christmas shipments from cargo ships out of China, LeapFrog began placing what would turn into a huge new order for LeapPads. Its factory, privately held Capable Toys Ltd. of Zhongshan, China, scrambled for extra plastic molds, custom-designed electronics, and scarce baby-drool-proof paper and pumped out LeapPads around the clock.

Frog's frantic race against the holiday deadline shows how technology and global supply chains are transforming a great business challenge. For years, toy makers would place their entire holiday orders in January and February blindly betting on demand for their products. By Christmas, they would have shortages of their hit products and huge stockpiles of their duds. In 1984, parents camped outside stores for Cabbage Patch Dolls, followed by Teenage Mutant Ninja Turtles in 1988 and the Little Mermaid in 1989. In 1993, executives at Bandai Inc. were slow to react to the popularity of Mighty Morphin Power Rangers. Only 600,000 of an estimated demand for 12 million made it to stores by Christmas. In 1996, Tyco Toys Inc. was also caught short on Tickle Me Elmo. The company rolled out about 1 million units of the giggly plush toy, but could have sold almost a million more.

### Electronic Commerce, Relationship Management, and Forecasting

The shift that let LeapFrog make its August forecast came just a few years ago with the Internet as major retailers, including Target, Kmart, and Toys "R" Us - which sell two-thirds of LeapFrog's toys - became less guarded about their market data and allowed suppliers real-time access to their sales databases. These days a LittleTouch sale at any US Wal\*Mart appears in LeapFrog's databases overnight. With new data-tracking systems, manufacturers know which stores sold the most products and the buyers demographics, including whether the shopper is more likely to speak English or Spanish.

With this data Mr. Carlson can make various extrapolations, even from sales as small as 360 units. In his small cubicle in LeapFrog's California headquarters, Mr. Carlson crunched the LittleTouch sales numbers through four computer models. They are designed to weed out unusual explanations for sales spikes—everything from discounts and TV advertising to where in stores the product was displayed. In the case of LittleTouch, he couldn't find an anomaly: It was a genuine hit. During the next five weeks, LittleTouch sales took off, surpassing those of LeapFrog's other top sellers during their own introductory periods.

After six weeks on the market, LittleTouch retail sales reached 5,000 units at LeapFrog's four major accounts. Based on that rate, forecast models were predicting sales of more than 700,000 in 2003, double LeapFrog's initial projections.

### **Global Sourcing, Capacity Decisions and Manufacturing Processes**

It took 12 months to produce the first 350,000 LittleTouch toys (the factory had to design the molds, produce the molds, and then once production started, the factory was running only 5 days per week). LeapFrog eventually would want to make the same number again in just four months (assume the factory went to a 7-day per week production schedule). In Zhongshan, an industrial town 60 miles north of Hong Kong. Managers at the Capable Toys factory had expected to wrap up production of LittleTouch for the year in early fall. But soon after the sale projections emerged in August, "every day the LeapFrog marketing people said to us, 'Can we have a few more?'" says Capable's chief executive, Kenneth So, 51. As the requests grew larger, Mr. So set up a special task force that met daily to prepare for an all-out LittleTouch emergency.

There was very little Capable could do immediately to increase production. The molds that make the plastic parts of the toy can pump out only about one piece every 40 seconds. The factory needed to find more raw materials and custom-made parts, such as microchips and special paper. The plant needed to hire more workers. Not long ago these issues would have made a last-minute request to increase production hopeless, Mr. So says. But Mr. So's factory isn't like the simple sweatshops that first sprouted up in China in the 1980s. To compete against low-cost, low-end competitors today, he markets his factory as a specialist in design and supply chain efficiencies that can dramatically speed up manufacturing processes

The showpiece of his 14-acre, five-building campus is the mechanical-design studio, where about 50 uniformed technicians and engineers use computer-automated-design software to create and improve toy parts and manufacturing processes. Here engineering supervisor Huang Hengbin, 32, made a breakthrough on the molds for the toy's plastic parts. The LittleTouch's 41 metal molds, also called tools, are a critical part of the production process. The factory runs the tools 24 hours a day, in three 8-hour shifts, to produce enough plastic parts to keep the assembly line running during regular hours. "When we design the product from the ground up, we know the limitations," says Mr. Huang, "So with the LittleTouch, we knew immediately that the limit was the tools," he says. One set could produce a maximum of 1,750 toys per day.

The factory, which had two sets of tools running around the clock, got the OK from LeapFrog for a third set of tools in late August when Mr. Bender, LeapFrog's global retail president, was sure that LittleTouch was a bona fide hit. During the first week in September, LeapFrog approved the making of a fourth set of tools. Work on creating the fourth set was started in mid-October, when the third set was ready to produce toys. Mr. Huang's contribution was not only to produce the extra sets, which take weeks to make and cost hundreds of thousands of dollars-but also to ensure that each new set was more than a mere duplicate. "Every single [toy] part can be improved to save time," he says. He did just that: The original two sets of molds produced 3,500 toys a day; the third set of tools improved output to 6,300 a day (a combined total for all three sets. That is, the third set can produce 2,800 per day, and the fourth set can also produce 2,800 per day.) His design improvements reduced the toys' fail rate to just 0.3 percent today from an initial 5 percent. That means hundreds more finished LittleTouch toys in the same amount of time,

### **Material Sourcing**

LeapFrog and Capable also had to hustle to find the specialized materials and parts they needed. Each toy is equipped with a mini-speaker and three microchips, as well as a specially designed electronic membrane that translates a child's touch into a signal for the toy's brain. The Capable Toys factory initially had trouble finding a supplier for touch-sensitive membranes, but then Mr. So's staff tapped its network of suppliers to hunt down a second vendor. Another material that caused headaches was the cloth-like paper called Tyvek used in the LittleTouch books and made by DuPont Co. Homebuilders use the material as part of the insulation process because it is water-resistant and still breathes. LeapFrog needed something that would be drool-resistant and still absorb ink. The only way to get the material was through a third-party supplier—a book printing firm—in the United States, says Andy Murer, LeapFrog's vice president of operations. That meant hiring the U.S. company to do the printing as well. That decision added 50 cents to 60 cents per book in production costs, but it was worth it to preserve the company's long-term image, Mr. Murer says.

### **Logistics**

The toughest and most costly decision for LeapFrog was to use air freight to respond to shortages. That happened around September 21, when retail sales of the \$35 LittleTouch began to flatten because of scarce inventory. After Mr. Bender started air shipping the toys, sales picked up again. But at \$10 to \$15 per lightweight, but bulky toy, air shipping sliced the company's profit on those LittleTouch shipments to almost nothing. As of late December 2003, retailers were again lean on LittleTouch products. The day after Thanksgiving, about 30 percent of retailers were out of stock. The toy was still being either flown in or put on special fast boats, which take 14 days from Hong Kong to Los Angeles without standard stopovers elsewhere.

### **Clarification of case item:**

The company has determined that they need 700,000 Leap Pads for the holiday season. The company needs to produce 350,000 more units in four months (they had 350,000 in inventory and need an additional 350,000).

### **Suggestion:**

Put together a timeline for the production of Leap Pads.

2) Do you agree or disagree with Leap Frog's decisions to make a 3<sup>rd</sup> and then a 4<sup>th</sup> set of tools? Why or why not? Back up your answer with numerical data from the case. (Use this page for your calculations)