BSBA AY 2016-2017 Assessment

Phase 1: Assessment Plan

Learning Outcome assessed:

[BSBA] Learning Outcome 9: LO Technology

Students will describe the intertwined relationship among technology, information, and the organizational structure and operations in order to assess and evaluate the core technology concepts that enable sound organizational decision making.

Assessment Method:

Trait 1 (written assignment): Students explain the relationship between technology, organizational social structure, and information and illustrate how these components interact in an information system.

Students were introduced to systems theory and the relationships between technical, social, and knowledge systems in an organization. This introduction was based on parts of the research paper by Allen Lee entitled "Thinking about Social Theory and Philosophy for Information Systems." Then we (the instructors) went through a case from which we extracted the three components and explained the interaction between the components. Our main goal is to instill the idea that technology is more than just a tool for the employees to use, it is a system that poses requirements from both information and people in an organization. Hence, technology may affect the organizational structure and requires attention to the importance of Business Process Re-engineering (BPR) as well as change management. Students were assessed by writing an essay in which they had to analyze a business case based on premises of system theory to describe the relationships between organization, technology, and knowledge systems. Students, (1) identified and described the social, technical, and knowledge systems in the case study, and (2) discussed the interaction between three subsystems.

Trait 2 (individual in-class activity): Students effectively use common business technology tools (to make organizational decision making).

Students were assessed by using SQL data queries to answer business questions. Business questions were formulated in such a way that students had to critically think and use their SQL knowledge in retrieving and compiling data from tables based on different business needs.

Targeted performance, based on rubrics:

Our assessment target is that 80% of the students meet or exceed expectations.

Evaluation Process:

Trait 1:

Students wrote an essay analyzing a business case study through the lens of system theory. First, students identified and explained social, technical, and knowledge systems and their

components in a business case study. Next, they explained and discussed the relationships and interactions of the three systems evident in the case study. Essays were evaluated based on three criteria of below expectation, meeting expectation, and exceeding expectation. Instructor of the course evaluated each individual essay as exceeding expectation if students clearly identified the three systems and their components and clearly explained their relationships, meeting expectation if students identified the three systems and their components but briefly explained the relationships, and below expectation if students identified the three systems and their components but did not explain the relationships of the systems. Details of the evaluations are provided in the rubric.

Appendix A includes the case and the two questions designed to measure this trait.

Trait 2:

Students answered 8 business questions about a short business case using SQL data queries. Students used aggregate functions such as average, maximum, and minimum in their SQL queries to retrieve specific data from tables in a database that could answer the business questions. Instructor of the course evaluated each individual submission as exceeding expectation if students used the correct SQL code with correct output table to answer each of the 8 questions, meeting expectation if students used SQL with output table with one or two minor mistakes in the syntax of the SQL code or values of the output table, and below expectation if students used one or more wrong SQL codes with wrong values in the output table. Details of the evaluations are provided in the rubric.

Appendix B includes the short description of the business cases with tables and 8 business questions designed to measure this trait.

** The assessment of both traits was conducted through the same assignment across the sections.

Rubric:

LO9: Technology	Exceeds expectations	Meets expectations	Below expectations
Trait 1: Students explain the relationship between technology, organizational social structure, and information and illustrate how each of these components is considered/used/applied for a sustainable competitive edge.	Identify the three components of the information system (technical, social, information) accurately, thoroughly explain a case of the interaction between the three components, and accurately measure the outcomes of those interaction.	Identify the three components of the information system (technical, social, information) accurately, but briefly explain the interaction between the three components, and adequately measure the outcomes of those interaction.	Identify the three components of the information system (technical, social, information), but not understanding the interactions between the components or the consequences of the interactions.
Students effectively use common business technology tools	Students comfortably use the tool and are able to draw accurate conclusions using the tool.	Students properly use the tool and draw generic conclusions using the tool.	Students are not using the tool properly and therefore are not able to draw conclusions.

Course where learning outcome was assessed:

BSBA, BUS 308 systems in organizations for sections 1;2;3;4; and 7.

Evaluator(s):

Muhammad Al-Abdullah, assistant professor

Majid Dadgar, assistant professor

Phase 2: Results Assessment and Planned Action

Results:

Students are assessed on a 3 point rubric. Trait 1 “Students explain the relationship between technology, organizational social structure, and information and illustrate how each of these components is considered/used/applied for a sustainable competitive edge.” Trait 2 “Students effectively use common business technology tools.”

BUS 308 Systems in Organizations Rubric Results

Number of students achieving target

Categories:	Exceeds Expectations = 3	Meets Expectations 2	Below Expectations 1		% Students Meeting or Exceeding Expectations
Students explain the relationship between technology, organizational social structure, and information and illustrate how each of these components is considered/used/applied for a sustainable competitive edge.	86	35	48		72%
Students effectively use common business technology tools to make organizational decision making.	118	40	11		94%

For trait 1 72% of the students met or exceeded the expectations while the target was 80%. For trait 2 the performance was strongest in that 94% of the students met or exceeded the expectations.

Suggested Action:

Trait 1:

The performance was that 72% of the students met or exceeded the expectation which is slightly below our target of 80%. The material was new to the students. It also is higher level material that requires further detailed cases and analysis examples to be presented to the students. Using one case example is obviously not enough. Furthermore, the students were not introduced to cases that exemplify the benefits of understanding such interactions by management. Accordingly, we recommend further presentation and discussion of business cases that will show the important role of technology in an organization. We also recommend the use of business cases that clearly illustrate how organizations should pursue an inclusive view of information system that embraces the three social, technical, and knowledge sub-systems. Such business cases can give the students an idea of the importance of such material (recognizing the interaction between the three sub-systems) to the success of a business that implements technology to achieve its strategy and goals.

Trait 2:

The performance was that 94% of the students met or exceeded the expectations which is strong achievement. This is reasoned to the fact that students practiced SQL and have rich background of using the software before doing the assessment. They had four individual assignments on SQL that were the building blocks for this assessment (building tables, connecting tables, retrieving data from tables). This assignment was asking to put all the previous knowledge together and then extract data that can answer questions for decision making. Therefore, we suggest to continue teaching SQL using the same approach.

Phase 3: Closing the Loop

In the year that the assessment is made, this is good place to describe how the suggested actions might be evaluated in a future assessment cycle. When that cycle is complete, the results can be added to this document to finalize the report.

Appendix A

Case Study: the benefits of data warehousing at Whirlpool

Whirlpool Corporation is the world's leading manufacturer and marketer of home appliances.
The Whirlpool family consists of over 45,000 people who manufacture fine appliances in 12 countries and market them under 11 major brand names. The company is based in Benton Harbor, Michigan and reaches out to approximately 140 countries around the world. It is the only major home appliance company with a leadership position in North America. Europe, and Latin America. Plus a growing presence in Asia.

Whirlpool began as a small family-owned business in 1911, and it now ranks 159 in the Fortune 500. The corporate vision for the company fosters growth and progress: Whirlpool. in its chosen lines of business, will grow with new opportunities and be the leader in an ever-changing global market. This vision is manifested in Whirlpool's Worldwide Excellence System (WES), its blueprint for approaching quality, customers, and continuous improvement. Initiated in 1991, WES incorporates the best of all Whirlpool quality programs, worldwide, with Malcolm Baldrige Award and International Standards Organization criteria to establish a common approach to quality, one that dedicates the company to the pursuit of excellence and total customer satisfaction.

Whirlpool is an information- intensive business. In North America. it has three or four thousand products that it sells at any point in time. Every one of the products has hundreds or thousands of components that are assembled every day in 12 major factories. The products are stored in 28 places.
Over 16 million appliances are sold a year and they are tracked throughout their lifetime.
One of the keys to thriving in this information-intensive environment is the ability to effectively coordinate and control its myriad processes and activities. This can be challenging from an information systems perspective. Business units need a complete understanding of the processes for which they are responsible, and the diversity and heterogeneity among systems make it difficult for them to get the information they need and to manipulate it in a useful, timely manner.

In the early 90' s, several business units identified a variety of specific information needs. For example, Quality wanted to create an application (later called Customer Quality Information System (CQIS» that would proactively identify quality problems based on customer complaints. Data existed in several places, including Whirlpool’s OneCall System that allowed any customer to take care of any necessary business, be it services, product information, or complaints with one phone call.
CQIS was to provide an environment in which the data could be queried and analyzed.
These applications had obvious value to the business, and senior management understood that the information systems infrastructure was inadequate to effectively support the various initiatives.

In fact, around that timeframe an expensive executive information system initiative had just been discontinued after several years of trying to combine data from multiple data sources and manipulating the data in a meaningful way for its users.

It was apparent that an infrastructure had to be put in place at Whirlpool to support the numerous decision support initiatives that its business units bad identified and were expected to demand in the near future. At that time, the marketplace was promoting data warehousing as a viable alternative to organizations that wanted to create a decision support infrastructure. Data warehousing is the process of creating, maintaining, and using quality data for decision support purposes, and its technology bad become cost effective and mature enough for organizations to implement. In the spring of 1993, the first efforts to use data warehousing at Whirlpool were approved, and CQIS was the first application to utilize the new infrastructure. It was expected that data warehousing would allow IS to provide business units with their applications quickly. with less cost, and with a greater likelihood of meeting their needs. Many business initiatives, which rely on data warehousing, have emerged since 1993. Currently, the data warehouse contains 14 specific collections of data (i.e., subject areas) that describe important facets of Whirlpool's business, like competitors, business partners, and facilities.

The business needs for Whirlpool's data warehouse and its applications were examined and assessed throughout their approval processes. Whirlpool gives approval for systems initiatives through a unique process called Value Oriented Systems Planning (VOSP). The idea of VOSP is to identify the value of an initiative to the company and the funds necessary to provide that value. The VOSP document has two parts. The first part is owned by the customer and identifies the functionality that is needed to meet some business need. The second part is completed by IS and describes the specific actions that IS will take to address the specified business needs and the funding required to accomplish this. The executive committee then ranks the VOSPs and decides whether or not to fund each one. A blanket IS VOSP is approved for significant hardware upgrades. The VOSP process continues after a system or application is in place; a post-implementation audit is conducted to ensure that the stated business needs are met.

The benefits from data warehousing can be considered in a variety of ways. Time savings can occur for two groups: data suppliers and end users. While developing a data warehouse is time consuming for IS, once it is in place, there should be less time spent responding to ad hoc requests for data because users can help themselves. More importantly, data warehousing creates the decision support infrastructure upon which future applications are built. If data warehousing is conducted effectively, the start-up costs associated with new decision-support initiatives are dramatically reduced. On the users' side, business analysts spend less time accessing data, processing it, and putting it in a format appropriate for their needs.

Before the data warehouse was in place, IS and functional area personnel were often called upon to make data available. This required a combination of downloading files, re-keying data, and creating extract files. These time-consuming tasks are no longer required because of the existence of the data warehouse.

Jerry Briney is a former manager in Quality, and he uses CQIS to investigate quality problems. Before CQIS, Briney would read upwards of twenty thousand service call tickets a month looking for and investigating problems. Tickets had to be (1) sorted by product and brand, (2) sorted by defect, (3) manually counted, and (4) read thoroughly. This was a mind-numbing task, as Jerry explains, "After a while you don't know what you are reading. You would read a ticket and not pay any attention to it. "With CQIS, Briney can specify a problem of interest and access all of the service tickets that report that problem. About 30 to 40 times as many service tickets can be checked using the data warehouse. Briney explains how this translates to the bottom line: "We produce 17,000 washing machines each day. 1fwe find a problem as small as a .1% service incident rate (SIR), we save 17 service calls per day (17,000 * .001). Each call is $75 which results in $1,275 saved in service calls per day and in a $38,250 savings per month."

The fact that employees now access more and better information impacts the quality and process of decision making. People can ask questions that they could never ask before, rely on facts instead of intuition, and understand situations at a much lower level of detail. Sue Bailey explains that the data warehouse has made people at Whirlpool "rethink the way we solve problems."
Whirlpool is continually looking for ways to produce a higher quality, lower cost product. A major way to do this is through the component parts used in its appliances. When a potentially better component is identified, it is placed in a test run (possibly 1 00,000) of appliances, and then monitored using CQIS. Before the warehouse, it took up to a year to learn about its performance. Now it is possible to more quickly decide whether to put it into all of the appliances. As Jerry Briney describes it, "You want either a quality improvement or a cost improvement. Either one, you want to get it as fast as possible, and it (CQIS) makes it much faster to do this. If you don't see any failures for six months in that 100,000, you say 'let's put it in four million per year."

Many of the biggest returns from the use of IT is when it is used in the redesign of business processes. This redesign can take place at the individual worker level. Before the warehouse, most of the quality data were based on 3 months of rolling data. Averages computed over the 3-month horizon tended to hide important developments. With the warehouse, monthly data became available for control chart purposes. According to John Doyle, "when you get into actually charting the monthly data. You can see the swings in the data. When something 'pops' on the control chart. You can take immediate action and find out what is going on with that particular activity. "When Doyle sees that a part is out of control, he is able to drill down into the data warehouse to see whether the problem is occurring in a particular plant or is due to a particular supplier. The ability to quickly identify and correct the problem source results in tremendous savings. Before the warehouse, problems were slow to detect and difficult to correct.

The evolution of data warehousing at Whirlpool reflects significant growth in data warehouse usage, support for an increasing number of business needs, a variety of benefits to the company, and valuable learnings. As mentioned earlier, nearly six hundred business users access data from the data warehouse each month, and this number should continue to grow. The data warehouse supports many business applications, and interest in these applications deepens with training and internal marketing efforts.

Most importantly, Whirlpool has experienced numerous benefits from data warehousing at the operational and strategic levels, in both quantifiable and intangible forms. An in-depth, exhaustive analysis of these benefits has not been conducted, per se, primarily because the analysis would be time-consuming and expensive. The identified benefits and high satisfaction with the data warehouse make this investment unnecessary. Instead, assessments of benefits are conducted during the post-audit process on an application-by-application basis. There are opportunities for Whirlpool to increase the return on investment from data warehousing by focusing on the high-level benefits derived from changing business processes and alignment with corporate strategy. In this way, Whirlpool can move forward with its business objectives supported by a sound and responsive information infrastructure.

Answer the following questions regarding Whirlpool case study:

1. **Identify and explain information, technology, and an organization in terms of knowledge system, technical system, and social system. Explain what each system is consisted of.** For example, a social system might be consisted of organization, processes, customers, employees, etc. A technical system might be consisted of ERP system, communication tools, etc. A knowledge system might be consisted of different kinds of data, information, and knowledge and insights.
2. **Explain the interactions/relationships between social, technical, and knowledge systems in terms of changes and benefits for each system. Identify, at least, 2 examples where the three systems interact and affect each other.**

Appendix B:

For ICA #5 and #6 Submissions:

1. **After each step provide your SQL code and screenshot of the result table (output). Save the file as PDF and submit it on Canvas.**

1.1. To create screenshot:

1.1.1. Windows: use snipping tool

1.1.2. Mac: https://support.apple.com/en-us/HT201361

Case description:

A store sells Halloween costumes to the customers. Each customer can purchase only one costume but a costume can be purchased by more than one customer.

Tables:

Customer table:

customer_ID	lastname	firstname	Product_ID
1	Adams	Frank	1
2	Smith	John	2
3	Hamilton	Edward	6
4	Parks	Sara	7
5	Zone	Nancy	3
6	Johnson	Mark	4
7	Craft	Susan	8
8	Ford	Henry	5
9	London	Jack	5
10	Polansky	Shelly	9

Product table:

product_ID	product_name	price	Store_location
1	superman	90	San Francisco
2	batman	100	San Jose
3	Wonder woman	120	San Francisco
4	Aquaman	80	Oakland
5	Spiderman	150	Oakland
6	Iron man	210	San Jose
7	Ghostbuster	70	San Francisco
8	Princess Leia	170	San Jose
9	Snow white	155	San Francisco

Answer the following questions using SQL query codes. After each question, provide your SQL code and the screenshot of the output table. Save your file as PDF and submit the PDF file on Canvas. Good luck!

1. **List the average price of products for each store location.**
2. **List the name of store locations that the average price of their products is less than $110. Show average column as average_price in the output table.**
3. **How many products does the store have in total? Show the column for the number of product as product_total.**
4. **How many types of products are there in each store location? Show the column for the number of product as product_quantity.**
5. **List store locations that have less than 3 types of products. Show the column for the number of product as product_quantity.**
6. **What are the minimum and maximum prices of the products? Show max and min column as min_price and max_price.**
7. **Which product has the highest price?**
8. **What is the total number of customers and average of all the prices for all the products sold to the customers? Show total number of customers as total_customer and the average of the prices as total_average_price.**

END OF ASSIGNMENT

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Use the following codes only if you have NOT created the database, tables, or added values into the tables.

First, we should create the tables in the "halloween" database. Use the following SQL codes to create the database and the tables in the database.

- **Database "Halloween":**

```
CREATE DATABASE halloween
```

- **Table "Product":**

```
CREATE TABLE product (product_id int PRIMARY KEY NOT NULL
AUTO_INCREMENT,product_name varchar(255),price int, store_location varchar(255))
```

- **Table "Customer":**

```
CREATE TABLE customer (customer_id int PRIMARY KEY NOT NULL
AUTO_INCREMENT,lastname varchar(255),firstname varchar(255),product_id int,FOREIGN KEY
(product_id) REFERENCES product(product_id))
```

Next, we should insert values in the tables. Use the following codes:

- Inserting 9 records into the product table:

```
INSERT INTO product
(product_name,price,store_location)
VALUES
("superman",90,"san francisco"),
("batman",100,"san jose"),
("wonder woman",120,"san francisco"),
("aquaman",80,"oakland"),
```

("spiderman",150,"oakland"),
("iron man",210,"san jose"),
("ghostbuster",70,"san francisco"),
("princess leia",170,"san jose"),
("snow white",155,"san francisco")

- Inserting 10 records into the customer table:

INSERT INTO customer
(firstname,lastname,product_id)
VALUES
("frank","adams",1),
("john","smith",2),
("edward","hamilton",6),
("sara","parks",7),
("nancy","zone",3),
("mark","johnson",4),
("susan","craft",8),
("henry","ford",5),
("jack","london",5),
("shelly","polansky",9)

NOTE: if you insert the values into a table and the auto_increment of the PK starts with a number other than 1, follow the following steps to fix it:

First delete all the values in the table using:

DELETE FROM table1

Next, change the auto_increment to start from 1 using:

ALTER TABLE table1 AUTO_INCREMENT=1

Next, use INSERT INTO to add values (records) into table1 again.