INFORMATION SYSTEMS EDUCATION JOURNAL

Special Issue: Teaching Cases

In this issue:

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INFORMATION SYSTEMS EDUCATION JOURNAL

Teaching Case

Black Box Thinking:
Analysis of a Service Outsourcing Case in Insurance

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Abstract

Often, users of information systems (both automated and manual) must analyze those systems in a "black box" fashion, without being able to see the internals of how the system is supposed to work. In this case of business process outsourcing, an insurance industry customer encounters an ongoing stream of customer service issues, with both the original provider and outsourcing organization. To understand and validate what is happening with his account, the insurance customer (Edward) and his representative (Penny) must deduce the operations, business rules, and data flows of the organizations. Most importantly, have the operations of these organizations released anyone's data inappropriately? And are these same customer service issues happening to other customers, who may not be in a position to spend the time and energy needed to catch and resolve them?

Keywords: Outsourcing, Information quality, Data migration, Business rules, Black-box, Case study

1. OVERVIEW

Often in business operations (particularly when technology is involved), professionals are compelled to try to understand how a system works without being able to study the internals – also known as "black box" analysis (Todd & Benbasat, 1987). Such an analysis might be required because of a proprietary system, a customer relationship that doesn't allow an internal view, or other causes.

In this case study, a large long-term care insurance provider (LTCCo) outsources its customer service business process to a third party (ServCo), creating a number of impacts on its customers, from unclear billing to late payments on claims. Given that most users of long term care insurance are older and often less able to manage their own claims, this sort of issue is particularly troubling.

Edward was one of the customers who was impacted by the transition of customer service processes. Edward's daughter, Penny, was assisting him in managing his claims. Initial servicing had gone reasonably well (with some notable errors), but partway through the process of initiating claims payments, LTCCo outsourced their servicing business process to ServCo, and advised their customers of this transition.

Following the transition, numerous issues arose with the servicing of Edward's policy. These

included delivery of checks made out to the wrong person, incorrect billing, incorrect payments, misplaced documentation, and other issues. Penny worked with ServCo to try to resolve these issues, and at the same time tried to analyze what underlying system problems were allowing the issues to erupt. Over the course of the 6 months of active conversation, Penny spent well over 30 hours on the phone or on hold with LTCCo and ServCo.

LTCCo and ServCo use information about their clients to make decisions about how to handle claims, issue bills, credit payments, etc. They base these decisions on the information available and on business rules that should guide them to make decisions that are legal, contractually correct, and consistent across all employees and customers. See Figure 1 for a general overview of the decision-making and communication processes. Note that the decision-making and communication processes are somewhat separate – decisions may be made by computers or humans, and the communication may be by a human or by a computer (in the case of an online system, or an auto-generated letter).

The goal of this case study is to provide a series of scenarios, including process inputs, outputs, and known business rules, from which you can infer the processing and information availability at LTCCo and ServCo. You can also provide recommendations on how to improve operations so as to avoid these types of customer-facing issues. We have provided questions specific to each scenario as a starting point for your consideration.

In section 2, we provide some important technical and business definitions which will help to understand the rest of the case. In section 3, a number of scenarios are outlined which illustrate issues with data flows, business rules, and decision-making. Finally, section 4 provides some concluding remarks. A short video overview of the case is available at http://youtu.be/dHZEp3DpGeg.

2. TECHNICAL AND BUSINESS BACKGROUND

This section will provide a brief background so that you will have a consistent understanding of the business and technical elements of the case.

Business Elements

Long-term care insurance is designed to cover the costs of care for individuals who can no longer safely perform some of the "activities of daily living" – eating, dressing, bathing, etc.

Servicing, in the insurance industry, is the function of processing claims, interacting with customers, issuing bills, processing payments, etc.

A business process is a set of related tasks that accomplish a particular business function (e.g., creating a bill, accepting payment, paying a claim).

Power of attorney is a document that allows one or more individuals (in this case, Penny) to work with healthcare-related organizations (like LTCCo) on someone else's behalf (e.g., Edward).

Information is an organized collection of facts (data) about people, places, things, concepts, etc.

Business rules are the rules which govern human and automated operations of an organization, including such things as authentication requirements, eligibility rules, payment limits, etc.

Decision-making is the process of determining the next steps to take, given a collection of available information and applicable business rules. It may be entirely manual, partly automated, or fully automated.

Information ethics deals with the ethical principles related to the management and use of information, particularly as it relates to the impact of that information on people (ACM, 1992).

Technical Concepts

Outsourcing is the transfer of the execution of specific business processes to a separate organization, often done with the intent to improve efficiency, quality, or both (Lankford & Parsa, 1999). Outsourcing is often enabled by information technology, so that the two parties in the outsourcing arrangement have access to the same information.

Data migration and conversion is the process of moving data from one system to another, either within or between organizations. In this case, LTCCo had to transfer customer records (both

paper and electronic) to ServCo in a timely fashion so that ServCo could begin processing customer activity on the planned date.

Black box is a term that refers to being unable to directly see and understand the internals of a system or process, requiring users to infer its structure based on external observations (Todd & Benbasat, 1987). In some circumstances, this might also be referred to as inductive reasoning.

As a simple example, consider what happens when you try to use a credit card for payment. Inputs to the system include your card information and the location, type, and amount of your purchase. Output from the system is either an approval, or some form of disapproval of your transaction, but the details of how that decision is made are not visible to you. For some online examples that you can try yourself, please visit the Black Box puzzle examples at www.toxicode.fr/black_box (Toxicode, 2015).

Information quality is a key measure of the success of an information system. The term is used to describe various characteristics of information, including accuracy, accessibility, timeliness, format, and other factors that make it available and suitable for use by organizations and individuals (Lee, Strong, Kahn, & Wang, 2002).

3. FLOW OF EVENTS

Penny, working on Edward's behalf, had successfully started the claims process (requesting reimbursement for covered expenses) following Edward's stroke in February, 2015. Just about the time that claims payments began, though, Edward received notice that ServCo would take on servicing responsibilities from LTCCo in June, 2015.

This is when the servicing of Edward's account began to unravel. He experienced the following issues: a check made out to someone else, errors in billing, errors in payment processing, and customer service inconsistencies. In each of the scenarios below, you will have an opportunity to diagnose what information the ServCo and LTCCo employees are seeing and interpreting, and how that information might be better designed and delivered to the employee and the customer to avoid the problems. As noted, such diagnoses have to happen in "black box" fashion, as neither ServCo nor LTCCo will reveal the internals of their operations to customers.

A high-level overview of the events of the case may be found in the Appendix, Figure 2. A detailed timeline of the interactions between Edward, Penny and LTCCo and ServCo is provided in the Appendix, in Table 1. The key events include a mis-named check, billing errors, mistakes in mailings from ServCo, unexplained payments, and contact with both the Chief Information Officer (CIO) and chief counsel at ServCo.

Check Enclosed ... Not!

In January, following his initial claims filing, Edward received copies of a number of letters that had been sent to his retirement home asking the management for documentation that LTCCo required before claims could be paid. Penny and Edward checked with the management at the retirement home to be sure the needed documentation had been faxed in to LTCCo. They learned that the documents had been faxed twice to LTCCo, immediately after each request was received.

Edward received a letter on February 19 stating, among other things, "your check is enclosed", "we need more documentation before we can make payment", "you have not yet met the eligibility requirements", and "because you didn't provide that documentation, we are closing this claim". There was no check in the envelope with this letter.

Penny called LTCCo, and confirmed that indeed, Edward had not yet met the full set of eligibility requirements. Eligibility for payments requires a medical or disability condition as well as an elapsed time period, which Edward had not yet met. The Customer Service Representative (CSR) looked online at the same letter that Edward had received, and agreed that the statement, "your check is enclosed," was misleading. When Penny asked if a new letter could be issued that was correct (so that Edward's files could be accurate), the CSR indicated that she would try to do that, but was not confident that it was possible. Ultimately, Edward did not receive a replacement letter.

Questions: What was wrong with the initial letter that Edward received? What information did LTCCo need so that it could provide a correct letter the first time?

Unexplained Payments

On April 7, Edward received his first claims payment for bills incurred in the prior month.

One June 8, he received an additional payment for that same claims period, though a much smaller amount. Given the errors that had happened so far, Penny was concerned that this might be another error, and that blindly cashing the check might set off other issues with the company, if it later found that the check had been issued in error.

Penny promptly called ServCo to inquire, and after resolving the Power of Attorney issues (see below), she was able to speak with a CSR and a supervisor (part of the "escalation team") about the issue. Neither was able to successfully explain why these additional funds were paid. Penny asked if there was an additional level of escalation available – and while none were available by phone, Penny was offered the option to write to the next level of management to request explanation.

Two weeks later, Penny received an answer from Raymond, a customer service manager, indicating that the additional funds were due to a change in the maximum allowable claims for Edward's policy. Apparently, LTCCo had underpaid (using the original policy limits), and ServCo had discovered the error and corrected it (by paying the additional amount), since the maximum amount had increased over the years that Edward held the policy.

In this case, ServCo had managed to uncover and resolve an issue in Edward's favor, without Edward or Penny realizing an error had been made.

Questions: As in the prior scenario, what could ServCo have done to prevent the customer confusion? What additional information and/or business rules would have been required to make this correction possible?

Someone Else's Name on a Check

The first really serious red flags arose when on June 8 Edward received a check addressed to him, at his full correct address, but the check itself was made out to someone else (though the check itself also had Edward's full address, including apartment number). Penny immediately called ServCo's customer service number, and talked with the customer service representative. The representative indicated that they were able to see a copy of the incorrect check in Edward's files, but could not determine why the name was incorrect.

The representative also did not seem motivated to address concerns about whether this might be a problem that had happened to other customers, nor was she able to answer the question of whether Edward's name had been provided to any other customers.

Penny had a fundamental concern that this problem of misplaced data (that started this whole train of discussion) would happen to other people, and that Edward's data might be leaked as well. ServCo's customer service management was only accessible through paper mail, and this was not timely enough for Penny's concern. So, knowing the name of ServCo, she investigated the company online to try to find executives she could contact directly, and quickly found the name and contact information for the Chief Information Officer (CIO), who was very responsive to her concerns.

The CIO promptly referred Penny to the Chief Counsel (senior attorney) for ServCo, who was very helpful in resolving the issues. The Chief Counsel's staff took charge of the situation: they made calls to other departments to investigate the issues, listened to recordings of Penny's calls to ServCo's CSRs, and coordinated activities with customer service and the information technology organizations. They then provided thorough and detailed feedback to Penny about the problem and its causes and solutions.

Both the CIO and the Chief Counsel appeared, from their conversations with Penny, to understand the potential magnitude of the problem. The Chief Counsel initially told Penny that this was a one-time error as part of the migration from LTCCo. When pressed for how this could be (in an automated data migration, Penny believed that one-off errors like this would be unlikely), the Chief Counsel agreed that more explanation was warranted. Further conversation with the CIO led to the understanding that this phase of the process, for a small number of customers, was at least partially manual, resulting in the risk of one-time errors. ServCo maintains that no other customers were affected by this issue.

Questions: Based on the information provided, what operational scenarios might explain how the wrong name ended up on a check (ignoring, for a moment, ServCo's claim that Edward was the only client affected)? Why did the CIO refer Penny to the Chief Counsel for resolution of the issue? Assuming that ServCo's claim is correct,

that only Edward was affected, how might this error have occurred?

Power of Attorney Issues

Immediately after Edward's stroke, Penny delivered Power of Attorney documentation to LTCCo, so that she would be allowed to talk with LTCCo on Edward's behalf. Before the transfer of servicing to ServCo, Penny spoke numerous times with LTCCo's representatives, with no mention of any concern about her Power of Attorney status. The CSR simply identified Penny through the usual queries about the insured person's name, address, etc., along with Penny's information (which was on the Power of Attorney document for verification). Penny had similar results in her first few contacts with ServCo, before June 10.

Some six weeks after ServCo took over operations, Penny called again to resolve one of the many issues that had arisen. While the initial few minutes went well, the CSR shortly indicated that the call could not proceed because Edward did not have a proper Power of Attorney document on file.

Penny asked to be transferred to a supervisor, and soon was speaking with James. James was unable to explain why Penny had been allowed to interact with LTCCo's customer service, as well as ServCo's for the last six weeks (albeit few contacts). James also appeared to become agitated, claiming that his company "had only had this account for two months". While this may have been true organizationally, the transition to ServCo was to have been invisible to customers, except for changes to phone numbers, etc. However, it is indicative of the difficulty that ServCo staff must have been having with finding and managing all of the data related to the LTCCo clients.

James asked Penny to fax in the Power of Attorney document, along with the death certificate for Penny's mother. Penny's mother was "first in line" for Power of Attorney, even though the document was worded to allow any of the listed people to serve as Power of Attorney.

Penny was given two different fax numbers, with the instructions to use one first, because that machine was closer, but the other should work as well. She did so, and called again on June 16 to verify that the document was received. During that call, the CSR indicated that the PoA was properly on file, but noted that it was the original which had been transferred from LTCCo, not the one faxed in two days prior, nor was the death certificate available. Those new documents eventually turned up in the proper place in ServCo's files a couple of days later, and no further issues came up with respect to Power of Attorney.

Questions: Based on the information provided, why did these issues arise? In particular, why did ServCo work with Penny initially, but then stopped about 6 weeks into their operation of LTCCo's clients? And how did Edward's *original* PoA document resurface after Penny had faxed in a new one?

Errors in Waiver of Billing

When a customer becomes eligible for long-term care claims payments, their payment requirement for insurance coverage (called insurance "premiums") is put on hold ("waived", or "put on waiver"), while the customer is actively collecting benefits. The specific details of how and when the billing is waived is defined by the specifics of the policy, based on the annual or monthly billing date and the date that the customer becomes eligible for claims payments.

The word "eligibility" apparently has some flexibility in its use at LTCCo/ServCo. At times in Edward's interactions with LTCCo/ServCo, eligibility referred to whether his condition met the criteria for long term care payments. At other times, eligibility referred to whether he met the criteria, AND had met a "claims deferral" period of 100 days from the time the condition first arose, intended to prevent short-term care issues from being billed as long-term.

Edward received his first claims payment from LTCCo on April 7, including a note from LTCCo that billing would be waived from that day onward. Penny called the next morning and received confirmation that the order to waive premiums had been entered (by a separate LTCCo department) on April 7. However, that business process normally takes up to 21 business days, which would make it likely to occur after ServCo took over. The CSR at that time made it clear that further premiums would not be required.

Given her experiences thus far, Penny was understandably cautious about accepting a verbal assurance, but she also had a document (the April 7 letter) that indicated premiums would be waived. So, on April 16, Penny called LTCCo to confirm details on the account.

LTCCo's CSR indicated that there had been an error previously in the waiver of billing notice, and that Edward would owe one month's premiums before the waiver could start ($350). Then on April 17, Edward received a bill (dated April 9) for $4,200 for the next year's premium, and on April 27, notice of LTCCo's upcoming transfer of servicing to ServCo on May 1.

The bills, it turned out, were variously based on monthly ($350) and annual ($4200) premium payment requirements. Edward's account was usually billed a year at a time, but the waiver of premium process allowed for it to be billed for only a month to bring it current. ServCo ultimately changed it to a one-month bill (again, a change in Edward's favor), but without explanation to Edward or Penny.

Question: What were the various errors, and sources of those errors, that occurred here?

Payment Processing Errors

When Penny found that a premium payment was actually due, she immediately sent a check (check #1 for $350) to the address on the most recent premium notice letter. This check was mailed on June 19, to ensure that it arrived before the policy would lapse on July 8 for non-payment.

Penny called ServCo on July 3 to confirm that payment was received, and ServCo reported that it had not been. Given that the policy would lapse on July 8, Penny immediately sent check #2, for the same amount, by overnight mail to the payment address provided by ServCo on the phone (which was different from the first payment address that she had used).

Organizations that handle large numbers of paper payments often use separate addresses for payment processing and for customer service correspondence, so that payments can be handled more quickly and securely. However, the correct payment address was not on the premium notice from which Penny paid.

On July 5, Penny checked online with her bank and found that check #1 had cleared, confirming that ServCo had received and cashed it. She confirmed with ServCo that the payment had been posted, and then issued a stop payment for check #2 (to avoid having to try to get a refund for that overpayment). On July 6, Penny called again to confirm that the actual waiver of premium status had taken effect, and was told that it had.

On July 18, Edward received a refund check for $350, which ServCo indicated in a phone call on July 19 was a refund for check #1. ServCo also indicated that it had accepted check #2 as payment for the premium due. Since Penny knew that check #2 had been stopped by her bank. She also knew that check #2 would not clear, and thus, Edward's account would again be unpaid. Penny was able to arrange for ServCo to stop its own refund check and use those funds to make payment on Edward's account.

Questions: What data flow and information quality issues most provoked this problem? Whose errors were they, if indeed they were errors?

Ongoing processing errors

While the major issues in interaction with ServCo had largely abated by the end of July, two relatively minor errors were repeated. Penny submits a claim each month for Edward's care provided by his retirement home. ServCo sends an acknowledgement of that claim, indicating it is in processing. About a week later, it sends another acknowledgement of the same claim, this time noting that it cannot be processed because it's a duplicate, even though Penny only submits it once.

Quarterly, ServCo requires Penny's care provider to reassess his need for long term care. This is done through a form called a Facility Cognitive Questionnaire, which the care provider completes and returns. However, it routinely takes 2-3 identical submissions of this document to ServCo before it is properly recorded and claims continue processing.

For both of these items, submission via paper mail or via fax seems to result in the same issues.

Questions: What do these issues indicate about workflow management and paper handling at ServCo?

4. CONCLUSIONS

This case provides an in-depth look at real-world scenarios in the use of information for decision-making in the long-term care insurance industry. From these scenarios, you can assess system functions, business rules, information flows, information quality, and decision making in a black-box type of environment.

We encourage you to analyze each scenario, mapping data flows, apparent business rules, decision-making approaches (does the decision appear to be made by a human, or is it an automated decision by a computer?), and information delivery. There are clearly many opportunities for LTCCo and ServCo to strengthen their customer service operations and communications, and we hope you will try to identify not just the problem sources but also potential solutions.

"Thinking Beyond the Case" Reflection Questions:
- What are the ethical implications of providing services and information to vulnerable populations? Do companies in this industry have a responsibility to be even more diligent, to protect those populations?
- What other stories have you encountered or in news reports that required "black box thinking" to analyze and understand?
- What other situations have you encountered personally that required you to use black box thinking to understand the situation or problem?

5. ACKNOWLEDGEMENTS

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Appendix

Decision making and business rules
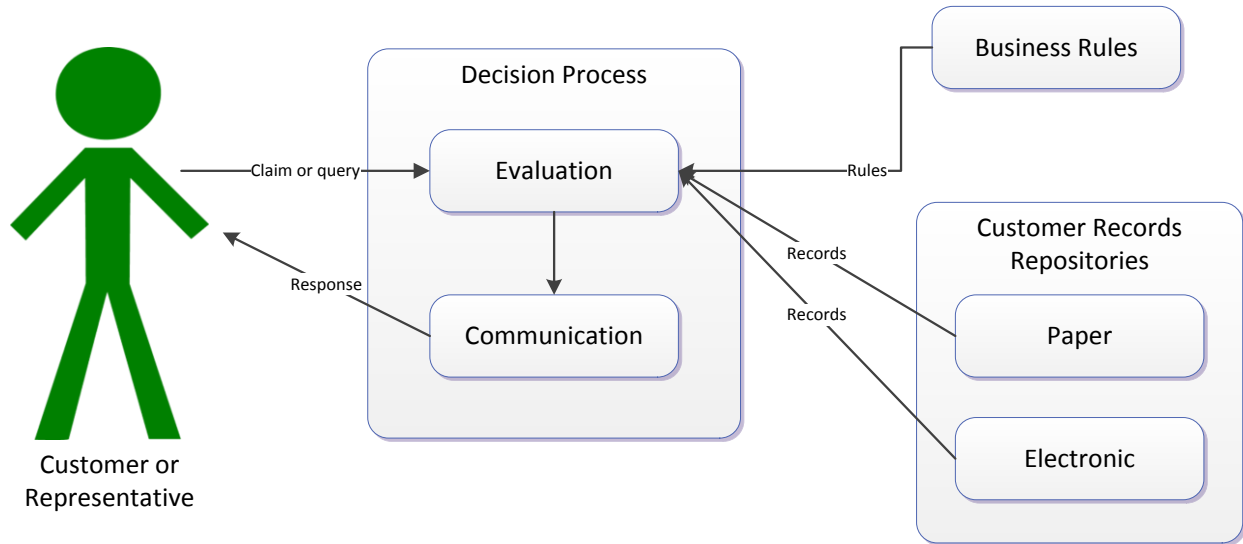
Figure 1 - Generalized decision process and information flows

Detailed list of events

Date	Event
Nov. 15	Edward suffers a stroke; initially meets criteria for eligibility for long-term care coverage
Jan. 15	First claim submitted – results in requests from LTCCo for facility information
Jan. 27	Second request from LTCCo for facility information – confirmed that facility had previously faxed the requested information
Feb. 13	Edward receives initial letter of eligibility for claims, confirming that both his condition and his facility met the conditions required
Feb. 19	Claims explanation received – "enclosed is your check" and in the same letter, "we need more information which you didn't provide, so the claim is closed" – and no check was enclosed
Apr. 7	First actual payment after required 100-day waiting period, including a note indicating that further premium payments would not be required (i.e., premiums would be waived)
Apr. 24	Bill for premiums sent to Edward – Penny believed they had been suspended as of April 7
Apr. 27	Notice of transfer of servicing to ServCo
May 1	ServCo takes over servicing operations for LTCCo policyholders
June 2	Edward receives check made out to wrong person with unexplained amount (added payments for a previously paid claim)
June 9	ServCo sends premium notice – Edward owes $4,200 by July 8 or policy will be cancelled
June 16	ServCo sends premium notice – Edward owes $350 by July 8 or policy will be cancelled; Penny is notified for the first time about Power of Attorney issues and faxes in a new Power of Attorney document and death certificate for Penny's mother.
June 19	Penny sends check #1, for $350, to make payment before policy is cancelled, while continuing to make calls to understand billing; payment mailed to address on June 16 letter
June 20	ServCo sends premium notice – Edward owes $700 by July 8 or policy will be cancelled
June 25	ServCo reports they have found the original Power of Attorney document
July 3	Penny calls to verify payment (check #1) received; it had not been received, and the check had not cleared the bank; Penny asks for confirmation of mailing address for payments (different, it turns out, from the address on the June 16 letter) Check #2 send on July 3 by overnight mail
July 5	Edward receives official waiver of premium letter; check #1 is cashed by ServCo and clears the bank; Penny issues stop order on check #2 after confirming payment had been received
July 6	Penny calls ServCo to verify waiver of premium status; CSR confirms
July 18	1) Edward receives refund for overpayment (refunding check #1) 2) Edward receives premium notice for $700 due immediately, because check #2 was treated as the payment, and check #2 had been stopped by Penny
July 19	Penny calls ServCo to clarify issues around payment; confirmed that ServCo had issued refund for check #1, and accepted check #2 as payment (though this would not clear because Penny had stopped it); ServCo agrees to put stop order on its own refund check and treat that money as Edward's payment
July 26	ServCo sends new premium notice for $350; ServCo confirms to Penny by phone that that notice had been created before all the payments issues had been worked out
Ongoing	Monthly errors in claims processing – initial claim for each month's service is acknowledged, and then, about a week later, acknowledged a second time with a note that this is a duplicate claim and will not be processed (even though each claim is only submitted once). Quarterly, ServCo requires that Edward's care provider reassess his disabilities to assess ongoing eligibility for long term care claims. Each quarter, the documentation seems to take multiple deliveries from the care provider to ServCo before ServCo's records are updated.

Table 1 – Detailed List of Events in Edward's Case

Timeline Overview
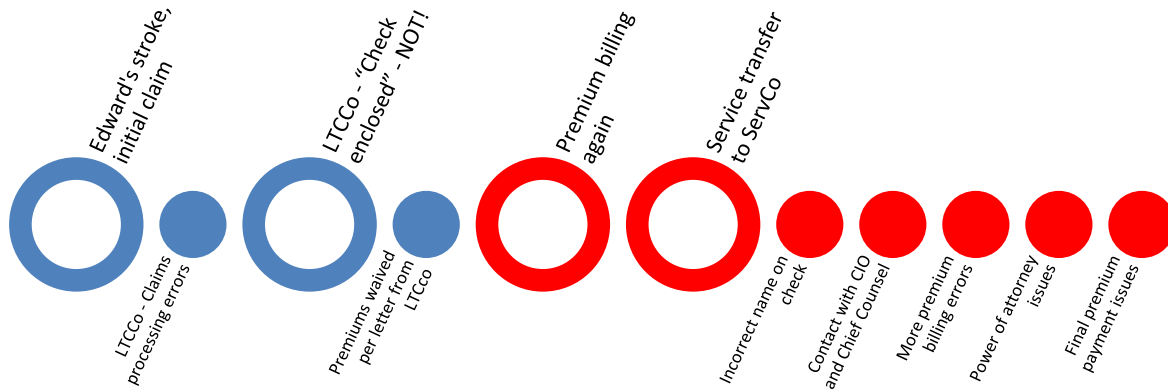
Figure 2 - High-level timeline of events

Teaching Case

Wooden Peg Game: Implementations as Both a Web App and as an Android App

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Abstract

Mobile application development is currently an important component of CS/IS education. Because of the rapid rate of change in the mobile application field, there are many websites that provide instructional material in tutorial format, but it is difficult to find a textbook that includes mobile application programming assignments and exercises. This paper presents two assignments, one as a web app implemented in HTML and JavaScript and one as an Android app implemented in Java using Android Studio, for an introductory level course in mobile application development. Both assignments implement the same game: a digital representation of the wooden peg game in which 15 pegs are arranged in a wooden triangle. When playing the game, one initial peg is removed from the board. Subsequent moves are made by jumping a peg over a second peg and removing the second peg. The ultimate goal is to remove all but one peg. The web app version of the game is assigned to students first, after other introductory html/JavaScript assignments have been completed. The html/JavaScript version can be used as an example of multi-platform development using PhoneGap or other multi-platform development environments. The Android app version of the game is assigned after other introductory Android applications have been completed.

Keywords: programming project, assignment, classroom experience, mobile application development, software development, programming, game development, JavaScript, Android development

1. INTRODUCTION

Two programming projects that were included in an undergraduate introductory mobile application development course are described in this paper. Both assignments implement the same simple game: a digital version of the wooden peg game in which 15 pegs are arranged in a triangle, and the single player must try to remove all pegs but one by jumping pegs over another peg and removed the peg that was jumped. One implementation is done in HTML and JavaScript and the other is an Android application. Students in the class must have had at least one programming course prior to enrolling in the class in which these project were utilized.

The learning objectives for the projects described here are:
- To gain experience with touchscreen input.
- To gain more programming experience.
- To appreciate some of the difficulties involved in game development.

1.1 The Institutional Context and Design of the Course
Introducing a new course into the curriculum is no easy task, no matter what the discipline. When that course is in a discipline that changes at such a fast pace as the world of information technology changes, the task is more difficult. Additionally, the instructor must also consider the environment in which the course is to be taught and the target cohort of students. In this

particular case, the environment is a Computer Science/Information Technology (CS/IT) department in a small liberal arts college. In order to guarantee a reasonable enrollment in such an institution, the new course must be target a broader range of students than may be the case at a larger institution. Therefore, the only pre-requisite to the course is a beginning programming course, which at the author's institution would be a course using either C++ or Visual Basic. The students are expected to have some experience with the basic programming constructs of

- Branching
- Iteration
- Functions, procedures and/or methods
- Calling functions, procedures and/or methods
- Parameter passing

The goal of the course is an introduction to mobile application development on more than one mobile platform. While there are books about mobile app development for single platforms available, no single book available at the time was found that provided the coverage of the desired topics at the desired level. Moreover, books on mobile application development, as is the case with many textbooks in the CS/IT field, quickly become outdated as the mobile platforms and development environments have been changing rapidly. For those reasons, course content was organized from a number of online resources. The online resources provided tutorials, examples and guides, but assignments and projects had to be created from scratch because the online resources typically have either complete solutions or very incomplete fragments.

Ultimately, the course covered web applications, Android and iOS applications. Although some (e.g., Kyrnin, 2012) advocate web applications in and of themselves, for this course, web applications were primarily included as primers for the more complicated Android and iOS portions of the course and so that multi-platform development using html and JavaScript such as PhoneGap Build (PhoneGap, n.d.) could be included later in the semester.

Prior to assigning either of the projects outlined in this paper, a number of simpler assignments were given to provide experience with the languages and development environments involved. One such assignment was a tip calculator that would provide the amount of a tip given the amount of a bill and the desired tip percentage.

2. The HTML/JAVASCRIPT VERSION OF THE WOODEN PEG GAME

Initial readings and assignments addressed HTML, CSS and JavaScript. To make sure that all of the students had similar knowledge of HTML, CSS and JavaScript, the online resources at http:\\w3schools.com was reviewed. After the initial introduction, a rudimentary game called Halma is introduced (Pilgrim, 2011). The goal of introducing this simpler game is to introduce the function calls needed to draw lines and circles, the calls needed to determine the screen position of a tap on the board and the logic of determining legal moves of board pieces.
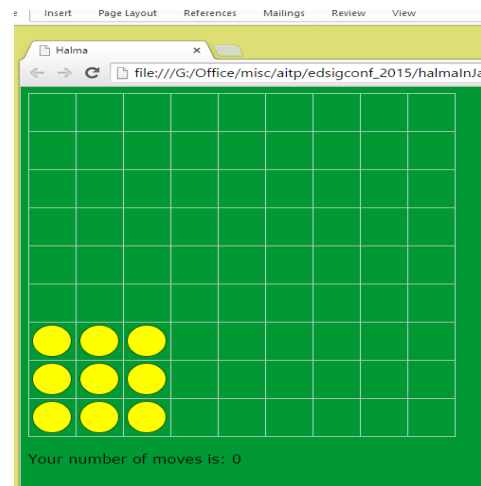
Figure 1. The Halma Game

The goal of the Halma game is to move 9 pieces from the lower left corner of a 9x9 square board to the upper right corner in the fewest possible number of moves. The pieces can move one square up, down, right left or diagonally, or can move two spaces in any of those directions by jumping over another piece to an empty square. Pieces that have been jumped over are not removed as they are in checkers. In fact, no pieces are ever removed from the board in this game. (Figure 1) To complete a move in the game, a piece is tapped to select it. A selected piece changes color. Then, an empty space where it is to be moved is tapped. If it is a legal move, the piece disappears from its original position, and reappears in the new position and returns to its original color.

Working in groups, students are given the source code for this game and are instructed to become familiar with the code. The source code,

which was adapted from the code provided online by Pilgrim (2011), is provided in the file given to students that is included with this teaching case.

Teaching Tip: To ensure that they become familiar with the code, you may want to remove one or more functions and assign completion of those functions as a preliminary assignment. Or you may want to trace through all possible events in class to ensure that students are familiar with the functioning of the Halma game before they try to implement the Wooden Peg game. If you do assign completion of some functions, for testing purposes, you may want to reduce the size of the Halma board because repeated testing becomes rather tedious. The size of the board can be modified by changing the values of two global variables named kBoardWidth and kBoardHeight.

After becoming familiar with the Halma game code, students are given the task with implementing the Wooden Peg game in HTML and JavaScript. Working in small groups, students were given two weeks to complete this assignment.

The Wooden Peg game has some similarities to the Halma game. The pegs in the Wooden Peg game are represented by the same round "pieces" as the pieces in the Halma game and moves can be made by the "pegs" jumping over each other.

However, there are many important differences. The goal of the Wooden Peg game is to remove all but the last peg. In the Wooden Peg game, the only moves that can be made are done by jumping over other pegs, and the peg that was jumped over is removed. The final difference is the board itself. The triangle pattern of the pegs is quite different than the square arrangement of the board and pieces in the Halma game. Not only are the pegs in the Wooden Peg game in a triangle, but the pegs in any one row are placed on the diagonal from the pieces in the adjacent horizontal rows. (Figure 2). Note that the grid lines do not appear in the Wooden Peg game because of the offset nature of the peg positioning.
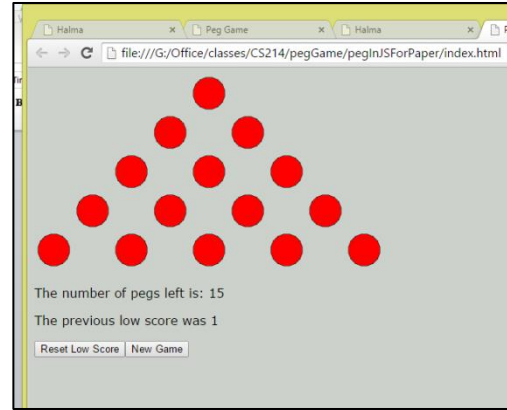
Figure 2. The Wooden Peg Game

2.1 The HTML/JavaScript Implementation
For continuity, the same row and column arrangement used in the Halma game is used for the Peg game, but the board is not a square. Only five rows are needed, but because there is a blank space between the pegs in the rows, the number of columns is still nine.

	0	1	2	3	4	5	6	7	8
0					0				
1				1		2			
2			3		4		5		
3		6		7		8		9	
4	10		11		12		13		14

Table 1. Wooden Peg Positions

The number of possible positions and the initial number of pegs are the same at the beginning of the game and because the pegs can move and be removed, it is the positions or "cells" that are maintained in an array. A Boolean property for each cell indicates if a peg is in the cell. The first cell at the top of the triangle is numbered 0 and its position is row 0, column 4. In the next row, pegs 1 and 2 are in row 1, columns 3 and 5 respectively (Table 1).

The offset nature of the pegs in adjacent rows makes figuring out legal moves more complicated than the moves in the Halma game. In the Halma game, the legal moves for a piece in any position can be figured out with simple math and some logic. If a piece has been selected, the legal moves are moving to an empty space that is one cell away, or jumping another piece. For a single cell move, the positions are one position away in column and/or row value. For a jump the logic is a bit more complicated. A jump is made to a position that are two columns or rows away but only if there is a piece in between the selected piece and the empty space.

Position	Possible Jump Positions
0	3, 5
1	6, 8
2	7, 9
3	0, 5, 10, 12
4	11, 13
5	0, 3, 12, 14
6	1, 8
7	2, 9
8	1, 6
9	2, 7
10	3, 12
11	4, 13
12	3, 5, 10, 14
13	4, 11
14	12, 5

Table 2. Possible Jump Positions

There is probably a nice, neat mathematical means of calculating the legal moves for a peg in any position or cell in the wooden peg game, because this arrangement corresponds to a triangle number sequence (Math Is Fun, 2014). However, the logic is much more complicated due to the triangular arrangement of the positions. Since the number of cells is manageable, a "jumplist" is used in the solution found in the solution accompanying this teaching case. Each possible position on the board is numbered from 0 to 14. For each position, the jumplist is an array of the possible positions to which a piece could jump assuming there is a piece in between the original position and the "Jump-to" position. The jumplists for each position in the Wooden Peg game is in Table 2. A jumplist for the Halma game would have been unwieldly due to the 81 positions.

The final difference between the Halma game and the wooden peg game is the scoring. In the Halma game, scoring is done by keeping track of the number of moves. In the Wooden Peg game, scoring is done by recording the number of pegs left when no more jumps can be made.

Teaching Tip: The jumplist (Table 2) was not provided to students, but it may be a good idea to do so. Figuring out the possible moves and how to represent them was difficult for some students.

Some of the functions from the Halma game can be re-used, some can be modified for re-use and some new functions are introduced in the final solution implementation for the JavaScript version of the wooden peg game is provided in the JavaScriptVersion.zip file.

3. THE ANDROID VERSION OF THE WOODEN PEG GAME

Before beginning to implement the Wooden Peg game for Android devices, the students must become familiar with a number of concepts and techniques such as:

- XML (Introduction to XML, n.d.)
- Java (Oracle, 2015).
- Once some simple Java programs have been successfully completed, Android development using Android Studio is introduced. See the training available at https://developer.android.com/training/index.html.
- Android Studio is available for download at https://developer.android.com/sdk/index.html.

After completing some simple Android applications, like the tip calculator mentioned above, students are provided with links to additional resources on the Android developer site to introduce them to means of implementing drawing using the canvas class and use of the touch screen in order to implement the Wooden Peg game. After becoming familiar with these topics, students are given the task with implementing the Wooden Peg game in Android Studio. Working in small groups, students were given two weeks to complete this assignment.

Teaching Tip: If the JavaScript version of the game is not done prior to assigning the Android version, the introductory material about the positioning of the pegs and the possible jumps available from each legal position should be included in the assignment instructions.

3.1 The Android Implementation

The Android implementation of the Wooden Peg game has some important differences from the JavaScript version of the game, since the JavaScript version is largely done with standalone functions, and in Java, everything must be implemented within a class. Therefore all of the functionality must be organized into class methods and for some students who have been exposed primarily to functional programming, this may present a challenge.

Teaching Tip: Two weeks was spent on Java itself before moving on to Android development. This helps enforce the concept of completely object oriented programming.

After completing some basics Android apps such as a tip calculator, students are provided with some online resources such as the following to become familiar with drawing lines and shapes on a view in Android.

- See the "On a View" section of the document at http://developer.android.com/guide/topics/graphics/2d-graphics.html
- http://stackoverflow.com/questions/3616676/how-to-draw-a-line-in-android

In the final solution implementation found in the AndroidVersion.zip file, there are three classes: MainActivity, pegCanvas and Cell. The pegCanvas class handles all of the touch events in the game.

4. CONCLUSIONS

This paper presented two programming assignments for completion of the Wooden Peg Game as a web application in HTML and JavaScript and as an Android application using Java. The students are presumed to have had at least one programming course prior to enrolling in a mobile application course in which these assignments would be appropriate.

Students in the course in which these assignments were given seemed to enjoy working on a game, even one as simple as this. Many seemed surprised about the amount of programming needed for such a simple game. Working in small groups seemed to be effective at evening out the differing levels of experience of the students in the class. Overall, these assignments were considered a success.

4.1 Future Variations
In the future, an iOS version of the wooden peg assignment is planned. There are other more complicated versions of the wooden peg game using larger number of pegs or marbles and boards of differing shapes.

A checkers game is another possible variation. Since checkers is a two person game, it either has to be designed to accommodate two players, or if a single user playing against the program is desired, game strategy would need to be incorporated.

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Teaching Cases

Advancing Student Productivity:
An Introduction to Evernote

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Abstract

This lab exercise exposes students to Evernote, which is a powerful productivity application that has gained significant purchase in professional work environments. In many academic settings the introductory computer applications course has a specific focus on standard productivity applications such as MS Word and MS Excel. While ensuring fluency in these applications is still relevant in today's business environment, we submit that colleagues should consider expanding the portfolio of applications we cover. The bulk of this paper is intended to expose colleagues to the capabilities of the application and help them prepare an in-class presentation and demonstration of Evernote. Appendix A contains a student lab exercise, which students can complete in or out of class. The instructor notes contain additional information and resources to help colleagues introduce this extraordinary tool to our students.

Keywords: Personal productivity, productivity applications, lab exercise, Evernote

1. INTRODUCTION

In the typical college computer applications class the technology emphasized is generally limited to standard productivity applications such as the MS Office Suite. The aim of this lab is to encourage colleagues to expand their approach to teaching productivity applications to include powerful tools that are widely used in the workplace such as Evernote. Evernote is a web-based notebook that combines the functionality of a traditional paper notebook and word processor with the collaboration and information sharing features of social media. It is considered one of the most valuable productivity oriented software tools available (Samuel 2015). Evernote also provides a structure for organizing content, which has been credited with replacing a physical filing cabinet and making it possible to become completely digital (Hyatt 2014).

Earlier in our discipline's history, when desktop computing diffused into organizations, and then into our homes, the need to educate our

students on the effective use of applications such as Word and Excel was paramount (Davis et. al 1999). Naturally, this task fell to Computer Science and MIS Departments, which implemented freshmen level courses intended to cultivate skills that would help them with future course work and make them competitive in the job market. While encouraging competency with the MS Office Suite still has merit in an introductory course, we submit this is no longer enough. The skills, tools, practices and challenges related to effectively participating in the modern workplace, not to mention our society, have changed substantially. As we know from the social psychologist Karl Weick, during times of great change we must not be afraid to drop our old tools and deploy technologies and techniques that are appropriate for the new context (Weick 1996).

The context in which today's knowledge workers operate is dynamic, multidimensional and demands new perspectives and tools (Friedman 2007). The modern context gives rise to the feeling that we all have a digital firehose aimed directly at us, which often leaves us feeling overwhelmed (Staff 2014). To combat this widespread problem it is argued that we need more effective mechanisms to capture, process, recall, and reflect on the information that is related to our professional and personal activities (Allen 2015). This issue is significant because it means that we must have the capability to capture relevant information through all digital and analog channels. This is further complicated by the widespread use of mobile and tablet platforms, which we expect to be conduits into our information repositories (Kelly 2013).

Another complicating factor the modern work context introduces is the project and group orientation of modern work (Schulte 2015). The new paradigm requires individuals to possess high levels of human capital and to collaborate with colleagues who are often geographically dispersed (Friedman and Mandelbaum 2011). Accordingly, it is incumbent upon us to help students cultivate their intellectual capabilities along with the ability to work in collaborative and dynamic settings. This requirement further illuminates a shortcoming in the typical approach to teaching productivity applications most academic environments promote.

When viewed from the perspective outlined above, we see that the narrow focus of teaching productivity applications such as Word and Excel, while important, do not go far enough.

Over the last three years we have introduced Evernote with great success to MBA students for the purpose of addressing the aforementioned problems. The course, which is the required MIS course that is given during their second year of the program, focuses on traditional MIS topics that range from globalization to securing the IT infrastructure. However, a small proportion of the semester is spent introducing digital tools and workflows that can help executives be more productive. The success and positive feedback from participants in the course serve as the motivation for this paper.

In the sections that follow we provide an overview of Evernote and some of its capabilities. While a full discussion of all of the functions and capabilities are beyond the scope of this paper, we introduce many of the features our students can put to work in a lab exercise that is outlined in Appendix A. The remainder of the paper is intended to introduce colleagues to this tool and provide information and resources that will allow them to prepare and demonstrate the technology to students who can then complete the lab exercise in or out of class.

2. Why Evernote?

Why choose Evernote as a productivity tool in an MIS course? Evernote is one of the most prevalent software tools used for storing and organizing information. Even its free version provides a multitude of features, and it has almost limitless creative applications spanning a variety of environments. Evernote can store and organize practically any type of information in diverse formats. This information is stored on a remote server so it is available anywhere with an internet connection and is accessible on multiple mobile devices. Evernote is one of the most popular free software tools available with a user base of 27 million in the U.S. and Canada, 31 million in Europe, Middle East, and Africa, 8 million in Latin America, and 1 million in China (Smith 2015). Evernote has countless applications to improve productivity for knowledge workers including instructors, students, and business professionals (Kelly 2013). The discussion below provides a few examples of Evernote use starting with general applications then narrowing the scope to its application in education and in particular a focus on its relevance for MIS courses.

Evernote Uses
Perusing Web articles and postings one can find many examples of Evernote applications for personal, professional, and educational

use. There are many ways Evernote can be used to manage and organize business and personal life. Business contacts, customer accounts, to-do lists, brainstorming activities and professional documents are a few of the many items business professionals may keep in Evernote. Personal applications may include keeping track of food and recipes, organizing photos, shopping lists, receipts, and monitoring fitness and health goals. In the classroom both students and teachers will find ways to put the efficiencies of Evernote to good use. Students may organize notes, scan or take pictures of paper handouts, organize schedules, task lists, contacts, and capture photo images of class discussion notes and diagrams drawn on whiteboards. Instructors may use Evernote to organize course content and communicate with students, voice record a discussion or lecture and make it available on a note in a shared notebook, and provide voice and written feedback to students. One example is Michael Cruz who shared a notebook in Evernote with all of his students to communicate and organize course material for his entrepreneurship class at San Jose State University. To help make this example more tangible, Michael has made this notebook public and available to view at the following link. https://www.evernote.com/pub/synergix/bus18 1#st=p&n=3f873454-d365-42eb-acab-b9c48efb2a8e .

Relevance for the Introduction to MIS Course:
Evernote provides a tangible and hands-on application for key topics typically covered in introductory MIS classes. For example, an instructor may want to pair the Evernote lab with other topics such as managing information overload (knowledge management) and cloud-based computing. With cloud-based computing information is stored in an off-site location and is accessible through an internet connection making information accessibility independent of physical location. Evernote is cloud-based and designed to run as a standalone application on a desktop or laptop as well as an app for multiple mobile devices including iOS, Android, Blackberry, and Windows phone. This makes Evernote a logical lead-in to class discussions on cloud-based computing concepts, advantages, disadvantages, and practical applications. With this lab students can experience firsthand the ability to share synchronized information on their computers, smartphones, and determine for themselves the efficiencies granted by the technology.

Evernote for Project Management and Application Development Courses
Although the focus of this paper is geared toward the introductory MIS Course, Evernote is appropriate for a variety of other MIS related courses. Two classes where Evernote may be particularly advantageous are project management and application development. Introducing students to specific project management templates such as the one for managing project status reports at http://tabletproductive.com/new-evernote-project-status-report-template/ is an example of an Evernote use in project management classes. Evernote may also be used as a tool to facilitate project management in a more comprehensive manner, such as using it as an Agile virtual storyboard (Barato, 2014). Jose Barato's Agile storyboard can be found at: https://www.evernote.com/Home.action#n=102 68fc9-68a7-45dc-93ba-eb43614252a2&ses=4&sh=2&sds=5&. To access this storyboard it will be necessary to login when prompted. Enter **pmpeople** for both the username and password, if the software prompts you to confirm Jose's email go ahead and confirm the email provided and proceed to Jose's example You may first need to logout of your Evernote account before logging in to Jose's pmpeople account.

Although the lab provided in this paper was designed with the introduction to MIS course in mind, instructors are encouraged to use this lab activity as a springboard for more creative applications in other classes. The aforementioned Project Management and Application Development examples only scratch the surface of Evernote's potential to facilitate learning in MIS related courses.

3. Description of Specific Evernote Features for Student Lab Exercise in Appendix A

Although there are a plethora of innovative ways to integrate Evernote into a college course, we will begin with a basic exercise for students to demonstrate the main features of Evernote to be used for managing a research project. The next section details the capabilities that will be required to complete the lab and is intended to provide the foundation so a colleague can deliver a demonstration of the application's capabilities to a class. The student lab exercise, which can be found in Appendix A, can be completed in or out of class following the demonstration.

Writing with Evernote
Evernote employs the metaphor of analog notes and notebooks. Just like the foundation of a standard notebook is an individual note, the same is true of Evernote. However, unlike a traditional analog notebook, Evernote makes it easy to capture different forms of content including words, audio and images into a powerful digital organizational system. Writing in Evernote is as simple as using a word processor and it possesses many of the same features found in mature word processing applications. The following short video provides an overview of writing in Evernote:
https://www.youtube.com/watch?v=CvsnMZz1o Qc

Capturing Audio and Images in Evernote
The types of information we encounter and want to capture far exceed elements that can be captured with words alone. Evernote provides the ability to digitally capture audio and images directly into an Evernote Note. For example, one of the authors requires a 15 minute oral final exam where the students are asked to discuss two to three major themes from the course. For each exam an Evernote Note is created that contains an audio Note of each student's exam. In addition to creating an audio Note the instructor types feedback for the student that is later passed along through the university's learning management system. In addition to audio Notes, one can capture images using a smartphone that are then placed immediately into an Evernote Note. Students are encouraged to capture complex formulas that are used in statistics and other required math courses. The following short video provides an overview of capturing audio in Evernote:
https://www.youtube.com/watch?v=Tnx-i_VsLjw

In addition to capturing audio and image files in Evernote it is also possible to capture almost all file types in the application such as PDFs, MS Word and Excel file types.

The following short video provides an overview of capturing different file types in Evernote:
https://www.youtube.com/watch?v=a_nYw0tcls w&index=5&list=PL4I5cq2DfrSpDiJChWD1oEDvc 2aZflqbB

Create Checklist of Activities in Evernote
Checklists can help students stay focused and on task for getting academic tasks accomplished. With checklists in Evernote students have the ability to organize what they need to accomplish conveniently within the same tool they use to gather and organize their information.

Checklists may be used to organize tasks to complete an assignment. Checking off each task can be a reward in and of itself and provide a sense of motivation to work on the next item. Another use of checklists is with assignments that require multiple deliverables. A checklist can be used to insure that all required deliverables are completed and properly submitted. Evernote provides a simple 5 step method for creating checklists, which is illustrated in the following video:
https://www.youtube.com/watch?v=7-S0WIVtp3Y

Capturing Web Content with the Evernote Web Clipper
Web Clipper is an add-in utility that enables students to take a snapshot of part or all of any webpage. This utility works through the web browser and allows one to grab web content from a site and then save the clips to Evernote. Examples may include clipping an article, the entire page, bookmarking, or capturing a specific screenshot. This feature also works with YouTube and Gmail. The Web Clipper extension is especially useful for collecting information in research projects because it makes web page information readily accessible at a later time from any mobile device, desktop, or laptop whether or not the Web is available. It also allows the web page content to be saved at the point in time of capture, so information is retained regardless of whether the page is removed or the content changes at a later time. If, on the other hand, one is interested in going back to the site and keeping up with its content as it changes then bookmarking the page or use a bookmarking tool such as delicious.com may be the best alternative.

The following video provides a demonstration of using Web Clipper https://www.youtube.com/watch?v=KfTcnuaw6 Qg&list=PL4I5cq2DfrSpDiJChWD1oEDvc2aZflqbB &index=4

Creating Notebooks in Evernote
As you can see, it is easy to capture large amounts of information into Evernote. However, we need a mechanism to begin the process of bringing order to the system and that is where the concept of Evernote Notebooks comes in. Just like in the analog world where notes are contained in a notebook that same is true in the Evernote application. Evernote Notes, regardless of content type, can be placed in a notebook. For example, a student using Evernote can create a wide array of Notes for your course including the notes taken during a typical

lecture, Evernote Notes that contain files such as the course syllabus in PDF to Notes that contain the audio from the guest speakers that visited the class. Those different Notes can be placed in an Evernote Notebook that is named for the course. Creating Notebooks is illustrated in the following video: https://www.youtube.com/watch?v=tAq0lfFx6M8

Organizing with Stacks

Similar to the concept of Evernote Notebooks, Stacks allow us to introduce even more organization. Again, just like in the analog world where we can have notebooks focused on various topics that we can then stack, the same is true in Evernote. For example, in the previous section we saw how a student in your course can capture different types of information that is then placed in an Evernote Notebook named for your course. The student could also do the same thing for all of the courses she is enrolled in for the semester. Accordingly, she can create Notebooks for each of her classes and then place all of the Evernote Notebooks into a stack named for the semester such as Fall 2016. Creating Evernote Stacks is illustrated in the following video: https://www.youtube.com/watch?v=jnXiJpgo0bE

Creating Tags in Evernote

Tags in Evernote facilitate the process of searching notes, reducing the waste of time and energy looking for information and ideas previously saved. Tags are keywords that describe a note. They provide an additional way to structure Evernote Notes that facilitate searching and identifying relationships across Notes, Notebooks, and Stacks. It is recommended that voice memos be tagged at the time of their capture because audio files that store voice memos cannot be directly searched by Evernote (Samuel, 2015). Creating tags is illustrated in the following video: https://www.youtube.com/watch?v=UJGLwuSdB9c

Creating Shortcuts in Evernote

In addition to organizing one's Notes by tagging or placing them into Notebooks or Stacks, one can create a shortcut that is easily accessed from anywhere in Evernote. When managing our digital lives we tend to collect and curate large amounts of different types of data. However, when working on projects we focus on a small subset of all of the information we possess. Shortcuts in Evernote allow one to quickly access a single Note, a Notebook or Stack. In addition, you can also create a shortcut to a tag which will pull notes regardless of location. Creating shortcuts is illustrated in the following video: https://www.youtube.com/watch?v=m25rEl47oVA

Modifying Images in Evernote Using Skitch

Sketchnoting is a feature that allows one to record creative ideas in nonlinear ways such as with drawings and annotations on graphic images. Sketchnoting is becoming more prevalent due to tablet computing (vanArnhem, 2013). Skitch is a free product that integrates seamlessly with Evernote to capture screen images, create drawings, and annotate images. The uses of Skitch primarily involve mobile devices and include features to annotate a PDF, annotate photos, mark up a web page, write on a map, and write or draw a note on a blank page.

The Evernote app for mobile devices will allow you to create an Evernote Note directly from the camera. Adding photo images to Evernote is demonstrated in the following video https://www.youtube.com/watch?v=hjKOxhXjMUA . Once the image is captured Skitch can be used to make annotations on the photo. This may be particularly beneficial for library research where pieces of information from books or journals can be captured by the camera, saved as a note, and then annotated through Skitch. Likewise, if students have written notes and would like to keep them in an electronic format they can take a picture of their paper and save it directly to Evernote. After photos have been captured then through Skitch additional annotations and drawings can be included in the image. The following video is a tutorial for using Skitch to annotate, rotate, and crop images. https://www.youtube.com/watch?v=VZEtRo9_kGs

Retrieving Information with Evernote Search

One can clearly see how Evernote can become the primary digital repository for much of our professional and personal lives. In early sections we highlighted the ability to create Evernote Notebooks and Stacks, which are useful organizing tools. However, as the number of Notebooks and Stacks increase, a more efficient discovery mechanism is required. The Evernote application possesses powerful search capabilities that allow one to easily drill down to the desired level. In addition, a key feature in Evernote related to image and document storage is its optical character recognition (OCR) capability. OCR makes the text content in

images and documents searchable. For example, if a student were to add a PDF of the course syllabus to Evernote, the document would become fully searchable. In addition, if a student captures images of hand-written paper notes or whiteboard notes, the contents of the paper notes or the whiteboard become fully searchable when captured with Evernote. The following video provides an overview of the search capabilities within Evernote: https://www.youtube.com/watch?v=yLuzye-mdr8

Mobile Devices and Evernote:
The aforementioned capabilities are enhanced through the integration with our mobile devices. The company has developed sophisticated applications for the iOS and Android platforms that allow for complete access to all of the information contained within one's Evernote repository. This is accomplished through automatically syncing new content to the mobile platform through the company's sync servers. Furthermore, the mobile applications have robust information retrieval capabilities and, of equal importance, possess powerful information capture mechanisms. The capabilities of the mobile applications are illustrated in the following video: https://www.youtube.com/watch?v=wQSZrL8vINY .

4. CONCLUSIONS

The need to learn and master applications that are related to effectively operating in organizations has informed our discipline since its earliest years. Historically, the focus has been on providing students with the knowledge to use standard tools such as MS Word and Excel, which have become ubiquitous. However, as technology continues to transform work practices we need to extend and refresh the tools and skills our students possess. This paper has endeavored to provide colleagues with an overview of the capabilities of this application and the resources to get up to speed on its use in a short period of time, so that one can give an effective presentation to students on its use. The lab exercise in Appendix A is intended to be distributed to students to complete in or out of class. The Teaching Notes contains suggestions based on our experience that will help colleagues prepare for the lab.

In addition to exposing colleagues to Evernote and streamlining the learning process, we hope to encourage discussion on the nature of the productivity tools we expose our students to and

how we might revitalize this area of instruction. The aim of our discipline is to combine the best of what human beings are capable of with the best of what technology can provide to improve organizations and society. We submit that when students begin to experiment and leverage technology that transforms their personal lives they can begin to imagine the power of technology, coupled with talented people, to transform organizations. This paper serves as the impetus for students to employ a powerful technology in their own lives with the hope they begin to see bigger possibilities for themselves and the organizations they will later lead.

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Appendix A: Student Evernote Lab Exercise

The goal of this lab is to focus on using the primary features of Evernote to manage a research project. The features are categorized into the functions they provide which include the capture of information, organizing and processing, sharing, and creating. This research lab is designed to take approximately 40 to 45 minutes of class time to learn how to sign up, install Evernote and practice using the features that will be needed to complete the project.

Setup Evernote, Clipper, and Skitch

1. Go to the Evernote.com website, create a free account, download the Evernote installation file, and install the software on your primary computer (desktop and/or laptop).

2. Launch Evernote on your main computer.

3. Open the browser you use most frequently and install Evernote web clipper from Evernote.com/webclipp.

4. Install Evernote on your mobile devices using the app store on your smartphone and/or tablet. Launch and sync Evernote on your mobile devices.

Assignment: Research Project

1. Create a new Notebook for your Research project.

2. Create a shortcut for your Notebook.

3. Add a note and create a To Do list (as a checklist) to plan the tasks you will need to accomplish for completing the research project.

4. Create a Checklist for the deliverables that need to be completed for the assignment.

5. Create a new Text note for writing up the draft of your paper.

6. In the process of gathering information for your research paper include the following:

    a. Write notes on paper and/or whiteboard. Take photo images of written paper notes and/or whiteboard notes. Additional photos may be taken from textbooks and journal articles if applicable.

    b. Use Skitch to annotate at least one of the images.

    c. Create tag(s) for your notes.

    d. Capture and tag voice note(s).

7. Search all your notes from one of your tags.

8. Create an outline of your paper and search through your notes to find support for your outline items. Include some of the following search techniques:

    a. Search through all notes using one of your tags.

9. Create an outline and write up the draft of your paper as you gather and organize your research data.

10. Include references.

11. Share the Notebook with your Professor.

12. Complete all the deliverables requested.

Teaching Case

Single Sourcing, Boilerplates, and Re-Purposing: Plagiarism and Technical Writing

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Abstract

In academia, plagiarism adheres to the traditional definition: utilizing another person's words or ideas without proper credit. Students are taught to cite everything, while instructors are given tools to detect plagiarism. This ultimately creates an atmosphere of paranoia, where students fear accusation and teachers are convinced that plagiarism will occur unless they remain ever vigilant. At the same time, technical writers create, reuse, remix, and remarket content on a regular basis in the form of instruction manuals, boilerplates, and other technical, factual, straightforward texts. In academia, the technical writer would be accused of (self-) plagiarism, which would not – given the context – be the case. In the professional world, where the majority of writing will be technical, students will find themselves creating content based on already-existing texts, a direct contradiction of their academic training. This teaching case asks students to consider not only plagiarism but also the concepts of copying and remixing, two ideas closely related to plagiarism, and develop their own conclusions, both personal and professional, about what is and is not ethical communication. It also seeks to demonstrate the importance of recognizing that difference and adjusting accordingly so that professional communications not only meet ethical standards but are also produced in an efficient and cost-effective manner.

Keywords: Technical Writing, Plagiarism, Remixing, Re-purposing, Ethics

1. THE ASSIGNMENT

Matthew Rice was beginning to seriously question his decision to choose technical writing as a career path. A junior at the community college, he had signed up for Ms. Parks' Technical Communications in Practice course, thinking that her real-world career as a technical consultant would be a bonus.

While it really was a bonus, the reality of technical writing was starting to become apparent. "The creative writing majors get to do the cool stuff," he grumbled to Lydia Jones during lunch. "Meanwhile, I'm supposed to write about some tech company that won a bunch of awards and make it sound interesting."

Lydia, who was in the same class, shrugged. "It's not that hard. Just take what was written and reword it."

"Isn't that plagiarism?"

"Not if you're using it for the same company. Think about the way that websites and annual reports are designed. Companies just keep reusing the same information. They call them boilerplates, and they're basically templates that you either don't change at all or only change a little bit. For example, you can use the same closing paragraph – the one that tells you when the company was founded, the awards they won, and how to contact them – in an annual report, in a brochure, and on a website."

Matthew nodded. What Lydia was saying did sound vaguely familiar. "I remember Parks talking about boilerplates. So it's really okay to just reuse someone else's words?"

"If you work for the company and you're creating it for the company, generally, yes. Check out chapter five in out text. The whole chapter is devoted to boilerplates and avoiding plagiarism."

Later that night, as Matt was working on his assignment, he thought about what Lydia had told him. *It's okay if you work for the company.* The assignment required students to evaluate a company's website, looking at its strengths and weaknesses, and provide recommendations. The assignment also required a short description of the company itself.

He was supposed to write the paper as if he were a company employee. Therefore, he reasoned, there was no reason for him to not used what was already written. Shrugging, he pulled up the company's website and began to copy-and-paste the text.

2. THE GRADE

Technical consultant Edie Parks describes her career as "being paid to tell people what to do," and she's not far off. She works for Unlimited Technologies, a consulting and research firm offering expertise in online learning, program evaluation, artificial intelligence, and data mining.

Edie's particular expertise lies in online learning and evaluation. She enjoys both technology and training, which makes Unlimited a perfect fit for her. When the opportunity to teach CP356 Technical Communications in Practice at a local community college, she jumps at it.

She loves it. The students, all either juniors or seniors, are engaged, and their work shows creativity and understanding. Everything is, in Edie's estimation, perfect.

Then she started to grade the midterm project, the largest assignment to date, one that asks the students to evaluate the strengths and weaknesses of a company's website. The resulting document would provide a brief description of the company, an analysis of the site discussing what it did well, what could be improved upon, and offer sample solutions. Their solutions were on track; however, several of the students used boilerplates, or standardized templates that can be reused with little to no changes, from their assigned company's website rather than create their own company descriptions. This gave Edie pause as it was something that she had done herself, but this was an assignment and she needed to know if the students actually knew the company or were simply cutting and pasting. She checked the project's guidelines and realized that she had not specified whether or not using boilerplate descriptions was acceptable.

As she continued to read, she realized that several papers used phraseology similar to some of the boilerplate templates that she had used in the past and had provided as examples, so while the content itself was generally original, the organization and format were not. Only one or two of the papers acknowledged the creator(s) of the templates in the bibliography. Leafing through the rest of the projects, she also recognized instances of *patchwriting*, or rearranging words in an attempt at paraphrasing (Appendix A).

This was not good. How could she give these students grades when they were using other people's work? And, when it came to patchwriting, was it a case of the student not knowing what else to say or was it deliberate laziness?

She picked up Matthew Rice's paper. He was usually a good student, and he was definitely creative. With any luck his work would improve her mood. Within three pages, Edie wanted to slam her head onto the table. As part of his recommendations for a small computer company, Matthew designed a new About Us page based on the already-existing users' manual (Appendix B). He didn't create content for the assignment, she developed exiting content. No citations were provided.

From a professional viewpoint, however, Edie knew that there are grey areas in technical communication that don't always exist in other fields. What was plagiarism is academia was not always plagiarism in the technical world simply due to the nature of the work. How many times during her career did she repurpose work, single source, or use boilerplates? Everything she did for her clients was original in terms of presentation, but that didn't mean that every solution was original. She had a collection of solutions from which she could pick and choose – then customize – as needed.

Edie put her red pen and grading rubric aside and read the projects as if they were business documents and not graded assignments. She realized that she needed to rethink her definition of plagiarism, copyright, and – while she was at it – intellectual property. The assignments, of varying quality, met the criteria and offered viable solutions to the problems. While, in the real world, some would be sent back to the drawing board, all of them demonstrated learning.

Edie also realized that she agreed with the argument *Copying isn't Theft*, something her students debated a few weeks ago, which argued that making more – as in the case of copying – does not fit the criteria of actual theft, which leaves one party without (Green, 2012a; Paley, 2009). The argument didn't advocate copying for profit, but it did argue that copying isn't *theft*, at least not in the traditional sense. The students argued that copying was similar to Lessig's statements on remixing, and that remixing was "a collage [created by] combining elements" and "leveraging the meaning created by the reference to build something new" (Lessig, 2008, p. 75).

Philosophically, Edie believed that a person's idea belong to that person. However, once that idea was spoken or written, and shared with the public, how could someone claim actual ownership? Additionally, given that ideas are not tangible, how could borrowing someone's ideas, particularly when they are good ones, be "wrong"? Using someone else's ideas does not result in that other person losing the ability to access the ideas. Just because the students used solutions she, or others, developed did not mean that anyone was harmed. Additionally, she believed that, in certain cases, Lessig's argument made complete sense. Her students took someone's work, remixed it, and applied it to a new situation.

2. CONVERSATION

Baffled, Edie met with Jim Bevans, her department head, and brought her concerns to his attention. An English Literature professor, he admitted that he didn't know the answer. Academically, he said, the students were guilty of plagiarism and subject to the school's sanctions, from a zero on the assignment up to expulsion. "It's up to you, Edie," Jim told her. "You can fail all of them for plagiarism, which will be a disaster, or you can offer them the chance to do it over. Again, it's a disaster."

"What if I don't make them do their work again and change my grading standards? After all, they met the criteria, and what they did is not, in technical writing, plagiarism," she told him.

"But it's unethical in life. These students did not create original content or give credit where it was due. Look at the music and movie industries. How many millions are lost to kids pirating – copying! – their stuff from the Internet?"

"True," she countered, "and I get the idea of pirating costing the artists money, but this isn't a top forty record or summer blockbuster..."

"Exactly, it costs someone money," he interrupted.

"Look, the students took boilerplates and templates and put them to good use. It's done all the time. Do you honestly think that I come up with totally original content every time I meet with a client? If they need the same information in three different places, I'm going to use the same content and just tweak it a little. I created the content for them, so it's not costing me money if I reuse it. Heck, it's putting money in my pocket." (Appendix C)

Jim leaned back in his chair and closed his eyes. "Look, Edie, you're the expert. If you come up with a fair, solid, and ethical solution, I'll back you. Just run it by me first, okay?"

Edie smiled. "Absolutely. Thanks, Jim. I'm not going to fail them for doing what I taught them. I'll figure something out and let you know."

4. DISCUSSION QUESTIONS

1. Take a moment to differentiate between technical writing and non-technical writing, e.g. academic papers, news articles, novels, and editorials. How are the ramifications different when it comes to a technical writer single sourcing and, for example, one novelist copying material from another? Why do you think this is so?
2. While it seems that the most logical answer to the problem is that Edie revisit her grading rubric and work with her students to ensure that they understand when it is and is not acceptable to remix material, can you see room for issues to arise in the future? Is this a double standard, and should all writers be held to the same

expectations regarding plagiarism? Why or why not?

3. Anyone with a computer can publish anything on the internet. As a result, there are countless websites that not only plagiarize from traditional media but also plagiarize from each other. Since there is no tangible theft taking place, since no one is depriving another of material property, and when no one profits financially, should we view copying material from one website to another the same as copying a tangible object, such as a DVD or book?

4. Is there a difference between copying with intent to profit and copying for the sake of sharing information? Why or why not?

5. Claiming another's work as your own constitutes plagiarism. In academia, the solution is to create assignments where plagiarism is difficult or impossible. Do you believe that this is an appropriate response? Why or why not?

6. Building on your response for question 5, what do you believe businesses can do to prevent unethical use of another's material, which would damage their credibility with the public and affect their profits?

7. How will you manage issues of copying and plagiarism in your professional career? Think about the field that you are entering and consider the opportunities to copy and/or plagiarize that are available.

8. Consider ethical theory, specifically the two most common: consequence-based and duty-based. How would a Utilitarian ethicist, one who focuses on the consequences, handle the discussion of copying? What about an ethicist who subscribed to a duty-based philosophy such as Kant's?

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Appendix A

Original text, taken from the company's website:

Founded in 2011 in Pittsburgh, PA, by sisters Olivia and Jayme Catalano, Livvie's Coffee (LC) is the largest mid-Atlantic provider of fair trade coffees and ethically-sourced teas for coffee shops, restaurants, and cafes. The winner of the 2013 Green Sourcing Award, LC offers clients "fresh and fair" products. For more information, visit: http://www.lcbeans.biz.

"Patchworked" text used to describe the company:

Pittsburgher Jayme and Olivia Catalano started Livvie's Coffee (LC) in 2011 in Pittsburgh, PA. It is now the largest coffee and tea beverage provider in the mid-Atlantic. LC provides clients with fair trade coffee and ethically-sourced teas. In 2013, LC won the 2013 Green Sourcing Award. On the company's website, http://www.lcbeans.biz**,** you can see…

Appendix B – Matthew's FAQ

Original text, taken from the company's website:

Founded in 1995, Branson's Communication Solutions (BCS) is the nation's largest provider of technical support for small- and mid-sized privately-owned businesses. Winner of the Organization of Technical Writing's 2013 Award of Excellence and named a Distinguished Provider by the Brotherhood of Technical Communications in 2014, BCS continues to offer innovative award-winning solutions to its clients. For more information, visit **http://www.bcs_solutions.biz**.

Founded in 2010, Caron Communications Solutions (CCS) is Pittsburgh's largest provider of tech support for small businesses.

APPENDIX C:

Example of a boilerplate found on a company website:

Founded in 2011 in Pittsburgh, PA, by sisters Olivia and Jayme Catalano, Livvie's Coffee (LC) is the largest mid-Atlantic provider of fair trade coffees and ethically-sourced teas for coffee shops, restaurants, and cafes. The winner of the 2013 Green Sourcing Award, LC offers clients "fresh and fair" products. For more information, visit: http://www.lcbeans.biz

Content repurposed for a charity event:

Olivia and Jayme Catalano started Livvie's Coffee in Jayme's kitchen in 2011. Today, Livvie's Coffee is the largest mid-Atlantic provider of fair trade coffees and ethically-sourced teas for coffee shops, restaurants, and cafes. The winner of the 2013 Green Sourcing Award, Livvie's offers clients "fresh and fair" products. For more information, visit: http://www.lcbeans.biz

Content repurposed for the new package:

It all started with a bitter cup of coffee in the kitchen of Pittsburgh native Jayme Catalano. With the help of her sister Olivia, Livvie's Coffee was launched in 2011. Their mission is simple: to provide products that are both "fresh and fair." Their mission paid off, and in 2013 they won the Green Sourcing Award. Today, Livvie's Coffee is the largest mid-Atlantic provider of fair trade coffees and ethically-sourced teas for coffee shops, restaurants, and cafes. For more information, visit: http://www.lcbeans.biz

In all cases, there were only minor changes to the wording. The information itself stays the same. This is not plagiarism because it was created by the company, for the company, and is used exclusively by the company.

Teaching Case

Too Much of a Good Thing:
User Leadership at TPAC

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Abstract

TPAC is a small third party health claims business that was seeking avenues for revenue growth and opportunities to increase efficiency. One course of action that management selected to achieve these goals was a change in the software application used to process claims. The new application was adopted to increase the speed and accuracy of claims processing. Given the enthusiastic motivation of the claims department manager, Susie Jeffer, and the importance of the new application to the Claims department; Susie was selected to lead the project. The case details the challenges the organization faced by selecting a leader for this critical project that had no project leadership experience or IT background. The implications of this decision on the business operations are presented and then solutions to the situation are explored. This case is targeted for an MBA IT management or strategy course; but could be used in an introductory course, a systems development course, or a senior-level undergraduate IS/T capstone course.

Keywords: teaching case, systems selection, project management, leadership

1. INTRODUCTION

It was a Monday morning in late October, a chill wind was in the air. Susie Jeffer leaned back in her chair, reflecting that her over-priced Chai tea latte and dry scone were not going to be enough to get her through the difficult meeting scheduled in the next hour with the company president.

Recently hired as a claims manager, Susie Jeffer had joined TPAC after 15 years in the healthcare industry. TPAC is a small third party health claims business located in El Paso, Texas. The company recently hired a new President with over 20 years' experience from a large third party health claims competitor and was planning to grow the business. To facilitate this growth, a review of the IT (information technology) infrastructure had been performed and a recommendation made to update the claims processing software application to lower costs which would allow TPAC to compete with its larger competitors and attract new customers.

The previous claims processing system did not have necessary capabilities to meet client needs. TPAC had become known for its flexibility in customizing benefit plan designs to help clients provide their employees an affordable benefit package that fit within the company's budget.

The previous system did not have the ability to auto adjudicate claims without manual intervention. Auto-adjudication is the ability to approve (or deny) a claim based on the facts of the claim and the benefits plan, without needing a human to validate it. Being a small company, it was difficult for TPAC to expand business without a claims system that could auto adjudicate claims. The primary benefit of having a system that requires less manual intervention is to allow the Benefit Administrators (claims processors) the ability to focus on clients' higher value needs; such as reports, claim adjustments, phone calls and other necessary tasks. The current system was restricting TPAC's potential to capture a larger market.

From Jeffer's perspective, she had done her level best to implement the President's new vision for TPAC. It had taken great courage volunteering to take responsibility for the implementation of the new IT system without any prior background in IT. Further, she had been the sole TPAC associate to receive the training on the new system! Further still, the training had only lasted two weeks – she was doing her best with what she'd been given. As far as she was concerned, her best had been stellar.

However, Jeffer was still fuming over senior management's recent criticism concerning the lack of programming she had put into the new system. If more capabilities were to be wrung out of the system, she would need a team to implement additional upgrades.

Jeffer's upcoming meeting with company president Sandy Davis had her worried, since Davis had become critical of Jeffer's handling of the implementation. Davis unabashedly voiced the opinion that TPAC now found itself back in the same spot they had been with the old system: it needed manual intervention, it was error prone, and it slowed claims turnaround. As she sipped at her Chai tea, Jeffer contemplated the long hours of work ahead. How will her employees adapt? Will her customers see a benefit? Or, will the company lose customers rather than grow the business?

2. THE ROLE OF A TPA

The traditional value stream (Exhibit 1) within the health care industry was for an employer to find a health care insurance company like Blue Cross, Anthem, or United Health Care to provide health benefits, assume payment risk, and process claims and payments for employees and service providers. This value chain came at a very expensive premium cost to the employer. As health care costs continue to rise, employers have been searching for ways to reduce the cost of employee healthcare.

A recent change in the value stream (Exhibit 2) in the administration of health care for employees has been for the employer to assume all payment risk as a self-insured company and contract a Third Party Administrator (TPA) that will handle the health claims and payments.

The TPA is neither the insurer nor the insured. Their task is to handle the administration of an agreed upon benefits plan that includes the processing, adjudication, and negotiation of claims. They also provide record keeping and general maintenance of the plan. The only difference in a TPA role versus a fully insured carrier is the TPA doesn't fund the payment of the claims; rather, the payment of claims is funded by the client.

The two main drivers for the use of third party administrators is lowering health care costs and

better plan design for company specific employee demographics and needs. Savings are significant because the company only pays for the administration of actual claim costs versus an insurance benefits' offerings that may or may not be used. Insurance company administration of claims is also much higher than a specialized TPA (whose focus is only on creating and administering the plan).

The TPA's have specialized software and processes that allow for timely and less expensive alternatives than the insurance companies. Typical cost savings a company can expect when moving from a fully insured plan to a self-insured plan with a TPA can be seen in Exhibit 3. An added benefit to the TPA business model is that it shelters the company from any concern of HIPAA (privacy) violations.

3. TPA PROCESSES

The claims system is programmed to process claims according to the plan design. One of the major benefits of being self-insured is that each client (employer) can customize their healthcare plan based on the needs of their company and their budget. This means clients are not sold "cookie cutter" plans that may include features that are not needed or may not include features that are very desirable. As each client's plan is designed uniquely for them, the claims processing system needs to be a robust system without plan setup limitations.

Every client has a different plan design which includes items such as:

- Eligibility - Determines the requirements of the employer regarding the number of hours an employee must work to receive benefits.

- Dependent Age.

- Timely Filing - Each employer determines the length of time within which a claim must be filed in order to be considered for processing (standard 1 year).

- Plan Design - This includes deductible, copays, and coinsurance

- Benefit Structure – this includes the definition of services that are covered or excluded and defines visit maximums on necessary services (physical, occupational, and speech therapy; and chiropractic services).

The goal of the system is to auto-adjudicate as many claims as possible, thus limiting the need for manual intervention while maintaining the quality guidelines. Auto-adjudication simply involves checking each of the claims for required information and restrictions and determining the amounts to be paid.

Also, the system needs to be able to accommodate any client's "reasonable" request. The more adaptive the system, the more able the claims administrator is to retain clients and increase future business. Providing quality healthcare for employees is expensive; therefore, employers need to rely on innovative TPA companies to assist in cost containment solutions.

4. NEW CLAIMS SOFTWARE APPLICATION SELECTION PROCESS

As TPAC's new president, Sandy Davis' first decision was to upgrade the IT infrastructure; and specifically the claims processing application. Davis convinced the board that a new system was necessary to achieve revenue growth and capture top-tier clients. A new application would increase flexibility for creating benefit plans and offer scalability allowing TPAC to grow by capturing larger volume clients.

With the prior system, each claim was manually processed by a Benefits Administrator. Since there was no auto processing of claims, the old system allowed room for more errors and inconsistency. There were instances where claims for the same procedure were handled differently: one claim was entirely covered, another partially covered, and a third denied. Ultimately, this slowed the process of claims processing and inflated the claims error percentage.

Davis tasked the Executive Management Team to narrow the choices for the new system. An industry consultant was retained to assist the Executive Management Team in exploring the alternative software solutions that would adequately fit their needs. Following weeks of debate, the options for the new application had been narrowed down to two: TreatFirst's Excaliber system and BigHealth's Benefitica IT suite.

The system finalists were very comparable. They both met the requirements for benefit plan

design flexibility and allowed for Consumer Driven Service products to be linked to each client rather than requiring a separate application to administer Health Savings Accounts, Flexible Spending Accounts, and COBRA (COBRA is health insurance that must be provided to employees when they are terminated).

TreatFirst's main disadvantage was that Excaliber took more time to set-up each benefit plan. However, this was mainly true because the application allowed the benefit plan design to be more detailed, thus increasing the accuracy rate of claims processing as well as tightening up measures to increase the auto adjudication rate. With the Excaliber system, TPAC could place more clients on the system without having to hire more Benefits Administrators to handle the additional work load.

On the other hand, BigHealth's Benefitica application was easier to use when building the benefit plans. There was less coding to be done which resulted in less time setting up a plan. The Benefitica system still increased efficiencies and also had a higher auto-adjudication rate. However, the integrated details in TreatFirst's Excaliber were marketed as having a higher accuracy rate.

The Executive Team invited the five Team Leads from each department to test the applications. After each lead was given a demonstration of both systems' capabilities, the Executive Team interviewed them for feedback. Team Leads cast their vote on which application they thought would best deliver functionality and performance.

Despite their desire to get broad-based input from all of the departments that would be affected by the new application, the voting was rigged. Although each Team Lead had their opportunity to vote, the voting wasn't kept confidential. Since the Executive Management Team had already cast their votes, the decision came down to the five Team Leads. Jeffer, the Claims Lead made no qualms about her choice. (Jeffer would have primary oversight of the application, it is a claims application and she is the claims manager.) She cajoled the four other leads to vote for her choice. The persuasion worked, as they felt pressured to vote for her preferred system.

The voting over, Davis revealed that TPAC would pursue Jeffer's choice: the BigHealth system. Feeling confident by her win and eager for a promotion, Jeffer volunteered to take on the configuration and implementation of the Benefitica IT application. Seeing potential in Jeffer, Davis tasked her with creating a roadmap for configuration and implementation of the new software.

5. TRAINING AND IMPLEMENTATION

The following week, Jeffer was on a plane to New York to receive training at BigHealth's corporate office. She received training on all of Benefitica's functionality, as well as how to configure the software to best fit TPAC's customized needs. Two weeks later, on the plane ride back to El Paso, Jeffer quickly sketched a roadmap for master data conversion, training, and implementation of Benefitica IT.

Concerning an implementation plan, Jeffer ranked the clients on a schedule based on their size (A-D, A being largest, D being smallest), and planned to convert the larger clients first hoping to realize improvements in productivity as quickly as possible. The conversion process involved duplicating all the unique attributes for each client's Summary Plan Description into a unique plan profile in Benefitica IT.

Jeffer was excited from her training and ready to get started on data conversion. She began the process of taking the Summary Plan Description, the guidelines of each client's plan, and translating the data into Benefitica's plan profile manager. After working 70 hours the first week, Jeffer' enthusiasm quickly waned as she realized the magnitude of the workload.

As the Claims department manager, Jeffer oversaw 10 Benefit Administrators (BA). She changed her conversion strategy, delegating the benefit plan set-up and data entry load to the BAs. Over the next week she scheduled several lunch-and-learns to familiarize the BAs with this additional responsibility.

Each BA was tasked with completing benefit plan profiles for clients according to the client's personalized Summary Plan Description. As each plan profile consisted of numerous attributes and settings the data entry was time consuming and prone to user error. The process was rushed because the number of clients assigned to each Benefits Administrator was roughly 15 to 1, with daily work still needing to be completed. As accuracy was vital, any incorrect setups resulted in claims being processed incorrectly.

6. PROBLEMS ARISE

Problems started to arise when the first batch of clients; i.e. Group A, the largest clients TPAC had, went live on Benefitica. Each client transferred to the new system without incident; however, the process was so quick that there was not enough time to iron out any issues before the next client went live.

With the new claims processing system, the auto adjudication rate was expected to increase to at least 90%. When a claim is auto-adjudicated through the system, the claim should be processed and paid correctly with no errors. If a claim doesn't meet all the requirements to go through the adjudication process, then it is pended for manual intervention.

During the benefit plan set-up these tight measures were not configured, which allowed more claims to adjudicate through the system and led to more errors. The industry accuracy rate was 96%, a metric shared with every prospective or current client. The increase in errors meant an increase in manual intervention for claims adjustment. It also resulted in increased calls from members, clients, and providers concerning incorrect claim processing.

Because of the extra errors and an already heavy workload, the BAs grew agitated with claims manager Susie Jeffer. Since the Benefits Administrators had daily contact with the clients and their employees, this required each BA to take extra time out of the day to explain to upset clients why there were errors.

This created friction internally from senior management all the way through the company. David, a Senior Benefits Administrator, could not understand why after so much time and effort there were so many issues and increased work. The new claims application was presented to his team as a change that would make their lives easier. Instead, the team received an increased work load which required more and more overtime. When Susie approached David about the amount of overtime the team was using, David could not control his emotions. David could not understand why Susie did not comprehend the volume of errors and problems with the new system. As David continued to document the errors and issues, Susie did not believe these errors were due to the new application and denied that they were due to any type of implementation error. She flatly stated these were not system related errors. Instead of reviewing the issue log, Susie ignored the errors. Instead she continued to forge ahead with the remaining client benefit plans. She was adamant that her project plan would meet the original deadlines.

Due to the deteriorating climate in the claims department, the Director of Operations decided it was time to take part in the weekly BA meetings. She hoped to drill down to the underlying problem and to understand what was happening from the source. Although she quickly realized the issue was related to the implementation of the new application; she added fuel to the fire by defending Susie. The team was furious.

7. THE FALLOUT

The Director of Operations began "mentoring" Susie to help fix issues, but glossed over the gravity of the situation to Senior Leadership to protect Susie's job (and her own reputation as well, she had been a supporter of Susie as a promising manager). Although system implementation was completed after nine months, issues were still being addressed and claim adjustment rates were at an all-time high. This had ramifications throughout the entire company. Phone calls for adjustments were increasing, Account Management was receiving requests for meetings by unsatisfied clients, and the overall morale was very poor.

In spite of it all, TPAC managed to retain its current clients and actually added new ones. As the company grew, the need for additional IT support was recognized and a new system administrator was hired. Jeff, the new system administrator, spent 6 months working with Susie to learn the system. After that time, Jeff was still not confident in her ability to manage, maintain, and enhance the system's performance.

Jeff finally convinced the Director of Operations to fund him for Benefitica training. He received training for four weeks. From this, he realized that there were many capabilities of the system that were not being used. In fact, the way TPAC was currently using the new application was not an improvement from the old system. Website functionality for employee self-service was not being utilized to its full capacity to allow clients to enroll employees online. This lack of functionality was creating problems on the eligibility side. While claims should be processed at a 90% auto-adjudication rate with a 98% accuracy rate, instead they were experiencing rates under 50% with 60% accuracy; this was

occurring primarily because the employee enrollments were not accurate and up-to-date.

These circumstances and other considerations led the Director of Operations to resign. A new Director of Operations, Rita, was hired. Rita had prior experience with another TPA and was very familiar with the new claims processing application. Her knowledge and expertise appeared to be extremely valuable to TPAC.

She was shocked when she discovered the issues TPAC was having with the software. She could not believe TPAC was even surviving with the way the system was functioning. She immediately brought this knowledge to the Senior Management team.

In addition, Rita tried to mentor and counsel Susie. She "confronted" Susie with all of the issues and her response (or lack of response) to them. Despite all this, Susie remained confident and felt she had not made any serious mistakes; except selecting the wrong system.

Given Rita's goal to make substantial improvements in claims processing, specifically improving the auto-adjudication and accuracy rates, she worked directly with Jeff. Susie was still on the project management team, but they had tasked her with leading the BAs to improve daily operations rather than any application related tasks.

8. SEEKING SOLUTIONS

Rita was under pressure from leadership to terminate Susie. Although unsure, Rita felt this was a bit of scapegoating by upper management. She thought they were looking for someone to blame for the unsuccessful project to alleviate some of the clients' concerns. And

Susie did appear to be a bit clueless at this point.

Rita didn't feel as if she was in the role long enough to make the decision to terminate Susie. Rita contemplated how to handle the situation, she decided to task Jeff to go back through each client setup and do a thorough audit of each plan to ensure they were setup accurately.

Rita spent the weekend in her office trying to weigh all of her options. The busy season with open enrollment was just around the corner and a decision needed to be made Monday morning. Some of the questions Rita pondered as she prepared for the meeting with Susie on Monday included the following questions:

- Should Susie be fired? Was she really a bad employee or was she just put into a role that wasn't compatible for her?

- How could Rita justify this action to leadership without letting Susie go? Should she?

- At this point, Susie was still on the project team and making changes to the software, she was one of the only people in the company with deeper knowledge of how the software worked. Should Susie remain on the project? Should she be moved? What role should have?

- Should Rita be concerned that there is a risk to the company that Susie will sabotage other areas of the company out of spite and anger? What should she do to mitigate this risk?

Editor's Note:

This paper was selected for inclusion in the journal as the EDSIGCon 2015 Best Case. The acceptance rate is typically 10% for this category of cases based on blind reviews from six or more peers.
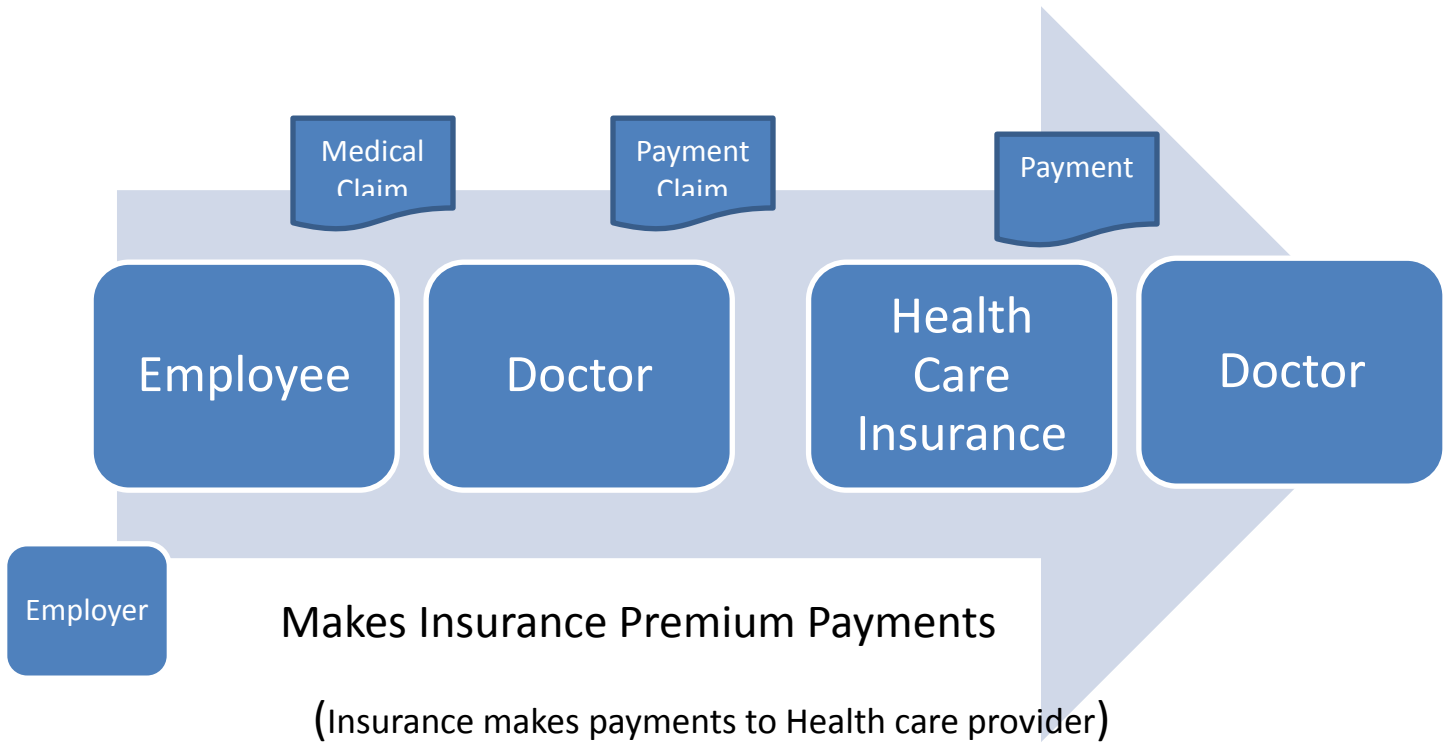
Exhibit 1 – Traditional Value Stream
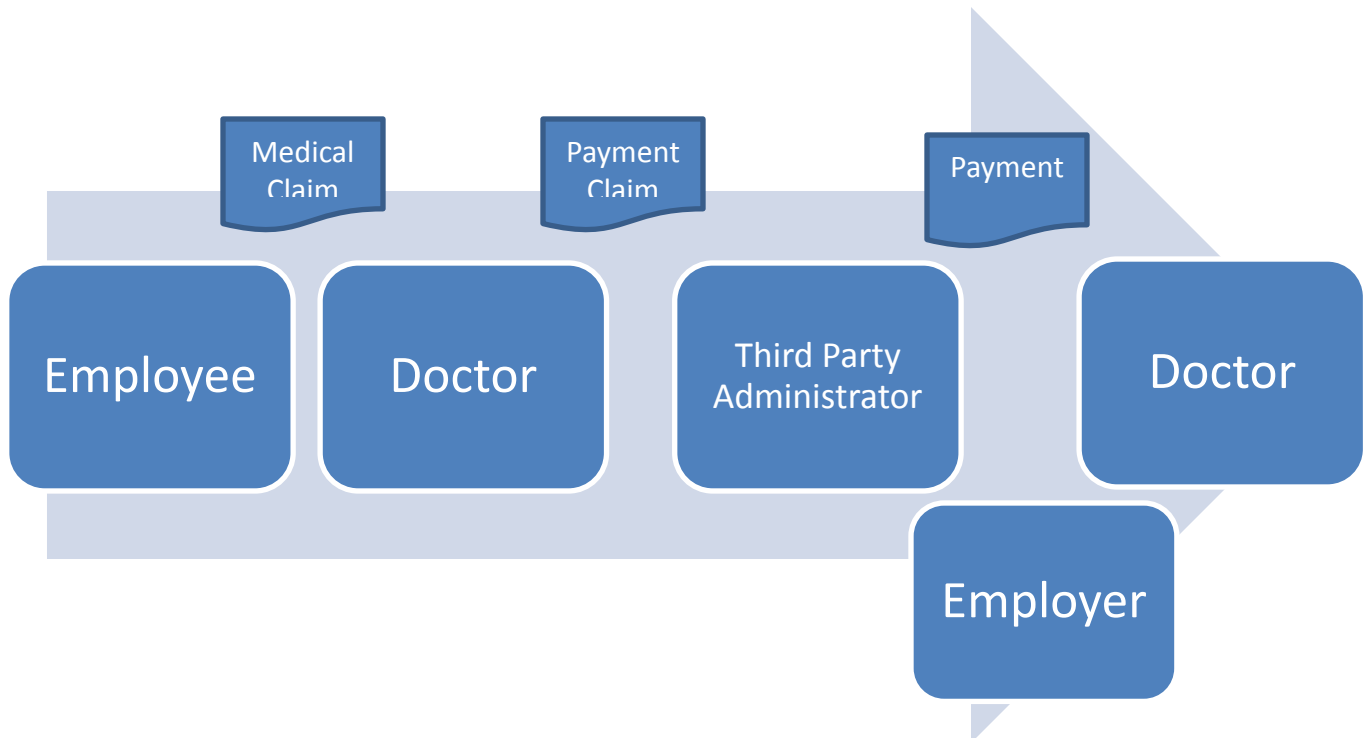
Employer Pays TPA for claims administration

(Employers makes payments to Health care provider)

Exhibit 2 – New Value Stream: TPA replacing Health Care Insurance

Exhibit 3 – Potential savings with a TPA
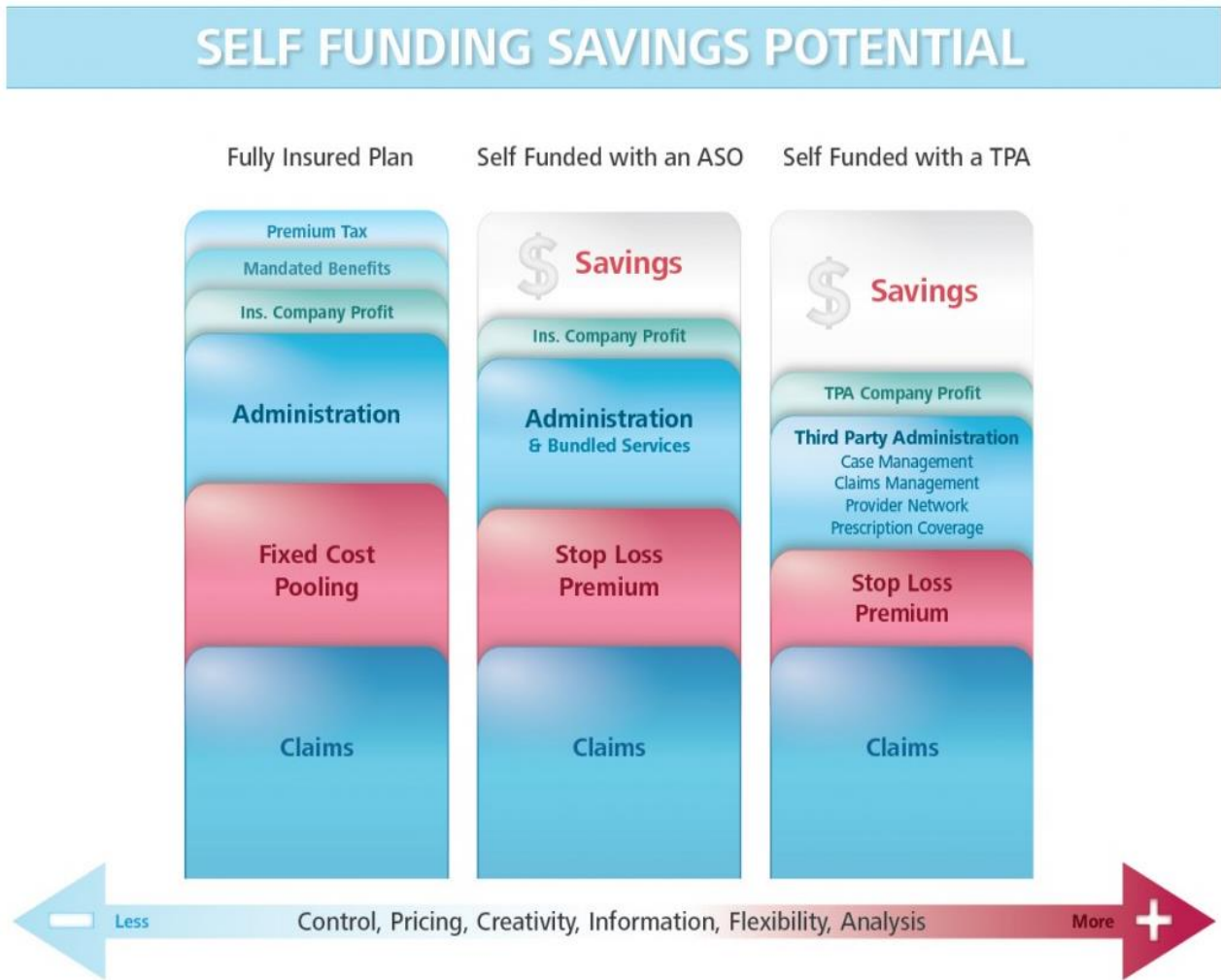
Teaching Case

Analyzing Security Breaches in the U.S.: A Business Analytics Case-Study

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Abstract

This is a real-world applicable case-study and includes background information, functional organization requirements, and real data. Business analytics has been defined as the technologies, skills, and practices needed to iteratively investigate historical performance to gain insight or spot trends. You are asked to utilize/apply critical thinking skills that will produce measurable insights from historical performance data that can be transformed into actionable insights. By critical analysis, reporting and visualization, you will engage with the three major analytic activities: (1) extract, transform and load (ETL) the data; (2) create reports and visualization graphs using business intelligence tools (e.g., IBM Cognos Insight, Tableau, Excel, SQL Server Reporting Services (SSRS)); and (3) engage in critical thinking to identify actionable items that will assist with decision making or recommendations. The Privacy Rights Clearinghouse (PRC) Chronology of Data Breaches reported more than 800 million records breached from over 4500 data breaches since 2005. Security breaches continue to increase: Therefore, there is an urgent need to analyze their patterns and provide meaningful insights to support better decision making.

Keywords: Information security, Business intelligence, Business analytics, Teaching case, Critical thinking

1. CASE SUMMARY

Data breaches have gone mainstream. Whether it is Sony PlayStation Network, Target, or Anthem Health attack, more and more consumers are receiving notifications from companies stating that sensitive, personally identifiable information has been exposed and possibly compromised. Across all industries, as the number of data breaches has increased, eliminating data breaches and protecting business-critical data remains a top priority as well as government's interest in protecting its citizens.

The Bureau of Consumer Protection, Information Security Commission (ISC) Office recently organized a task force seeking to understand the nature of data breaches across the government, and selected industries including: retail, financial and insurance, and healthcare. The task force is seeking your help to collect and analyze the data obtained from the Privacy Rights Clearinghouse Chronology of Data Breaches.

Table 1. Organization Type

Code	Description
BSO	Businesses Other
BSF	Businesses Financial and Insurance Services
BSR	Businesses Retail/Merchant
EDU	Educational Institutions
GOV	Government and Military
MED	Healthcare Medical Providers
NGO	Nonprofit Organizations

Privacy Rights Clearinghouse (PRC), accessible via http://www.privacyrights.org/data-breach, is a nonprofit corporation in California that was established in 1992. PRC keeps up-to-date information of data breaches across all industries and the government within the US. PRC aims to provide timely and historical information on data breaches and to educate stakeholders (e.g., consumers, businesses, and policymakers) of currents trends in data breaches. PRC reported more than 800 million records breached from over 4500 data breaches since 2005. These breaches span across financial institutions, retail, educational institutions, government and military, healthcare, non-profit and other businesses (see table 1). PRC also provides data about different types of breaches as outlined in table 2.

Table 2. Type of Breaches

Code	Description	How it occurred
DISC	Unintended Disclosure	Information made public via web
HACK	Hacking or Malware	Electronic entry by outside party
CARD	Payment Card Fraud	Fraud via debit or credit cards accomplished by means other than hacking
INSD	Insider	Someone with legitimate access intentionally breaches
PHYS	Physical Loss	Non electronic records lost, discarded, or stolen
PORT	Portable device	Data lost, stolen or discarded through electronic devices
STAT	Stationary device	Lost, stolen or discarded stationary electronic device
UNKN	Unknown or other	Unknown

Data breaches are endangering the privacy and confidentiality of consumers and resulting in dire organizational consequences, such as reputation damage, monetary penalties, and civil and criminal liabilities. Organization leaders recognize the importance of keeping track of breaches trends and their impacts.

Therefore, there is an urgent need to have tools that communicate patterns difficult to see. As part of the task force, your team will produce a report to help the bureau understand the patterns of data breaches in the government and the selected industries identified above.

The case study includes a set of functional requirements (technical, business, and critical thinking), the data set, and the business intelligence tools to be used. Below are the detailed technical and business functional requirements.

2. TECHNICAL REQUIREMENTS

Extract – Transform – Load Process
Clean, meaningful and useful data play a very important role in getting better analysis and more insightful results. The ETL process consists of three steps; extract, transform, and load. First, the extract step consists of pulling data from a source. Next, the transform step involves converting the raw data into a form that can be loaded into a target system for further processing. Lastly, the load step entails putting the transformed data into the target system. In the end the ETL process take source data, cleans it, and integrates it into a target system.

Before beginning the analysis, you will perform an ETL process set using PRC data.

- Extraction: extract data from the PRC website. The dataset can be downloaded as a CSV file from http://www.privacyrights.org/data.
- Transformation: transform data into a suitable format as required by the target system. The transformation process takes place in Excel by saving the CSV file into an Excel file. You can delete the columns for street address, the name of the business, postal code, city, description, and a few unnamed columns. You can remove either the "total records" or "records breached" column to eliminate redundancy. In addition, a few columns need to have their headers changed. For example

"location" to "city" and the "state" column to be changed from ",". Additional columns can be derived from the "Date" column such as the year and the quarter. An example of a finalized and transformed dataset is provided in Appendix A.

- Loading: load the data into the business intelligence (BI) application. This starts by loading or importing the transformed file into your BI tool. During the loading, you have to identify dimensions and measures among the available attributes. You can choose several dimensions such as entity, type, state, year, and quarter. An example of measures is the number of breached records and the count of breaches

Business Intelligence Tools
The ISC Office and organization leaders want a tool that allows them to know the state of information breaches across different industries, impacted geographical areas (States with higher breaches) and type of breaches by which they are threatened.

BI tools are used to retrieve, analyze, and report data to support decision making by providing meaningful insights. Several BI tools are available and some providers offer trial versions or free student versions. Some of the BI tools currently available are EXCEL, SSRS, Tableau, and IBM Cognos Insights.

You will need to select the appropriate BI software to use and install it; keeping in mind that some BI tools are only windows compatible.

3. BUSINESS REQUIREMENTS

Reporting or Descriptive analytics
Descriptive analysis answers the "What" questions (See Appendix B) and provides a view of both current and historical results. Descriptive analytics tells the business how they are performing and help identify key issues in their current performances. Using the dataset provided by PRC, you need to address the requirements outlined below:

1. **Total Number of Breaches:** This report should outline the number of breaches by year; broken down by government and the selected industries (e.g., retail, financial and healthcare). The visual representation should allow the changes and trends throughout the years among the above-

mentioned industries and government. Advanced report options include exploring any seasonal trends (e.g., quarterly analysis).

2. **Type of Data Breaches Report:** This report compares the different types of data breaches reported. This report can be broken into two sub-reports. The first sub-report will show different breach trends across all different years provided, while the second sub-report will represent different type of breaches broken down by industry to be able to see the most prevalent type of breaches within different industries. Advanced report options should combine the findings from the previous report (total number of breaches) to the type of data breaches. This will allow comparison of the highest occurrences of breaches to the type of breaches reported.

3. **Geographic Location of Breaches Report:** This report describes the geographic locations (States) associated with the breaches in the United States. Advanced report options can integrate this geographic representation to be interactively displayed on a U.S. map.

4. **Citizens Impacted by Breaches Report**: This report provides a comparison of the total individuals impacted by the breaches in comparison to the total number of breach occurrences. Advanced report options should consider adding the type of breaches and their location to this report for more meaningful insights.

5. **Cost Analysis of Breaches Report:** This is an advanced report options where you can include a new measure called "Estimated Cost of a Breach". This measure is calculated based on the average cost per breach published by the Ponemon Institute. By multiplying the records breached by the average cost per record you will be able to determine an estimated cost for an entire breach for an entity. In your reports, you can analyze (1) the total cost of breaches per industry, (2) the cost per type of breach and, (3) cost of breaches over the years.

Visual Communication
Organization leaders need to be able to make quick and accurate decisions. Therefore, a need for simple graphs that stand out and aid in their decision making is very important. These graphs provide insights into the data and address the

key issues of the problem identified in descriptive analytics reports.

You should create visual representation of all the above reports along with a short analysis of the reports.

4. ACTIONABLE INSIGHTS: CRITICAL AND ANALYTICAL THINKING

While having descriptive and historical reports is very important, business leaders are looking for the needle in the haystack. Meaning they want you to provide them with recommendations that are actionable. Your recommendations should be based on the insights gathered through the reports and supplemented by recommendations to safeguards against data breaches. These preventative recommendations can be:
- Pertinent to specific types of breaches.
- Specific to a particular industry or government or span across all the industries and government.

- Either technical recommendations (e.g., encryption), human recommendations (e.g., education/training, awareness, social engineering), or policies.

5. CONCLUSION

As data breaches continue to increase, countermeasures can only be effective if they align with what is causing the breaches. Therefore, a thorough analysis of breaches and their trends is crucial. A real and up-to-date data set of security breaches is provided by the privacy rights clearinghouse. The Information Security Commission Office is seeking your help to clean the data, build and analyze reports, and ultimately provide insights into the state of data breaches in the U.S. for the purpose of better preventative safeguards.
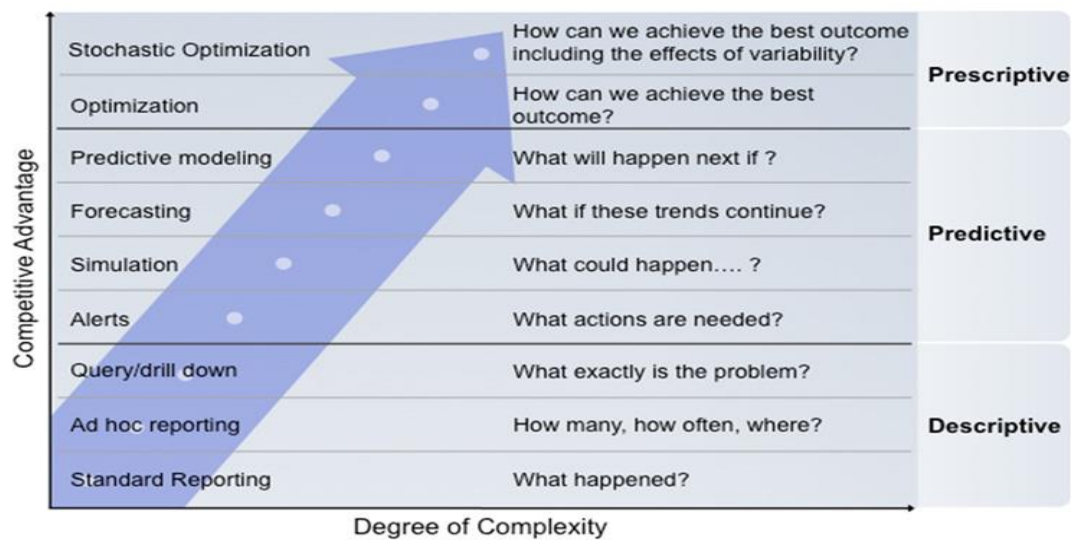
Note: Teaching Notes and Case Supplements are available by contacting the authors

Appendix A – Sample of a Transformed Dataset

	Date Made Public	Name	Entity	Type	City	State	# Records Breached		Year	Quarter
1	Date Made Public	Name	Entity	Type	City	State	# Records Breached		Year	Quarter
2	20-Jan-09	Heartland Paym	BSF	HACK	Princeton	New Jersey	130,000,000	Dataloss DB	2009	Q1
3	17-Jan-07	TJ stores (TJX), i	BSR	HACK	Framingham	Massachusetts	100,000,000	Dataloss DB	2007	Q1
4	5-Feb-15	Anthem	BSF	HACK	Indianapolis	Indiana	80,000,000	Media	2015	Q1
5	2-Oct-09	U.S. Military Vet	GOV	PORT	Washington	District Of Columbia	76,000,000	Dataloss DB	2009	Q4
6	2-Sep-14	The Home Depo	BSR	HACK	Atlanta	Georgia	56,000,000	Media	2014	Q3
7	16-Jun-05	CardSystems	BSF	HACK	Tucson	Arizona	40,000,000	Dataloss DB	2005	Q2
8	13-Dec-13	Target Corp.	BSR	HACK	Minneapolis	Minnesota	40,000,000	Media	2013	Q4
9	10-Nov-11	Steam (The Valv	BSR	HACK	Bellevue	Washington	35,000,000	Databreaches.net	2011	Q4
10	22-May-06	U.S. Departmen	GOV	PORT	Washington	District Of Columbia	26,500,000	Dataloss DB	2006	Q2
11	2-Aug-08	Countrywide Fir	BSF	INSD	Calabasas	California	17,000,000	Dataloss DB	2008	Q3
12	26-Mar-08	Bank of New Yor	BSF	PORT	Pittsburgh	Pennsylvania	12,500,000	Media	2008	Q1
13	27-Apr-11	Sony, PlayStatio	BSR	HACK	New York	New York	12,000,000	Media	2011	Q2
14	3-Jul-07	Fidelity Nationa	BSF	INSD	Jacksonville	Florida	8,500,000	Dataloss DB	2007	Q3
15	30-Mar-12	Global Payment	BSF	CARD	Atlanta	Georgia	7,000,000	Databreaches.net	2012	Q1
16	27-Apr-12	Office of the Te:	GOV	DISC	Austin	Texas	6,500,000	Media	2012	Q2
17	26-Oct-12	South Carolina [	GOV	HACK	Columbia	South Carolina	6,400,000	Media	2012	Q4
18	14-Sep-07	TD Ameritrade F	BSF	HACK	Omaha	Nebraska	6,300,000	Dataloss DB	2007	Q3
19	6-Jan-09	CheckFree Corp.	BSF	HACK	Atlanta	Georgia	5,000,000	Dataloss DB	2009	Q1
20	18-Aug-14	Community Hea	MED	HACK	Franklin	Tennessee	4,500,000	Media	2014	Q3
21	17-Mar-08	Hannaford Bros.	BSF	HACK	Portland	Maine	4,200,000	Dataloss DB	2008	Q1
22	28-Aug-13	Advocate Medic	MED	STAT	Park Ridge	Illinois	4,000,000	Media	2013	Q3
23	6-Jun-05	Citigroup, UPS	BSF	PORT	New York	New York	3,900,000	Dataloss DB	2005	Q2

Chronology-of-Data-Breaches_-_P   us_states

READY

Appendix B -- Questions to consider in your analysis

Type of question	Sample question pertaining to the data set provided
WHAT questions Descriptive Analytics	• What type of breaches? • What is the breakdown of breaches per year? • What the breakdown of breaches per geographic location? • What entities/type of entities are impacted the most? • What are the seasonal trends if any (quarterly analysis)? • What is the total number of breaches in comparison to the total of individuals impacted by the breaches?
WHY Questions Getting to the meat	These types of questions allow you to further analyze your findings. It involves more depth in your analysis/discussion getting and may require the use of other data sets. • Why is a particular breach type higher than others? • Why are breaches the highest in certain geographical areas (States)? • Why is it important to focus on the number of breaches rather than the number of individuals impacted or vice versa? • Why are breaches lower in certain States? (may have to check the stringency of their privacy/security policies)

HOW Questions Prescriptive Analytics (check figure below)	• How do the above findings and discussion provide a competitive advantage or improve decision making?
	• How can one achieve the best outcome using the following?
	    o Technical countermeasures
	    o Physical countermeasures
	    o Policies and regulations
	    o Training and education

Based on: Competing on Analytics, Davenport and Harris, 2007

Teaching Case

Stalled ERP at Random Textiles

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Abstract

Andre Raymond, Executive Vice President of Sales and Marketing for Random Textiles Co. Inc. (RTC), stood in front of the podium to address his team of 70 sales consultants in Las Vegas, NV. The organization had increased market share and achieved record sales over the past three years; however, in the shadow of this success lurked an obstacle that threatened the financial stability of the company. The enterprise resource planning (ERP) software system RTC planned to use for future growth had not been implemented yet. The new ERP software was introduced in 1996 and RTC had planned to roll it out company wide by 2004. Ten years later, no companywide rollout had taken place. The consequences of this problem were beginning to surface in the form of customer complaints due to unexpected stock outs, inefficient business processes, and high employee turnover. This teaching case addresses learning objectives related to recognizing and mitigating problems with IT management in general and IT project management specifically, the importance of evaluating vendors, the importance of IT planning and estimating time and resources required. This case is intended for the undergraduate IT Strategy (IS2010.7) or Foundation (IS2010.1) courses. It could also be used in the IS Project Management (IS2010.4) or an MBA course focused on IT strategy or management.

Keywords: ERP, project management, planning, teaching case

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1. RANDOM TEXTILES CO. INC.

RTC was co-founded in 1940 by Todd Weisman and Freddy Benintendi. Todd and Freddy sold various textile products from their 5th street apartment in Cincinnati, OH. In 2014, RTC has expanded to one of the largest, privately owned companies in the world. RTC manufactures reusable textile products for healthcare and hospitality facilities. Their products consist of patient gowns, bath towels, robes, baby blankets, and window treatments. RTC is a vertically integrated company and they own a number of domestic and global manufacturing and warehouse facilities. RTC is known for product development and innovation, they offer a handful of proprietary fabricated products which provide numerous benefits to the customer such as lower cost per use, more efficient textile processing, and increased patient comfort.

Organizational Profile
The business units within RTC are distinguished by two product categories: 1) reusable textile products and 2) decorative products. The organizational structure includes functional units of Accounting, Finance, Human Resources, Legal, and Executive Management which all support both product categories.

In contrast, Sales & Marketing, Information Technology (IT), Product Development, Manufacturing, Sourcing, Customer Service, and Sales Analytics business units are all customized to each product category (Exhibit 1). For example, reusable textile products such as bath towels and bath blankets are relatively small and cotton rich. These products were typically globally sourced and low cost is of chief importance in order to stay market competitive. In addition to these reusables, proprietary textile products were usually manufactured within an RTC owned facility and these products had higher costs since they offered innovative benefits to the customer. Despite the different supply chains, these products were handled similarly on the sales side of operations.

Decorative products were very large and bulky and were made with a variety of materials such as cotton, polyester, wood, and plastic. These items were generally purchased from other suppliers and inventory costs were high given the bigger size and weight to store these at a warehouse. These products required different processing for the sales cycle.

The IT Function
The Sales team at RTC drove much of the company's revenue and they owned the relationship with customers. Most of RTC's internal business units were set up to support the Sales team.

The IT department was no exception to this and they were a large business unit within RTC. In addition to supporting Sales, they also supported all the other business units. IT was responsible for the development and maintenance of the Sales Force Automation (SFA) program which allows sales reps selling reusable textile products to look up pricing, provide quotations, and access historical customer purchase activity. The SFA is a web application that is fueled by RTC's ERP software system.

In contrast, the web-based Sales application on the decorative products side is The Configurator (TC). Here, Sales reps can place customer orders, access pricing, and check inventory and product availability. TC was linked to RTC's ERP software system as well; however, system capabilities for decorative products were more highly customized compared to reusable textile products.

For example, a sales order for decorative products would be billed under one line item which includes multiple products and services such as the window treatment fabric, labor, and installation. In contrast, a reusable textile sales order would have many line items all representing an actual finished product SKU.

ERP System
Starting in 1980, RTC utilized Oracle's JD Edwards for their ERP system needs. At that time they specifically began using the AS400 platform. In 1995, RTC had determined business processes were beginning to become more complex and the current AS400 platform had limited capabilities in supporting company growth and the many manufacturing locations that were being added to RTC's operation. There also was an urgent need to ensure ERP systems were Y2K compliant. Therefore, in 1996, RTC announced they would convert their ERP system to Oracle's Enterprise 1 (E1) solution. The scope of this project was to include all business units as part of the planned migration. RTC thought it was reasonable to target 2004 as the projected full companywide conversion date. After all, this

gave the company eight years to rollout the system to the entire company.

ERP System Implementation Team
The influential leader of the new ERP system implementation team forming in 1996 was Kevin Jones, Chief Financial & Information Officer (CFIO), who managed the Accounting, Finance, and IT divisions at the executive level. The IT associates on the evaluation team consisted of two Vice Presidents, three Directors, and three IT associates from each business unit.

This totaled thirty-six internal IT employees all working on the new ERP system implementation for half of the work week. The other half of the work week was devoted to regular job duties such as refreshing the SFA and TC, writing code and queries for various programs and applications, and regular maintenance of the company's internal web page. The Implementation Team would pull in advanced system users of the current AS400 system at the business unit level on an "as needed" basis to provide guidance regarding the business processes and requirements.

RTC also brought in external consultants that represented Oracle who would work as a third party collaboratively with the internal IT division and with high end business unit system users. RTC would hire new employees as needed if they were falling behind on regular job duties as they did not want to remove emphasis of the new ERP initiative.

2. CURRENT BUSINESS PROCESSES

As mentioned, the Sales team was the primary driver of all other business processes at RTC. They would work with customers to determine which product specifications and quantities were desired. Many times when picking up a new account, products would be designed to meet a custom, non-stock fabrication in order to win the new business.

At that point Product Development and Sourcing teams were engaged to create these products. Accounting and Manufacturing were also involved with forecasting for future customer demand, to identify slow moving inventory, and to make recommendations to sales to accommodate immediate consumer demand.

Customer Service worked with Sales and customers on a daily basis processing orders, expediting product shipments, and approving substitute product shipment when stock items were not available. Sales Analytics worked on strategic projects with Sales and Executive Management; these projects included responses to requests for proposal (RFPs), group purchasing organization (GPO) data analysis, and competitive pricing requests. Legal would also be involved with review of signed contract agreement language.

The Finance team functioned primarily as a back end unit. They would review historical margin and financial performance reports with Senior Management. IT was involved intimately with all business processes and units described above and had at least a general understanding of how each business unit utilized the current AS400 ERP system. Additionally, IT had dedicated teams that supported each business unit. However, many of the advanced users of the AS400 system were within the particular business units. (Exhibit 2)

3. CURRENT SYSTEM STATUS

RTC's current Oracle JD Edwards AS400 ERP system had been in use since inception in the 1980's. Even today (in 2014), RTC still utilized the old AS400 system in most of the business units. The AS400 was referred to as "the green screen" and many of the associates at RTC were very comfortable with this system because they had been using it for the past twenty years.

The experienced associates liked the AS400 system so much that over time when business processes posed a problem the system could not handle; they created custom programming within the current system to "override" other parameters of the system. For example, in 2008 there was a major cotton shortage that slowed supply and increased raw material costs. In response, RTC had to implement price increases to their customers especially in the reusable textile products market. In response to these economic conditions, Sales Analytics had to upload many price increases in the AS400 system. However, Sales commissions were to remain unaffected by market driven price increases. The result was the implementation of many overrides and custom modules (developed by IT and the respective business unit) as a way to "patch" the existing system and keep things running smoothly.

4. SYSTEMS SELECTION & PLANNING

IT planning prior to the ERP system implementation was not a top priority at RTC. Despite identifying and understanding current business processes, there was not a systematic evaluation of all available new ERP system software options. RTC felt that the current system in place had proper functionality and capability to support and integrate all business units. The E1 solution was simply a newer version of their current AS400 platform so why would they need to consider other options?

The intent was to implement the new E1 ERP system within each functional business unit one after another. For instance, the new system would be trialed and tested in Accounting and once it was fully functional and all team members had the proper training then they would "go live" with E1. Then the implementation would move to the next functional business unit and begin the process all over again. The ERP implementation process was driven by Executive Management including the CFIO with a primary objective of minimizing cost.

5. E1 IMPLEMENTATION

The first action taken by the E1 Implementation Team in 1996 was to provide companywide communication describing the ERP migration that would take place. The purpose of this was to generate excitement among the associates and to explain the various internal and external benefits the new E1 system would bring. In the communications, a schedule for implementation by business unit was established (Exhibit 3).

RTC started the E1 ERP system conversion with the Accounting and Finance business units. The justification to start there lied in the fact that most of the Y2K compliance concerns, especially for reporting purposes, were within these two business units. RTC thought E1 could be implemented and "live" in the Accounting and Finance divisions prior to the year 2000. It also made sense to take advantage of the fairly standardized systems within Accounting and Finance since they were made up of more standard business processes without much customization.

The IT associates who supported the Accounting and Finance divisions began partnering with high end system users and leadership of the respective business units. Third party consultants with experience in implementing the software were also brought in to partner with the IT associates. It was imperative that both of these parties understood the current AS400 functionality in the respective business units so that business processes could be successfully transferred to the new E1 system. As anticipated, configuration ran smoothly for the E1 implementation in these areas because most of the current system and business processes were fairly basic and standardized. E1 training was provided to Accounting and Finance associates and the new program was gaining acceptance despite some resistance to the new system. One Finance employee commented:

"I was initially skeptical of using the new E1 system since I was so comfortable using the old system. Why would they change something that was working for us for years? I guess it is the best thing to do given the business has evolved and grown exponentially the last 10 years. It will take me some time to get used to this but I am confident that I can learn."

By summer of 1999, E1 was live and functional in the Accounting and Finance departments. This marked a small victory for RTC and gave them momentum as they rolled the new system out to other areas in the company. The following year they began implementation in Legal, Human Resources, Sourcing, and Manufacturing. They expected the Legal and Human Resources conversion to go much like Accounting and Finance because again business processes in these divisions was in line with industry standards. More time was allocated to the Sourcing and Manufacturing functions because here there was a lot of customization among reusable textile and decorative products. As IT associates and external consultants were digging into Sourcing and Manufacturing business processes in 2001, the E1 project was also initiated in Sales & Marketing, Product Development, Customer Service, and Sales Analytics.

6. SYSTEM CHALLENGES

In mid-2002, IT professionals and Oracle consultants could not understand how some of the current system functionality in the Customer Service area worked (and could not find any documentation related to the programs). They came to the conclusion that there were many legacy systems that were built in-house and ran

exclusively on the hardware (IBM AS400) infrastructure that was in place. Additionally, the external consultants had never seen some of the custom applications.

For example, Customer Service representatives would key in orders and a sleeper batch file would run overnight updating new inventory levels on the Manufacturing side. That same day sales representatives would work with forecasting who would also adjust future inventory levels that impacted Manufacturing. These were two separate, manual processes that would not update in real time. Associates would have to wait until the next business day for inventory availability to update in the system.

Furthermore, the Customer Service application utilized in this process differed from the application that Manufacturing worked with when dealing with inventory quantities. In other words, each functional area had their own definition of "inventory availability" so the actual product supply was incorrectly or inconsistently displayed within the system. This caused Sales Analytics to provide bad information to sales consultants looking for substitute product to ship to customers. This resulted in backorders, customer complaints, and in some cases, lost large new business accounts.

There were also issues identifying current business processes and how the AS400 applications supported those processes. In 2003, many high performing employees left RTC due to non-competitive compensation and a micromanaging leadership culture. IT personnel and external consultants found it difficult to trace how certain business units were utilizing the AS400 system simply because the human capital resources were no longer with the company. This was particularly a problem in the Decorative Product Development division. Since decorative product orders were custom in nature, advanced system users had to manually enter product specific information into the AS400 such as supplier, commission structure, and pricing calculations.

IT determined the data driving these systems was based on exception programming and associates in these business units had to be trained by IT to locate specific system applications to perform their roles. RTC fell so far behind in the trial and testing phase of the ERP implementation in some business units that they reached out to ex-employees pleading with

them to return at least part time so they could attempt to regain understanding of key business processes.

In 2008, the only business units that had a functional E1 system in place were Accounting, Finance, Legal, and Human Resources. The initiative was four years behind schedule in the other business units. The problem now was integrating all business units on the E1 platform. RTC had concluded that each business unit that was non-functional on E1 had business processes that were specific to each area, so customized that E1 would not work for them. This prevented a companywide rollout anytime in the near future.

Even worse, associates in Accounting and Finance had to be provided access to the old AS400 system in addition to the new E1 system because they depended on the old system in order to work with Sales, Marketing, and Sales Analytics. For example, Sales Analytics ran sales reports and calculated fees owed to some large customers. Once Sales Analytics came up with a rebate amount for each customer, this had to be entered in the system and accessed by Accounting for budgeting purposes. Accounting could not access this information on E1 because the coding was not linked to the custom AS400 Sales Analytics environment. One employee commented on the frustration he faced:

"If we are to be excited about the new system how do they expect us to believe it is best for the organization when months after we train on the new system we have to go back and keep using the old system. It seems like the company wasted time and money on implementing a system that doesn't work. They should consider abandoning E1 and the money they save by doing that they can give to their poorly compensated employees."

7. THE FUTURE FOR RTC

In 2012, RTC decided to jettison the external consultants they had been working with and hire new consultants. They felt the project was not getting anywhere and that new associates bringing a different perspective could restore the ERP implementation initiative. An IT Vice President and two directors were also asked to leave by RTC. Despite turnover costs, there was some success with E1 implementation in the Customer Service and Sourcing areas. Customer Service was entering orders through E1 and Sourcing was populating product costing through

the new system as well. There were still integration issues and every time RTC tried to "go live" in Sales & Marketing, Customer Service, Manufacturing, and Sales Analytics they still ended up resorting to the old AS400 system so users had dual access to both the old and new systems.

Andre Raymond had much to be proud of as he thought of how to begin his national sales meeting introductory speech. The company had strong sales and many seasoned sales representatives that effectively sold products and built relationships with the many RTC customers. Andre then hesitated and felt disappointment as he knew he had to delivery bad news on the status of the E1 initiative. He looked at Kevin Jones, CFIO, who was also in attendance at the sales meeting, and pondered:

1. Did we take all the appropriate actions in planning the new ERP system implementation?

2. Was the schedule realistic based on the scope and budget of the project?

3. Why have the problems with the old and new systems been dragged out for so long?

4. How can we get this project back on track?

5. Can RTC continue their sales growth and success if internally their systems are in shambles?

Andre took a deep breath and began his inspirational speech to the sales team.

Appendices and Annexures

Exhibit 1: Organizational Chart
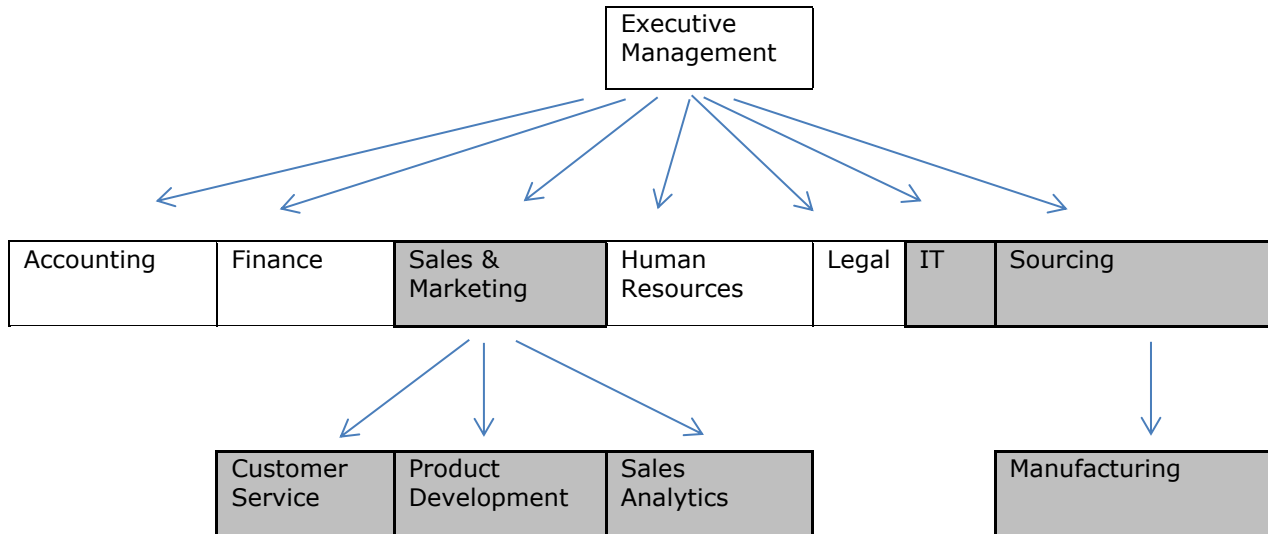
Key:

= Unit operates independent from Product Category

= Unit operates with dual subsets based on Product Category

Exhibit 2: Business Processes

Sales & Marketing
-Generates product demand and inventory
-Require IT application solutions such as SFA & TC
-Owns relationship with the customer
-Builds trust and provides face-to-face support to clients

Accounting	Finance	Sourcing	Customer Service	Product Development	Sales Analytics
-Issues rebate payments to customers	-Reviews financial performance	-Works with domestic & global suppliers	-Order Entry	-Establish new product specifications	-Composes RFP responses
-Accounts Receivable / Collection functions	-Provides margin reports	-Obtains negotiated cost of products	-Handles customer complaints	-Introduce new products	-Provides strategic pricing
-Ensures employees are compensated	-Provides profitability results & targets	-Sets time frame of delivery of new products	-Communicates expected delivery to customers	-Has knowledge of types of products demanded in market	-Works on new business proposals

Manufacturing
-Produces physical products
-Ships finished goods to Warehouse
-Quality Assurance

Key:

= IT facilitates flow of business process via ERP system & technology

Exhibit 3: Schedule by Business Unit

Business Unit	Start of Implementation	Key users interviewed; further understand business processes	Trails and Testing	E1 "Go Live" Date
Accounting	9/1/1996	1/1/1997	1/1/1998	7/1/1999
Finance	9/1/1996	1/1/1997	1/1/1998	7/1/1999
Human Resources	1/1/2000	4/1/2000	4/1/2001	12/31/2002
Legal	1/1/2000	4/1/2000	4/1/2001	12/31/2002
Sourcing	7/1/2000	11/1/2000	4/1/2002	7/1/2004
Manufacturing	7/1/2000	11/1/2000	4/1/2002	7/1/2004
Sales & Marketing	1/1/2001	4/1/2001	9/1/2002	12/31/2004
Product Development	1/1/2001	4/1/2001	9/1/2002	12/31/2004
Customer Service	1/1/2001	4/1/2001	9/1/2002	12/31/2004
Sales Analytics	1/1/2001	4/1/2001	9/1/2002	12/31/2004

Teaching Case

Front-End and Back-End Database Design and Development: Scholar's Academy Case Study

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Abstract

This case study consists of a real database project for a charter school – Scholar's Academy – and provides background information on the school and its cafeteria processing system. Also included are functional requirements and some illustrative data. Students are tasked with the design and development of a database for the purpose of improving the current process of keeping track of students' meals. Skills to be learned include logical database modeling and design, physical design and implementation using both ACCESS (front end) and SQL Server (back end) Databases. Queries, forms and reports are to be developed in ACCESS while the tables will be created in SQL Server. This Case study targets students with no prior programming or database experience. However, more advanced students can further explore the intricacies of an enterprise level database management system (e.g., SQL Server).

Keywords: Teaching Case, Database Design and Development, SQL Server, ACCESS.

1. CASE SUMMARY

Scholar's Academy is a public charter school that emphasizes a Math and Science focus. Within the last five years, enrollment has increased from 400 students to 800 students and lunch service has grown from 100 to 300 students. The nutrition director and the school principal would like to collect students' meal information in a computerized database in order to have timely and accurate information on all types of students (paid, reduced and free meals). Currently, Scholar's Academy relies on a manual process to track students' meals supplemental by an Excel spreadsheet. Due to the increase in enrollment, it has become an inefficient and cumbersome system. Moreover, to be compliant with privacy policies, cafeteria staff cannot discuss account balances with students as they pass through the lunch line, therefore allowing some students to continue getting meals while having an unpaid balance. This concern is clearly stated by the nutrition director:

"There are so many rules that make it hard to collect in the lunch line. I can't highlight the students that owe money because other students may see or hear me. Our system is set up as paid students are charged $3.00 per meal. Reduced students are charged $.40 and then our free students. If I say to a student in the lunch line that he owes $2.40, then I just identified that student is on reduced lunch and breached confidentiality."

As a result of this current process, Scholar's Academy was forced to write off over $7,000 last year in unpaid lunches.

Current Process Description:
Scholar's Academy's current cafeteria processing system consists of the following: 1) a daily paper printouts of students' list, 2) manual check mark next to the student's name and type of meal at the actual cafeteria line as the students go through the line, 3) data entry in Excel Spreadsheet, 4) manual end-of-day production of daily reports, and 5) manual end-of-day production of emails and/or printed letters to parent/guardian regarding student meal balances.

In an interview with the nutrition director, she emphasized the above steps:

"A typical day for me is to print off the entire school roster which wastes paper as only half of the students eat lunch, take the list to the cafeteria and check off the students' name as they get their lunch tray. Later that day I will enter the checked names into the information in the computer in Excel. I look up student names, select their meal (breakfast, or lunch), and make sure I have today's date. If I am behind, I have to enter yesterday's date."

Due to additional duties and the complexity of the different types of meals applied to individual student, it has become more difficult for the Director to monitor the student's lunch balances.

Problems with Current System:
Scholar's Academy's current cafeteria processing system is hindered by the following problems:

o   The current system relies heavily on the use of paper printouts and manual data entry, which is extremely time-consuming and causes a slow movement of students through the meal line. This reduces the amount of time that students have to complete their meal before returning to class.

o   The current system does not have an efficient mechanism in place that allows for full compliance with the federal law that prohibits schools from overtly identifying students receiving free and reduced price meals.

o   The current system does not have an electronic mechanism that ensures that a "free" student obtains a "full meal", rather than simply getting limited individual items. Scholar's Academy is required by the USDA

to prove that all "free" students get a "full meal"; otherwise Scholar's Academy's funding will be jeopardized.

o   The current system does not have an electronic mechanism that ensures that a particular customer is only allowed to go through the meal line only once per meal session.

o   The current system does not have an efficient mean of verifying that the actual student in the meal line matches the student name on the roster list.

o   The current system does not have an efficient electronic mechanism to ensure that information for each and every instance of a customer transaction is captured, which causes inaccuracies in recordkeeping and reporting.

2. FUNCTIONAL REQUIREMENTS

The nutrition director, along with the school principal, wants a more efficient cafeteria processing system that will keep track of students' meals and balances. The nutrition director needs access to a computerized form at the cafeteria to allow staff to either check students at the lunch line. Daily internal reports are needed to accurately capture total transactions to the school administration while external reports are sent the State for reimbursement for free and reduced meals.

Database Design Requirements
Each student has a unique six-digit ID number, a photo and fingerprint scan. Students must be linked to at least one parent/guardian (for payment purposes). The contact will have a unique six-digit ID number along with name, address, phone number, and email recorded. The unique identifier for meals will be a five-digit ID number and a description of the meal will also be included.

A student may purchase several meals but each transaction is associated only one student. A transaction is made for only one meal. Transactions have a unique seven-digit number as an identifier and date, time, and transaction amounts are recorded as well.

A payment can be made by the student through cash, check or credit card (unless it is free then, there is no payment). An instance of payment is associated with only one customer. Payment will

be uniquely identified by a six-digit number, and amount, date, payment method and processor.

Parents/guardians are associated with students for the sole purpose of receiving monthly meal statements and for notification when balances are unpaid.

Queries Requirements
The nutrition director needs several different queries to obtain the information needed to become more efficient and cut down on losses.

1. **Student List:** List all students' first name, last name, and grade. Sort by grade first and last name second.

2. **Students and their Meal Status:** List all students' first name, last name, meal status (free, reduced, or paid). Order by meal status first and last name second.

3. **Daily Transactions:** Calculate the total number of meals served and the sum of meal cost per day.

4. **Total Free Meals:** Calculate the total number of meals served to students with a status of free meal and the cost of the meals.

5. **Total Reduced Meals:** Calculate the total number of meals served to students with a status of free meal and the cost of the meals

6. **Payments by Students:** List all payments made by students.

7. **Student Balances:** List the name of students, their current charges and payments

8. **Unpaid Balances:** List students' names and any payments that are less than total charges.

Forms Requirements
The nutrition director requested several data entry forms to either enter new data or view existing records for the following tables: Student, Menu, Payment, and Parents. Other forms are also needed and require linking two or more forms:

1. **Transaction Form:** This form will be used at the cafeteria line to display a student name and photo as soon as he/she places a thumb on the biometric device attached to the computer, and allow the staff to select the menu item that the student is consuming during a transaction.

2. **Payment History Form:** This form will hold all information on the meals consumed by a student as well as payments made. A drop down list allow users to select a student name.

3. **Main form:** Scholar's academy would like a simple main form that allows easy access to either reports or other forms.

Report Requirements
Scholar's Academy will need several reports to ensure accurate internal reports, external reports free meals to the State, and external reports to the parents.

Internal Reports
1. **Student Lunch Count:** Sub-total by free, reduced, or full paid lunches including total charges (in dollars).

2. **Monthly Total Lunches:** Sub-total by free, reduced, or full paid lunches including total charges (in dollars).

3. **Total Lunches per Grade:** Sub-total by free, reduced, or full paid lunches per grade.

4. **Total Meal Charges versus Payments:** Sub-total of meal charged; Sub-total of payments received.

5. **Daily Reports to the Teachers:** Daily list of students with zero or negative balance. This will prevent students from being told in the lunch line that they have no funds.

External Reports
1. **State Funding Report:** Total amount of free and reduced lunches reported to ensure those students receiving free lunch receive a "full meal" and not jeopardize school funding.

2. **Reports to Parents:** Individual report per student showing unpaid balances. The report should show the meal charged and the payments received.

3. DELIVERABLES

Deliverable One
Identify entities and attributes and develop an entity-relationship diagram (ERD). Mark cardinalities and modalities, and solve any

many-to-many relationships (i.e. associative entities). Document any assumptions.

Deliverable Two
Revise the previous ERD (if necessary). Convert assumptions into business rules. Create data structures normalized to 3NF. Complete an attribute description table including: field name, data type, and comments.

Deliverable Three
SQL will be used as the back end to create the tables and Access as the front end for the forms and reports. Students will have to set up an ODBC connection.

1. Create the tables and populate them with made up student data. Students can use the appendix to populate the meal table.

2. Run the queries and reports mentioned.

3. CONCLUSION

Before ending the interview with Scholar's Academy nutrition director concerning their requirements, she noted:

"There must be several ways to handle the cafeteria processing system better than what I currently am doing. What options are available to me to become more efficient and how do I start to find more information about them?"

Clearly, Scholar's Academy needs your assistance. As the school enrollment grew from 400 to 800 students, the current process presents several shortcomings. The daily print out of the entire school roster, the manual check off at the cafeteria line, and the end of day data entry into Excel is preventing Scholar's Academy from accurately and effectively processing students' meal information. To prevent another year of writing off unpaid balances and wasting staff time, Scholar's Academy needs your assistance with developing a database to better track its data. Help Scholar's Academy get rid of its current practices and become more efficient.

Appendix

Breakfast is a 2 week cycle menu. The regular paying student price is $1.50, reduced student is $.30. If a student does not get the full meal, they will pay more for individual items regardless of their meal status. The breakfast entrée will cost $2.00, fruit $1.00, and milk and juice will cost $.75 each.

Lunch is a 3 week cycle menu. The regular paying student price is $3.00, reduced students is $.40. If a student does not get the full meal, they will pay more for individual items regardless of their meal status. The lunch entrée will cost $3.50, fruit and vegetables are $1.00 each and milk is $.75.

Calendar		
Menu	Description	Schedule Day
BREAKFAST: WAFFLES, SYRUP, FRUIT, JUICE, MILK…….LUNCH: SALISBURY STEAK, MASHED POTATOES, GREEN BEANS, PEARS, MILK		
BREAKFAST: COLD CEREAL, SUPER BUN, FRUIT, JUICE, MILK……..LUNCH: CHICKEN QUESADILLA, BAKED BEANS, MANDARIN ORANGES, MILK		
BREAKFAST: WW BLUEBERRY MUFFIN, FRUIT, JUICE, MILK……..LUNCH: HAMBURGER ON WHEAT BUN, FRIES, BANANA, MILK		
BREAKFAST: CEREAL BAR, YOGURT, FRUIT, JUICE, MILK………LUNCH: BREADED CHICKEN SANDWICH, CORN, CARROTS, PEACHES, MILK		
BREAKFAST: EGG PATTY, BISCUIT, FRUIT, JUICE, MILK………LUNCH: BAKED ZITI PASTA, BROCCOLI, WHEAT BREAD, PINEAPPLE, MILK		
BREAKFAST: FRENCH TOAST, SYRUP, FRUIT, MILK, JUICE…………LUNCH: CORN DOG BAKED BEANS, PEACHES, MILK		
BREAKFAST: BLUEBERRY MUFFIN, FRUIT, JUICE, MILK……………LUNCH: CHICKEN NUGGETS, GREEN BEANS, WHEAT BREAD, BANANA, MILK		
BREAKFAST: CEREAL BAR, YOGURT, FRUIT, JUICE, MILK…………..LUNCH: CHICKEN PASTA, CARROTS, WHEAT BREAD, PEARS, MILK		
BREAKFAST: CHEESE MUFFIN, FRUIT, JUICE, MILK………LUNCH: BEEF & BEAN BURRITO, GREEN SALAD, FAT FREE RANCH DRESSING, PINEAPPLE, MILK		
BREAKFAST: TURKEY SASAGE, BISCUIT, FRUIT, JUICE, MILK………..LUNCH: GRILLED CHICKEN SANDWICH, FRIES, MANDARIN ORANGES, MILK		
BREAKFAST: WAFFLES, SYRUP, FRUIT, JUICE, MILK…………LUNCH: CHICKEN NUGGETS, SWEET POTATO FRIES, PEACHES, WHEAT BREAD, MILK		
BREAKFAST: COLD CEREAL, SUPER BUN, FRUIT, JUICE, MILK…LUNCH: COUNTRY STEAK, MASHED POTATOE, GREEN BEANS, ORANGES, WW BREAD, MILK		
BREAKFAST: BLUEBERRY MUFFIN, FRUIT, JUICE, MILK………..LUNCH: SPAGHETTI, BROCCOLI, APPLE, WW BREAD, MILK		
BREAKFAST: CEREAL BAR, YOGURT, FRUIT, JUICE, MILK………LUNCH:CHEESE BURGER MACARONI, RANCH BEANS, PINEAPPLE, W BREAD, MILK		
BREAKFAST: EGG PATTY, BSCUIT, FRUIT, JUICE, MILK……….LUNCH: PIZZA POCKET, GREEN SALAD, FF RANCH DRESSING, PEARS, MILK		
BREAKFAST: FRENCH TOAST, SYRUP, FRUIT, JUICE, MILK………..LUNCH: SALISBURY STEAK, MASHED POTATOES, GREEN BEANS, PEARS, MILK		
BREAKFAST: BLUEBERRY MUFFIN, FRUIT, JUICE, MILK……….LUNCH: CHICKEN QUESADEILLA, BAKED BEANS, MANDARIN ORANGES, BANANA, MILK		
BREAKFAST: WAFFLES, SYRUP, FRUIT, JUICE, MILK…………LUNCH: CORN DOG, BAKED BEANS, PEACHES, MILK		

Calendar		
Menu	**Description**	**Schedule Day**
BREAKFAST: COLD CEREAL, SUPER BUN, FRUIT, JUICE, MILK..........LUNCH: CHICKEN NUGGETS, GREEN BEANS, WHEAT BREAD, BANANA, MILK		
BREAKFAST: BLUEBERRY MUFFIN, FRUIT, JUICE, MILK..........LUCNH: CHICKEN PASTA, CARROTS, WHEAT BREAD, PEARS, MILK		
BREAKFAST: CEREAL BAR, YOGURT, FRUIT, JUICE, MILK..........LUNCH: BEAN & BEEF BURRITO, GREEN SALAD, FF RANCH DRESSING, PINEAPPLE, MILK		
BREAKFAST: EGG PATTY, BISCUIT, FRUIT, JUICE, MILK..........LUNCH: GRILLED CHICKEN SANDWHICH, FRIES, MANDARIN ORANGES, MILK		