STARExplorer Case: Searching for ways to integrate data analytics and accounting

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ABSTRACT

Since the turn of the century many industry employers have used data analytics to improve their businesses. In listening to employers, universities have begun to utilize data analytics in the classroom. Many schools have embarked on the development of specialized business analytics graduate programs while others choose to weave data analytics through a variety of courses in many majors. This case looks at the implementation of data analytics within the core curriculum of an accounting program. This case can be used in a variety of ways to demonstrate the use of analytics within the accounting curriculum, and how knowledge of these tools can enhance the students' learning experiences to prepare them for future employment. The case is appropriate for undergraduate accounting courses in intermediate/advanced accounting and accounting information systems. The following case study does not require the use of an SAP server. The case scenario uses the current version of SAP Lumira.

Keywords: Analytics, SAP Lumira, Visualization, Trends in Accounting Education

INTRODUCTION

Accountants in today's environment provide critical decision support to senior management, which often involves the analysis of complex data. The accountant's role is moving away from transactional processing towards providing decision support and analysis to upper level management. Supporting management decision making often involves gathering and assembling complex data sets to facilitate the process for organizing and visually displaying data in an interactive and user-friendly interface. Pan and Seow (2016) identify the growing number of skill sets accountants will need as we, "transform the way accountants think from looking backward to looking forward – calculating and forecasting the future."

Many organizations currently use data to structure better decisions on strategic management and operational direction. Reyes (2015) states, "Big data – large and complex datasets collected from digital and conventional sources that are not easily managed by traditional applications or processes – have transformed business industries affecting millions of organizations and individuals." Moffitt and Vasarhelyi (2013) observe that, "Today's businesses are run differently, based on hundreds of linked transactions happening at once." The challenge remains to find the analytical tools that can encapsulate complex data into meaningful patterns that can be interpreted efficiently by business leaders.

As many organizations are now using visualization software, educators now face the increasing challenge of including big data applications in their classrooms that provide opportunities to use data visualization tools to produce dashboards. DeBoseky, David, and Doran (2012) notes, business students in general and accountants in particular need to be exposed to this new technology within their undergraduate curriculum. Hill and Kline (2014) describe the development of an undergraduate business course in big data analytics and focus in the article on the many hurdles and challenges both the students and faculty have faced to produce even limited success.

Moffitt and Vasarhelyi (2013) write the need for accounting courses to accommodate business needs generated by rapid changes in technology. The question becomes what course best provides the learning opportunity to deliver knowledge of analytics in a big data environment. Van der Heijden (2013) examines the use of information dashboards in non-accounting related courses such as Information Systems and Business Intelligence. Janvrin, Pinsker, and Mascha (2013) observe that analytics is particularly useful in financial statement disclosures and could easily be applied to Finance courses. Cong and Romero (2013) focus on the information systems complexity presented using analytics within auditing courses. Steinbart et al (2013) believes that analytics should, at a minimum, be taught and presented within the accounting information systems courses with a stress on teaching students how to develop analytic dashboards. A consistent theme of prior research is that technology skills should be started early in the business curriculum, and extend into several courses.

MOTIVATION AND METHODOLOGY

Access to SAP Lumira is enabled through the SAP University Alliance network. The SAP University Alliance is a multinational network of over 1100 schools providing university faculty members with the tools and resources required to instruct students on integrated business processes and strategic thinking through the use of ERP technology.

In 2010, our university realigned its curriculum around 6 courses with the plan that technology tools would be integrated into four of the six courses. Intermediate Accounting (FAIS I), Intermediate Accounting II (FAIS II), Advanced Accounting (FAIS III), and Cost Accounting (MAIS) would be integrated around one common case within SAP ERP and completed through the use of spreadsheet software and advanced data visualization tools. The case integration was led by a senior full professor and enabled by the STAR Scholars program. These STAR Scholars students assist in classroom delivery by developing in-class handouts/scripts and continue to service the course by maintaining a help desk for students.

Students can access SAP Lumira by a download on www.saplumira.com. The website allows for a thirty-day free trial. The case developed is implemented in the classroom within the thirty-day trial period of the initial download. Students utilize SAP Lumira to develop data visualizations and dashboards.

THE CASE

This case requires students within an undergraduate accounting curriculum to create a simple interactive application to support strategic business decision making. The case helps to show students the advantages of interactive visualization, typical of what they may see in a real-world environment. This case utilizes Excel and SAP Lumira but can be done using other visualization tools such as Tableau.

Global Bike Inc. (GBI) has approached STAR Group Inc., a fictional public accounting /consulting firm, to evaluate transactional data for the past seven years. Throughout this case study, the students will serve as the consultants for STAR Group Inc. and will report directly to the CEO, Art Vandelay. Using the database created by students within SAP ERP provided by GBI, students are asked to create forecasted financial statements within Excel and then use SAP Lumira to effectively visualize this information

This case study describes how to analyze and visualize data using SAP Lumira. The questions are based on the income statement of the Global Bike Inc. enterprise in the US and Germany. The learning objective is not only to understand how to use SAP Lumira, but also, how to analyze a given reporting request or problem, and based on possible options, how to present the best way to visualize the solution. Data analytics using visualization tools have become the standard for businesses and corporations as they allow the working professional to distinguish patterns within massive amounts of multi-dimensional data generated by a modern business. Visualization software such as SAP Lumira has visualization and dashboard capabilities that allow for data mining which summarizes data into useful information, information that can be used to increase revenue and cut costs. The students use this case study as an opportunity to explore the world of data analytics and utilize their accounting knowledge to provide useful insights to the CEO, Art Vandelay, in order to help sustain GBI's operational and functional growth.

COMPANY BACKGROUND

Global Bike Incorporated (GBI) is a supplier of bicycles to other bicycle retailers. GBI primarily deals with established sets of customer and vendor companies. GBI is involved in both wholesale purchasing and selling of two unique categories of product: bicycles and accessories. Each sales and purchasing division of GBI has unique personnel. The purchasing divisions have

Accounts Payable Accountants who have specific duties such as the processing of invoices and payments. The sales divisions have Accounts Receivable Accountants who have specific duties such as the processing of incoming payments.

This case study describes how to analyze and visualize data using SAP Lumira. The questions are based on sales data of the Global Bike Inc. enterprise in the US and Germany. The main learning objective is not to understand how to use SAP Lumira, but how to analyze a given reporting request or problem, and based on possible options, how to present the best way to visualize the solution. The modern business professional has trained him or herself to identify patterns in large quantities of data to ensure quality decision making for upper level management.

THE CASE OBJECTIVES

o Investigate the role of analytics in financial reporting
o Develop a multi-year analytics based report evaluating corporate performance
o Develop a dashboard menu within SAP Lumira enabling users to access key performance indicators
o Evaluate corporate performance attaching analytics report in e-mail communication to senior executives

This scenario deals with examining the business reporting function needed to evaluate and analyze company trends. The case starts by defining a key problem a corporation is facing and allows the students to determine business information needed to solve the problem and present it in analytic format to the CEO of the company.

Phase 1: Students are asked to precisely define the information needs arising from a recent corporate decision. The communication between the students and the simulated CEO of Global Bike as seen in Appendix A1, the CEO expresses concern with the content and formatting of the report as provided from SAP ECC 6.0 and also makes a request for an updated report to close the month of October including a pro-forma projection over the 10 years. (Appendix A1)

Phase 2: From the database in the general ledger, the student downloads the SAP report into Microsoft Excel. In Microsoft Excel, students transition the SAP report into a US GAAP compliant financial statement by eliminating artifacts and legacy data, removing account numbers using a midpoint formula, deleting the negative sign from accounts that have credit balances using the absolute value function. (Appendix A2)

Phase 3: After creating a US GAAP compliant Income Statement, students will then use a constant yearly growth rate of 20% to measure what the income statement will look like in over the course of the next 10 years given the annual growth rate of 20%. After applying the annual growth rate, students will then transpose the data to prepare for seamless transition from Microsoft Excel into the data visualization software SAP Lumira. (Appendix A3)

Phase 4: Students will prepare two different visualizations within SAP Lumira; one to indicate the relationship between revenue, gross profit, and sales and how they have all grown incrementally together at a constant rate; and another visualization identifying what GBI main expenses looks like over the next 10 years. After completing both visualizations, students aggregate the reports into a dashboard which is made interactive when students Lumira's slice and dice capabilities. (Appendix A4)

Phase 5: After creating the dashboard, students will then write an email to the CEO using the SAP Business Workplace offering their opinion as to where the company is going in light of the data and how it might achieve its long-term goals. (Appendix A5)

LESSONS LEARNED AND FUTURE DIRECTION

- After three semesters of using this case many lessons have been learned about integrating technology within accounting curriculum.
- Communicate exactly what you want students to do before, during, and after you have them do it.
- There is and always will be a learning curve when technology is involved; much of that deals with the teacher and the students they are teaching; do not be afraid to adapt and change the way you want to deliver the material.
- Faculty need to become more comfortable with being the "guide on the side".

The use of cases implies that students are doing most of the work, and given their technology talents, it probably makes the class more effective. This case could also be applied in other courses such as Business Intelligence and Analytics as well as Finance using real data accessed through an external database. The key is to get the data translated to Excel, the integration between SAP Lumira and Excel is seamless.
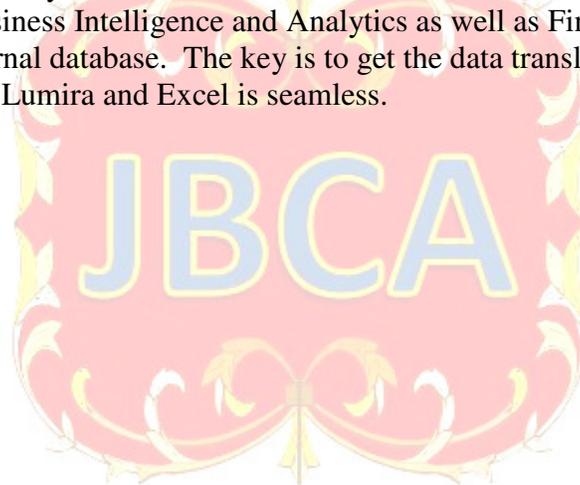
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APPENDIX A: DASHBOARD VISUALIZATIONS

Phase 1 – Appendix A1

Phase 2 – Appendix A2

	A	B	C
1			
2		**Global Bike Inc.**	
3		**Income Statement**	
4		**For the Year Ended December 31, 2016**	
5		Sales Revenue	88000
6		Cost of Goods Sold	28000
7		Gross Profit	60000
8		Supplies Expense	1500
9		Utilities Expense	15000
10		Rent Expense	25000
11		Payroll Expense-Office	3840
12		Payroll Expense-Administrative	960
13		Shipping Expense	2400
14		Net Income	11300
15			

Phase 3 – Appendix A3

	A	B	C	D	E	F	G	H	I	J	K
1	Fiscal Year	Sales Reve	Cost of Goods	Gross Profit	Supplies Expense	Utilities Expense	Rent Expense	Payroll Ex	Payroll Ex	Shipping Expense	Net Income
2	2016	88000.00	28000.00	60000.00	1500.00	15000.00	25000.00	3840.00	960.00	2400.00	11300.00
3	2017	105600	33600	72000	1800	18000	30000	4608	1152	2880	13560
4	2018	126720	40320	86400	2160	21600	36000	5530	1382	3456	16272
5	2019	152064	48384	103680	2592	25920	43200	6636	1659	4147	19526
6	2020	182477	58061	124416	3110	31104	51840	7963	1991	4977	23432
7	2021	218972	69673	149299	3732	37325	62208	9555	2389	5972	28118
8	2022	262767	83608	179159	4479	44790	74650	11466	2867	7166	33742
9	2023	315320	100329	214991	5375	53748	89580	13759	3440	8600	40490
10	2024	378384	120395	257989	6450	64497	107495	16511	4128	10320	48588
11	2025	454061	144474	309587	7740	77397	128995	19814	4953	12383	58306
12	2026	544873	173369	371504	9288	92876	154793	23776	5944	14860	69967
13											

Phase 4 – Appendix A4

GBI Analytics Dashboard
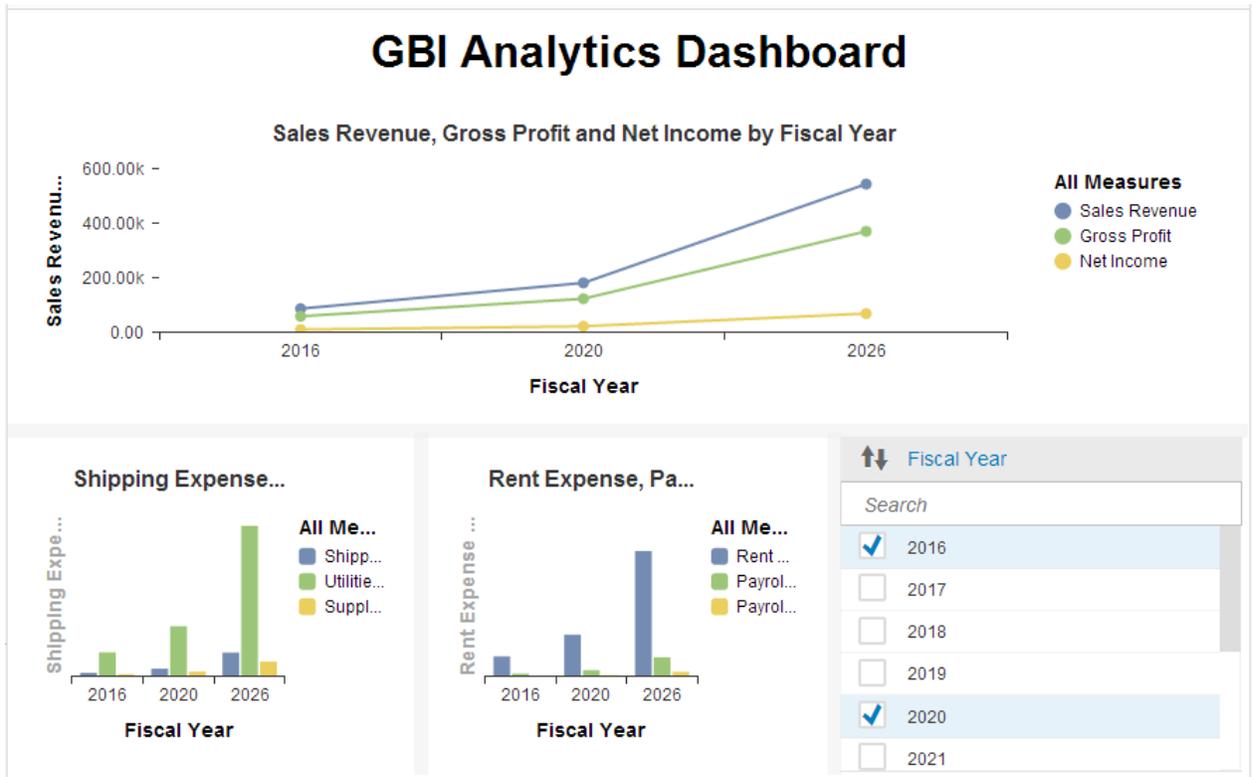
Phase 5 – Appendix A5

Good morning, Art,

I have attached a dashboard that displays three different graphs of data regarding GBI's forecasted future. The first, the upper line graph, displays sales revenue, gross profit, and net income. The growth of sales and net income is balanced from 2016-2020; however, operating expenses exponentially increased between 2020-2026. The second, a column chart to the bottom left, displays supplies, shipping, and utilities expense. Utilities expense displays skyrocketing behavior over the ten year forecast. This is one of the expenses that decreases net income most between 2020-2026. The third, a column chart to the bottom middle, displays payroll expense – office, payroll expense – admin, and rent expense. Rent expense is based on percentage of sales, and therefore becomes less manageable when sales are at their highest between 2020-2026. Lastly, there is a fiscal year filter to filter the data to view trends over long periods. These graphs display the value of data analytics and forecasting. Given one year of data, we have been able to forecast ten years of data for you to view trends, relationships, and make key business decisions on how to continue business operations or make changes.

Data analytics can be conducted cost effectively given prior or current year data and Microsoft Excel. Although we have utilized SAP Lumira, a powerful data analytics visualization tool, Excel enables one to conduct data analytics through manipulation and formatting of data. In addition to this, SAP Lumira allows us to produce dashboards. Dashboards are the formatting of several data analytics graphs on one easy to view screen. Dashboards, such as the one I have attached, could allow executives to determine whether they would like to continue on the course that they are on or whether they would like to make changes for the future, such as changing variables costs to fixed costs, as in the case of utilities expense, payroll expense – office, and rent expense as revenues continue to grow over time.

As demonstrated in the dashboard attached, utilities expense and rent expense are exponentially greater than other expenses within their categories. It is been brought to my attention that GBI pays rent on a percentage of revenue basis. As this is the current practice, it would be valuable to stay on this course if GBI did not predict growth and expansion; however, the forecast of data in the dashboard was conducted on a 20% annual growth forecast. As GBI's revenues grow steadily, rent expense will continue to grow, while the facilities stay the same. I would recommend this practice be discontinued and changed to a fixed cost to focus more on the bottom line. This change to a fixed cost would have to be negotiated with the landlord of the facilities. Depending on the particular contract renegotiated, a variable cost based on revenues may be more profitable for the short-term until 2020, then switching over to a fixed cost in time when costs and revenues increase dramatically between 2020-2026.

As all of GBI's employees work on a commission basis, payroll expenses are variable based on sales revenues. At this point in time, it makes sense to continue payroll expense as a variable expense. However, over time, I believe it would be in GBI's interest to move payroll expense for office employees (as opposed to administrative employees) to a salary basis instead of a commissions basis. Although payroll expenses have not increased as much as some of the other expenses, commissions incentivize overstatement of sales, employee competitiveness and misguided business practices, as demonstrated as Wells Fargo's account setup fraud recently publicized.
Data analytics and dashboard creation are useful tools for forecasting and executive decision making. Please see the attached dashboard. If you have any questions, please let me know.

Have a nice day,

Student