TW2Beers

**Sample Only**

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Final Report

Revision Number 3

**1. Problem statement and approach**

Three entrepreneurs who love beer have built their own microbrewery in Topeka, Kansas. Ultimately, their goal is to produce and deliver beer across the nation, but since start-up funds are tight, they must produce beer in a single distillery in Topeka and select one initial city to which they will deliver beer to distributors over the next twelve months. They are now trying to decide in which city to initiate sales and have narrowed their choices down to Madison, Wisconsin or Austin, Texas. TW2Beers will base their decision on which scenario realizes the most beneficial and optimal efficiency ratio over a twelve month period, as compared to the microbrewery industry standard.

Using Microsoft Excel, we have developed a spreadsheet model, named TW2Beers, that will help the three brewery owners decide between scenario one: initiating sales in Madison, or scenario two: initiating sales in Austin. The overall business objective is to select the destination city for which the company’s efficiency ratio (expenses/revenue) is lower than the industry standard efficiency ratio over the most number of months during the next twelve month period. A lower efficiency ratio is more favorable because a low efficiency ratio indicates that a company’s expenses are relatively low and revenues are relatively high. To stay competitive in the microbrewery marketplace, TW2Beers strives to have their efficiency ratio stay at or below industry standard efficiency ratio as much as possible.

The scope of the model will include revenue projections (i.e., sales less cost of goods sold); operating expenses (i.e., selling, transportation, and depreciation expenses); and efficiency ratios (i.e., expense divided by revenue). The final output streams that will be used for decision-making are: (1) cumulative monthly revenue over the next twelve months; (2) cumulative monthly expenses over the next twelve months; and (3) efficiency ratios over the next twelve months. Analyses other than those mentioned here are out of scope for this model.

After consulting with the TW2Beers sales department, and receiving reliable market forecasts and sales projections that included the sales price of beer, number and cost of kegs manufactured per brewed batch, employee productivity and pay rates, and transportation capacity and cost, we have modeled production, sales, and transport for Madison (scenario 1) and production, sales, and transport for Austin (scenario 2). Business in each city generates a separate and unique efficiency ratio over the next twelve months, and this is indicative of the market for Light and Dark beer and the costs to distribute in each region. Per the goals of the firm, TW2Beers will initiate sales in whichever city the company’s efficiency ratio (expenses/revenue) is lower than the industry standard efficiency ratio over the most number of months during the next twelve month period.

**2. Descriptions of scenarios**

The two scenarios facing TW2Beers and its team of owners are: (1) initiating beer sales in Madison, Wisconsin or (2) initiating beer sales in Austin, Texas.

Madison fosters a culture for cheese and dark, heavy beer, and the predominantly cold weather leads consumers to purchase more dark beer than light beer. Because demand for dark beer is higher in Madison, the sales price for dark beer is also higher. The production of Dark beer is more expensive than that of light, but the higher costs can be passed on to the consumer as dark beer has a higher price point. The cost of living is slightly higher in Madison (as opposed to Austin), so the monthly salary for a sales representative is higher in Madison. Seasonal costs are also incurred from distributing in Madison. In the colder months, transporting the beer from Topeka to Madison is more expensive because the wintry and harsh road conditions require TW2Beers to purchase and retrofit special equipment such as snow tires. Traveling between Topeka and Madison will create more wear and tear, and the potential for damage to the delivery truck, so the trucks scrap value will be lower. Due to the seasonal and cumbersome road conditions, and the experience and expertise needed for navigating in severe weather, driving to Madison is more difficult than driving to Austin, so the learning curve for our Madison delivery truck drivers will be steeper than that for drivers delivering beer to Austin.

Austin is home to a climate and culture that is typical of the south, which is dominated by hot weather and Nascar; this creates a market of consumers who like to quench their thirst with more light beer than dark. Sales and demand for light beer are higher in Austin, so TW2Beers is able to charge a higher sales price for light beer. The cost of living and wages are relatively low in Austin, so the monthly salary for a sales representative is lower in Austin than it is in Madison. Transporting the beer from Topeka to Austin, where the sun and dust can damage the delivery trucks along the route requires TW2Beers to take preventative measures and purchase special equipment such as heat resistant paint and wax. However, the drive to Austin will be less treacherous overall, so the trucks scrap value will be higher and the learning curve for an Austin driver will be less steep.

**3. Conclusions of the study**

The TW2Beers spreadsheet model comparing initiating beer delivery in Madison versus initiating beer delivery in Austin, has been used to conclude that given these two options, TW2Beers should initiate sales in Austin, Texas because when delivering to Austin, TW2Beers’ efficiency ratio is below the industry standard six out of the next twelve months. As seen on the output tab, in months six, seven, eight, nine, ten, eleven, and twelve, TW2Beers’ efficiency ratios of 54%, 54%, 53%, 53%, 53%, and 53%, respectively, are lower than the industry’s efficiency ratio which during the period modeled here is a constant 55%. For Madison, TW2Beers’ efficiency ratio is only below the industry standard four out of the next twelve months. As seen on the output tab, only in months nine, ten, eleven, and twelve are TW2Beers’ efficiency ratios of 54%, 53%, 53%, and 53%, respectively, lower than the industry’s efficiency ratio which during the period modeled here is a constant 55%.

A lower efficiency ratio is more favorable because a low efficiency ratio indicates that a company’s expenses are relatively low and revenues are relatively high. To stay competitive in the microbrewery marketplace, TW2Beers strives to have their efficiency ratio stay at or below industry standard efficiency ratio as much as possible.

As such, given these two options, TW2Beers should initiate sales in Austin, Texas.

**4. Budget and schedule performance**

Since the midpoint status report, a “Final Status” column has been added to the far right of the following table. The “Final Status” column reports the actual completion date of each scheduled item as well as a description of whether the task was completed early, on-time, or late.

|  |  |  |  |
| --- | --- | --- | --- |
| FINAL SCHEUDLE | | |  |
| **Action Item** | **Deadline**  **(established 10/1/2013)** | **Midpoint Status**  **(as of 10/30/2013)** | **Final Status**  **(as of 12/18/2013)** |
| Team meeting | 10/06/2013 | Complete | 10/06/2013,  on-time |
| Define the problem | 10/06/2013 | Complete | 10/06/2013,  on-time |
| Allocate the project components amongst the team members | 10/07/2013 | Complete | 10/07/2013,  on-time |
| Devise a schedule for completion of the entire project | 10/08/2013 | Complete | 10/08/2013,  on-time |
| Draft Course Project Proposal | 10/08/2013 | Complete | 10/08/2013,  on-time |
| MILESTONE 1: Submit Course Project Proposal deliverable via DropBox | 10/09/2013 | Complete | 10/09/2013,  on-time |
| Model sales revenues in Excel | 10/15/2013 | Complete | 10/15/2013,  on-time |
| Model cost of goods sold in Excel | 10/23/2013 | Complete | 10/30/2013,  late |
| Team meeting | 10/25/2013 | Complete | 10/25/2013,  on-time |
| Draft Midpoint Status Report | 10/27/2013 | Complete | 10/27/2013,  on-time |
| MILESTONE 2: Submit Midpoint Status Report deliverable via DropBox | 10/30/2013 | Complete | 10/30/2013,  on-time |
| Model selling expenses in Excel | 11/10/2013 | In progress | 11/20/2013,  late |
| Model transportation expenses in Excel | 11/20/2013 | In progress | 11/30/2013,  late |
| MILESTONE 3: Circulate draft spreadsheet model deliverable to all team members for review | 11/30/2013 | On track | 11/30/2013,  on-time |
| Team meeting | 12/6/2013 | On track | 12/7/2013,  late |
| Revise spreadsheet model | 12/7/2013 | On track | 12/7/2013,  on-time |
| Draft Final Report | 12/2013/2013 | On track | 12/14/2013,  late |
| Draft Usage and Maintenance Guide | 12/15/2013 | On track | 12/14/2013,  early |
| Team meeting | 12/17/2013 | On track | 12/16&17/2013,  early on-time |
| MILESTONE 4: Submit Final Report and Usage and Maintenance Guide deliverable | 12/18/2013 | On track | 12/18/2013, on-time |
| De-identify all project documents | 12/20/2013 | On track | 12/18/2013, early |
| MILESTONE 5: Submit De-Identified Project Documents for submission to Course Project Library deliverable via DropBox | 12/20/2013 | On track | 12/18/2013, early |

At the midpoint status report, we estimated that the total cost to deliver the proposed spreadsheet model would be 74 hours. After completing the project, the final, actual total cost was 76 hours. The itemized breakdown can be found below.

|  |  |  |
| --- | --- | --- |
| FINAL BUDGET | | |
| Action Item | Estimated Total Cost ( in hours) | Actual Total Cost (in hours) |
| Planning |  |  |
| Define the problem | 7 | 7 |
| Allocate the project components amongst team members | 2 | 2 |
| Devise a schedule for completion of the entire project | 2 | 2 |
| Modeling |  |  |
| Model revenues | 10 | 10 |
| Model expenses | 10 | 11, over |
| Model net income | 6 | 6 |
| Graphically display output using charts | 5 | 5 |
| Documents |  |  |
| Cost of producing Course Project Proposal | 5 | 5 |
| Cost of producing Midpoint Status Report | 4 | 4 |
| Cost of producing Final Report | 9 | 10, over |
| Cost of producing Usage and Maintenance Guide | 7 | 8, over |
| Execution |  |  |
| Explore the problem | 3 | 3 |
| Make observations of model’s behavior | 4 | 3, under |
| TOTAL | 74 | 76,  2.7% over budget |

**5. Lessons learned**

Lesson 1: It took our team a significant amount of time to fully understand the definition of a dynamic model. At first the decision-making output was a single value at a single time point – projected net income after 12 months. We then revised the decision-making outputs to be temporal streams of values - amount of cash required over the next twelve months. Also, at first, our proposed model was only minimally dynamic for it only included running sums. We then revised the model to include convolutions in order to model intermediate outputs such as equipment depreciation over time. If our team could do this project all over again, we would invest more time upfront exploring, examining, and ensuring understanding of exactly what a dynamic spreadsheet model is and does.

Lesson 2: In the end, our proposed schedule was partially over-ambitious. Due to unforeseen personnel scheduling conflicts and cost overages (i.e., more hours actually needed than originally planned), the following tasks were completed late (behind schedule): “Model cost of goods sold in Excel” was completed seven days late; “Model selling expenses in Excel” was completed ten days late; “Model transportation expenses in Excel” was completed ten days late; “12/6 Team meeting” was completed one day late; and “Draft Final Report” was completed one day late. Despite delays completing interim tasks during the project period, the final deliverables (Final Report, Usage and Maintenance Guide, Project Model Scenario One, and Project Model Scenario Two) were delivered on-time. If our team could do this project all over again, we would allot more time for the labor-intensive tasks of: modeling expenses and drafting final reports.

Lesson 3: In the end, our final deliverable came in 2.7% (i.e., two hours) over budget. Modeling expenses was more challenging and time-consuming than originally anticipated. Examining depreciation is a relatively labor intensive process, for it involves sophisticated Excel formulas. Furthermore, six to eight pages, single spaced, in font size 10, is a lot more content that the team originally realized. The following tasks were completed over budget: “Model expenses” came in one hour over budget; “Cost of producing Final Report” came in one hour over budget; and “Cost of producing Usage and Maintenance Guide” came in one hour over budget. If our team could do this project all over again, we would budget more hours for modeling expenses and writing final reports.

Lesson 4: Coordinating use of different versions of Microsoft Excel (2010, 2013, PC, Mac) was challenging and required careful inspection to ensure that all of the material in the final compilation was correctly calculated, formatted, displayed, and named. If our team could do this project all over again, we would either set an Excel version standard to which each team member would be expected to comply or we would have assigned one team member to become a subject matter expert on use of technology by learning upfront how to best merge content from various workbooks that use various versions of Excel.

Lesson 5: The most challenging part of this project was taking something as dynamic and complicated as a business process and whittling it down to its core, necessary characteristics. For example, in the case of TW2Beers, they produce, sell, and deliver beer. There are myriad items that could be modeled. Determining which variables to include and which to exclude was extremely challenging. If our team could do this project all over again, we would focus more intensely on one aspect of the business. This would have allowed for a more thorough model instead of one that is all encompassing. For example, focusing on producing the beer could have allowed us to model inventory from the raw ingredients to the finished product or to create a more dynamic hiring stream for more than one type of employee (brew masters, inventory handlers, floor managers, etc). Although we were still able to model these scenarios our project takes a broader scope.

**6. Appendix**

None.