

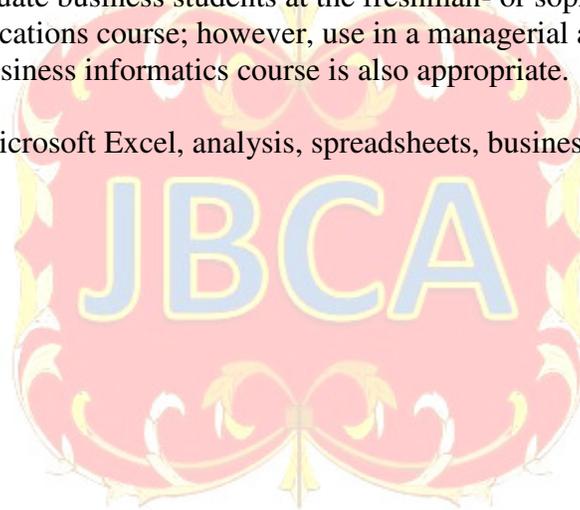
Beautiful Homes Inc.: A Microsoft Excel case for a business computing applications course

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ABSTRACT

This spreadsheet-based case study on a custom home builder presents students an opportunity to manipulate financial and operational datasets in order to display historical information in tabular and graphical formats. Students are invited to evaluate the firm by performing calculations on data, analyzing and presenting data, and creating dynamic worksheets through pivot tables. Next, students are asked to respond to several analytical questions based on their spreadsheet output. Finally, students are encouraged to propose enhancements to a graphic that enriches the information being communicated. This case is intended for undergraduate business students at the freshman- or sophomore-level in a business computing applications course; however, use in a managerial accounting, managerial finance, or business informatics course is also appropriate.

Keywords: case study, Microsoft Excel, analysis, spreadsheets, business computing applications



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INTRODUCTION

This case study provides business students an advanced review of spreadsheet functionality including performing calculations on data, analyzing and presenting data, and creating dynamic worksheets through pivot tables. The case is best completed in Microsoft Excel, although other spreadsheet applications may be used. The case focuses on a custom home builder, Beautiful Homes Inc. The discussion begins with an overview of the company, its construction process from selling agreement to delivery, and its derivation of net income. Students are then asked to produce key data points and trend data for Beautiful Homes through germane operational and financial ratios, charts, and pivot tables. Finally, students are asked to respond to several analytical questions based on their spreadsheet output and to propose enhancements to a graphic that enriches the information being communicated.

LEARNING OBJECTIVES

After completing this case, students will be able to:

1. Manipulate financial and operational datasets to present information in tabular and graphical formats
2. Use basic and advanced spreadsheet functionality to evaluate a firm's historical results
3. Propose enhancements to graphics that enrich the information being communicated
4. Assess their ability to use formulas and functions, to create charts and tables, and to generate pivot tables

THE CASE OF BEAUTIFUL HOMES, INC.

Beautiful Homes, Inc. is a builder of premium single-family homes in the United States. Founded in 1969, the company sells new homes in high-end, pre-planned communities (i.e., selling communities) in New England, New York, Pennsylvania, Virginia, and Florida. Its selling communities are typically gated communities, consisting of multiple home lots and common areas comprised of walking paths, lakes, golf courses, or pools. Each community is governed by a homeowner association which assesses association fees to maintain the appeal and market value of the respective community.

Beautiful Homes, Inc. constructs only custom homes, tailored to each customer's design requirements; it does not build speculative housing. As such, the construction process typically starts with a sales agreement between the company's selling agent and a prospective buyer. The agreement outlines each home's requirements and expected start and delivery dates, as well as other items such as financing or remediation. A project manager works with every buyer throughout the construction process, ensuring that every single home is completed according to schedule. Typical construction lasts 4 to 6 months; the time varies for multiple reasons including the complexity of the build, the number of change orders, the weather, the availability of construction supplies, and the timely scheduling of subcontractors like electricians, plumbers, or landscapers. Upon completion of a home, the project manager will perform a final "walk-through" with the buyer to ensure her home meets the agreed-upon specifications. Any last minute changes are recorded on a "punch list," which is a document that details finishes, fixtures, materials, or structures that need to be corrected and/or completed prior to delivery. On average, it takes Beautiful Homes about 1 week to complete all the punch list items. At that point, the

home is cleared for delivery, and the buyer and Beautiful Homes appear at a settlement meeting, called a closing, where the ownership of the property is transferred to the buyer. The company warrants its workmanship and each home's mechanical equipment for 1 year after closing.

Financially, the company records revenues and cost of revenues from home sales at the time each home is delivered to the buyer and title/possession is transferred. The difference between total revenues and cost of revenues is called gross margin; this is essentially the company's profits before paying for other costs such as advertising, depreciation, salaries, benefits, and taxes. Deducting these other expenses from gross profits determines the company's net income.

THE CHALLENGE

Assume you were recently hired by Beautiful Homes Inc. as a business analyst. Presume the company asked you to investigate several key data points and trends in their business over the last 10 years (see required questions). You decide to use a spreadsheet application to examine the firm because spreadsheets quickly help individuals understand and visualize data. To support you in your assignment, Beautiful Homes Inc. provided you the following additional resources which illuminate the home building industry and the home buying process:

1. Key terms in the home building industry: Table 1 (Appendix)
2. Industry overview from Value Line:
http://www.valueline.com/Stocks/Industries/Industry_Overview_Homebuilding.aspx
3. Industry advocacy from the National Association of Home Builders: <https://www.nahb.org/>
4. Home buying process for new construction homes from Coldwell Banker:
<https://www.coldwellbankerhomes.com/advice/buying-a-home/new-construction-homes/>

REQUIRED QUESTIONS

Using the financial and operating data in the provided workbook, [Beautiful Homes \(Student\)](#) (external hyperlink), respond to the following questions using spreadsheet software such as Microsoft Excel. Your instructor will inform you whether to record your responses directly in the Beautiful Homes (Student) workbook or in a separate workbook or file.

1. Calculate the following two operating ratios for 2008 – 2017 for Beautiful Homes Inc. using the worksheet **Datasheet (1)**. (Note, an operating ratio is a term describing a mathematical equation that conveys information a company's business operations). Round all values to the nearest whole unit or dollar. So that your formula does not result in an ERROR, use the =IFERROR() function and replace error messages with "N/A".

a. Average Selling Price per Home (\$000)

Formula: Total Value of Homes Delivered ÷ Number of Homes Delivered

Format: Currency

b. Average No. of Homes Delivered per Community

Formula: Number of Homes Delivered ÷ Number of Selling Communities at Year-end

Format: Number

2. Plot the Average Selling Price per Home (\$000) and Average No. of Homes Delivered per Community as determined in Requirement #1 as a Line Chart; plot Average Selling Price per Home (\$000) on the primary y-axis and Average No. of Homes Delivered per Community on a secondary y-axis. Plot years 2008 – 2017 on the x-axis.

Design the chart with the following elements:

- Add a legend at the bottom of the chart which accurately details the plotted data
- Include an appropriate chart title above the chart and vertical axis' titles
- Remove gridlines
- Add a linear trend line to the Average Selling Price per Home (\$000) data series; format the trend line as a dashed line

Format the chart as necessary to improve readability.

3. Calculate the following financial ratios for 2008 – 2017 for Beautiful Homes Inc. using the worksheet **Datasheet (1)**. (Note, a financial ratio is a term describing a mathematical equation based on accounting data). Express all values as a percent; round all values to the nearest whole percent. So that your formula does not result in an ERROR, use the =IFERROR() function and replace error messages with "N/A".

a. Cost of Revenues % of Revenues

Formula: Cost of Revenues ÷ Revenues

b. SG&A Expenses % of Revenues

Formula: Total Selling, General, & Administrative Expenses ÷ Revenues

4. Using the data determined in Requirement #3, create a Stacked Column Chart for the years 2008 – 2017.

Design the chart with the following elements:

- Add a legend at the bottom of the chart which accurately details the plotted data
- Include the chart title "Beautiful Homes Inc. Operating Expenses as % of Revenues" above the chart.
- Remove gridlines
- Add data labels to both data series

Format the chart as necessary to improve readability.

5. Create a Pivot Table using the worksheet **Datasheet (2)**. Assign *Line Item* to columns, *Year* to rows, and *Values* to values. Set the field values for *Values* to Sum.

Explore the pivot data by completing the following:

- Filter the pivot report for the years 2013 – 2017
- Filter the pivot report for Number of Homes Delivered and Number of Homes in Backlog
- Remove grand totals for columns and rows

Change the format by performing the following:

- Format the pivot report (columns) to Number with no decimals; use a comma as a separator
- Format the row and column labels as necessary to improve readability.

6. From the pivot table created in Requirement #5, generate a Pivot Table Chart (Line with Markers).

Design the chart with the following elements:

- Add a legend at the bottom of the chart which accurately details the plotted data
- Add an appropriate chart title above the chart; add a vertical axis title
- Remove gridlines

Format the chart as necessary to improve readability.

7. Review the output generated in Requirements #1 through #6. Then, address the following questions:
 - a. What year had the lowest average selling price per home (\$000)? What year had the highest average selling price per home (\$000)? By how much did the average selling price per home (\$000) change between the lowest year and the highest year?
 - b. Review the line chart from Requirement #2. Describe the linear trend line that was added to the Average Selling Price per Home (\$000) data series.
 - c. Examine Cost of Revenues % of Revenues. Are any values greater than 100%? If so, explain the meaning of a percentage greater than 100% in the context of costs versus revenues.
 - d. Review the stacked column chart from Requirement #4. Suggest design elements that could be added or modified to improve the chart's presentation of total operating expenses as a percentage of revenues.
 - e. Which is growing faster in 2017: Number of Homes Delivered or Number of Homes in Backlog? What does this single data point tell us regarding the short-term future prospects of Beautiful Homes Inc.?

APPENDIX

Key terms in the home building industry are shown in Table 1.

Table 1: Home Building Industry Terminology

Key Term	Definition
Cost of Revenues	All material, labor, and overhead costs incurred to construct a home
Homes Delivered	New homes that have been finished and delivered to the buyer (i.e., an ownership transfer)
Homes in Backlog	New homes that are under a sales contract, but are not completed/delivered to the buyer
Revenues	The sum of home sales prices, adjusted for selling incentives
Sales Agreement	A legally binding sales contract between a home builder (developer) and a buyer which outlines the selling price, home features and upgrades, and expected delivery
Selling Community	A new home subdivision comprised of multiple single-family homes and common areas
Speculative Home	A new home that is constructed before a buyer is under contract

TEACHING NOTES

Business schools recognize the importance of cross-department partnerships in order to prepare students for the business world (Bisoux, 2012). One such partnership is the addition of an introductory business computing applications course as part of a business core curriculum. Typically taught by computer science faculty, business computing applications courses prepare college students in the fundamentals of office software such as Microsoft Excel. Yet, cross-departmental relationships must be actively maintained to ensure continuity of expected outcomes and student success because over time, deficiencies can arise in the level of relevant coverage as non-business faculty may not be aware of trends in the business environment. Such was the case at a previous institution, where business faculty were increasingly dissatisfied with the level of student proficiency in spreadsheets after taking the business computing applications course. As such, working alongside computer science faculty, the author wrote this case to freshen, strengthen and advance the Excel content in the business computing applications course.

The case is a broad review of spreadsheet functionality for business students, and is best completed in Microsoft Excel, although other spreadsheet applications may be used. The case is based on real annual report data retrieved from Toll Bros, Inc., a builder of premium homes in the US. The case was first implemented in 2014 with 28 years of historical data to analyze; the case presented here is a shortened version using only 10 years of data. Moreover, to keep the case relevant, additional years beyond 2014 have been inserted to include more recent financial and operational results.

The case combines financial data (e.g., Profit & Loss), operational data (e.g., number of homes delivered and number of homes on backlog), and spreadsheet functionality to analyze a homebuilder, Beautiful Homes, Inc. Specific to spreadsheets, the case study addresses the following items:

- Formatting
- Formulas and calculations
- Functions
- Charts
- Formatting Charts
- Pivot Tables (with filters)
- Pivot Table Charts
- What-if Analysis via Goal Seek (optional content – see the Ways to Enhance section)

The teaching notes presented here provide the case's educational objectives and implementation guidance. The classroom experience, efficacy, and ways to simplify or enhance the case are provided. For the recommended solution, contact the author at kaufinger@kutztown.edu.

EDUCATIONAL OBJECTIVES & LEARNING OUTCOMES

Entry-level business graduates need both analytical skills (Kavanagh & Drennan, 2008) and technical proficiency in spreadsheets (Tam, 2013). Students should begin developing these abilities at introductory levels (Bowers & McCarthy, 1993; Grant, Malloy & Murphy, 2009). To this end, the primary educational goal of this case is to prepare undergraduate students for the

expectations of entry level positions. Specifically, the case provides students a learning environment whereby they can apply spreadsheet tools and techniques in a safe, simulated setting. The case affords students the opportunity to see how spreadsheet apps like Microsoft Excel can inform decision making. Moreover, the case lets students make analytical judgments about historical company performance.

A secondary objective is to educate students in preparation for Microsoft Excel certification. Certification programs are beneficial in satisfying demands that graduates can use technology for data analysis (Elrod, Pittman, Norris, & Tiggeman, 2015). Here, the case's content is consistent with certification topics at the specialist and/or expert levels (*cf.* Microsoft Office certifications at <https://www.microsoft.com/en-us/learning/office-certification.aspx>).

The case endeavors to achieve several student learning outcomes. In particular, after completing this case, students will be able to:

1. Manipulate financial and operational datasets to present information in tabular and graphical formats
2. Use basic and advanced spreadsheet functionality to evaluate a firm's historical results
3. Propose enhancements to graphics that enrich the information being communicated
4. Assess their individual ability to use formulas and functions, to create charts and tables, and to generate pivot tables

Additional benefits accruing to the student-learner include exposure to the home building industry and its operations, and insight into spreadsheet design.

IMPLEMENTATION GUIDANCE

This case is intended for undergraduate business students at the freshman- or sophomore-level in a business computing applications course; however, use in a managerial accounting, managerial finance, or business informatics course is also appropriate.

The case assumes that students were previously exposed to spreadsheets and have received anywhere from 5 to 10 weeks of Excel instruction in calculations on data, analyzing and presenting data, and creating dynamic worksheets through pivot tables. Prior understanding of the home building industry is helpful, but not required. However, since many students have never purchased a home, the topic may seem foreign to them. Therefore, significant effort on the instructor's part may be required to bridge gaps in students' understanding of the home building industry. To support the instructor's efforts, this author strongly suggests that students reference the supplemental resources under "The Challenge" section of the case.

This author recommends that the case study be used as an individual assignment. However, for instructors who wish to promote spreadsheet collaboration, a group assignment can be considered by storing the Beautiful Homes (Student) data file in the cloud. Introduce the case and its requirements in a class period; expect 20 minutes for introduction and questions. Students should anticipate a range of three to six hours of non-class time to complete the case study, depending on the students' level of Excel and business acumen. This author recommends using 30 minutes to debrief the case study. Emphasis during the debrief session should focus on the recommended solution, on any struggles that students encountered, and on students' proposed enhancements to the stacked column chart in Requirement #4.

EVIDENCE REGARDING EFFICACY

The effectiveness of the case study was evaluated in an introductory business computing applications course (100-level) at a Midwestern university. Students in the course were primarily freshman and sophomores. The case was used as a required capstone assignment in the course; it was assigned after several weeks of Microsoft Excel instruction and was used as a final assessment before students took a standardized but optional Excel certification examination. Previous student exposure to the business setting and business content presented in the case was mixed, with differences driven primarily by previous exposure to the industry and to accounting, and secondarily to academic standing. The assignment was completed individually and graded on a 100-point numerical grading scale. The mean score was passing (> 70%).

The average time to complete the case study varied from a few of hours to several hours; the wide range for completion was a function of a student's Excel proficiency and their ability to interpret the case requirements.

Indirect evidence of the case's efficacy is the number of students passing a Microsoft Excel certification exam. To further the case's learning outcomes, the computer science faculty piloted an optional Excel certification exam for all students immediately after they completed the case study. The exam results were strong, with 71% of the students passing the exam within two attempts. Since the exam was optional, however, several students did not take the exam seriously, as evidenced by their extremely low scores; this seems to have skewed the pass rate lower than what was expected. Table 2 summarizes the results.

Table 2: Excel Certification Pass Rates

Attempt	Number	Percent	Comments (700 is passing)
Passed on First Try	12	39%	Average Passing Score: 829
Passed on Second Try	10	32%	Average Passing Score: 773 (Avg. Amount of Improvement: 280 points)
Failed twice	6	19%	Average Highest Score: 488
Failed once/did not retake	3	10%	Scores: 96, 191, 286

Instructor & Student Feedback

Full-time computer science faculty were asked to use the case study. The author did not survey these instructors, per se, but several provided ex post qualitative assessments. Overall, the faculty saw utility in the case study. Some faculty comments are provided here.

This looks really good! I loved how it was set up, and how it hits the main ideas.

I believe the content reflected in the case comes close to covering the required information for the Excel certification exam.

[The case] is a comprehensive review of Excel for business students.

Student feedback was not formerly collected, but anecdotally, students were receptive to the assignment.

WAYS TO SIMPLIFY OR ENHANCE THE CASE STUDY

This case might not fit every classroom due to its content, effort, or pedagogy; as such, ways to simplify or to enhance the case study are presented here.

Ways to Simplify

Here are several ideas to simplify the case.

- Limit the number of years to analyze. For example, selecting only 2013 – 2017 will minimize the number of data points students are asked to compute and analyze. Note that you might need to change Requirement #7(d) if you exclude fiscal year 2009 from the analysis.
- Focus only on a few of the required questions. For example, if pivot tables are not included in your course, the case can be successfully completed by utilizing only required case questions #1 - #4, and #7, parts a – d.

Ways to Enhance

Here are several ways to enhance the case.

- To go deeper into some advanced functionality, consider adding other functions, such as the INDEX function. Here is an example of how this function could be incorporated:
 - Use the data in the worksheet Student Datasheet (1) and the INDEX function to retrieve the following:
 - Number of Sales Agreements Signed in 2014 (row 2, column 8)
 - Other Revenues in 2008 (row 4, column 1)
 - Pretax Income/Loss in 2016 (row 10, column 10)
- To incorporate advanced analysis, consider using Microsoft Excel's Goal Seek functionality. Here's an example:
 - Use Goal Seek to find the number of homes Beautiful Homes needed to sell in 2018 to achieved \$6,000,000 in revenues. Assume the Average Selling Price per Home (\$000) is the same as what was calculated for 2017 in Requirement #1.

2017 Base Data:

Total Value of Homes Delivered (\$000)	\$ 5,815,058
# of Homes Delivered	7,151

- To keep the case relevant, continue to add years beyond 2017. Reference the SEC Edgar database (<https://www.sec.gov/edgar/searchedgar/companysearch.html>) and search for

Toll Brothers, Inc. under the NYSE ticker, TOL. Retrieve new data from a Toll Brother's 10-K (annual report).

- Expect additional computations beyond the required ratios. Other ratios that are used in the home building sector include: gross margin, year-over-year growth, and effective tax rate.

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