ADMN 580 - CASE 02
Frito-Lay's Quality-Controlled Potato Chips

NOTE: Please be sure to watch the associated case video embedded in the Pearson e-text.

TEXTBOOK CASE

Frito-Lay, the multi-billion-dollar snack food giant, produces billions of pounds of product every year at its dozens of U.S. and Canadian plants. From the farming of potatoes—in Florida, North Carolina, and Michigan—to factory and to retail stores, the ingredients and final product of Lay's chips, for example, are inspected at least 11 times: in the field, before unloading at the plant, after washing and peeling, at the sizing station, at the fryer, after seasoning, when bagged (for weight), at carton filling, in the warehouse, and as they are placed on the store shelf by Frito-Lay personnel. Similar inspections take place for its other famous products, including Cheetos, Fritos, Ruffles, and Tostitos.

In addition to these employee inspections, the firm uses proprietary vision systems to look for defective potato chips. Chips are pulled off the high-speed line and checked twice if the vision system senses them to be too brown.

The company follows the very strict standards of the American Institute of Baking (AIB), standards that are much tougher than those of the U.S. Food and Drug Administration. Two unannounced AIB site visits per year keep Frito-Lay's plants on their toes. Scores, consistently in the "excellent" range, are posted, and every employee knows exactly how the plant is doing.

There are two key metrics in Frito-Lay's continuous improvement quality program:

(1) total customer complaints (measured on a complaints per million bag basis) and

(2) hourly or daily statistical process control scores (for oil, moisture, seasoning, and salt content, for chip thickness, for fryer temperature, and for weight).

In the Florida plant, Angela McCormack, who holds engineering and MBA degrees, oversees a 15-member quality assurance staff. They watch all aspects of quality, including training employees on the factory floor, monitoring automated processing equipment, and developing and updating statistical process control (SPC) charts. The upper and lower control limits for one checkpoint, salt content in Lay's chips, are 2.22% and 1.98%, respectively. To see exactly how these limits are created using SPC, watch the video that accompanies this case.

ADDITIONAL INFO (FROM YOUR INSTRUCTOR)

Assume your team is a consulting group that specializes in implementing quality systems at medium-to-large sized manufacturers. You are competing with another consulting firm to win Frito-Lay's business. As part of the selection process, Frito-Lay management has asked you to conduct an initial assessment of their current quality systems and present your recommend improvements. This presentation will give you the opportunity to demonstrate your team's understanding of the client's issues, your ability to conduct a logical quantitative analysis, and your strategic approach to problem solving.

The client has asked you to include the following deliverables in your presentation.

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1. ***ASSESS ANGELA'S PROPOSED (NEW) PROCESS***

   Getting the salt content "just right" is critical to producing a quality potato chip. Angela McCormack has been working on improving the salt delivery process on Frito-Lay's potato chip production line. During a trial run of her new proposed process, Angela collected samples of the chips being produced and measured the percentage salt content. As you can see from the following table, she took five samples during four different observations of the NEW PROCESS.

Salt Content	Obs 1	Obs 2	Obs 3	Obs 4
Sample 1	1.98%	2.11%	2.15%	2.06%
Sample 2	1.99%	2.00%	2.08%	1.99%
Sample 3	2.20%	2.10%	2.20%	2.05%
Sample 4	2.18%	2.01%	2.23%	1.98%
Sample 5	2.01%	2.08%	2.14%	2.16%

   Demonstrate your knowledge of Statistical Process Control (SPC) by analyzing this data using a 3-sigma x-bar chart. Include an SCP Chart in your presentation and be sure to discuss whether the new process is "in control" or "out-of-control" (and why).

   TIP: Although PERCENTAGE salt content is being measured, we should NOT use a P-chart in this case. The percentage salt content is a measurable **variable** (not the proportion of defects in the sample) - therefore, an **x-bar chart** should be used. Refer to the "Oat Flakes" example (Program S6.2 on page 265 and 266 of the textbook) as a guide as you build your spreadsheet model.

2. ***DETERMINE THE CAPABILITY OF THE TWO PROCESSES (OLD AND NEW)***

   The food scientists at Frito-Lay know exactly how much salt content consumers crave. Assume the potato chip "recipe" (aka the **specification**) calls for salt content of 2.01% +/- 0.20%. To demonstrate your expertise in process capability calculations, Angela has asked that you determine the **Process Capability Index (Cpk)** for both the current OLD process and for her NEW proposed process.

   Use formula S6-14 (on page 260) to calculate **Cpk** for each process.

   (S6-14)

$$C_{pk} = \text{Minimum of}\left[\frac{\text{Upper specification limit} - \overline{X}}{3\sigma}, \frac{\overline{X} - \text{Lower specification limit}}{3\sigma}\right]$$

   TIP: As mentioned in the textbook case (and video), the process standard deviation (σ) for the "old process" is 0.07%. Use the STDEV.S function in Excel to estimate process standard deviation (σ) for the "new process".

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Be sure to cover your analysis of the process capability of both the OLD and NEW processes in your presentation. Include any ideas you may have for ways to improve the capability of the salt delivery process.

3. *ANALYZE CUSTOMER COMPLAINT DATA*

Switching gears, Angela also wishes you to look at data collected by the consumer services department. Consumer service representatives field calls and emails from customers who have complaints about their Frito-Lay "potato chip experience". The reps use the following ID codes to categorize customer complaints.

ID	COMMON COMPLAINTS
BC	Burnt Chip(s)
CP	Crushed Product
FO	Foreign Object In Bag
NS	Not Salty Enough
OT	Other
SP	Stale Product
TS	Too Salty
UB	Underfilled Bag

Angela provided you with THIS LINK to an excel spreadsheet including the consumer complaint log for the first quarter of 2019. Demonstrate your mastery of TQM tools by categorizing, prioritizing, and reporting the complaints in a visual format (aka Pareto Chart). Then conduct a brainstorming session with your team to identify likely root causes for the most common complaint. Recommend logical next steps and/or a basic corrective action plan to help eliminate future re-occurrences of the most common complaint.

Please feel free to check in with the CEO of your consulting firm (aka your instructor) if you have any questions about how to engage with this client, conduct the required analysis, or prepare your presentation. And, please be sure to read the appendix of this document for more information on how to prepare for your presentation.

GOOD LUCK!

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APPENDIX

TEAM CASE COMPETITION:

Students will be placed on one of eight teams (of three to five members). Each team will be assigned a case/company from the textbook to present and will act as consultants advising the subject company on the issues presented in the case. We will cover four cases in this course. For each case, two of the teams will compete by presenting their recommendations in an attempt to win the client's business. Your instructor will score the teams' performance and select the winning team.

NOTE: Your team should NOT simply answer the questions posed in the textbook – but present a cohesive analysis of the issue at hand along with an operational strategy for the subject company. The presentation should:

- Provide background on the business situation to baseline understanding with the client
- Summarize the current situation (issues, challenges, opportunities)
- Highlight associated client questions if applicable
- Highlight applicable industry best practices (do a bit of light supporting research for this)
- Summarize your analysis approach and results (briefly and effectively)
- Cover strategic initiatives to help the client with their operational situation
- Note risks to implementation (if any) and associated mitigation actions
- Note any key action items to drive successful implementation of the strategic initiatives
- Close strong with a clear call to action to your client (the final sales pitch)

After each consultant team presents, there will be a brief Q&A session with the company management team (aka the rest of the class and the instructor) to discuss approaches, findings and recommendations. The consultant case presentations should take approximately 15 minutes followed by ~5 to 10 minutes of Q&A.

Each team shall post the final version of their presentation file to Canvas PRIOR TO presenting in class.

TIPS FOR SUCCESS:

Each team is required to meet at least once with their instructor (outside of class) to discuss their approach to the case. Teams are responsible for proactively scheduling this meeting at least two weeks prior to their scheduled presentation date.

Leading up to your presentation make sure you have practiced presenting as a team to make sure your story is clear, and your hand-offs are smooth. On the day of the presentation arrive to class early and make sure your slides work.

Take this presentation seriously. Be professional in the way you prepare and present. Use this as an opportunity to practice presentation skills for the real-world. Make sure you introduce yourselves clearly, be confident in what you are presenting, and be sure to end strong with a clear conclusion and call to action for your client. Dress code for teams presenting is business casual.

SCORING RUBRIC:

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Following is the rubric that will be used to score all the case presentations this term.

COMPONENT	WEIGHT	GREAT TO EXCELLENT	ACCEPTABLE TO GOOD	FAIR TO POOR
Introduction / Overview	10%	Introduction stating purpose, with concise overview of the situation / problem. Provide relevant background info. Highlight critical client "pain points" if any.	Somewhat clear purpose, with general overview of the situation / problem. Provide some background info. Highlight some client "pain points" if any.	No clear purpose, limited information on the situation / problem. Provide little to no background info. Not sure what client pain points are.
Analysis	30%	Identify and clearly summarize key operational issues. Assumptions and analysis are logical. Calculations (if any) are correct. Relevant outside research conducted to support analysis (if applicable).	Some info on key operational issues. Assumptions and analysis are somewhat logical. Calculations (if any) are correct. Limited outside research conducted to support analysis (if applicable).	Little to no discussion of operational issues. Assumptions and analysis are not logical Calculations (if any) are incorrect. No outside research conducted to support analysis (if applicable).
Strategy / Recommendations	30%	Strategy logically follows from analysis. Recommendations are valid and "doable". Provide clear implementation plan (key next steps).	Strategy somewhat linked from analysis. Recommendations are valid. Provide some actionable next steps.	Strategy not directly linked to analysis. Recommendations do not make sense Provide no actionable next steps.
Presentation / Q&A (Defense)	30%	Confidently and enthusiastically presented material. Smooth presentation flow. Strong opening and closing. Spoke clearly and held attention of audience throughout. Presented materials concise and informative. Demonstrated full knowledge of topic by answering questions and facilitating class discussion. Able to strongly defend position. "Off book" - no notes required.	Effectively presented material. Acceptable presentation flow. Solid opening and/or closing. Spoke clearly most of time - held attention of audience for most of the time. Presented materials included good information but may have lacked conciseness (or detail) Demonstrated some knowledge of topic by answering questions effectively. Defended position appropriately. Referred to notes periodically.	Lacked enthusiasm Presentation lacked flow. Weak opening and/or closing. Did not speak clearly and lost attention of audience. Presented materials not concise and/or lacked professional look. Demonstrated lack of knowledge of topic by not answering questions effectively. Unable to defend position appropriately. Read from notes.