The Krusty Krab Inventory Management System

Planning Phase Deliverables

Alyssa Bronge, James George, Chadler Stegen

Dr. Kaefer

INFS 347

September 27, 2022

Table of Contents

System Request – Inventory Management Project

Project sponsor: Eugene Harold Krabs – CEO/Owner

Business Need: The project addresses the need to be able to more efficiently manage inventory within the restaurant. This system will account for waste/spoilage that has occurred. Allow for servers to simultaneously create checks and update inventory through the POS system. The system will also help streamline the reorder process by making it a computerized activity. The system will also be connected to suppliers to find out whether they can supply proper inventory when the time arises. Also, provide better-computerized inventory forecasting to help adjust for the seasonality of sales to help make future inventory decisions.

Business Requirements: Servers will be able to input orders into the POS system and the system will update current inventory based on that information. Chefs or a manager in the back will have access to the system to account for any miscellaneous dilemmas that require an update in the inventory. Different users will have different access to the system to prevent any potential theft or mismanagement. All ingredients for recipes of menu items need to be determined to effectively manage inventory through POS system. The system must be able to properly forecast inventory to optimize the reorder process. Managers should be able to check the system to get a live and accurate depiction of the current inventory. System needs to provide information in an easily comprehensible way.

Business Value: Creates a single system that allows for easily accessible live inventory information. +Will mitigate labor costs of physically tracking inventory. Provides a more efficient process for determining inventory levels by allowing servers to both create tabs and update inventory in one singular process within the same system. The system will help eliminate stockouts and optimize our reorder process. Having a stronger grasp of live inventory can help when making on-the-spot decisions regarding serving certain menu items and efficiency of food preparation within the restaurant.
Conservative estimates of tangible values to the business include

- $200,000 in reduced inventory costs
- $130,000 in reduced labor costs for inventory management
- $100,000 in revenue from increased customer sales

Special Issues or Constraints: Due to the nature of the restaurant business we must account for the freshness of food and expiration dates when implementing the system so we will utilize the first-in-first-out (FIFO) system when deciding which inventory to use. The System needs to be able to manually update through the backend if a known mistake was made by a server for example when using POS. Managing and tracking certain foods may prove difficult.

Inventory Management Project Executive Summary

Patrick Star has created the following feasibility analysis for The Krusty Krabs' inventory management project. The System Request is attached, along with the detailed feasibility study. The highlights of the feasibility analysis are as follows:

Technical Feasibility

The inventory management system is technically feasible, although it is associated with some risk.

Krusty Krabs' risk regarding familiarity with operation of inventory management system is moderate.

- Servers are already familiar with operating the Point-of-Sale (POS) system and the new system will be very similar with minimal/if any additional electronic processes on their end.
- Management already has familiarity with the POS system as they operate the business aspect of the system and should be easily able to understand accessing and assessing the new system's information and tasks.

Krusty Krabs' risk regarding familiarity with the technology of the inventory management system is moderate.

- Our POS system was internally created so our engineers and developers have experience building a system of this caliber.
- Although combining an inventory management system into the already existing POS system presents some risk. As we do not want to worsen any of the already existing functionalities or make those more difficult to operate.

The Project size is considered relatively high.

- We are looking to completely rehaul our inventory management by computerizing/automating it into our POS system.
- Will require up to five employees to plan, oversee, and create the system.
- Will need to create a recipe costing structure to be implemented into system.

The compatibility with Krusty Krabs' existing internal infrastructure should be good:

- The system will be based on already existing technical infrastructure used in order processing and employee tracking.
- There is already a solid internet infrastructure within the restaurant that supports current systems.
- By hosting our system in-house, we do not have to rely on uncertainties regarding third-party services.

(Economic and Organizational Feasibility can be found on the next page)

Inventory Management System Feasibility Analysis (*continued.*)

Economic Feasibility

A cost-benefit analysis was performed; see the attached spreadsheets for details. Conservative estimates show that the Inventory Management Project has a solid likelihood of contributing to Krusty Krabs' bottom line.

ROI over 5 years: 49%
NPV over 5 years: $63,282
Break-even occurs after 2.45 years

Intangible Costs and Benefits

Better Supplier relations as we will be better able to communicate with suppliers about when we expect to reorder in the present as well as the future, and account for changing quantity of purchases in advance. Increased customer service as more optimized inventory management will reduce stockouts of items allowing for menu items to be more available when serving customers. Increased operational transparency through live inventory tracking will allow management to feel more comfortable addressing situations regarding inventory at the time a decision needs to be made. Higher quality menu, since we will be able to optimize our inventory, we will be better equipped to serve food that is fresher and therefore tastier for our customers.
(Feasibility Analysis continued on next page)

Organizational Feasibility

From an organizational perspective the project has high risk.

- Top Management Support: Top executives of the company have great support for the project
- Project Champion: Harold Eugene Krabs is a well-regarded and astute business executive who has been eager to implement a better inventory management system
- Organization Management: Unequivocally, managers support the creation of the new inventory management system. This will allow them to better understand the living environment of the restaurant. As well as allowing them to make more informed decisions when it comes to managing inventory. Some risks are associated with management being able to effectively use the system.
- Chefs: High risk associated with chefs having to comply with recipe guidelines for live inventory tracking to be effective. As well as accounting for any spoilage/waste that occurs within the food preparation process.

Servers: High risk associated with servers accurately inputting order information into the system. The system must not force them to spend additional time associated with manually tracking inventory.

Work Plan

				Estimated		Actual				
Task ID	Task Name	Assignec To	Duration (days	StartDate	End Date	Start Dat	End Date	Duration Variance	Depende	Status
3	**Design Phase**		31	1/6/2023	2/17/2023					Open
3.1	Develop database design document	Alyssa	9	1/6/2023	16-Jan					Open
3.1.1	Staging database design	Alyssa	9	1/6/2023	1/16/2023					Open
3.1.2	Suspense databse design	Alyssa	9	1/6/2023	1/16/2023					Open
3.2	Develop reject-handling design document	Alyssa	9	1/17/2023	1/29/2023				1.1.1, 1.:	Open
3.2.1	Reject-handling engine design	Alyssa	9	1/17/2023	1/29/2023					Open
3.3	Develop OLAP design document	James	9	1/17/2023	1/29/2023				1.1.1, 1.:	Open
3.3.1	Universe design	James	9	1/17/2023	1/29/2023					Open
3.4	Develop OLAP design pt. 1	Chandle	8	1/10/2023	1/21/2023					Open
3.4.1	High-priority reports design	Chandle	8	1/10/2023	1/21/2023					Open
3.5	Develop application design document	Alyssa	9	1/17/2023	1/29/2023					Open
3.5.1	Group consolidation + corporate reporting maintenance application design	Alyssa	9	1/17/2023	1/29/2023					Open
3.6	Extract, transform, load (ETL) design document	James	2	1/30/2023	1/31/2023				1.5	Open
3.6.1	Data export utility design	James	2	1/30/2023	1/31/2023					Open
3.7	Application design document	Chandle	27	1/16/2023	2/11/2023					Open
3.7.1	Web entry application UI design	Chandle	26	1/16/2023	2/10/2023					Open
3.7.2	Web entry application UI design sign-off	Chandle	1	2/11/2023	2/11/2023					Open
3.7.3	Web entry forms and database model validation	Alyssa	11	1/15/2023	1/29/2023					Open
3.8	Functional requirements document	James	9	1/20/2023	1/30/2023					Open
3.8.1	Application design	James	9	1/20/2023	1/30/2023					Open
3.8.1.1	User authentication	James	4	1/20/2023	1/23/2023					Open
3.8.1.2	Call logging	Chandle	2	1/24/2023	1/27/2023					Open
3.8.1.3	Search	Chandle	3	1/28/2023	1/30/2023					Open

				Estimated		Actual				
Task ID	Task Name	Assigned To	Duration (days	StartDate	End Date	Start Date	End Date	Duration Variance	Dependency	Status
1	Planning Phase		13	9/6/2022	9/27/2022					Open
1.1	System Request	Chandler	2	9/6/2022	9/8/2022					Open
1.2	Feasibility Study	Chandler	5	9/9/2022	9/16/2022					Open
1.2.1	Technical Feasibility	Chandler	2	9/9/2022	9/12/2022					Open
1.2.2	Econmic Feasibility	Chandler	2	9/13/2022	9/15/2022					Open
1.2.3	Organizational Feasibility	Chandler	1	9/16/2022	9/16/2022					Open
1.3	Project Plan	Alyssa	6	9/19/2022	9/27/2022					Open
1.3.1	Work Plan	Alyssa	2	9/19/2022	9/21/2022					Open
1.3.2	Staffing Plan	Alyssa	1	9/22/2022	9/22/2022					Open
1.3.3	Standards List	James	1	9/23/2022	9/23/2022					Open
1.3.4	Risk Assesment	James	2	9/26/2022	9/27/2022					Open

Task ID	Task Name	Assigned To	Duration (days	StartDate	End Date	Start Date	End Date	Duration Variance	Dependency	Status
2	**Analysis Phase**		16	10/3/2022	10/24/2022					Open
2.1	System Propsal	Chandler								Open
2.1.1	Requirements Definition	Chandler	4	10/3/2022	10/6/2022					Open
2.1.1.1	Functional Requirements	Chandler	2	10/3/2022	10/4/2022					Open
2.1.1.2	Non-Functional Requirements	Chandler	2	10/5/2022	10/6/2022					Open
2.1.2	Use Cases	Alyssa	3	10/7/2022	10/9/2022					Open
2.1.3	Process Model	Alyssa	4	10/12/2022	10/15/2022					Open
2.1.4	Data Model	James	3	10/16/2022	10/20/2022					Open
2.2	Appendices	James	2	10/21/2022	10/24/2022					Open

Staffing Plan		
Role	**Description**	**Assigned To**
Project Manager	Will lead the project and ensure that the team meets their objectives with time and budget	Chandler
Infrastructure Analyst	Verifies that the system will conform to current infrastructure standards, ensures that current system can support the new system being implemented	Alyssa
Systems Analyst	Analysis and Design- with focus of alternative design for management-focused component	James
Systems Analyst	Analysis and Design- with focus of management-focused component	Chandler
Systems Analyst	Analysis and Design- with focus of server-focused component	James
Programmer	Codes Information System	Alyssa
Reporting Structure: all project team members will report to Jack Special Incentive: if the project deadline is met each member of the team will receive paid time off that they can use after project completion		

Standards List

Types of Standards	Standard
Documentation Standards	-The project name, date, and page number should be written in the top right corner of every document. -Project deliverables should be included in the table of contents.
Coding Standards	-Proper indentation is necessary -Avoid lengthy functions
Procedural Standards	-Consult with the project manager before adjusting the requirements document -Attend both Zoom and in-person meetings with team members whenever they occur.
Specification Requirement Standards	-Describe the system's primary purpose -Understand the end users of the system
User Interface Design Standards	-Include image of specific product (like chicken wings) to make it easier for staff to identify and adjust inventory. -Bold inventory quantity then highlight in different color when quantity is low.

Risk Assessment

RISK #1: Staff are unfamiliar with operating the new system.
Likelihood of risk: Potentially high depending on restaurant employee's education and familiarity with technology.
Potential impact on the project: This risk could impact the benefits of the system and make it worthless.
Ways to address this risk: Provide training for restaurant staff and make the system easy to navigate.
RISK #2: Inventory adjustments may not update quick enough
Likelihood of risk: Moderate risk
Potential impact on the project: The system will fail to manage inventory correctly in terms of quality and quantity available.
Ways to address this risk: Ensure that significant testing takes place to test the system and decrease the probability of this occurring.
RISK #3: Restaurant owners are comfortable with their current system and are not willing to implement the newly developed system.
Likelihood of risk: Low
Potential impact on the project: Waste of time and resources in creating the system
Ways to address this risk: Meet with restaurant owners and offer them trials of the system to show its simplicity and added value.

Krusty Krab Inventory Management System Simple Cost-Benefit Analysis						
	2022	**2023**	**2024**	**2025**	**2026**	**Total**
Benefits						
Reduced Inventory Costs		50,000	50,000	50,000	50,000	200,000
Reduced Inventory Checking Labor		30,000	32,000	34,000	36,000	132,000
Increased Sales		20,000	25,000	35,000	47,500	127,500
Reduced Waste/Spoilage		15,000	15,000	15,000	15,000	60,000
Reduced Theft		1,500	1,500	1,500	1,500	6,000
Total Benefits		**116,500**	**123,500**	**135,500**	**150,000**	**525,500**
Development Costs						
1 Server	40,000	0	0	0	0	40,000
Software Licenses	14,000	0	0	0	0	14,000
Server Software	6,000	0	0	0	0	6,000
Development Labor	90,000	0	0	0	0	90,000
Total Devleopment Costs	**150,000**	**0**	**0**	**0**	**0**	**150,000**
Operational Costs						
Hardware		15,000	15,000	15,000	15,000	60,000
Software		5,000	5,000	5,000	5,000	20,000
Operational Labor		40,000	42,000	44,000	46,000	172,000
Total Operational Costs		**60,000**	**62,000**	**64,000**	**66,000**	252,000
Total Costs	**150,000**	**60,000**	**62,000**	**64,000**	**66,000**	**252,000**
Total Benefits - Total Costs	**(150,000)**	**56,500**	**61,500**	**71,500**	**84,000**	**273,500**
Cumulative Net Cash Flow	**(150,000)**	**(93,500)**	**(32,000)**	**39,500**	**123,500**	
Return on Investment	**109%**	($273,500/$252,000)				
Break- Even Point	**2.45 years**	2+(($71,500-$39,500)/$71,500)				

Krusty Krab Inventory Management System Discounted Cash Flow Cost-Benefit Analysis						
	2022	2023	2024	2025	2026	Total
Benefits						
Reduced Inventory Costs		50,000	50,000	50,000	50,000	
Reduced Inventory Checking Labor		30,000	32,000	34,000	36,000	
Increased Sales		20,000	25,000	35,000	47,500	
Reduced Waste/Spoilage		15,000	15,000	15,000	15,000	
Reduced Theft		1,500	1,500	1,500	1,500	
Total Benefits		**116,500**	**123,500**	**135,500**	**150,000**	
Present Value Total Benefits		**105,909**	**102,066**	**101,803**	**102,452**	**412,230**
Development Costs						
1 Server	40,000	0	0	0	0	
Software Licenses	14,000	0	0	0	0	
Server Software	6,000	0	0	0	0	
Development Labor	90,000	0	0	0	0	
Total Devleopment Costs	150,000	0	0	0	0	
Operational Costs						
Hardware		15,000	15,000	15,000	15,000	
Software		5,000	5,000	5,000	5,000	
Operational Labor		40,000	42,000	44,000	46,000	
Total Operational Costs		**60,000**	**62,000**	**64,000**	**66,000**	
Total Costs	**150,000**	**60,000**	**62,000**	**64,000**	**66,000**	
Present Value Total Costs	**150,000**	**54,545**	**51,240**	**48,084**	**45,079**	**348,948**
NPV (PV Total Benefits - PV Total Costs)						**63,282**
*Present Values calculated using a 10% discount rate						