TEAM 03: REBEL FORCE

IS – 636 (Sec-02): Structured Systems Analysis and Design

Deliverable 4: Feasibility Analysis

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Feasibility Analysis

Description:

The proposed solution is to implement an integrated restaurant management system that includes an inventory management system, a customer relationship management system, Leadership management, and an order management system. The system will be designed to streamline and automate the restaurant's operations, reduce manual involvement in processes by reducing deviations from ideal workflow, and improve communication between staff and management with the goal of providing excellent customer service.

The inventory management system's primary duties will be to monitor supply and ingredient levels, send automatic alerts when inventory levels fall below a predetermined level, facilitate easy inventory reordering and supplier purchases, and instantly update the staff on inventory levels and any shortages. The restaurant will be able to collect and save client data, such as preferences, order history, and contact information, thanks to the customer relationship management system. Information about consumer behavior and preferences will be provided via data analysis, enabling data-driven, specialized marketing and advertising activities. It also plays a key role in categorizing customers based on several factors like age, profession, frequency of visits, and amount spent and providing offers to them .Customers will receive real-time updates on the status of their orders thanks to the order management system, which will give the staff a simple interface to view and manage orders in real time, accommodate special requests, allow for order modification, and notify staff members of any delays or issues. Quick maintenance of inventory levels and the restaurant's investment economics is made possible by the leadership management system.

A cloud-based system that can be accessible via a web interface or mobile application is among the hardware and software components of the solution. Hardware like barcode scanners will be needed for the inventory management system, and the customer relationship management system will require hardware such as tablets or smartphones for staff to input customer information.

The combination of outsource-and-buy strategies will be used to achieve the solution. The hardware needed for the system will need to be purchased by the restaurant from a cloud provider, either outright or on a lease. The restaurant's think tank must then communicate with the outsourcing team (a third-party service provider) the key goals of the establishment and its requirements so that they may create software solutions with their team using the infrastructure that the establishment's management has given.

Significant impacts will be seen on the organization. By minimizing manual work, enhancing interaction between employees and management, and increasing the accuracy of inventory management, the system will aid in maximizing the restaurant's performance. Increased resource efficiency, lower costs, and better customer service will result from this. The approach would

address the underlying issue of communication hiccups between local branch personnel and management when seeking clearance for purchases, which resulted in inventory shortages during peak periods.

Economic Feasibility Analysis:

This analysis is performed to analysis if a proposed solution adds benefits to business and if it provides benefit how long would it take to reach break-even point. (Robinson, R. (1993)). We found few references from Cline, W. R. (1973).

Listing of costs:

1) Cost of cloud infrastructure (recurring)

2) Cost of outsourcing vendor (recurring)

3) Cost of new hardware (one-time).

1. The order management system helps to improve order management time, which in turn results in reduced wait times for customers, which in turn will have a direct influence on the level of satisfaction experienced by those customers.

2. The decrease in the number of raw materials that are wasted as a result of improved inventory management and automated methods for the reordering of inventory. This may be accomplished by controlling the inventory in accordance with the number of orders that have been placed.

3. This proposed solution would prevent staff members from accepting orders for things that are not currently available in the shop, which is another obvious benefit to the business. Staff members may not always be aware of the products that are currently stocked in the store. When there is insufficient supply of a particular item, the inventory management system will automatically remove it from the menu. Because of this, the restaurants are unable to contact their customers in order to modify their meals after the orders have been placed.

4. The implementation of the new system results in an increase in the rate of retention of customers. This is accomplished by the implementation of customized marketing activities, such as the provision of special deals to consumers depending on factors such as their age, occupation, amount spent, and number of visits.

5. Staff notification systems enable employees to look at orders, determine their projected time of delivery, and see the status of the order, which indicates whether or not they are behind schedule or making excellent progress with the order.

6. A customer display that shows offers in addition to the state of client orders together with the order names will assist customers about the progress of their purchases.

The Intangible costs that the restaurant should consider:

- Costs incurred on an as-needed basis via cloud infrastructure.
- Since the infrastructure of the cloud is handled by different third-party businesses, we can assume that this is the primary cost.
- Purchasing extra capabilities from companies that specialize in outsourcing.
- This expense cannot be avoided since outsourcing services are offered by other businesses that are considered third parties.
- The expenses associated with maintaining software.
- In order to manage the inventory, more infrastructure is required.

The Intangible benefits that the restaurant should consider:

- **Increased customer satisfaction:** If the solution that has been presented is put into action, there is a one hundred percent chance that this will be successful.
- **Customer retention:** If the proposed solution is implemented this can be achieved with 100% confidence.
- **Positive rise in brand name:** If the proposed solution is implemented this can be achieved with 100% confidence.
- **Organized management**
- **Reduced Wastage**

The Cost benefit analysis for Chopathi Indian Restaurant:

Has been derived from (Adityo Wicaksono, Tommy Hendrix, Asep Nurhikmat,2023)

		2023	2024	2025	2026	Total
1						
2	Benefits					
3	Increased sales		100000	150000	200000	450000
4	Reduced Inventory costs		30000	38000	45000	113000
5	Reduced wastage		15000	19000	21000	40000
6	Total Benefits		145000	207000	266000	603000
7	Development costs					
8	Cloud charges	38000				38000
9	Software licenses	10000				10000
10	Printer	1500				1500
11	Inventory hardware	10000				1000
12	Total Devlopment cost	59500				50500
13	Operational costs					
14	Software		900	1200	1500	3600
15	Internal Hardware		4500	5000	5500	15000
16	service		1000	1200	1300	3500
17	Total oprational costs		6400	7400	8300	22100
18	Total costs	59500	6400	7400	8300	72600
19	Total Benefits - Total costs	-59500	138600	199600	257700	530400
20	cumulative flow	-59500	79100	278700	536400	
21						
22	ROI	730.5785124	530400/72600			
23		the org becomes profitable n 1 year				

Fig1: Cost benefit analysis

Technical feasibility analysis:

- **Types of technology required to implement the solution:** In order to put the solution into action, we need cloud infrastructure.
- **Technical expertise needed:** The ability to comprehend both the technical aspects and the aesthetic qualities of the organization's website.
- **Whether expertise is available in organization:** Since the majority of the previously hired workforce does not possess the needed degree of technical skill, the creation of this system will need to be contracted out to a third party.
- **What other existing systems/processes the new system needs to be compatible with:** Since the system will be storing client information, it is essential that it be completely secure. It is required that all conventional procedures, such as disk encryption, be followed, and that backups be kept. In order to ensure the continuation of the company's operations, the new system has to have the capacity to revert to the previous operating system in the event of a catastrophic failure.

Organizational feasibility analysis:

Schedule/Politics/Change management/Legal concerns/Will it work (ways which solution might not end up actually solving the problem)?

Organizational feasibility analysis for the proposed solution is as follows:

A. **Schedule:** The execution of the suggested solution would need a substantial amount of time, resources, and preparation on the part of the people involved. The precise schedule for the implementation will be determined by a number of elements including the size of the organization, the level of difficulty posed by the systems, and the accessibility of the necessary resources. However, in order to guarantee that the project will be finished within a time frame that is considered to be reasonable, an accurate timeline for the implementation should be developed and shared with all of the stakeholders.

B. **Politics:** It is possible that the execution of the suggested solution may alter the power dynamics already in place inside the organization, and certain people may fight against the change. The team working on the project has to determine who the prospective stakeholders are and explain to them how the proposed solution would benefit them. The team working on the project has to come up with a change management strategy as well. This plan should handle any possible opposition to the change and ensure that all stakeholders are on board.

C. **Change Management:** The suggested approach would result in certain individuals inside the business taking on new responsibilities in their current jobs. The team working on the project has to identify these people and make sure they are aware of the changes. In addition, the team has to provide training to ensure that staff members are able to make efficient use of the new technology. A successful management of change will assist reduce opposition to the implementation of new systems.

D. **Legal Issues:** The adoption of the suggested solution might potentially cause legal difficulties, such as legislation regarding the privacy of data or contractual responsibilities. It is the responsibility of the project team to identify and handle any legal problems that may arise, as well as to guarantee that the newly implemented system complies with all applicable laws and regulations.

E. **Will it work?** There are potential risks associated with implementing the proposed solution. For instance, there can be certain technical flaws or problems with the interoperability of the systems. The team working on the project has to carry out an exhaustive risk assessment and come up with backup plans to deal with any possible problems. In addition, the team should undertake user testing and seek input from stakeholders to guarantee that the solution satisfies the requirements outlined by those stakeholders.

In Conclusion, If the project team can successfully manage the timetable, resolve political issues, offer effective change management, assure legal compliance, and address any hazards, then the suggested solution has a high organizational feasibility. Evidence gathered from the real world demonstrates that businesses that properly manage these aspects have a greater chance of successfully implementing new systems and achieving the intended advantages.

Alternative Solutions:

Alternative Solution 1:

Implement a leaner menu and streamline kitchen processes (low-end, non-technical)

Chopathi Indian Restaurant can streamline its menu by concentrating its efforts on the preparation of its most popular dishes and decreasing the number of different courses. Because of this, there will be less of a need for an enormous inventory, and less food will be wasted. In addition, they may improve the flow of orders and optimize the layout of the kitchen, which will cut down on the amount of time that clients must wait while they place their orders. It is also possible for the restaurant to install modern software for the administration of the kitchen and the taking of orders, which will make the process of monitoring inventory and placing orders more effective.

Major Features:

- A more streamlined menu with fewer options for the types of food that are most often ordered by consumers.
- Streamlined the order-taking and processing procedures in the kitchen in order to cut down on wait times.

- The installation of brand new software for the administration of the kitchen and the taking of orders, which will make the process of monitoring inventory and placing orders more effective.

Major findings from the feasibility analysis:

- Requires a low initial commitment of capital.
- A significant decrease in the amount of food that is thrown away, which results in cost savings.
- A quick turnaround for implementation
- Positive ROI
- There was no appreciable effect on the amount of work being done by employees or their morale.
- There is a possibility that fewer menu alternatives will have an effect on the overall customer experience; however, this effect may be offset by ensuring that the most well-liked items are not removed from the menu.

How is alternative solution different from the primary proposed solution:

This solution requires less initial expenditure and is implemented faster than the original proposal. It significantly reduces food waste, saving the business money.

Alternative solution 1 may affect consumer experience owing to menu decrease, unlike the original recommended solution. Keeping the most popular foods accessible may help. This strategy may not improve client retention via customized marketing as much as the core option.

Both solutions should have little impact on employee workload and morale. Alternative option 1 may need kitchen staff training to improve operations and apply the new order taking and kitchen management software.

Alternative Solution 2:

Hiring an order manager who investigates the orders and is responsible for sharing information with head chef and inventory manager.

Major features:

- A hiring manger is responsible for sharing order details to inventory manager to identify keep trach of inventory.
- Having a manager in store to check in the order delivery process makes the staff to work as per Hawthorne effect.
- No need of new system to manage orders.
- We can use existing in-house database to perform CRM system.

Major findings from the feasibility analysis:

- Low initial investment required.
- Significant reduction in food waste, leading to cost savings.
- Short implementation time.
- Positive ROI.
- No significant impact on employee workload or morale.
- This prevents inventory supply delays.
- Quick to implement.
- Increases effective communication.

How is this alternative solution different from proposed solution:

This alternate solution is a low-end solution which involves manual process hence it carries a risk of errors and potential mishandling in case of absence of the person who handles the responsibilities usually.

Quick inventory loading as inventory manger manually goes through the store inventory levels. He uses a store vehicle to get restock inventory manually.

An Alternatives Matrix

Criterion 1:

Short title: Customer Satisfaction

Type (requirement, risk, constraint, or other): requirement

Description: This criterion assesses, for each solution, how likely it is that the solution will increase customer satisfaction and loyalty, leading to increased revenue and repeat business.

A low rating (1) would mean: The solution is unlikely to boost customer satisfaction and loyalty, which would have little to no influence on revenue and repeat business.

A High rating (5) would mean: The solution is very likely to boost customer satisfaction and loyalty, which will have a major influence on revenue and repeat business.

Criterion 2:

Short title: Implementation Complexity

Type (requirement, risk, constraint, or other): constraint

Description: This criterion evaluates the complexity of the solution's implementation, including potential interruptions to routine business operations, personnel training needs, and technical know-how requirements.

A low grade of (1) would indicate that the solution is difficult to execute and would result in major interruptions to regular business operations, extensive employee training needs, and a high level of technical skill.

A high grade of (5) would indicate that the solution is simple to adopt, causes little interruptions to regular business operations, requires little employee training, and doesn't need a lot of technical know-how.

Criterion 3:

Short title: Cost-effectiveness

Type (requirement, risk, constraint, or other): requirement

Description: This criterion evaluates each solution's cost-effectiveness, taking into account any upfront expenditures, ongoing expenses, and prospective cost reductions or income gains.

A low grade (1) indicates: The solution is not cost-effective, with high upfront expenses, ongoing expenditures, and little to no potential for cost savings or revenue growth

A high grade of (5) indicates: The solution is extremely cost-effective, has low upfront and ongoing expenditures, and has a substantial potential to reduce costs or boost income.

Criterion 4:

Short title: Impact on Employee Morale

Type (requirement, risk, constraint, or other): risk

Description: This criteria evaluates how each option could affect worker morale, considering the degree of change necessary, prospective job losses, and adjustments to job tasks or responsibilities.

A poor rating of (1) means: The solution is likely to have a major negative effect on staff morale, which will lower productivity and increase turnover

A high rating of (5) means: That there is little chance the solution will significantly lower staff morale, which will boost productivity and reduce turnover.

Criterion 5:

Short title: Customer dissatisfaction

Type (requirement, risk, constraint, or other): risk

Description: This criterion assesses, for each solution, how likely it is that the solution will decrease customer satisfaction and loyalty, that might effect revenue and business image.

A low rating (1) would mean: The solution is unlikely to boost customer satisfaction and loyalty, which would have little to no influence on revenue and repeat business.

A High rating (5) would mean: The solution is very likely to boost customer satisfaction and loyalty, which will have a major influence on revenue and repeat business.

Evaluation Critera	Weight (optional)	Alternative Solution 1: Implement a leaner menu and streamline kitchen processes	Score (1-5)	Weighted Score	Alternative Solution 2: Hiring a order manager who looks into the orders and is responsible for sharing information with head chef and inventory manager.	Score (1-5)	Weighted Score
Criterion 1: Customer Satisfaction	30.0%	Improved	4	1.2	improved	4	1.2
Criterion 2: Implementation Complexity	15.0%	reduced	5	0.75	reduced	3	0.45
Criterion 3:Cost-effectiveness	15.0%	reduced	4	0.6	improved	4	0.6
Criterion 4:Impact on Employee Morale	20.0%	moderate	3	0.6	reduced	1	0.2
Criterion 5: Customer Dissatisfaction	20.0%	reduced	2	0.4	reduced	2	0.4
Totals:	100.0%		18	3.55		14	2.85

Fig2: Analysis alternate matrix

References:

1. Adityo Wicaksono, Tommy Hendrix, Asep Nurhikmat; Cost-benefit analysis on transforming conventional food businesses into canning businesses during Covid-19 pandemic. AIP Conference Proceedings 13 January 2023;

2. Cline, W. R. (1973). Cost-Benefit Analysis of Irrigation Projects in Northeastern Brazil. American Journal of Agricultural Economics, 55(4), 622–627.

3. Mishan, Edward J., and Euston Quah. Cost-benefit analysis. Routledge, 2020.

4. Robinson, R. (1993). Cost-benefit analysis. British Medical Journal, 307(6909), 924-926.