

Customer Satisfaction as a Critical Success Factor for ERP Design

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Abstract: Enterprise Resource Planning (ERP) systems have been an important tool in managing business processes in corporations worldwide. This paper briefly looks at some popular business process analysis methodologies such as Balanced Scorecard and Critical Success Factors (CSF). It also includes a customer satisfaction analysis as a supplementary mechanism to design and implement an ERP system for small to mid-size enterprises (SMEs). In addition to the traditional metrics, customer satisfaction is included as a critical success factor that drives the changes to business processes and provide insight into the design of an effective ERP for an SME.

1 INTRODUCTION

Enterprise Resource Planning (ERP) systems are software systems that are utilized to manage all aspects of operations within a corporation (Kiran & Reddy, 2019). ERP systems typically focus on vendors, accounting, human resources, sales, customer service, inventory, purchasing and production planning departments. All of these individual areas and departments are linked through an ERP system in order to get valuable information on internal business processes and company information in a consistent and timely fashion.


Small and Mid-sized Enterprises (SME) are businesses that generally consist of companies with less than 250 people on staff within a given location (Alaskari et al., 2021). In much of the world, SME's have a notable impact on the economies of countries and contribute to a significant portion of gross domestic product (GDP) internationally (Genc et al., 2019).

Previous to the development of ERPs, many companies would utilize decentralized systems to manage their business processes. This can lead to undesirable situations where individual departments are the only ones with access to information other departments might urgently need (Elbahri et al., 2019).

For example, a centralized ERP system can enable a sales department representative, in response to a customer query, to easily check the database of the inventory department and give feedback in real time. If a product is not in the inventory, the inventory department can do a purchase request immediately. Or, if a product is to be manufactured internally, the by-products can be purchased and preparation can be made to get that product manufactured for the customer. Throughout the entire process the customer can be provided valuable time sensitive information on what stage the product is in before it is ready for shipping or pickup.

Utilizing an ERP system allows an accounting department to get information on all transactions and process them accordingly. Billing can be sent to customers, while vendor accounts can be handled simultaneously and all in real-time. Vendors are able to send in their invoices and those invoices can be reconciled with what is on the ERP system and then processed for payment.

The human resource department can manage the corporate workforce and make decisions based on the jobs coming in from the Sales and Production Planning department. This information indicates the production output levels required which can drive the necessary staffing levels. An ERP system can also maintain a database of available staff, their work-load as well as those recently interviewed.

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An ERP system can maintain inventory listing information that may be valuable for price comparisons and approval of purchase orders. This can also be important for formulating price indices for future analysis.

An ERP can also be utilized to keep track of customers. Customer data whether prior, present or future, can be used for marketing and promoting a business.

2 ANALYSIS METHODOLOGIES

2.1 Balanced Scorecard

The Balanced Scorecard is a management model and tool that was designed to help corporations measure their performance (Frederico et al., 2021). The main parameters are:

1. Financial
2. Customers
3. Business Process
4. Learning and Growth

The “Financial” parameter looks at the actual monetary gains made throughout the period being analysed. The “Customers” parameter takes a broad look at the customer’s overall experience with the organization and enables changes to be made to improve customer interaction and satisfaction. The “Business Process” parameter deals with process management. It includes an analysis to check if internal processes are up to par with current standards while also determining if any processes can be improved. The “Learning and Growth” parameter deals with companies making improvements, learning from mistakes and improving. It also relates to understanding the customer experience as a whole.

For implementation of an ERP system, the balanced scorecard approach can be used in the assessment stage.

2.2 As-Is and To-Be Business Process

The As-Is methodology is a process map used to record business processes in an organization (Elragal & Haddara, 2012). After recording the step-by-step business processes, an analysis can be done to see where potential improvements can be made.

Before implementing an ERP system, an analysis of business processes can be made. Subsequently, a To-Be map can be generated that describes the future business processes based on the ERP modules that are to be incorporated.

2.3 Critical Success Factors

Critical Success Factors (CSF) look into the activities of a company that are required for a company to be successful (Vargas & Comuzzi, 2020). Often, the critical success factors for an SME are considered to be parameters related to internal metrics such as:

1. Project team competence and composition
2. Vendor and consultant support
3. Business process reengineering and minimal customization
4. Software development testing
5. End user involvement
6. User training and education
7. Clear goals and objectives
8. Monitoring and feedback

2.4 Customer Satisfaction as a CSF

Maintaining customer satisfaction is an important part of any business. Consumer buying patterns can be influenced by the level of customer service obtained which then leads to customer loyalty (Adam et al., 2020).

Previous studies have also found that parameters like product quality and price perception have a significant impact on customer satisfaction and customer loyalty (Hudaya, 2020).

This research postulates that in addition to the common critical success factors for SMEs, customer experience and satisfaction can be utilized as a CSF for help in both designing and evaluating the effectiveness of an implemented ERP system.

3 INITIAL PROCESS ANALYSIS

To conduct this research and obtain some practical and real-world results, a local auto repair shop and SME in Regina Saskatchewan agreed to participate in this research and implement a subsequent ERP design.

An initial mapping of the process flow of the business helps one understand the business operations, both for software design insight as well as to see where operations can be improved upon (Parhizkar & Comuzzi, 2017). During this step, the focus was on the “Business Process” parameter of the Balanced Scorecard approach as well as the “Business process reengineering and minimal customization” of the Critical Success Factors methodology.

Included in this analysis is the determination of problems that could be solved to help improve customer satisfaction. Some of the problems identified for the SME were:

1. Customer documentation filed manually
2. Billing and documentation done manually
3. No notice board to keep staff aware of activities at the establishment.
4. No organized price list
5. No employee records filed
6. Accounting done manually
7. No system in place to handle increased workload, which leads to delays in customer service.

Through utilizing the assessment methodologies of the Balanced Scorecard model and Critical Success Factors the additional success factor of customer satisfaction was also included. In order to explore this more fully, an analysis of customer responses from a list of customer survey questions relevant to customer satisfaction were also measured and evaluated to include in the overall analysis. To accomplish this, a survey with 17 questions relating to customer satisfaction was created and sent out to previous and current customers of the SME. 34 customer surveys were completed and gathered for analysis.

The 17 questions included a 5-Point Likert Scale ranging from Strongly Disagree to Strongly Agree that attempts to determine levels of customer satisfaction. For example, the following are five questions that were included in the survey:

- a) Would you say this company has a high level of efficiency?
- b) Would you say you have gain a high level of satisfaction with our team in resolving your issue?
- c) Would you say this company delivers customer service at a high-speed?
- d) Based on your experience, would you agree to returning to us again to do business?
- e) Based on your experience, would you agree to recommending us to others?

4 SURVEY ANALYSIS

Some of the analysis of the customer surveys indicated that:

- 1) A majority of the customers like the staff
- 2) A majority of customers indicate that the efficiency is not at a high level
- 3) A majority of customers indicate that the customer service is not at a high level

- 4) A majority of customers believe price levels are too high
- 5) A majority of customers feel phone calls are not answered in a timely manner.
- 6) A majority of customers do not have a high level of satisfaction
- 7) A majority of customers would not recommend the company
- 8) A majority of customers do not feel updates are communicated in a timely manner
- 9) A majority of customers do not feel there are multiple methods of payment available
- 10) A majority of customers do not feel the booking process was an easy process
- 11) A majority of customers do not intend to return to do business or recommend the business to others.

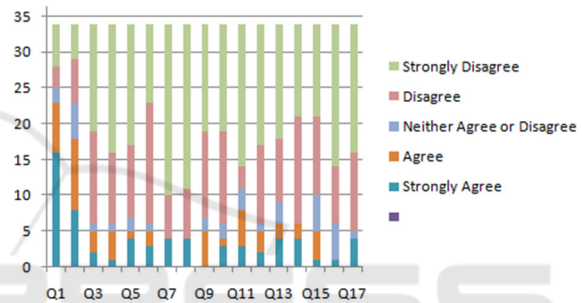


Figure 1: Survey Question Response Graph.

With the data from the customer satisfaction survey and the internal issues that were found from the As-Is analysis, a To-Be process map could then be created. To-Be flow charts were then developed with the ERP implementation in mind to aid in the To-Be map of the future business processes.

5 ERP DESIGN

Based on the analysis in the previous section and discussion with the owner of the SME, the design of an ERP for the business was developed to improve the business processes as well as improve customer satisfaction. The design included things such as customer history, accounting tools, cost analysis tools, human resource management and a system to handle processes that will hopefully cut the delay time for customers.

The up-front implementation of these analysis methodologies allowed for the ERP to be designed and developed to address issues uncovered through the analysis which included both internal processes and their potential effects on customer satisfaction.

This allows the ERP design to both address the internal business process issues as well as addressing the customer satisfaction issues simultaneously.

The customer satisfaction survey also provided insight into internal issues that may not have otherwise been picked up on without this type of analysis such as:

- 1) The ERP design allows office staff to take a customer's query and at the same time record the customer's information and post all correspondence to the ERP.
- 2) Appointments can now be organized within the ERP. All this is done in an orderly fashion and can be done quickly.
- 3) The ERP enables a customer work queue that is automatically generated. The mechanic can look at his workstation and see the request and appointments for the day and can assess the vehicle in real time.
- 4) After assessment, a note can be made in the ERP system and the mechanic can move on to assessing other vehicles in the queue. This enables staff to give customers feedback on the assessment of their vehicles immediately.
- 5) Quotes can also be generated and customers can decide how they would like to proceed.
- 6) Deposits and/or payment through the ERP with functionality to take many payment types based on the customer's preference.
- 7) Mechanics can work on vehicles and update the ERP in real time so when customers make a query, staff can provide updates to customers in real-time. When situations change, staff can also call or email customers with updates.
- 8) As soon as the vehicle is ready, the balance of payment can be collected, the ERP updated, and a survey sent to customer to measure customer satisfaction. As customer satisfaction is continually measured, a continual improvement business process is established through the ERP design.
- 9) Customer issues with the price may have been caused by the office not doing a proper cost analysis per job. The ERP system design has an accounting module as well as a human resource module attached that will enable management to do cost analysis before pricing. This includes monitoring expenses and knowing the cost of goods sold before generating any customer pricing.
- 10) The human resources module includes other available staff such that as the work load rises, additional man power can be utilized such that the level of customer service is maintained.

8 CONCLUSION

Utilizing customer satisfaction analysis as a critical success factor provides additional information that shapes the resulting design of an ERP system. The ERP is then designed to improve the internal business processes in addition to addressing improvements in customer satisfaction.

The ERP implementation in this paper was intended to both improve the internal business processes while simultaneously improve customer satisfaction. This included addressing such things as efficiency, speed, price, payment methods, real-time status updates, marketing, and appointment processing as well as maintaining a process for continual improvement through ongoing customer satisfaction input.

Analysis utilizing the Balanced Scorecard and traditional Critical Success Factors can be important for an ERP design. As an additional measure, a customer satisfaction analysis provides both context and further insight into the potential effectiveness of an ERP design for improving an SME's business.

Future research work will include the SME utilizing the aforementioned ERP design for a year. Following that period, another customer satisfaction analysis will be done to gather data and try to understand if the improvements in customer satisfaction have been achieved. The management and staff will also be surveyed to determine if the ERP system has led to any significant improvement in their business processes and customer satisfaction from their unique perspective.

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