

STRATEGIC INFORMATION SYSTEM FOR BUSINESS AND ENTERPRISE

Case Study of Citizen's Gas Company (CGC)

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Executive Summary

The core purpose of the following report is to discuss the criteria to consider in specifying the structure and features of the new system of CGC. Second, the report is intended to identify the data that has to be incorporated into the new system to offer enough planning capability. In associated with it, the importance of each data item will be explained in the report in accordance with the CGC service. It was found from the report that new system of CGC has to be equipped with the factors of Accuracy, Cost/benefit, Supportability, Quick Turnaround and User-friendly. On the other hand, for the new system, the data that has to be incorporated mainly include customer data, client's industry data, data of capacity of storage field, heating factor data, data of suppliers and weather data. Through incorporating the different data, the new system could better give the desirable results to the company and control over the cost structure of the company. Most importantly, through the new system, the company could control the cost related to suppliers and could best pace up with the demand and supply factor.

Introduction

The following report is based on the scenario of Citizen's Gas Company (CGC), offers the service of natural gas to 200,000 customers. The customers are classified into three classes as Residential, Commercial, and Industrial posed \$160 million, \$25 million, and \$65million of revenue respectively for the company. Instead of such a huge number of customers, the company is unable to control the supply during the gas year or establish a strong information network of long-term contracts of the suppliers. On the other hand, the fact is that the company has a contract of 5 to 15 years with the ten pipeline companies in exchange for the supply of natural gas. In accordance with the situation above, the company has decided to purchase and implement an information system that could help analyse gas supply and demand. The major reason behind is the loss of sales revenue of the company or bring in an excess of supply at the gas year end (Case Study). Also, the curtailing of gas service goes side by side as sometimes for industrial customers or sometimes for commercial or residential customers. On the basis of it, an information system now becomes necessary that will provide a gas plan per month for the next five years.

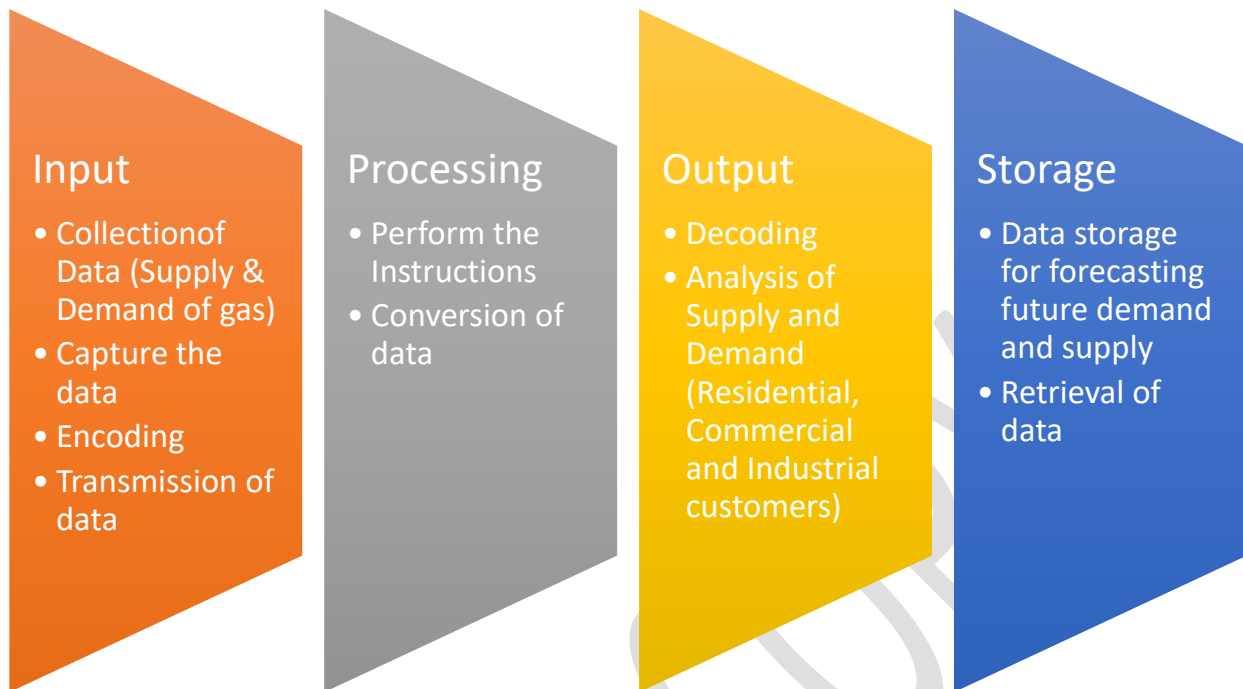
Structure and Features of New System

Structure of the New System

Data Processing

In accordance with Schiebahn et al., (2015) an information system has to be equipped with a significant amount of computer resources so as connect the different data components. From the received component to the processing at different steps, for each of the customers i.e. Residential, Commercial, and Industrial, to the fulfillment of the desired quantity, it is necessary to go through a number of small systems. In order to illustrate more, below the diagram represents the key stages of data processing of an information system:

Table 1: Data Processing Cycle



Source: Made by the author

From the above diagram, it will now become clear to CGC so as the number of small systems required at each stage and their usage as well. Typically, planning system will require a significant number of small systems, for processing, on-time delivery, and storage of data for future.

Supportability

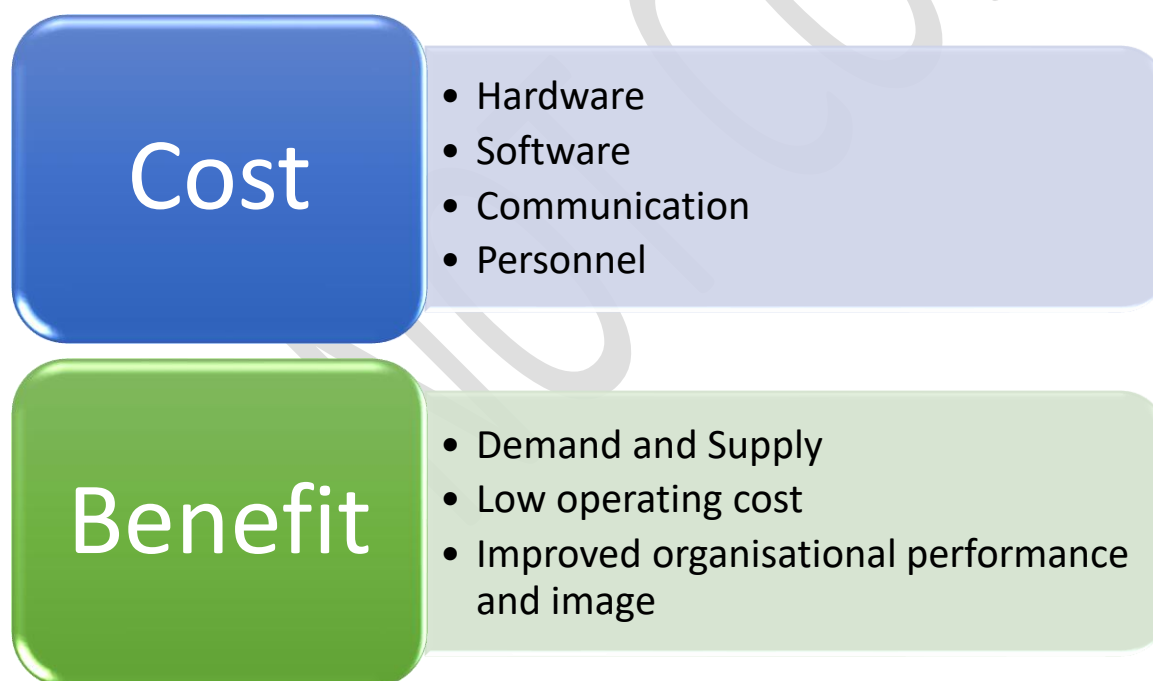
According to Schiebahn et al., (2015) structure of an information system has to be such like that it could provide the best support to the personnel of a company i.e. a user-friendly system. The ease of usage has to from the process of collection and entering data to the updating of the system. On one hand, Wisner, Tan, and Leong, (2015) identified that in the case of excessive support burden, the system will be unable to show timely reporting, ultimately impacts over the degree of accuracy and reliability of the system. On the other hand, Gao and You, (2015) stated that in the case when the structure of a system could not be readily modified and maintained, then the system will be used to go in the state of disrepair position, that would give no results in the long run. In this way, the structure of an information system has to be feasible

that it provide the best support to its users not only in terms of usage but in terms of maintenance also.

Cost-Benefit Analysis

On one hand, Wisner, Tan, and Leong, (2015) stated that any sort of information system has to be implemented while analyzing the cost-benefit avail from the system. Particularly the information system for Citizen's Gas Company (CGC), the structure of the system will be such like that it could analyze gas supply and demand, provide the gas plan for the next five years on the monthly basis, with a special focus on the first year (Case Study). On the other hand, the system will be such like that it incurred less cost of CGC, as the company already in financial crisis due to loss of sales. An overview of the key benefits and costs are as under:

Table 2: Cost-Benefit CGC



Source: Made by the author

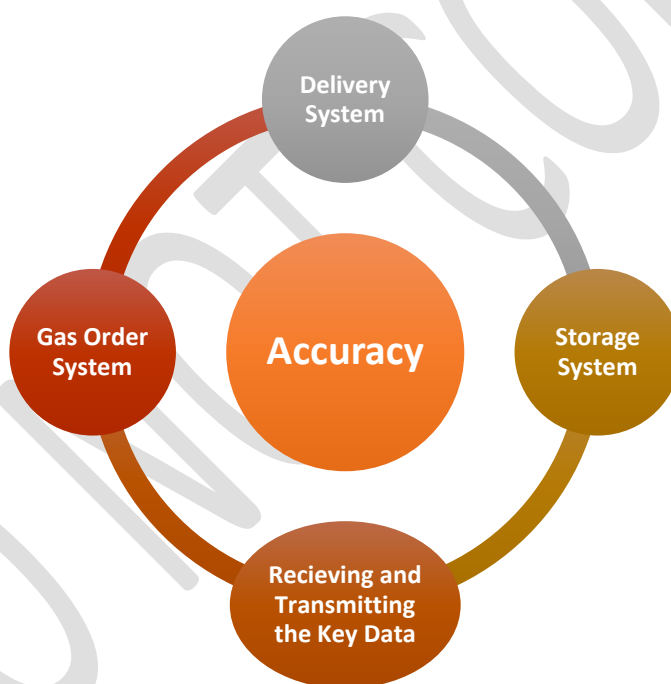
Hence, the information system has to be justified on the basis of cost/benefit.

Features of the New System

Accuracy

According to Twidell & Weir, (2015) for such an information system that could help in analyzing the gas supply and demand, accuracy is the first and foremost feature. Through the function, a company could identify the exact level of demand and supply while using actual data during the year so as to project demand for the year. In this perspective, the level of accuracy required from the system will be to determine the required level of supply and demand detail, quality of the input data, and complexity of the system logic. Extracted from the above discussion, the factor of accuracy has to be maintained enough in the key areas as under:

Table 3: Factors of Accuracy



Source: Made by the author

On the other hand, Kraucunas et al., (2015) stated that along with the factor of accuracy, care has to be taken enough so as does not spend excessive efforts in bringing out accuracy in a particular area. Instead, the overall accuracy is essential, backed behind the plan for the environment (Hwang, Lansey, and Quintanar, 2015).

Frequency of Usage

Turnaround

Market Information

According to Twidell & Weir, (2015) in order to analyze gas or energy supply and demand, the key factors and quantities have to separate from the other areas of the business. The reason behind is to save the key information from the existing rivals of the industry as well as the emerging competitors. Hence, on the basis of the relative importance of supply and demand, it is essential to protect and secure the key corporate information. Consequently, on the basis of the effect of demand and supply quantified, it is necessary for the system to keep pace with the security of data.

Planning Capability

The data that has to be incorporated into CGC's new system to provide adequate planning capability are underlying here:

Number of Customers

It is observed from the Case Study that customer demand at CGC has projected only on the basis of the aggregate number of customers. For this reason, the number of customers has to be broken down into classes as residential, commercial, and industrial customers so as to facilitate estimating demand and supply. Below the table shows the number of customers that CGC has in its each class:

Table 4: CGC Number of Customers

Number of Customers (Citizen's Gas Company)	
Commercial Customers	38,000
Industrial Customers	2,000

Residential Customers	160,000
Total	200,000

Source: Case Study

Besides, Gao and You, (2015) suggested that the number of customers for a gas demand and supply analysis could also be broken down into commercial heating, commercial non-heating, industrial heating, or industrial non-heating customers. Hence, the number of customers has to be projected on the monthly basis, so as to associate the number of customers in conjunction with the growth factor.

Weather Data

The Case Study reported that weather plays a significant role in estimating and analyzing the demand and supply of gas. Particularly, the usage of gas of residential customers is highly depended on the weather, while commercial customers' usage partly depends on the weather. For this reason, by collecting weather data, heating requirements could easily be projected by CGC. While defining the process, Nahmias and Olsen, (2015) stated that in the first year, a gas supply company could analyze the warm or cold weather through meteorological trends data. However, in the later years, average monthly weather data could be used by the company. Hence, as the year passes by, short-term forecasts will be entered to develop the analytical capability of the system while maintaining the factor of accuracy.

Sales Forecasts

The Case Study demonstrated that each class of customer i.e. residential, commercial, and industrial customers exerted their revenue as Residential (\$160 million), Commercial (\$ 25 million), and Industrial (\$ 65 million). The figures of sales revenue of CGC described as under with aggregate revenue of \$250 million:

Table 5: CGC Revenue

Citizen’s Gas Company (Revenue)	
Commercial Customers	\$ 25 million
Industrial Customers	\$ 65 million
Residential Customers	\$160 million
Total	\$250 million

Source: Case Study

Keep in view the figures, the revenue to the top revenue generator would then be forecast on the individual basis by month for the first year of the five-year plan. Regarding the future years, Benjamin, Tan, and Razon, (2015) stated that a company could make use of the annual growth rates. Similarly, taken into account the Case Study, revenue class will be projected heating and non-heating sales for the different class of customers.

Industrial Data

The usage of gas of industrial customers is highly or almost entirely depends on the business factors (Case Study). Keep in view the fact; the data of industrial trends will be of high importance, particularly the industries to which CGC deals with. Nahmias and Olsen, (2015) stated that the growth of the industrial customers has a high importance for a gas supply company. As much as the industry progress, more and more industrial customers would emerge, needs or demands of which have to be identified by the company so as balance the demand and supply factors. Also, it is observed from the Case Study that the industrial sector is the second most revenue generator of CGC, on the basis of which it is essential to record the key industrial trends and data.

Heating Factor Data

According to Tan and Razon, (2015) the heating factor data is the data comes out from the conversion of weather data into the demand of customers. As much as intensive the weather is, the demand would consequently be much intensive for the company. At this time, the demand for each class of CGC consumers is as under:

Table 6: CGC (Demand in cubic feet)

Citizen’s Gas Company (Demand in Cubic Feet)	
Commercial Customers	15 billion
Industrial Customers	50 billion
Residential Customers	80 billion
Total	145 billion

Source: Case Study

In this way, as per the above defined classes of customers and their respective level of demand, the heating factor data is required from the information system so as to pace up with the supply and demand of present as well as future. The heating factor would not require varied as per monthly basis unless there would be the existence of the seasonal relationship or the fluctuation in the trends may observe to a significant extent.

Supplier Contract Data

The background of the fact is that the company CGC has ten supplier pipeline companies who purchase natural gas (Case Study). The amount of the gas is specified in the contracts of supply, valid for 5 to 15 years. On one hand, few suppliers increase the supply of natural gas as per monthly basis; yet, few suppliers varied the supply in accordance with the weather or heating season. However, important is that there is a drawback in the supply of natural gas there was

no data regarding the supply as per the contract amount or not. Hence, the company CGC is bound to pay for the volume of the natural gas specified in the contract, whether suppliers offered the desirable amount or not.

For this reason, CGC requires an effective information system that could record the volume of natural gas each contract supplied as well as the payment made by the company. In this sense, illustrated by Xu et al., (2015) each supply contract, the contract terms including beginning and ending dates will require entering into the new system. Most importantly, the monthly volume supplied by each ten pipeline companies, costs per unit, and take-or-pay terms will be recorded into the system. Through this, the company would not face any shortage of supply and expenses incurred to purchase the natural gas would also be reduced, ultimately leverage the business.

Capacity of Storage Field

The Case Study identified that there seemed no restriction on the gas storage field as per the demand of customers. In this sense, the field used to be filled at the starting of each gas year i.e. at September 1st. However, instead, the field has to be filled in accordance with the usage of natural gas. Not only had this but, the field has to fill as per the usage capacity of the different class of customers. The entire process requires an effective information system as demonstrated by Matopoulos, Barros and Van der Vorst, (2015) in which each class data of customers when it would quantify the need and identify the capacity.

For this purpose, the data regarding the capacity of the gas storage field is required to enter into the new system so as to determine the amount of gas remain in the storage that can be reserved to for the additional supply of natural gas. In this sense, by identifying the capacity of stored natural gas, the company could better supply to its customers as well as could increase the supply as per the demand. Most importantly, the storage capacity would then be divided automatically as per the revenue each class of customers generated for the company.

Conclusion

It is concluded from the above report that while specifying the structure and features of CGC's new system, it is essential to keep pace with the factors of Supportability, Cost/benefit, Accuracy, User-friendly, and Turnaround. The information system has to be equipped with a

range of small systems so as to cover up the detailed steps of data processing cycle. Most importantly, the information system has to be highly secured and protect the key corporate information of the company. In this way, by following on few of the critical aspects of an information system, CGC could best control over the demand and supply of the key natural resource. Regarding the data that has to be incorporated into CGC's new system to provide adequate planning capability, includes customer data, weather data, industry data, heating factor data, data of suppliers and or data of capacity of storage field. All the data collected through information system far much more important so as to identify the level of demand as per the different class of customers of CGC. Also, the data is important to generate or leverage out the capacity in the storage or push suppliers to increase the supply of natural gas.

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