

# Case of Civic Company: The Implementation of Enterprise Resource Planning

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## Abstract

Many researches before has been completed their research on this topic and many researcher point out this question of misfits between company processes and enterprise systems. This research will look like a slice of the puzzle. When companies should modify their ERP and when companies should modify their processes of business. We are using theoretical framework (existing) to impact of technology over companies, this discussion will go towards business strategy and technology fits and misfits. On enterprise resource planning before researches has been conducted, but this research will contribute in-depth study of Enterprise resource planning and it will help and provide advices to managers and academics, would dismiss (local level) complaint of ERP (enterprise resource planning)-driven process changes out of hand. And this article is applying theory (Rockart & Scott Morton Model) for the purpose of evaluating the knowledge of ERP-driven changes to Processes of Company's business.

**Keywords:** enterprise resource planning, management processes, technology, business strategy, role of managers, bill of material

## 1. Introduction

### 1.1 Introduce the Problem

This article uses a careful study of the design and use of an effort asset Organization (ERP) framework on civil company, the relationship between aggressive method of organization to examine a few of his scratch-business forms and use of the ERP. (The name, product line and industry are disguised. We have made every effort to ensure the relevant competitive & manufacturing characteristics of the industry and the product that was studied) the company's results with ERP system have experienced mixed. There experienced some success stories as well some failures and disappointments. In the middle of these two extremes points there are many ERP executions that are half successful and half failure. And this case which we will discuss, this will best described to the middle ground of two extremes points (success and failure).

Expenditure (supposed and real) for ERP driven process changes become considered in different articles. This article will extend to the existing knowledge and add to the community and people understanding of this problem. Actually the company was based on single (standardized) database, ERP also have standardized processes of business. Usually these types of intra-firm processes (standardization) are considered as an advantage for the organization. This in-fact rarely cited as an objective of installing (ERP system). According to the many experts process standardization can be "two edged sword". Despite the fact that companies has ability to choose best-practices during the configuration process of ERP system. "Off the shelf" many companies find that's few of the process (business) which they consider needed, are not viable using their ERP.

Many academic and business experts advised that if any company face this kind of misfit (between desired processes of business and existing business process), that process should be changed. However, like most prescriptions, this one is likely not valid and correct (universally). ERP codes can be modified with some risk (considerable) and cost, certainly it is possible. According to a research question, under a company' chosen enterprise resource planning configuration, existing process cannot be modeled. Under what circumstances

should the process be changed and in what condions should it be maintained (consequence of modifying the ERP)?

To that issue, this article provide in-depth description of ERP system mandated, change issues of processes, MTO/ETO (Make to Order)/(Engineer to Order) context. It analyzes many processes separately, paying specific consideration to the business issues involved. To the research question, this case will suggest minimum one answer. Many business processes are not strategic and only some are strategic. When ERP system-driven process changes increase or have a neutral effect over the process strategy alignment, they are likely well advised. Nevertheless when enterprise resource planning-driven process change decreases to the firm's ability to implement its strategy, then it must be avoided in favor of changing the software.

### 1.2 Problem Statement

The range of plants Multan serves a corner where high customization and flexibility are order winners. And order qualifier is lead time (order delivery) when the market is very strong, and when demand is soften so it sometimes is a winner of the orders in the market. This positioning has many implications for the manufacturing environment. The high degree of customization means procurement and engineering can consume a disproportionat and inconsistent amount of allowable lead time. Over time the Civic company plant had developed various practices for coping with the very challenging aspects of this environment (business). Many of the practices center on compressing lead times for design procurement and engineering work so that adequate lead time (manufacturing) is preserved. Maintaining and keeping flexibility in the order management systems and materials is another key. The enterprise resource planning forced some conditions and requirements on the plant, which conflicted with some of these practices. However the software increased to the alignment between plant's competitive strategy and certain processes.

### 1.3 Company Background

Civic company is based in Pakistan, Company sells electric motors in industrial applications with three plants in 3 cities, and we focused on the division headquarters and a manufacturing facility.

Table 1. Employee's interviewed

	<b>Production Manager</b>	<b>MIS Director</b>
<b>Vice President</b>	<b>Senior Sales Manager</b>	<b>Senior Procurement</b>
<b>Plant Manager</b>	<b>Human Resource Officer</b>	<b>Inventory Manager</b>

Of several views Civic Organization 3 plants are really self-sufficient-they recognize and plan their own requirements, build and ship of their particular motors and buy their own special materials without contribution area Central Command in Multan work with a Liberation need to plant their special offers and creation design meetings, the report and discovered line to the VP for the construction division to base camp readily into the system administrator. Department of Planning has about 55 people, the real plans and significant updates to the model lines have to be regular but not taken with the preparation of applications to the plants.

The commercial center for modern engines is particularly aggressive. Expansive customers to purchase from time to time 150 or more at a time, which can make available for them a considerable amount of normal. One of the ways Civic company has completed is to request forms by the above expectations in the plurality of modified fragments of the business including real and besides adjustments to stock models, One of the Civic plants of each organization to create a solitary type of engine with moderate bit of variety in its details. The two remaining systems allow customers to remarkable feature outline modifications. The range of Multan plants does the best adjustment. Apparently, the customization is a key requirement for business winner fragments of Multan area system; On the other hand conveying time and cost too important. "Our business people go and collect this engine, which is a real doozie, and the majority of suddenly someone must always try to spend the whole thing to reconfigure, and they will appreciate the motor at exactly the same speed how to do a cream puff goes the line "short transport times are particularly important when the business is sensitive.

#### 1.3.1 Enterprise Resource Planning

In today's world speed play a vital role in the business, and speed can be increased by visibility, APCIS, CSCP Module 01, (2013). The ERP software definition synonyms is integrated (standard) software packages, enterprise wide systems, enterprise application systems, enterprise systems, enterprise integrated vendor software. Many authors and researchers defined, but there are not as much major and too much differences (Gable, 1998;

Rosemann, 1999; Holsapple & Sena, 1999). Enterprise Resource Planning (ERP) as a standard application (software) customizable, ERP has integrated solutions of business for their major processes such as planning and control, production, WM (Warehouse Management) as well major functions of administrative including HRM (human resource management) and accounting. According to the Gable (1998), ERP has comprehensive software package solutions find to integrate to the whole and complete processes of the business and functions in order to present a whole and holistic view by a single IT architecture and information.

A goal was to keep the adjustment of the beam projects to a base. The new ERP framework would have regular programming on all Company plants. It would also be a typical internal matter expert. Community organization took the field plants Multan as the best place to first upgrade the new framework on the grounds that Multan area systems takes over most of diversity in the information for its engines. Method reasoning was that if the organization could make the scope of the work there, it would be moderately guide to strip it to be alternative investments. In addition, two key players in the effort, the range MIS and design meetings were right down the street from the plant.

Using municipal organization worked through his business methods using a “meeting room pilot” methodology that takes into educated directors and working conditions to be recognized by business methods, such as the frame would handle any problems or gaps between the committed business forms with the plan of distinction and the ERP framework. The conference room pilot was occupied by a 50-50 mix of data frames and “business side” representatives. The MIS people were basically Senior IS staff. Members on the client side were middle managers.

## **2. Method**

Surrounded by the end of 2013 and beginning of 2014, the interviewed of 20 workers of the plant Civic company and its division base camp said (close and personal) (Table 1). An initial phone meeting and subsequent meetings with the management data frame (MIS) chief were performed in addition. All sessions were recorded and also seen a few reports and reviewed.

## **3. Partial Overview of Order Management and Related Processes**

This part will provide a brief overview of various key processes of the business background to understand the impact of ERP systems. Once there is an real order, sales engineering reviews to the specification to make pricing are correct, not wrong (usually sales uses a book of price for standard orders, and there is a pricing staff (central) for nonstandard), to catch any issues related to engineering, and to initial scheduling. And after this all orders all transfer towards production engineering. After receiving the order by production engineering check each order for problems from the perspective of design point of view after then perform pricing (another) check. Virtually in production engineering all orders receive some modifications and changes-owing to the complexity generated by the divers’ combinations and models. Often the correction in production (engineering) cause adjustments in other areas like, in material management or in accounting (calculation) parts if already have been relieved. When releases orders (once a week) by production engineering once a week, then ERP systems processed material requirements.

### *3.1 Informal Systems*

To facilitate to the short lead times and with delivery of high customization, the plant has two informal systems. “Per-Print” this systems and culture, procedure which facilitated utilizing its workers for midable knowledge base, as a consequence of the high customization many of the components at Multan in the area of plant parts are fabricated and purchased. Specifically for a particular given order. One way Civic firm had traditionally responded to the need for customization through Per-Print parts. To implement a new parts formally requires assigning a number on the part, engineering drawings, generating the routings (required), putting it over the items master file, and sending all material through costing for obtain the price, and it’s all procedure require 10 days approximately-order can be released for manufacturing before. In past, workaround for many parts, takes a copy by sales engineering group for an existing similar part, marks on it, tag and assign a special number, and finally send it directly for manufacturing, and these called Per Print parts. The drawings of “Per-Print” are kept on file (microfilm) and the number of Per-Print is associated with order. Regularly the area of plant Multan is all print items every week with 250 to 350. These Per-Print parts to the manufacturing information systems are invisible and cause headaches in pricing the motors, but they have Civic company allowed to do what the customer needs quickly.

In the ERP system the “Per-Print” part were not viable. There was the reason of “ERP systems are integrated tightly” so it is not possible to keep any parts outside from the ERP systems, that’s why the ERP, in effect

removed to that ways, in which Civic company can respond on the customization request to the customers quickly. To resolve to these problem sales has started working with engineering and sales engineering to screen anticipated orders as soon as possible. It identifies, which previous orders was similar to order coming up, and from these “previous/old” orders engineering take all the information about “Per-Print” in advance formal part information (orders) entered in to the systems. It means when orders received actually, there were few “Per-Print” entered in to the systems and formally defined. While this increased collaboration appears effectively but it’s been not a permanent and complete solution of this problem. Like “Per-Print” parts are service parts and demand of these usually appear without caution and warning.

### 3.1.1 Configured Bill of Materials

While removing to the “Per-Print” systems has built a challenge, as an improvement, broadly ERP driven process change has been accepted. Company was using bills of material (discrete) before the ERP systems. And order entry (personnel) used many selection charts, for each and every order BOM develop and prepared and prepare by engineering people. With this legacy practice tens of thousands of motor (different) design and produced were possible, this was the problem with this practice (legacy). To preparing BOM (Bill of Material) for each product was really time consuming and error margin were high. And alternative option was possible by an application, which ERP vendor provided configuration of a BOM. This module (automates) all parts of the order creation process, create a dynamic bill of material on the based of specification for the motor. It also saving to the many times and better control of the configuration management, less obvious but important, benefits of this is better protection in terms of liability-design defects. Under the traditional system “with a hope you put a unit together, that it would fit all and you would not be hit with product (down the line liability problem)”. If compare to the new process with the old process, so flawed design will be released, and it make less effective and likely by new process

### 3.1.2 Worker Experience and Judgment on the Shop Floor

The great longevity of their floor (shop) workers, it was the advantage for the Civic organization. People with knowledge (extensive) regarding building and assembly to the motors and with ability to diagnose and avoid problems, in-fact without formal BOM (bill of material) and routings file, there is no doubt plant for using BOM for every single order, but it was the reality that’s “every BOM was inaccurate”. Every one compensated for it and understood. In-fact the personnel of material management was facing problems and they complained that “due to inaccurate BOM we cannot order right material” but other side (engineering side) they was not very serious to solve this problem. And the worker of shop floor was good in building correct motors. *In the manufacturing area some people will only look to the order and say we know it needs that’s and this, in-fact they do not look to the BOM. And to check the Bill of material is not my job (attitude of the guys) whether its correct or not. My work is only to make motors. Material Manager*

### 3.1.3 Representative Experience and Judgment in Arranging Material

When the floor was using informal systems including BOM, routings, so ultimately problems was facing by departments, because they rely over the shop floor data, like planning and accounting. However, the information systems (legacy), and policies (informal and formal) allow to the organization to adjust and compensate in other areas. E.g the system (legacy) more easy way and efficient for planners and buyers to look over customers and shop orders, that were driving lower level material requirements. In opposite the ERP reduce these all opportunities to use their judgment in the system. Buyers and planners was looking to the MRP action messages -which is systems generated, about the quantities of the order and timing-it’s very complex to retrieval of the information regarding the nature of the requirements. Like information about safety stock was not appear with the action messages, and system was not configured properly to support order pegging. Usually a routine allow to the planners to regulate and determine the level (higher) item requirements, which are driving level (lower) requirements. *According to the plant manager: the problem in the ERP, we in-fact does not know, these parts ordered for what? We are not driven by the order, but by the parts, for example if we have got 60 of a casting (certain) ordered. So we also do not know from these 60 orders 20 will be used for this order and 40 will be used in other order. It is not apparent for the person buying the parts.*

The systems (ERP) has removed many opportunities for the buyers and planners to change and use their judgment, and use manually valid data from the floor, the bill of material, and elsewhere has more become critical. It’s not clear, whether these areas (other) are transitioning sufficiently and adequately as the following statement. *According to the procurement manager: you can change the amount you are going to order, but many buyers said, “This information got should not be incorrect, whatever the system of ERP says, and that’s I am going to do” and it will really good, if information which going in to the systems is not incorrect. From all*

*departments. But as a buyer we face the problem is on a regular basis “almost having to overcome and outsmart to the system” just because which information we are receiving is not correct and it’s difficult, while issuing a purchase order only is easier.*

However, there is different mentality over complying to the procedures that keep the system smooth and accurate, and everyone think, now because of ERP procedures and many operations are on one linked so cooperation has been increased and employees are more professional. In past before the ERP system no one was serious to hear about correct BOM, wrong material are using in manufacturing and engineering, before the ERP atmosphere were very rude and no as such cooperation among departments.

#### 3.1.4 Flexibility to Change Open Orders

Another major problem appeared after the system have been operational (for a short time). In a very large order a customers request for changes about the motors specification. After those customer orders have been released for manufacturing. In the business usually the large customers built equipment for companies (other) and they do not know the exact requirements of customers till late. In the previous record of Civic company they did accommodated these types of request from the customers, as long as that’s aspect of motor have not been manufactured already. But in the ERP systems not changes are possible after orders released to manufacturing. Now Civic company can change to this order, by first cancel to this order originally (which materials already used will be back out and reenter order as a new order and go forward artificially with the production in the system till system caught up with the partly made motors already) *the customer contacted to the senior management, who (directed) that the order (be modified per the customer request). In-fact turn off to the ERP whole system. But in the real CIVC Company did not turn off and shutdown to the ERP system. And they did work with ERP vendor for 6 months more to resolve this problem.* In the engineer to order segment of the industry, access to the information are becoming very important. Like according to the ETO (Engineer to Order) manager *faster access of information is extremely important in today’s business, because of current and latest information you can minimize to your lead time from the designing stage to the production stage, if you want to be competitive you must need to minimize your lead time.* However, according to the ETO manager the system of ERP has a small impact in facilitating to process of ETO (engineer to order). As well he believes ERP can be an excellent accounting inventory management system. He also anticipates advantages from the consolidating disparate system (legacy) and by increasing discipline.

#### 4. Discussion and Findings

Civic company’s many existing processes may perhaps be carried out under the system of ERP. But as with major ERP executions, there were some elements of plant’s processes, which were not feasible in the system of ERP package. Due to the limitation in the ERP package and due to decision of Civic company took during the software configuration. As a result of central and plant management was faced with decision, when modify to the business practices and software. Researcher gave advice to the management that’s when processes of business are strategic, misfits between the system of ERP and those processes, can be solve by modifying the system of ERP, but processes of business should be modified in other cases. According to the Henderson and Venkatraman (1990) IT infrastructure, business process and IT strategy should fit to the business strategy.

As per the model of Rockart and Scott-Morton’s five critical components of the company design must be in sync. If any one component will not be aligned with the other components, it will be discontinuity in the company. And discontinuities are solved either by unplanned company shifts or by intentional action of management. These both which finally will bring to these sex componenets back into sync. We are going to evaluate Civic company (responses towards ERP implementation) on the basis of Rockart and Scott-Morton’s Model.

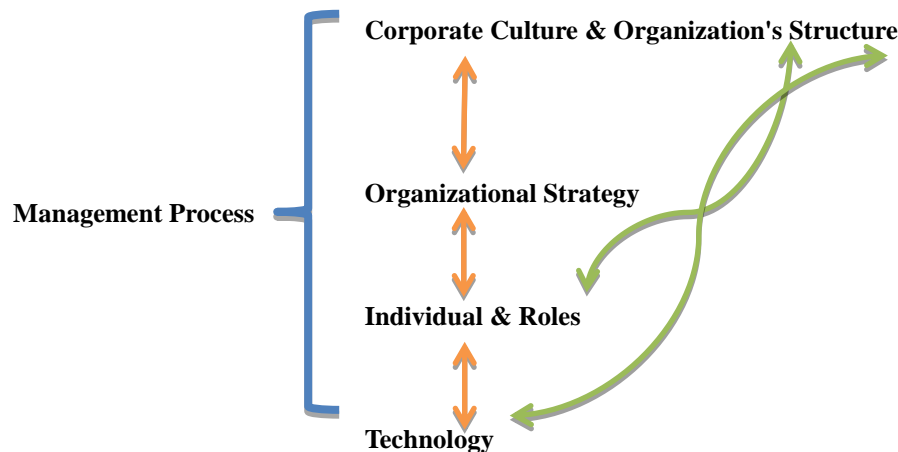


Figure 1. Rockart and Scott- Morton model

First consider to the Civic company's strategy, which can be conceptualized as it is order qualifiers and winners. Order winner for the Multan Plant's market segments are flexibility and customization. Mostly when market and business are slow, then lead time is a key order qualifier and order winner some times. Many of the processes and systems the case describes are very crucial to producing these order qualifiers and winners. Production engineering is also a very important process. Which challenge was facing "completion of the necessary production engineering" like BOM (bill of material, design and routings and material work of preproduction, (procuring materials and planning especially non-standard one) without consuming too much time from total allowable lead time.

Rockart and Scott-Morton Model's another key component is technology. Implementing of ERP on Civic company involved shift in technology from several loosely coupled IS (information systems) and many informal systems to integrate single IS (information system) because the current strategy of business has been successful, a challenge which Civic company was facing is implementation of ERP-new technology. That gives the expected benefits like improvement in cost and defined processes without compromising and negotiating its ability to implement its strategy- give order winners-(mentioned above). Further we will discuss to the three cases or instances from the in which the new technology affects to the strategic position of the plant.

#### 4.1 Instance One: The BOM Configurator

The module of configuration management is an example of the type of outcome many companies hope, for when they execute ERP. Here the technology shifts from legacy to ERP technology and improve to the ability of the plant to execute to the business strategy. As before discussed, able to perform customization (in a timely) is a critical capability for the Multan plant of Civic company. The facilitates of the configurator this capability because it speed of Bill of Material construction, and its also minimize to the chances of mistakes. As well as, because the new process, improved strategic alignment without threatening roles, it was fairly accepted easily.

#### 4.2 Instance Two: Changes to Process in Order

Intially Configuration of ERP system, Civic company has eliminated the option of changing orders of customer's once manufacturing process begun (and it was possible before in old systems). As the section on flexibility to change orders (open) suggests, un-checked, these technological shift can result in to a strategic shift away from flexibility and customization. As the case explained, managenet realized quickly that such a shift was not reliable with business strategy of plant. Therefore management ordered to the package of ERP be customized to allow changes in order (open). The company changed to the ERP technology as per the requirement-as opposed to its strategy, process and other factors in Figure 1. Maintain to the technology, strategy alignment that existed before implementation of ERP system.

#### 4.3 Instance Three: Informal Systems

This example represent individual responsibilities, roles, culture and processes all shifting to create ERP (Post) alignment between technology and strategy. Many technologies (alternative) have evolved and coexisted with formal legacy (IS) information system. And these included: One is the Per-Print system that's minimizing to the preproduction engineering time. Second is the shop floor technology and planning employees routinely

overriding to the system like Bill of material, MRP planned orders, etc. on their judgment based. These systems (informal) were possible just because with the individual experience and knowledge (worker) of the long time. These latest technologies were facilitated with management process which included a tolerance for inaccuracies in inventory counts and high inventories etc. This loosely coupled; infrastructure (informal) allowed Civic company to put design in production without improving them, and because of this eliminated time consuming (formal) process for correcting errant and inaccurate orders-a Bill of material revision (formal) process for orders (open) - and establishing new part numbers for the items of low volume.

Due to the new technology (ERP) integration is high level, so it was practically not possible to operate and run outside from the system (ERP) using any informal technologies. Therefore the informal shop floor and per-print system adjustments in to the Bill of Material (BOMs), routings, were no options. In simple words between the IS (information system) and business, ERP demanded consistency, this in-ability to work around the information technology (new) had the potential to threaten the capability of plant to perform fast and rapid customization. Therefore management processes individual responsibilities and roles and the factory floor's culture all evolved. Like the cited case advised the increased sense of interdependence urged by Enterprise Resource planning is causing employees in departments such as manufacturing to work with another department to remove the in-accuracies and correct to the Bill of Materials (BOMs) standards etc. because design employee and production employees was working closely with information system (IS) employees to maximize to the system accuracy and to enter per-print parts quickly, Enterprise Resource Planning was changing to excellent replicate and reflect the business.

## 5. Conclusion and Future Research

Many researcher before addresses the problem of misfits between the business (existing) processes and ERP, When organizations should modify to the ERP system or business process? This research will help to give answer of this question or problem. The starting point was an account of the effects of Enterprise Resource Planning system over various business processes. The impact of technology over organizations, In instance one the using an existing theoretical framework, the discussion explored and discovers fits and misfits between strategy and technology. Technology (ERP) improved the company's ability to implement its strategy. But things are not simple as we think; Instance second a case, management selected to change to the technology to preserve it is ability to implement to the strategy, and in the last Instance three, discussed processes, roles and culture all shifting to achieve alignment between the strategy and the ERP. The vital contribution of this research is its in-depth and too much description of the several key Enterprise Resource Planning fit issues. This article and analysis should serve as an advisory note to top management of the organizations and professionals. Even though too much problems can be attributed simply to resistance to change, some reflect authentic issues and problems. In-depth Understanding about the business process and information technology (how to implement and how to overcome barriers) play a crucial role in the success of ERP. And this research give in-depth understanding about the ERP successful implementation, as well this article also give advices and suggestion and used a rationale theory based model (Rockart & Scott-Morton) for assessing the insight of potential ERP driven changes in to the business processes.

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