

## Web-Based Enterprise Resource Planning System: An Alternative for Small and Medium Size Business Companies

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### Abstract

Implementing an enterprise system is “corporate equivalent of a root canal,” a meaningful analogy given that an ES with its single database replaces special-purpose legacy systems that once operated in isolation. An Enterprise Resource Planning System has the herculean task of supporting and integrating a full range of business processes, uniting functional islands and making their data visible across the organization in real time. Not surprisingly, the software that vendors such as People-Soft, SAP, and Oracle provide is unwieldy, expensive, hard to implement and creates organizational change that can be as painful as, well.

If organizations can endure the implementation cost and pain, they are rewarded with large increases in both efficiency and effectiveness. When organizations build their information systems in house, they design the systems to fit functional requirements, often with a different system for each function. With this mind-set, systems proliferate at an alarming rate.

An integrated system built on one database eliminates these problems. With a single unified database, everyone can instantly see data entered anywhere in the system, and no one has to enter the same data again—a common inefficiency of isolated systems. With fewer processing delays and increased data quality, organizations can more easily plan their operations, and managers can uncover, analyze, and address problems as they arise.

**Keywords** - Enterprise Resource Planning, Integrated System, Cost Effective, Small and Medium Sized Business

### I. INTRODUCTION

When someone says enterprise resource planning (ERP), most people think of an expensive, complex, and difficult to implement commercial products that were the rage a few years ago. Although many large corporations did reap tremendous cost savings from the implementation of such systems, an average implementation cost counted in the millions of dollars; this has prevented ERP systems from spreading to small and medium-sized businesses. After ERP deployment, its “black box” nature prevents from understanding and eventually improving the business processes it implements, leaving some important business decisions to the software publisher rather than to the corporate manager, preventing scientific researchers from getting involved in management innovation. This situation provides much of the motivation for our architecture, which offers several advantages for small and medium size business. This website incorporates, from scratch, advanced concepts such as object-oriented databases, industry required modules, synchronization within modules, variations,

workflows, and a method to model and implement business processes.

Implementing an enterprise system with its single database replaces special-purpose legacy systems that once operated in isolation. An ES, or enterprise resource planning system, integrates business processes, uniting functional islands and making data visible across the organization. Many software that vendors such as People-Soft, SAP, and Oracle provide is expensive, and hard to implement. Even less surprising is that their implementation may create organizational change that can be as painful as, well, pulling teeth. If organizations can endure the implementation cost and pain, they are rewarded with large increases in both efficiency and effectiveness.

When organizations create information systems on their own for self use, they design the systems to fit functional requirements, often with a different system for each function. With this mind-set, systems proliferate at an alarming rate. One company had 58 systems just to support order

fulfillment. The resulting morass clogs the free exchange of information among and within business units and spawns other usability problems, which in turn decrease data quality. An integrated system built on one database eliminates these problems. With a single unified database, everyone can instantly see data entered anywhere in the system, and no one has to enter the same data again—a common inefficiency of isolated systems. With fewer processing delays and increased data quality, organizations can more easily plan their operations, and managers can uncover, analyze, and address problems as they arise.

Although the potential benefits are compelling, ES implementation is still risky enough to daunt many organizations. Buying and implementing an ES can cost from tens to hundreds of millions of dollars, and the process can take anywhere from 10 months to several years. Moreover, the software is only a fraction of the total cost. The cost of services such as technical consultants and part-time help for staff whose hours must be partially diverted to the implementation can balloon to many times the software cost. Indeed, an organization can only realize an ES's benefits by going through a lengthy and costly implementation process—one that almost guarantees spending more time and resources than for any project the organization has yet undertaken. As the "Why Is ES Implementation Different?" Many issues have no right answer, and managers must be able to identify and manage these tensions during and after implementation.

## II. PROBLEM STATEMENT

This paper is based on the ERP (Enterprise Resource Planning) concept where the integration of different departments is the fundamental idea put across. One organization is the co-ordination of the different departments like Accounts, Sales, Purchase and Inventory etc. Nowadays every enterprise requires a solution where they can intercommunicate with each other at the end of the day they can come to a conclusive part which will justify the process flow in the organization and that will generate filtered data and the reports which will help the department heads to concentrate more on the decision making process.

As far as the future enhancements are concerned the application is platform and architecture independent and re-deployable and reusable. The project has taken the departmental details in the corresponding modules and has found integration among other modules.

## III. LITERATURE SURVEY

On the basis of our observing ES implementations, we have developed an informal

roadmap that hopefully will help managers achieve both technical and organizational objectives and reap an ES's considerable benefits.

82 SMBs without ERP that responded to ERP Survey face a few common business pressures.

### A. PRESSURE SMBs FACING WITHOUT ERP

Growing organizations are exposed to more outside factors. As they interact with supplier, they need to provide more accurate data to extend enterprise.

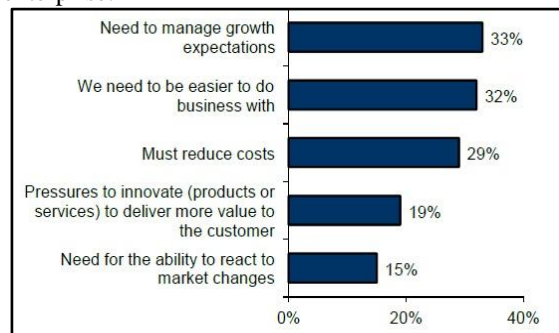


Figure 1: Pressure SMBs Facing Without ERP

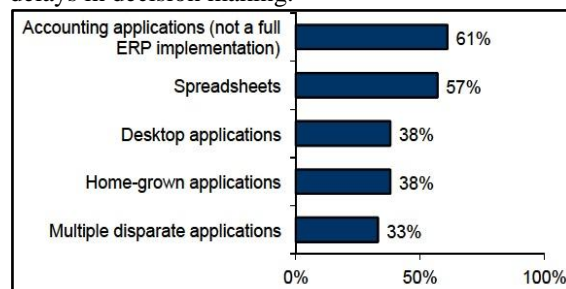
Key points according to figure-

- 33% cited a need to manage growth expectations as one of top two pressures. As SMBs grow they may be adding new locations, employees and products.
- 29% of companies cite this as top-two pressure. Costs can quickly spiral out of control in a growing organization, need to be carefully managed.

SMBs without ERP need a way to help managers make informed, agile decisions, while cutting organizational costs, improving communication across geographic boundaries and satisfying customers.

### B. WHAT ARE SMBs WITHOUT ERP USING TO RUN THEIR BUSINESS

According to this survey 33% use many disparate applications. This strategy increases contradictory data, which leads to mistakes and delays in decision making.



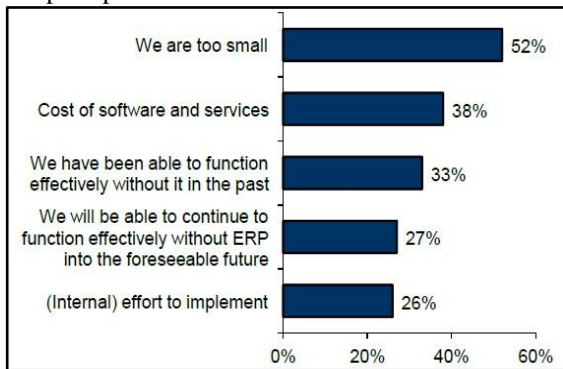
**Figure 2: What are SMBs using as an alternative to ERP**

Spreadsheets are better than nothing, performance differences indicate that companies using spreadsheets or home-grown applications as a platform to run their business are missing out on top performance. Some believe they are too small for implementing ERP.

Sixty-eight percent (68%) of organizations under \$50 million in annual revenue have already implemented ERP. The efficiencies that this ERP can provide can benefit organizations of all sizes.

**C. WHY NOT TO IMPLEMENT ERP SYSTEM**

Some other managers feel that they have functioned well without ERP in past. This is fine for organizations that expect to stay static but growth and change can have unforeseen effects on business that prompt new investments.



**Figure 3: Reasons Industries not implementing ERP**

Twenty-six (26%) of SMBs without ERP have not adopted it because of effort required to implement. These companies lack IT resources, or feel that they cannot take valuable resources away from their day-to-day jobs for ERP.

**D. ERP SYSTEM RELIABILITY CHECK**

The Meta Group reports that as many as 70% or 7 out of 10 ERP projects end in failure, which is two and half times the industry average. A Computer Associates survey of 886 managers reports 44% of ERP projects lose \$1 million per year, 35% lose \$5 million per year, and 21% lose \$11 million per year. Other causes of ERP failures include inexperienced analysts, long work weeks, poor communication, lack of employee involvement, incentives and management support. AMR Research recently reported that ERP is regaining momentum. The latest data shows the market for ERP will grow from US\$ 13.4 billion in 2003 to a projected US\$ 15.8 billion in 2008, a compounded annual growth rate of 3%.

**Table 1: Cost and Features Comparison of Existing ERP System**

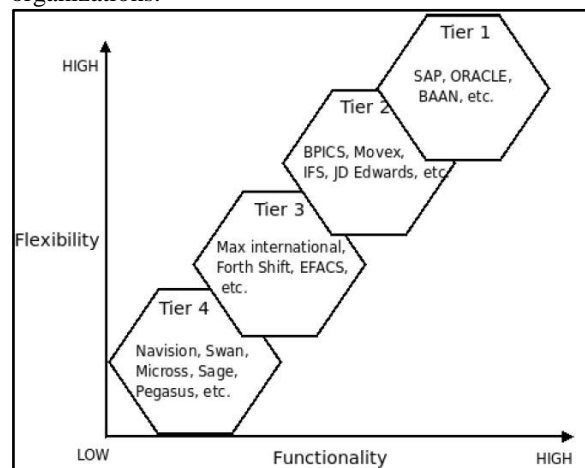
Product	Cost/Month/User	Features
Quickbooks	\$10	A
Zoho	\$12	S
Freshbooks	\$15	A
Xero	\$30	A
Work etc	\$40	S
Sugar CRM	\$45	S,O
Open ERP	\$50	A,I,S,M,O
Open Bravo	\$50	A,I,S,M,O
Sales Force	\$65	S
Bright Pearl	\$100	A,I,S
NetSuite	\$100	A,I,S,M
SAP	\$125	A,I,S,M

**Features Description :**

<b>A</b> – Accounting	<b>I</b> – Inventory	<b>S</b> – Sales
<b>M</b> – Manufacturing	<b>O</b> – Open Source	

Sixty-one (61%) of organizations with ERP integrate manufacturing operations with customer oriented service, delivery and logistics, employees do not interact with each other, except through product; can collaborate to deliver value to customer.

Sales and engineering collaborate to set proper expectations with customers. Cross functional continuous improvement teams are responsible for improving operational performance. Manufacturing operations are integrated and coordinated with customer service, logistics and delivery organizations.



**Figure 4: ERP Systems classification by Tier**

**E. SELECTION CRITERIA OF ERP SYSTEM**

If the functionality an organization needs is not available in the selected ERP, then the organization will not see full range of benefits from using that system. Ease of use is also important if employees cannot use ERP, they will make mistakes. Also total cost of ownership is a top concern for

SMBs. Lastly, since ERP is designed to be an end to end solution; it must be an integrated suite, rather than multiple point solutions.

The key selection criteria are listed-

1. Functionality
2. Total cost of ownership
3. Ease of use
4. Integration with system

#### IV. PROPOSED SYSTEM

The network is built on the Windows 2007 Server platform; along with this Windows 2007 operating system we are using SQL Server and the .NET technologies. Here we make use of the C# with ASP.NET with SQL Server with which we can implement three-tier architecture. Using VB.NET we can develop all User Interface Application such as form designing, report designing, etc SQL Server can be used to store huge amount of data with higher security.

As this is a web based ERP System, one of the major advantage is that the user can operate it from any corner of world with network connectivity. Also its capability to provide maximum functionalities in minimum cost makes this system affordable for Small and Medium Size Business Companies.

An ERP is recognized by the functionalities it provides to its user. ERP integrates different modules of an organization into a single unit. The modules developed in this proposed system are:

##### A. ADMIN

System administration is not a business function but a role that manages tools of business. ERP administrator cares for the system by applying vendor provided fixes to bugs, enhancements and supporting the technical infrastructure on which it runs.

##### B. MASTER

In the Master module, we have heads like Account, Item, General, Excise, Warehouse and Report. Each head s has its own sub section where the Administrator could enter the details required to manage the master. After the master is defined, when the user select any section, all the details such as price or condition, entered in the master for that particular head will be applied.

##### C. SALES

Sales Order Module Comprises of Contact Management and Sales Order Processing Management. It is an integrated solution comprising of marketing and sales activities. Organization can

act immediately improve sales, service and marketing effectiveness by using this Module.

##### D. BILL OF MATERIAL

The BOM module identifies a standard list of items or components, required to produce a different, or parent item. It defines relationships between items being produced and items needed to produce them.

##### E. PURCHASE

Purchase procures all types of items or a product required by the organization, provides all departments with their necessary item requirements, keeps a ready count of the quantity of the different items and deals with the suppliers in an endeavor to procure new stock.

##### F. INVENTORY

Whether you are a manufacturer, wholesaler or retailer, management of your inventory is critical to controlling your costs and ensuring the smooth operation of your business. ERP Software gives you real time information on current stock levels and values including stock on order, raw materials, work in progress and finished goods.

##### G. ENQUIRY

The purpose of this module is to keep the record of all the enquiries regarding any product or its material. The enquiry is sent to the supplier for the requirements of goods. This module is also integrated with the quotations in order to generate the amount for the enquiry made.

##### H. QUOTATION

Quotation module generates the quotation for a particular enquiry. When enquiry is saved in the database, its quotation for that enquiry is generated and on confirming the quotation, the required materials are dispatched from Inventory and amount is updated on Sales module.

All these modules are integrated in a single module operated by Master Module. The implementation of this ERP System would require a Server, on which the web-pages will be uploaded. These web-pages will be accessed by the machines which are authenticated to be connected with server. Once the machines are connected to server, the can access the web-pages and all the data can be updated in a centralized database which is uploaded at server.

This ERP System focuses on the integration of the organization with its Suppliers and Customers. The inventory module is updated whenever there is an exchange of goods either at supplier end or customer end. For each sale of good or purchase of good, there is bill and purchase order generated.

## V. NEED OF ERP FOR SMBs

It's taking longer and longer to reconcile financials at the end of the month. Your sales forecasts are based more on guesswork than solid figures. Your business is having trouble keeping up with its order volume and customer satisfaction is faltering as a result. You have no idea how much inventory you have in your warehouse, and it's a pain to find out. If this sounds like your business—or close to it—then it may be time to consider an ERP system. As every company is unique, there's no single indicator that says, "You need ERP now!" However, the companies that would benefit most from ERP software often face similar problems.

### A. DON'T HAVE EASY ACCESS TO INFORMATION OF THE BUSINESS

If someone asked you what your average sales margin is, how long would it take you to find out? What about other key performance metrics, like orders per day or sales to date? For companies that rely on soloed systems and spreadsheets that need to be constantly updated and reconciled manually, it could be a long wait.

The pace of business is faster than ever before, which means employees across your company need immediate access to key data. With an ERP solution, executives can get a holistic view of business operations at any time, while other staff can get the information they need to do their jobs more effectively. For example, sales representatives should be able to view a customer's full transaction history and more proactively improve renewal rates while increasing up-sell and cross-sell opportunities.

### B. DIFFICULT ACCOUNTING

Often, the first noticeable signs that your company needs ERP software will come from your accounting department. If your employees rely on paper-based invoices and sales orders—and spend hours every week manually entering them into different accounting and sales systems—you need to consider how much time is being wasted on tasks that ERP software can handle in an instant.

The same goes for financial reporting—if it takes ages to consolidate or reconcile financial information across systems and through countless spreadsheets, an ERP solution can make a significant impact. With all financials in a single database, accounting staff won't have to spend hours cross-posting information, rekeying numbers, or reconciling data manually. Your accounting staff will be more productive, freeing them to deliver critical reports without delays and frustration.

## C. LOW SALES AND CUSTOMER EXPERIENCE

As companies grow, one of their biggest challenges is often inventory management. Ensuring that the right amount of products is in the right location at the right time is a vital part of business operations.

When sales, inventory and customer data are maintained separately, it can create serious problems across your company. If you run out of a popular product, sales will be off until the next shipment arrives. Meanwhile, if a customer calls to inquire about an order and employees can't track it to see if it's been shipped—or if it's even in stock—your company will start to develop a poor reputation for reliability and service.

## VI. ADVANTAGES OF ERP FOR SMBs

With an ERP system, staff in every department will have access to the data, up-to-the-minute information. Customer-facing representatives should be able to answer customer's requirements, without having to hang up the phone and check with another department. Better yet, customers should be able to simply go online to their account and view status information. Meanwhile, the warehouse manager can see that stock is getting low and can reorder. Some other advantages are:

### A. DEMAND FORECASTING

ERP enables to forecast the sales of a particular product/service based on historical patterns, current business environment, current order booking rate etc. ERP System have capability to generate forecast based various statistical techniques developed to handle different data trends.

### B. PURCHASE PLANNING

ERP are capable of generating purchase plans based on the demand & forecast, lead times, current order positions, lead time of procurement etc. The generated plans go for approval process before getting converted to final orders.

### C. MATERIAL RECEIVING

This process facilitates receiving of materials for the purchase order which are ready to be received. Based on bills, the system updates the warehouse/location wise inventories of the material. Inspection advises are generated based on set parameter and facility of recording good and bad quantities are provided.

### D. INVENTORY MANAGEMENT

Complete control on inventory is possible through system by way of update of stock based on

receipts and issues of materials. One can see detail view of stocks lying at different locations in plant/warehouse. System automatically suggests the location where a given materials is to be stored and picked as per depending on transaction driving the action.

**E. SALES HANDLING**

There is process and facility for booking orders either for standard or specific items. System controls prices in form of predefined pricing, discounts and rebate strategies. The booked orders go for approval process before passing to warehouse of dispatch and invoicing. System takes care of credit limit of customer and required controls to reduce collections risks.

There have more than a dozen integrated modules that address the breadth of the organization’s needs. They can scale to grow with the organization, contain a toolset that allows for user customization, and rely on a sophisticated, relational database with open access. The vendor has a solid understanding of the market’s wants and needs and is committed to meeting them through its offerings.

**F. PERFORMANCE BENEFITS**

Even if managers from an organization without ERP firmly believe that the systems they are using are effective and reasons that they have yet to implement ERP are sound, it is still though to deny the differences in performances between SMBs using ERP and those are not.

**Table 2: Comparison in Organization With ERP and Without ERP**

Parameters	With ERP	Without ERP
Day to close a month	5.1	5.9
Day sales outstanding	41.8	43.3
Growth in operating margins over last 2 years	12%	10%
Decrease in time to decision over past year	18%	10%
Inventory accuracy	94%	85%
Days cycle time from service completion to invoicing	4.2	6.4
Customer retention	86%	82%

ERP users are more likely than those without ERP to enact strategies that combat the pressures listed.

1. Standardize business processes

2. Streamline and accelerate processes to improve efficiency and productivity
3. Provide visibility to business across functions and departments.

**VII. CONCLUSION**

In this paper, we have described how a web-based ERP System can help in growth of small and medium sized business at low cost. As this is a web-based system, the user has provision to access it from any place at any time, required that it is connected with the server on which data is stored.

Our ERP System is very much cost efficient as compared to other available products in the market and also with the integration of different modules it can ease the burden on the organization.

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