

ERP – THE CHANGES TRENDS OF INFORMATION TECHNOLOGY

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ABSTRACT

This research presents an overview of the Systems Applications and Products in Data Processing (SAP) Enterprise Resource Planning (ERP) implementation methodology and important tools that make SAP a complete solution to allow any organization to plan and execute the implementation of SAP ERP software. The ASAP (Accelerated SAP) methodology is used as the SAP implementation reference model in this study as most of the companies implementing SAP use ASAP methodology.

In a study of articles on software implementation effectiveness, more than 30% of projects were perceived to have failed because of a lack of effective project planning, while 10% were perceived to have failed because of technology-driven causes.

Content analysis of articles reporting SAP implementations of six companies from all over the world have been done. Four of these companies had a successful SAP ERP implementation and the other two were failures. Sustained executive management support and their ownership of the implementation, project team composition and good project management especially pertaining to process design, testing and training of the end users are the most important factors contributing to the success of SAP implementations in most organizations. Due to long time, cost, and be short of sustained management support / contribution and user involvement / training and testing are seems to be the factors contributing to the success/failure of SAP implementations in most organizations.

Keywords

SAP- Systems Applications and Products in Data Processing, ERP- Enterprise Resource Planning, ASAP- Accelerated SAP, CRM- Customer Relationship Management, SCM- Supply Chain Management, BI- Business Intelligence, SD – Sales and Distribution, ROI – Return on Investment, SLA- Service Level Agreement, SKU- Stock Keeping Unit, MRO – Maintenance Repair and Operational

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INTRODUCTION

Since for so many years with rapid changes in the business world, companies need and looking forward to have an integrated and flexible enterprise system that supports all aspects of their business with state-of-the-art functionality. Companies have struggled with extremely long project timelines in order to develop information systems that met their specific requirements. Companies had to develop a custom code which was tedious process requiring many programmers as well as significant end-user involvement. Moreover, after implementation most of these programmers needed to be retained for the maintenance of custom programming. Project timelines were dragged out because often business owners didn't know what they wanted until they saw it. Due to departmentalized systems, which did not share information and thus became the "information silos" within an organization? This resulted in data discrepancies which resulted in companies taking a long time to close the books for quarter and year-end reporting. These unconnected and multiple systems also created a need for many distinct interfaces between systems that were not designed to talk with each other.

In order to eliminate these problems, a new breed of software systems, called Enterprise Resource Planning (ERP), was created. These systems provide a single source of data with designed integration between different functional modules (for example, Accounting, Sales and Distribution, Materials Management, Production planning, etc.). These ERP systems are customized using the table-driven customization method, which provide a common set of data source to the whole organization. Due to table settings instead of old-fashioned hard-coded program logic, new and changed business requirements are rapidly implemented and tested in the system. There are various ERP products available today for example from SAP, Oracle, PeopleSoft, JD Edwards, Salesforce.com, Baan, Microsoft, and HP to name a few.

SAP AG founded in 1972 is the world's largest Enterprise Resource Planning (ERP) software with 93,000 customers / 116,500 installations / 12.8 million users in 120 countries as of year 2010. The SAP system comprises of a number of fully integrated modules:

Human Resources

Financials

Customer Relationship Management

Sales and Distribution,

Supplier Relationship Management

Product Lifecycle Management

Business Intelligence

These modules or solutions, as SAP would like to call them, cover virtually every aspect of business management. SAP provides standard business application software which reduces the amount of time and money spent on developing and testing all the programs.

With hundreds of companies implementing the ERP systems to make their business more efficient only few are very successful in implementing them. According to a survey done by Gartner only 60% of companies implementing ERP system claim they got expected benefits

In general an implementation is considered successful if it is done within budget and time with meeting all the preset implementation goals as measured by ROI, etc. Also, it is important to understand that delivering an ERP system on time and budget doesn't make sense if no one in the company uses it.

In any ERP implementation lots of variables are involved like personnel (business side, technical side, support side, users), implementation partner (for e.g., IBM, Accenture, Cap Gemini, Delloite, Wipro, independent consultants, etc.), software and hardware vendor (SAP, Oracle, QAD, PeopleSoft, JD Edwards, Baan, Salesforce.com, Baan, HP, Microsoft, etc.), and implementation strategy. With so many things coming together in a matter of few months to a year or so for implementation it is important to know the critical factors for success and failures of an implementation. This field project is a study in depth of twenty SAP ERP implementations all across the globe (ten of them successful and ten of them failures) to determine critical success factors and what needs to be done and what mistakes to avoid for a successful implementation.

LITERATURE REVIEW

Literature review is divided into Two sections: ASAP Methodology and Case Studies.

ASAP METHODOLOGY

ASAP is a complete method and group of processes that lay down the road-map to implement SAP in an organization. The two methodologies used to implement SAP are Conventional and ASAP. In early days of SAP, Conventional methodology known as SAP Procedure Model was heavily in use. ASAP methodology as is fast and provide flexibility, with the exception of very large companies with revenues in billion dollars, hence SAP Procedure Model has been overshadowed by ASAP methodology. Here ASAP is used as the reference methodology.

In 1996, SAP AG introduced the ASAP (Accelerated SAP) methodology. This methodology provides an excellent tool for small and midsize companies to rapidly implement SAP and take advantage of its integrated business processes. ASAP provides content, tools, and expertise based on thousands of successful implementations by SAP and its partners. The ASAP methodology consists of a roadmap that defines the five phases of SAP implementation process and supports these with a comprehensive project plan5.

ASAP Roadmap

Phase 1: Project Preparation - This phase provides initial planning and preparation for the implementation which includes project plan, project scope, and project team organization. In this phase the initiation of the SAP ERP project, which includes the overall goals, detailed task plans, and processes is formally announced to the company. Main activities in the project preparation phase include a Kickoff meeting and Project team standard meeting which include the following tasks:

- Define project mission statements which reflect the overall company goals and vision for the SAP ERP implementation.
- Identify specific company objectives and business drivers for initiating the SAP ERP implementation like improved inventory turnover, reduced shipping costs, improved customer service.
- Identify business measurements and document the implementation goals. These business measurement tasks measure the success of the project, specifically the business-related goals. Examples of business related goals are: Integration of business processes, reduction of on-hand inventories.
- Identify project measurements and document implementation goals, and how they are measured, specifically the project-related goals. Examples of project-related goals are: Target dates for completion of specific implementation phases or milestones, measurement of actual expense performance versus budgeted costs, completion of a specific deliverable(s).
- Develop the change charter: develop a comprehensive charter for the change project within the organization.
- Assemble project charter components: prepare a document that consolidates the mission statement, business drivers, business measurements, and project measurements.
- Approve project charter: reach agreement between company executive management, the project sponsor, and members of the project team on the project charter. It is important to have all members in agreement so that total commitment can be achieved.
- Finally, most important milestone of this phase is kickoff meeting. This meeting should be conducted with high energy and should be attended by company senior management. A strong first impression is important to project momentum.

Phase 2: Business Blueprint - In this phase the scope of the implementation are documented and defined and the Business Blueprint is created. The Business Blueprint is a detailed documentation of the company's requirements. Application consultants and the Business Process Teams achieve a common understanding of how the enterprise intends to run its business within

the SAP ERP System, by carrying out requirements-gathering workshops. The Business Blueprint is created by detailed documentation of the results gathered during these requirements workshops. Furthermore, the Business Blueprint serves to document the business process requirements of the company. On this basis, a common understanding of how the company intends to run their business within the R/3 System is achieved.

A Business Blueprint comprises the following structure elements in a hierarchy:

- Organizational Units;
- Master data;
- Business scenario;
- Business processes; and
- Process steps.

The major milestones of the business blueprint phase are:

- Workshops to gather business requirements with the customer's functional leads;
- Creation of the detailed business blueprint document;
- Determination of changes to initial project scope and time schedule (if applicable); and
- Project phase review and sign-off from customer.

Phase 3: Realization - In this phase, all the business and process requirements gathered in the Business Blueprint are implemented. System configuration is done step by step in two work packages, Baseline and Final configuration. The consultants validate and update the configuration and demonstrate processes. The project team updates the work instructions (business process procedures, for example) and performs unit

- Minimize the number of changes to setup and scope as such changes significantly affect testing and training;
- Communicate clearly that your project and IT teams will be responsible for ensuring data quality and integrity of data migration;
- Ensure your project leads are present during all or large parts of system validation and acceptance testing; and
- Review all output documents – for example, invoices, purchase orders, and reports as well as financial statements before sign-off

The major milestones of Realization phase are:

- Software installation and customization based on the business blueprint;
- Data migration (if applicable);
- Validation of system setup;
- System testing;

- Definition of training and cutover plan; and
- Project phase review and sign-off from customer.

Phase 4: Final Preparation - In this phase, testing and end user training is completed with system management and cutover activities to finalize the readiness to go live. Furthermore, the Final Preparation phase serves to resolve all critical open issues. Upon successful completion of this phase, you will be ready to run your business in your live SAP ERP System. The following are required for success in this phase of the project:

- Officially announce to all stakeholders the training and cutover plan and the schedule; and Make sure each user participates in the relevant training.

The major milestones of Final Preparation phase are:

- Key-user and administrator training;
- System readiness for going live; and
- Completion of cutover activities.

Phase 5: Go Live and Support – This phase achieves the transition from a project-oriented, pre-production environment to successful and live production operation. The going-live and support phase consists of two distinct sub phases. First, the project is completed with a formal project closing. During this time, the software is used productively in day-to-day operations, all issues and problems are resolved, transition to the production support team is finalized, knowledge transfer is completed, and the project is signed off. Subsequently, the continuous improvement sub phase begins during which the production support team provides on-going support and assistance for post go-live. It covers solutions for those activities which are standard in a productive environment: business changes; technology changes; or changes in the user community. For success in this phase of the project the following are required:

- Involve your executive steering committee in the project closing meeting for final project acceptance; and Make sure your functional leads of the project.
- Monitor how end users work to ensure correct and consistent use of the software
- Record all issues and required enhancements to performance, functionality, and usability to be discussed during the review and optimization conference

The major milestone of Go Live and Support phase is full production implementation of SAP ERP software.

CASE STUDIES

Tata Steel

Headquartered in Jamshedpur, India, Tata Steel is among the top ten steel producers in the world with an existing annual crude steel production capacity of 30 million tons per annum (MTPA).

Established in 1907, it is the first integrated steel company in Asia and is now the world's second most geographically diversified steel producer and a Fortune 500 Company⁴⁸.

In 2001, Tata Steel started implementing an SAP ERP system with the primary goal of improving its financial accounting, costing, procurement, and plant maintenance. The primary objective was better revenue management through improved gross margins.

SAP implementation at Tata Steel was a success with increased online order confirmations from 55% to over 90%, reduced finished-goods inventory from 29 to 23 days of sales, lowered MRO inventory by 24%, and reduced breakdowns in the Hot Strip Mill by 768 hours.

Critical success factors in Tata Steel's implementation were that the SAP implementation was backed up by appropriate change initiative measures and organizational realignment with support from top management. A great deal of effort was put on extensive and comprehensive training as well as proper communication on process changes throughout the organization.

Gujarat Heavy Chemicals Ltd

Gujarat Heavy Chemicals Ltd or GHCL is into two primary verticals namely Home Textiles and Chemicals (Soda Ash). In 2006, GHCL had successfully set-up a new Home Textiles manufacturing unit in Vapi located in the Bhilad district of Gujarat. The unit has a production capacity of 1.25 lakh meters per day. Being a green-field set-up, GHCL wanted to implement ERP for automating the operational processes and decided that it needed a globally proven ERP solution and selected SAP.

The macro objective for implementing SAP was to achieve integration between the various businesses within GHCL and to provide support for decision-making across all levels. GHCL wanted an ERP system that would automate and streamline its transactional systems as well material resource planning, manufacturing and dispatch and activities such as costing and getting the Bill of Materials (BOM) in place to achieve about 85-90% accuracy in the business.

The deciding factors were the simplicity of the SAP architecture, loading, the integration that would be possible etc.

The GHCL steering committee was involved with the technical evaluation and vendor selection criteria from July 2006. A Project Team was formalized consisting of steering committee, functional users, consulting agency, end users and IT support. The team had 24 members with 18 dedicated to the project on a full time basis. The team was in place by September 2006. The formal order to implement SAP was given in October 2006. GHCL took the big-bang approach for implementation and took six months to complete it. The project went live on 1st March 2007. Though SAP ERP went live in 2007 in GHCL, it was only in mid-2009 that all systems stabilized and achieved 85% of the MIS requirement.

GHCL implemented Sales & Distribution, Materials Management, Production Planning, Quality Management, Finance and Costing modules. SAP modules are basically accessed by all hierarchies. “mySAP has allowed GHCL to centralize information to be entered into the system for the correct and accurate flow of information across various departments such as sales, material management, production planning and finance and costing.”

GHCL has seen a clear improvement in tracking work-in-progress. The mySAP ERP system tracks right from incoming raw material till outgoing finished goods with thorough quality approval. Raw materials received, quality parameters recorded and vendor-wise date details are available instantaneously at the click of a button. With this automated system (mySAP) the moment a PO is received, all the processes involved get released directly from the system and there is no running around to get the details of inventories, stocks, production planning, machine scheduling and the like.

And online availability of information meant that it was available to the top management at anytime via VPN connectivity. lead time from sourcing of raw materials to production has decreased significantly. GHCL gets a consolidated view of its annual consumption of all types of raw materials and gets better pricing through reverse auction

GHCL have total transparency into our business process, SAP ERP have reduced inventory carrying costs by 40%.

Border State Industries

Based in Fargo North Dakota Border State Industries (BSE) distributes products to several different categories of customers. BSE distributes electrical and electronic products and services to the construction, industrial, utility, and data communications markets. The company has a distribution partnership with OSRAM SYLVANIA. BSE also carries data networking equipment in its product catalog. The company operates more than 50 branches serving customers in 15 states, primarily along the northern and southern borders of the nation. It also has a location in Juarez, Mexico. BSE was established in 1952 and at present employs more than 1,200 people and is wholly owned by its employees through an employee stock ownership program

BSE engaged IBM and SAP Consulting to implement the new ERP software to support the company's business processes for sales and distribution, materials management, finance, controlling, and human resources. The software went live on February 1, 1999 – nine months after the start of the implementation.

In 2004 BSE upgraded its SAP software to support more e-commerce activity, automated special price agreement processing, and terminal-based credit-card processing – completing its upgrade on time and within budget. Later, in April 2007, BSE embarked upon yet another SAP software upgrade, adding more functionality from SAP ERP as well as from the SAP Customer Relationship Management application and the SAP NetWeaver® technology platform.

ROI analysis of the SAP software deployment at BSE showed that SAP software deployment paid for itself in the first 2.5 years, and continues to deliver a 37% annual return, and has proven to be a strong success.

One of the success factors for SAP implementation was that BSE adapted their business processes to benefit from the standard best practices recommended by SAP rather than replicate their legacy business processes into the SAP software. In their earlier SAP ERP implementation at BSE, SAP AG had done lots of customization, which had resulted in project delays and budget overruns. Involvement of senior management was another success factors for implementation. BSE appointed one of its vice presidents (VP) to oversee the implementation. The VP worked closely with IBM and SAP Consulting and regularly met with the BSE board to keep them informed on progress⁴⁸.

The VP also engaged many of the most senior managers within BSE and solicited their active involvement in the implementation of the SAP software. Although BSE executives acknowledge now that day-to-day operations suffered while these managers were involved with the implementation of the SAP software, they nevertheless conclude that the close involvement of senior management is one of the key reasons for the implementation's ultimate success.

In summary, two key lessons emerged from BSE's Implementation experiences. First, customization can be costly and, ultimately, unnecessary – it should be avoided whenever possible. Second, the input and involvement of internal business experts – the people who know the company's business – are crucial to the success of the implementation.

Finnish Food Processing Company

Finnish Food Processing Company, HK Foods, is one of the largest slaughtering, cutting and meat processing companies in Finland consisting of eight sites in south-west part of the country. Its turnover in domestic market is 2.2 billion FIM with number of employees 2800. In addition to that there are 1000 more employees and 0.7 billion FIM turnover in Estonia. Market shares per product group in Finland vary from 20 to 57 percent.

HK Foods implemented SAP ERP system in three different phases over a period of three years starting in 1997. The implementation was a big success as far as project schedule was concerned but the cost of implementation went over budget. All in all the implementation was a success as per the feedback of users and management.

Critical success factors and lessons learned from the implementation were that the balance between internal employees of the company and consultants as well as high exchange rate among project personnel was maintained. An optimal balance between the company forces and external consultants could be two company people against one external consultant. This is not only to keep the knowledge in house, but also to take full use of consultants during the time they are on the project. A good balance facilitates the transformation from project to competence and support

team. This all can be achieved by strong management commitment and support to the project and creates an environment to retain these trained employees and consultants.

Hershey Food Corporation

The Hershey Company engages in manufacturing, marketing, selling, and distributing various chocolate and confectionery products, food and beverage enhancers, and gum and mint refreshment products. Its chocolate and confectionery products include chocolate bars and drinking cocoa mixes, high-cacao dark chocolate products, handcrafted chocolate gifts, and natural and organic chocolate products. The company sells its products through sales representatives and food brokers, primarily to wholesale distributors, chain grocery stores, mass merchandisers, chain drug stores, vending companies, wholesale clubs, convenience stores, dollar stores, concessionaires, department stores, and natural food stores. It principally operates in the United States, Canada, Mexico, Brazil, Japan, Korea, the Philippines, India, and China; and markets confectionery products worldwide. The company was founded in 1893 and is based in Hershey, Pennsylvania²⁰.

The consequences of SAP ERP system implementation at Hershey Foods were so bad that during Halloween, big customers like Wal-Mart and Kmart were loading up candy from Hershey's competitors. Mid-September 1999 order processing problems resulted in a 19% drop in Hershey's third quarter earnings. Computerworld²¹ described Hershey's ERP implementation as catastrophic failure. One of the main reasons for this debacle was that users of the new SAP ERP system at Hershey Foods didn't get enough time to learn the new system and didn't understand how the integrated processes of an ERP system impacted their daily roles and responsibilities. The original plan was to implement the system in four years which was compressed to two and half years by the Hershey's management. To make things worse SAP ERP implementation went live in July 1999 just before the business peak season for Hershey starts. Hershey employees needed to correctly follow the business logic built in the SAP software. They needed to understand how various models worked and interacted with each other. Hershey was not only implementing SAP ERP system but also a CRM system from Siebel Systems and a logistic system from Manugistics²². All this went live at the same time just before the peak business season started. Since the user training was inadequate, Hershey's employees suffered from information overload.

The company could have very well avoided this trouble if only they thought of going live with ERP system during those occasions when the business process in the whole market experiences a slow period and at the same time providing ample time for user training.

Waste Management Incorporated

Waste Management, Inc. was founded in 1894 and is based in Houston, Texas. Waste Management, Inc. provides integrated waste management services in North America. The company offers collection, transfer, recycling, disposal, and waste-to-energy services. In 2005,

Waste Management started looking for a new revenue management system. Waste Management had grown by acquiring small companies and had various old legacy systems working concurrently.

SAP AG proposed its Waste and Recycling product and claimed it to be an out-of-the-box ERP system with no customization required. SAP AG assured Waste Management that its software would meet their needs without any customization or enhancements and would be implemented throughout the company within 18 months.

The SAP Revenue Management ERP implementation was anything but a success. Waste Management filed a \$100 million lawsuit against SAP AG on March 20, 2008 after months of failed meetings to resolve the issues at hand. Waste Management complained that the SAP system that was used for waste haulers in Europe didn't work well for them in United States. In the lawsuit filed in Harris County, Texas Waste Management said SAP AG made false promises about the potential of their product and duped them into buying it. They put the blame even on SAP Americas' president and CEO, Bill McDermott, stating that he participated in rigged and manipulated demonstrations which were based on fake software environments which didn't work well in real environment³². There were significant gaps between the SAP software's functionality and Waste Management's business requirements. Later on in the project implementation phase Waste Management discovered that these gaps were already known to the product development team from SAP AG in Germany even before the SLA was signed. Also, SAP AG's claims that they have well-trained personnel with the requisite expertise, experience and knowledge of the revenue management software for waste and recycle industry were false according to Waste Management.

Some experts put blame on Waste Management's management as they, being the owner of the project, should have checked whether the metrics the vendor has put together makes any sense. If they were not capable of doing it themselves then they could have hired some consulting firm to do the legwork for them. Also, there is the possibility that Waste Management's management team didn't provide the SAP software implementation team with timely and accurate business requirements and decision empowered users and managers. As of now, accusations are still flying between Waste Management and SAP AG about documentation, depositions and delays in bringing the case before a judge. That proposed 18-month implementation now sounds like a dream scenario.

RESULTS AND DISCUSSIONS

In this globally competitive environment companies need to constantly improve business performance by improving their business processes. Since the 1990's more and more companies are turning to enterprise resource planning to replace obsolete process and improve business performance. Now the IT implementation dynamics have changed such that companies expect a

breakeven ROI of two to three years. Doing the implementation right can be rewarding; failing can be devastating. Therefore, it is very important to know the critical success factors of implementation and make sure full emphasis are put on these.

Factors of Success Stories:-

BORDER STATE INDUSTRIES

- Avoid customization
- Sustained management support
- Project team composition

GUJRAT HEAVY CHEMICAL LTD.

- Trust between partners
- Sustained management support
- Adequate training program
- User involvement and testing

TATA STEEL

- Sustained management support
- Effective organization change management and business process reengineering
- User involvement and training

FINNISH FOOD PROCESSING COMPANY

- Usage of appropriate consultants
- Project team composition
- Sustained management support
- Strong communication inwards and outwards

Analysis of the above ERP implementation success stories reveal that sustained management support / contribution, adequate training program and right project team composition are the critical success factors contributing to successful SAP ERP implementation. Other success factors right behind were user involvement and testing and trust between implementation partners. Finally, good project scope management, usage of appropriate consultants, empowered decision makers and avoiding customization were contributing critical success factors in some of the successful implementations.

Implementation failures and what critical success factors were lacking that resulted in their implementation failures are defined.

Hershey Food Corporation

- User Involvement and testing
- Adequate training program
- Planning and scheduling
- Adequate ERP implementation strategy
- Adequate legacy system knowledge

Waste Management Inc

- Business Process Engineering
- Trust between partners
- Usage of appropriate external consultants
- Project team composition

Analysis of these ERP implementation failures reveal that lack of sustained management support /contribution and user involvement / training and testing seems to be the most prominent causes for failure. Other factors right behind were lack of appropriate consultants and trust between implementation partners, and effective organizational change management and business process reengineering. Finally, lack of planning and scheduling, adequate ERP implementation strategy, preventive troubleshooting, good project scope management, project team composition and strong communication inwards and outwards were also reasons behind some implementation failures. No major technical reasons were found to be contributing towards implementation failure except for adequate legacy system knowledge in one instance.

Executives of the company implementing SAP ERP system need to realize that it is as critical to their business success as anything else can be. Management needs to be involved in every aspect of the implementation starting from business case development, providing appropriate resources as and when needed, and by resolving personnel and other issues that may arise. User involvement and training is another most critical aspect of implementation. These internal users or power users have the business knowledge and know how about how day to day transactions

SUGGESTION FOR ADDITIONAL WORK

The scope of this research is limited in identifying the successful SAP ERP implementation. These factors were identified based on content analysis of articles reporting SAP implementations in companies all over the world. For additional work it will be prudent to get the surveys from the Sr managers and the business users of the companies and see if they concur with the findings of this work.

In this project a successful implementation has been identified as the one which was completed within time and budget and gave a predetermined ROI. Implementation is only the beginning of

the adventure with a new ERP system. A well chosen system will, with time, become the pillar of company's operations. It will set the standards and epitomize the best business practices. In order for this to happen, companies need to choose an option that will not only suffice for the time being, but which will have the potential to accommodate the various growth paths the company has as it evolves. Choosing an option that works for now, but does not allow for growth may seem cheaper, but when one factor in the amount company will eventually spend to extend the system and make changes to functionality; a company will end up paying more for this temporary solution than for a system that can grow. It is a real challenge for a company to plan and execute a long term implementation strategy as both the internal business scenario and the software from the vendors are evolving continuously.

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