

Name:			
Enrolment No:			
<b>UNIVERSITY OF PETROLEUM AND ENERGY STUDIES</b> <b>End Semester Examination, May 2020</b>			
<b>Course: E-Enterprise Management</b> <b>Program: MBA OG</b> <b>Course code: DSIT 8002</b> <b>Instructions:</b>		<b>Semester: IV</b> <b>Time: 3 Hrs</b> <b>Max. Marks: 100</b>	
<b>SECTION A</b>		<b>(5 * 6 Marks - 30 Marks)</b>	
<b>Describe in Brief</b>			
1	SCADA	5	CO 2
2	ESS	5	CO 2
3	OLAP	5	CO 2
4	Machine Learning	5	CO 2
5	IoT	5	CO 2
6	Business Intelligence	5	CO 2
<b>SECTION B</b>		<b>(10*5= 50Marks)</b>	
1	What are Knowledge Work Systems?	10	CO 2
2	Detail the parameters to be monitored to avoid a drilling operation failure? What, in these parameters, would be indicative of an approaching failure?	10	CO 5
3	Discuss the utility of 'Refining Process Simulation Software' (viz. ASPEN) with relevant examples and illustrations.	10	CO 4
	Briefly discuss the Information Systems that help in decision making at various levels of an Organization.	10	CO 4
	How can Information Systems help to counter the competitive forces in the market as described by Michael Porter?	10	CO 2
<b>SECTION C</b>		<b>(5*4= 20 Marks)</b>	
<b>(Answer the questions based on the attached Case study)</b>			
1	What problems was Border States Industries encountering as it expanded? What management, organization, and technology factors were responsible for these problems?	5	CO 1
2	List and describe the benefits from the SAP software.	5	CO 2
3	How much did the new system solution transform the business? Explain your answer.	5	CO 5
4	How successful was this solution for BSE? Identify and describe the metrics used to measure the success of the solution.	5	CO 4

## **Border States Industries Fuels Rapid Growth with ERP : CASE STUDY**

Border States Industries Inc., also known as Border States Electric (BSE), is a wholesale distributor for the construction, industrial, utility, and data communications markets. The company is headquartered in Fargo, North Dakota, and has 57 sales offices in states along the U.S. borders with Canada and Mexico as well as in South Dakota, Wisconsin, Iowa, and Missouri. BSE has 1,400 employees and is wholly employee-owned through its employee stock ownership plan. For the fiscal year ending March 31, 2008, BSE earned revenues of over US \$880 million.

BSE's goal is to provide customers with what they need whenever they need it, including providing custom services beyond delivery of products. Thus, the company is not only a wholesale distributor but also a provider of supply chain solutions, with extensive service operations such as logistics, job-site trailers, and kitting (packaging individually separate but related items together as one unit). BSE has distribution agreements with more than 9,000 product vendors.

BSE had relied on its own legacy ERP system called Rigel since 1988 to support its core business processes. However, Rigel had been designed exclusively for electrical wholesalers, and by the mid-1990s, the system could not support BSE's new lines of business and extensive growth.

At that point, BSE's management decided to implement a new ERP system and selected the enterprise software from SAP AG. The ERP solution included SAP's modules for sales and distribution, materials management, financials and controlling, and human resources.

BSE initially budgeted \$6 million for the new system, with a start date of November 1, 1998. Senior management worked with IBM and SAP consulting to implement the system. Although close involvement of management was one key ingredient in the systems' success, day-to-day operations suffered while managers were working on the project.

BSE also decided to customize the system extensively. It wrote its own software to enable the ERP system to interface automatically with systems from other vendors, including Taxware Systems, Inc., Innovis Inc., and TOPCALL International GmbH. The Taxware system enabled BSE to comply with the sales tax requirements of all the states and municipalities where it conducts business. The Innovis system supported electronic data interchange (EDI) so that BSE could electronically exchange purchase and payment transactions with its suppliers. The TOPCALL system enabled BSE to fax customers and vendors directly from the SAP system.

At the time of this implementation, BSE had no experience with SAP software, and few consultants familiar with the version of the SAP software that BSE was using. Instead of adopting the best-practice business processes embedded in the SAP software, BSE hired consultants to further customize the SAP software to make its new SAP system look like its old Rigel system in certain areas. For example, it tried to make customer invoices resemble the invoices produced by the old Rigel system.

Implementing these changes required so much customization of the SAP software that BSE had to delay the launch date for the new ERP system until February 1, 1999. By that time, continued customization and tuning raised total implementation costs to \$9 million (an increase of 50 percent).

Converting and cleansing data from BSE's legacy system took far longer than management had anticipated. The first group of "expert users" were trained too early in the project and had to be retrained when the new system finally went live. BSE never fully tested the system as it would be used in a working production environment before the system actually went live.

For the next five years, BSE continued to use its SAP ERP system successfully as it acquired several small companies and expanded its branch office infrastructure to 24 states. As

the business grew further, profits and inventory turns increased. However, the Internet brought about the need for additional changes, as customers sought to transact business with BSE through an e-commerce storefront. BSE automated online credit card processing and special pricing agreements (SPAs) with designated customers. Unfortunately, the existing SAP software did not support these changes, so the company had to process thousands of SPAs manually.

To process a credit card transaction in a branch office, BSE employees had to leave their desks, walk over to a dedicated credit card processing system in the back office, manually enter the credit card numbers, wait for transaction approval, and then return to their workstations to continue processing sales transactions.

In 2004, BSE began upgrading its ERP system to a more recent version of the SAP software. The software included new support for bills of material and kitting, which were not available in the old system. This functionality enabled BSE to provide better support to utility customers because it could prepare kits that could be delivered directly to a site.

This time the company kept customization to a minimum and used the SAP best practices for wholesale distribution embedded in the software. It also replaced TOPCALL with software from Esker for faxing and e-mailing outbound invoices, order acknowledgments, and purchase orders and added capabilities from Vistex Inc. to automate SPA rebate claims processing. BSE processes over 360,000 SPA claims each year, and the Vistex software enabled BSE to reduce rebate fulfillment time to 72 hours and transaction processing time by 63 percent. In the past, it took 15 to 30 days for BSE to receive rebates from vendors.

BSE budgeted \$1.6 million and 4.5 months for implementation, which management believed was sufficient for a project of this magnitude. This time there were no problems. The new system went live on its target date and cost only \$1.4 million to implement-14 percent below budget.

In late 2006, BSE acquired a large company that was anticipated to increase sales volume by 20 percent each year. This acquisition added 19 new branches to BSE. These new branches were able to run BSE's SAP software within a day after the acquisition had been completed. BSE now tracks 1.5 million unique items with the software.

Since BSE first deployed SAP software in 1998, sales have increased 300 percent, profits have climbed more than 500 percent, 60 percent of accounts payable transactions take place electronically using EDI, and SPA processing has been reduced by 63 percent. The company turns over its inventory more than four times per year. Instead of waiting 15 to 20 days for monthly financial statements, monthly and year-to-date financial results are available within a day after closing the books. Manual work for handling incoming mail, preparing bank deposits, and taking checks physically to the bank has been significantly reduced. Over 60 percent of vendor invoices arrive electronically, which has reduced staff size in accounts payable and the number of transaction errors. Transaction costs are lower.

The number of full-time BSE employees did increase in the information systems area to support the SAP software. BSE had initially expected to have 3 IT staff supporting the system, but needed 8 people when the first ERT implementation went live in 1999 and 11 by 2006 to support additional SAP software and the new acquisition. BSE's information technology (IT) costs rose by approximately \$3 million per year after the first SAP implementation. However, sales expanded during the same period, so the increased overhead for the system produced a cost increase of only 0.5 percent of total sales.

BSE management has pointed out that much of the work that was automated by the ERP systems has been in the accounting department and involved activities that were purely

transactional. This has freed up resources for adding more employees who work directly with customers trying to reduce costs and increase sales.

In the past, BSE had maintained much of its data outside its major corporate systems using PC-based Microsoft Access database and Excel spreadsheet software. Management lacked a single company-wide version of corporate data because the data were fragmented into so many different systems. Now the company is standardized on one common platform and the information is always current and available to management. Management can obtain a picture of how the entire business is performing at any moment in time. Since the SAP system makes all of BSE's planning and budgeting data available online, management is able to make better and quicker decisions.

In 2006, Gartner Group Consultants performed an independent evaluation of BSE's ERP implementation. Gartner interviewed top executives and analyzed BSE data on the impact of the ERP system on BSE's business process costs, using costs as a percentage of sales as its final metric for assessing the financial impact of SAP software. Cost categories analyzed included costs of goods sold, overhead and administration, warehousing costs, IT support, and delivery.

Gartner's analysis validated that the SAP software implementation cost from 1998 to 2001 did indeed total \$9 million and that this investment was paid back by savings from the new ERP system within 2.5 years. Between 1998 and 2006, the SAP software implemented by BSE produced total savings of \$30 million, approximately one-third of BSE's cumulative earnings during the same period. As a percentage of sales, warehouse costs went down 1 percent, delivery costs decreased by .5 percent, and total overhead costs declined by 1.5 percent. Gartner calculated the total return on investment (ROI) for the project between 1998 and 2006 was \$3.3 million per year, or 37 percent of the original investment.

BSE is now focusing on providing more support for Internet sales, including online ordering, inventory, order status, and invoice review, all within a SAP software environment. The company implemented SAP NetWeaver Master Data Management to provide tools to manage and maintain catalog data and prepare the data for publication online and in traditional print media. The company is using SAP's Web Dynpro development environment to enable wireless warehouse and inventory management activities to interact with the SAP software. And it is using SAP NetWeaver Business Intelligence software to learn more about customers, their buying habits, and opportunities to cross-sell and upsell products.

**Sources:** Border States Industries, "Operating System-SAP Software," 2010; Jim Shepherd and Aurelie Cordier, "Wholesale Distributor Uses ERP Solution to Fuel Rapid Growth," AMR Research, 2009; SAP AG, "Border States Industries; SAP Software Empowers Wholesale Distributor," 2008; [www.borderstatesele.c-tric.com](http://www.borderstatesele.c-tric.com), accessed July 7, 2009; and "Border States (BSE)," 2008 ASUG Impact Award. How successful was this solution for BSE? Identify and describe the metrics used to measure the success of the solution.