

Case Study: The Direct ERP Connection

NOTE: This project was developed and managed for a Fortune 1000 chemical company, referred to as "MCC" in this case study.

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Case Study: The PC B2B Connection

Section 1: Executive Summary

In June 2000, MCC, Inc. (MCC) embarked on an e-business connectivity project with customer PC. The point-to-point B2B (business-to-business) ERP (enterprise resource planning) system connection was implemented with project management assistance from Accenture consulting and was initiated to reduce supply chain costs and increase productivity at both companies.

Although the project documentation did not include specific metrics, the objectives are easily measured and the project's effectiveness extrapolated from analysis of the project cost and its objectives' influence on future profitability of the PC business.

Several years later, the B2B connection is still active and operating as planned although it has required some modifications. In 2001, PC upgraded to SAP R4.6, and in 2003, another modification was undertaken to enable PC to take freight allowances.

This case study examines the project objectives, costs, and results with an analysis of the overall benefits, drawbacks, and recommendations for future connectivity projects.

Section 2: Background

Why Connect?

In 2000, PC and MCC were using the same version of SAP and sought opportunities to leverage the SAP investments by reducing costs and gaining efficiencies. The project was launched to integrate order-to-invoice work processes and transactions, and it attempted to prove an e-business capability that could be leveraged with other customers and suppliers to eliminate wasteful tasks and unnecessary cost.

At the request of PC, MCC Chemicals agreed to participate in a B2B Connection project and to fund development and implementation.

PC

PC began their SAP implementation in 1995. When it was complete in 1998, PC had integrated its business data and was impressed with efficiencies enabled by integrated connectivity. The purchasing group sought to connect with suppliers to gain similar efficiencies and business intelligence from those relationships.

MCC

MCC began their SAP implementation in 1997 and completed in late 1999. MCC had also conducted a couple smaller e-business projects including online railcar tracking. Planning to initiate its own e-Center group MCC Chemicals agreed to participate in and fund the PC connectivity project. MCC was keen to demonstrate the effectiveness of close connectivity to a customer, believing that connectivity could be a differentiator as well as a cost-savings tool.

Team Members

The PC B2B connection project was undertaken by a core team of MCC and PC commercial employees. Andersen Consulting (which became Accenture in 2001), was contracted as a consulting partner in the project. The following are the project roles, one from each company and various from Accenture:

- *Project Sponsors*
- *Project Managers*
- *Steering Committee*
- *Functional/Technical Team Business Process/SAP*
- *Functional/Technical Team IT Architecture*
- *MCC Functional Organizations*

- Cust. Service
- S&OP
- Sales
- Marketing
- Distribution
- A/R

- *MCC Additional Resources*
 - IT
 - BPI
 - Legal
 - Asset Auditing

Project Timeline

6/13/00	Kick-off
6/23/00	Design Complete/Sign-off
7/12/00	Build Complete & Start System Test
7/14/00	End of System Test
7/16/00	Conversion
7/21/00	Project Complete

Section 3: Objectives

The following were the PC–MCC B2B Connection Project objectives:

Combined

1. Develop the ability to tightly integrate MCC and PC's supply chain
2. Create a Process and Technical platform to enable the following:
 - Simplified Business Processes and Practices
 - Seamless integration between trading partners
 - Business to Business (machine to machine) e-Commerce
 - Improved in-transit visibility of inventory
 - Decreased manual effort in creating Purchase orders and Sales orders
 - Eliminate shipments updates
3. Establish the business rules, responsibilities, and processes for an integrated supply chain
4. Make each partner more efficient, flexible, and responsive to business market changes
5. Create working approach (methods and linkages) for PC & MCC supply-chain integration
6. Automate the following transactions:
 - Requirements Planning
 - Purchase Orders/ Sales Orders
 - Purchase Order Changes/ Sales Order Changes
 - Order Confirmations/ Acknowledgements
 - Advanced Shipment Notifications
 - Invoice generation
7. Reduce effort spent manually executing transactions

MCC

8. Improve production planning through integrated customer demand forecasting
9. Proving technology by integrating the MCC supply chain with PC
10. Maintain key supplier position with newly-formed PC

PC

11. Operational Excellence – especially in procurement

- Eliminate wasteful transactions, activities
- Focus on managing, processes

12. Working capital reduction

- Separation of one of the businesses via SAP caused a 20 – 25% increase in working capital

Section 4: Costs

PC-MCC B2B Connection Expenses

	Time/Dollars		Travel/Lodging	Project Fee	Total Expenses
	Hours	Dollars			
<i>MCC Personnel</i>	1,400	\$71,000	\$35,000		\$106,000
<i>Additional Consultant</i>		\$16,230			\$16,230
<i>Project Fee to PC</i>				\$350,000	\$350,000
Total		\$87,230	\$35,000	\$350,000	\$472,230

Section 5: Implementation & Critical Success Factors

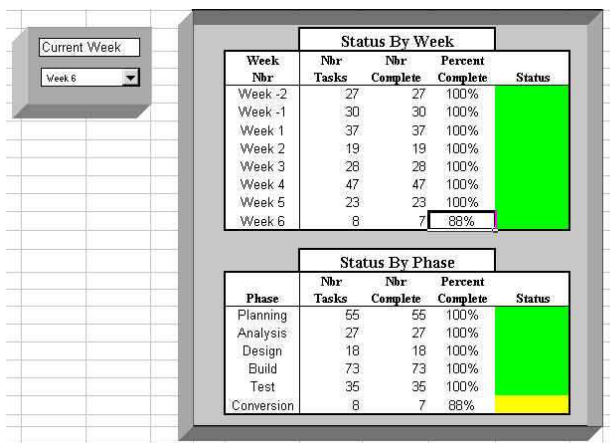
The project team kicked-off in May 2000. Some of the team worked full-time on the 6-week project and others played a part-time role. The team was split between locations, with about a dozen team members at MCC’s headquarters and a PC team of e-business personnel who worked on this project.

The project was completed according to schedule in July 2000. The following are the project phases:

1. Design: functional design sessions with entire group of business representatives
2. Build: building new non-SAP components and configuring the B2B architecture
3. Unit/Component Testing: testing each thread (architecture and functional) individually, eliminating bugs and errors
4. System/Product Testing: testing all threads (architecture and functional) together including all SAP modules that may have affected the threads
5. Conversion: executing live production transactions between PC and MCC – getting the system up and running

The project team utilized a combination of tools including tracking spreadsheets, weekly reports, and meetings to keep them on track. The following is an example of the “Scorecard” the team used to track progress on each task.

Project Task Scorecard



Critical Success Factors

The team was charged with developing and implementing new, unique connectivity between the two companies. The success of this project was contingent upon several critical success factors:

1) Executive support

In 2000, companies were embracing the idea that e-business was a revolutionary approach to business promising increased productivity and ultimately, greater profits. PC and MCC were both e-business early adopters with significant investments in the SAP enterprise resource planning infrastructure. The companies' senior leadership sought to leverage the platform as much as possible and connections to suppliers and customers also using SAP made operational sense. Both companies had senior management support for the connectivity project and were willing to take the first steps in an effort to yield higher ROI and better relationships between them.

2) Guidance from an experienced consulting partner

The concept of B2B connectivity was new to PC and MCC. Both companies had done extensive business process analysis in the early phase of SAP implementation enabling them to identify the areas of greatest opportunity in B2B connectivity. Since neither company had actually done previous work to create such a connection, an experienced, reliable consulting partner was required. Accenture had experience working with both SAP and e-business projects. Thus, their process and leadership skills played an important role in the project's completion

3) Technology

The technology connecting the two companies' SAP systems needed to work with few glitches and minor issues.

4) Change management

The implementation of a dedicated B2B connection between the companies required change management planning. The areas of greatest change included transactional execution, reconciliation, and billing.

At PC, the approach was to direct productivity gains to more value-added activities like supply management. At MCC, the approach was similar, focusing CSR's on customer account management.

Section 6: Performance Metrics & Results

When the project was completed, the team had achieved almost all of its functionality objectives. The table below itemizes the functionalities and their status.

Objectives	Status	Comments
Combined		
1. Develop the ability to tightly integrate MCC and PC's supply chain	Achieved	Connection was implemented and has quickly become a part of the infrastructure. The only issues to date have been related to the technology.
2. Create a Process and Technical platform to enable the following:		
<ul style="list-style-type: none"> Simplified business processes and practices 	Achieved	PC used strong business process focus to analyze and identify connectivity opportunities.
<ul style="list-style-type: none"> Seamless integration between trading partners 	Achieved	
<ul style="list-style-type: none"> Business-to-Business (i.e. machine to machine) e-Commerce 	Partly Achieved	MCC has not developed another dedicated B2B connection, the capability wasn't expanded into a "platform".
<ul style="list-style-type: none"> Improved in-transit visibility of inventory 	Achieved	MCC CSR is able to "watch" the customer account and proactively respond to anomalies.
<ul style="list-style-type: none"> Decreased manual effort in creating purchase and sales orders 	Achieved	Automation has eliminated time spent on "wasteful" tasks.
<ul style="list-style-type: none"> Eliminate shipment updates 	Achieved	Functionality built into the connection eliminated this activity.
3. Establish the business rules, responsibilities, and processes for an integrated supply chain	Achieved	MCC leveraged the new knowledge to other tech projects.
4. Make each partner more efficient, flexible, and responsive to business market changes	Partly Achieved	Only PC added more B2B connections with other suppliers, providing them with somewhat better market or business intelligence.

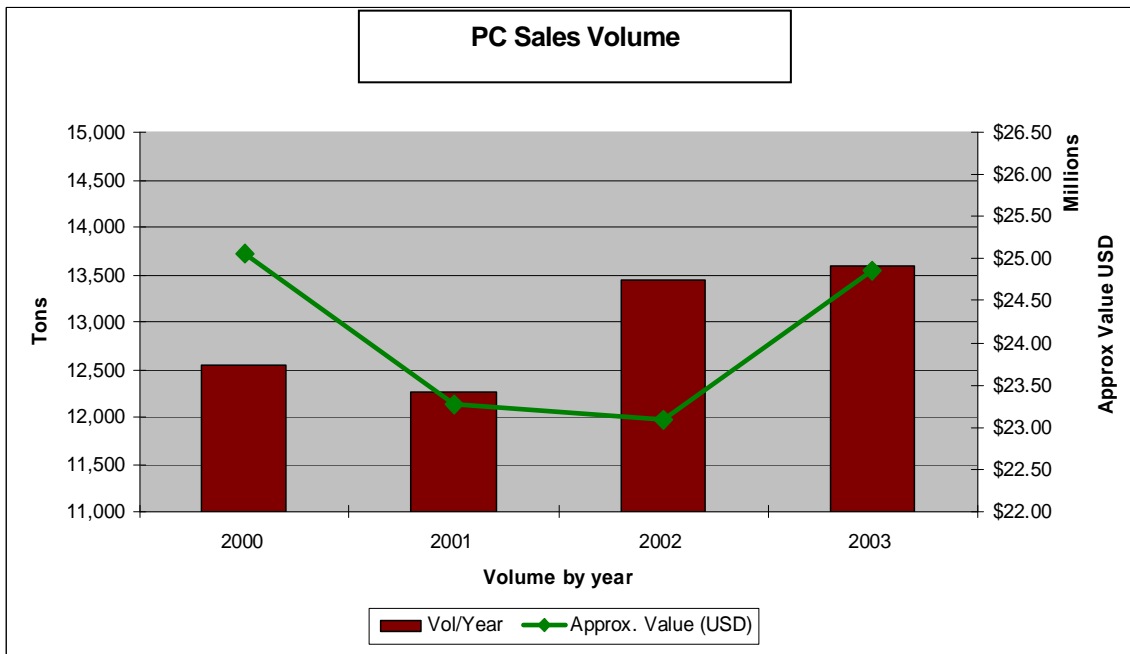
5. Create working approach (methods and linkages) for PC & MCC supply-chain integration	Achieved	Project documentation and processes were utilized.
6. Automate the following transactions:		
<ul style="list-style-type: none"> Requirements Planning 	Not Achieved	Processes not in place to utilize this functionality.
<ul style="list-style-type: none"> Purchase Orders/ Sales Orders 	Achieved	
<ul style="list-style-type: none"> Purchase Order Changes/ Sales Order Changes 	Achieved	
<ul style="list-style-type: none"> Order Confirmations/ Acknowledgements 	Achieved	
<ul style="list-style-type: none"> Advanced Shipment Notifications 	Achieved	
<ul style="list-style-type: none"> Invoice generation 	Achieved	However, not directly using standard SAP R/3 functionality, but another interface.
MCC		
7. Decrease manual effort spent manually executing transactions	Achieved	Both companies have reduced the number of man hours required executing transactions.
8. Improve production planning through integrated customer demand forecasting	Partly Achieved	Maintenance requirements for the planning module exceeded both companies' resources
9. Proving technology by integrating the MCC supply chain with PC	Achieved	Dedicated B2B connections, however, are too costly. One-to-many connections via a middleware solution are the preferred method of integration.
PC		
10. Operational excellence – especially in procurement	Achieved	Eliminated wasteful transactions, activities; focused on managing, processes
11. Reduction of working capital	Achieved	Separation of one of the businesses via SAP caused a 20 – 25% increase in working capital; connectivity project reduced it.

Financial and Market Share Impact

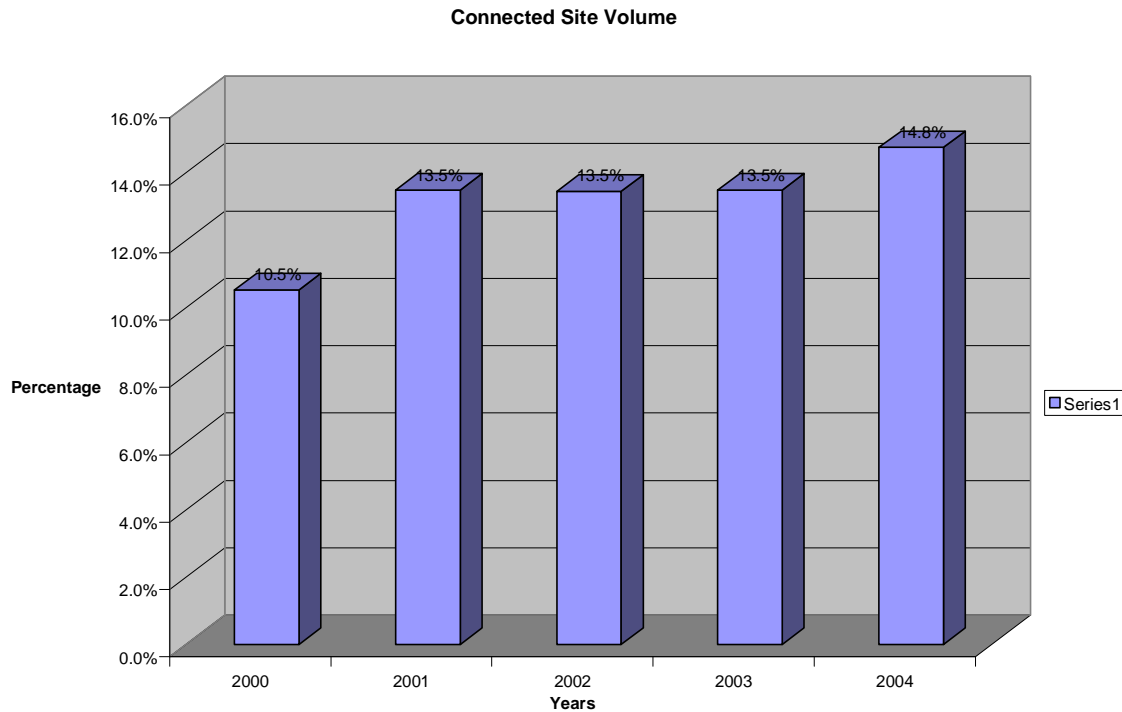
At the time this case study was conducted, very little tracking of the financial metrics was available. It is not clear whether documentation does not exist or whether tracking files may have been “lost” during changes in personnel.

Several critical changes in the industry should be addressed at this point. The first change involves the merger of two large companies into PC in mid-2000. The second is the nationwide economic downturn, which affected most industries. The third is PC’s financial dilemma, which was not dissimilar to MCC’s own financial issues. These factors all play a part in the tepid financial results

Financial results of the B2B connection were mixed; however, the data show that connected PC sites’ share of total North American sales increased nearly 38 percent over the five years since the connection was established.



Source: SAP Business Warehouse



Market Factors

In 2000, the industry entered the lowest price cycle in more than 20 years. Inventories grew, and customers and suppliers were consolidating. Competition for volume was intense and suppliers were scrambling to increase profit margins by any means available.

Corporate Factors

PC was created by a merger of two MCC customers. The new company decided to award volume to only two strategic suppliers, MCC and another competitor. As a result of the merger, PC lost some of unrecoverable market share, and their overall volume in the market decreased slightly.

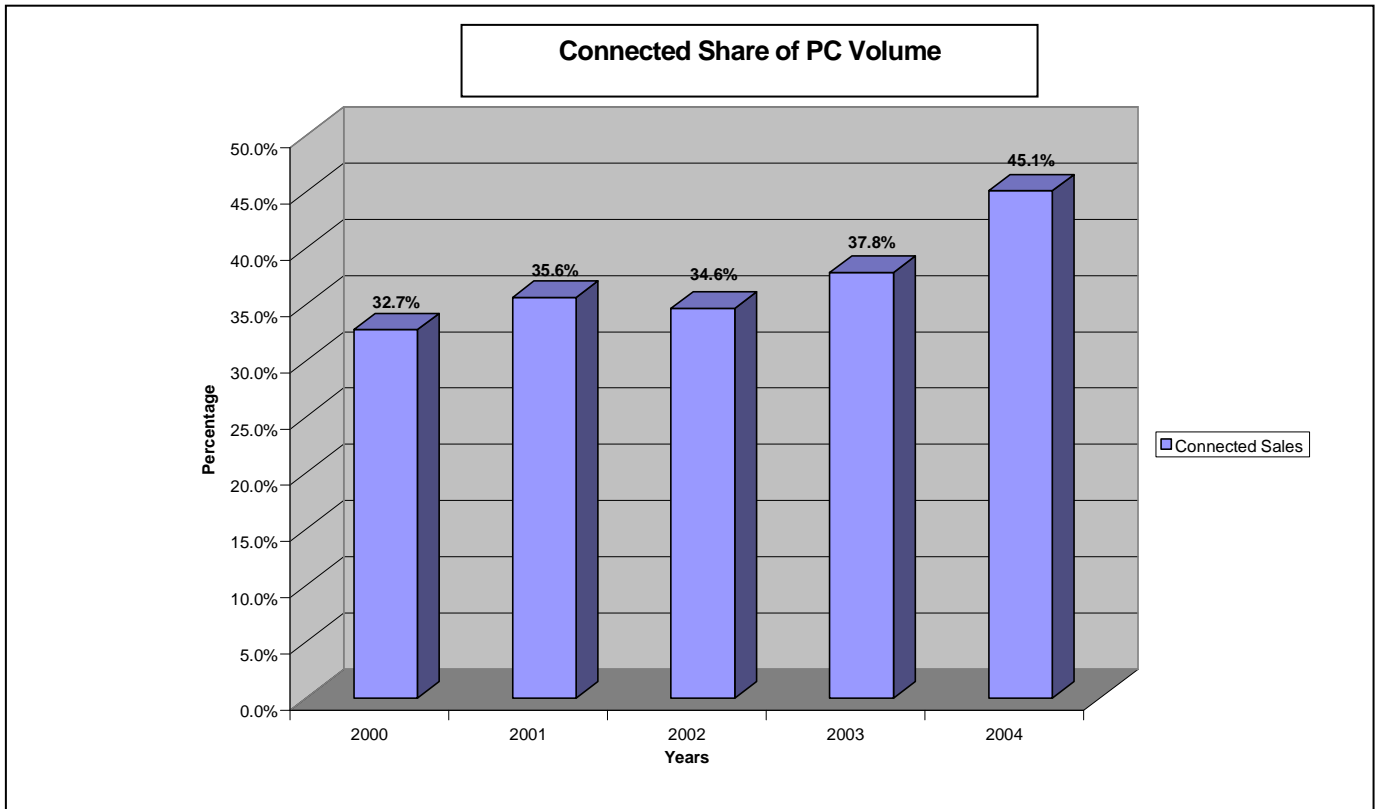
As price dropped, MCC sought to offset profit losses with increased sales volume. MCC was encouraged by PC's desire to enter into a strategic-supply partnership and agreed to undertake the B2B project as a show of good faith to an important customer and to "test the e-business waters." The hope was that PC's volume and price would increase incrementally as a result of the connected relationship.

Pricing Factors

Price increases in 2002 didn't have much effect on the PC account since price did not rise consistently with average market prices.

Volume/Price Snapshot

	2001	2002	2003	2004 (YTD)
market volume	46,500	49,000	52,000	117,611
Volume at PC	12,267	13,435	13,586	9,417
Average Mkt price	\$1,976	\$1,804	\$1,841	\$1,872



<i>Measurement</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>5yr growth</i>
Total Market: NA	283,000	280,000	298,000	285,000	311,000	9.9%
MCC Vol: NA	47,912	46,568	49,021	51,837	58,307	21.7%
MCC Share: NA	16.9%	16.6%	16.5%	18.2%	18.7%	10.7%
Usage: PC Global	39,000	33,200	34,500	38,000	38,500	-1.3%
Usage: PC NA	20,790	17,022	17,866	24,688	25,013	20.3%
Volume: PC NA	10,557	9,918	9,995	10,172	10,002	-5.3%
Volume: Connected Sites	4,107	4,477	4,643	5,123	5,680	38.3%
Volume: PC Global	12,549	12,567	13,400	13,545	12,600	0.4%
Volume: Connected PC NA	10.5%	13.5%	13.5%	13.5%	14.8%	40.1%
Connected %: MCC Sales to Connected PC NA	32.7%	35.6%	34.6%	37.8%	45.1%	37.7%
MCC Revenue:	2,138	1,977	1,802	1,840	1,877	-12.2%
MCC Revenue: PC	2,067	1,936	1,714	1,746	1,765	-14.6%

Key Performance Indicator Analysis

<i>Metric</i>	<i>Projected Amount</i>	<i>Actual Amount</i>
Consigned Inventory Savings	\$48,579	(\$34,003)
DSO Savings	\$64,692	\$102,457
TOTAL	\$113,271	\$68,454

Cost Benefit Analysis

<i>Cost Benefit Analysis</i>	<i>Projected Amount</i>	<i>Actual Amount</i>
Project Cost	(\$472,230)	(\$472,230)
Ongoing/Future Cost	\$0	(\$38,800)
Total Cost	(\$472,230)	(\$511,030)
<u>Project savings (annual)</u>	\$113,271	\$0
5-year estimated savings	\$566,355	\$68,454
Total 5-year ROI	\$207,396	(\$442,576)

Comments

- Estimated ongoing/future costs: \$10,000 materials and \$28,800 man hours.

Section 7: Connection Issues

Overall, the connection is working as it should. MCC Customer Service reps PC purchasing users express overall satisfaction with the connection.

The issues identified fall into four main categories:

1. System sustainability
2. Internal Ownership
3. Scalability
4. Technology

System Sustainability Issues

- Connection's software is at least two versions behind
- Was supposed to be migrated to middleware to address software issues; delay in middleware has delayed upgrade of system.
- PC has license for partner software, not sure about future versions
- Threat of something breaking: licensing issues, upgrades

Internal Ownership Issues

- The connection is effectively "out of sight out of mind;" thus, it doesn't always get the same focus as more visible e-business channels.

Scalability Issues

- Not all of PC sites are currently connected; full cost savings and data integrity benefits not realized
- The issues of internal ownership and system sustainability become critical when considering how to connect to the other sites. These need to be addressed first.

Technology

- If additional sites would come online, it would not be financially advantageous to implement point-to-point connections for each. Instead, a middleware solution might be the appropriate alternative. Another option is using an Internet hub.

Section 8: Technical SWOT Analysis of the B2B Connection

The following is an adaptation of the traditional marketing SWOT analysis methodology, highlighting the technical strengths, weaknesses, opportunities and threats created by the implementation of the point-to-point connection with PC.

Input was provided by project participants, IT, and current industry thinking about point-to-point connectivity.

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> • Considered helpful by MCC and PC users • Improved user productivity • Communication loop tightened: reduced errors • Shortened order-to-cash cycle • A degree of lock-in with customer • Better demand management • Better invoice turnaround time 	<ul style="list-style-type: none"> • Dedicated to one connections point; cannot leverage to others cost-effectively • Not a strong differentiator • Not a substitute for lower price • Data double-entry is a problem • Some older users don't like it • Not all sites online now; complete value of connection not realized • Data synching
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> • Expanding capability could help PC realize additional cost reductions • Switching connectivity to middleware solution could make connections more cost-effective 	<ul style="list-style-type: none"> • Other suppliers connecting via industry hub dedicated connection • Disconnecting would be viewed negatively • Price suppliers might undercut savings of connectivity • Timing and cost of SAP upgrades (need to be concurrent) • System integrity and security is questionable, could pose serious shut-down threat • Lack of Business interest in tool – no ownership could spell problems for connection.

Section 9: Lessons & Recommendations

Lessons

- **Avoid paying for total fees in projects with customers.**

The numbers suggest that the project costs MCC shouldered will not be fully recovered until 2006. Market conditions during 2000 – 2002 were the opposite of what MCC predicted, and ultimately, the project didn't have a financial impact on the relationship with newly-formed PC.

- **Make conservative estimates of savings from unproven technology projects.**

The estimates of working capital and days to pay reductions were 65 and 70 percent, respectively. The actual results were difficult to assess, as these two elements were in the midst of re-engineering at the time of this study. Anecdotal evidence, however, indicates that the goals were never met.

Other Lessons Learned:

- Connection improves information flow and reduces errors between companies.
- Establish a cost ownership and maintenance schedule. Define the route for bringing all sites online. The PC sites not online in the initial phase of the project never got online, and may never be brought on.
- Document all project work for future reference.

Recommendations

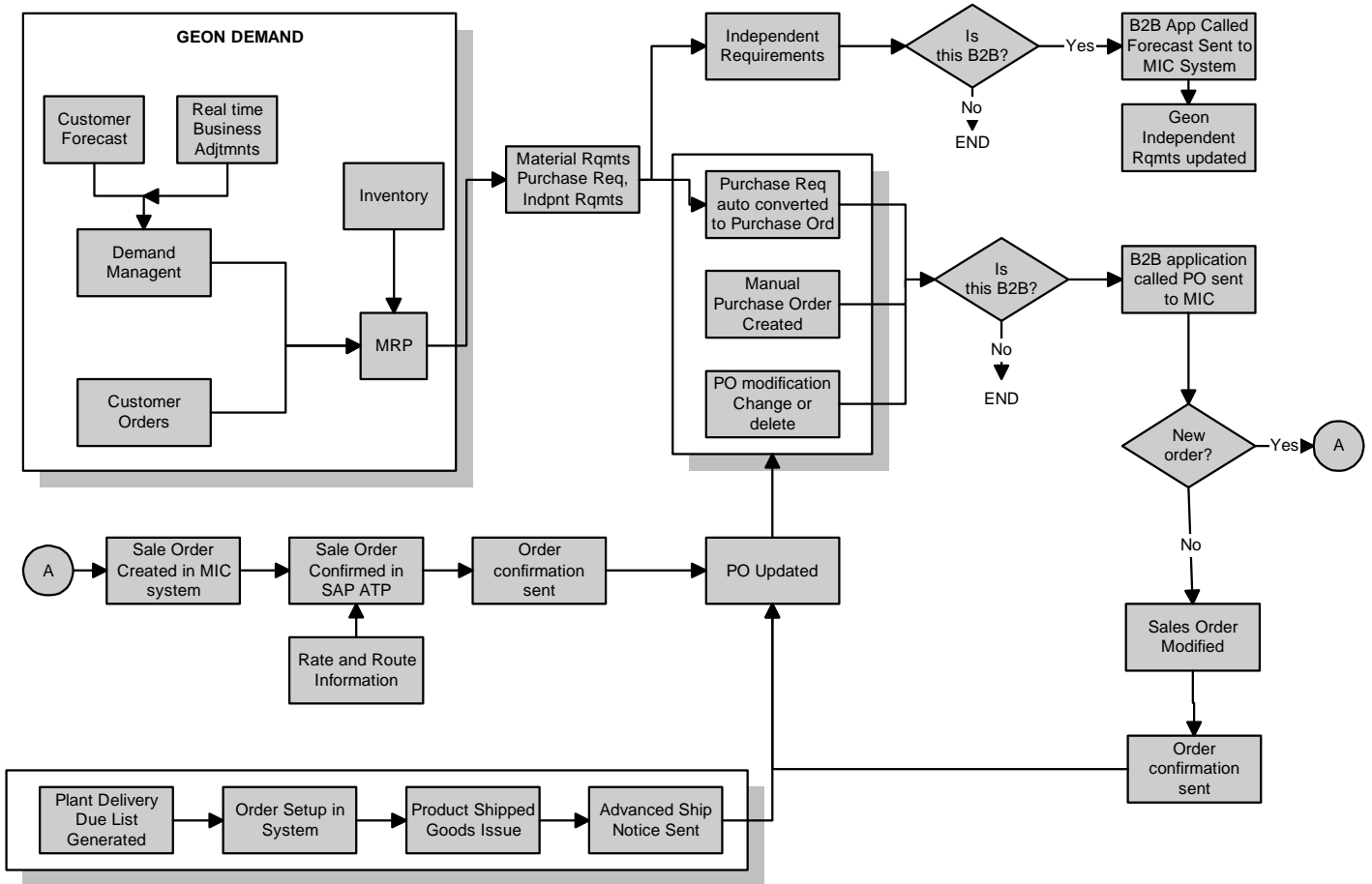
MCC and PC should jointly review the cost savings of the connection after 2006 and decide on connecting the additional PC sites if the financial analysis warrants.

New wireless, middleware, and RFID technologies coupled with SAP modifications could simplify existing implementation issues and make direct connections more affordable and timely. Both companies should keep abreast of technology developments that may enhance the capabilities of their SAP systems.

According to this analysis, connecting to other customers' SAP systems does not seem to make sense unless highest volume sites are connected and the cost of connectivity has decreased. Given the industry pricing downturn, the cost of this project wasn't realized in a generally acceptable 3-year timeframe for capital investments.

Section 10: Appendix 1 – Schematics, Flow Charts

High Level Process Flow



Section 10: Appendix 2 - PC Interview

Discussion with PC Manager August 4, 2004

I. Background

- a. What prompted PC to select this project?
 - i. In 1995, Geon undertook SAP implementation and integrated businesses. After full implementation (1997 – 1998), Geon led the connectivity benefits SAP brought to their internal businesses and sought to employ similar connectivity with top 10 key suppliers.
 - ii. MCC was first supplier to connect.
- b. What was happening at the company?
 - i. SAP implementation, followed by merger with M.A. Hanna
- c. What has been going on since the project?
 - i. Merger completed, followed by financial issues exacerbated by downward economy.
 - ii. PC re-emerging as tighter better organized company.
 - iii. Interest in e-business connectivity still alive, but not focus.

II. B2B 2000 Project Objectives

- a. What were PC's main objectives for the connectivity project?
 - i. Operational excellence – especially in procurement
 1. eliminating wasteful transactions, activities
 2. focusing on managing, processes
 - ii. Working capital – separation of one of the businesses via SAP caused a 20 – 25% increase in working capital
- b. Do you believe those objectives were achieved? Yes.
 - i. Able to move FTE's from time wasting activities that can be managed by IT and redeployed them on more value-added assignments
 - ii. Reduced working capital back down to prior levels
- c. Did you achieve the following:
 - i. Simplified business practices
 1. Yes: able to re-train people to use the data in SAP to make educated judgments about the business, not relying on guesses
 2. Removed many wasteful tasks along with the potential point of error
 - ii. More efficiency and flexibility

1. Yes: Better data integration, accuracy
 2. Be more flexible by focusing on the business information gleaned from the data.
- iii. Decreased manual effort spent executing transactions
 1. Yes. See above.
 - iv. Proving the technology
 1. Yes. Did 6 more connections with other vendors.
- d. Would you repeat the project and objectives again? If not, please advise on areas and reasons for modification.
- i. Yes: irrespective of the specific technology, would do the project the same way, because it helped to greatly improved business processes by way of the analysis required in automating the transactions.
 1. For each connection, they've spent at least 3 weeks analyzing the business processes.

III. Connectivity

- a. Have you done connections w/other suppliers or customers?
 - i. If yes, how did the project compare to this one?
 1. Yes, done with 6 other point-to-point connections. MCC project was best because MCC was willing and ready.
 - a. Other connections include Exxon Mobil, BASF
- b. Are you considering additional connectivity with suppliers and customers?
 - i. Not at this moment. The last several years have been financially difficult, and the company was focused on survival. They've got a better understanding of data requirements and the supply chain links now.
 - ii. Connectivity projects are difficult to do while in survival mode.
 - iii. More selective approach to which customers/suppliers they connect: e-business isn't always right for every company.
- c. Regarding the dedicated B2B connection w/MCC , how do you feel about the following:
 - i. Connection's strengths
 1. Data integrity and availability; drives better processes and decisions
 - a. Some JIT production; this is not scalable to all businesses because of the nature of business and players.
 - ii. Connection's weaknesses

1. Maintaining data integrity: some business processes may not support/provide good data. Business process analysis is absolutely paramount.

- iii. Connection's value

1. Simplification: minimum transactions, minimum mistakes
2. Flexibility: enables company to respond quickly and confidently to supply chain and/or business process issues
3. Cost advantages: this technology was ahead of its time. As it develops and more industry members become connected, the lower the costs for all companies. Future changes in industry will herald the strengthening of connectivity:
 - a. Necessity (others are e-enabled)
 - b. Global nature of business
 - c. Need for centralized procurement

IV. Metrics and results

- a. What metrics did you use to gauge success?
 - i. Was project on time and on budget
 - ii. Reduction in working capital
 - iii. Reduction in number of transactions

V. Future Opportunities

- a. What future connectivity opportunities do you foresee?
 - i. Opportunity for better data integrity
- b. Have you considered "middleware" as a tool to enable one-to-many connections to suppliers and vendors?
 - i. Yes, have middleware. Don't care if suppliers want to connect directly via SAP or via middleware.
 - ii. Not current member of Elemica:
 1. Concerns about business processes being sound
 2. Heavy-handed approach was turn-off
 3. Ultimately Elemica is same costs and resources as middleware
 4. Have done some good things for the industry (e.g. CIDX)
 5. Knowledge capital they've added to industry is benefit
- c. What is your timeframe for additional connections?
 - i. Not immediate