COOPERATIVE COMPUTING - A BRIDGE TO THE FUTURE

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"Cooperative Computing - A Bridge To The Future"? The future?
The future of what? What is "cooperative computing"?

In its broadest sense, cooperative computing implies a systems
architecture and a communication infrastructure that permits
the sharing of organizational information and applications in
a multiple CPU network - PC, minicomputer and mainframe.

A cooperative computing environment can provide the essential
building blocks for strategic business systems. It is these
systems that will carry businesses into the future with
increased effectiveness and a competitive advantage.

It is no secret that advancing information technology affects
products, processes, companies, and industries. Firms
implement new technology for a variety of reasons. Until
recently, most implementation has been in support of new
processes for producing or distributing products or to more
efficiently support the administrative requirements of running
the day-to-day business. Consequently, most implementation
planning has typically focused on a specific activity of the
business. Often too little thought or planning is given as to
how that technology fits or "cooperates" with the technology
of the rest of the organization.

More and more managers are beginning to assess the current and
potential impact of information technology on their
businesses. They are beginning to understand the strategic
implications of new technology and how information can be used
to improve their businesses competitive positions. As this
understanding grows, managers will be able to strategically
focus their information resources on the firm's critical
success factors.

As managers plan strategically for information technology, the
relative priority of investments in information technology may
change. For example, increasing the efficiency of a payroll

system may not be the investment that yields the highest return. It may be that solving customer service problems with a new on-line order entry system is a more strategic investment for a firm. This new system may cut order-entry costs and provide more flexibility to customers in both the time and process required to place the order. The system has the potential to provide the firm with a significant competitive advantage over rivals. The added value for the customer combined with reduced order processing costs and a potential increase in sales can assure the firm of future success in the marketplace. Obviously, a more efficient payroll system may be very important to administrative efficiency and reduced administrative cost but it does not provide a competitive advantage so necessary to the continued viability of the firm.

The purpose of this document is to describe how a strategic planning process for business information systems can help assure a firm of future business growth. This will be accomplished by:

1. Offering some examples of strategic systems built with today's technology and identifying the key business success factors that these systems addressed.

and

2. Discussing the strategic planning process and how MIS managers need to look at current information capabilities as "building blocks" or "platforms" providing technological growth paths for cooperative computing environments.

EXAMPLES OF STRATEGIC IMPLEMENTATION PLANNING

A Decision Support System For Gas Allocation

The managers for a natural gas commodity trading firm recognized the need to analyze the gas industry to determine the key factors for the success of a business in that industry. They understood that a competitive advantage in

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that business required that the most current information on
market supplies and market demands be quickly analyzed and
assembled to provide a timely bid or proposal for the supply
or sale of natural gas. Having gained this knowledge about
the external competitive environment, they then looked
internally, at the organization, to study the current flow of
information and identify those areas where improved access to
information could provide the most significant benefits.

They looked for areas where there was guesswork caused by lack
of information. They also looked at areas where information,
currently available, could be more quickly disseminated
throughout the organization to provide more timely analysis
for the allocation of gas between suppliers and buyers.

The allocation process was done once a month. It required a
thorough analysis of the gas supply available, the
transportation or logistical requirements, and the market
needs. Decision makers from throughout the U.S. and Canada
met together one week before the allocation deadline to
compare supply and demand spreadsheets and determine how the
gas would be allocated at the end of the week.

Equipped with a thorough understanding of the business need
and the process flow, they then searched for the information
technology that would allow the firm to more efficiently
accomplish the allocation process.

They chose Hewlett-Packard's Business System Plus software to
provide not only the information access, analysis and file
sharing capabilities but also to provide the LAN environment
needed for the fast exchange of information. The PC was
viewed to be essential to allow individuals to process the
information according to their needs yet be able to quickly
share this information with other decision-makers throughout
the organization.

With the ability to "share up-to-the-minute information on a
moment-to-moment basis" decision-makers no longer need to meet
together. Using information technology in a cooperative
manner, decision-makers can finalize the allocation process
within minutes of the deadline. By waiting until the last
minute to make the deals with their suppliers they are able to
negotiate better prices on their gas purchases. Needy buyers,
waiting to be notified of an allocation, may be willing to pay
slightly more to assure themselves of the necessary supply of
gas. The advantage to the firm is a wider profit margin on

their brokerage activities. This is what provides this firm with a competitive advantage.

Focusing on just one area of the business has had a major effect on this firms competitive position. These managers have found the key to success for the firm is through process improvement. To assure the firm's future success they will continue to look for ways to create substantial and sustainable competitive advantages through the deployment of information technology, much of which is available today.

A Business Information System for Hewlett-Packard's Information Systems Group

Even computer firms, like Hewlett-Packard, which are in the information business, need to step back from the fast-paced implementation of technology to study their fundamental business needs.

Managers in HP's Information Systems Group found that answers to basic questions about the group's divisional sales results were often not easy to obtain in a timely manner for decision-making. In fact, given the size, complexity, and international scope of the order entry process, much of the information was not available until several days after the month end close of business. The information, though available, was typically widely dispersed throughout the organization, held in a variety of formats on multiple machines. The business analyst, trying to respond to management needs, found it necessary to gather data from a wide variety of sources and consolidate that data locally to perform the necessary analysis.

Recognizing a fundamental business need for managers to get faster, more timely access to sales information, the group controller and the MIS manager tracked the information that was most frequently required by the various management levels within the group. It became readily apparent that the higher levels of management simply wanted to track some key business metrics in order to "manage by exception". Exceptions would prompt them to ask questions of the responsible lower level managers. These lower level managers, in turn, would require more extensive access to information in order to respond to their managers needs.

After thoroughly understanding the source and flow of the product information throughout the organization's information systems, the MIS manager was able to identify the information technology required to meet the business needs of the various levels of management within the group.

The uppermost levels of management desired a daily, graphical "snapshot" of their key measures for success. They wanted to be able to note the exceptions, understand the reasons for the exceptions, and take the appropriate actions required to better manage their businesses on a day-to-day basis rather than waiting until the end of the month. "Time to action" is a critical success factor.

Examples of a few of the key measures they required are:

- Actual orders versus targeted orders for the business unit
- Actual orders versus targeted orders by region (domestic and international)
- Major product actual orders versus targeted orders
- Trade discounts by major product

You can imagine the kinds of questions that might be asked when exceptions are noted in these measures.

To meet the needs of the upper level managers, the MIS manager implemented a "push button reporting system". Using the command file capabilities of HP's Information Access and Graphics Gallery products, he was able to access information from a variety of computing resources and automate the process of presenting this business information in a graphical PC format. This information is distributed to upper level managers throughout the organization, including the European operations, using the electronic mail capabilities of Business System Plus. Managers simply select one key to automatically view a graphical representation of the daily sales information. This timely access to the information they need allows them to respond quickly to any aberrations in their business.

Lower level managers demanded not only the same graphical reporting capability but also access to the supporting detail information. They wanted to be in a position to anticipate their managers questions, gather and analyze the necessary information and be prepared to proactively (versus reactively) respond to critical needs in the business environment.

The strategic implementation of the integrated PC and HP 3000 computing capabilities of Business System Plus (information distribution, information access, shared resources and personal applications, such as Graphics Gallery) enables Information Systems Group managers to more effectively manage their products, their product lines, and their businesses. The ability to take immediate action in response to aberrations in key business success factors can improve the the entire group's overall performance and contribution to profit.

A Market Sales and Service System For a Consumer Goods Manufacturer

Imagine having 10,000 customers and only 350 sales representatives! This firm is always looking for ways to increase the productivity of these sales representatives while improving the efficiency and quality of the order entry process. The key success factor in this business is customer satisfaction through prompt response to customer needs and timely, accurate turnaround time from order entry to customer delivery.

The vice president of MIS has studied the sales process to ascertain where information technology could not only improve the process but also offer the firm a competitive advantage over rival firms. He found that sales representatives are not spending the entire day calling on customers. In order to keep up with the administrative detail, sales reps return to their offices in the middle of the afternoon, often spending more than an hour on the telephone with the firm's order processing department. Any orders that require immediate input are transmitted over the phone. If customers had questions that the sales rep could not immediately answer, such as product availability, this is also obtained over the phone from the order processing personnel. A follow-up call to the customer is then required to provide the necessary information. All other orders taken during the day are summarized on a daily order form and mailed in for subsequent data entry by order processing personnel.

It was very apparent to the vice president that a significant amount of information is often being handled by multiple people before being processed. Duplication of effort occurs all through the process from the point of the customer's

initial order to the servicing of the sales rep requests for information. In many instances customers are waiting several days for a sales rep to call on them to take their orders. These are frequently the instances where the sales rep is required to provide immediate order input via the telephone. At each step in the process there exists many opportunities for the wrong information to be entered into the firm's information systems. Inaccurate order information leads to shipment of the wrong products. This results in a "snowballing" of corrections. The correct information has to be reentered; credits for returned merchandise have to be entered; inventory has to be adjusted; customer rebillings have to be issued; etc..

The rest of the industry has the same problem. The vice president knows that the strategic implementation of information technology could offer his firm a competitive advantage over their rivals. The advantage might be short-lived but it will take awhile for the competitors to catch up thus giving this firm a chance to grab valuable market share.

This firm plans to put portable computers in the hands of their sales force. The portables will be equipped with a cooperative processing order entry application that provides access to and update of the central database. The sales reps will enter the order information while at the customer site, verifying the accuracy of the data entered with the customer. Larger customers will be provided with their own personal computers and access to on-line order entry. Using HP's Cooperative Services, a significant amount of product information can be downloaded to the portables so that sales reps and customers can answer the majority of the most frequently asked product questions. At the end of the day the sales reps will upload the order information to the central database. If necessary they could dial-in to this central system from their customers site to immediately enter the orders or obtain such information as product availability from the central database.

Through the implementation of this integrated order entry system, sales reps will be relieved of the daily paperwork. Their job satisfaction should increase because they will be able to concentrate their efforts on what they do best – selling. The elimination of the paperwork and most of the telephone calls should allow for more time to call on current customers and cultivate new customers.

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Not only is there potential for an increased level of sales but overall organizational effectiveness will be improved. The need for the middle layer of order entry personnel will effectively be eliminated. The more accurate entry of information into the system will eliminate the need for numerous corrections. The ability of the portable and the central system to cooperatively process the order information will provide for the most effective use of the firm's computing resources.

More importantly, a competitive advantage may be obtained. Customers will be serviced in a more timely and accurate manner. Larger customers will have even more flexibility in the timing and entry of their orders. The result should be an increased level of customer satisfaction, a critical success factor for this industry that can assure this firm of continued growth in the future.

GROWTH PATHS TO COOPERATIVE COMPUTING ENVIRONMENTS

In each of the above examples, management assessed the key success factors for their businesses and identified how information technology could impact their competitive position. They strategically planned for the integrated information systems that would meet their business needs.

This growing need for truly integrated information systems is due to various technological, economic and organizational factors such as:

- The need for fast, reliable information exchange in response to rapidly changing markets, products, and services.

- The evolution of guidelines, standards, and protocols.

- The penetration of information systems into internal business processes.

- The increasing technical quality and capability of information systems technology.

- The use of information systems technology to distinguish a product and/or a company.

How can an MIS manager provide these types of solutions with limited resources and constrained budgets?

Today's environment seems to require an ever-increasing sophistication in terms of software, hardware, and networking technology. Certainly, none of the examples described earlier could have been developed in reasonable timeframes if MIS had started from scratch with basic Cobol programming.

The answer, clearly, is to start with higher-level building blocks to leverage cooperative computing "platforms".

<u>Cooperative Computing Platforms</u>

Platforms, in this context, can be used to describe an architectural framework upon which information systems can be built. The ultimate goal of the platforms is to provide the structure for a cooperative computing environment to support the information systems. The information systems themselves are the solution.

Hewlett-Packard's goal is to provide the fundamental foundation through:

- A Scalable RISC Computer Systems Family
- Easy to Use Integrated Workstations
- Industry Standard Networking
- Industry Leading Support

Industry standard networking will provide the link between HP computer systems and software and the network of heterogeneous systems and software present in so many organizations. To enable a platform to support cooperative computing and coordinated work, this network linkage is key to the distribution of information and computing throughout the organization.

HP's NewWave interface architecture, focusing on business tasks rather than application tools, will provide the transparent, object-oriented environment necessary for these easy to use workstations.

Upon this foundation, HP is committed to offering building blocks, such as Business System Plus, to fulfill the fundamental needs for integrated individual, workgroup, and organization-wide communication and computing. These building blocks are necessary to construct information systems which can take advantage of a "cooperative computing" environment to support the firms strategic plans.

Today, HP's Business System Plus integrates the powerful information access, analysis, sharing and distribution capabilities needed to build multi-purpose information systems such as the example described above for gas allocation. By providing intrinsic access to data, files and services through products such as Cooperative Services and the HPDeskmanager intrinsics, these multi-purpose information systems can become highly integrated single-purpose transaction systems similar to the order entry system also described above. These same systems can be further customized by adding third party product pieces to provide truly competitive information system solutions. These building blocks can provide the foundation for comprehensive Decision Support Systems, Executive Information Systems, Medical Analysis Systems, etc..

In summary, HP will continue to provide more and more building blocks designed to be integrated in a truly cooperative computing environment. HP itself, our customers and our third parties will be able to use these building blocks to provide the strategic information systems necessary to achieve their businesses critical success factors.

MIS managers need to view the office functionality available from HP and third parties as essential building blocks, or system development platforms, for these future strategic systems. For example:

- The need to view a capability like HPDeskManager, not as an electronic mail system for only person-to-person messages, but as an information transport system to tie together operational systems.

- The need to view data access capabilities, PC spreadsheets, and graphics tools all as component building blocks of strategic operational systems.

As business managers grow in their level of sophistication in identifying key success factors and planning for the strategic implementation of information technology, it will be increasingly important that these building blocks be in place. After all, time to action is critical to firms desiring to obtain a competitive advantage and it is a competitive advantage that will ensure the firm a "bridge to the future".