Paper 5150
Implementing Enterprise Desktop Management
The Big Picture

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Overview

In 1992 Hewlett Packard began its first efforts to manage PCs in a fast-growing client server environment. With no off-the-shelf products or industry standards, a small team in Fort Collins, Colorado and Palo Alto, California tackled the 'sticky' subject of standardizing PC configurations and PC software.

In the beginning the PC environment looked something like the following:
- Fragile and unreliable operating software
- "Owned and managed" by individuals
- Underutilized by most users
- Primarily floppy disk utilization
- Extremely expensive to support
- Pervasive and market dominant
- The Achilles Heel of a client/server environment

Initial efforts to manage and standardize this environment elicited responses such as:
- "This will never work!"
- "You're crazy!"
- "Why do you think they call it a PERSONAL computer?"
- "Just don't touch my computer."
- "The whole point of the PC is to reduce IT control."

However, by 1994, Brandt Faatz was presenting Paper 5007 at HP World explaining the problems, the solutions and benefits of PC COE to the world. With a total of approximately 58,500 PC COE subscribers in Hewlett-Packard, the collective tune had changed. Now customers and business managers were saying such things as:
- "I don't know how we could survive without it."
- "I can't imagine trying to manage my own PC again."
- "We've made it a prerequisite for our applications."
- "It's a major competitive advantage for us."

The PC COE team has not been standing still since 1994. They are now in the process of migrating the entire corporation to the new NT client/server platform. They have defined a standard server environment as well as client environment and the means to manage that environment. In addition, they have made the PC COE environment available to the virtual office work force--those road warriors that live in hotels, airplanes and customer sites.

The vision continues to grow and change as the PC COE team re-invents itself to match the ever-expanding, global business needs of Hewlett Packard and the extended enterprise. This means that the focus will be on PC COE processes which will allow business partners access to our PC COE environment to enable an easy, flexible interchange of business.

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As word of the PC COE success story has spread to the business world, other business organizations began asking how we did it. "Can we buy PC COE from you?" has been the common question. In response to that question, HP formally announced the release of the Enterprise Desktop Management (EDM) services in Fall 1996 and subsequently began plans to productize our internal COE in March of 1997.

Since PC COE is NOT a shrink-wrapped package, but is a solution comprised of people, processes and technology components, EDM services have been defined around the same model. It requires all three elements working together at both the centralized and site levels as well as all the pieces of technology being tightly integrated.

Learning from HP's internal success story and from evaluating the progress or lack thereof, of the various EDM projects that are underway with other large organizations, the following critical success factors must exist in the business environment.
- A driving business need,
- A centralized IT management organization to serve as the Vision Keeper,
- High-level management support,
- Support for Management of Change in the Organization,
- Support for the enabling technologies,
- A well-coordinated communication plan,

In addition to the lack of the above critical success factors, the following barriers to success have be identified along the way.
- 'Can't see the forest for the trees' syndrome,
- Inflexible management styles,
- 'Not invented here' syndrome,
- 'Just give us a tool' syndrome,
- Poor design or lack of customer-focused processes,
- Reduced recognition of the impact of new technologies,
- Poor internal marketing and communication,

It is clear by looking at the elements of the EDM solution itself and all the surrounding success factors, that EDM is a big project and initiates big changes to the organization. It requires planning, resources and time. However, the ROI is an order of magnitude bigger. The results can be seen in the bottom line by a reduction in the total cost of ownership in PCs. Employee productivity is increased as well as customer satisfaction with IT services. It is one significant way that IT organizations can be seen as a business enabler instead of a cost center where business units throw money down a dark hole.

This paper, while providing a historical introduction, is primarily focused on the critical success factors needed in the organization as well as other potential barriers to success when implementing Enterprise Desktop Management services.

Historical background from HP perspective

Hewlett-Packard's PC COE is becoming a common reference point in the world of PC desktop management. Three year's ago at the '94 HP World Conference, Brandt Faatz presented Paper 5007 on HP's PC Common Operating Environment. That paper detailed the PC Management problems Hewlett-Packard was trying to solve, the strategy and solution to the problems and the ultimate benefits. This section touches the main points of Paper 5007 and how we have continued to improve and re-invent PC COE as well as our entire IT management infrastructure. For more detailed information, please refer to the original paper.

Highlights from Paper 5007

The Problem - Why PC COE?

As the rate of new technology introduction increased , the desktop PC became more and more unreliable. Newly installed software packages were not compatible with old software and users were faced with difficult and hard to understand configuration instructions. As a result frustrated users were experiencing lost hours of work trying to manage their PC. This, then, snowballed to ever increasing calls to the IT Helpdesks. With complex configurations and multiple platforms, most calls could not be handled by phone, thus requiring 'hand-on' technical support staff. Costly on-site support staff began increasing at every site.

Meanwhile, users were learning more and more about all the wonderful PC productivity tools. They wanted to use these tools and share information each other. However, because these tools were implemented in a very unmanaged way, with each department or office buying their own preference, data sharing and process automation was difficult and often nearly impossible.

The problem got worse as an increasing number of client/server applications were purchased and had to be integrated into Hewlett-Packard's computing environment. The PC was not ready for mission critical, client/server applications, but the businesses needed the application. Neither processes or tools were available to manage such an environment which resulted in application conflicts, frustrated users and a chaotic, unreliable and unsupportable base of about 60,000 PCs.

Of course, this environment drove the total cost of ownership (TCO) to unacceptable levels. The required ratio of Helpdesk and IT support staff to users was about 1 to 50. In most cases, IT couldn't support to that level, so effective support was impossible. It was clear that HP needed to get its PCs under control. In 1992, the initial PC COE services were rolled out to a selected group of users in Fort Collins, Colorado and Palo Alto, California.

The Solution - What is PC COE?

The basic goal of the PC COE strategy was to control the cost of technology ownership by managing PC technology implementation to minimize cost increases and maximize technology utilization. The cost on owning the technology is mapped against the value the technology returns. If the ROI isn't there, then that technology should not be used.

The PC COE solution focused on five objectives to increase the ROI on technology:
- Connect all clients to the network,
- Standardize PC configurations,
- Manage configurations via the network,
- Distribute a common, core set of office productivity tools,
- Develop a process for integrating applications into the environment.

By accomplishing these five objectives and implementing a very strong and well-coordinated internal marketing tool, the PC COE team has enrolled 121,189 PC clients into the PC COE program by April 1997.   Of that number, 62,077 are on some version of the NT platform.

The Benefits of PC COE

PC COE has met these objectives by providing a different value proposition to different audiences of people as shown in the table below.

Audience	Value Proposition
Application providers	A predictable target platform and an application integration process.
Site IT service providers	A way to deliver a complete, integrated, fully -supported set of computing services to the end-user.
Corporate Information Systems	A way to implement corporate-wide strategies and systems very quickly to the right people at the right time.
End Users	A robust set of services while hiding the complexity of the technology.

Reduced cost model (not including hardware procurement & setup)

Cost Driver (per PC per year; based on an average technology utilization level of 15 software components per PC)	Desktop Management Costs Without PC COE	Desktop Management Costs for the Same Level of Technology Utilization With PC COE
Software Licenses & License Administration	$1500	$500 (based on centralized license administration)
Purchasing (order processing)	5 (PO's per year) * $100 (PO processing cost) = $500	1 (PO's per PC per year due to central purchasing) * $100 (PO processing cost = $100
Installation & Update Effort (performed either by IT support personnel or end users)	1 (hour per install/update) * $50 (per hour people cost) * 10 (component upgrades per year) = $500	[0.5 (hour per automated install/update) * $50 (per hour people cost) * 10 (component upgrades per year)] = $250
End-User Technical Support(performed either by IT support personnel or end users)	40 (hours) * $50 (per hour people cost) = $2000	20 (hours) * $50 (per hour people cost) = $1000
Desktop Management Infrastructure Cost	$0	(Electronic software distribution cost, server management cost, etc.) = $650
Total Cost of PC Ownership	$4500	$2500

With over 100,000 desktops in the PC computing environment, Hewlett-Packard believes they have saved over $200 Million by implementing PC COE.

(Cost before PC COE - Cost after PC COE) x Number of PCs = Total Savings
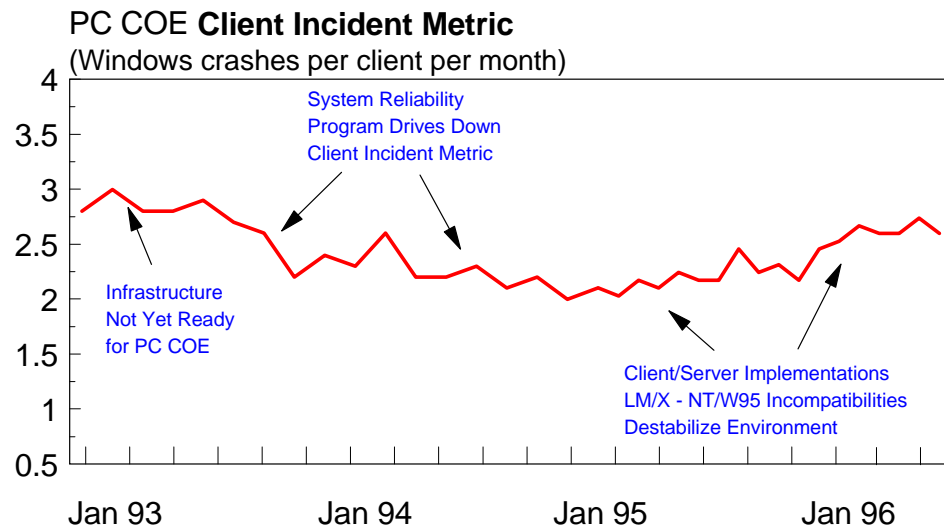($4500 - $2500) x 100,000 = $200 M

HP PC COE team continues to re-invent their services and their team.

New NT Client/Server platform

The initial focus of the PC COE team was to standardize and stabilize the PC Client environment. They did that by defining, engineering and implementing a standard PC Platform and a core set of PC applications That platform was built in a Window 3.1 environment which connected to LMX servers (HPUX with a LAN Manager stack). They did not attempt to standardize the server platform.

As PC COE met those initial objectives, the PC COE subscriptions increased and so did customer satisfaction. During this time the PC COE team began collecting PC metrics as well. The metrics demonstrated that PC lockups and downtime was decreasing as the PC COE subscriptions were increasing. This inverse ratio of increased subscriptions and decreased PC lockups continued until about the beginning of 1995.

What happened then? Two factors influenced the upward trend in the PC lockups. 1) After examination of the data, the team discovered that as the PC COE platform got more stable and customers could rely on it, they were using the PC applications more. In addition, those applications became more sophisticated with more need for memory and system resources. Windows 3.1 on DOS just couldn't meet the need. 2) The PC COE had been anticipating the need for a more flexible, powerful platform. With the strategy and decision to migrate to the NT and Win 95 platform was fairly well defined by the end of 1994, selected sites and groups of users began beta testing the new platform in 1995. The combination of demand by high - end users on DOS and Windows 3.1 plus beta testing on NT and Win 95 and an incompatibility issue with LMX servers, the client incident metric began to climb as shown in the graph below.
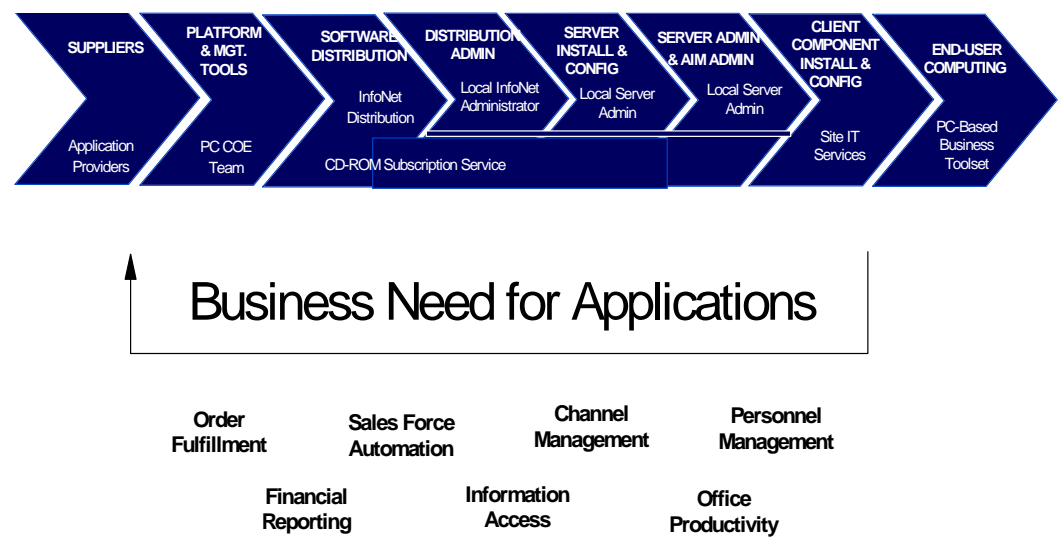
PC COE **Client Incident Metric**
(Windows crashes per client per month)

As stated above , the NT and Win 95 clients and LMX Servers do not play well together. It soon became extremely evident as the LMX servers were loaded with more NT Clients that the COE team had to do something about standardizing and stabilizing the PC server environment. Another service to the Site IT organizations was born as this team forged ahead in designing, engineering and implementing standards for a NT server environment for the entire HP client/ server environment. As more servers and clients are migrated to the NT platform, the expectation is to see the client metric drop even lower than its previous low point in 1994.

New PC COE team organization

The PC COE Team's initial mission was to enable application providers to deliver business solutions quickly and to enable IT infrastructure management organizations to provide PC services at a minimum cost.   As this mission has been accomplished and HP's IT service quality has increased, demand for the COE team's services, process improvements and platform changes has increased and a new mission is on the horizon as well as the expanded value chain described below.

Brandt Faatz, PC COE Team Manager, explains the value chain as follows.   "The salient new features are the additional definition of service delivery value links, and the graphical depiction of the CD-ROM subscription service being provided directly to site IT services. In general, the PC COE team provides product and service components to be integrated into the services provided by the service delivery teams. Together with Team InfoNet, we provide a software management service and target platform for application providers.

PC COE Value Chain:

It's important to understand the relationships in the value chain. In one sense, everyone to the right is a customer, and everyone to the left is a supplier. In another sense, we're all business partners, and we all need to understand something about the whole chain. (The exception is the end user who should not be required to understand the structure of the chain). The links in the chain are not opaque.   That is, each participant needs to see through the chain and understand the relationships among the other links."

In addition, the increasing demand has pushed the team to grow large enough that it has subdivided into five teams to provided focus on specific areas. The teams and their missions are shown the following table.

PC COE Sub-Teams	Team Mission
PC Client Team	• Enable business solutions & reduce costs for client infrastructure. • Continue to lead the industry in desktop management. Remain very visible to end users -- operate as the PC COE flagship.
PC Server Team	• Provide NT Server Administrators with tools and processes to facilitate the operation and management of a flexible, cost-effective, scaleable, and reliable NT Server environment. • Leverage internal and external solutions where possible. • Provide ongoing vendor management for NT Server software implemented company-wide. • Focus on the company-wide migration from LM/X to NT Server in the short term.
Process Team	• Define and refine core processes to support the PC COE Client and Server teams. • Enable application providers. Communicate to the customers information about the products and services of the PC COE Team.
Virtual Office Program	• Focus the Client, Server and Process teams on Virtual Office issues and drive the necessary changes in the PC COE value chain: Client architecture & user interface, Software distribution, Application Provider Program, Testing process, Statistics collection, etc. • Deliver VO specific products and services (PC COE on CD-ROM, Bundled hardware certification, disaster recovery tool set, etc.) • Provide a forum where Service Management, Service Delivery, and Product Division associates share their plans, priorities and concerns, and act as a steering committee of the PC COE VOP activities.
Research/ Strategy & Architecture	• Provide technology strategy, vision development and external market analysis • Provide HP-internal market research, analysis and strategy • Research system architecture, design integrity • Perform IT Risk Management assessments

PC COE Future Direction

As the world of business becomes increasingly complex and the model of the extended enterprise becomes a reality, it important the HP PC COE environment be accessible to our business partners.   Today's mode of doing business with out-sourcing partners and business process partners requires a different paradigm.

During the migration to NT, the COE team has had to support at least four platforms at the same time.   This has have moved the team away from a single platform model into a multiple platform model.   While the intention is to migrate everyone internal to HP to a single NT platform again, the COE team has seen the larger business need to support multiple platforms in the extended enterprise model.

HP cannot dictate or control the various platforms with which they must interact.   The shift in paradigms is from standard environments to standard processes which will allow HP to manage delivery of applications to a known set of standards and interfaces in any specified environment internal or external to HP.   In addition, it gives a method to get visibility to what exists in these platforms even though they may not be uniform across multiple companies.

New Technology Infrastructure Services organization

As the PC COE Team and its services has matured, so has other aspects of HP's client/server environment. The new Technology Infrastructure Services (TIS) organization that was once aligned with specific technology silos, such as network management, server management and client management, have realigned around business processes. The new alignments are focused in the following areas:

- Technology and Research
- Services for various customer segments
- Operations focused on manufacturing needs
- Customer Linkages focused on account management and customer needs

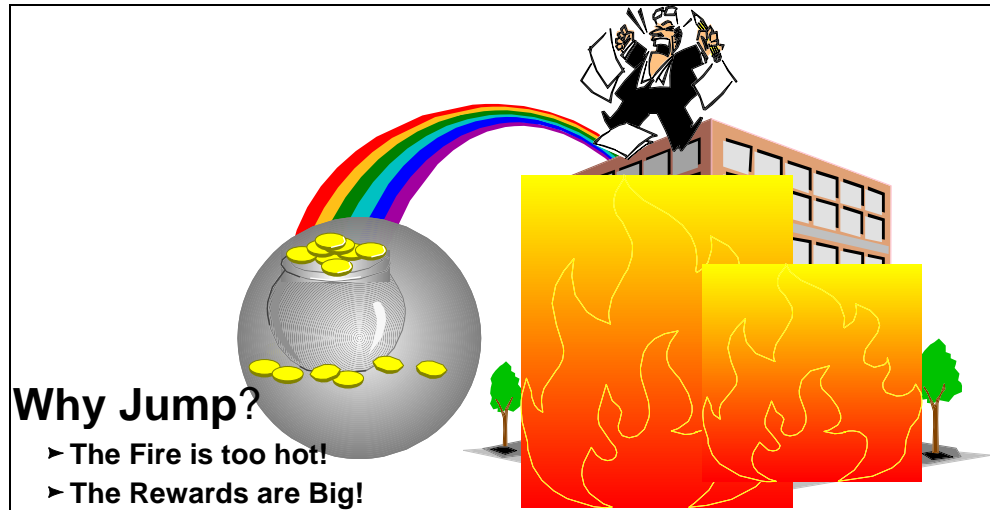TIS has identified the following critical success factors:

- An imaginative understanding customer's needs both now and in the future.
- A deep understanding of what needs to be done to harness technology into services.
- A strong linkage with our partners and customers.

Critical Success Factors

There are many critical success factors (CSFs) that must exist for an Information Technology (IT) organization to be successful when making major fundamental changes to the way it delivers service to its customers. Change is not easy on any organization and changes to technology and the way it is delivered seems to be even harder on an organization. Worse yet, are changes the PC and the way it is managed since most employees have the perception that the PC is their personal tool. Listed below are some of key critical success factors for implementing Enterprise Desktop Management (EDM) and why it is important.

A driving business need

Two type of business needs drive organizations to change how the manage their PC environment.

Typical reasons why the fire is too hot are:
- Business Units cannot meet business needs.
- Total cost of ownership (TCO) for PCs is out of control.
- IT customers are dissatisfied with customer service.
- High loss of productivity both for IT personnel and end-customers.

The rewards for change include:
- Business units need new systems, new tools, new platforms to gain competitive advantage; IT organization must change to support business unit.
- Total cost of ownership (TCO) will be reduced.
- Customer satisfaction will increase as their complexity is reduced.
- IT / PC environment will be easier to manage; reduced frustration.

Without some driving business need, it will be almost impossible to implement a change like EDM. People simply will not expend the money, time or energy.

A centralized IT management organization to serve as the Vision Keeper

To implement any program on this scale requires that a high-level, strategic vision exists and that some organization is accountable and responsible to support and implement it. The real benefits of Enterprise Desktop Management (EDM) are not fully realized unless it is implemented over a large number of clients. The key components of EDM which provide these benefits are:
- Centralized purchase and management of software.
- Centralized, network licensing of mainstream applications.
- Centralized electronic software distribution and delivery over the network.
- Standardized, automated, yet flexible software installation processes and procedures.
- Centralized, comprehensive data collection for overall PC environment.
- Standard, reliable, maintainable, supportable PC configurations across the Organization.

Additional support services complete the picture for a full EDM picture. The support components that further decrease total cost of ownership and increase customer satisfaction are:

- Helpdesk services which provide incident control by restoring service quickly and effectively with highly skilled technicians.
- Problem Management Functions which provide root cause analysis.
- Change Management which provides the processes by which the IT organization manages change to its IT components.
- Configuration management which tracks , records and reports on the current status, configurations, owners, locations, etc. for IT components across the organization.

When examining both the key components and the support service components , it is clear that real economies of scale cannot exist unless the benefits and the cost of the solutions is spread over the enterprise. In addition, a centralized management function provides the focal point and the political power to manage and fund the development process and the enabling technology as well as deliver a common, well-defined communication and marketing plan to all business units.
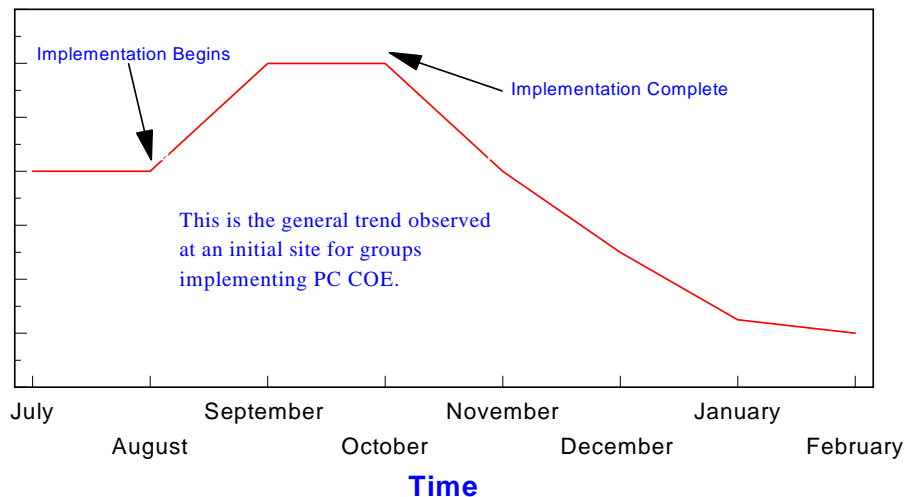
In the HP model, the centralized function does not serve as the dictator pushing out a mandate to all business units. Rather, the HP Corporate IT organization supports the PC COE team to create and hold the Vision and to build a high quality service which delivers real value to the business units. In fact, the successful implementation of EDM is more like a well-coordinated dance between a centralized management function and the decentralized site IT support organizations and application developers.

High-level management support

To ensure success, to gain the maximum benefits and to reduce the cost of implementation, any attempt to implement EDM should have the support of the top level of management in the organization. This, of course, is strongly linked to the idea that EDM is an enterprise solution that will eventually touch all organizations and effect the way the organization does business.

They must see and believe that this type of solution will bring real benefits to the organization in the long run especially since initial startup costs will increase overall costs rather than reduce them. EDM is a strategic solution for the long run not the short haul. The graph below depicts the rise in cost which was incurred at one initial site as well as the overall reduction in costs.

Total Hours

Implementation Begins

Implementation Complete

This is the general trend observed at an initial site for groups implementing PC COE.

July   August   September   October   November   December   January   February
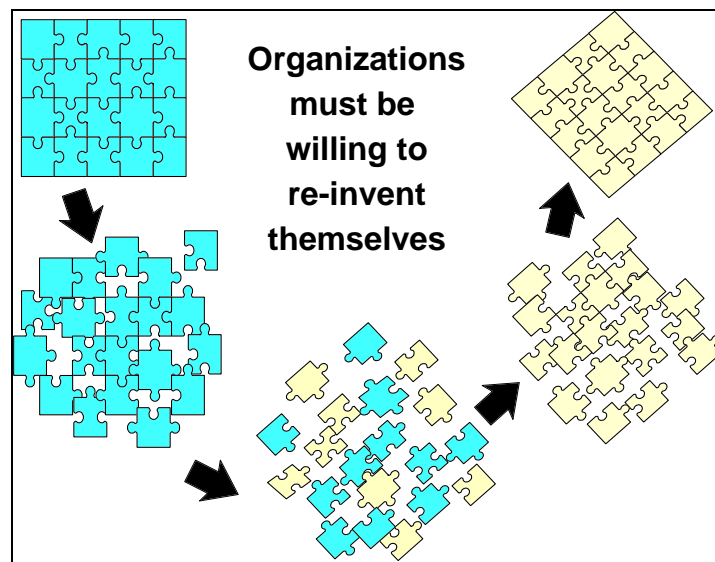
Time

Support for Management of Change in the Organization

Organizational culture is a key piece of the puzzle when evaluating whether an organization will be able to successfully implement EDM.   Cultures that support change and encourage new ideas will be most successful as well as cultures that are used to reorganizing around new processes.

The EDM solution changes the fundamental way that employees view their PC.   It is no longer a personal computer to load and configure whatever software they can purchase.   Instead it is viewed as a corporate asset to be used in much the same way as the telephone/ voice mail system. It is managed from a central point with a core set of guaranteed functionalities and an extensible set of options.   PCs are ordered, configured and setup with the integrated, tested and guaranteed, platform and core set of applications.   Additional tested and centrally managed software options can be pulled from the network server.

The support services model also changes.   With standard sets of hardware, software and processes in place in the client/server environment, IT organizations can change from being a reactive, 'fire-fighting' organization to a proactive, solution delivery organization.   This requires an organizational shift from technology silos to organizing and aligning around IT support processes.   For most IT organizations, this requires a tremendous paradigm shift.   It is also exactly the shift that needs to be made, to create the environment for IT shops to become technology enablers and business partners to all the other business units within the enterprise.

Organizations must be willing to re-invent themselves

Enabling Technologies

Although the IT organization may realign around service processes, it is extremely important to recognize that the enabling technologies must be present as well for these services to actually succeed.   The following core technologies must be implemented and integrated for EDM to deliver the promised results.

- Ability to push software applications from a centralized software application server to site application servers.
- Ability for site IT to push installation of required software to end-users or allow pull of optional software by end-users.
- Ability to gather PC configuration data and hardware information remotely and deposit data in a central data warehouse.
- Ability to monitor and log PC lockup events to a centralized data warehouse.
- Ability to track and monitor software license usage across the network.

- Ability to manage, sort and report on data collected in data warehouse.
- Ability for application developers to easily link into the core application delivery technology.
- Ability to manage the platform changes and releases separately from the application upgrades and releases.

In addition to the core set of technologies, the support services must have the appropriate enabling technologies, preferably all integrated together for maximum benefit.
- A call management system which includes all the enabling telephony and knowledge base technologies.
- A configuration management system which houses all the information about components in the IT environment as well as their relationships to each other.
- A change management system which tracks all requests for changes to the environment as well as the timing of changes.

Well-coordinated communication plan

Change and complexity both breed fear and distrust in the organization. When fear and distrust are high, then rumors begin to fly and the organization can quickly be paralyzed. What started out to be an excellent strategic plan can easily by sabotaged.

Communication flowing both up and down the organization which is simple to understand, frequent and consistent is the best antidote for fear and distrust. Recognition for a communication plan, resources to develop and implement the plan and communication vehicles to deliver the message are essential.

Business unit leaders and end-users must hear the same story from various parts of the organization and the story must be believable. They must hear and believe that the value they are getting is greater than anything they may perceive they are losing. They must be able to have input into the process definition and the end product design.

Barriers to Success

As various enterprises have moved forward to implement EDM, their efforts have been met with varying degrees of success.   The following list of barriers to successful implementation have been identified by HP facilitators and consultants helping organizations assess their environment and develop an implementation plan.

Lack of strong overall IT management vision

Many organizations lack someone or some organization that can really carry the Vision. Individual technology silos or IT departments have a glimpse of what is possible, but cannot pull together a cohesive group which can make decisions.   They lack political power or support to move forward on solutions that impact the enterprise as a whole and other parts of IT organization are in the same log jam.   Each group cannot solve their problems alone because their solutions falls outside their boundaries and they cannot move forward together because there is no Vision leadership. Such phrases as 'I feel like I'm running in a squirrel cage' are often heard.

'Can't See the Forest for the Trees' Syndrome

In other situations, some parts of the IT organization is very focused on their particular problems. They fail to see the big picture or the possible solution.   They are overwhelmed by the details and by the rising demand for service.   They are caught up in 'fire fighting' and 'keeping the blaze at bay' rather than identifying and solving the real problem.   They have neither the time nor the energy to spend on planning an overall strategy.

Inflexible Management Styles

When implementing changes in an organization, flexibility is essential.   No single management style or approach is the answer.   In some cases, the hierarchical, top down approach is what is needed. When it comes to setting the vision, planning the strategy and providing resources, strong leadership is necessary.

In other situations, the consensus building, 'everyone gets a say', approach is just what is needed. When issues like service definition, timing of service delivery or implementation of organizational changes are being decided, consensus building and inclusive activities are effective.

The majority of problems in this area arise when managers are very attached to particular styles, and cannot change that style to fit the new situation.   Depending on the situation, this inflexibility can produce organizational paralysis or increase the fear and distrust.

'Not Invented Here' Syndrome

Another face which inflexibility sometimes takes is the attitude that if the solution was conceived and developed outside the organization, it's not going to work.   The solution is either too expensive, too complicated or the customers will hate it.   The attitude can be seen at the top of the organization as it deals with external partners when looking for solutions or it can be observed in site IT organizations when they are informed about a corporate solution.

This attitude is tightly linked to fear of change and mistrust. When a centralized IT organization is dealing with local or decentralized IT shops, it is best dealt with by using good Management of Change techniques.

'Just Give Us a Tool' Syndrome

Because technology and tools are so much a part of any IT organization, it is easy for IT groups to be technology focused.   One of the most common questions that HP consultants hear about EDM is 'How do we order this package?'   There is an expectation that either the right hardware or the right software package will solve any problem.

When this expectation is deeply ingrained, some IT organizations have not been able to see the value in well-defined processes. Not do they see any need to realign their people to manage processes. What usually happens is that they eventually spend a lot money buying a software tool and the hardware to support it, install it and turn it on. When they discover that problem they set out to solve isn't fixed, they blame it on the wrong tool. Then they start the tool buying process all over again.

Poor design or lack of customer-focused processes

Occasionally organizations will tell you that they have many processes and that they are well-documented and they have piles of documents to prove it. However, things are still not working. Customer satisfaction is low and the costs are high.

After some investigation into some these situations, the following problems have been revealed.
- Process links with other process are broken or do not exist
- Processes were written from an IT perspective without customer input
- There is no process for customer input.
- Personnel have not been trained on processes
- Processes are viewed as static documents instead of living, changing documents that real people use and update as required. There is no process to manage and update the processes themselves.

Reduced recognition of the impact of new technologies

New technologies are entering the market at a rate that is overwhelming both the individual and the IT organization. To counteract this sense of overwhelm, some IT organizations take the 'ostrich in the sand' approach. They believe they can ignore this whirlwind of technology and continue business as usual. This tactic usually works for a little while, until they lose their competitive advantage.

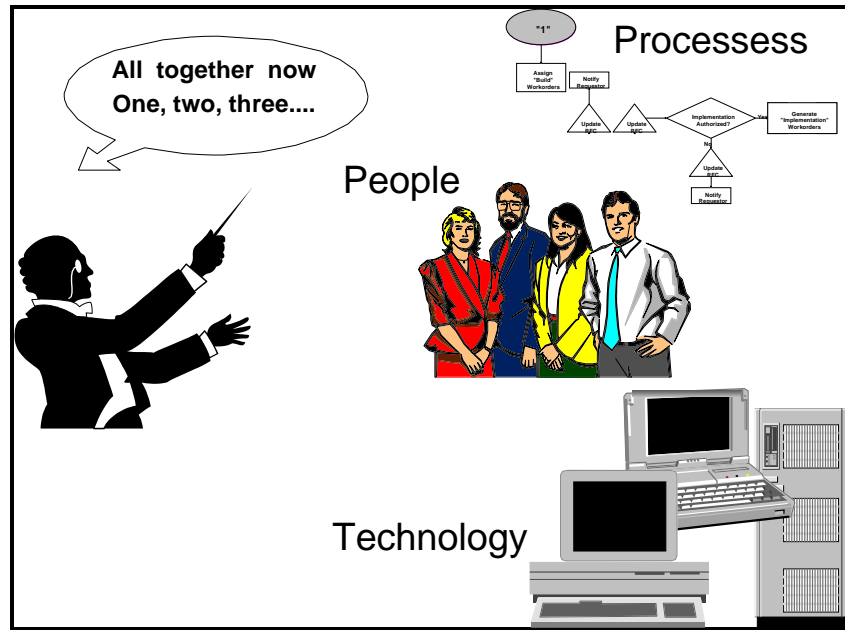Eventually this type of thinking can result in one or more of the following:
- Loss of revenue for business units,
- Failure of the entire business
- IT organization being out-sourced
- Forced re-organization of IT department
- Frustrated customers
- Loss of productivity

Poor internal marketing and communication

As stated in the section on critical success factors, good communication is necessary for the success of any project which makes major changes in the way the organization does business. Of course, the inverse is also true. To implement a solution like EDM, a clear, consistent message which delivers a strong value proposition must be delivered at all levels of the organization. In addition, an excellent communication plan must exist to deal with management of change issues.

Conclusion

To reiterate, the successful implementation of EDM requires people, processes and technology all orchestrated together to create harmony in the client/server environment. It requires a driving business need and the support of high level management. There must be some central function which can provide the vision and cohesiveness to build the service and provide the necessary communication. The organizational culture must support change in all three areas. Finally the enabling technologies must be in place and integrated with each other to complete the orchestra.

Harmony in the client/server environment