

Assessing Return on Investment for Enterprise Change Management Systems

*Protecting Digital Assets and Leading the Pace of
Change in the E-Business Economy*

WHITE PAPER



Abstract

This white paper will discuss the return on investment (ROI) benefits that can be derived from applying effective Enterprise Change Management (ECM) products and practices from MERANT.

ECM is now a hallmark of organizations that are succeeding in today's economy. Without ECM, organizations are generally characterized by a sub-optimal ability to compete.

In the next few pages, we'll outline the areas most often impacted when ECM becomes part of the daily operation of Global 2000 organizations. Once you have invested the time to understand how ECM might help your business, you can assess the potential impact on your organization more accurately and specifically by using the ROI analysis points described in this paper.

CONTENTS

A Case for Enterprise Change Management..... 1

**The Measurable Impact of
Enterprise Change Management 2**

The Cost to Deploy Enterprise Change Management..... 3

A Framework for Measuring ROI..... 4

- Costs associated with deploying an ECM environment..... 4
- Benefits associated with deploying an ECM environment..... 5
- System analysts and designers..... 5
- Software developers and content developers 6
- System testers, production personnel and content editors..... 6
- Project managers, test managers,
production managers and general managers..... 7
- Users of effected business applications..... 7

The Case for Enterprise Change Management (ECM)

Protecting business assets, and leading change by deploying them into new markets or products, have been hallmarks of competitive, growth-oriented businesses for ages. Compared to just a decade ago, both the definition of business assets, and the pace of change required of market leaders, have been altered in unpredictable ways. Despite this unpredictability, we know that the breadth of business assets will continue to expand and the pace of change is not likely to slow anytime soon.

Just a few short years ago, when digital content and software were knit together to ignite the e-business revolution, the depth and breadth of digital assets exploded and the pace of change accelerated. This new reality has emerged almost without warning and left many organizations struggling to keep up.

This is particularly true when software, data, information, knowledge, and content become key assets in the competitive business landscape. At MERANT, we've been helping businesses protect and rapidly change their digital assets for decades. Our products and services give our customers the ability to lead change or adapt quickly to it.

In this white paper we will pass along some of our experience and help you estimate the benefit of implementing ECM as part of positioning your organization to compete and lead change. The returns for most of our customers have been tremendous. So don't be surprised if you find the same to be true for your business.

Unfortunately, recent experience with our worldwide client base indicates that many organizations remain ill equipped to deal with this new reality. The pace of change and the rapid expansion of the digital asset base are literally mind numbing. Most organizations are faced with a complex array of content and software that is spinning out of control.

Content is being rapidly populated into numerous intranet, extranet, and Internet presences that are meant to simplify sales, delivery, and service processes. As long as the information they contain is up to date, accurate, and easy to locate, their impact can be tremendously positive.

Meanwhile competitive and regulatory changes continue to bombard businesses in all industries. This requires software applications to change rapidly to reflect new business requirements.

Typically, the combination of these two forces leaves software developers, content developers, software testers, content editors, users, and production support teams with a complex array of bugs, fixes, enhancements, and releases that must be continuously monitored to maintain a stable, accurate production environment. Make no mistake; this is not an easy task. When left to manual, error prone processes, most organizations are too slow to respond to the pressure of change, much less lead it.

ECM is now a hallmark of organizations that are succeeding in today's economy. Without ECM, organizations are generally characterized by a sub-optimal ability to compete with those organizations that "get it." If you "get it," you know that to compete in today's environment a coordinated effort of people, efficient business processes, up-to-date software, and current information is required. That's what ECM is all about.

In the next few pages, we'll outline the areas most often effected when ECM becomes part of the daily operation of Global 2000 organizations. Once you have invested the

time to understand how ECM might help your business, you can assess the potential impact on your organization more accurately.

MERANT can further help you realize the potential of ECM with our products and services. You will also find them described at www.merant.com. If you'd like to speak to our professional sales and services staff, we're prepared to help you in any way we can, just take a look at the end of this white paper for phone numbers and locations worldwide.

The Measurable Impact of Enterprise Change Management

Enterprise Change Management (ECM) is the result of the convergence of software configuration management (SCM) and digital content management (CM). SCM tools automate the process of changing and deploying software applications. CM tools automate the process of changing and deploying content typically associated with e-business systems.

Together, these tools for process automation, communication, coordination and change management provide a return on investment (ROI) by:

- Streamlining software and content builds
- Shortening development and change cycles
- Increasing productivity for human resources throughout the organization that build and/or use software applications and their associated content
- Reducing errors in both software and content that impact virtually all sales, delivery, and customer service processes
- Speeding recovery to previous versions of software or content when errors are identified
- Improving system performance by directly impacting system availability

Depending on the initial status of the environment into which these systems are deployed, ECM can:

- Improve software and content developer productivity by 20% - 60%
- Improve the productivity of those associated with managing, testing, and deploying new software or content by 10 percent to 30 percent
- Shorten development and change cycles by 50 percent or more
- Reduce build times by up to 90 percent
- Reduce software and content errors by up to 90 percent

There are numerous additional benefits that accrue to organizations, benefits that are a bit more difficult to measure:

- Avoiding lost revenue opportunities due to lengthy development cycles, unsatisfied requirements, software/content errors in production environments and poor software quality
- Improved management and progress reporting regarding tasks performed by software development and content creation teams
- Improved communication and coordination with remote team members

- Leveraging existing investment in development and management tools
- Reusing existing code and reducing repetitive development efforts

As a result of all these benefits, organizations have enjoyed a 200 percent to 2000 percent ROI (on a present value basis discounted over three years) by deploying these systems. Or, from a different perspective, investments in these systems are typically recovered in the first year, with significant benefits accruing thereafter.

An example of some of the benefits that could be experienced by deploying an ECM environment for a team of 150 and expanding the team to 240 in two years is provided on the following page.

Following the example is a description of the MERANT ROI framework, which should help you understand the basis on which we have measured ROI.

These are representative benefits associated with deploying an ECM environment for a 150-person development group that grows to 240 people within two years:

Costs to Deploy Enterprise Change Management

	Year 1	Year 2	Year 3
Hardware Cost	\$64,000	\$22,000	\$2,000
Software Cost	\$505,665	\$418,350	\$205,200
Implementation Cost	\$2,938,797	\$1,369,246	\$80,000
Ongoing Support Cost	\$490,000	\$580,000	\$610,000
Total Cost	\$3,998,462	\$2,389,596	\$897,200

Benefits from Deploying Enterprise Change Management

	Year 1	Year 2	Year 3
Software Developers	\$5,400,000	\$8,667,000	\$9,273,690
Software Development Mgmt.	\$984,375	\$1,579,922	\$1,690,516
Software Testers	\$243,000	\$390,015	\$417,316
Software Test Management	\$157,500	\$252,788	\$270,483
Content Developers	\$756,000	\$1,617,840	\$1,731,089
Content Editors/Testers	\$81,000	\$173,340	\$185,474
Content Development Mgmt.	\$157,500	\$252,788	\$270,483
IT Systems Operations	\$58,500	\$87,633	\$93,767
IT Systems Operations Mgmt.	\$157,500	\$252,788	\$270,483
Non-IT System Users	\$5,115,789	\$8,210,842	\$8,785,601
Total Personnel Benefit	\$13,111,164	\$21,484,954	\$22,988,901
Additional Benefits	\$0	\$0	\$0
Total All Benefits	\$13,111,164	\$21,484,954	\$22,988,901

Analysis of Cost/Benefit – Return on Investment

Discount Rate	8%
3-Year Net Present Value	\$43,008,229
3-Year Net Present Value	
Return on Each \$1 Invested	\$7.29
3-Year Internal Rate of Return	106%
Payback Period	3.66 Months

Depending on a wide range of factors, your organization may experience lower or higher ROI benefits. If you would like MERANT to help you complete a more extensive review of your organization, and more accurately project the benefits you may experience, please contact us at one of our worldwide locations listed at the end of this document.

A Framework for Measuring ROI

Any method for measuring ROI balances the benefits of investment against the costs of those investments. Typically, investments must be made before benefits begin to accrue. The costs and benefits are then discounted over time. For example, the longer you wait to enjoy the benefits of an investment, the less they are worth today.

The discounted costs and benefits are then added together to determine the Net Present Value. Based on actual experience in deploying ECM systems, a dollar invested today can be expected to return from two to twenty dollars of discounted value over the next three years.

Costs associated with deploying an ECM environment

The costs associated with deploying an ECM environment can be categorized into hardware, software, implementation costs, and ongoing support costs.

Hardware costs, for example, are the costs associated with buying computers (servers and/or clients) to support users of the systems, installing or expanding private networks to give users access to the system, and perhaps creating the facilities to house the hardware.

Software costs are typically license fees and maintenance fees in the first year and maintenance fees thereafter.

Implementation costs are often a large portion, sometimes the largest portion, of the investment required for successful deployment of an ECM environment. These costs are associated with consulting, training, or additional hiring necessary to support the environment.

Implementation costs can involve developing customized software for your organization. In some cases, existing staff can absorb this cost. Another alternative is to hire new staff and/or consultants to handle this work.

Training is often overlooked and under-funded in many deployment efforts. These costs involve hiring trainers, setting up classrooms and taking people away from their current jobs to learn the new environment. MERANT’s customers and competitors often overlook the cost of taking people away from their current jobs. However, we

include calculations for these costs and many others to ensure greater accuracy in projecting returns on ECM investments.

Ongoing support costs are the costs associated with maintaining the environment and continuing to modify the software as your business evolves. Most of these costs are associated with establishing and maintaining operational and maintenance personnel. These costs are often associated with internal staff, but can be outsourced if desired.

Benefits associated with deploying an ECM environment

Although there are many components associated with measuring the benefits of deploying an ECM environment, increased productivity for many people in your organization will form the foundation. For this reason, we focus on the major roles that people play and how their productivity can be effected.

While you consider the impact that ECM may have on your organization, keep in mind that salary is only one component of human resource costs. There are also:

- Benefits that typically add 10 percent to 15 percent of the salary paid
- Cost of office space that typically adds 5 percent to 10 percent of salary paid
- Administrative overhead for accounting and management that typically add 5 percent to 10 percent of salary paid
- Annual depreciation of computer hardware, software and other equipment costs unique to code and content development positions

With these thoughts in mind, we provide a summary of the major roles associated with code and content development and how they can be effected.

Systems analysts and designers

Over the last 20 years, significant evidence has been collected that suggests that reducing requirements and design errors has a more significant impact on project costs and timeframes than uncovering errors at later project stages.

The cost of catching errors accelerates dramatically. Fixes in the requirements stage can cost half of what it costs to fix errors revealed in the design stage. Once development begins, the cost of repair doubles. As code or content product enters unit test, this cost doubles again.

In acceptance test, where users are typically first introduced to the code or content they requested, costs increase by two and a half times. At this point, the cost of correcting errors is ten times what it would have been if detected in the design phase and 25 to 50 times if detected in the requirements stage.¹

Requirement and specification documents are an important and necessary part of the development process, but these are seldom able to keep up with the fast rate of change found in today's software development processes. ECM systems can significantly improve the ability of developers and managers to respond to change after initial requirements have been gathered.

Clearly, the opportunity to properly record and track requirements for changes to code and content is critical to effective e-businesses.

¹ Boehm, B. and Papaccio, C. "Understanding and Controlling Software Costs," IEEE Transactions of Software Engineering, Oct. 1988.

SCM and CM tools have been able to reduce errors and improve productivity by moving entire organizations up to higher and higher layers of the Capability Maturity Model (CMM). It is not unusual for organizations that deploy these tools to move to CMM Level 3. MERANT provides a wide range of tools to help organizations migrate in very cost-effective ways to higher and higher levels of CMM.

In documented studies regarding CMM, organizations have experienced up to a 67 percent increase in productivity, with a median gain of 35 percent. These same studies show improved early detection of errors, reduction in time to market, and reduction in post-release defects that provide up to \$8.80 return for each dollar invested (\$5.0 median) in ECM technology and best practices.²

Alfred Pietransanta³ reports that most organizations experience about 9 defects in every 1000 lines of code. Those organizations that have above-average sophistication in their development management (i.e., those that have automated systems for tracking defects, requirements, etc.) can decrease the level of defects by as much as 30 percent.

Robert Grady⁴ reports that on average it takes about 6.3 developer hours to find and fix a defect. Users of a change management or defect tracking system report significant time-savings in the debugging process, knocking as much as 1.9 hours off the average fix time.

Software developers and content developers

Numerous research studies show that 15 percent to 20 percent of the day-to-day effort of software developers is spent dealing with configuration and change management activities on new development projects. On maintenance projects, this number increases to 25 percent to 40 percent.

Leading ECM tools, such as those (PVCS products) available from MERANT, reduce the time necessary to track, manage, and communicate these configuration and content management activities.

Further, some studies show that developers can spend up to 50 percent of their time completing tasks that don't produce code or content, but yet are required in order to track and report their activity. ECM tools have been shown to reduce the effort associated with these overhead tasks. In some cases this can produce as much as a 67 percent increase in code or content developer productivity as cited earlier.

Systems testers, production personnel and content editors

In addition to benefiting developers, the return on the investment for a version control system (just one component of an ECM environment) alone can be significant for systems testers, production personnel, and content editors.

Consider the development process problems that can be effected:

- Lost source code or content changes due to lack of coordination between developers
- Inability to recreate historic builds for maintenance work and defect resolution
- Quality assurance unable to test accurate and consistent builds
- Developers unable to isolate changes and versions from a product baseline

² Herbsle, J.; Carleton, A.; Rozum, J.; Siegel, J.; Zubrow, D. "Benefits of CMM-Based Software Process Improvement: Initial Results," Carnegie Mellon Software Engineering Institute, CMU/SEI-94-TR-013.

³ Piestasanta, Alfred M., "A Strategy for Software Process Improvement," Ninth Annual Pacific Northwest Software Quality Conference, Portland, Ore., Oct. 7-8, 1991.

⁴ Grady, Robert, "Practical Software Metrics for Project Management and Process Improvement," Englewood Cliffs, NJ, Prentice Hall Inc., 1992.

- Lack of visual differencing facility
- Lack of visual merge facility for developers to review changes prior to baseline modification
- Inability to reuse software/content components due to lack of a central source code/content repository

The ROI for version control systems increases with team size, and increases at an increasing rate as opposed to a linear increase. This is because the number of people each individual may need to communicate with in order to coordinate development increases exponentially. Thus a relatively modest improvement of 5 percent for a small team quickly grows to a 25 percent annual return for teams of 25 or more. For more information on the increasing cost of interactions in large-team development refer to the book *The Mythical Man-Month* by Frederick P. Brooks.

An additional feature that will increase ROI is automated workflow of enhancement and change requests. Automating workflow eliminates many meetings, allowing time for more productive work.

Project managers, test managers, production managers and general managers

Management tasks associated with assigning, tracking, and reporting activity in code and content development projects can be a significant overhead cost. ECM systems automate many of these management processes and have produced at much as a 60 percent increase in management productivity.

An important aspect of ECM is the ability to automate the workflow of development and change processes—change management at the organizational as well as file or asset level. This replaces many manual efforts that significantly impact managerial productivity. MERANT's PVCS Dimensions product, for example, is widely used as a platform for process automation and rule-based process monitoring.

Many development and change requests require the effort of several team members. Tracking the effort performed by the team members on a task basis permits management to get a clearer understanding of process bottlenecks. It also allows quick identification of these problem areas. Task management also permits developers to better plan and estimate their workload and leads to improve cost estimation for new features and defect resolution.

Responsibility for tasks can be assigned to individual team members allowing each to have a personal "to do" list for the project. Workflow of tasks allows team leaders to be automatically notified of task completion, code reviewers/testers to be informed of source code changes needing review, and team members responsible for dependent tasks to be informed that they can begin their work.

Users of effected business applications

Perhaps the groups that benefit the most are in the user community. Whether that is employees, customers, partners, or suppliers, accurate information and up-to-date systems available 24 hours a day, 7 days a week have become a normal expectation. When this type of environment is provided, a positive, high-quality reputation becomes a catalyst for others to join the community. This is a community that also enjoys increases in productivity similar to those that directly use ECM systems.

Unfortunately, this may be more difficult to measure than the other benefits listed above, but clearly more accurate information and software applications with full functionality and higher quality will improve the user experience and drive up productivity.

Typically, system availability is increased when ECM systems are deployed. Even small increases in system availability can significantly impact the productivity of those who depend on Application Systems to produce the work or product they are responsible for. Particularly in the case of higher paid knowledge workers, system availability is critical to overall productivity. As an example, think of what one day without email would mean in terms of productivity throughout your organization.



FOR MORE INFORMATION

MERANT is a leading provider of software solutions for enterprise change management and data connectivity. More than 5 million professionals use MERANT technology at 60,000 customer sites, including the entire Fortune 100 and the majority of the Global 500. Founded in 1976, MERANT has 1,500 employees and more than 500 technology partners.

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