
Best Practices in Collaborative Commerce

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"Supernatural" was Santana's 37th album. Thirty-seven (!), most of them great, some of them merely fabulous. To put it into perspective, the Beatles only released either 10 or 12 albums, depending on whether you count the two imports.

The Grammys that Santana won that night, after 32 years in the music industry, were his first ever. What happened? Did Carlos Santana suddenly get that much better? What made the difference between all those great records, and this one?

Here's what: Another genius, Clive Davis of Arista Records, had the vision to take Santana from merely great to Grammy winner by suggesting that Santana collaborate with some of the rising stars in pop music at the time, Wyclef Jean, Lauryn Hill (both of whom were veterans of the great and sadly missed Fugees), Rob Thomas, and with some graybeards like Eric Clapton. . . .

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The competitive necessity of collaboration is undisputed. Manufacturers outsource up to 80% of product design to their supplier network, and must be able to bring together their extended enterprise and design chain partners throughout the concept stage to optimize innovation, capitalize on tight market opportunities, eliminate design errors and associated risks and maximize profits.

At one end of the value chain, customer involvement in product development ensures that the product being developed meets or exceeds expectations. At the opposite end of the value chain, OEMs working closely with their supplier network ensures that the final product incorporates the optimal components and multiple dimensions of product knowledge from these suppliers, enabling companies to deliver compelling, market-dominating products within critical windows of opportunity. . . .

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Supernatural, and the Zen of Collaboration

By Andy Moore, Editorial Director, *KMWorld* Specialty Publishing Group

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Collaboration is the living example of the power of synergy. One plus one equals more than two. Clive Davis knew it. Carlos Santana learned it. And businesses are sensing the same influences as they shift from a cost- and efficiency-based model to an innovation and differentiation model. Santana made 37 great albums, but he's only made one *winning* album.

"Every customer we talk to is looking for a way to accelerate their innovation," says Chris Groves, president, CEO and founder of Centric Software. Centric focuses on the manufacturing space, where collaboration among internal teams is equally critical as collaboration across supplier networks. "The basis for competition (in manufacturing) is *variety tailored to taste*. Companies struggle to differentiate. It's a response to the fundamental movement among consumers around choice," Chris says.

And as always, it's a trade-off. At one extreme is the "new" public, whose expectations of personalized service and one-to-one marketing has reversed the uniform consumer expectation of the '50s ("I want one just like the Joneses") with a cult of the different ("I want one like the Joneses, except in Tawny Metallic, with the LL Bean option package and the 4.2 liter engine. Oh, and a CD player.")

Collaboration is what brings this to life. If the same old German guys kept designing cars, they'd all look like Wolfsburg Edition VWs forever. Not that there's anything

"Collaboration is the living example of the power of synergy. One plus one equals more than two."

wrong with that. It's just not in tune with the zeitgeist.

"One thing you have to remember," says Chris, "is that if you own a BMW, 70% of that car was made outside of BMW." And the *variety tailored to taste*, that Chris likes to talk about, stems from the collaboration.

But collaboration is easier spoken of than accomplished. Today's significant manufac-



Andy Moore

Andy Moore has often been a well-known presence in the emergence of new technologies, from independent telecommunications through networking and information management. Most recently, Moore has been pleased to witness first-hand

the decade's most significant business and organizational revolution: the drive to leverage organizational knowledge assets (documents, records, information and object repositories) and the expertise and skill of the organizations' knowledge workers in order to create true learning organizations. He can be reached at andymoore@adelphia.net and welcomes feedback and conversation.

turers and service providers are global in size, organizationally layered and functionally separated in so many ways that collaboration is nearly impossible to do in real space and time. That's where technology comes in:

"Every customer of ours has a war room," describes Chris. "This is a physical place where designers and marketers and engineers get together and go over plans and designs. Teams in charge of any project of importance, or any project in trouble, work here. There are drawings pinned to the walls, and so forth, and this is the place where meetings and reviews take place.

"More often than not there are teams in far-flung offices who should collaborate together, but it's difficult to fly them in, etc. SO guess what they do? They literally take down the walls, pack them up and ship them out to other offices for meetings!

"We create a virtual place for that room. It's still very much modeled after the way they already work, it's just a richer, software equivalent. Where there's usually a clay model of the car, in our room—we call them Innovation Centers—there are 3-D models."

Chris continues: "The key is that we don't enforce any new way of doing things. It's still a war room. You just don't have to go there."

The fundamental characteristics of these virtual spaces don't change much from one implementation to the next, but the mix of tools and support technologies used by the collaborators change often. "You can't expect groups from different organizations to standardize on a basic CAD program or a design template. You have to let people work the way they already work." In the "old days" a certain amount of political coercion from the IT department was commonplace. IT mandated what tools everyone would use.

But when 70% of the car is made by somebody else, there's no chance that standardization could survive.

If You Build It, Will They Come?

Just because you CAN create an environment where people can collaborate, it doesn't mean they will. Peter Auditore, VP of U.S. Marketing at Hummingbird, has logged thousands of air miles talking to customers about one thing: How can we make it easier to collaborate?

In Peter's worldview, innovation depends on collaboration. And collaboration depends on trust. "You have to create an environment, from management down, of trust. Trust that the individuals will make the right decisions ... most of the time anyway," he asserts.

"When you talk about collaboration and knowledge sharing, you're into the realm of industrial psychology. That's why collaboration is so difficult. People misunderstand that it's not a technology issue," Peter explains. And that's why, he says, so many so-called KM initiatives fail. "Unless there's a strong commitment to trust and a knowledge-sharing culture, it is probably going to fail."

I always find it sort of spooky how much of the buzz around collaboration and KM preoccupied with touchy-feely issues like "trust" and "empowerment" and "sharing cultures."

For example, just today, Microsoft announced its initiatives for next-gen Web Services.

"We call it 'TrustBridge,' announced Microsoft's director of Web Services, apparently with a straight face. He went on to explain that, thanks to this empowering technology, "basically two companies can trust each other ... one company can give access to resources to users in another company in a very simple way." The same news service even made it a point to note that Sun Microsystems is countering with a competing suite of products they plan to call "Liberty Alliance."

Trust? Liberty? Empowerment? What's going on here? If you didn't know better you'd think it was a Tuesday episode of *Oprah* with Dr. Phil.

Yet, it's true. It's not the first time that KM-connected issues have evoked such personal analogies as "empowerment," but collaboration, by its nature, begs the outer edges of the envelope. It "significantly transcends technology," asserts Peter (and I agree) and almost escapes it altogether.

Almost.

"You've got to have your house in order first. I've spoken to customers who want to 'do KM.' So I ask them if they even have decent federated search technology in place, or a content management system. It's amazing how few of them do. The analysts say that 50% of the world's businesses do not have even the most basic of document management. I say it's more like 75%."

Peter Auditore is most certainly NOT Dr. Phil, and lands back on planet Earth with a

thud when the subject of technological readiness comes up.

"You can do a Google search on me right now and come up with hundreds of hits, any of which can give you information about who I am, where I work, and so forth. And yet some guy could steal my identity and mess up my credit rating, and the credit reporting companies would never even figure it out. They don't use the technology that is available to them."

"The market is strewn with a myriad of products," he writes. "These enabling technologies include enterprise information portals, knowledge management, information retrieval and search, document/content management, collaborative computing, workflow/business process management and business intelligence."

This is not trivial stuff, and should allow us to be the "smartest" generation of humans to ever walk around on planet Earth. And yet, he points out, our own intelligence organizations couldn't prevent a known bad guy from obtaining a travel visa, leading to disastrous results last September. It could be, as he adds, that the KM and collaboration space is also "perhaps one of the most confusing and chaotic in the industry."

What's the answer? Simple teaching and learning from those who might know a little bit more. Even though innovation is a mercurial thing, hard to pinpoint and difficult to pass on, "there's no reason the younger people in an organization can't learn from the graybeards," Peter says. "There ARE best practices," he insists. And you need to leverage the knowledge of mentors. "Create a place where young people can come in to ask the stupid questions," he advises. "That's how you learn."

The Zen Part

Right now, I'm listening to an interview on our local "grassroots radio." The guest in the studio is Bill Payne, keyboardist extraordinaire of Little Feat (the greatest American rock and roll band, don't even bother to argue with me on this point).

"Creativity is like sneaking up on a glass of water," he says. I have no idea what that means, but if you stay with it for a while, it reveals a truth: That in many ways, a finished product is always there, waiting to be discov-

"KM significantly transcends technology, and almost escapes it altogether. Almost."

ered. The trick is, like Michelangelo argued, to reveal what's already there.... "I start with a block of marble and take away everything that's not supposed to be there."

In every organization is the potential to be great. Some fail to see what's right in front of them. Some fail to make it safe for members of the team to reach their potential. In a time when "careers" last maybe six years, tops, and the most intense leverage you can apply is inside your head, how do you encourage the environment of trust and the atmosphere of sharing that both Chris and Peter want to foster?

You do several things, as the essayists in this White Paper point out.

1. You make it worth their while. That can be with compensation. Or it can be with recognition. In the automobile design segment that Chris lives in, there are many times that an idea doesn't make it into a car. Does that make it a bad idea? Does that mean the designer shouldn't be encouraged to do it again?
2. You make it OK to goof. And if you do it right, they learn to trust you. There can be no trust if the people in your organization are punished if they make a mistake. In mistakes there is discovery and learning. Allow them to happen.
3. You trust them. If one in 10 of the ideas you have in a year works, and makes the company money, you're pretty happy, right? How come the people in your organization have to be right 100% of the time?

As Peter Drucker reminds us, the participation of knowledge workers in our organizations is basically voluntary. "They leave at 5 p.m., and we pray like hell they come back the next morning," he says.

Prayer? Sounds like Dr. Phil stuff to me. And maybe there's something to that after all. ■

Andy Moore is an editor by profession and temperament, having held senior editorial and publishing positions for more than two decades. As a publication editor, Moore most recently was editor-in-chief and co-publisher of *KMWorld* (formerly *ImagingWorld*) Magazine. Moore now acts as a contract editorial consultant and conference designer. As *KMWorld's* Specialty Publishing Editorial Director, Moore acts as chair for the current series of "Best Practices White Papers," overseeing editorial content, conducting market research and writing the opening essays for each of the white papers in the series. He can be reached at andymoores@adelphia.net and welcomes feedback and conversation.

Knowledge Management in the Millennium

By Peter J. Auditore, Vice President U.S. Marketing, Hummingbird USA

For many IT professionals, knowledge management, often referred to as KM, is perhaps one of the most confusing and challenging technologies to implement and derive a clear ROI from. Several years ago many KM projects were thought to be failures, and even today many C-level executives are reluctant to support KM initiatives. The primary reason for their failure was that KM transcends the world of technology into the realm of organizational development (OD) and industrial psychology—areas that IT professionals are not accustomed to dealing with and/or facilitating. However, they are paramount in any KM initiative and are woven into the fabric of many business processes. Aside from technology, the key issue of getting people to participate, collaborate and share information in KM projects, is still a significant challenge for many organizations.

One of the most commonly asked questions during IT/line of business manager and vendor meetings these days goes along these lines: “You guys do great document/knowledge management and collaboration, but how are you going to help me get all of these employees to join a community of interest/best practice, to collaborate and to share their secrets?” This indeed presents a significant dilemma to both IT and LOB managers, because you can’t just throw technology at people and expect them to change the way they work and use technology, suddenly participating in KM initiatives, which in many cases have no clear benefit to them.

In the early 1980s Tom Peters, author of *In Search of Excellence*, identified the seminal issue that impacts nearly all KM initiatives; he defined KM as 90% people, politics processes, and organizational culture. If your organization dictates a culture of non-information sharing (this usually emanates from the top), you will encounter significant barriers to implementing KM, especially collaboration. But what really is KM? Most industry pundits have done an excellent job of confusing the market, and envision elaborate KM systems that are in many ways science fiction. In fact, the real irony here is

that most of these analyst groups have not implemented a KM system themselves.

In an effort to understand what KM means to customers, I visited and interviewed more than 50 of our customers over the past year. What we discovered was quite simplistic and surprising: most customers think that if they have document management (DM) and information retrieval (IR) systems in place they are doing KM. They believe that they are indeed capturing their most significant organizational intellectual assets. In contrast, law firms appear to be on the bleeding edge of KM, as many mandated DM systems years ago and understand the value of these systems and how to leverage tacit and explicit information. They are now employing highly sophisticated KM systems for conducting collaborative e-Commerce, web crawlers to push information to portals and PDAs, and are deploying B2C portals to keep their clients up to date on their cases.

According to analysts, less than 50% of all organizations worldwide currently have an enterprise-wide information management, document, record management system. This is changing rapidly as organizations realize

how vital the management of business content—email, documents, records, policies, procedures and other digital assets—is to core business processes. Aside from law firms, one of the fastest KM growth sectors are state, federal and local government agencies, primarily because of the electronic information act. However, change was not rapid enough to prevent the INS service from sending out an approved visa for a terrorist who blew up the World Trade Center six months after the heinous mission was completed. Another key issue that is driving KM systems and B2E portals is the virtual workforce and the decentralized nature of most organizations. Delivering relevant information, whether it’s simply policies and procedures on how to run a retail outlet or instant access to HR information, is often vital to the virtual workforce.

Key Business Drivers for Knowledge Management in the Enterprise

- ◆ Transforming traditional business processes to e-Business.
- ◆ Empowering the virtual workforce.
- ◆ Increasing overall organizational competitiveness, and competitive intelligence.
- ◆ Increasing organizational and individual productivity by delivering relevant information anywhere, anytime and on any device.
- ◆ Facilitating collaboration, which leads to innovation of business processes, ultimately increasing organizational productivity and competitiveness.
- ◆ Customer relationship management—mandates that you look at all information about the customer, structured and unstructured.
- ◆ Communities of interest—brings people together with similar jobs and tasks.

Key KM Enabling Technologies

B2E Enterprise Information Portal	Provides a single point of access to all relevant information and applications, while also functioning as a gateway to communities of interest, best practice, etc. EIPs can also function as a platform for knowledge networks.
Federated Search	The ability to search across all organizational structured (databases) and unstructured (documents, records, emails, video & audio files, etc) information sources.
Taxonomy, Classification and Indexing of Information Sources	Indexing of information resources and establishment and/or automation of an information taxonomy for industry-specific or organizationally specific information.
Document/Information Management Systems	Organization and archiving of documents, emails, files, illustrations, policies, procedures, records, audio files, video files, etc.
Collaborative E-Commerce Application Environments and/or Workspaces	Enable organizations to easily create virtual project team rooms, and/or communities of best practice by allowing team members to collaboratively develop and store documents, tasks and schedules in a secure virtual environment.
Simultaneous Collaboration	Allow workgroups and project team members to share information in real-time.

- ◆ Best practices systems encourage business process excellence and innovation.
- ◆ Expert systems leverage thought leaders and expert experience throughout the organization.

We view KM as a suite of enabling technologies, with the foundation usually being a document, content or record management-centric enterprise information system that is seamlessly integrated with information retrieval technology.

Depicted in the graphic below are the five building blocks of KM, which in some



leading-edge organizations are viewed as the core components of an enterprise information management system (EIMS).

The emergence of the B2E enterprise portal market has injected new life into the KM market and stimulated tremendous interest in its core enabling technologies, which are depicted in the tables herein. B2E portals are a key enabling technology for enhancing the KM interface, while at the same time aggregating appropriate applications, content and information into a single, easy to use graphical user environment. The majority of B2E enterprise information portals being implemented today have an enterprise information systems' back end that provides the user with easy access to document, record and content management systems. Organizations should view B2E portals as evolving platforms with many components that will provide gateways into information sources relevant to business process, in addition to facilitating eLearning and eMentoring.

Taxonomy, classification and the indexing of information sources is still a bleeding-edge technology, and there are a number of new startup companies that are promising automation. However, most of these systems still require a significant degree of manual interaction on a regular basis. Once a taxonomy, or nomenclature, is established within an organization, it should be viewed as a living organism; some new technologies that have just entered the market will alert the

◆ **Business Process Management and Community of Interest Building** — Facilitates best practices and community of interest building by leveraging an EIP front end with threaded discussion groups and collaborative technologies through an EIP.

◆ **Intelligent Agents—Web crawlers, knowbots** — Enable relevant information derived from automated searching to be pushed to the desktop or added to a repository.

◆ **Network News & Threaded Discussion Groups** — One of the first technologies of the web to be employed as a KM system for sharing information on projects and topics. Can also serve as a key technology for facilitating e-mentoring.

◆ **Chat/Instant Messaging** — A technology that evolved from Internet Relay Chat, enables real-time person-to-person interaction.

◆ **Automated Community Building Software** — A new class of software that automatically builds communities of interest by profiling e-mail and documents.

◆ **Visualization Software for Information Systems** — A new class of software that provides a more intuitive and easier interface for navigating information systems including web sites; this new way of viewing information can significantly enhance information discovery and access.

◆ **Expert Systems** — Another new class of software that connects organizational experts with other members of the community by asking questions like "who knows about this?"

organization about new areas that need to be added to the system.

KM technologies that are of the most interest to many companies are expert systems, communities of interest and best practice. These technologies are often built into a B2E portal system enabling the organization to leverage tacit intellectual capital across the enterprise. An expert system is just what it sounds like, a live information source, and/or database that quickly enables the user to identify and easily interact with the thought leaders and experts in particular areas.

Communities of interest and best practice are vital components of advanced KM systems that allow employees to share their work experience with others—and in the best of all worlds share on the job secrets, and how they generally get their jobs done. These advanced KM components are much more difficult to deploy and require active participation of the

community along with a leader or manager who oversees the interaction. When most successful, they are applied to a specific business process and the experience in building and maintaining them is leveraged in other business units. In the best of all worlds these systems can increase overall business unit and individual productivity and lead to business innovation. Innovation can significantly improve productivity and increase competitive advantage.

These systems are complex and can include a variety of enabling technologies including B2E portals, collaborative environments, structured databases, instant messaging, sophisticated search algorithms for



finding and profiling experts and thought leaders and threaded discussion groups.

In summary, knowledge management is back in vogue and the return on investment is clearer than ever. The preceding graphic depicts a KM value chain, where information is organized and managed, accessed, discovered and explored to facilitate action and collaboration. At the heart of any successful KM system, however, is an enterprise information management system, which delivers on this vision by encompassing a wide array of enabling technologies that can securely and effectively deliver vital information to anyone, anytime, anywhere, and on any device. These enabling technologies include enterprise information portals, knowledge management, information retrieval and search, document/content management, collaborative computing, workflow/business process management and business intelligence. The market, however, is strewn with a myriad of products and is perhaps one of the most confusing and chaotic in the industry. ■

Hummingbird Enterprise delivers on its mission by providing a business-critical suite of EIMS components enabling organizations to provide employees, partners, customers and suppliers with the ability to easily access, find, analyze, manage, and collaborate on enterprise content across a wide variety of formats, languages, and platforms. Before you build the portal or KM system to nowhere, where nobody can find anything, have an EIMS system in place and deliver on the promise of KM.

Accelerating Innovation

By Chris Groves, President & Chief Executive Officer, Centric Software, Inc.

The competitive necessity of collaboration is undisputed. Manufacturers outsource up to 80% of product design to their supplier network, and must be able to bring together their extended enterprise and design chain partners throughout the concept stage to optimize innovation, capitalize on tight market opportunities, eliminate design errors and associated risks, and maximize profits.

At one end of the value chain, customer involvement in product development ensures that the product being developed meets or exceeds expectations. At the opposite end of the value chain, OEMs working closely with their supplier network ensures that the final product incorporates the optimal components and multiple dimensions of product knowledge from these suppliers, enabling companies to deliver compelling, market-dominating products within critical windows of opportunity.

Levels of Innovation

Manufacturers and their supplier networks are under pressure to optimize their product innovation while balancing their portfolio between three levels of innovation. Research indicates that market dominance requires the right mix of three innovation levels:

- ◆ Linear Innovation—enhancements and additions to current product lines, 20%
- ◆ Customer-driven Innovation—custom-configured products to customer specifications, 30%
- ◆ Radical Innovation—enables manufacturers to continually break new ground, create paradigm-shifting new breakthrough products and expand into new market segments, 50%

Innovation Management

The Volvo Monitoring and Concept Center—challenged with fusing ideas and capabilities of a geographically dispersed team and quickly converting concepts into products by bringing clarity into the innovation process—sought a collaborative product innovation management solution to maximize number of programs-to-market, reduce “entry ticket” and shorten cycle time by 50%. Centric Inno-

vation enabled Volvo to achieve its goal of optimizing consensus-building and decision-making and therefore being able to focus more time on the actual innovation process by bringing together diversified teams from many time zones, thereby synthesizing more possibilities.

The Innovation Center features three levels—executive portfolio management, project management, and end-user collaboration. Team members can work with design-chain partners to brainstorm, define, and validate product possibilities, review concepts, and ultimately present new product concepts to executives for go-to-market decisions. Project managers can track and monitor activities and deliverables, and executives can manage their product development portfolio. This environment parallels the physical world of war rooms and project rooms and facilitates the creation of more unique and innovative product possibilities, which are then defined, explored and ultimately validated. This enables manufacturers and their supplier network to increase new product successes by 200 percent through harvesting, testing, and converting more “raw” ideas into market-dominating products, ensuring the development of more innovative products within critical windows of opportunity.



Innovation Center - Monitor Projects, Manage Portfolio, and Maximize Radical Innovation.

Design-to-Order

Another industry leader that emphasizes customer input is Square D, the North American flagship brand for Schneider Electric.



Chris Groves,
President & CEO

Chris Groves joined Centric Software, Inc. in May 1997 as President and Chief Executive Officer. Before coming to Centric Software, Groves was Vice President and General Manager of Computervision's Workgroup Products business unit in Boston from 1991 to 1996 where he drove the

growth of the company's market-leading product data management software, including 3D assembly and visualization tools. The business unit served customers in the aerospace, automotive, and manufacturing industries.

Chris Groves also held executive positions within Computervision's marketing, operations and indirect sales organizations. Previously, he held various executive engineering and management roles at cellular pioneer Novatel Communications from 1984 to 1991, including Senior Vice President of Product Development and Vice President of Manufacturing. Chris began his career as a research and development manager at Mitel Semiconductor from 1978 to 1984. He received a BS in Engineering Physics from the University of Toronto and is a graduate of the Executive PDM Program at Harvard Business School.

Square D required a solution that would increase the company's overall growth rate by optimizing its custom-order engineering process. Their deployment of Centric Innovation Design-to-Order enabled them to significantly accelerate customized product output and reduce associated costs, while enhancing customer responsiveness and increasing satisfaction.

Square D is now able to work together with its customers during the development process and collaboratively validate product functionality in the Centric Innovation 3D project environment. This enables manufacturers to maximize end-product innovation.

Through this solution, Square D increases efficiency by drastically accelerating order fulfillment time from approximately eight weeks to a few days while achieving an increase in volume business by 20% to 30%. Other manufacturers are able to cut response time for custom-configured products by at least 50% through rapid development and validation of a Concept BOM (cBOM). D2O adds velocity to the product delivery process by organizing the extended team around a total product objective, quickly identifying customer needs, mapping to possible alternatives, leveraging corporate assets, and digitally validating product functionality throughout development. It enables customers to see these results more quickly and participate in the product's development, assuring customer ac-

What Customers Say About Centric Software

Volvo Monitoring and Concept Center

"At Volvo, we were faced with the challenge of assessing ideas from geographically dispersed teams in order to quickly turn a multitude of concepts into products.

Centric Innovation provided the Volvo Monitoring and Concept Center with a unique 3D, digital, collaborative project environment in which teams could meet and review concepts in the context of new product programs, and present these to executives for go-to-market decisions.

This streamlined our processes, and increased our capacity. With Innovation Management, Volvo Monitoring and Concept Center can significantly decrease concept cycle time, allowing for more focus on the upstream innovation process."

—*Benny Sommerfeld, Concept Business Manager*

Square D Engineering

"At Square D, we are committed to continually enriching the customer experience and ensuring that their needs are not only met, but exceeded. This is particularly important for our customized, designed-to-order business, which requires significant hands-on engineering involvement. Through our implementation of Centric Innovation, we incorporate the customer into the development process—increasing product value as the 'voice of the customer' is heard from the project's outset, and concepts are digitally validated throughout development. This increased efficiency enables our team to drastically decrease order fulfillment time from as much as eight weeks to a few days, and therefore increase volume of business achieved by 20 to 30%."

—*Dave Guidette, VP of Engineering*

Siemens TS HR

"Our cooperation with Centric Software will further our innovation potential by drastically accelerating development cycles, guaranteeing Siemens TS an enormous competitive advantage in today's race to cut time to market and increase market share."

—*Wilhelm Waidmann, Head of Product Management*



Design-to-Order - Maximize Customer-Driven Innovation and Cut Response Time to Custom-configured Products by 50% through Rapid Development and Validation of a Concept BOM (cBOM)

ceptance by developing products that meet or exceed their requirements.

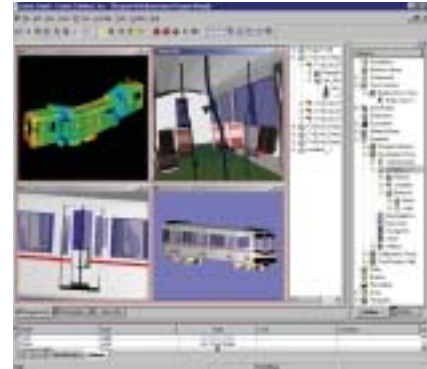
Functional Prototyping

Siemens Transportation Systems sought a collaborative product innovation solution to enable its team to identify design errors during the ideation phase, thus offsetting the need to construct expensive physical prototypes. The result: maximization of innovation potential and an economization of the process.

Leveraging Centric Innovation Functional Prototyping, Siemens digitally validates new concepts and the total product functionality of complete train systems to quickly correct any possible errors—dramatically decreasing development time and costs, as well as optimizing innovation. Functional Prototyping enables Siemens to perform hundreds of "what if" scenarios and takes digital mock-up to a new level—beyond simple form and fit of geometry—providing true insights as to the product's intended function through synthesizing behaviors and product structure. Additionally, it is the first solution to integrate every aspect of mechanical, electro-mechanical and electronics—"mechatronics"—processes so that multi-disciplinary teams can collaboratively validate product performance throughout development and identify optimal product decisions. Functional Prototyping maximizes innovation and enables rapid partnering and solution development across the marketplace.

Through complete system-level digital simulation, manufacturers are able to reduce physical prototypes by 50% and eliminate errors. By identifying and eliminating design conflicts early in the concept phase, time to market accelerates, and costs are reduced. The solution includes the industry's most advanced technology to connect distributed data located in proprietary sources, and roll this data up into a master product definition. This also enables the re-use of content alternatives in multiple scenarios. The master model can be "zoned"

and partitioned to key team members; unique data probes synchronize distributed development. For the first time, rigid and flexible body analysis can be brought together in a single environment for complete validation.



Functional Prototyping - Maximize Competitive Advantage through Early Validation of Optimal Product Concepts, Reduce Physical Prototypes by 50% through Complete System-level Simulation, and Eliminate Errors

ROI—Return on Innovation

Centric Innovation provides manufacturers many tangible and intangible benefits. These can be measured by looking at the return on investment, or an even better measure would be the "Return On Innovation." The benefits of Centric Innovation are staggering:

- ◆ Bring 200% more successful products to market by leveraging more new product ideas.
- ◆ Maximize customer-driven innovation through rapid response and validation of custom-configured products and increase business volume by 50%.
- ◆ Maximize competitive advantage through early validation of optimal product concepts, reduce physical prototyping costs by 50%, and eliminate errors.
- ◆ Reduce product development cycles by up to 50 % through optimizing supplier network activities. ■

Centric Software, Inc. accelerates innovation by empowering manufacturers to maximize the collective competencies of their extended enterprise and supplier network to deliver compelling, market-dominating products within critical windows of opportunity. Its flagship product, Centric Innovation™, integrates all disparate business and technical information into a single unified environment—the "Innovation Center." Centric Software's Collaborative Product Innovation (CPI) software solutions—Innovation Management, Design-to-Order and Functional Prototyping—enable manufacturers to optimize all three levels of innovation—linear, customer-driven and radical innovation.

Centric Software is headquartered in San Jose, Calif., and provides sales and support services to its customers through its offices worldwide. For additional information, please visit the Web site at www.centricsoftware.com/km

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