

R.R. Donnelley & Sons Company Graphics Management Division

Gold Award, North America, 2001

OVERVIEW

In 1998 the R.R. Donnelley & Sons Company, a leading North American printer, communications services, and logistics company, realized that one of their divisions was facing a growth challenge. R.R. Donnelley's educational book publishing customers were requesting the Graphics Management division to produce custom educational projects with greater complexity than projects produced in previous years. These requests for custom work were causing the division to experience a challenge in managing their expanded workload.

As a result of this change in the market, the Graphics Management division conducted a time-based study to assess their current business practices. They reviewed the process by which they were designing and producing educational and marketing kits, as well as their services that included research and analysis, structural design of kits and packages, prototype development; manufacturing, procurement; project quality and supply chain management.

The analysis showed that increasingly complex projects were creating significant amounts of non-value-added work for key personnel—limiting both present and future capacity for Graphics Management. As a result, R.R. Donnelley decided to invest in developing PRISM, a web-based project management system to support the Graphics Management team.

Graphics Management's Challenge

Graphics Management's business with its customers was becoming increasingly complex. The division needed to produce custom projects that were complicated to develop and that included multiple components. The K-12 (kindergarten through 12th grade) educational curriculum content had moved from simple book offerings to content packages that included multiple forms of media.

For example, the number of components per project for elementary and secondary education curriculums has increased from primarily textbooks to multiple media projects, including CDs and Internet technology, and interactive learning tools like games and puppets. Five years ago, components per project averaged to two to five pieces, and recently projects contain up to 24 components.

During the production process of a project, Graphics Management work together with customers and suppliers, After Graphics Man-

agement receives a project from a customer, the division bids out components of the project to suppliers. From the beginning of the bidding process to the completion of a project, Graphics Management continually needs to collaborate and negotiate with suppliers, while meeting the commitments that revolve around deadlines, deliverables, prices and etc. With the advent of multiple component projects, this process was becoming complicated and harder for Graphics Management to manage.

One reason Graphics Management was having trouble managing the production process was that the major contributors to projects, the suppliers, were outside of R.R. Donnelley's control. Suppliers adhered to their own business processes that were different from Graphics Management's. Since the division had a commitment to their customers for producing the final project, the division was ultimately responsible for the suppliers to complete the components. Graphics Management was unable to easily collaborate and manage commitments made with suppliers, and this became even more critical, especially if unanticipated changes or problems occurred.

For instance, when a customer requested a modification of a book cover's design, Graphics Management needed to renegotiate with a supplier. The current system was time-consuming, paper intensive and cumbersome for the project management team and prevented responding to this type of change order effectively and easily. The increase in complex, multiple component projects magnified the pain of unanticipated changes.

It became clear that R.R. Donnelley needed a way to stay flexible with its suppliers, and at the same time manage and track changes in deliverables. The division's goal was to synchronize business processes with customers and suppliers that were outside of R.R. Donnelley corporate boundaries, and outside of its direct control.

Graphics Management Solution

In order to meet the new demands of customized multiple component projects, it became crucial for R.R. Donnelley to adopt an innovative business process system that would enable internal staff to collaborate and track commitments and changes, as well as negotiate with customers and suppliers. PRISM was R.R. Donnelley's solution.

Utilizing ActionWorks® Metro, PRISM provides R.R. Donnelley the power to involve suppliers and customers in collaborative commerce.¹ As defined in this case study and utilized by R.R. Donnelley, collaborative commerce occurs when customers, suppliers and partners create a unified business process or project that enables participants from across corporate boundaries to design, develop and deliver new products or services uniquely tailored to customer

¹ ActionWorks® is a registered trademark of Action Technologies, Inc.

needs. Collaborative commerce embraces the web's capacity for rich interaction, allowing participants to collaborate, negotiate, and manage commitments. In addition, PRISM is web-based; participants can exchange information and provide updates online. ActionWorks Metro provides the solution for Graphics Management to manage complex projects and successfully meet their commitments to customers.

KEY MOTIVATORS BEHIND INSTALLING PRISM

Internal Factors that Necessitated a Solution

When launching a packaging or kit project, an Account Management Specialist (AMS) at Graphics Management works with the customer to define the scope of the project and the manufacturing specifications for each of the project's components. The AMS is a project manager and serves as the coordinator for both the customer and the supplier.

Upon customer approval of a project's scope and specifications, the AMS begins a bidding process to obtain quotes from a selection of suppliers for each of the project's components. Throughout this bidding process the AMS receives bid information for project components from multiple suppliers and, based upon those bids, quotes a price for the entire project to the customer.

Upon approval of the quotes, the AMS manages the manufacturing and fulfillment processes to create the complete kit. These processes have become much more complex as the number of components for each project has grown. In addition, Graphics Management is ISO certified.² The certification requires Graphics Management to obtain bids from at least three suppliers for each component quote. Obtaining three quotes per component added yet another layer of complexity to the entire process.

As customers approached Graphics Management to produce these multi-component kits, it became more time consuming for the AMS team to present customers with timely and complete pricing information because that information was dependent on getting bids from suppliers quickly and accurately. The greater complexity of each job also increased the AMS team's need to coordinate with a larger pool of suppliers for the fulfillment of each job. As a result, the AMS staff was spending a lot of non-value-added time manually assembling job quotes for their customers and tracking their communications with suppliers. Fast becoming buried in administrative

² ISO, (The International Organization for Standardization), is a non-governmental organization established in 1947. The mission of ISO is to promote the development of standardization and related activities in the world with a view to facilitating the international exchange of goods and services, and to developing cooperation in the spheres of intellectual, scientific, technological and economic activity, [http://www.iso.ch/infoe/intro.htm#What is ISO](http://www.iso.ch/infoe/intro.htm#What%20is%20ISO).

tasks, revenue per AMS was a critical issue, and could possibility impact plans for business growth.

The time-based study detailed how this complexity was impacting the AMS staff's day-to-day activities and what could be done to assist them. The study revealed that the staff was spending increasing amounts of time on limited value-added administrative tasks such as phoning and faxing project information to suppliers and customers. At that time Graphics Management had clearly outgrown its existing Windows-based quoting system. To obtain better leverage of their AMS staff, it was clear that they needed a more comprehensive and efficient way to coordinate work.

With a new system Graphics Management hoped to improve:

- Managing the bidding process with suppliers
- Collaborating with suppliers
- Supplying customers accurate quotes
- Meeting commitments
- Efficiency of administrative tasks
- Accuracy and accessibility of historical information

BUSINESS INNOVATION

Jim Schultz, Graphics Management's Division Director, recognized that the increase in administrative time was a hindrance to the division's growth. He decided that the division needed to develop an infrastructure that would automate processes, to increase productivity and drive business growth.

Schultz believed the challenge for R.R. Donnelley was to automate the collaborative business process between customers, Graphics Management and suppliers. Equally important was the need to accurately capture information in a data repository, making it available to the entire workgroup and supply chain. Additionally, they needed a system to track the status of work, such as the commitments made by each supplier. Such a system would provide better leverage of their AMS team, improving productivity, and allowing the current AMS team to handle additional clients within the existing structure.

The infrastructure Graphics Management conceived resulted in the development of PRISM, an application that would provide Graphics Management with a web-enabled process system. The ultimate objectives of PRISM were to create e-business relationships with customers and suppliers, so as to improve the business process of the entire supply chain: the publisher, Graphics Management AMS teams and the certified supplier base. In addition, the data repository would allow project-by-project review and feedback to all the participants.

The Role of the ActionWorks Business Interaction Model

PRISM provides users the ability to track and complete their projects in order to fulfill associated commitments. In PRISM, making and managing commitments requires a structure to ensure “customer/performer” agreement and the flexibility to negotiate and change agreements. This customer/performer agreement simply states that the person making a request takes on the role of customer while the person(s) doing the work takes the role of performer. It is only the customer role that decides and accepts work as being complete. Satisfaction with the work done is evaluated against explicit conditions.

As stated, this feature allows Graphics Management to effectively respond to unanticipated changes. PRISM utilizes ActionWorks Metro's ability to ensure a closed-loop business interaction—where commitments are met and chaos is transformed into a smooth running business process.³ PRISM utilizes Metro's flexible structures that are necessary to negotiate and modify complex agreements.

The means for achieving the closed-loop interaction is derived from ActionWorks Business Interaction Model. The Model has a theoretical basis described in the book, *Understanding Computers and Cognition*, written by Terry Winograd and Fernando Flores.⁴ Based on this work, Action Technologies has received seven patents for Human Communication and Business Process Management. The basic concepts of the Model, (as depicted in Figure 1), are the following:

1. A strong definition of roles. Every agreement clearly defines who is the customer and who is the performer.
2. The Business Interaction Model maintains the context of all business interactions necessary to achieve the satisfaction of customer requests. This defines what actions come next and who does them.
3. Conditions of satisfaction are explicitly specified so that interactions are focused on completely satisfying the customer.

³ The term "closed-loop" in this case study is defined by the **customer** starting a loop of business interactions that become closed when the **customer** declares satisfaction.

⁴ Terry Winograd and Fernando Flores, *Understanding Computers and Cognition: A New Foundation for Design*, Ninth printing, Addison-Wesley Publishing Company, 1994.

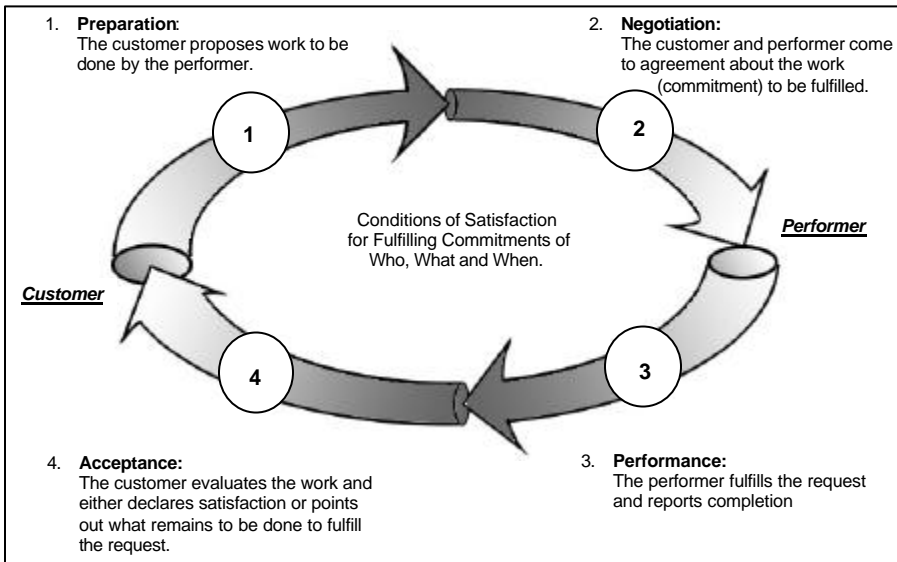


Figure 1 Source: Action Technologies

Utilizing Metro, PRISM manages the collaborative interactions required for Graphic Management to facilitate internal and external business processes. For example, after an AMS accepts a bid from a supplier to produce a component, a commitment is negotiated between the AMS (the *customer*) and the supplier (*performer*) for the supplier to provide the component (the *what*) by an agreed due date (the *when*). PRISM is able to support modifications from the supplier, such as changing the due dates and design modifications, and having kit additions and alterations, etc.

TECHNOLOGICAL INNOVATION

David Oberst, Graphics Management's IT Manager, served as the key project leader and was the principle IT advocate for PRISM. He formed a cross-functional IT team with internal representation from Operations, Finance, Sales, Quality, and Design. His team chose to work with The Revere Group, an e-business consulting firm, to manage the technical project.

The initial vision for PRISM was to create an application sitting on a data repository that would allow suppliers and Graphics Management's employees to view, among other things, project information, reports and order status.

Development of PRISM

During the prototyping stage of PRISM, Oberst's team realized that they needed to integrate three traditionally separate technologies: a project information database, a business process database and R.R. Donnelley's financial system. This integration was accomplished by completing a thorough operation process map. Using ActionWorks

Metro Process Builder Developer Edition, the team mapped out Graphics Management's procedures from selling a project to the point when purchase orders are issued to suppliers.

The development team used the detailed process map to identify key areas of potential productivity gain. Next, they identified the appropriate technology for each process step that would help attain the desired productivity benefit. Third, they completed a 3-month RAD design. The database was designed first. Then, the storyboard or general business process flow was designed in collaborative sessions with the business users. Finally, the business logic was designed.

During the development process it became apparent that keeping the data (such as reporting, work order, purchase order forms) updated and making it accessible online was integral to making the application not only accurate, but a vital reporting mechanism as well. The database needed to be linked directly to Graphics Management's operational processes. The development team understood that the repository would only be as good as the ability to automatically update it.

This was an important factor in the development team's decision to use Metro. One of Metro's features is the software's ability to link data to the organization's business processes. The fact that PRISM would collect business process data and information data would be essential for R.R. Donnelley's business growth. To automate the collaboration between customers, Graphics Management and suppliers, the development team therefore created dynamic and personalized interfaces for each person's role on the team. This was accomplished by combining the collaboration-driven business process management of ActionWorks Metro with customized web interfaces.

Metro enabled R.R. Donnelley to create a flexible, web-based system that automated many functions previously requiring paper, phone or fax. And, because the application captures relevant data at each interaction point in a process, dynamic reporting allows them to analyze and improve their processes. Metro also enabled users to manage commitments, collaborate and negotiate over the Internet.

To capture information correctly, and make it available to the entire workgroup and supply chain in a productive manner, Graphics Management created more than 40 standardized information capture templates, (e.g. Books, CDs, tabs, corrugate, etc.) The AMS team uses the templates to build a Bill of Materials based project structure and specifications. As a result Graphics Management has experienced benefits such as better quoting capability and reduction in errors.

The developers used ActionWorks Metro Process Builder to create the templates. Two examples of forms are below.

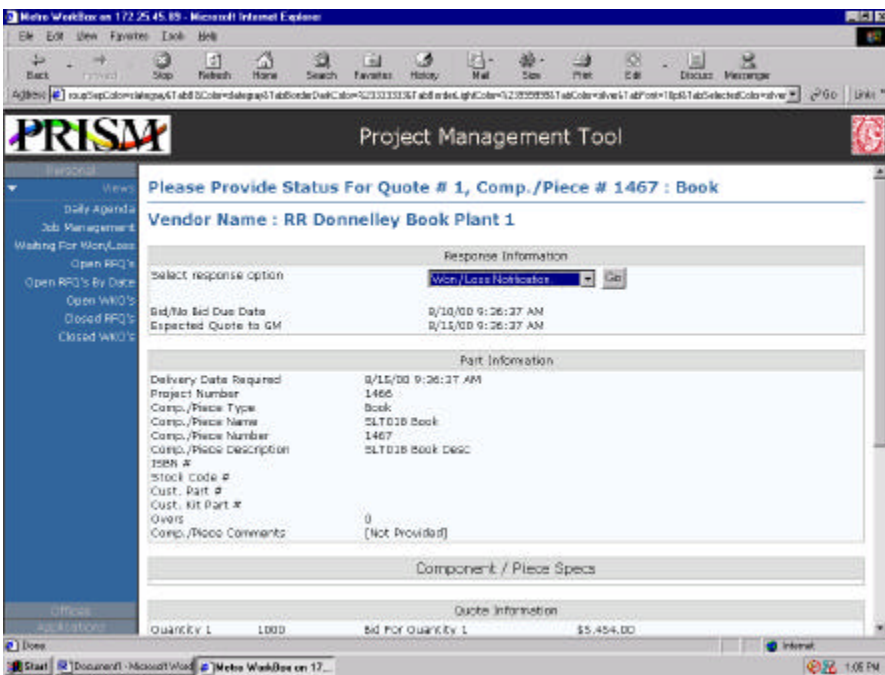


Image 1: Main Customer Reply Form

The Customer Reply Form is an example of a user-friendly form.

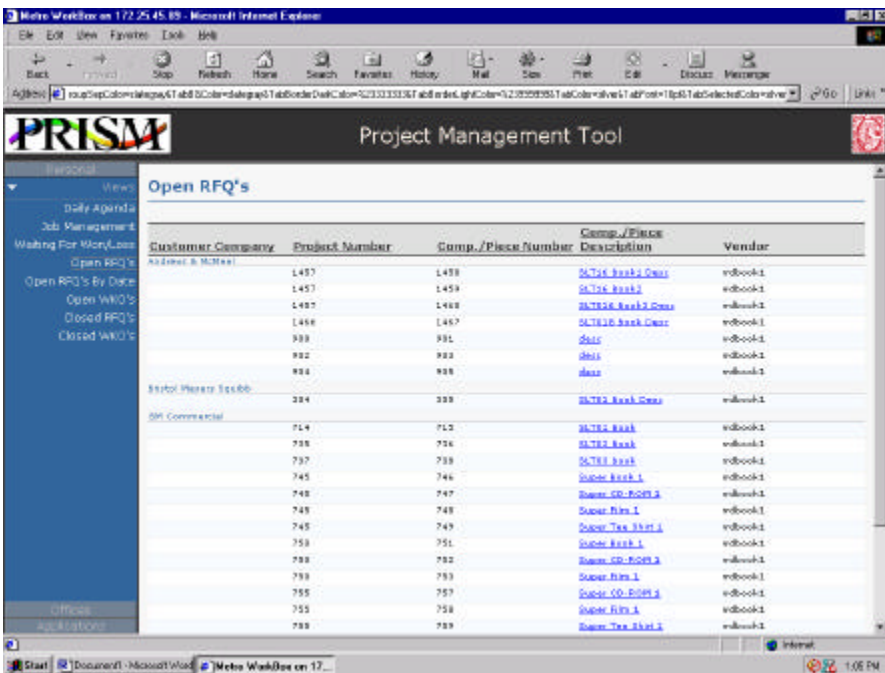


Image 2: Custom View Form

The Custom View Form allows users to customize views. In the form below, the user has chosen to view Open RFQ's. Users can sort

views based on projects. They can choose to view a particular project by clicking on the project name. When clicking on a project's name, a work order page opens. The user can see the stage of all processes in a project.

For the developer, ActionWorks Metro also simplifies future changes and enhancements of PRISM, as it did for initial application design. ActionWorks Metro is engineered to maintain the business process integrity of an application by the use of intelligent versioning. Developers do not have to manually review tedious lines of code looking for potential breakdowns when planning a change. Instead, when a change is implemented the ActionWorks Metro software remembers what version any current work was started under and will intelligently complete the open work using the appropriate application version.

Mike Mudry, the lead Graphics Management PRISM Developer, commented on the ease of use of Metro, "You do not have to be a hard-core programmer to work in ActionWorks Metro Process Builder to create the forms & the functionality that is required. You just need a little bit of programming knowledge to make your application work. With this knowledge you can personalize and customize forms and make them user-friendlier. The ActionWorks Metro forms are out-of-the-box and are very straightforward. All of these features save me time."

Technical Benefits to Organization

One of Graphics Management's goals was to build an application that would support internal and external users. Therefore, PRISM supports customers and suppliers plus multiple internal departments including design, account project management, finance, sales and quality management. The application's online tracking of all interactions regarding the publisher's production—from kit design and specs, to request for quotes, to inventory of components, to production status—delivers optimal inventory management, online access to ISO certified suppliers, and reduced administrative time and cost.

The application is 100 percent Internet-based, and allows for efficient managing of data and rich interactions between parties. Users access PRISM through a secure website, which requires a User ID and password for access. Internal and external users are actively managed and can interact together in a singular system. Users are not able to add themselves to the system without approval. Graphics Management's Supply Chain Manager must certify suppliers before they are added to the PRISM system. The user interacts with the system via a web browser and the Internet or R.R. Donnelley's Intranet.

Instead of a cumbersome stand-alone system, dependent on manual input, Graphics Management now has a web-based quoting, tracking, and production status Project Management system.

Given R.R. Donnelley's business and technical requirements, the company benefited from choosing ActionWorks Metro because it offers:

- Web-based interface allows access by multiple value chain companies
- An attractive ROI (return on investment)
- Management of uncertainty in the production process
- Complete Microsoft platform
- Quick Implementation
- Scaling capability to handle current as well as future needs
- Easy maintenance of the process components by the development team

SYSTEM USERS AND WHAT THEIR JOBS NOW ENTAIL

The AMS as a User

The AMS staff is now empowered to successfully manage relationships with customers and suppliers via the Internet. These service professionals communicate and negotiate with both parties, often frequently and throughout the day. They no longer have to rely on mental Rolodexes, (paper files and perfect memories). AMS teams have information at their fingertips and can quickly search the online data needed to build accurate quotes, enabling them to make agreements and meet commitments with customers. All AMS members are equally equipped to access PRISM's database and find the information that is required to supply quotes to customers.

PRISM allows AMS staff to take advantage of many features of Metro. One such component of the software is the ability to monitor the status of projects. Through status monitoring, an AMS has the means to immediately know when a component is delayed.

Because all work is now web-based, AMS team members can work at remote locations including the customers' offices, suppliers' offices and at home. Thus PRISM has allowed Graphics Management to create a collaborative commerce application that: (a) improves the efficiency of getting bids from suppliers, (b) creates quotes for customers, and (c) enables interaction among AMS geographically distributed team members.

The Supplier as a User

The ease of using the online template empowers suppliers to proactively bid for Graphics Management jobs. One instrumental feature Metro provides is the ability for suppliers to view a 3D image of structural components. Since suppliers have Internet access of the

image, they are able to provide a more accurate quote and submit their bid more quickly.

Another feature of Metro is the ability to perform live calculations. While suppliers are entering the bids online, PRISM will check their quotes against the form for accuracy. This results in greater accuracy in the bid to Graphics Management, and subsequently Graphic Management's quotes to customers are more accurate.

With each bid a supplier submits, the AMS team lets the supplier know if they won or lost the bid. The suppliers that were not selected are given feedback about why they were not chosen. The feedback helps the suppliers adjust future bids to try to win business from R.R. Donnelley. The feedback loop has resulted in bids that are more accurate for R.R. Donnelley. While at the same time, suppliers have recognized additional benefits. Suppliers are already reporting that they too are experiencing noticeable productivity gains within their organizations and improved accuracy of initial quotes as well. The intention of R.R. Donnelley is to have PRISM enable a 15 to 20 percent productivity improvement across the supply chain by reducing administrative tasks.

The Customer as a User

Customers also use the system to keep updated. Customers have the ability to go online and see where their product is in the production process. PRISM also allows customers check inventory. As the suppliers post inventory to Graphics Management, Graphics Management verifies and consolidates the information and posts it to the customer.

Process Steps for All Three Users

PRISM has changed the way in which projects are managed at Graphics Management. Below is an outline of the process steps that are now taken to complete a client project:

1. **Project Orientation:** An AMS enters a project into PRISM. At this point there is an option to search for past project information. Throughout the entire life of a project an AMS only has to enter data once. When a user chooses to generate a form, the data is automatically inserted into the form—saving the user time.
2. **Bill of Material:** Next, the AMS conducts work according to a Bill of Material—an internal work-order form that includes specifications for each component of a project. Previously, a Bill of Material was paper-based, and kept by the AMS working on a particular project. It was difficult for the AMS to keep track of the specs of each component. In addition, it was time consuming to look through historical Bills of Material to help provide a quote. Now, a Bill of Material is electronic. If an AMS wants to work on a component such as a hardcover book project, the component and supporting data can be easily accessed online.

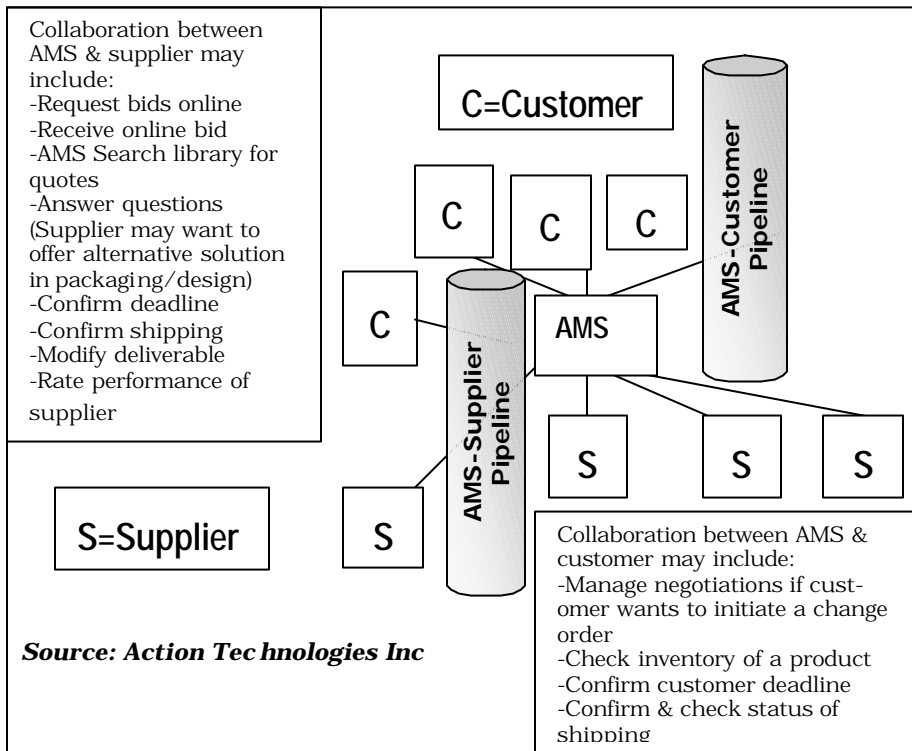
Accessing a Bill of Material online allows the AMS team to be proactive in production planning. If a supplier has to modify a commitment, the negotiation seamlessly takes place online with the AMS team. Eliminating uncertainty and resetting expectations and commitments is a key benefit of the Metro system.

3. **Supplier RFQ:** In PRISM, the AMS now searches online for the appropriate suppliers for each project. The AMS accesses an online supplier list and searches for suppliers that specialize in the area required, such as fast turnaround capability when printing large quantities of a 200 page hardback book. When the AMS selects a supplier, ActionWorks Metro automatically sends that supplier an RFQ (request for quote.) The supplier receives an email notification of the RFQ from the system that includes a link to the secure PRISM website. Providing their password, the supplier is then able to access the RFQ. As the supplier enters a bid, a live calculation of the quote appears that enables quick and accurate completion of the form.
4. **Bid Grid:** PRISM also allows the AMS to view a user-friendly presentation of the bids. When an AMS selects a project component an on-screen Bid Grid for that particular component pops up. With this view, the AMS can quickly choose the supplier that provides the best quote.
5. **View/Generate Quote:** Selecting a quote on the bid grid allows the AMS to view all of the relevant information for that quote. When a quote is selected, the AMS can add information to it, such as additional supplier data (e.g. percentage amount), and generate the approval quote.
6. **Receive Approval:** Next the AMS must get approval for the selected quote from the sales manager and enter that approval into PRISM.
7. **Send Quote to Customer:** Once the approval is entered in PRISM, the system automatically generates a quote document that is sent to the customer via the Graphics Management Sales Representative. The document is stored in PRISM's relational database.
8. **Customer Approval:** When the AMS receives customer approval of the quote and enters that approval information into PRISM, the system then automatically interfaces with the R.R. Donnelley financial system to create purchase orders to suppliers.
9. **Generate Work Order:** PRISM automatically generates a work order and notifies suppliers if their bids were accepted or rejected. This feedback step utilizes Metro's closed-loop Business Interaction Model. As the supplier reports completion of a component, the AMS uses Metro's closed-loop model to accept or reject completed work based on the agreements the two parties negotiated within Metro.

10. Status: Throughout the assembly and fulfillment process the suppliers send status reports to PRISM. Customers and Graphics Management's employees can check online to see where a particular project component is in the fulfillment process. Customers use this capability to track inventory, receiving and shipping information, and production status. Graphics Management has found that making key information available to customers, in a timely manner, has improved project and inventory management and also customer satisfaction. This, in turn, has also resulted in increased customer trust.
11. Final Delivery: Product is delivered to customer.
12. Integrate with R.R. Donnelley Financial System: The AMS staff creates a daily transfer file for uploading to R.R. Donnelley's financial system.
13. Supplier Quality Review Form: Upon project completion, the AMS team reviews the suppliers' performance and posts scores in PRISM. Internal staff and suppliers can access the information. The scoring of suppliers includes the timely delivery of product, quality of work and competitive pricing. This helps build a knowledge database regarding suppliers' capabilities. AMS members can assess the capabilities of each supplier and capture that data for future projects. The suppliers also have access to their scoring information. Suppliers value this data; it helps them win future bids and improves their business relationship with R.R. Donnelley. Having access to this data about each supplier, gives R.R. Donnelley a powerful strategic advantage when negotiating future bids with suppliers. For instance, an AMS can quickly pull up the price of a past project and compare the price with a future bid.
14. Customer Feedback: Over time, using PRISM will also help customers forecast costs and response times. Tracking a number of projects for each customer and gathering information about those projects will provide historical trend data to the clients. Analysis of this information will enable the client companies to better forecast time and costs for various project types. Metro's audit trail of all interactions makes this possible.

Interactions Utilizing PRISM

PRISM has widened the communication pipeline between R.R. Donnelley's internal staff and both sides of the supply chain. The diagram following displays examples of interactions utilizing PRISM.



BIGGEST HURDLES OVERCOME

R. R. Donnelley's Graphics Management division wanted to move its business processes from the desktop to the World Wide Web, and connect its AMS teams with its supply chain and its customers.

Before PRISM, it was a challenge for the AMS staff to communicate with its suppliers. The AMS staff had to rely on suppliers returning their phone voicemails, memos and faxes. There was inefficient collaboration between suppliers and Graphics Management. Without supplier communication, the AMS teams had to manually verify where projects were in the production cycle. PRISM brings Graphics Management's suppliers into direct online collaboration with the project management process.

PRISM tracks and provides project status checking in real-time, via the web. AMS staff can reach suppliers, regardless of the time of day or the location of the supplier. This has proved to be a significant benefit; now the AMS teams have the ability to track the status of their projects anytime, anywhere. Graphics Management overcame the challenge of getting non-technical users proficiently using PRISM by making certain the Intranet pages were user-friendly and consistent with one another. Metro provided tools to help achieve success with this challenge. The software easily lets the developer to create user-friendly pages. For example, in Metro, a developer can choose a button or an icon and create titles on pages to help guide users.

Scott Leonard, Senior Web Developer, led the web development team in building PRISM. All applications that his team develops for the web are customized. Scott noted, "It would have been a challenge for my team to integrate legacy, new, and custom systems. Because Metro contains all of the necessary web-based business process front-ends, the software integration was straightforward and saved us time."

NEW SYSTEM CONFIGURATION

To build a fully functional application, the development team constructed PRISM with a 3-tier architecture—User Interface, Business Logic, and Data. The team developed each tier in parallel. Milestones were created for interim integration and testing. The milestones methodology allowed Graphics Management to closely monitor the implementation for each stage. PRISM works with standard Microsoft technology. All users must be connected to the web to use PRISM. Users can use Netscape 4.5 or greater or Internet Explorer 4.01 or greater.

The developers used the following system configuration:

- ActionWorks Metro Process Builder to build the application, Process Builder Developer Edition is the development and mapping tool used to define business processes
- Microsoft Visual Studios
- Microsoft SQL Server for the relational database that recorded information
- Microsoft NT 4
- Microsoft IIS4
- Internet Information Server
- Microsoft Transaction Server
- Microsoft SourceSafe
- Microsoft Visual Basic
- Visual InterDev
- Open messaging to deliver complete solutions

COST SAVINGS, INCREASED REVENUES, AND PRODUCTIVITY IMPROVEMENTS

The business objectives of R.R. Donnelley for the PRISM project were to create durable e-business relationships with both customers and suppliers and to improve productivity to help build profitable business growth. Originally, the team estimated PRISM would enable a 12 percent gain in productivity. Since April 2000, post-project completion review proved that the productivity gain was in the 14 to 16 percent range—well surpassing Graphics Management's original estimates. R.R. Donnelley has experienced lower transaction costs and has benefited from a reduction in errors, and rework costs. The increase in productivity will enable R.R. Donnelley to significantly grow its business. Graphics Management can now manage much larger projects (in the million-dollar range) and AMS team members can accept a larger number of complex projects per year. Prior to PRISM, AMS members could handle approximately 6 to 10 complex components; now, AMS members work in teams and can work with

more than 24 different components, and manage more projects at once. Achieving much greater leverage of their AMS staff lays the foundation for Graphics Management to grow.

COMPETITIVE ADVANTAGES GAINED

PRISM has elevated R. R. Donnelley's Graphics Management division into a leadership position with its customers and suppliers.

Mel Hennrich, Graphics Management's Process Manager, noted, "PRISM is Graphics Management's link to customers as the provider of print procurement and project management services. The application has built barriers to customers exiting and publishers feel connected to the production process. PRISM has strengthened communication with customers, improved productivity through standardizations which is helping to build increased customer loyalty."

Graphics Management now has more control over the supply chain management process. AMS teams access a supplier's cost and work history and are able to choose a supplier based on past performance. The speed of the Internet for checking the status of projects in real-time allow AMS teams to quickly solve unexpected problems. PRISM has streamlined the management process, and the application has helped Graphics Management get closer to the ideal of zero inventory. By working with customers and suppliers to reduce inventory, Graphics Management now has increased control over both internal and external business processes.

IMMEDIATE AND LONG-TERM PLANS TO SUSTAIN COMPETITIVE ADVANTAGE

PRISM has heightened the awareness of Graphics Management within the company's target market. Other business units of R.R. Donnelley are making inquiries about how the PRISM business model could help streamline their e-business processes. Discussions are already under way about the implementation. This in turn might help control and share capacity and capability between plants thus strengthening scheduling and equipment utilization rates.

David Oberst states, "PRISM has allowed R.R. Donnelley to gain a significant competitive edge over competitors in the areas of managing complex multi-component projects. PRISM has allowed Graphics Management to integrate its Supply Chain Management, Customer Inventories, Structural Design and ISO-based Project Management/Quality systems. PRISM improved customer demand and will help R.R. Donnelley build a framework for the future."

R.R. Donnelley has experienced such a high degree of success with ActionWorks Metro that it plans to expand PRISM's application. The company's strategy would allow the publishers even more direct access to PRISM, thus hoping to build even stronger corporate relationships and even higher barriers to overcome.