



Are You Ready for Practical Data Management? *Lessons from Three Leaders*

March 31, 2005

By Bruce Jenkins, Senior Analyst

Are you ready for practical data management? Is the way you manage, share and reuse engineering data holding back your business?

Spar Point studied three small to medium-size manufacturers that successfully implemented data management using Autodesk Vault. We investigated what drove them to recognize the need, how they implemented a solution, and what payback they're seeing.

We found six flags that signal an urgent business need for companies to improve how they manage, share and reuse engineering information. If any of these describe your business, practical data management may be for you.

1. **Data disorder** You can't afford any more schedule setbacks from designers overwriting each other's files or working on outdated versions.
2. **Hard-to-find parts** You've got to stop redesigning and remanufacturing parts you know you've made before, but can't find when you need them. You know you could reuse the same part in many places – within a single product, or from one product to the next – if you had a better way to search existing designs.
3. **Design bottlenecks** You need a way to get more engineers working in parallel on a project – to speed up design, to take on more complex work, to make more efficient and flexible use of your engineering staff.
4. **Ambiguous customer specs** You need to get control of ambiguous customer specifications. Your customers aren't sure what they need or how to spec their order until you're well into design, but they want it twice as fast, usually at fixed price. You need a better audit trail of design reviews – what you showed the customer when, how they responded, what happened next.
5. **Not enough "A-team"** One of your engineers is a configuration genius who can look at a 2D assembly drawing and instantly see what can be reused in the next project. But your company's throughput is gated by the whole team – you need a way to transform your database of past designs from dead inventory to working capital, and make everybody a star engineer.

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6. Fiscal reality Your budget for getting data management under control is closer to \$10,000 than \$100,000. You can't afford an army of programmers and a year to implement.

Lessons from three leaders

Here are the stories of three companies we studied: Why data management? Why Autodesk Vault? Was it hard to implement? What's been the payback?

ADAPT AUTOMATION, INC.

Santa Ana, CA USA

www.adaptautomation.com

Custom machinery design and manufacturing firm

Est. annual revenue \$10 million

45 employees; 10 engineering staff: 7 mechanical engineers, 3 electrical/software engineers

7 seats of Autodesk Inventor; Autodesk Vault implemented on all seats

Product: assembly machines for diverse industries, particularly medical device manufacturers and automotive airbag systems manufacturers

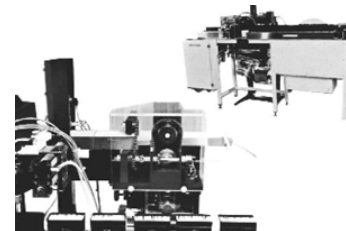
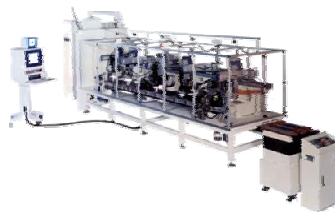
Typical unit price: \$100,000-\$1,000,000

Typical number of parts: 1,000-3,000

Each machine one of a kind, but high levels of design reuse: within each industry served, products for different customers average 75% of design content in common

Images courtesy ADAPT Automation, Inc.

Need ADAPT Automation moved from 2D to 3D to make team design *possible*, then implemented data management to make team design *practical*. More than a year ago the company realized it had to change the way it worked if it hoped to continue



meeting its customers' twin demands for shorter project schedules and ever more complex products. "We used to compete on quality, then price, then delivery," president Tim Van Mechelen told us. "Now it's flipped – delivery, then price, then of course a high-quality machine."

The challenge was to change the work process from one engineer per project to team design. "Our products are so complex now that one person alone doesn't have a chance of getting it done on time," engineering manager Dave Twist reports. Reusing data to speed up design was another challenge. "Working in 2D," Twist explains, "if we tried to use part of one machine on another machine, there was no way to know what drawing to change without a lot of effort."

The first step, he saw, was to move from a 2D AutoCAD-based design process to Inventor so multiple engineers could work on different portions of a machine in parallel. Why? "The way part drawings and assembly drawings relate to each other in 2D, it's almost less efficient to put two people on a job than one." After 3D, the second step was to implement data management. "We started managing data by working in the 'semi-isolated project' mode of Inventor," he says. This let multiple engineers work together on a design, but did not stop people from overwriting one another's files or inadvertently working on out-of-date versions.



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Selection What to do? In developing control software for ADAPT's machines, Twist had used a source-code management tool that helps software engineers work in teams. "I tried using that program to manage Inventor files, but it never quite worked." Then he heard about a new Autodesk product called Vault. When Vault 3 came out, Twist investigated the technology with ADAPT's Autodesk reseller, KETIV Technologies, Inc. (Fullerton, CA), and decided it was time to act.

Implementation What was the decision process for implementing Vault? "I pretty much just did it spontaneously," Twist reports. "The switch from 2D to 3D had heavy management involvement, but how we manage drawings is an internal engineering issue."

Was Vault difficult to implement? "It wasn't too hard," according to Twist. "We don't have an IT department; we handle it ourselves" in engineering. Twist installed the Vault server software – "nothing complicated about that," he reports – and experimented with Vault for a few weeks. "After I got comfortable with it, I rolled it out, sat our people down in a conference room, and said, 'Here it is.'"

Did ADAPT's engineers have to change their work processes? Very little. "They were used to the concept of semi-isolated projects in Inventor," Twist says. "With Vault, most of the workflow concepts of check-in, check-out and so on are similar to Inventor." What do ADAPT's engineers think of Vault? "It simplifies work for us," says designer Rick Vaughn. "It allows me to concentrate on what I'm supposed to be doing, not checking files in and out. It takes care of all that stuff I don't even want to know about."

Payback "By letting more than one designer work on a project at once," says Tim Van Mechelen, Inventor and Vault "let us quote more aggressive price and schedule." Letting multiple designers work on a project at the same time is a "huge advantage" for ADAPT.

The key business benefit that ADAPT gained from practical data management is flexibility – perhaps the most powerful competitive advantage that small and medium-size U.S. manufacturers possess. Besides putting multiple engineers on a project, the company can readily bring on contractors and off-site workers as workloads fluctuate. "You can let people work remotely via VPN because you're sending files only when you check them out or in, not every time you modify or save them," Twist notes. "And with Vault over VPN, I can check daily to see that someone designing off-site doesn't go down the wrong path." The advantage lies not only in going faster, but in gaining the agility to reconfigure and redeploy engineering assets quickly in response to changing opportunity and demand.

TNA AUSTRALIA PTY LTD
Silverwater, NSW Australia
www.tnarobag.com

Food packaging machinery design and manufacturing firm

Est. annual revenue Aus\$90 million

150 employees; 17 engineering staff

17 seats of Autodesk Inventor; Autodesk Vault implemented on 6 seats to date

Product: Vertical fill form and seal (VFFS) food packaging machinery

Typical unit price: Aus\$200,000

Typical number of parts: 25,000-30,000

34 product models; different models average 80% of design content in common



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Images courtesy TNA Australia Pty Ltd

Need When TNA expanded its product range from four models to 34, “we needed to control the information for all those designs – design content, who gets what, and when it’s released,” reports Asia/Pacific operations manager Rod Hunt. Reducing manufacturing costs was also key in order to compete with rivals in low-cost manufacturing centers. To this end, TNA wanted to make engineering and manufacturing more time-efficient and cost-effective by increasing its design reuse. “We’re trying to design products that have multiple instances of the same part,” explains product design engineer Darren Alchin. “We want to use one part in many different instances” – both in a single model and across different models – “to gain from a supplier and cost viewpoint.”



Selection “Tight integration between Inventor and Vault is what swayed us,” Hunt reports. Before Autodesk Inventor, TNA had tried CATIA V5 and SmarTeam. But a typical TNA machine has 25,000 to 30,000 components, and the company reports CATIA V5 was overwhelmed by assembly models this large. After moving to Inventor, TNA considered using SmarTeam to manage its Inventor data, but rejected it because “the implementation process is massive,” Hunt reports. “If a company is looking at data management and wants to go from A to Z, with Vault you can go from A to C, then D to G, and so on in small steps. But with SmarTeam, you’d better be ready to go from A to Z all at once. We needed to go in small steps so we could decide questions like: How should we be using Vault? How should we manage check-in/check-out?” TNA also considered Cyco’s Meridian data management offering, but liked Vault’s tight integration with Inventor and the fact that both Inventor and Vault came from the same company.

What was the justification process? “That Vault was already paid for helped,” says Hunt. “But it still required a fair amount of consulting to set up, which was not free.” Hunt and his team explained to the company’s financial controller the need for Vault and “the payback we could get, and it was given the go-ahead.” What was the ROI calculation? “We didn’t really come up with a number – we just explained the principles of weak links in the design-to-manufacture chain, and our controller was won over.” The justification was “the time saved in searching for data, and being able to convey that information to everyone who needs it.”

Implementation To implement, TNA engaged Autodesk Consulting to assess TNA’s need for BOM information flow throughout the organization, map the system to TNA’s needs, set up a part numbering system, populate the Vault with a sample TNA data set, promote the information into Productstream and assign item numbers, and train TNA staff in how to manage and use the system. TNA reports this took just four days; and cost Aus\$16,000. Also involved was TNA’s reseller, CadGroup Australia Pty. Ltd. (Glebe, NSW).

Payback A key benefit for TNA has been to make team design easier and more efficient. “Vault lets people design around each other rather than on top of each other,” says Hunt, and “it lets everyone see where the project is – it lets each team member understand the whole project rather than just their little piece of it.” Vault is also helping TNA reduce part counts through better design reuse, and ensure that the right information is sent to manufacturing.



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“Vault we were comfortable implementing as a starting point,” Hunt reports. “From there, Autodesk Productstream offers capability we see as necessary once we start pushing information out to manufacturing.”

UNVERFERTH MANUFACTURING COMPANY, INC.

Kalida, OH USA

www.unverferth.com

Agricultural equipment design and manufacturing firm

450 employees; 40 engineering staff

27 seats of Autodesk Inventor; Autodesk Vault implemented on 6 seats to date

Product: tillage and sprayer equipment; hay, manure and grain handling equipment; agricultural dual and specialty wheels

Typical unit price: \$2,000-\$70,000

Typical number of parts: 200-2,600

New models average 75% of design content reused from previous generation

Images courtesy Unverferth Manufacturing Company, Inc.

Need Unverferth needed a way to migrate from Autodesk Mechanical Desktop (MDT) to Autodesk Inventor without changing its work process for managing and releasing design data – moving design files from a work-in-progress area to a protected “released” directory using Windows Explorer. This works with MDT data, but if Inventor files are moved with Windows Explorer, “the linkages between files break and the assembly model won’t resolve,” director of engineering Dave Smith notes. Vault solves this problem, says project engineer Steve Hilvers, and “lets us mimic our present workflow” when moving to Inventor.



Beyond that, Unverferth wanted to reduce part counts by making it easier for engineers to find existing parts to reuse in new designs. “Working in MDT, we find data to reuse just by using our MRP system, searching on text attributes such as material attributes,” Hilvers explains. Once an engineer identifies a reusable part, “we go back to our ‘Released’ directory, get the MDT part model, and insert it into the new design or else modify it slightly. Vault will make a night-and-day difference – it offers quicker, much more powerful search, and you get a view [of the part] directly in Vault.”

Another drawback of the old process was that “you’ve got to watch your ‘where-used’ so you don’t mess up other designs,” Hilvers says. Tedious manual coordination was required so that developing and releasing a design would not cause problems for other projects that shared parts with that design. “We think Vault will really help here.”

Selection Unverferth selected Vault after considering several competing offerings. Vault had two advantages: it fit Unverferth’s needs, and it was the right price. “We chose Vault because, number one, there’s no software cost – it’s packaged with Autodesk Inventor Series,” says Hilvers. Equally important, “Autodesk said [Vault] would work for us. With the other systems, nobody could guarantee that, after we’d spent \$100,000, we could use Inventor” in a way “comparable to our present workflow.”



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Implementation Implementation was “very easy,” reports engineering director Dave Smith. Steve Smith, Unverferth’s I.T. administrator, worked with the company’s reseller, Ed Rose of Industrial Technology (Fort Wayne, IN) and Autodesk Professional Services, to install the Vault server, a process that took only about two hours.

How did engineers react? “Naturally they’re going to resist change,” says Hilvers. “But we overcame that by showing them everything Inventor can do – just the eye candy of Inventor sells them on going to Vault.” First engineers are “introduced to Inventor, get comfortable with it, then after a couple of weeks we introduce them to Vault.” How does that go? “Once you get them used to the workflow, they understand,” says Hilvers. “Once they grasp that they’re not at risk of duplicating work, overwriting files and so on, they see how much more efficient it is.”

Payback “The number one benefit,” Hilvers sums up, “is that Vault allows the average CAD user to use Inventor” with Unverferth’s existing workflow. Next is more powerful and efficient design reuse – finding parts with Vault takes one-half to one-third the time it took using the MRP system, according to Hilvers, “and the amount of data we can search on is a lot bigger and more complete.” As a result, “part counts will go down” as more projects are executed using Vault. Finally, “our incorporation of Autodesk Productstream down the road will let us feed our MRP system from engineering – let the drawing drive the system, rather than MRP driving the system.”

What should you expect from practical data management?

What can practical data management do for your business? As the lessons of these three leaders show, today the value of practical data management is how it can help you:

1. **Save time and error** Save your engineers from losing time working on the wrong version of a design or having their work accidentally overwritten by someone else. Every company studied cited the value of Vault in ensuring that when an Inventor assembly is opened, the latest version of each part is referenced.
2. **Reuse designs** Put your hands on past designs and components – quickly and easily enough to cut out wasteful remodeling and remanufacturing. Drive down part counts by reusing parts that already exist – in a past project, or elsewhere in the current design. Unverferth formerly used its MRP system to search for reusable parts, but says Vault searches take one-half to one-third the time, and allow much more engineering information to be queried. TNA reports similar savings.
3. **Work in teams** Partition a project among multiple engineers – to go faster, to tackle more complex work, to become more efficient and agile in deploying engineering resources. Using Vault and Inventor to break the bottleneck of a one-engineer-per-project work process, ADAPT Automation today puts up to five engineers on one project. TNA, whose success depends on time to market, likewise relies on Vault for better team design.
4. **Wring ambiguity out of customer specs** Have an audit trail of what went on in design reviews. ADAPT Automation bids custom machinery fixed-price, fixed-schedule, but often customers only realize midway through the project what they should have asked for. Vault records and archives what was quoted, reviewed, agreed on – and makes it easier to roll back to a previous design state when needed.

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5. Share knowledge Make your company's engineering knowledge accessible to all, not just your lone-eagle genius. At every company studied, Vault is helping rank-and-file designers retrieve and reuse design data as efficiently as the chief engineer.
6. Afford data management now Get your data under control without spending \$100,000 and a year of your time. TNA evaluated SmarTeam but chose Vault to be able to implement data management "in small steps" rather than in one giant leap.

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