



# How to Implement a Manufacturing System

>> Compliments of Microsoft Business Solutions

# How to Implement a Manufacturing System



## >> Compliments of **Microsoft Business Solutions**

© 2003 Microsoft Corporation. All rights reserved. Microsoft and Microsoft Business Solutions are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

**Microsoft®**

No two organizations ever implement the same manufacturing system in the same way. Combine the vagaries of different companies, business processes, people, and systems, and “the directions” for how to implement a manufacturing system take on the wandering complexities of James Joyce’s *Ulysses*. Yet just as the Joyce epic has crib notes, so, too, does manufacturing system implementation.

In simplest terms, a successful implementation boils down to managing a handful of key activities:

- > **Assemble a cross-functional project team with a respected project leader.**
- > **Understand why the organization needs the system (i.e., define your business “pain”) and why the pain exists (e.g., system issues and/or business-process issues).**
- > **Define the scope of the system.**
- > **Establish phases for system implementation.**
- > **Gather and define the organization’s requirements of the system.**
- > **Prepare the organization for change.**
- > **Prepare people and data.**
- > **Manage “scope creep.”**
- > **Thoroughly test the functionality of the system.**
- > **Run and refine the system.**

## >> Assemble the Project Team and Leader

Implementation requires assembling a cross-functional project team with constituents from all business units likely affected by the new system. At the heart of this group is the project team leader. Many personalities can fill this role, but good leaders always:

- > **Know when to say “no” or at least “not right away.”**
- > **Possess the energy to question everything.**
- > **Are part diplomat and part drill sergeant.**
- > **Are disciplined and do what they say.**
- > **Deal deftly (and swiftly) with whiners, nay-sayers, and bullies.**
- > **Have enough authority to manage the project.**
- > **Make or find the time to do the project right.**

Every implementation project also requires an executive steering committee to keep the team focused and to occasionally play “bad cop” to the leader’s “good cop.” Lack of top-executive participation in the project through a steering committee (or in smaller companies, through a key executive) is the primary reason for implementation failures.

## >> Define Your Business “Pain” and Why It Exists

Every company typically has three to five business “pains” that call for a manufacturing system antidote, such as an inability to expand operations, an inoperable system, or an eroding customer relationship. A common driver of system change is the pain caused by changing customer requirements, as clients demand improved service levels or better systems integration. Pain can also come from the supply chain as a company attempts to manage materials more efficiently or to integrate supplier systems. *External* pains frequently are the manifestation of *internal* pains, such as an outdated system that can no longer manage production and thus fails to satisfy customer cost, quality, or deliverability needs.

Recording and defining pains allow an organization to justify the need for a new manufacturing system, provided the underlying issues are indeed system-related. For example, a company may fail to satisfy customers (pain) because it ships late, its inventory is inaccurate, and its investment in inventory is too high or not enough (issues). The company realizes it must better manage its inventories (business objective) but first needs to understand the root causes of its inventory difficulties. Is it a system problem? A new system must positively impact the issues that cause the pain and help achieve business objectives, or it risks merely making old, mistaken-laden processes run faster – at higher costs.

## >> Define System Scope and Implementation Phases

The scope of the project is determined by the business objectives your organization hopes to achieve, the issues it hopes to resolve, and the functions impacted by those resolutions. (Scope can also be influenced by political or technological concerns.)

Scope is delineated by duration or phases, and, depending on the breadth of your project and organization, the implementation could go live in a single day or extend over months as various departments and/or physical locations turn on their systems. Factors to consider in selecting a start sequence include ease of implementation, site accessibility to the project team and partners, and location of the best-prepared staff and most-thoroughly tested functionality.

Project teams typically organize implementation phases by department, according to support of business objectives and how *live* departments will impact the processes of other connected but *non-live* departments. For example, if the business objective is to maintain inventory accuracy, obstacles to overcome may include inaccurate bills of materials (bad data), poor inventory-movement procedures, and unorganized warehouses. Given those issues, an MRP implementation would likely proceed through Phase 1 – financial modules to get the transactional elements in place that impact inventory data; Phase 2 – planning functions, such as master scheduling to begin feeding new data into the system; and Phase 3 – tactical functions, such as shop-floor scheduling where new, accurate data is a system imperative.

## >> Gather and Define System Requirements

While business pain triggers the need for a manufacturing system and an issues analysis helps to establish business objectives and system scope, these steps won't determine the specific requirements or design of the new system. A solid plan will carefully gather requirements from all departments within the system's scope.

Remember that a new system may be an antidote for an organization's pain, but the implementation team is not a band of faith healers capable of miraculous achievements. Managing unrealistic expectations and requirements is a critical step and demands a rigorous review of all system and

## >> CASE STUDY

### Assessing Pain

#### Multiple drivers of change

The Alabama Institute for the Deaf and Blind, Talladega, Ala., had several reasons for pursuing implementation of a new manufacturing system. The not-for-profit AIDB consists of numerous entities including Alabama Industries for the Blind, which employs blind and visually impaired workers to manufacture and sell products. AIDB's entities were running different manufacturing applications; its primary pain was the need to standardize on one system and to get all production units talking to one another.

"From an IT perspective, one of the first mandates that I had when I took over as director was that I wanted to find some way we could move everybody into a system that met the needs – or 95 percent of the needs – of every entity within AIDB," says Henry Segalas, AIDB IT director and implementation committee leader. "That was really a dream, but as we started to face more and more dysfunction in existing systems, we realized this dream had to be a reality."

#### Missing functionality

At Knelson Concentrators, Langley, B.C., a manufacturer of gold-mining equipment, the pain was easy to define. The manufacturing and distribution functionality of its current system provided standard costing capabilities but could not track actual costs. As Knelson's business migrated toward make-to-order production, the company gradually realized the old system could not accommodate actual costing – and that Knelson could not succeed without it.

#### Down and out

Mid-Continent Instruments, a Wichita, Kans., manufacturer of aircraft instruments, realized that its current MRP system simply didn't work. It was releasing manufacturing orders to the floor with incomplete production pulls, delaying orders so drastically that 15 percent of shipments were late. A new system was a necessity – a clear example of system issues.

#### Process visibility and IT benefits

Gibson Guitar Corp., Nashville, Tenn., has more than a dozen divisions in the U.S. and Europe. All offices were using Microsoft Business Solutions financial and distribution applications, but Gibson also needed a manufacturing system – in part to migrate from an old COBOL system that rode on two servers and consumed 15 percent to 20 percent of IT staff time. Gibson also required a new system to establish greater visibility of its processes and inventories, especially for tracking of finished-goods inventories as required by a lender.



data requests. Too many organizations bend over backward to accommodate old processes or reporting methods that are archaic, wrong, or simply unnecessary. Successful project leaders tie requirements to the established *objectives* – e.g., standardization, real-time plant data, or improved materials management – and not to old processes. By limiting system selection and design to requirements based on old processes and methods, many companies unwittingly saddle themselves for another five years with inferior practices and missed opportunities.

In system design sessions, prioritize requirements by viewing them within the context of current pains, issues, and a flowchart of current processes, while at the same time developing a vision of future processes and necessary requirements. These sessions should give weight to all departments impacted by the system so that you can assess all functionality required of the new system and its integration throughout the organization.

As the vision develops, begin documenting system procedures. Record exactly how the system will be used for every step of any business activity it touches, such as releasing a manufacturing order to the floor or updating sales forecasts; this will help to create training documents and new procedures.

The requirements planning process will be critical to system selection, and it also will help develop a cost/benefit analysis. At the very least, your team should calculate total cost of ownership (e.g., maintenance fees, staffing), which can prove helpful when comparing system vendors. When evaluating systems, some companies emphasize return on investment (ROI) calculations that assess quantifiable measures (e.g., costs) and qualitative measures (e.g., improved productivity).

A key component in the cost/benefit analysis and the success of the implementation is selecting the right partner, with particular emphasis on both parties understanding the partner's role. While this role may vary, the ideal partner will come with significant experience in manufacturing, in your industry, and with the system you'll eventually implement.

## >> CASE STUDY

### Rolling Up Requirements

#### Individual needs to collective requirements

AIDB project leader Segalas originally identified the opportunity for a system change based on anticipated “de-support” notices for existing systems, as well as awareness of arising needs in the organization. He created a draft proposal outlining the potential of a new integrated system and then invited each department affected by the system to add to his proposal. This collaborative list of requirements and priorities was then reviewed, narrowed down, and agreed to by all departments. An implementation committee (which incorporated one member and a backup from every department) then used the completed proposal to evaluate vendors and systems.

#### Prioritizing needs

Knelson mapped its current processes through all departments and came up with a requirements list for every area, says Pat Thornton, systems manager and project leader. The project team then reviewed and prioritized the list into a first phase of implementation. Although the project team took care to acknowledge every user request, it was realistic – and clear – about what could actually be implemented quickly and efficiently.

#### Departmental balance

Gibson Guitar Corp., Nashville, Tenn., implemented its financials and distribution applications in one massive project across all 13 of its office sites, but chose the headquarters location as the first to deploy the system's manufacturing application. Gibson initially focused solely on the requirements of manufacturing, which resulted in the accounting department quickly responding, “You can't do that.” After Gibson placed the requirements of manufacturing and accounting on equal footing, the implementation proceeded more smoothly.



## >> Structure the Implementation and Prepare for Change

Your implementation success will hinge less on technology itself than on creating new, more efficient processes enabled by technology. As such, treat the system launch like the most important strategic project you'll ever manage – because it probably is. This will require a disciplined project-management schedule that includes an aggressive timeline, quality checks and milestones, and mandated attendance for team members at weekly meetings (all meetings, not just those that impact their departments, in order to provide peer scrutiny and pick up best practices from other departments).

The implementation team must now begin to describe for all users the objectives, when they will realistically occur, new processes and system procedures, and the role of each department in training and testing. Be prepared for resistance. Some departments can be coaxed into compliance by educating them about specific improvements, while others may request system workarounds to ease process transitions; still other departments may require personnel changes. Realize that no matter how well you've prepared the organization, change will be difficult, particularly if you have unique, long-standing processes.

## >> Prepare People

Before system training hits the front lines, the project team needs to be fully trained as early in the implementation process as possible (immediately following project planning). The project team members must be well-versed in order to design the system, train end-users, and define system procedures.

All others affected by the system should receive some level of system training. How much training is a matter of debate. While some companies opt for large-scale training that includes an overview of the entire system with deep-dive breakouts for specific modules, most organizations have trouble devoting the time or resources for such exhaustive measures.

## >> CASE STUDY

### Change Management Issues

#### Transitional satisfaction

Knelson soothed the acceptance of changes between their old and new systems by establishing short- and long-term process changes. In the short term, the implementation team didn't argue too much over why someone would want the system to work a certain way (e.g., the way the old system worked). Instead, they tried to find a temporary solution that worked for the individual and then returned six weeks later to reassess the workaround. Those that worked and made business sense, stayed; those that didn't were discarded in favor of new processes.

#### Speak now

AIDB project leader Segalas put a premium on trust and respect, and formalized that into a "Rules of Engagement" for the implementation committee. Paramount was the mandate that no committee members complain or denigrate the project or process outside of the committee without first giving their peers an opportunity to respond. Segalas did not want subversive comments, no matter how casual, to erode the organization's confidence in the new system – and wasn't shy about calling committee members out when they voiced frustrations outside the committee.

#### Partner perspectives

Gibson's handcrafted production environment created a unique situation in that most staff were familiar only with Gibson processes and systems; they had never worked in any other type of facility. As a result, Gibson looked to its technology partner to offer process changes as the implementation progressed. According to Gibson project leader Mathew Mullins, if the company had done the implementation themselves, they probably would have designed a system very similar to their previous configuration – and without significant process improvements.





Instead, most organizations will provide – or users will demand – training based around specific job functions and the screens that affect an individual's work. This can involve formal sessions delivered by the project team, meetings conducted within departments, or one-on-ones guided by a team member. Differences between the old and new systems as well as employee familiarity with the new system will indicate the appropriate level of training. For example, manufacturing personnel may have steeper learning curves because functions and processes that never occurred on the shop floor may now take place at new production-level terminals.

Frequently, though, the problem isn't who and how much to train, but convincing employees of the need to get trained in the first place. Think out of the box, and use whatever methods necessary to get users up to speed. And budget in far more training time than you think you'll need.

## >> Data Integrity and Migration

Data migration is critical (i.e., garbage in, garbage out) and offers a tremendous opportunity to ease the transition and improve process efficiencies going forward by deleting unnecessary or redundant information. Data can be classified into one of four categories prior to migration:

- > **Irrelevant data that can be left behind;**
- > **Questionable data that should not be transferred but retained;**
- > **Pertinent data that may prove useful and must be retained and cleansed; and**
- > **Priority data upon which the new system will rely and that must be thoroughly scrubbed.**

Start data migration as early in the implementation process as possible in order to train and develop the system using as much real data as possible and to ensure ample time to test data integrity. Remember that during data transfer it's helpful to have staff well-versed in both the old and new system. Successful implementers also advise that you select a launch date that coincides with the start of a fiscal reporting period, preferably the fiscal year. While this can add to organizational stress by requiring you to close the books while booting up a new system, it prevents some data transfer issues and allows a fresh start with new data.

Successful implementations follow these migration steps:

1. **Define the scope of the data migration;**
2. **Identify the amount of data cleansing required;**
3. **Clean the data to be migrated;**
4. **Map legacy data to the new system;**
5. **Develop necessary data-migration tools;**
6. **Conduct initial data migration;**
7. **Run data-integrity checks;**
8. **Perform data-migration tests;**
9. **Make necessary changes;**
10. **Retest; and**
11. **Perform final migration.**

## >> CASE STUDY

### Training

#### Increase awareness

Pat Thornton, systems manager at Knelson, says greater participation from people in training and testing would have significantly aided his company's implementation. Knelson had a particularly tight implementation timeline (September to February) that crossed through the holidays, which may have impacted employee commitment. Knelson eventually required that its executives sit in on training to underscore its importance while also conducting daily "Lunch and Learns" for users. Each luncheon session covered a specific microtopic, which enabled Thornton to get live feedback from users about their requirements.

#### Never enough

Although Mid-Continent spent ample time training their staff, even that could have been supplemented with additional learning using real data. Because the company completed its data conversion just before going live with its manufacturing module, training and testing were done on sample data. In hindsight, Mid-Continent wishes it had opted for real data during the training.

#### Training by committee

AIDB did not conduct formal training sessions, but instead relied on implementation committee members to work within their departments to train peers on the screens specific to their job functions. Says Segalas: "Their defined role was to prepare the people in their departments to do their jobs."



## >> Manage “Scope Creep”

No implementation proceeds without suggestions to alter or expand the original project. This “scope creep” requires a project team leader with both the authority and strength to make original decisions stick and, where the scope creep is legitimate to achieve business objectives, to revise the project. The steering committee is critical when creep arises because it carries veto power.

In considering scope revisions, it’s vital that everyone understand what is native in the system and which additional functionalities will require a modification or integration with a third-party solution. This requires two steps:

- > **Assess whether there is a gap between the new needs and the current system’s out-of-box capabilities.**
- > **Determine if an alternative to modification or third-party integration is possible, or if modification or third-party integration can be postponed.**

At each implementation milestone, you and your technology partner will manage scope creep and develop a list of gaps that still exist, along with corresponding solutions and timelines.

## >> Test the System

As the system launch grows closer, it’s important that users adhere to a testing schedule and vigorously track and follow up on issues that arise from testing. This testing must be thorough and as close to post-launch conditions as possible; one successful method is the use of monitored sessions under the guidance of the implementation team – “conference room pilots” – that simulate real-world usage. If testing can’t occur in pilots, team members must monitor individual testing sessions and ensure that no integration issues exist.

## >> Run and Refine the System

Once the system is up and running, the refinement process typically consists of clean-ups to solve small problems, review of previous workarounds, a look at postponed issues and new issues that may have arisen, and planning of subsequent phases. Above all, make sure that a myopic focus on “the system” hasn’t blinded you and your staff to the need to deliver improved processes that achieve your business objectives.

Lastly, if you’re the project leader, be sure to have a worst-case-scenario plan that will enable the organization to perform necessary business activities if serious problems occur. You may never need it, but the very process of preparing it will make you realize what could go wrong – and how to fix it. You want your implementation to be remembered not for its glitches, but for the business objectives you achieved – today and tomorrow.

## >> Don’t Implement without Them

As you move forward with your implementation, make sure you follow the proven steps outlined in this paper. They have been proven many times in many projects and in many industries, and they’ll continue to lead to success, provided you start and finish every project with the following *must-have* components:

- > **Strong-willed project leader with time and resources;**
- > **Representative project team with time and resources;**
- > **Well-defined list of business objectives;**
- > **Rigorously critiqued list of system requirements;**
- > **Realistic but aggressive timeline;**
- > **Thoroughly documented system procedures;**
- > **Partner that is the right strategic fit with industry, manufacturing, and system experience; and**
- > **Thorough testing that can uncover any problems and ensure a smooth kick-off.**

### >> CASE STUDY

#### Testing

##### Conference room pilots

Knelson Concentrators held a conference room pilot session seven weeks before the planned go-live date. “We simulated a typical week at Knelson; we had all the users come in and practice based on the documentation we created on how to do the jobs they were doing in the old system in the new system,” says Pat Thornton. Among the issues identified by the test was the lack of readiness among staff who had not adequately tried to learn the new system. After additional training, a second conference room pilot was conducted three weeks prior to go-live with the owner of the company and the VP of finance in attendance. People involved in this pilot knew that they as well as the system were being tested, and it went off without a hitch.







WINNING STRATEGIES FOR **MANUFACTURING**

**Microsoft Business Solutions**

Lone Tree Road

Fargo, ND 58104-3911

e-Mail: [mgpinfo@microsoft.com](mailto:mgpinfo@microsoft.com)

Phone: (888) 477-7989

Fax: (701) 281-6868