

Understanding “millwide integration”

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The topic “millwide integration” appears in every trade show, conference, publication, and computer/controls brochure. Descriptions include many fuzzy benefits, undisclosed costs, and a profusion of technical solutions. What remains unclear, however, is consensus about the scope (what it is), the value (why do it), the approach (how to do it), and the impact (who is affected and how).

The purpose of this workshop is first, to build consensus by defining the scope, opportunities, and impediments of millwide integration. And second, to outline how to plan the overall program and manage the organizational change and technology that must be implemented.

Defining the millwide environment

The first order of business is to define “millwide.”

Millwide is a total working environment. An environment where functions, processes, operations, people, and systems all work together in harmony for the benefit of the whole. Activities that do not add value are eliminated. Valuable activities are simplified and improved. The flow of information is open, timely, and accurate. The result is an organization where the right people, information, and materials are in the right place, at the right time, doing the right things.

This is a rather abstract definition, but it raises a key point. Millwide integration is not a computer system and cannot be treated as such. It relies on computer and network technology as a utility to facilitate integration, much like a telephone system facilitates communications. But, the integration of computer systems is not the goal; it is the medium.

Millwide integration is an improved way of operating that depends upon the integration of people, and technology. Like the mill itself, the integrated environment must be planned for, designed, and built.

Scope of the millwide environment

Before attempting to define the scope of the millwide environment, it is important to understand how millwide integration will affect the way a traditional mill operates.

A typical mill operation consists of a number of components (processes, departments, functions, and systems). Each has an established set of boundaries (walls), which serve to subdivide the operation into more manageable pieces.

As illustrated in **Fig. 1**, each component receives something (materials, information, funding, etc.), processes it, and passes it to the next component. The walls provide a definite start and finish, allowing more precise control and accountability.

The resulting environment, shown in **Fig. 2**, is typical of a mill operation today. It consists of a number of individual components (blocks) that work together to build the overall operation. This environment provides for improved optimization of each individual component, but limits overall optimization of the organization by restricting the flow of information. The boundaries that for years allowed the fine tuning of the component are now barriers that limit the ability to fine tune the overall operation.

In the integrated millwide environment, **Fig. 3**, the barriers between the individual components of the operation are opened up. The components still exist, but the priorities change. Accountability for the efficiency of the component now becomes secondary to the efficiency of the operation as a whole. Boundaries between components become transparent, allowing a holistic view of the operation. Individual components share information to assist in the operation of components that precede or follow them in the production chain, developing a team-oriented operation.

When defining the scope of the millwide environment, then, it is important to realize that there are several dimensions to be quantified. First is the obvious functional (chipping to shipping) dimension that indicates the scope of the physical operation that may be integrated. Second is the more glamorized technology dimension that indicates the scope of the computer system integration. Finally, and most importantly, are the often-neglected people and organizational dimensions that indicate the impact on mill staff and organization.

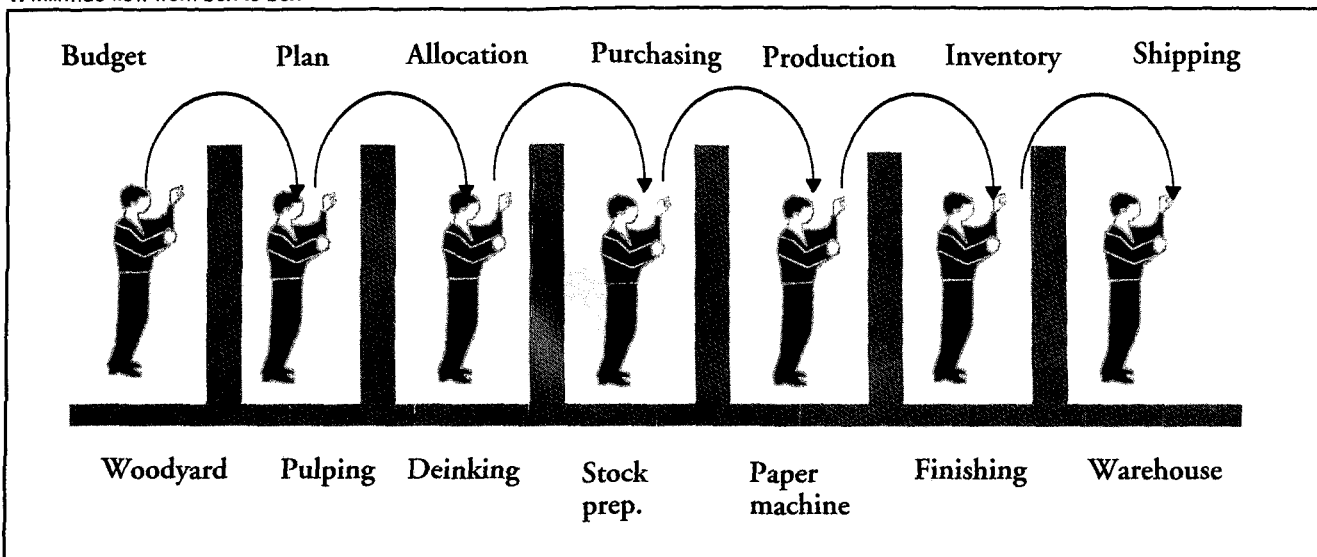
The scope of the millwide environment can (not must) include all processes, functions, computer systems, and people. The actual scope will evolve according to the individual mill (corporation) and its defined needs, beginning with limited integration in key areas, then expanding as required and as the organization and people adjust (**Fig. 4**).

Millwide opportunities

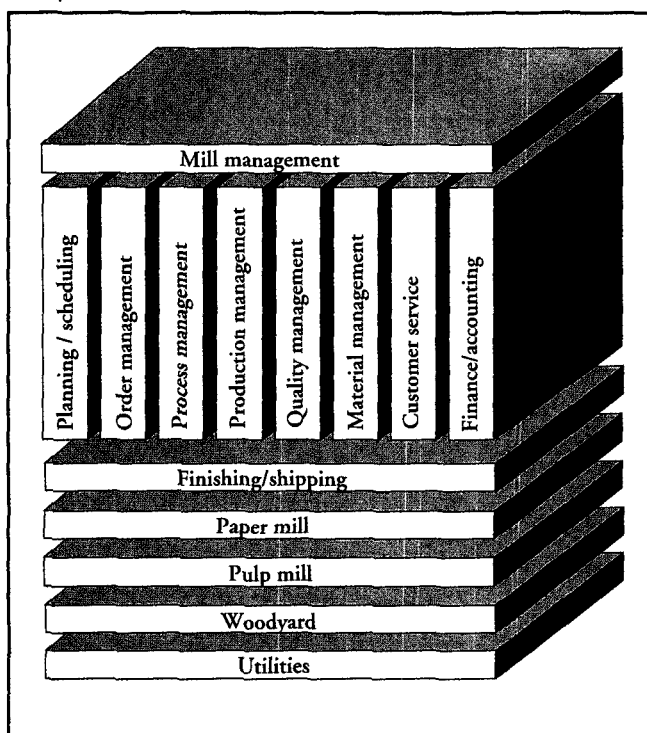
The opportunities that millwide integration offer are as broad as the scope, and are inversely proportional to the current state of the operation. In other words, integration will have less impact on those operations that are already highly efficient or are low volume than it will on operations that are high volume or low in efficiency. In general, however, opportunities (benefits) fall into three definable categories.

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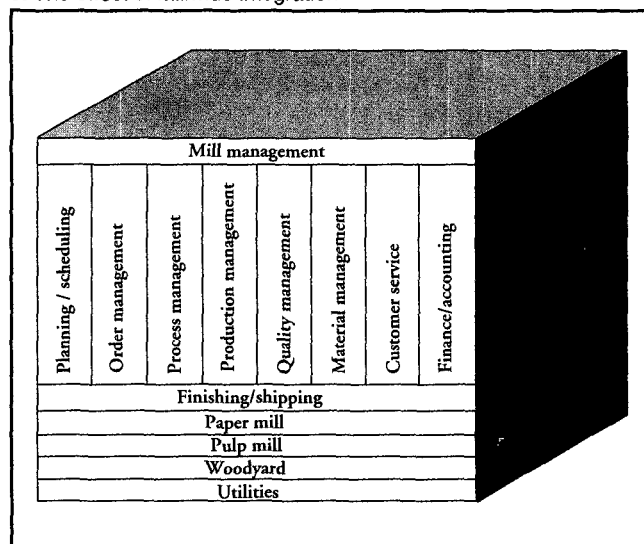
1. Millwide flow from box to box



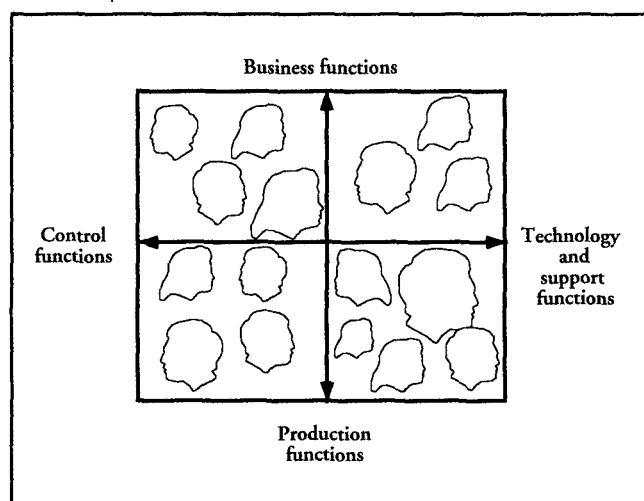
2. Separate millwide boxes



3. The effect of millwide integration



4. The scope of the millwide environment

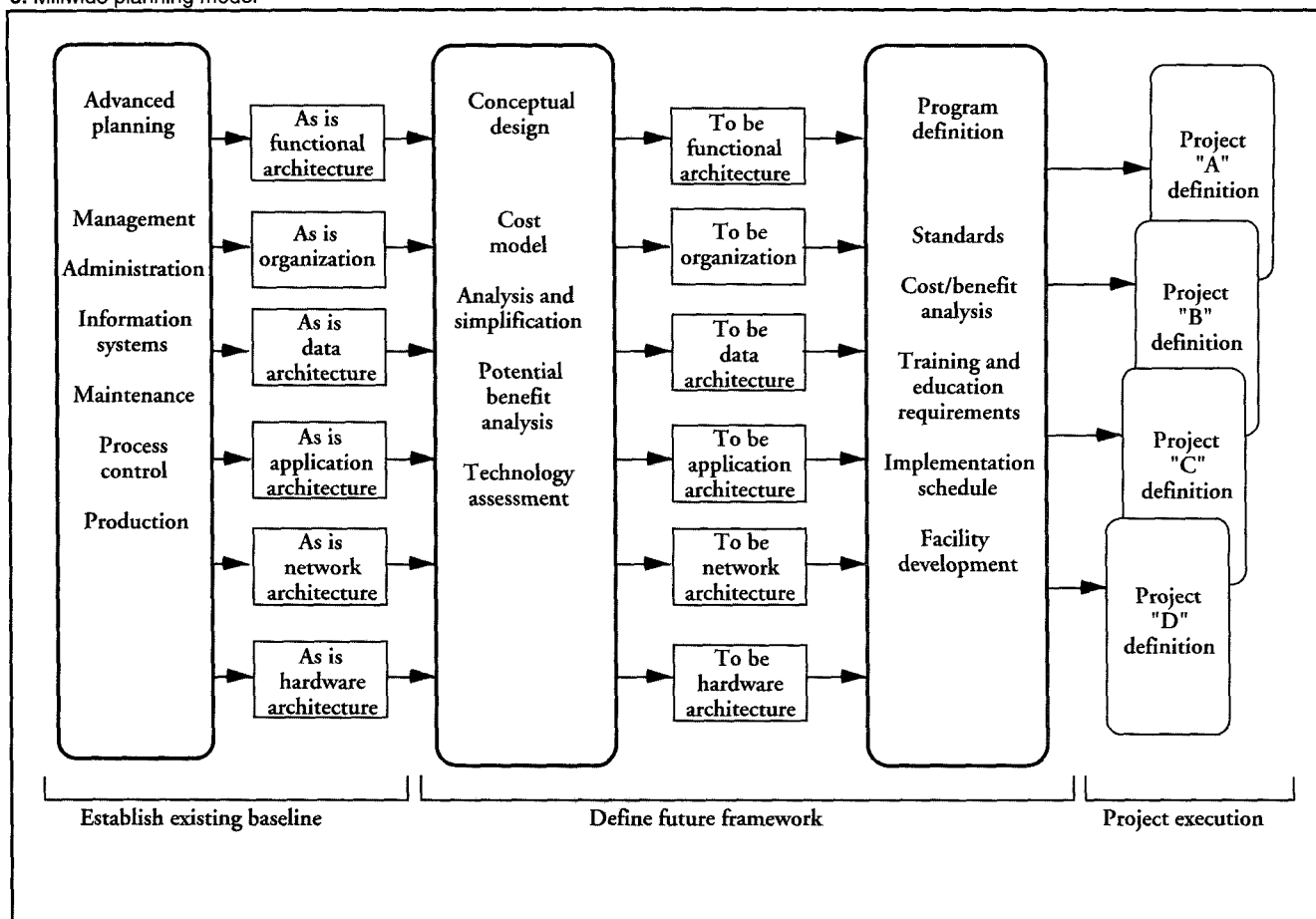


Increased throughput

This category includes increases in manufacturing throughput because of the following:

- Less waste and off-quality production
- Less downtime due to equipment failure and changeovers
- The ability to operate at a more constant level (less upsets).
- A better understanding and control of the process/operation allowing faster production speeds.

5. Millwide planning model



This category also includes increases in non-product related throughput such as processing orders, schedules, invoices, etc.

Reduced cost

This category includes reductions in cost attributable to the following:

- Reduced labor requirements as a result of the automation of activities and processes
- Less waste, energy use, and off-quality product as a result of reduced variation
- A better understanding of, and control over, variable costs, allowing more precise cost management.

Improved quality

This third category includes less product variation, which affects throughput and costs as described above. But it also includes improved, consistent service (internal and external). The combination of higher quality product and service increase product demand.

The only way to accurately determine the opportunities for improvement in a given mill is to assess the entire operation. The assessment should begin with a broad overview to iden-

tify major areas of potential opportunity. Each opportunity must then be evaluated in sufficient detail to specify requirements and quantify benefits. This step, as we will later see, has a great impact on the impediments to millwide integration.

Impediments to millwide integration

The major obstacle to millwide integration today is not technology, it's people. The technology is available, and has been for some time. The key impediments to millwide integration are the result of a lack of consensus, confusion, or fear. The confusion stems from a lack of understanding and agreement on the scope, benefits, technical approach, and organizational structure. This confusion or uncertainty then manifests itself as a fear of change and the risk of failure.

In reality, there is no risk to millwide integration! If it is well planned and implemented over a period of time, as illustrated in Fig. 5, change will be embraced and it will cost nothing.

Why then do most millwide efforts fail to achieve the desired results? They simply do not receive the necessary focus, leadership, and sense of ownership. They are treated as a technical exercise, and as such can rarely be justified as an overall program. Many independent projects are, with the

best intent, implemented by different groups (divisions, departments, etc.) only leading to further segregation and a lack of ownership.

Millwide integration can be implemented without risk if you avoid the following traps.

Lack of leadership

Without leadership a millwide effort will resemble a flock of sheep without a shepherd. Individuals will head off in many directions, toward unknown goals, with different objectives. Even if no millwide integration effort exists, this will still occur, because over time computers will require replacement, processes and procedures will evolve, and new technology will be acquired. Without leadership, these changes occur as parts of individual projects, with no common goal to guide them.

Not leading the effort, therefore, doesn't mean there won't be one; it will only ensure that it fails!

Lack of focus

If you are not sure where you are and where you want to go, you can't possibly know how to get there, what to take, how long it will take, or what to expect. This situation instills a great deal of fear in most people, and rightly so; it's high risk! Not only will millwide integration fail in this situation, it probably will never start.

The whole millwide effort depends upon a common vision based on the understanding of:

- What is our current situation?
- What is our future goal?
- What opportunities do millwide integration present us?
- What benefits can we achieve?
- What will it cost?
- How will it impact our organization and staff?
- How should we proceed?
- What are our priorities?
- What is our plan?

This vision (plan) will be the cornerstone of the millwide effort and will shape all you attempt to build!

Lack of ownership

The greatest killer of any well-led and well-planned system is lack of ownership. If the people using the system aren't committed to it, don't want it, and don't use it then it won't be successful.

As Niccolo Machiavelli observed in 1513:

"There is nothing more difficult to plan, more doubtful of success, nor more dangerous to manage than the creation of a new system. For the initiator has the enmity (mutual hatred) of all who would profit by the preservation of the old system and merely lukewarm defenders in those who would gain by the new system."

When implementing an integrated millwide environment

it's important to remember that management information systems, engineering, or equipment vendors alone cannot implement millwide integration. In addition, millwide integration affects every procedure, operation, and employee in the organization.

Failure to include all parties in the effort, whether in planning, education, or development stages, is a sure recipe for lack of ownership!

Premature technology

It was stated earlier that technology is not the major impediment to millwide integration. However, addressing technology before defining goals, and establishing leadership and ownership, is the next largest impediment.

- Without goals, the odds of selecting the appropriate technology are very poor.
- Without leadership, the odds of funding the appropriate technology are very poor.
- Without ownership, the odds of the appropriate technology being used effectively are very poor.

Selecting technology prematurely will lead to one of three scenarios:

1. The cost of technology cannot be justified, and the integration efforts never start.
2. Technology is implemented but is not effectively used, therefore the integration effort dies on the vine.
3. Technology is implemented and integration begins to evolve slowly with a small group of supporters. The supporters shape the destiny of the effort, for good or for bad. Successful use will gain supporters; lack of success (not necessarily failure) will gain enmity.

Successful implementation

It was stated earlier that there is no risk in millwide integration. That statement was based upon the following facts:

1. Millwide integration is not rocket science! The technology is available and it works.
2. Over time, existing technology will be replaced, processes and operations will evolve, and new technology will be acquired. The resulting capital expenditures would build the millwide environment, if there was a plan to follow.
3. When the fear of change is managed (through education, participation, and training) most people welcome improvements to their life (job) and enjoy personal growth (learning).
4. Most people want to do the very best they can and will actively help others, if they see a purpose (goal). □

The second half of this workshop, titled "Implementing millwide integration," will follow next month. This workshop will describe methods for defining goals, evaluating opportunities, estimating return on investment, building ownership, and managing environmental and technical change.