Managing Interfaces: A Key to Rapid Product and Service Development

Peter B. Scott-Morgan

Today, innovation contributes as much to protecting profits as cost containment. Indeed, many companies risk corporate failure unless they produce the right products or services at the right time. To keep up with their innovative competitors, both manufacturing and service industries recognize the need to encourage ever-closer interaction between groups with different skills. For example, rapid product development requires manufacturing and marketing tradeoffs as early as possible. Unfortunately, the necessary skills are typically found in different functions of the organization – and managing efficient and effective cross-functional cooperation is notoriously difficult.

Interfaces as Barriers

We all know that conventional management structures inhibit day-to-day interaction between departments. The problem shows itself when one department hands a project over to another at the end of a phase: „They can't make what we've designed, and Marketing wants something else anyway!"

People from different departments and disciplines often work to different objectives. In an attempt to overcome the barriers to communication, senior managers may make the mistake of involving themselves at too low a level of detail. Lower-level managers find themselves held up by their lack of authority to make day-to-day decisions or by bureaucratic procedures. To suggest that the solution is „organizational restructuring" is glib: the cost of the disruption it causes is often too high. The pragmatic solution, shown in Exhibit 1, is to focus attention on the deliverables required at the interfaces between phases of business activity. The interfaces correspond to those points at which big spending or resource decisions have to be made or where teams or functional responsibilities change – for instance, between development and production or between trials and production scale-up.

Interface Management (IM) helps senior managers achieve the results they want, not by telling different functions what to do, but by agreeing on objectives structured in a way that encourages the right involvement of the right groups at the right time.

Why Traditional Management Doesn't Work

At Arthur D. Little, we recognize IM as a key success factor in the variety of successful approaches to project management and product innovation evolved over the last 20 years by leading companies in automotive, electronic, and software engineering, including Ford, Hewlett-Packard, Philips, and Xerox. Over the last five years, we have been at the forefront in developing IM techniques for major clients across several industries. Many of these applications have focused on the product creation process. Recently, the need for IM has increased. For example, the most common application of IM is in the „product program" – from generating an original product idea to withdrawing the product from the market (Exhibit 2).

Exhibit 1

Refocusing Senior Management Attention

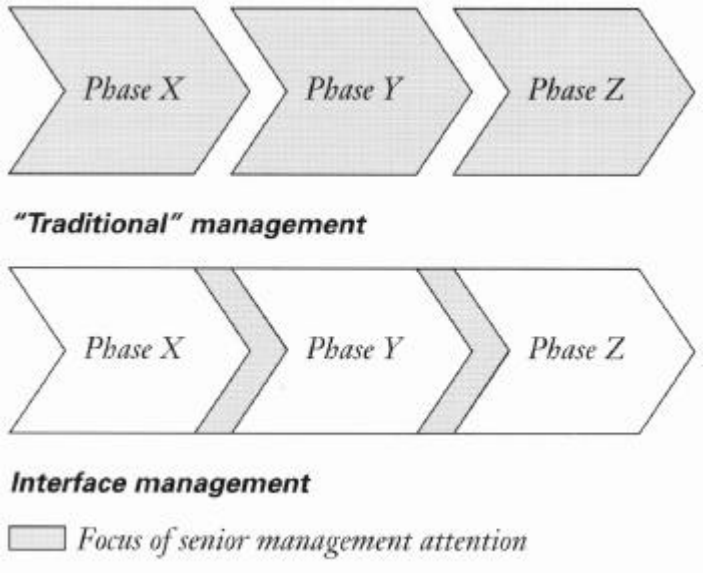
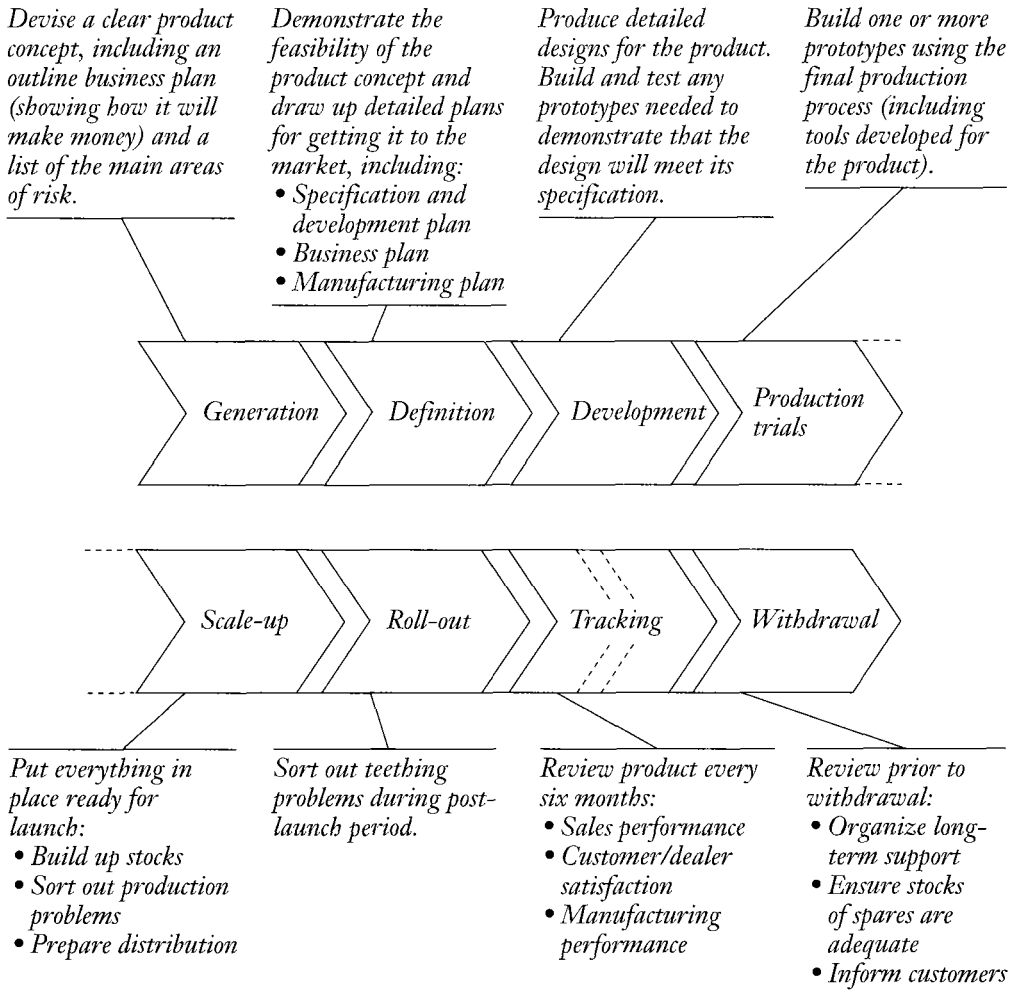


Exhibit 2

Product Program Phases



Whatever names your company gives to the various phases of the product program, you will recognize the sequence. Traditionally, individual phases of the program have been allocated to various business functions (typically R&D, Manufacturing, and Sales/Marketing), as shown in the top half of Exhibit 3. However, problems at handover have increasingly been recognized as symptoms of lack of communication earlier. Over the last two decades, such problems have become crucial in a growing number of companies – first in automotive, then in electronics and software, next in general manufacturing, and now in almost all product industries. With more new products and product variations, with greater technical complexity, and with shorter product generations, the need for improved communication increases dramatically. As shown in the bottom half of Exhibit 3, not only do more than three business functions need to be directly involved in a successful product program, but often many functions need to be involved within a single phase. Traditional management approaches to coordination do not work on this scale.

How Interface Management Works

IM is based on a series of detailed sets of objectives against which senior managers and cross-functional teams review progress and direction together at the interfaces between program phases (Exhibit 4). Between reviews, project teams can concentrate on the task at hand, with support from senior managers as coaches or mentors when they need it. To make sure that the business is on course to meet its objectives, that all ist programs of activities are the right ones, and that they occur at the right time, senior management needs to manage three steering processes: business direction, review/planning, and information-gathering.

Exhibit 3

Responsibility and Involvement of Functions in Product Programs

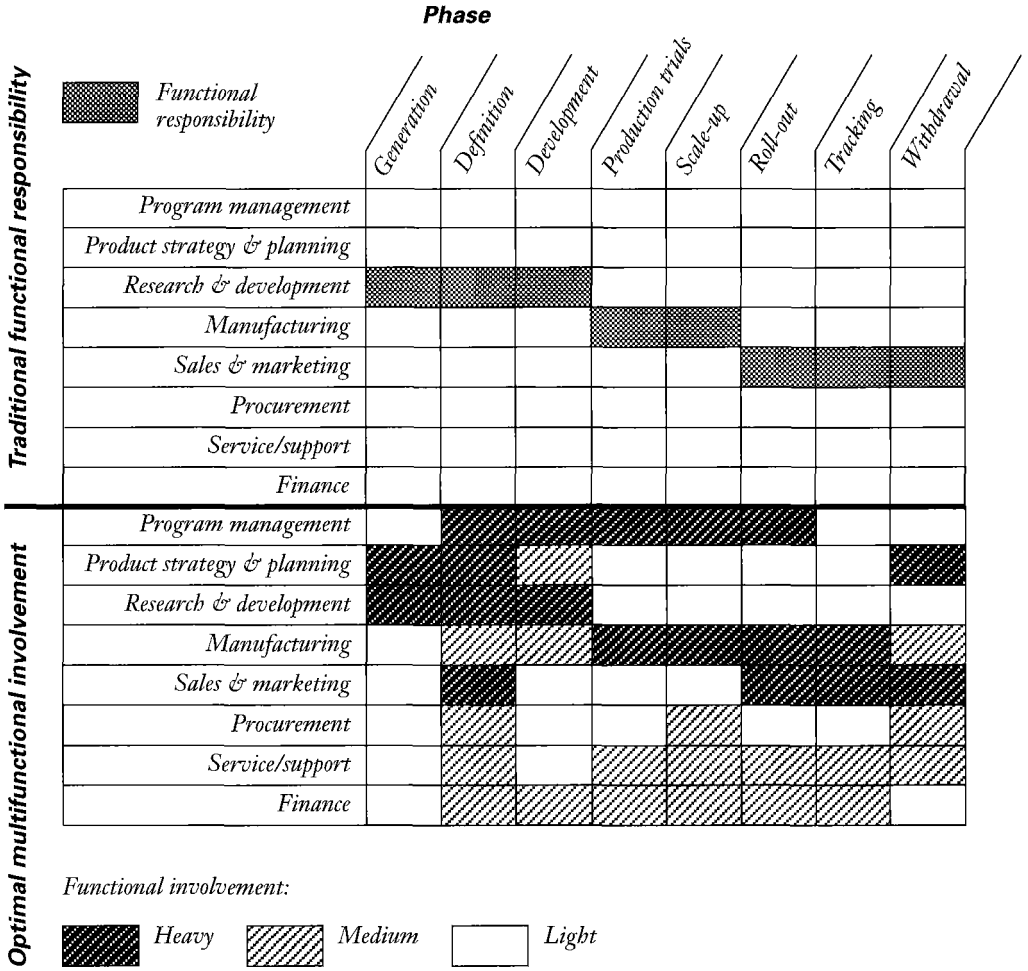
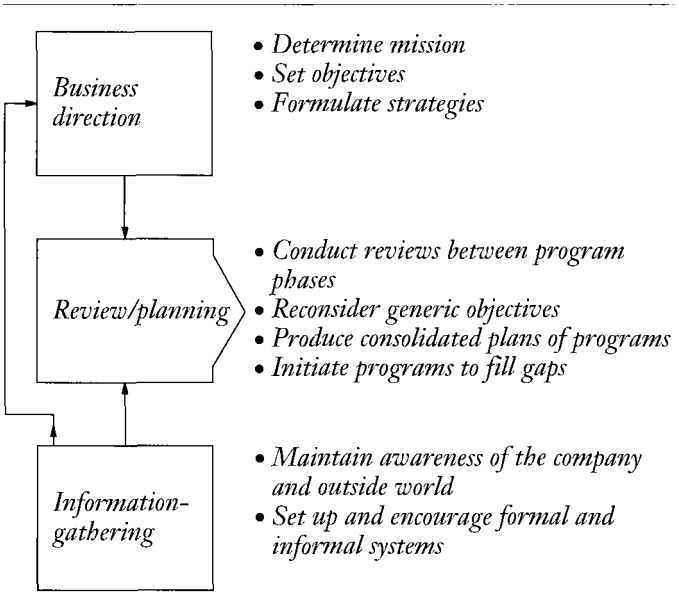


Exhibit 4

Steering Processes

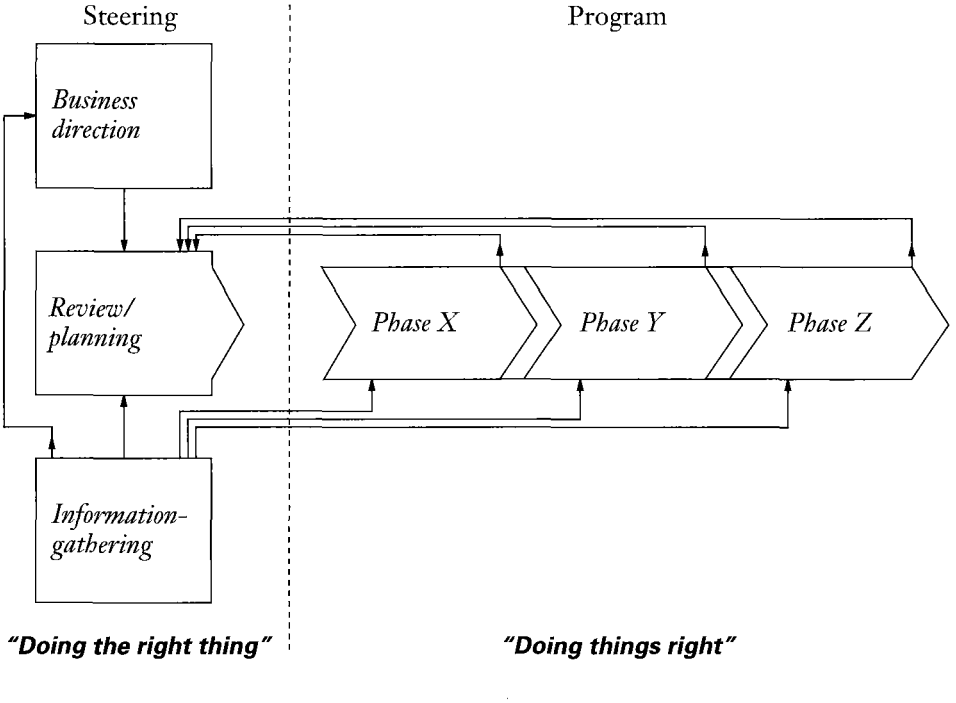


Within that context, IM uses the framework of reviews and objectives to achieve the right balance between control and delegation. Senior managers take responsibility for setting overall objectives and strategy. They also make sure that everyone who can benefit from it has comprehensive, up-to-date information on market and customer requirements, competitors, technologies, legislation and standards, availability of resources, and general changes in the industry.

As Exhibit 5 shows, while specific programs of activities draw on the information-gathering process during the phases, formal review/planning by senior managers takes place only at the interfaces. For this purpose, management adopts a series of generic review objectives that are focused on approval, decision-making, and problem-solving and are designed to keep risk to a minimum as financial commitment increases.

Exhibit 5

Interfaces Between Program Phases and Steering Processes



Because the broad objectives for a given interface tend to remain the same whatever the details of a specific project, they do not need to be recreated for each project. The program manager and team know that a review will take place at each of these interfaces. At each review, the completed objectives provide management with identification of the main technical and/or commercial risks in the succeeding phases, as well as a statement of what is going to be done in the next phase to reduce risk to an acceptable level. The team aims to complete its objectives to an agreed-upon timetable, giving management the information and the confidence it needs to authorize the next phase.

As shown in Exhibit 6, when objectives have been reached, senior managers review them and approve the allocation of the next level of investment or commitment of resources. If necessary, working with the program manager, they refine the program direction in the light of changes in the outside world or in the company itself and fine-tune the objectives for the next review.

Examples of the key questions typically addressed for a product program appear in Exhibits 7 and 8. Each set of objectives specifies all the deliverables required from every function or other relevant party – R&D, Manufacturing, Marketing, etc. – to complete the next phase. Examples of review objectives for the definition phase of a product program are shown in Exhibit 9.

Exhibit 6

Three Aspects of Interface Reviews

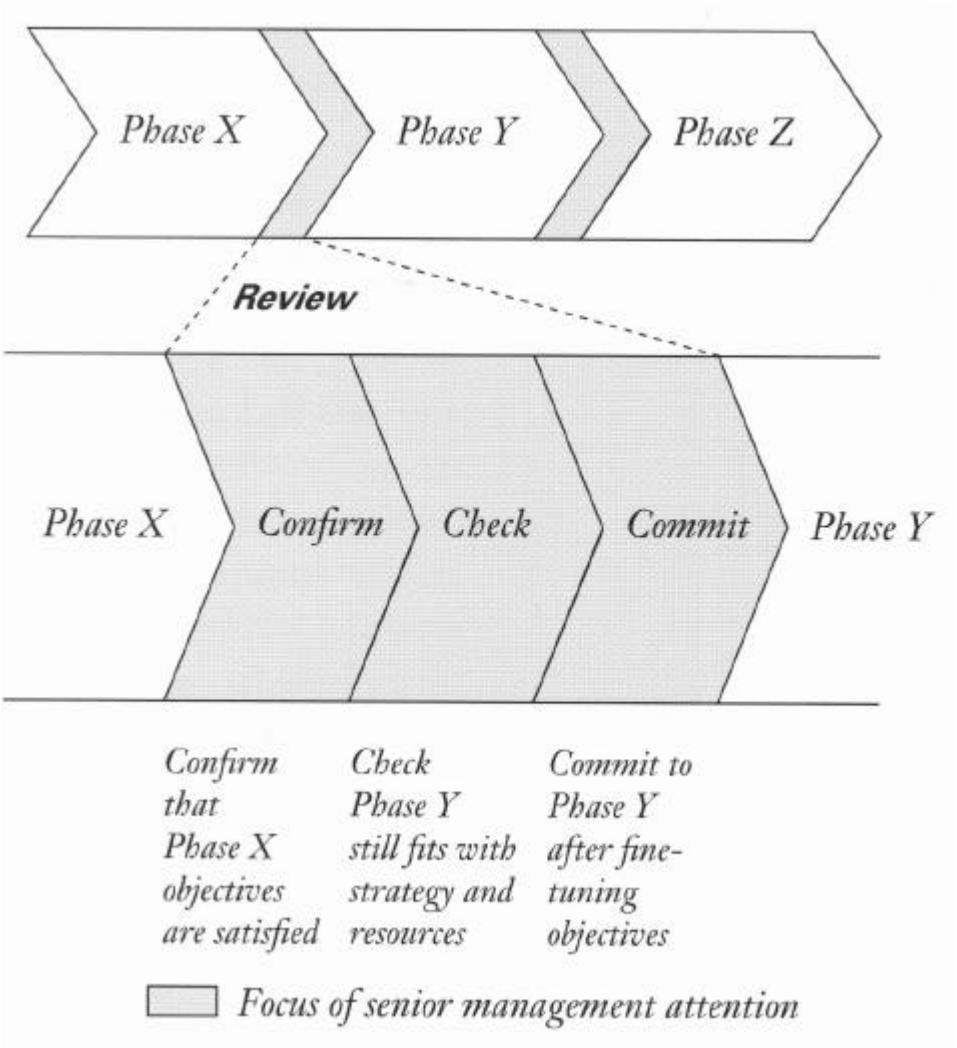


Exhibit 7

Steering Process Objectives – Key Questions

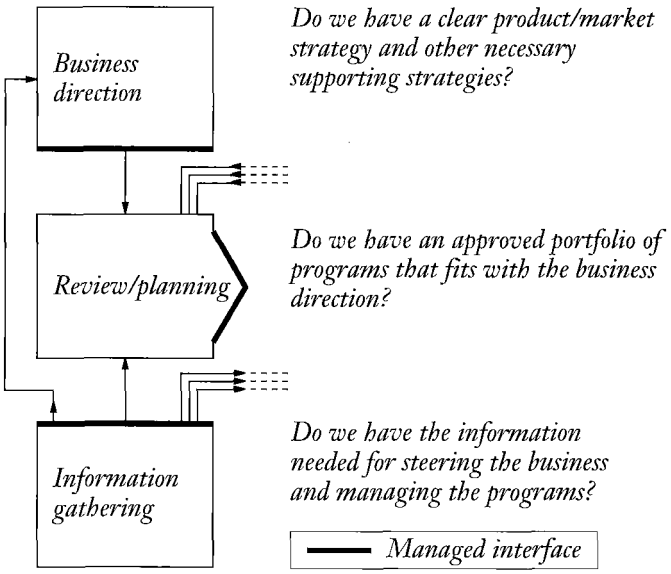
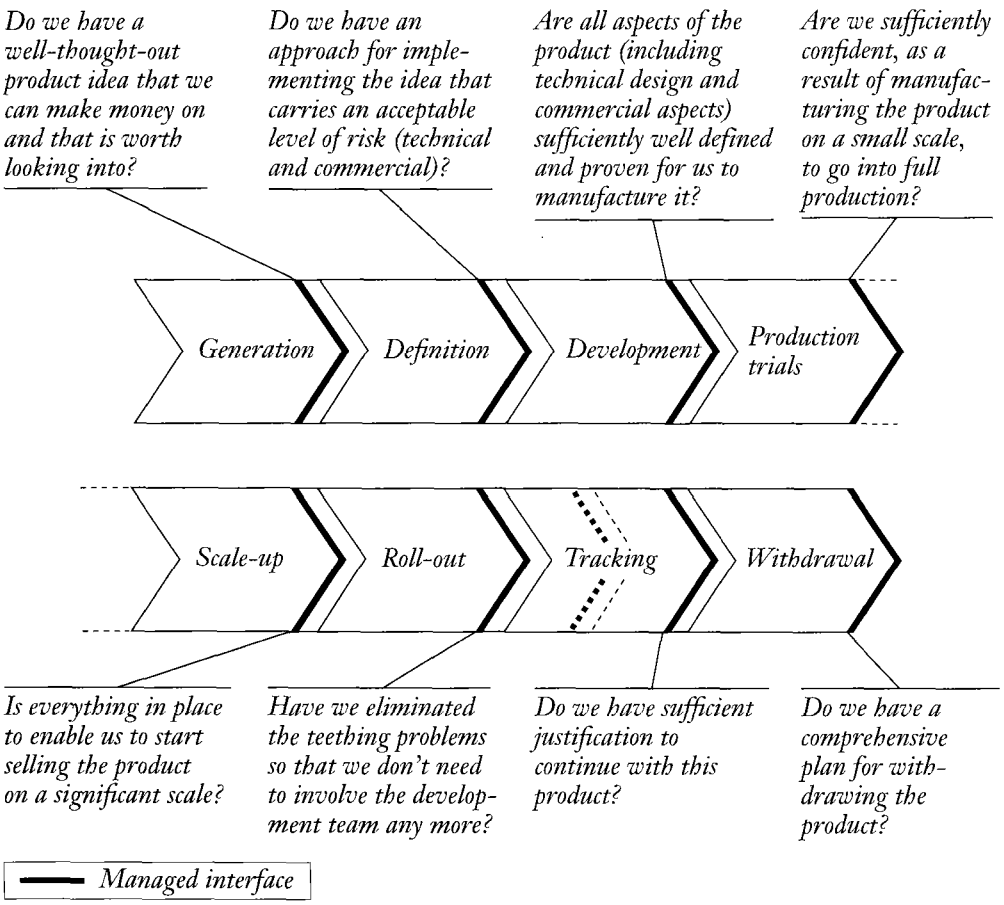


Exhibit 8

Product Program Objectives – Key Questions



The review objectives are for guidance, not for catching people out. They must be credible, based on experience and know-how, and include all the questions people would need to ask if the program were their own business.

To make the review system work, we have found three practices important:

• Give approval for the next phase only when all the objectives for the preceding phase have been met. Assuming that you can satisfy the final 10 percent later can be a mistake.

• Retain all documentation, to learn from experience.

• Update the generic objectives periodically to include items that had been overlooked or delete any that have become redundant.

With the review system in place, it helps to delegate as much responsibility as possible to dedicated program teams. The guidelines serve to encourage and reward teamwork, providing continual appreciation and support as well as appraisal and reward. They also help to make sure that teams use the same approaches and tools for planning and estimating. Finally, they encourage efficient working practices, such as:

• Getting it right the first time

• Reducing unnecessary diversity and complexity

• Working in parallel

• Working faster

Exhibit 9

Product Program – Definition Phase – Generic Review Objectives

Overall	Do we have an approach for implementing the idea that carries an acceptable level of risk (technical and commercial)?
Program management	*Do we have a plan that meets our overall time scale and cost objectives?* • *Detailed planning for next phase* • *Outline planning for rest of program* • *Responsibilities and resource requirements highlighted (internal and subcontractor)*
Product strategy and planning	*Have we validated the business plan comprehensively enough to reduce the risk to an acceptable level?*
Research and development	*Do we have a proposed technical approach that we are confident will meet the requirements of the product?* • *Performance* • *Cost* • *Time scales*
Manufacturing	*Do we have adequate plans for all long-lead-time activities?* • *Agreement on factory/staff allocation* • *Process development* • *Ordering of tools* • *Training employees* • *Preparing for testing*
Sales and marketing	*Have we validated the critical aspects of the sales/marketing support plan and drawn up detailed plans?*
Procurement	*Have we confirmed the plan by identifying and approaching potential suppliers for all the key components/raw materials?*
Service/support aspects	*Have we validated the critical aspects of the service/support plan and drawn up detailed plans?*
Finance	*Do revised financial projections, based on the latest plans, justify a decision to continue?*

Product strategy and planning	*Have we validated the business plan comprehensively enough to reduce the risk to an acceptable level?*
• *Product concept* • *Target customers* • *Coverage of range* • *Price (and pricing structure)* • *Volume/market share targets*	Confirmed by appropriate level of concept testing, market research, and direct customer contact?
• *Launch date*	Checked for consistency with project plan?
• *Key assumptions and variables*	Tested?

Getting Started

In the last five years, we have helped many companies in manufacturing and service industries reap the benefits of IM. But if your company has not been using IM, how do you introduce it? How do you start changing the way you do things?

To prepare for the changes required, as shown in Exhibit 10, you need to:

• Decide which interfaces need to be managed

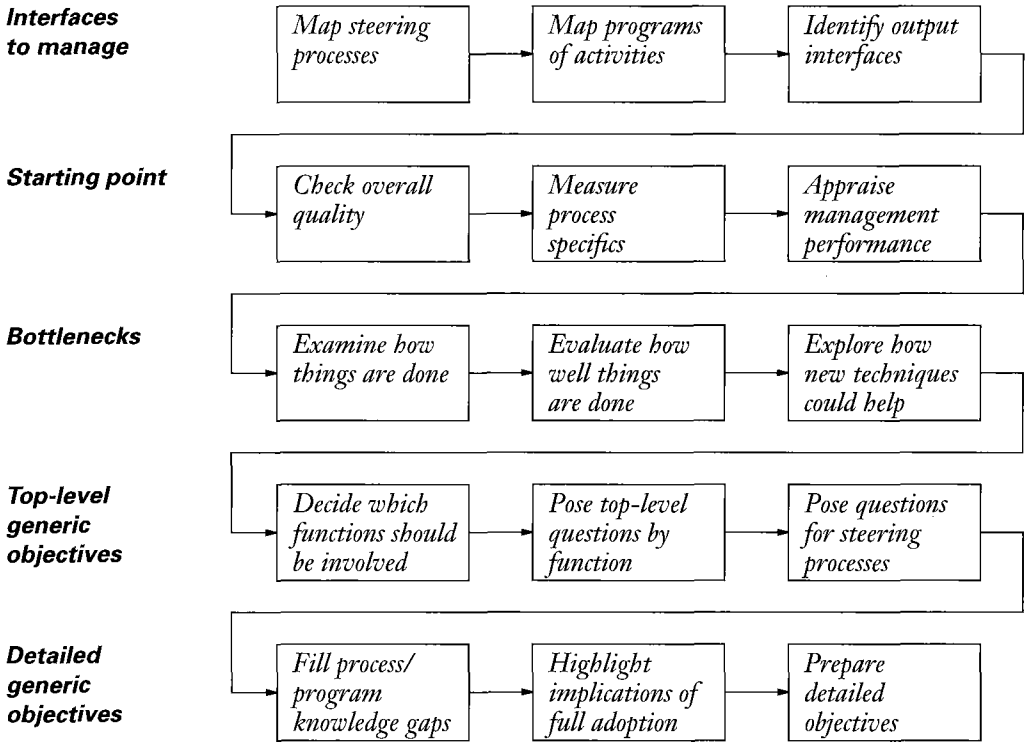
• Decide what your starting point is and what potential there is for improvement

• Identify and remove bottlenecks

• Prepare generic review objectives

Exhibit 10

Preparing for Interface Management



To decide on the right interfaces, first categorize your main programs, and then for each category identify natural breaks between phases, looking for points where teams and functions change, financial risk or resource allocations increase, or other milestones.

Using this framework, find out where you are now and where you could get to – in other words, industry best practice. You can adopt or develop measures for every essential activity and then benchmark your rating against those of your immediate competitors and those of the best comparable companies in other industries. This information will provide you with your justification to continue investment in the IM initiative.

You may find bottlenecks either at the interfaces or within phases. If interface management is completely new to your company, for example, late or incomplete handovers from one phase to another may be a problem for some time. The solution is to concentrate on managing that particular interface very tightly, perhaps with especially detailed review objectives, until it begins to work smoothly.

Other problems may arise within phases because people do not understand what best practice in that phase entails. The solution is to make everyone aware of the standard of performance required and to train people in new tools and techniques if necessary. Use diagnostic techniques such as analyzing past projects to check how things are being done, how well they are being done, and how they could be done better.

Draw up sets of generic objectives for each important interface. Include all the questions that project teams would want answers to if the business were their own. Then detail the objectives and highlight any organizational implications. With concerted effort, most companies get through this stage within a few months of deciding which interfaces need to be managed.

Making It Work

As with any other improvement initiative, however, rapid and full implementation of IM is the real trick. Insight and empathy are key – forcefitting IM does not produce results. We have learned that the most practical approach is to use a formal change management methodology to take a close look at how things work in a company. What are the real „rules of the game?“ Do unwritten rules guide individual behavior and give conflicting signals? People will change their attitudes and behavior only when they see that the rules of the game „fit“ with an improvement initiative.

Top managers in one of our medium-sized client companies decided to introduce IM to be sure that it was meeting its customers' long-term product needs. They arranged for all staff to be trained in sharing information on customers' needs. In spite of the training, however, little changed. At this stage, the company sought our help. Managers hadn't realized that the way the company worked failed to encourage the sharing of information. Indeed, the rules of the game positively discouraged it. The reward system, for example, was based on results within functions, and loyalty was to immediate superiors, not to corporate management.

We helped the company change the career development and reward system to align with the goals of IM and so avoid the conflicting signals. People changed their attitudes and behavior as soon as they saw that the rules of the game were consistent with the IM improvement initiative.

If you decide to change the rules of the game in your company, do it cautiously to avoid unwanted side-effects. We always make a systematic assessment of the extent and type of change required – across functions, up and down the hierarchy, and between sites – before advising any action to make the rules of the game more conducive to IM.

Then introduce IM as quickly as possible, to maintain momentum. Train everyone who needs to be trained, formally or informally. If necessary, produce a manual of the new IM-related techniques and distribute it widely.

Once they have planned and implemented IM, successful companies keep reaping the benefits, even when their markets and customers' requirements change. IM allows them to do exactly what the best of their competitors are doing – maintaining constant feedback, fine-tuning whenever necessary, and improving continuously.

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