

Aligning Development Resources with Product Development Priorities for Continuous Improvement

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This article tells the true story of a company that was losing market share because its Marketing, R&D, and Manufacturing units were operating on three separate paths. The company redesigned its entire product development process, aligning business priorities with technological capabilities and creating teams on which all functions of the company worked together. As a result, the company was able to respond to the market much faster and more effectively than ever before.

„It seems that the new products we need in order to compete exceed our development capacity by far,“ observed Mr. Celsius, the CEO of Heatup Inc., at a recent meeting of the company’s management team. [All names have been changed to protect confidentiality.] Heatup is a large manufacturer of household appliances, specializing in microwave ovens. The technical director, Mr. Hot, immediately replied, „Indeed, consumers are asking for more functionality and more options, while our competitors are constantly reducing product life cycles. We must increase our development capacity if we want to maintain our technology leadership. We have more than 10 new products to be developed in the coming two years, requiring new programming features and a very innovative solution for the man-machine interface, and we simply do not have a technical solution ready to be implemented.“

The marketing director, Mr. Share, was incensed. „Our major competitor just launched a product exactly like the one we had in mind two years ago. Why didn’t we seize that opportunity? I’ve been asking for a low-cost, simple microwave for the low-end segment for more than three years, and now I hear that we have no technical solution. What have you been working on for the last three years?!?“

In the ensuing discussion, the tension between Marketing and R&D continued to rise. Over the next several months, to resolve the conflict, the company made various short-term decisions, stopping and starting projects almost capriciously and incurring considerable cost in terms of both money and morale. Meanwhile, Heatup’s competitors launched more new products.

The situation described above is not unusual. Ineffectual product development tends to lock companies in vicious cycles that increase the gap between the firm’s business priorities – driven by customers and competitors – and its technology assets, which reflect scientific priorities and areas of intellectual interest (Exhibit 1). As this gap widens, the firm’s competitive position deteriorates.

When Mr. Celsius realized that Heatup was caught in such a cycle, he called in his technical and marketing directors and presented a challenge: how to realign Heatup’s product and technology strategies and build the necessary development capacity – without inflating the R&D budget? After conducting some research with the people in their respective departments, the two directors came to the conclusion that, with minor exceptions, they had the right competencies in place. They also agreed that the only way to align business priorities with technological thrusts, leading to a comprehensive validated product plan, was to start a major learning and change program, focusing on individual and team learning through talking and thinking together.

Mr. Celsius summarized the discussions that had been going on in the marketing and development departments: „We have to radically rethink our key processes. Clearly, we must focus on the real market priorities, translate these priorities into technology innovation programs, and then optimize our development capacity to meet the market’s most important needs. We cannot continue to develop everything for everybody, because we end up developing nothing – while increasing our R&D budget!“

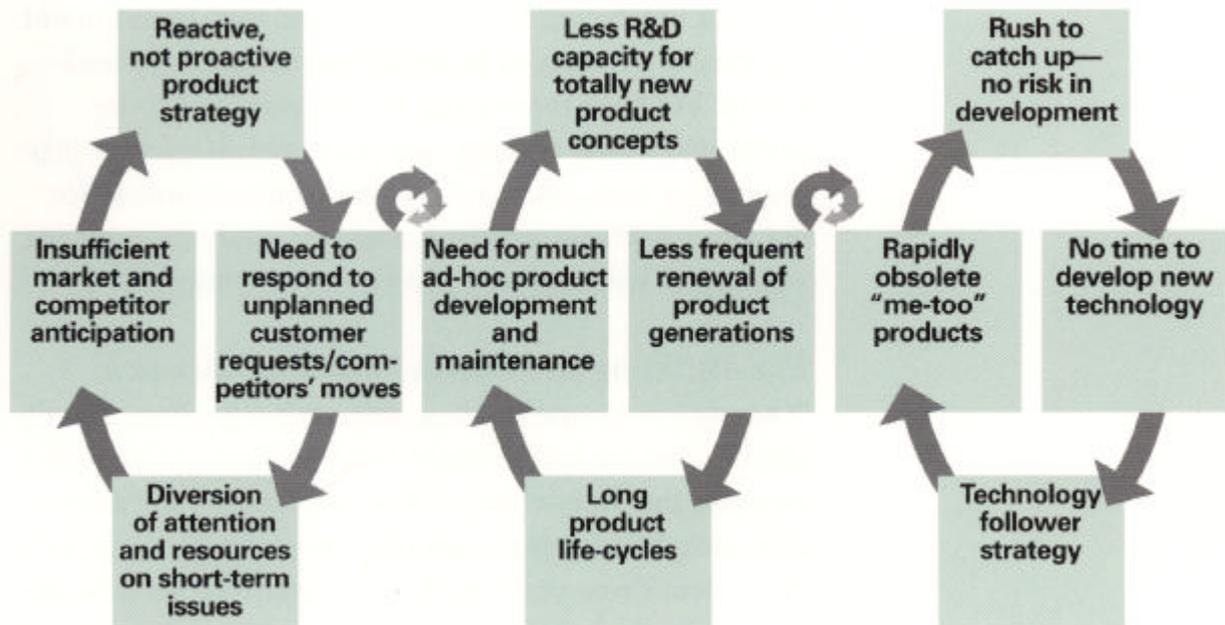
The message was clear. Mr. Hot and Mr. Share were appointed co-leaders of a major change program to bring Heatup’s technology innovation program into alignment with market needs. They would lead multi-functional process teams that would design and implement the change program in parallel with an actual product development program for a new-generation microwave oven. First, the teams had to establish a vision of the new way of working.

Establishing the Vision

The multifunctional process teams, composed of people from marketing, development, manufacturing, and sales, started by defining the ultimate goal of the change program: to establish an ideal alignment between technology and business, so that each would reinforce the other to increase the value of the firm over time.

Exhibit 1

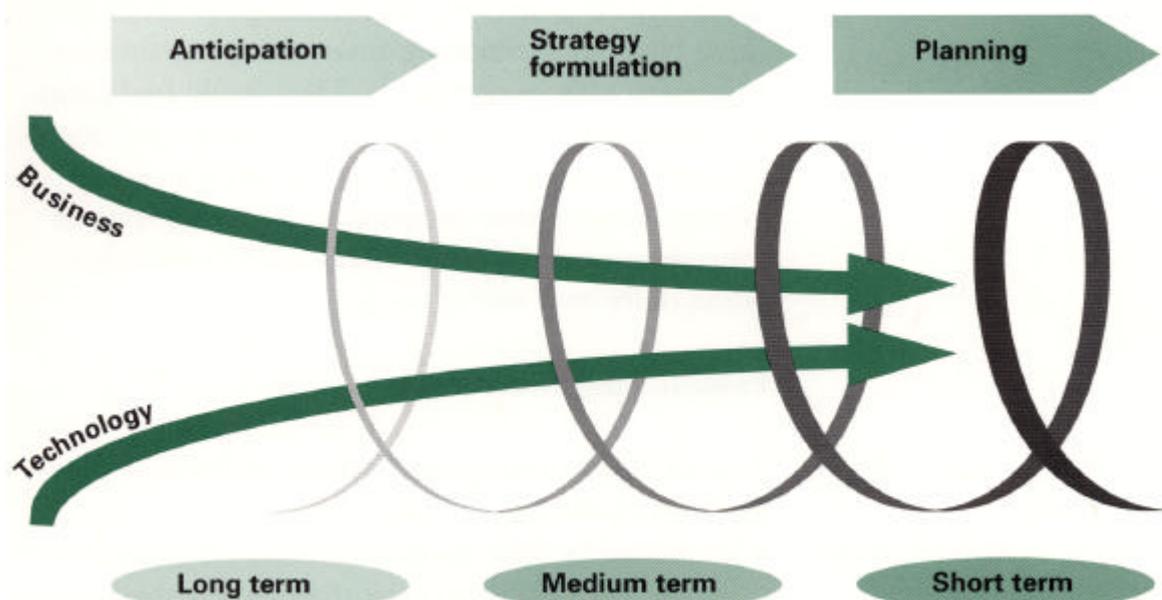
Ineffectual Product Development Cycles



Knowing that most people in Heatup Inc. were pragmatic, the teams decided to illustrate what they meant so that their vision could be easily shared with the rest of the organization. „Alignment implies that business opportunities should be effectively supported by adequate know-how, solid experience, and innovative solutions. For example, in the case of the intelligent, easy-to-use microwave oven we want to develop, it would be useful if we had considerable experience in fuzzy logic,“ said an experienced designer. The European product manager for combination ovens added, „Alignment also implies that technologies trigger new business opportunities by creating new ideas, new ways of realizing a function or a product, or new customer needs. For example, by applying fuzzy logic, we could target a three-in-one (microwave, oven, and grill) product line to elderly people who are still reluctant to use our sophisticated microwave ovens because they simply do not understand the user manual!!!“

Exhibit 2

Reinforcing Business and Technology Priorities



After more discussion, the teams agreed that, to be effective over time, the reinforcing mechanism between business and technology priorities should be organized around three phases, each with a different time horizon (Exhibit 2):

- *An anticipation phase*, in which business aspects and technologies are analyzed for their long-term and breakthrough opportunities. For example, Heatup might investigate new cooking requirements triggered by social trends, as well as new sensor technology to control the cooking process.
- *A strategy formulation phase*, in which major directions are set and choices made. Mr. Share said, „We must reinforce our low-cost basic product line to compete globally against the low-cost strategy followed by the traditional oven manufacturers.“ The North American plant manager responded, „This product strategy will affect our technology portfolio. If we really want to focus on low-cost products, we have to investigate at least two alternative concepts, one for a cheap, low-energy device, and one with a simplified mechanical architecture to reduce manufacturing costs.“ They were implicitly making choices, progressively building convergence between the needs of an attractive market segment and the corresponding technology innovation requirements.
- *A planning phase*, in which projects are scheduled over time, in line with available resources. The marketing people understood that their requests of the R&D department had to focus on the most attractive opportunities. Mr. Hot in turn realized that after having made choices and aligned the product and technology strategy, he would have to plan the development resources and identify the bottlenecks.

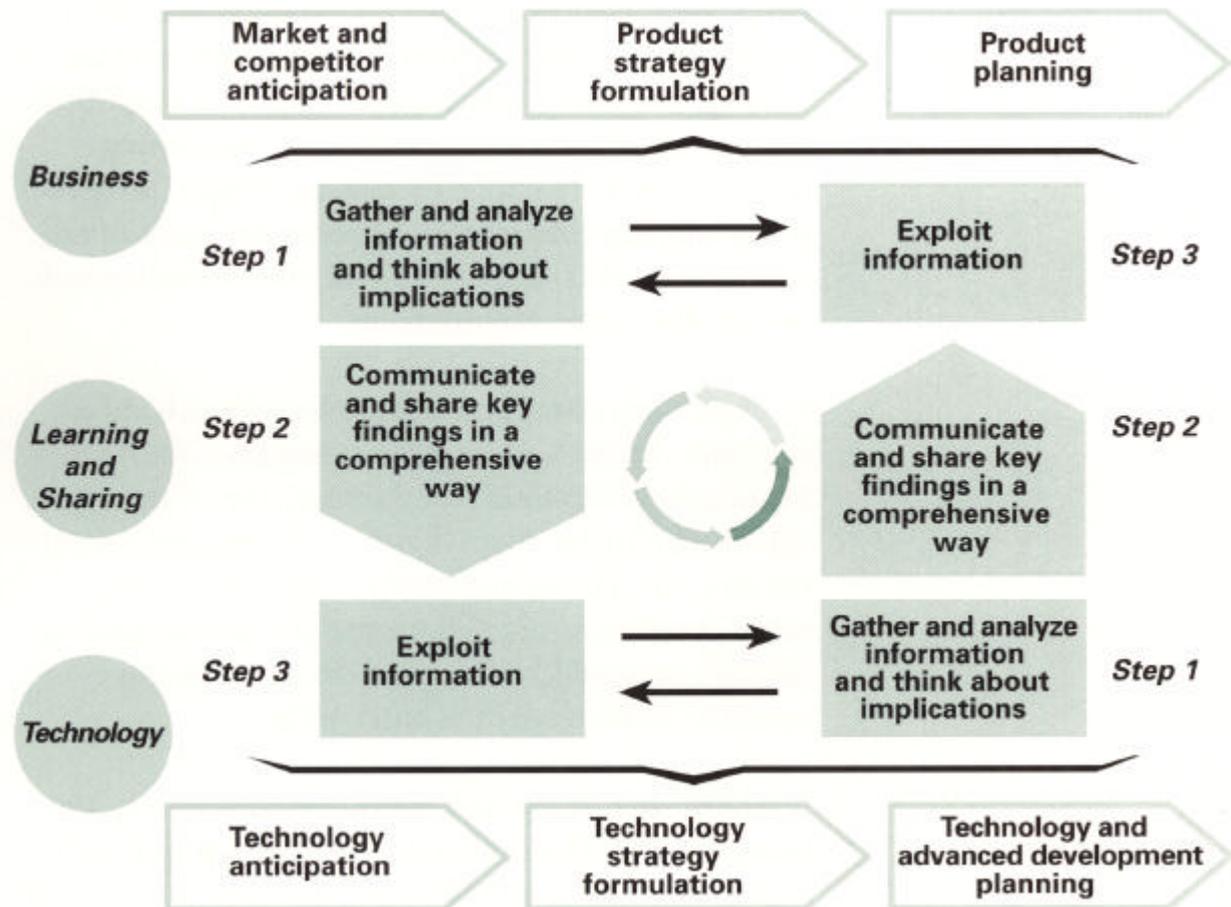
A month later, at the next management meeting, Mr. Share and Mr. Hot outlined the three-step approach to alignment that the multifunctional teams had come up with. They had discovered that simply by talking about this alignment project they were already building on each other’s ideas. In other words, alignment arose naturally from an exchange of well-structured information, allowing all functions to build iteratively on that information (Exhibit 3).

Mr. Hot said: „The first step consists of *gathering and analyzing information specific to the technology or business field and thinking about the implications*. What are the emerging market segments for our microwave ovens? The ‘elder generation’ segment is representative. Demographic trends show that this is a growing segment and a very affluent one. They have very specific requirements for easy-to-use products with automatic temperature control, which can be used for multiple purposes. One of their specific needs is the ‘error free’ concept, whereby the oven detects and corrects any mistake, as elderly people generally have little experience with electronic controls. To support this segment, which technologies are emerging? For example, the fuzzy logic technology applied to autofocus cameras could be adapted to the microwave oven to make it error-free, leading to an easy-to-use multipurpose microwave oven.“

Mr. Share explained the second step, focusing on *the communication and sharing between business and technology representatives*. Ideally, this step is organized around interactive sessions, including creative brainstorming workshops, so that all parties can capitalize on each other’s ideas. Mr. Share commented, „When describing our requirements to the R&D people, we should explain why some specific features are becoming very important over time. For example, asking for an easy-to-use microwave oven does not make sense until we explicitly describe that we are targeting the attractive and growing segment of elderly people who have difficulties in using remote controls and programming VCRs. Furthermore, sharing information about this segment highlights the importance of meeting the easy-to-use requirement in a complex three-in-one product that caters to the wide usage pattern of elderly people, from wanting to make home-cooked food to preparing diet foods prescribed by physicians. Expressing these somewhat conflicting requirements on paper is far less useful to our technology colleagues than a constructive explanation of the reasoning behind our expressed needs. Furthermore, these conversations open the door to additional technology opportunities. For example, our technologists suggested a new coating technology allowing more colors, thus triggering the opportunity to design the range around a colorful, appealing design style without adding cost to the product.“

Mr. Share and Mr. Hot then explained the third step in the program, showing how both Marketing and R&D *could capitalize on the exploitation mechanism*. For example, after the brainstorming session, the R&D department could focus on the technology project portfolio, identifying a short list of low-cost technologies around the coating process, while the marketing department evaluated the traditional features that might be eliminated from the low-end line, thereby reducing both complexity and cost. Exhibit 4 presents a detailed framework of the business/technology interaction, listing the most important issues to be investigated and communicated at each step.

Exhibit 3
Building Alignment



Mr. Celsius and the other management team members listened attentively as Mr. Hot and Mr. Share presented the vision that had been created. The managers liked what they heard, and authorized them to launch the change program. Mr. Celsius stated some ground rules:

He said: „As in the design stage, I want this program to be highly interactive and multifunctional, involving the most important functions of the company, specifically Marketing, R&D, and Manufacturing. Therefore, I am asking you to build the program around cross-functional events.“

He continued by reaffirming the commitment of senior management. „You are the project leaders, but it must be clear that this is our project and will therefore receive top priority.“

In order to ensure longlasting results, he underlined the importance of building a bottom-up process, involving the young product managers and the new engineers. Everyone involved should see this project as an opportunity to express his or her creative ideas and almost immediately begin a new way of working.

He observed that the people implementing the alignment process ought to respect the other key processes already in place at Heat-up and synchronize the main events of the program with the firm’s overall strategy and business planning cycles. Finally, he noted that the new process was unlikely to work perfectly the first time around. Therefore, he said, „we will repeat this process once or twice every year so that we can gain experience and keep improving it.“

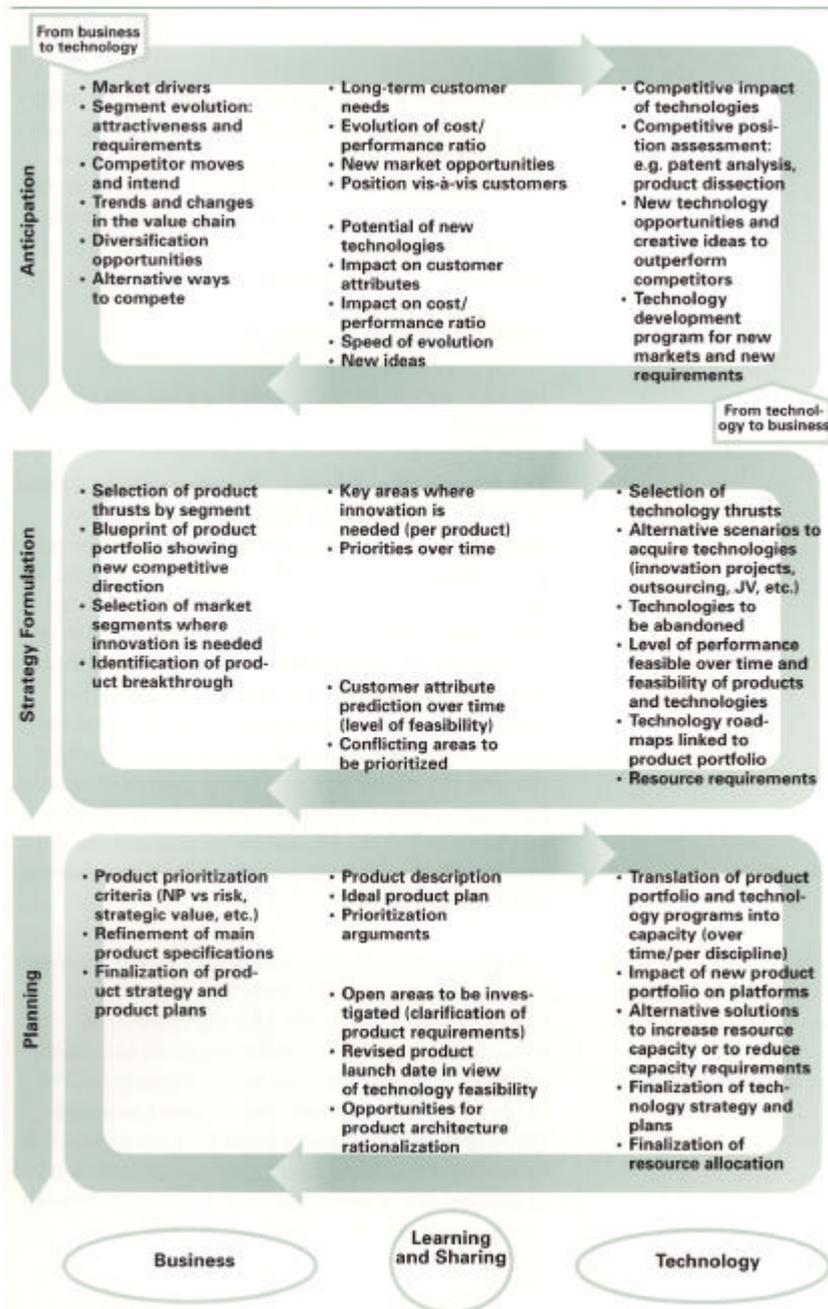
Implementing the Program

Implementation entails two phases: preparation and execution.

The Preparation Phase. The process teams headed up by Mr. Share and Mr. Hot began preparing for implementation by fully describing the change program and establishing a preliminary schedule of key events and supporting formats. They explained the importance of this process design step as follows: „It is crucial to collectively set up models of the various processes that we will follow and share these models throughout the

organization. Speaking the same language across the various functions is essential. Furthermore, by understanding the overall structure of the alignment process, participants will understand the sequence and interdependencies of all the steps in the process and the relevance of their contributions both to their own function and to other functions.“

Exhibit 4 Capitalizing on the Exploitation Mechanism



The preparation phase of such a large change program has three main objectives. First, it is important to build a *shared vision*. As Mr. Hot explained to his colleagues, „During the last five years, we have been concentrating on short-term issues, focusing on cost reduction and productivity improvement programs rather than developing new innovative strategies. Now we really have to face current reality. Unless we succeed in aligning our business priorities with our technology innovation programs, we will not succeed at all.“

Second, it is essential to select the *key players* who will make change possible. Change initiatives often fail because of insufficient functional proficiency, lack of motivation, or conflicting personal agendas of the key players. Mr. Share was concerned about the importance – and difficulty – of ensuring a balanced representation of Heatup’s various regions and businesses. Together with the Human Resources Manager, they rated the potential candidates in terms of proficiency, motivation, etc., before putting together the teams that would start the new way of working.

Third, it’s important to recognize *existing processes and competencies*. During the preparation phase, Mr. Hot and Mr. Share and other team members were visited by many functional managers, who were worried. „We understand that you are designing a new innovation process. However, we have already developed and implemented new processes, and some of them are very good. For example, we have a new resource planning mechanism, which takes into account our scarce resources in specific technological fields. Please don’t reinvent the wheel!“ It became obvious to the process team that they must rapidly assess which practices currently in place were effective, as failure to do so would be both wasteful and frustrating to the people who had already devoted themselves to these improvements.

Of course, some process elements were simply missing. The team agreed wherever possible to fill these gaps with „turnkey“ solutions as a starting point. Later, if necessary, the organization could adapt them to its own tailor-made solutions.

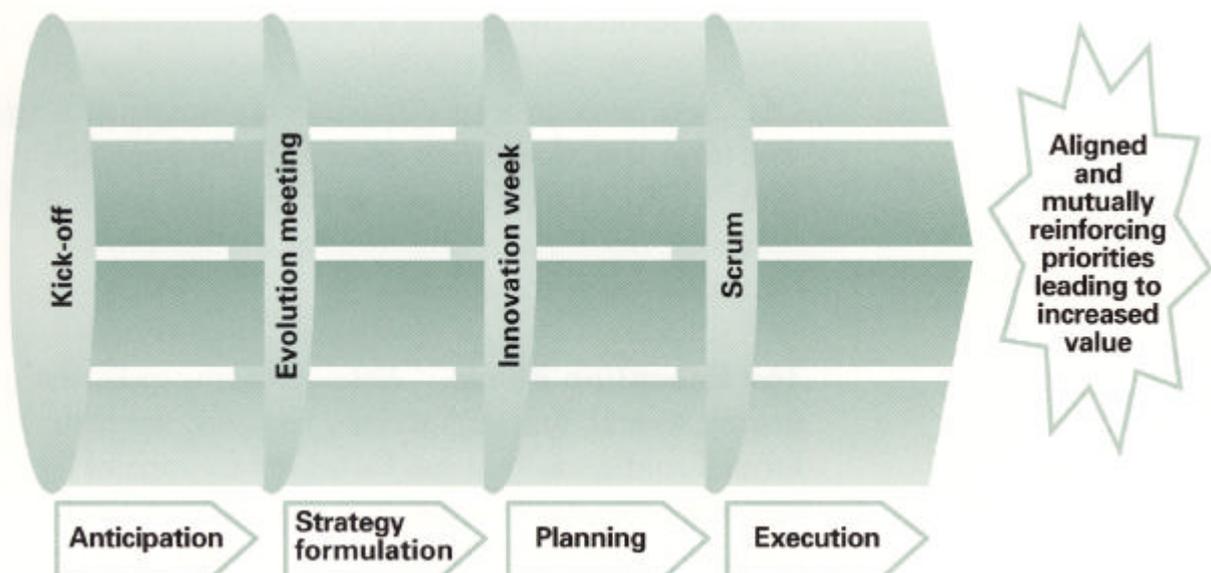
The Execution Phase. Although many tasks that involve several functions across a company are performed continuously, it can be helpful to think of business processes in terms of cycles, each of which contains key events. The repetition of cycles is what creates the opportunity for team learning.

The process team envisioned the product development cycle in terms of four phases: anticipation, strategy formulation, planning, and execution. Within this cycle, they planned a number of key events, in which all the various teams would share their thinking interactively, building on each other’s work. Recognizing that the key to ensuring effective alignment between business and technology is frequent communication among the various functions at every level, the team decided to run the program around four key events: a kick-off meeting, an evolution meeting, an innovation week, and a „scrum“ (Exhibit 5).

The kick-off meeting. Although the alignment process would affect the daily operations of many people across the organization, time constraints and operational priorities would necessarily limit the number of active participants in the alignment process. Mr. Hot and Mr. Share realized how important it was that the learning generated by the alignment process not be limited to the people actively participating in the process, but cascade through them to the rest of the organization. So they invited a very large group to participate in the kick-off meeting, including the product managers from the different product lines, the leaders of each technological group, the key people in central research, and people involved in manufacturing key components in the microwave oven.

Exhibit 5

The Product Development Cycle



Two months after the presentation to the management team, the kick-off meeting took place. It focused primarily on communicating the goals of the alignment program and determining who would be involved in the various task forces in the coming months. The main presentation was by Mr. Celsius, the CEO, who stressed the importance of this project to Heatup's chances of regaining leadership in their business.

The evolution meeting. After the kick-off meeting, the various participants started gathering the necessary information in their respective fields. Product managers interviewed key customers, quantifying the evolution of their needs with respect to key attributes, collecting the views of lead users of microwave ovens, and analyzing the results of the most recent market surveys. They also reviewed market segmentation and migration. Mr. Share, who was leading that task force, mentioned informally to Mr. Hot, „This six-week period of 'full market immersion' represents the unique opportunity for my product managers to move away from their preconceived ideas and look at the market with different eyes. They are focusing on the coming evolution meeting, when they will have to communicate the new trends to their colleagues from R&D. Naturally, they don't want to appear as if nothing has changed since last year! In fact, the trend toward low-cost microwave ovens is likely to be much more important this year, influenced by Korean mass producers of commodity products.“

Similarly, the R&D key players were preparing to present the most advanced technologies they could foresee in the microwave oven business. The evolution meeting consisted of a limited number of presentations focusing on new information from both Marketing and R&D.

After the evolution meeting, Marketing and R&D prepared the product/market strategy. Marketing concentrated on the product strategy, describing the most important products they could foresee for the future and why. This year they, stressed cost issues and the rapid growth of specific segments that Heatup had not traditionally addressed. For example, the student business, considered marginal for a long time was now showing very attractive growth. Similarly, the traditional, so-called „average“ family segment was showing signs of maturity. Heatup's marketing people took these trends into account in shaping their product strategy, defining where to compete, how to compete (which attributes to promote), and when to compete (how fast innovative products were needed per segment).

While marketing staff looked at the markets, R&D prepared the technology strategy. Anticipating the now-imminent innovation week, they had prepared a demonstration model of their most recent high-performance cooking device. But as innovation week began, Mr. Hot was worried, feeling the enormous gap between what he was hearing from the marketers and the „performance“ issues addressed by his R&D teams.

The innovation week. The strategy formulation phase, which took about a month, culminated in the third key event, the innovation week. This was a large meeting, lasting 4 – 5 days, which had two goals: first, the two sides would share and align their strategies in view of what is feasible and what is unrealistic. Second, they would identify the most important and most urgent actions necessary to shape the long-term technology portfolio.

During Heatup's innovation week, marketers met engineers and exchanged their views on real business issues. „Last year we described the importance of the high-performance microwave oven. We must recognize that our market is now changing its focus. All the indicators show a trend toward low-cost, low-energy, easy-to-use products. The sophisticated programming functions that we thought were important are less and less appealing to consumers, who don't want to pay for a feature they never use. On the contrary, they insist on a clear man-machine interface, with no additional features. Moreover, aggressive product entries from Korean manufacturers have set the price level at 15 percent below last year's!“

During these discussions, engineers appreciated the openness and detail provided by the marketers. They recognized that last year's assumptions were no longer valid, and they responded by defining a more focused product strategy. The head of central research reported, during a workshop on technology innovation, „We have identified five technologies that, in combination, would allow us to develop a low-cost microwave oven, by combining our low-energy source with our simple driving mechanism, built into our new-material, single-piece cabinet. If we could stop working on three high-performance projects, we would free up enough capacity to show preliminary results in less than a year.“

This innovation week also allowed participants to review the list of core components that were re-used in most Heatup products, generate ideas on product platforms, and create a large proliferation of potential products using a minimum number of building blocks and components.

The scrum. After the innovation week, the product managers prepared the „justification“ of the required products. This takes the form of product portfolios, showing the most important dimensions along which the products will be prioritized. In parallel, the R&D leaders prepare estimates of the man-capacity needed to develop each product from the wish list and to execute each relevant technology program.

Soon after the innovation week, Mr. Hot asked his people to run a first simulation, adding all the capacity requirements to satisfy the product managers. The preliminary results were startling. He immediately called his colleague, Mr. Share, and said: „We have a problem! We need three times more capacity than our current staffing to develop all the products you need. We cannot go into the scrum like this; we'll lose our credibility.“

They analyzed the situation together and identified potential improvement opportunities. Mr. Share said: „We could probably combine some of our product wishes, building in the differentiation at the latest stage of manufacturing.“ Similarly, Mr. Hot added: „We could try to free up some capacity by asking our local development units to concentrate on short-term product improvements, allowing me to concentrate our core competencies on new products. Also – last but not least – I will start an improvement program to improve our productivity.“

Three weeks later, with some trepidation, Mr. Share and Mr. Hot hosted the scrum. They went into it afraid of open conflicts between Marketing and R&D, and were positively surprised to see how Marketing, R&D, and Manufacturing had all generated creative solutions to optimize new product throughput: „Let's try to shift the launch date of this product by two years, we can probably survive with our current version. ... Can we boost our capacity by involving some of our local development colleagues more heavily? ... I propose we combine these two products in one, thereby postponing the launch date by only three months, still on time for the Christmas season! Can we have the new manufacturing line ready on time?“

During the scrum, products were added, removed, shifted, and combined. Similarly, resources were reallocated over time to align the available capacity with top-priority market opportunities.

Conclusions

When the final product plan was issued, with the full commitment of Marketing, R&D, and Manufacturing, Mr. Celsius organized a debriefing session with Mr. Hot and Mr. Share. „Today, over half a year after our first discussions, what can we say about the outcome in terms of results and lessons learned?“ asked Mr. Celsius.

Mr. Share stated, „The number of development projects focusing on small product improvements has been halved, while we have some clear leadership products in our product plan. Furthermore, we have made a significant move toward more global products instead of many slightly differing regional ones.“

Mr. Hot added, „We have redirected our research portfolio to our strategic priorities. Two-thirds of our program is geared toward low-cost breakthroughs and ease-of use technologies, while last year we had hardly anyone working on these priorities. As a positive side-effect, the total number of research programs has been reduced by 50 percent, thereby increasing our focus, as well as our chances of technical success. And finally, cooperation among the various functions has improved tremendously. We have really learned how to involve each other in making difficult product and technology decisions.“

They crystallized the key lessons they had learned from the first experience of the new, aligned product development cycle:

- Harmonize the process steps in all the teams dealing with similar issues. Variations in quality and depth of the analysis must not lead to simplifying the process, but to reducing the depth and level of details of the process execution.
- Communicate the overall process in simple terms, leaving the complexity of the processes to the teams actually performing the detailed tasks.
- Document the process fully during its execution, formalizing the tools used in a practical and teachable manner.
- Give real-time, face-to-face, communication priority over written communication.

Finally, Mr. Celsius congratulated his colleagues for their leadership in aligning their respective functions through a common process and encouraged them to keep improving it with every cycle.

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