

Analysis of strategy formulation and implementation at Hewlett-Packard

Rainer Feurer, Kazem Chaharbaghi and John Wargin

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Abstract:

Dynamic strategy formulation and implementation is achieved at computer giant Hewlett-Packard by transferring ownership of the strategy to every member of its organization. This ensures that the developed strategies are attuned to the business environment and opportunities while attaining speed and focus. As a support to this strategy process, a structured framework that includes a variety of tools is employed, guaranteeing that strategies are monitored, changed, communicated and adjusted at regular intervals. This framework also influences the development of an integrated corporate strategy. Formulation of strategy is considered a constant learning process at the company, supported by a structure and culture that fosters change and continuous learning. Cross-functional and process-oriented teams expedite the strategy formulation and implementation process by enhancing the quality and span of their knowledge base. Implications of this approach are discussed.

Full Text:

Presents a number of approaches to strategy formulation and implementation which represent some of Hewlett-Packard's best practices

Introduction

There is a general recognition that competitive environments are changing at an accelerating rate culminating in a high level of uncertainty. As a result, the critical success factors are constantly being challenged. This calls for a constant change in competitive strategies[1-3]. Subsequently, organizations can no longer afford to adopt a unidirectional or step-by-step approach to strategy development which entails several stages including data collection, development of strategic options, evaluation, selection and implementation. In the face of a high level of uncertainty and change there is a need for a dynamic approach in which strategy formulation and implementation are carried out simultaneously. This represents an ongoing process of analysing the competitive environments and developing strategic options together with their evaluation. This process should take into account the required implementation time-frame and the span of the strategic gap[4]. The need for moving towards a dynamic approach to strategy formulation and implementation is illustrated in Figure 1.

Dynamic strategy formulation and implementation are realized when they are no longer regarded as centrally performed processes but as part of a continuous learning process such that the overall operations and supporting strategies are constantly aligned[5]. The fact that organizations worldwide are abandoning their central planning departments and dispersing the ownership of strategy formulation throughout their organizations is a clear indication of the significance of the dynamic approach.

While the transfer of strategy ownership throughout the organization speeds up the formulation and implementation process there is also the danger of organizations losing their focus and engaging in a wide range of activities which may result in the dilution of competitive advantages and a sub-optimal usage of the organization's capabilities and resources. It is therefore necessary to find the right balance between establishing an overall strategic direction for the whole organization and maintaining flexibility to ensure swift reaction to changes in the competitive environment. This can only be achieved through a high level of communication and coordination within the organization and the availability of common tools for strategy

formulation and implementation. Furthermore, it requires the existence of a structure and culture in which constant change is regarded as necessary rather than being an exception.

A large number of methodologies have been developed over the years on different facets of strategy formulation and implementation. However, only a few organizations succeed in translating these methodologies into measurable performance results. It is therefore necessary to question why some organizations are able to achieve outstanding results in financial terms as well as non-financial performance, such as customer and employee satisfaction in competitive environments where both the speed of change and competitive pressures are enormous. For this purpose the computer industry provides a good platform, as it is characterized by an almost unparalleled speed of change concerning key success factors, product development, customer expectations and shifting distribution channels. In the face of intense competition some organizations in the computer industry are demonstrating three-digit growth rates while others, which have been market leaders for years, are forced to cut costs by half in order to survive.

This article focuses on one of the success stories of the computer industry, Hewlett-Packard, and examines its approaches to dynamic strategy formulation and implementation. Hewlett-Packard has grown to become the second-largest computer manufacturer in the US and has been ranked as the most admired computer manufacturer for three subsequent years[6]. While other organizations in the industry have been writing considerable losses, in the last quarter of 1993 Hewlett-Packard has achieved an improvement in profitability of 41 per cent[7].

While each unit within Hewlett-Packard has a large degree of freedom on the selection of tools and techniques in strategy formulation and implementation, there is an overall framework which links and combines the individual strategies to the overall organization strategy. This article presents a number of approaches to strategy formulation and implementation which represent some of Hewlett-Packard's best practices. Based on various discussions at Hewlett-Packard, the authors have abstracted and combined these into a holistic and integrated framework. An overview of Hewlett-Packard's organization together with its competitive environment is first presented. A high level description of the strategy formulation and implementation process is then provided using selected tools and frameworks for illustration purposes. The article finally demonstrates the way in which Hewlett-Packard's structure and culture support its dynamic approach to strategy formulation and implementation.

An overview of Hewlett-Packard

Founded in 1939 in Palo Alto, California, Hewlett-Packard has grown to employ approximately 92,000 people in 110 countries. Its manufacturing and R&D activities are based at 52 locations in 18 countries where 18,000 catalogued products and services are manufactured and distributed. Total net revenue of Hewlett-Packard by the end of 1992 amounted to US\$ 16.4 billion. Total net profit has never dropped below 3 per cent of net revenues even though growth has slowed down since 1989. Hewlett-Packard has consistently devoted 10 per cent of its annual revenues to research and development in order to meet growing customer expectations concerning quality, user friendliness and price. In 1992, R&D expenditure totalled more than US\$ 1.5 billion.

Over the last decade the competitive environment of Hewlett-Packard has changed tremendously. This change can be measured by the speed with which Hewlett-Packard has had to update and introduce new product offerings as shown in Figure 2. More than half of the total revenue is currently made up of products and services which have been introduced within the past two years. The degree of change in the competitive environment is also reflected in the average revenue distribution of individual products and services. As shown in Figure 3, the lifespan of individual products and services is continuously being shortened.

In addition to the speed of change Hewlett-Packard is also experiencing a number of other challenges which include:

- * reduced capital expenditure by customers together with a shrinking or constant proportion of total investment in information technology;
- * slow or declining growth in key industries such as defence or aerospace;
- * advances in open systems which are lowering the entry barriers as well as switching costs;
- * growth of alternative distribution channels which are eroding profit margins.

The above competitive pressures have led to a constant increase in the cost of sales as a percentage of net revenues, thus reducing the potential of increasing profitability. In order to sustain its competitiveness Hewlett-Packard has had to reduce its operating expenses in line with the increasing cost of sales, which is the result of constant product and process development. Therefore, Hewlett-Packard's approach to facing its competitive challenges is to establish the right balance between continuity and change, which in turn requires a dynamic approach to strategy formulation.

Dynamic strategy formulation and implementation

Hewlett-Packard's strategic thinking has historically been based on the concept of total quality in order to achieve improvements in business processes and customer satisfaction. The company has embraced total quality in several key areas of the organization including customer focus, employee participation and improvement cycles and process management. These key areas are not looked at in isolation but exist to perform specific roles in the overall strategy formulation and implementation process. At the core of this overall approach lies the strategic thinking process itself. In order to improve communication links and speed up the implementation process Hewlett-Packard has adopted a standardized method which is referred to as Hoshin-Kanri. This is a Chinese expression which means "providing direction". Hoshin-Kanri is a systematic process of defining key issues at each level of the organization rather than being a centralized planning tool. The Hoshin templates created at each level are used for the generation of objectives. They are also used to review progress towards set objectives and are changed when necessary. To ensure that everyone in the organization is working towards the same objectives, the templates, which are standardized and are of a hierarchical nature, are cascaded down through the organization as shown in Figure 4.

The Hoshin-Kanri process incorporates a host of standardized tools which are used throughout the organization. Examples include templates for objective setting and implementation, improvement tables on business fundamentals as well as templates for performance reviews which include deviation analysis. Although this approach takes a hierarchical form, it is not meant to be a centralized strategic planning approach in which high level plans are broken down into lower level plans. In contrast, each unit within the organization is responsible for defining objectives, thus becoming a "strategy owner". The strategic objectives can be divided into two categories: breakthrough and business fundamental objectives. Breakthrough objectives are aimed at radical innovation while business fundamental objectives focus on incremental innovation. The selection process is always limited to a few objectives which will have the greatest impact on key business issues. Each objective is supported by clearly defined measures. The aim is to link strategy and measures at one level directly with the objectives at a lower level in the organization. This is to ensure that focus is always maintained. Such an approach spreads the process of strategy formulation and implementation throughout the organization, with each level experiencing its own contribution. This is in contrast to a centralized planning process in which an overall strategic plan is defined and dictated along the hierarchy of organization structure.

It is worth mentioning that although each individual within the organization of Hewlett-Packard is part of the strategy formulation and implementation process, there is a difference in focus at each level. The higher levels focus on the development of strategies that lead to breakthroughs (radical innovation) while the lower levels mainly concentrate their effort towards continuous improvement (incremental innovation).

The Hoshin tables as well as the tables for performance review and corrective actions are updated dynamically. Once the plans are developed attention is directed towards implementation and review of performance. If deviations are identified, corrective actions are taken immediately, thus allowing continuous feedback and swift strategic adjustments.

The Hoshin-Kanri process therefore forms the core of both strategy formulation and implementation and ensures that everybody within the organization is made part of the overall process and directs effort in the same direction. However, the Hoshin-Kanri templates are only the tools for formulating and communicating the strategy itself. It is therefore necessary to describe how each unit within the organization develops plans and contributes to the formulation and implementation of the overall strategic direction.

The process of management at Hewlett-Packard

Hewlett-Packard regards its organization as one with a multitude of processes which are manageable and can be improved. The management function is also regarded as a continuous process involving five activities. This process is similar to the plan-do-check-act cycle developed for the implementation of TQM[10]. These activities cannot be looked at in isolation and the process is applied at every level of the organization. In order to implement this concept Hewlett-Packard has created a number of tools for each stage as well as an overall framework for the implementation of business processes. These are described later in the article.

The starting point of the process of management is to establish a common purpose. This is achieved by communicating with customers, scanning the business environment and aligning organizational objectives with business unit objectives, as well as business units negotiating with each other for the purpose of cross-alignment. The common objective statement which Hewlett-Packard has defined for its overall business activities is "to create information products that accelerate the advancement of knowledge and fundamentally improve the effectiveness of people and organisations". The second step in the process of management is to build a shared vision. This involves developing common values which ensure and maintain alignment. The shared vision is usually expressed in the form of five-year objectives, the purpose of which is to identify the key success factors in measurable terms. The purpose of the measures is not to create a complex control mechanism but rather to provide a clear direction for all employees. The shared vision forms the basis for the Hoshin-Kanri process which is carried out annually. A statement by Dick Hackborn (former vice-president and general manager Peripherals Group) places this approach into perspective:

Five year objectives in a highly dynamic environment are more a vision than a highly detailed set of objectives; it consists of one or two very clever differentiating concepts; a vision that stands the test of time and contains very good differentiation, combined with excellent year-to-year execution is the best formula for business success.

This is followed by the "lead the action" phase, the aim of which is to ensure that the set objectives are realized. This is achieved by the management facilitating the review process, giving and soliciting feedback, supporting and developing people, leading by example, granting recognition and rewarding contribution. The final phase closes the loop by evaluating results and processes. This evaluation involves determining customer and shareholder satisfaction, identifying areas of strength so that they can be built on, and identifying any weaknesses so that they can be overcome.

Dynamic strategy formulation and implementation tools and frameworks

The process of management is supported by a number of standard tools and frameworks to ensure its speedy and coherent implementation. These tools and frameworks focus on the critical business processes rather than functions. They can be categorized under the following headings:

- * envisioning;
- * breakthrough objectives;
- * ten-step business planning process;
- * business strategy review;
- * leadership and teaming;
- * measurement and evaluation.

The critical business processes which have been identified by Hewlett-Packard are summarized in Figure 6. All the critical business processes represent the interaction of the traditional functions and in this way Hewlett-Packard has shifted the focus of the whole organization towards cross-functional teams.

All the core business processes are designed in such a way as to maximize their impact on customer satisfaction. As a consequence, the analysis and satisfaction of customer needs has been put at the top of strategy formulation and has been fostered with a number of customer feedback mechanisms such as customer satisfaction surveys. Figure 7 abstracts Hewlett-Packard's customer satisfaction process, stressing its role in the process of strategy formulation and implementation.

Envisioning

The purpose of the envisioning process is to identify the key competitive issues in the future so that new strategies can be formulated and critical business processes redefined. Rather than merely extrapolating past and current developments, the envisioning process examines different competitive parameters in order to develop a vision of what is important in the future, thus enabling the organization to have a clear direction of where it is heading in a rapidly changing and uncertain environment. Hewlett-Packard sees the visioning process as necessary in order to ensure that it constantly examines its assumptions as these may become inappropriate because of changes in the competitive environment. Table I provides illustrative examples of how key business assumptions for Hewlett-Packard have changed over time[13].

Envisioning is based on a future state definition process which considers a number of key issues including stakeholder requirements, benchmarks, enablers, core competences and current performance. This process spans all cross-functional, multisite and intercompany activities within the organization. The developed vision is by no means limited to the internal operations of Hewlett-Packard but also encompasses those of the suppliers and customers. The organization of Hewlett-Packard is not seen as a collection of single-site operations, but rather as a coherent multisite and worldwide operation which is event-driven. For example, a business opportunity creates immediate and concurrent ripples throughout the enterprise triggering other events such as team formation, customer needs analysis, product development, etc. Using this enterprise philosophy, the visioning process is executed by multifunctional, multisite, multinational teams. There is [TABULAR DATA FOR TABLE I OMITTED] no single approach for such a process. However, they follow a similar step-by-step structure an example of which is provided in Figure 8.

From the example it becomes apparent that the visioning process of Hewlett-Packard is clearly driven by the requirements of its stakeholders. This in turn results in a sense of purpose which is by no means inhibited by the current organization structures and activities. This is illustrated by the mapping process used for stakeholder needs analysis which includes customers, shareholders and employees and which forms the starting point of the visioning process as shown in Figure 9. The outcome of this mapping process is, inter alia, the definition of all constraints which are then addressed for the achievements of the objectives set out.

Breakthrough objectives

Breakthrough objectives are defined at the highest level of the organization in order to achieve significant improvements in customer focus and operations. An example of an organization breakthrough objective is the Hewlett-Packard's "10X Quality Improvement" programme, the aim of which is to reduce defects that reach the customer by a factor often within ten years. Each unit within Hewlett-Packard is continuously evaluated on progress towards this goal and in the case of divergence the management attention is focused to place the unit back on track. The main aim of this quality programme is to stretch the objectives of every individual by creating high expectations and accountability throughout the organization.

A structured strategy formulation process

Competitive strategies are formulated for a given business unit using a structured process. This process uses a selection of tools and frameworks in order to develop the necessary knowledge base regarding the competitive environment together with the impact of different strategies. The outcome of the planning process is a set of cross-functional strategic action plans which are the result of the analysis performed in the fields of research and development, manufacturing, quality, marketing and finance. These action plans in turn form the basis for the Hoshin process described earlier. Figure 11 provides an overview of the strategy formulation process and the order in which the steps are carried out.

Each step in the strategy formulation process is defined through a set of clear objectives and goals. A recommended procedure for its execution is provided, which encompasses a number of tools and templates where necessary. The strategy formulation process is by no means carried out as a unidirectional process. It is an iterative process of data collection, hypothesis generation and validation where specific ideas are tested, strengths and weaknesses are assessed, financial implications are examined and implementation issues such as timing and availability of skills and knowledge are considered. It is therefore possible that hypotheses from each step of the process may need to be reconsidered or rejected and new hypotheses questioned.

The process starts with the simultaneous execution of "step C" and "step D" the aims of which are to:

- * define and prioritize market segments on the basis of demand;
- * identify segments which are financially attractive;
- * determine the probability of achieving a dominant position in the segments identified.

This requires imaginatively understanding customer and user needs, identifying the most attractive global market segments, determining success factors and identifying the most appropriate distribution channels. For this purpose a number of selected tools and templates, such as market classification tables and competitor share histogram, are available. The selection of target segments during this process is not limited to any geographical area or industry boundaries. Once the target segments and the basis of competition have been identified, a purpose statement is formulated for the business unit under consideration. Here,

the aim is to provide a clear sense of direction and identify reasons for the unit's existence. The statement of purpose is then aligned with that of other interacting business units. The final statement will cover three basic elements of business strategy:

- (1) What users' need segments will be served?
- (2) What is the Hewlett-Packard's value proposition?
- (3) What is the basis for sustainable competitive advantage?

Once the statement of purpose is finalized, the five-year objectives are generated. These include financial, customer satisfaction and internal objectives such as employee satisfaction. The next step is to specify a set of products and services that target the customer needs and desires. The idea is to define the benefits or uses rather than the finalized products. Creativity is therefore of key importance. "Step F" addresses the way in which the benefits and uses specified in step E can be realized by assessing the organizational capabilities and requirements in the area of technology development, marketing and distribution, operations and resource planning.

At this stage a strategy review process is used in order to identify potential conflicts between business units together with those issues that go beyond the boundaries of a specific business unit. Business strategy reviews are not part of the ten-step planning process but represent the core of corporate strategy formulation. They ensure that the strategies which are developed within the individual business units are aligned. In case of conflicts, the purpose of the business unit under consideration can be changed.

In "step G" the financial implications are evaluated and analysed on whether they meet the objectives as defined in "step B". The financial models used in "step G" also aid in the quantification of risks. The potential problem analysis is the aim of the next step and is used to anticipate potential problems, assess their impact, and create contingency strategies for any major event that will require a change in strategy. The idea is to create a set of offensive and defensive action plans so that a strategy can be changed swiftly when necessary. "Step I" concentrates on identifying the key interrelationships in the organization which must function effectively if the formulated strategy is to achieve its full impact. These are identified by itemizing key dependencies and critical linkages. Subsequently optimized processes are defined and supported by measures in order to track progress towards the selected goals. Finally, Hoshin templates are developed for the first year, in order to translate the formulated strategy into actions.

In summary, the strategy formulation process closes the gap between the competitive environment, vision, breakthroughs and the Hoshin-Kanri process. This is achieved by defining the purpose and the first-year objectives for each business unit, as illustrated in Figure 12. The process therefore represents a vital mechanism for:

- * identifying business opportunities and formulating strategies for each individual business unit;
- * defining the overall purpose and developing corporate strategy.

The linkage between the above two items is achieved through business strategy reviews.

Business strategy reviews

The business strategy reviews are used to ensure the integration and alignment of:

- * strategies of different business units;

* strategies of business units and the strategic direction of geographic operations.

This integration and alignment is necessary because of the way in which Hewlett-Packard has been structured. Business units are not limited to a specific geographic region but concentrate on certain customer segments or business opportunities. These encompass product divisions and service divisions. In addition to these there are national Hewlett-Packard units which usually have their own sales divisions as well as the larger geographic organizations (e.g. the European organization) which focus on the requirements of a specific geographic region. As a result of this structure goals and strategies can potentially be conflicting. Furthermore, it is possible that certain business issues affect more than one unit or geographic region and therefore are best dealt with at a higher level. The optimization of worldwide logistics or central purchasing operations are examples of such business issues. Moreover, each business unit has a number of levels (e.g. different product categories and service offerings) which need to be aligned and integrated into one business strategy in order to minimize conflicts and achieve the best results possible.

Alignment and integration go beyond marketing and sales integration and include the definition of growth geographies, local presence, manufacturing optimization and local content considerations, standards and regulatory compliance, strategic alliances and partnerships, etc. Business strategy reviews are carried out by top level management as well as management teams from other business units. The outcome of the business strategy reviews is then documented as a business strategy summary. This summary is then examined very closely to identify new or recurring cross-business issues the scope and impact of which cross organizational boundaries, and which might have a potential impact on business performance. The summary is also used for developing Hewlett-Packard's consolidated financial summary and the overall resource-allocation plans for each financial year to include the formulation of targets and the definition of the highest level Hoshins.

From the above it is apparent that corporate strategy is not centrally formulated but reflects the culmination of aligned business level strategies that have been formulated throughout the organization. Focus is maintained through high level business objectives by setting boundaries in the form of purpose statements. Figure 13 summarizes the process of business strategy reviews and the way in which corporate strategy is created and integrated with the business unit strategies.

Teams and leadership

A dynamic approach to strategy formulation as described above can only be implemented successfully if it is supported by a sound management structure and by employees who work towards the achievement of overall goals.

Within Hewlett-Packard strategies are defined by cross-functional teams focusing on business processes rather than functional areas. This is also reflected by the way in which Hewlett-Packard organizes its operations. While there are still some functional areas such as purchasing or manufacturing, the employees working in these areas are not regarded as being part of that functional department but rather as performing a function as part of a larger process team. In case of process change the individuals will alter their role and position within the organization accordingly. The dynamics of such a structure are illustrated by the fact that some individuals move their organizational position or physical locations more than once a year and in some business units hierarchical organization charts have been abandoned completely.

Teams are formulated according to the requirements of the task. Team members can work in different countries and belong to different business units within Hewlett-Packard. Priority for team member selection is closely related to the importance of the task and conflicts are usually resolved by the individuals concerned rather than by top management. The process orientation

and team orientation is also reflected by the lack of central units such as marketing or research and development. These functions are carried out within the business units in which they are required. As a result, jobs within Hewlett-Packard are increasingly defined by the project or task to be undertaken rather than the functions to be performed. While such an organizational structure may result in a certain degree of redundancy it ensures optimal effectiveness and a high level of flexibility in a fast changing competitive environment.

The organization structure highlighted above requires a different thinking philosophy throughout the organization. The need for a systems thinking approach is widely promoted and communicated within Hewlett-Packard. Figure 14 compares functional and systems thinking.

Hewlett-Packard has experienced a number of benefits by making the transition from a functional or hierarchical organization to that of a cross-functional team structure. While the new structure has increased the need for communication and co-operation, it has also enabled the organization to reduce the time of accomplishing tasks. The span and quality of knowledge required for completing the task had to be correspondingly improved from department/function specialist knowledge to multifunction or whole-system knowledge. A cross-functional team structure can only be achieved if the requirements for communication and co-operation are satisfied. Communication demands the availability of technology in order to exchange relevant data and information between teams and individuals on a worldwide basis while co-operation requires a culture which fosters taking over responsibility and accepting the possibility of failure.

In order to ensure sound communication on a macro-level, Hewlett-Packard has constantly invested in its information links which today include a company-wide electronic and voice mail system together with high-speed internet networks and video-conference systems. The improvement in communication is reflected in the increase in network traffic at Hewlett-Packard between 1980 and 1993. During this time, total network traffic has increased by a factor of 1,000. Furthermore, the emphasis in communication has shifted from transferring marketing information and financial reports to the transfer of a wide variety of information with a focus on engineering and product development information which is typical for the information exchange of cross-functional teams.

At business unit and team levels communication is stimulated through informal and open channels which are part of Hewlett-Packard's basic values, such as the use of first names when addressing others and the nonexistence of any status symbols or separating doors within Hewlett-Packard's offices.

Co-operation is fostered through a culture that is based on the belief by the founders that the people want to do a good job. This culture has been formalized and christened as the "HP-Way". The HP-Way is a common set of values which include:

- * mutual trust and respect for individuals;
- * focus on high levels of achievement and contribution;
- * conducting business with uncompromising quality;
- * achievement of common objectives through teamwork;
- * taking over responsibility for quality, innovation and flexibility.

The above list also includes the right to make failures and for individuals to pursue their interests within limits.

Measurement and evaluation

Measurement and evaluation form the final part of the process of the management cycle. They provide the necessary feedback on whether:

- * formulated strategies have been successfully implemented (by keeping track of progress towards the objectives);
- * strategies have been formulated correctly in the first place (by measuring business results as well as customer and employee satisfaction).

They also provide a basis for rewarding and promoting success. Hewlett-Packard measures the performance of individuals, teams, business units and processes against mutually defined objectives. The criteria used are directly related to the reasons for measurement and represent a careful balance between efficiency (doing things right), effectiveness (doing the right things) and evolution (the ability to adapt to change and sustain a competitive position). This performance measurement framework is different from traditional measurement systems which focus mainly on efficiency measures, as shown in Figure 15.

Performance measurement and evaluation is communicated openly throughout the organization through the use of scorecards which compare the performance of different business units or geographical regions against the objectives and goals defined. Using the scorecard approach, management attention is directed towards only a limited number of key objectives. In this way a high level of motivation is achieved, as no business unit or region wants to be seen to be falling behind target.

Performance measurement and evaluation is further supported by a

structured benchmarking system with which performance is benchmarked against "best internal and external practices". In order to overcome the major limitation associated with benchmarking (i.e. being equal or only slightly better than the top performers) the measurement procedure is further supported by setting breakthrough or stretch objectives. This will culminate in a set of delineated measures (usually defined in terms of product features, time, quality and costs). Figure 16 summarizes this approach.

The selection of measures is situation-dependent and depends largely on the changes in the competitive environment. For example, Hewlett-Packard is currently focusing on operating expenses as there is a clear upward pressure on cost of sales because of an increased level of competition. To remain highly profitable Hewlett-Packard must focus on operating expenses, and therefore measures are defined in this light.

Hewlett-Packard is increasingly moving towards the use of measures that focus on processes including:

- * cycle time metrics such as customer turnaround, supplier response time, traffic response time, field transit time and installation time;
- * defect metrics such as defects on booking, defects on arrival and defects after installation.

Furthermore, Hewlett-Packard has established measures which improve the co-operation of cross-functional teams. An example of such a measure is break-even time which gauges the time between the initiation of a project and the time at which the cumulative net profit equals the cumulative net profit investment[15]. Such a measurement approach relates time to the expected financial return of a project, thus enabling cross-functional teams to consider different product scenarios with respect to features, launch time and resource requirements. The project control graph shown in Figure 17 demonstrates the way in which such a measurement approach is applied.

The graph is used by cross-functional team members to examine the way in which their decisions will influence the overall project from several angles. First, they will consider project cost reduction in order to decrease the break-even time. Second, they view profitability in overall terms and not only in relation to sales (a project must meet customer needs at reasonable development and manufacturing costs). Third, a project must ensure adequate sales which requires speedy introduction measured in time to market.

In summary, measurement and evaluation are an essential part of strategy formulation and implementation by creating knowledge, providing feedback and motivating people towards the desired behaviour. They require a balanced set of measures which incorporates all the internal and external factors as opposed to providing a partial picture using a selected number of short-term efficiency measures as illustrated in Figure 18.

Summary analysis

The concepts, procedures and tools presented above are all part of Hewlett-Packard's comprehensive strategy formulation and implementation framework. Apart from the process of management which is ongoing, Hewlett-Packard also assigns task forces on a regular basis to review the organization's critical business processes in order to ensure that the requirements arising from the competitive environment are constantly met. The business process reviews are executed using a structured process which is similar to the overall framework presented above. The redesigned processes are then aligned and integrated with the existing business processes of the organization. Implementation is ensured by transferring the ownership of the task-force findings to the business units concerned.

Strategy formulation and implementation at Hewlett-Packard clearly constitute a constant learning process which takes place throughout the organization. Knowledge about the competitive environment is dynamically transformed into strategies which are then translated into measurable objectives and actions.

The process of management can be regarded as a double-loop learning cycle which combines cognitive and behavioural learning[5]. The primary learning cycle develops the necessary know-how for formulating and implementing strategies while the value learning cycle generates the knowledge necessary regarding the values that have to be satisfied. Figure 19 places this double-loop learning cycle in the context of strategy formulation and implementation at Hewlett-Packard. Such a learning approach to dynamic strategy formulation and implementation is possible as the structure and culture of Hewlett-Packard promote learning and change.

Conclusion

Hewlett-Packard achieves dynamic strategy formulation and implementation by making every individual a strategy owner. Such an approach ensures that the formulated strategies take account of the business environment and opportunities while maintaining speed and focus. The approach is supported by a structured framework which includes a selection of tools. This ensures that strategies are constantly reviewed, changed, communicated and aligned. It also forms the basis for developing a coherent corporate strategy.

Strategy formulation within Hewlett-Packard should be regarded as a constant learning process which is supported by a structure and culture which promotes change and continuous learning. Cross-functional and process-oriented teams have enabled Hewlett-Packard to speed up the process of strategy formulation and implementation by improving the quality and span of their knowledge base.

The findings of this work have implications for both researchers and practitioners. In dynamic environments, researchers should constantly examine their assumptions and align the

research objectives in line with changes in both the strategic focus of organizations and the underlying conditions of their competitive environments. The implications for practitioners are fourfold. First, strategy formulation cannot be detached from strategy implementation and in this context the process of management plays a key role. Second, strategies should be developed at the point where the highest quality knowledge exists. Third, supportive structures are necessary if individuals are to act readily on such knowledge. Fourth, the knowledge generation process relies on the availability of the appropriate tools and frameworks. These implications call for an even closer relationship between researchers and practitioners when studying strategy formulation and implementation in dynamic environments.

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Rainer Feurer and John Wargin are with Hewlett-Packard GmbH, Boblingen, Germany, and Kazem Chaharbaghi is based at Cranfield University, Cranfield, UK.

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