From Experience: Linking Projects to Strategy

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There is a dramatic rise in the use of project management as organizations shift to provide customer-driven results and systems solutions. Some implementations of project management have been successful, whereas others are spectacular failures. A common occurrence in many organizations is too many projects being attempted by too few people with no apparent link to strategy or organizational goals. Research and experience indicate that the support of upper management is critical to project success. This article reviews actions that upper managers can take to create an environment for more successful projects in their organizations. Specifically, the authors discuss practices for upper manager teamwork and offer a complete model for selecting projects that support a strategic emphasis. The article includes experiences from within Hewlett-Packard Company.

Introduction

Growth in organizations typically results from successful projects that generate new products, services, or procedures. Managers are increasingly concerned about getting better results from the projects under way in their organizations and in getting better cross-organizational cooperation. One of the most vocal complaints of project managers is that projects appear almost randomly. The projects seem unlinked to a coherent strategy, and people are unaware of the total number and scope of projects. As a result, people feel they are working at cross-purposes, on too many unneeded projects, and on too many projects generally. Selecting projects for their strategic emphasis helps resolve such feelings and is a corner anchor in putting together the pieces of a puzzle that create an environment for successful projects [6].

This article covers a series of steps for linking projects to strategy. These steps constitute a process that can be applied to any endeavor. Included throughout are suggestions for action as well as guidelines to navigate many pitfalls along the path. Process tools help illustrate ways to prioritize projects. The lessons learned are from consulting with many firms over a long time period and from personal experiences in applying the lessons within Hewlett-Packard Company (HP), a $40 billion plus company where two thirds of its revenue derives from products introduced within the past 2 years.

The Importance of Upper Management Teamwork

Developing cooperation across an organization requires that upper managers take a systems approach to projects. That means they look at projects as a system of interrelated activities that combine to achieve a common goal. The common goal is to fulfill the overall strategy of the organization. Usually all projects draw from one resource pool, so they interrelate as they share the same resources. Thus, the system of projects is itself a project, with the smaller projects...
being the activities that lead to the larger project (organizational) goal.

Any lack of upper management teamwork reverberates throughout the organization. If upper managers do not model desired behaviors, there is little hope that the rest of the organization can do it for them. Any lack of upper management cooperation will surely be reflected in the behavior of project teams, and there is little chance that project managers alone can resolve the problems that arise.

A council concept is one mechanism used at HP to establish a strategic direction for projects spanning organizational boundaries. A council may be permanent or temporary, assembled to solve strategic issues. As a result, a council typically will involve upper managers. Usually its role is to set directions, manage multiple projects or a set of projects, and aid in cross-organizational issue resolution. Several of these council-like activities become evident through the examples in this article.

One example at HP was a cross-organizational council pulled together to resolve input/output (I/O) architectural issues for a new line of computer systems. A computer architecture is the underlying structure that directs hardware to implement software commands. The processor architecture was solid, but portions of the I/O were vague, broken, or undefined. Hundreds of technical issues were logged against the architecture. Individual project teams were optimizing solutions to fit their objectives (organizational suboptimization). Meanwhile, the overall architecture was at risk of getting out of control. Because this architecture provided the structure for a new platform of minicomputer products, impact on the product family would be enormous.

One project manager (a champion) took the initiative to convene an upper-manager council. The council accepted ownership to resolve the set of interrelated issues. People accepted membership on the council because they came to understand the strategic importance of the mission. The council authorized groups of engineers to study, propose, review, and accept solutions. It first established a set of priorities and constraints to guide the study groups. The council met at least once a month to review progress and make changes. When several issues bogged down, it authorized an escalation path to two managers who would listen to the arguments and make decisions. Because of the tremendous impact on time to market of projects dependent on the outcome, the council kept appropriate pressure on making progress. At the end of the resolution phase, it enthusiastically supported a celebration party for the hard work contributed by hundreds of engineers. They listened to recommendations from a retrospective analysis and took action on suggested improvements, applying them to subsequent projects that were initiated to resolve additional issues.

Over time the process improved dramatically and led to reduced anxiety about the chaotic state of the architecture.

This systematic approach illustrates the vast and
important influence of upper management teamwork on project success. Increasingly evident are companies who convene portfolio selection committees. We suggest that organizations begin by developing councils to work with project managers and to implement strategy. These councils exercise leadership by articulating a vision, discussing it with the project managers, asking them their concerns about and needs for implementing the strategy, listening carefully to them, and showing them respect so they become engaged in the process. In this way, upper managers and project managers develop the joint vision that is so necessary for implementation of strategy.

Process for Project Selection and Prioritization

Once the upper management team is established, they can follow a process to select sets of projects that achieve organizational goals. They are then ideally positioned to implement consistent priorities across all departments. Figure 1 represents a mental model of a way to structure this process. Outputs from the four steps interrelate in a true systems approach. This model comes from experience in researching and applying a thorough approach to all the issues encountered in a complex organization. It is both simple in concept and complex in richness. The authors use the model both as an educational tool and to facilitate management teams through the process.

What the Organization Should Do and How to Know When You Are Doing It

First, identify who is leading the process and who should be on the management team. More time spent here putting together a “mission impossible” team pays dividends later by getting up-front involvement of the people who will be affected by the decisions that will be made. Take care not to overlook any key-but-not-so-visible players who later may speak up and jeopardize the plan. This team may consist solely of upper managers or may include project managers, a general manager, and possibly a customer. Include representation of those who can best address the key opportunities and risks facing the organization. Ideally they control the resources and are empowered to make decisions on all projects. The leader needs to get explicit commitment from all these people to participate actively in the process and to use the resulting plan when making related decisions. Be aware that behavioral issues become super urgent. This process hits close to home and may have a severe impact on projects that people care personally about. Uncertainty and doubt are created if management does not tread carefully and pay attention to people concerns.

The team begins by listing all projects proposed and under way in the organization. Many times this step is a revelation in itself. A usual reaction is, “I didn’t realize we had so many projects going on.” The intent is to survey the field of work and begin the organizing effort, so avoid going into detailed discussion about specific projects at this point.

The team clarifies or develops the goals expected from projects. Be careful not to get constrained through considering only current capabilities. Many teams get sidetracked by statements such as “We don’t know how to do that,” effectively curtailing discussion on whether the organization ought to pursue the goal and develop or acquire the capability. Rather, the discussions at this stage center around organizational purpose, vision, and mission. This is a crucial step that

![Figure 1. A systematic approach to selecting projects.](image-url)
determines if the rest of the project selection process can be successful. In the authors’ experience, those organizations with clear, convincing, and compelling visions about what they should be doing move ahead rapidly. Any lack of understanding or commitment to the vision by any member of the team leads to frustration, wheel spinning, and eventual disintegration of the whole process. This pattern is so prevalent that clarity of the goal or strategy is applied as a filter before agreeing to facilitate teams through the process.

Organize the projects into categories that will later make it easier to facilitate a decision-making process. Wheelwright and Clark [14] suggest using grids where the axes are the extent of product change and the extent of process change. Some organizations use market segments. The benefit to this effort is that seeing all projects and possible projects on a continuum allows checking for completeness, gaps, opportunities, and compliance with strategy. This might also be a good time to encourage “out-of-the-box” thinking about new ways to organize the work. Use creative discussion sessions to capture ideas about core competences, competitive advantage, and the like to determine a set of categories most effective for the organization. For example, the categories might be:

- **Evolutionary or derivative**—sustaining, incremental, enhancing.
- **Platform**—next generation, highly leveraged, and
- **Revolutionary or breakthrough**—new core product, process, or business.

The actual products in Figure 2 were introduced to the market over time in alphabetical order and positioning shown. Although the figure represents a retrospective view, it illustrates a successful strategy of sequencing projects and products. There is a balanced mix of breakthrough products, such as A, followed by enhancements, B through E, before moving on to new platforms, F through H, and eventually developing a new architecture and product family with L. At the time, this strategy was improvisational [1]; it now represents a learning opportunity for planning new portfolios. No one area of the grid is overpopulated, and where large projects exist there are not too many of them.

Another reason to organize projects into these “strategic buckets” is to better realize what business(es) the organization is in. Almost every group the authors work with get caught in the “tyranny of the OR” instead of embracing the “genius of the AND” [2]. In trying to do too many projects and facing the need to make tradeoffs among them, the decision becomes this OR that. In reality, most organizations need a balanced portfolio that creates complete solutions for their customers. They need to do this AND that. The way to achieve this goal is to set limits on the size of each category and then focus efforts on selecting the best set of projects within each category. The collective set of categories becomes the desired mix, a way of framing the work of the organization. The ideal percentage that constitutes the size of each category can be determined from the collective wisdom of the team or perhaps through experimentation. The organization can learn the right mix over time but only if it makes a concerted effort to do so.

![Figure 2. Bubble diagram of a product grid for one HP division. Size of bubble = size of project.](image-url)
Within each category, determine criteria that can assess the “goodness”—quality or best fit—of choices for the plan. A criterion is a standard on which a comparative judgment or decision may be based. Because the types of projects and the objectives within categories may be quite different, develop unique criteria for each category or have a core set of criteria that can be modified. Many teams never get to the point of developing or clarifying criteria, and they usually want to discuss projects before agreeing on criteria; reversing the order is much more effective.

Several works on research and development project selection [8,9,12] provide a robust set of criteria for consideration. Examples include strategic positioning, probability of success, market size, and availability of staff. Most important is to identify the criteria that are of greatest significance to the organization; fewer are better. However, teams usually need to brainstorm many criteria before focusing on few.

The role of each criterion is to help compare projects, not specify them. Select criteria that can measurably compare how projects support the organizational strategy. For example, one criterion may be degree of impact on HP business as interpreted by a general manager. On a scaling model from 1 to 10, small impact scores a 2, strong a 6, critical to the success of one business an 8, and critical to the success of multiple businesses a 10. Most likely all proposed projects meet meaningful specifications and provide value to the organization. The task is to develop tough criteria to select the best of the best.

Some organizations use narratives to describe how each project contributes to the vision; others use numerical scores on whether one project is equal, moderate, or strongly better than another. It is also helpful to set thresholds or limits for projects that will be considered for the plan. These help to screen out projects so that later prioritization efforts can focus on fewer projects.

Writing a thorough description of each criterion helps ensure understanding of the intent and expectations of data that must be supplied to fulfill it. One team of three or four people at HP spent 5 days working only on the criteria they were to use for decision-making. And this was only the beginning; they next involved customers in the same discussion before reaching consensus and beginning to evaluate choices. An “Aha” occurred when people found they were wrong to assume that everyone meant the same thing by terms such as packaging; some used wider definitions than others did, and the misunderstanding only surfaced through group discussion. Asked if the selection process ever failed the team, its leader replied, “If the results didn’t make sense, it was usually because the criteria weren’t well defined.” Unfortunately, most teams do not exhibit the same patience and discipline that allowed this team to be successful.

One team lost energy at this point; in recognizing the power that the criteria would exert on project selection, team members realized they were still not comfortable with the goal. A time-out was taken to reassess the team’s approach. It would have been futile to push ahead on details until the big picture was clear. The manager was frustrated that the team did not achieve consensus on criteria during this session, but the team truly was not ready. Going through the process with an outside facilitator at an offsite meeting helps through these rough spots.

Before moving to the next step, the team should establish relative importance among criteria. Assign a weighting factor for each criterion. All criteria are important but some more so than others. The example in Figure 3 is the result of one team’s brainstorming session that ultimately led to selecting four criteria. Breakout groups subsequently defined each criterion with subcriteria. They also devised scoring methods to apply the criteria. Collectively they then determined the respective weighting or importance of each criterion (see the Process Tools section for how they did this). Unlike threshold criteria that “gate” whether a project is go or no-go, all projects have to satisfy selection criteria to some extent. Weighting of criteria is the technique that can optimize and determine the best of the best. Another “Aha” that helped teams get through the hurdle to develop effective criteria is when they realized the task at this point is “weighting, not gating.”

It is the authors’ experience that criteria, while universally desired, are usually lacking or not formalized. One benefit of effective criteria is the shaping effect it has on behavior in the organization. When people know how projects will be scored, they tend to shape proposals in positive ways to meet the criteria better. A pitfall is when people play games to establish criteria that support personal agendas. Then it is up to the leader to name and question these tactics. Remind people to support the greater good of the organization. Significant effort could be devoted to the behavioral aspects that become relevant when deciding upon criteria; suffice to say, be warned that this is a touchy area to approach with sensitivity and persuasiveness.
What the Organization Can Do

The next step for the team is to gather data on all projects. Use similar factors when describing each project in order to ease the evaluation process. Engage people in extensive analysis and debate to get agreement on the major characteristics for each project. This is a time to ask basic questions about product and project types and how they contribute to a diversified set of projects. Reexamine customer needs, future trends, commercial opportunities, and new markets. The person consolidating the data should challenge assertions about benefits and costs instead of accepting assumptions that may have been put together casually. It is important for each member of the team to assess the quality of the data, looking closely at sources and the techniques for gathering the data. When putting cost figures together, consider using activity-based costing models instead of traditional models based on parts, direct labor, and overhead. Activity-based costing includes the communications, relationship building, and indirect labor costs that usually are required to make a project successful.

The team needs to constantly apply screening criteria to reduce the number of projects that will be analyzed in detail. Identify existing projects that can be canceled, downscaled, or reconceived because their resource consumption exceeds initial expectations, costs of materials are higher than expected, or a competitive entry to the market changed the rules of the game. The screening process helps eliminate projects that require extensive resources but are not justified by current business strategies; maybe the projects were conceived based on old paradigms about the business. The team can save discussion time by identifying must-do projects or ones that require simple go/no-go decisions, such as legal, personnel, or environmental projects. These fall right through the screens and into the allocation process. Determine if some projects can be postponed until others are complete or until new resources or funding become available. Can project deliverables be obtained from a supplier or subcontractor rather than internally? Involve customers in discussions. The team constantly tests project proposals for alignment with organizational goals.

It is not necessary to constrain the process by using the same criteria across all categories of projects. In fact, some teams found that different criteria for each category of projects was more effective. Also, consider adjusting the weighting of criteria as projects move through their life cycles. Kumar et al [7] documented research showing that the most significant variable for initial screening of projects is the extent to which “project objectives fit the organization’s global corporate philosophy and strategy.” Other factors, such as available science and technology, become significant later during the commercial evaluation stage. A big “Aha” experienced by some teams when confronted with this data is that they usually did it the other way around. That explains why they got into trouble—by focusing on technology or financial factors before determining the link to strategic goals.

Cooper (and others before him) report that top-

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**Table: Sample Criteria and Weighting**

<table>
<thead>
<tr>
<th>Category</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Customer Satisfaction</strong></td>
<td>(28%) improves service levels, results in more consistent and accurate information/transactions, helps ensure services are delivered as promised &amp; expected</td>
</tr>
<tr>
<td><strong>Employee Satisfaction</strong></td>
<td>(7%) improves employee knowledge, increases employee efficiency or effectiveness, improves work/life balance, positive impact to employee survey, helps balance workload</td>
</tr>
<tr>
<td><strong>Business Value</strong></td>
<td>(46%) achieves results that are critical for a specific window of opportunity, minimizes risk for implementation and ongoing sustainability, improves integration and relationships with partners, provides a positive ROI in &lt; 2 yrs, aligns with business goals</td>
</tr>
<tr>
<td><strong>Process Effectiveness</strong></td>
<td>(19%) enables employees to do things right the first time, increases the use of technology for service delivery, reduces manual work and non-value added activities, increases employee self sufficiency</td>
</tr>
</tbody>
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*Figure 3. Sample criteria and weighting, plus subcriteria, developed by one HP team.*
performing companies do not use financial methods for portfolio planning. Rather, they use strategic portfolio management methods where strategy decides project selection [3]. This lesson is still a hotly debated one, especially for those who cling to net present value as the single most important criterion. The difficulty lies in relying upon forecast numbers that are inherently fictitious. The authors’ experience is that teams get much better results tapping their collective wisdom about the merits of each project based upon tangible assessments against strategic goals. Using computed financial numbers more often lead to arguments about computation methods and reliability of the data, leading to unproductive team dynamics.

The next part of gathering data is to estimate the time and resources required for each potential and existing project. Get the data from past projects, statistical projections, or simulations. The HP Project Management Initiative particularly stresses in its organizational initiatives to get accurate bottom-up project data from work breakdown structures and schedules. Reconcile this data with top-down project goals. Document assumptions so that resource requirements can be revisited if there are changes to the basis for an assumption. For new or unknown projects, make a best estimate, focusing first on the investigation phase with the intent to fund only enough work to determine feasibility. The team can revisit the estimates when more information becomes available. Constantly improve estimation accuracy over time by tracking actuals with estimated task durations.

Next, the team identifies the resource capacity both within and outside the organization that will be available to do projects. Balance project with nonproject work by using realistic numbers for resource availability, taking into account other projects, vacations, meetings, personal appointments, and other interruptions. Tip: a wise planner consumes no more than about 50% of a person’s available time.

One assessment about the quality of projects in a portfolio is to look at the rejects. In a story attributed to HP founder Bill Hewlett, he once established a single metric for how he would evaluate a portfolio manager’s performance. He asked to see only the rejects. He reasoned that if the rejects looked good, then the projects that were accepted must be excellent.

All the actions in this step of the process are intended to screen many possible projects to find the critical few. The team may take a path through multiple screens or take multiple passes through screens with different criteria to come up with a short list of viable projects. Figure 4 represents one scenario where Screen 1 is a coarse screen that checks for impact on the strategic goal. Subsequent screens apply other criteria when more data is available. Any number of screens may be applied, up to the number $n$, until the team is satisfied that the remaining projects relate to compelling business needs. These steps actually save time because the next section on analysis can get quite extensive if all possible projects go through it.

It usually is necessary to go through several validation cycles before finishing the next step: the upper

![Figure 4. Application of criteria screens during a funneling process eliminates the trivial many projects from the critical few that the organization can realistically complete.](image-url)
management team proposes project objectives, project teams provide preliminary estimates based on scope, schedule, and resources back to management, management is not happy with this response and makes adjustments, and so on. This exercise in due diligence is a healthy negotiation process that results in more realistic projects getting through the funnel.

Analyse and Decide on Projects

The next step is to compare estimated resource requirements with available resources. A spreadsheet is useful to depict allocation of resources according to project priority.

Part of the analysis is qualitative: Consider the opportunity costs of committing to short-term, opportunistic, or poorly conceived projects that take resources away from future prospects that may be a better fit strategically. Also, avoid selecting “glamorous” new ideas over addressing the tough issues from ongoing projects. Some people lack the stamina to deal with the details of implementation and so are ready to jump to a new solution at the slightest glimmer of hope from the latest technology. This is a recipe for disaster. Also, be careful to balance the important projects rather than giving in to urgent, but not so important, demands.

Documenting all the findings and supportive data using a common set of descriptive factors makes it easier to compare similar factors across projects. Use a “project charter” form or a template where all information about each project, its sponsors, and key characteristics is recorded.

The team can now prioritize remaining projects. Focus on project benefits before costs; that way the merits of each project get full consideration. Later, include costs to determine the greatest value for the money. Compute overall return from the set of projects, not from individual projects, because some projects may have greater strategic than monetary value. Requiring each and every project to promise a high financial return actually diminishes cooperation across an organization. For example, a computer system division depends on an interface card from the networks division to produce a whole product. But if the networks division has other priorities, it may not commit to developing the card. Such situations require the prioritization process to happen higher in the organization. Also, optimize return over time and continuity or uniformity of revenue from the projects. Some future projects must be funded early to ensure a revenue stream when current projects taper off.

Using previously agreed-upon criteria and weighting factors, the team compares each project with every other one within a category. Repeat the process for each criterion. See the discussion and example later in this article about using an analytical hierarchy process (AHP) to facilitate this step. Consider using software to compute results—an ordered list of projects within each category. A pitfall to avoid that engenders fear among the team is showing one list that prioritizes all projects from top to bottom. People get concerned when their project is on the line. It is not fair to compare internal development projects with high grossing products; keep them separated and within their respective categories.

Finally, the team is ready to decide which projects to pursue. Ask what you should do, not what you can do. Especially in high-tech industries, people are often tempted to include a new technology without being sure that customers are interested or will get value from the investment. Be prepared to do fewer projects and to commit complete resources required by projects that are selected. Decide on a mix of projects consistent with business strategy, such as 50% platform projects, 20% derivative projects, 10% breakthrough projects, and 10% partnerships. Note that these total only 90%; taking some lessons from financial portfolio management, diversify the set of projects by investing in some speculative projects. The team may not be sure which markets or technologies will grow, so buy an “option” and make a small investment to investigate the possibilities. Include experimental projects. It is also important to leave a small percent of development capacity uncommitted to take advantage of unexpected opportunities and to deal with crises when they arise.

Wheelwright and Clark [14] cite an organization that reduced the number of its development projects from 30 to 11: “The changes led to some impressive gains...as commercial development productivity improved by a factor of three. Fewer products meant more actual work got done, and more work meant more products.” Addressing an internal project management conference, an HP Executive Vice President emphasized the need to focus on doing fewer projects, especially those that are large and complex: “We have to be very selective. You can manage cross-organizational complex programs if you don’t have very many. If you have a lot of them with our culture, it just won’t work. First of all, we need to pick those opportunities
very, very selectively. We need to then manage them aggressively across the company. That means have joint teams work together, strong project management and leadership, constant reviews, a framework, a vision, a strong owner—all those things that make a program and project successful.” Subsequently, a number of organizations sought help from the HP Project Management Initiative to systematically reduce 120 projects down to 30. Another organization went from 50 projects down to 17. It appears counter-intuitive, but by prioritizing and more carefully selecting projects, organizations actually get more projects completed.

Figure 5 illustrates a document that captures the output of this process. Record projects that are fully funded in an aggregate project plan (in-plan). In a separate section or another document, list projects for future consideration (out-plan); also capture and communicate reasons for delaying or not funding projects. The plan of record (POR) is both a process and a tool used by some organizations at HP to keep track of the total list of projects. It lists all projects under way or under consideration by the entity. If a project is funded and has resources assigned, it has achieved in-plan status. Projects below the cutoff line of available resources or that have not yet achieved priority status are on the out-plan. The figure also categorizes the projects and specifies the desired mix.

Project managers at HP describe one benefit of the POR process as identifying gaps between required and actual resources. For flexible changes, the process gets all people into the communications loop. If people want to add something, the management team has to decide what should be deleted. The process helps two divisions that work together agree on one prioritized list instead of two. They utilize direct electronic connections for bottom-up entry of projects and resources by all project managers into a centralized administration point.

**Implement the Plan**

No job is complete until it is acted upon. The team needs to “evangelize” all others in the organization to

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**Figure 5. An example plan of record showing the mix of projects in priority order and the time line for each project.**
use the aggregate project plan or POR to guide people who plan work, make decisions, and execute projects. Although it may be countercultural to do so, do not starve committed projects of the resources they need. The team or the responsible upper managers need to enforce the plan by fully staffing committed projects; that now becomes possible because fewer projects are happening simultaneously. Also, use the plan to identify opportunities for leverage across projects or for process reengineering. Match people skills to project categories to tap their strengths and areas for contribution.

The team or a program management office needs to maintain the plan in a central place, such as a project office or online. Make it known to, and accessible by, all people in the organization doing projects, subject to confidentiality requirements. All the work to this point may go for naught if the process, the steps, and the results are not widely communicated.

The same people who develop the plan are also the ones who can best update it periodically, perhaps quarterly or as changes occur. Use tools such as an online shared database to gather data directly from project managers about resources needed for each project. This system can be used both to gather data when developing the plan and to update it. View the plan as a “living document” that accurately reflects current realities.

The challenge for HP and many companies is to “master both adaptive innovation and consistent execution...again and again and again...in the context of relentless change...Staying on top means remaining poised on the edges of chaos and time...These edges are places of adaptive behavior. They are also unstable. This instability means that managers have to work at staying on the edge” [1]. The advice is clear: the plan is indispensable as a strategic guideline, but don’t fall in love with it! Be prepared to adapt it and to communicate the changes.

Process Tools

One tool that can assist in the decision-making process is the AHP [10]. Because of the interactions among many factors affecting a complex decision, it is essential to identify the important factors and the degree that they affect each other before a clear decision can be made. The AHP helps structure a complex situation, identify its criteria and other intangible or concrete factors, measure the interactions among them in a simple way, and synthesize all the information to obtain priorities. The priorities then can be used in a benefit-to-cost determination to decide which projects to select. The AHP organizes feelings and intuition alongside logic in a structured approach to decision-making—helpful in complex situations where it is difficult to comprehend multiple variables together. An individual or team focuses on one criterion at a time and applies it step by step across alternatives. A number of sites across HP find value in using AHP.

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**Getting to the Should’s**

- Vivid description of future state associated with portfolio success
- Important factors that assess & compare projects’ ability to achieve goal
- Alternatives (existing & potential projects)
- Improve project management across the company
- Business impact
- Need Funding
- Workshop
- Conference
- Tools
- Process

Figure 6. An analytical hierarchy process, with definitions on the left and examples on the right.
Figure 6 depicts the structure of the hierarchy. The examples along the right-hand side represent choices available to the HP Project Management Initiative.

In another example, a team got together to choose among a set of services they will offer to customers. More choices were available than the organization had capacity to support. After defining organizational strategy or product goals, the first task was to identify which criteria to enter into the decision-making process. After give-and-take discussion, they decided that the criteria are customer satisfaction, business value, process effectiveness, and employee satisfaction.

Next, the criteria were ranked according to priority by making pairwise comparisons between them. Which is the more desirable criterion and by how much, customer satisfaction or business value? Process effectiveness or employee satisfaction? Business value or process effectiveness? These questions were asked about all possible pairs.

Each potential project or service then was scored underneath each criterion, and decisions were made about which projects to include in the portfolio, based upon existing resources. This team went on to create a POR similar to Figure 5.

A detailed explanation for computing the priority scores and the final rank ordering list can be quite complex, involving eigenvalues and eigenvectors, so it is much easier to get a software package (Expert Choice [4]) that does the computations. As an alternative, a spreadsheet could be constructed to normalize the numbers.

This process appears complex and analytical but is easy when the software handles the computations, and the management team concentrates on the comparisons. It is thorough in guiding the team to consider all criteria, both emotional and logical, and to apply them to all projects. One team rejected the process as too analytical, so be aware that it does not work for everyone.

The key benefit in doing this process is the improved quality of dialogue that occurs among the management team members. In facilitating a number of teams at HP through this process, each one achieved far more progress than they thought possible. People admit that they become addicted to the AHP process. They immediately buy the software. The systematic approach is feasible whether selecting products for a product line, projects that comprise a portfolio, or the best supplier or candidate for a job. In reality, the discussions are more valuable than the analysis. The process in this case provides the discipline that makes the dialogue happen.

Frame [5] offers an alternative “poor man’s hierarchy.” He puts selection criteria along the side as well as across the top of a grid. If the criterion on the side is preferred to the one on the top, put a 1 in the cell. If the criterion on top is preferred, put a 0 in the cell. Diagonals are blanked out where criteria would be compared to themselves. Below the diagonal, put the opposite value from corresponding cells above the diagonal. Then add up the numbers across the rows to get total scores, which provide a rank order. One team at HP modified this process to replace the 1s and 0s with an actual count of how 18 people voted in each pairwise comparison of alternatives. Again, they added up the rows and normalized the results for a priority order and weighted ranking (Figure 7).

This simplified hierarchy is especially helpful for weighting criteria. It can be used for prioritizing projects when applied to one criterion at a time. It becomes bulky and less useful when applied to multiple projects over multiple criteria.

**Barriers to Implementation**

Now for a reality check. The model depicted in this article is thorough, and it integrates objective and
subjective data. When all is said and done, however, people may throw out the results and make a different decision. Sometimes the reason is a hunch, an instinct, or simply a desire to try something different. Sometimes people have a pet project and use the process to justify its existence, or a hidden agenda may be at play—perhaps the need to maneuver among colleagues, trading projects for favors. Politics at this stage cannot be ignored, nor are they likely to disappear. It is imperative for leaders to become skilled in the political process. Any attempt at leading change in how an organization links projects to strategy is bound to meet resistance. The concept receives almost unanimous intellectual support. Implementing it into the heart and soul of all people in the organization is another story. It goes against the cultural norms in many organizations and conjures up all kinds of resistance if the values it espouses are not the norm in that organization. The path is full of pitfalls, especially if information is presented carelessly or perceived as final when it is work in process.

Some people resist because the process is too analytical. Some want decision-making to be purely interactive, intuitive, or the purview of a few people. A complete process cannot be forced upon people if the organization has more immediate concerns or unresolved issues. Resistance occurs when there is no strategy, the strategy is unclear, or people are uncomfortable with the strategy. Work on the process may come to a standstill when people realize how much work is involved to fully link projects to strategy. If the pain is not great enough with the status quo, people are not ready to change.

When people sense that the leader does not authentically believe in any of the elements, such as the goals, the process, or the tools, they are hesitant to follow with any enthusiasm. When the leader lacks integrity and exhibits incongruity between words and actions, people may go through the motions but do not exert an effort that achieves meaningful results.

Enablers for Effective Implementation

It is possible to lead people through this change process if the leader asks many questions, listens to the concerns of all people involved, and seeks to build support so that people feel they have an active role in developing the process [9]. A flexible process works better than a rigid one. Cultivate “champions” who have the credibility and fortitude to carry the process across the organization. Believe that change is possible.

When the effort appears too massive, one approach is to go after the low-hanging fruit. Start with one of the more pressing issues and use the general concepts of this model to address it. Still have a vision for what the organization ultimately can achieve but understand that patience and pacing are necessary to get there.

Consider also that this process is hierarchical—it can be applied singularly or collectively, up or down the organization. A mental model of linking projects to strategy is like fractals and chaos theory. As a viewer moves through layers, each is a reduced-size copy of the whole, exhibiting all its similar but chaotic traits—unpredictable and sensitive to small changes. The leader invoking this process in action experiences both order and disorder. Behavioral patterns appear in irregular but similar forms. Amidst unpredictable actions, however, we find patterns of similar behavior. The process or the behaviors do not vary across the layers as much as the type of projects on which they are utilized. It is not necessary for every level in an organization to apply the process, but it is much more effective if they do. Be accountable to take action where you are. Expect to work within a realm of “bounded instability” [11]. Each and every team, individual, or organization benefits by using the process.

For people who get frustrated when all linkages are not present, the authors urge teams and individuals to invoke the power of one and “just do it.” Small changes in initial conditions have enormous consequences. Eventually successes or small wins are noticed. The practices start to permeate an organization. This can happen in the middle, move up, and then over to other organizations. Incidentally, a corporate group like HP’s Project Management Initiative helps facilitate this transformation. We do this by acting as a conduit for success stories and best practices.

Over the long run, we believe that organizations that follow a process similar to the one described increase their odds for greater success. This happens because teams of people following a systematic process and using convincing data to support their arguments more often produce better results than individuals. Their projects have more visibility, and the quality of dialogue and decision-making improve. The power of using criteria that are tightly linked with strategy and known by everyone in the organization is the mitigating effect it has to guide behavior in constructive ways. Having a process means it can be replicated and improved over time until it is optimized. It also means
other people can learn the process and coach others, thereby creating a learning organization.

In summary, the successful complete upper manager:

• Knows that projects without strategic emphasis often end in failure.
• Develops an upper management team to oversee project selection.
• Focuses on the goals of what an organization should do before limiting choices by considering only what the organization is capable of doing.
• Works to develop a system of projects and links them to organizational strategy.
• Guides the development of consistent criteria that are used to prioritize projects.
• Selects projects based on comparative priority ranking of contribution to strategy.
• Reduces the total number of projects to minimize possible disruption.
• Knows that a system of projects utilizes a common resource pool and that the pool may be abused without cooperation across the organization.
• Develops a system to manage the resource pool and reward interdepartmental cooperation.
• Allows unallocated capacity in a resource pool for emergencies and for creativity.
• Believes in the power generated by a learning organization.

• Creates a model for linking projects to strategy and supports it with authenticity and integrity.

References