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**THE MULTI-DIMENSIONAL AND
RECONFIGURABLE ORGANIZATION**

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EXECUTIVE SUMMARY

In this paper I argue that multi-dimensional organizations like Procter & Gamble's Four Pillars structure are a new form of organization. The complexity of these forms requires the creation of new horizontal processes. Indeed, these new forms are massively horizontal. They use cross-functional, cross-company teams that work through global common business processes.

IBM uses cross-functional teams consisting of hundreds of people to implement its new Smart Planet strategy. These teams are constantly being combined, dismantled and reconfigured to work on anything from the Stockholm traffic system to a smart electric grid for the island of Malta. This constant assembly and disassembly of teams makes IBM a reconfigurable organization. As a response to the complexity, IBM has returned to a functional structure and assembles teams to address any dimension, whether they are products, countries, new businesses or Smart Planet solutions. IBM can configure itself around any dimension. This paper explains how and why.

THE MULTI-DIMENSIONAL AND RECONFIGURABLE ORGANIZATION

One of the new forms of organization that will evolve in the 21st century is the multi-dimensional organization. In their lead article, the editors describe the U-Form or unitary form of organization. The U-Form is a one-dimensional organization where functions report into the chief executive. They then described how the M-Form or multi-divisional structure was created. The M-Form is a two-dimensional organization where business units and functions report into the CEO. Today the M-Form is disappearing. One can still find them among the conglomerates like United Technologies. The lead article described how some technology companies have moved to the two-dimensional matrix design. Since then, companies have added new dimensions of geography, market segments, channels and solutions to their structures. They have evolved into three- and four-dimensional matrix organizations. These dimensions are not just add-ons. They are interdependent and must be interwoven with the existing dimensions. The organizational innovation in these designs is in the creation of new coordination mechanisms like management processes, reward systems and career paths. The companies that are successful with these designs, like Procter & Gamble, are masters at multi-dimensional coordination.

The other feature that is being developed in today's multi-dimensional multi-nationals is the ability to reconfigure themselves. In order to avoid commoditization, many companies are moving away from just selling to stand alone products. They provide integrated packages of products, services, software and most of all, thought leadership. Companies like IBM, Cisco and other infrastructure providers are creating customized solutions for their customers. They assemble and disassemble teams of hundreds of people from across the company that move from opportunity to opportunity. These companies have developed reconfigurable organization designs. The reconfigurable organization consists of a stable part and a variable part. The stable structure is usually the functional and/or geographical homes for nurturing talent. The reconfigurable part is the talent that is selectively moved into cross-company teams

servicing an ever-changing portfolio of opportunities. This type of company will organize around any dimension that represents an opportunity and for which the company has the expertise to create value for the customer.

In this paper I will first describe the reasons why some companies are being driven to adopt more complex organizational designs. Then we will examine the three-dimensional matrixes of Nestlé and Philips. Procter & Gamble's Four Pillars design will follow. Then we will focus on the multi-dimensional and reconfigurable design of IBM. And finally, I will discuss the theoretical and managerial implications of managing complexity.

DRIVERS OF COMPLEXITY

Managers usually dislike complexity. They far prefer to "keep it simple." So why are they adopting more and more complexity? I think that there are several reasons driving them. First there is the pressure for growth and the law of requisite variety, which force companies to adopt multiple dimensions. Second is the shift of competition to the provision of customized solutions and away from stand alone products. Third is the focus on growth in emerging markets and sustainable infrastructure. The second and third reasons present large companies with an ever changing array of opportunities. The reconfigurable organization allows them to reorganize around opportunities. And finally, in order to create solutions for sustainable infrastructure, like smart electric grids, companies are turning to the new digital technologies. The size of these problems is driving the return of "Big Science," which is tailor made for big companies that can organize around opportunities. Let us look briefly at each of these drivers.

Companies are driven by growth. Publicly traded companies need growth to drive their stock price and maintain an above average price to earnings ratio. When growth stops, a company's stock trades like a bond. So companies pursue growth to achieve an elevated stock price to reward management, gain access to capital and investors, and to serve as a currency for acquisitions. Growth by itself is needed to

attract talent. Truly talented people seldom want to join a stagnant company. Growth, however, is limited in a company's core business and home country. Therefore in order to grow, companies diversify into adjacent businesses and expand across borders into other countries. For example, Dell has expanded from its core desktop business into laptops, servers, printers, storage devices, services and now outsourcing. It has expanded from the U.S. to Europe, Asia and now is focusing on emerging markets.

The other factor driving complexity is the law of requisite variety. It states that as the environment fragments, the organization must also fragment and create new units to manage those environmental fragments that are relevant for their goals. The sales and marketing functions are good examples. As the mass market has fragmented, these functions have created new units for market segments, and for different types of media and multiple distribution channels to reach these segments. The computer companies used to send direct sales people to call on the Chief Information Officer (CIO). They still do. But in addition, sales are generated directly from call centers and through websites. Increasingly sales also go indirectly through independent software vendors (ISVs), systems integrators, value added resellers (VARs), retailers and original equipment manufacturers (OEMs). If the computer companies want to reach all end users, they need to create multiple organizational units that focus on all of these channels. Their sales and marketing functions have necessarily adopted more complex multi-dimensional structures. Both of these forces – growth and fragmentation – are likely to continue in the future driving more complexity in their paths.

As mentioned above, the move to solutions by Western companies allows them to compete by avoiding commoditization of their products and by drawing upon their accumulated intellectual capital. When microprocessors are embedded into every possible object, everything can talk wirelessly to everything else. By combining these objects and adding software, companies can create useful services for customers and teach them how to change their behavior to profit from these services. For customers,

solutions represent a form of miniature outsourcing, and they welcome the ability to let others create value for them. The trend to solutions is also likely to continue.

The information technology companies like IBM and Accenture started with small e-commerce solutions and then managed large global implementations of Enterprise Resource Planning (ERP) systems. Today these companies and other providers are tackling even larger infrastructure challenges like the transport and traffic systems of cities like Stockholm and London, the electricity grid for the island of Malta, and the food supply from farm to fork for Norway. These companies have to organize and reorganize themselves as such opportunities come and go.

Another factor is the focus on emerging markets. This focus comes from the growth potential of countries in these markets. Emerging markets are a source of many large infrastructure opportunities. Saudi Arabia and China are creating whole new cities from scratch. But in many of these countries the government is a major player in the economy. There are state-owned enterprises that are simultaneously customers, partners and potential suppliers. The result has been the re-emergence of the country manager in global companies. They are representing the voice of the governments in the multi-national matrix designs.

So managers are adopting more complex organizations in spite of their preference for simplicity. Growth is a primary driver in that it forces companies to enter into new businesses and geographies. The switch to solutions that are ever larger in size and always changing leads to organizations that are reconfigurable around these dynamic opportunities. Such large infrastructure solutions are uniquely suited to large Western multinationals. The companies can avoid commoditization and leverage their thought leadership to tackle the world's problems. They can also use their managerial sophistication to create the organizations that are needed to deliver the complex solutions.

MULTI-DIMENSIONAL STRUCTURES

Many companies have moved beyond the M-Form by adding new dimensions to their structures. First they added a geographical dimension and then some of them added and are adding a customer or customer segment dimension. In doing so, they became and are becoming three- and then four-dimensional structures.

The Three-Dimensional International Organization

As growth slowed in their home markets, most companies chose to expand in markets in other countries. The initial organizational response of companies from large countries was to add a separate international division. These companies were able to preserve their multi-divisional or M-Form structure. However, when sales from outside the home country reached about 30 to 40 percent of the total sales, the international division was broken up. If the company was a consumer goods company, like P&G, the international division was replaced by a regional structure with the U.S. as one of the regions. If the company was a business-to-business enterprise, then it evolved to worldwide business units. The international division was divided up among the business units. In both cases, the companies retained the other dimension, businesses or countries, as an overlay or matrix on their dominant profit center structure.

Nestlé is an example of the former. Historically Nestlé was an M-Form organization with its divisions or profit centers set up as the countries. It was a local food and beverage business. Its expertise was the process for producing powdered food (soups, sauces) and beverages (tea, coffee, chocolate, milk) and in trading in the commodities from which the products were made. The products were all modified to appeal to local tastes. But in the last few decades decision making has slowly moved from countries to regions and global business units. The problem with autonomous divisions – whether businesses or countries – is that they all create their own functions and duplicate each other. So as Europe moved from a collection of countries to the European Union, Nestlé moved cross-country supply and customer decisions to its

European region away from the countries. Nestlé also learned how to manage global brands. While it recognizes that every country is different, Nestlé has learned that the countries are not 100 percent different. Significant economies can be achieved where countries are the same. Savings in common advertising copy, new product development and packaging can be achieved by having these decisions made by global business units.

One of the biggest changes has been the increase in investment in R+D. Each country cannot efficiently fund its own R+D. As Nestlé has focused its strategy on health and nutrition, its R+D investment has gone from 0.5 percent of sales to 1.6 percent. It is removing fat, adding vitamins, and maintaining taste in its products as well as understanding digestive processes and the role of enzymes. This investment has increased the authority of the global R+D function and the role of the global business units. So over time, Nestlé has moved to a three-dimensional matrix organization. The P+L is still in the geographies, but more power and authority has moved to regional and global functions and to global business units.

Nestlé's structure is shown in figure one. Reporting to the CEO are the normal corporate functions. The technical functions like R+D are grouped into an entity called Nestec and charged out to the P+Ls, which are countries. The line organization is geographic. It begins with zones and is then broken into regions and large countries. The business units comprise the other dimension reporting to the CEO. They are responsible for global brands like Nescafé and Buitoni. Nestlé Germany is shown in the figure. Germany is organized around functions and business units. The functions and businesses report to the country manager and to their respective corporate units forming a three-dimensional matrix. Since the global businesses take the lead in new product development, they have an R+D function as well. It is important to note that three-dimensional matrix designs do not lead to managers having three reporting relationships. There are only two reporting relationships at any given time to reduce the

complexity.

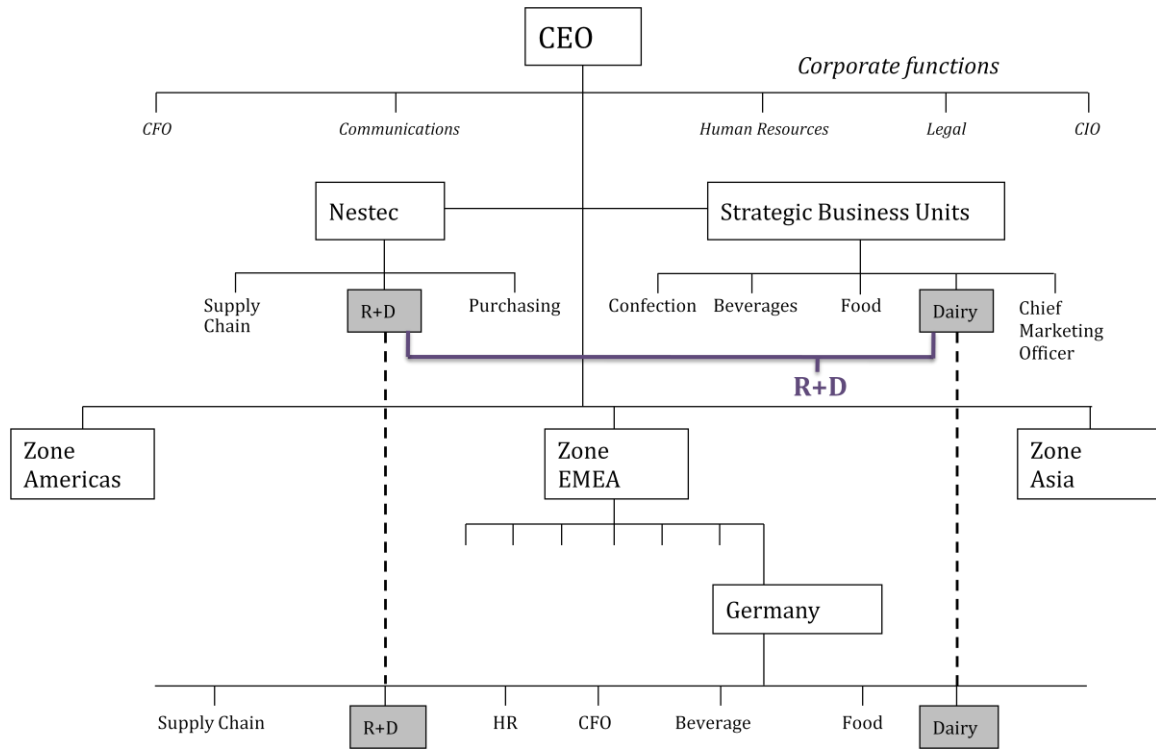


Figure 1. Nestlé's Three-Dimensional Matrix

Royal Dutch Philips has also arrived at a three-dimensional matrix from an M-Form, but through a very different process. Philips, like Nestlé and many other European companies, adopted an M-Form based on country profit centers following World War II. Then as the European Union formed and globalization drove the world economy, Philips, who invests about 7 percent of sales in R+D, evolved from country P+Ls to global business unit P+Ls. So by 2000, it was an M-Form based on business divisions, and the country organizations were eliminated. However, a new CEO has re-established the geographic organization and added it to the global business structure. The reason is that Philips is targeting emerging markets for growth. It requires country managers in China, Brazil and India. At one point the country manager for China reported directly to the CEO in order to signal the country's importance.

Another reason for the return of the country managers is the One Philips strategy and the need for local partnerships. Philips is promoting the collaboration between its

businesses to offer solutions. One example is the cooperation between its Medical Systems and its Consumer Electronics businesses. Medical Systems is a leading producer of patient monitoring equipment for emergency rooms. Now Philips is miniaturizing these products and making them available to consumers. As patients move out of hospitals and take advantage of home care, these products become consumer products. In order to implement this practice, the patient monitoring equipment makes use of the Consumer Electronics business's expertise and local distribution, and it's linked to the Internet. Consumer Electronics' partner in the United States, Comcast, a cable company, provides the Internet links to the patients' homes, physician's offices and clinics. The country manager coordinates across businesses and develops partnerships with physician groups and clinics that monitor the patients and prescribe Philips equipment. The country organization also develops relationships with local third party payers like governments and insurance companies. The solution makes use of global products from Medical Systems, uses expertise, distribution, and partners from Consumer Electronics, and partners and relationships from the country organization. So at Philips the geographic dimension has been added to manage government relationships in emerging markets and to implement local health care solutions.

The Four-Dimensional Structure

In the 1990s and more recently, firms have encountered their customers in multiple countries and in multiple businesses. Many of these customers have indicated a preference to be served through a single unit in the vendor organization. Some of these vendors have created global account units to serve their customers. Other customers have desired closer relationships with their suppliers and prefer to buy solutions and even outsource certain activities to them. The suppliers like IBM, Accenture and Procter & Gamble have formed multi-functional, multi-business, multi-country customer-facing units. Their organizations have been divided into two parts, a front end, which is customer-focused, and a back end, which is business-focused. This front-back model

allows these companies to achieve global scale with their businesses and local adaptation and customization for their customers.

An example of this structure is Procter & Gamble's organization. They call it their Four Pillars Structure 2005. Prior to the Four Pillars design, P&G operated a three-dimensional matrix very similar to Nestlé. The structure that existed in June 2009 is shown in Figure Two.

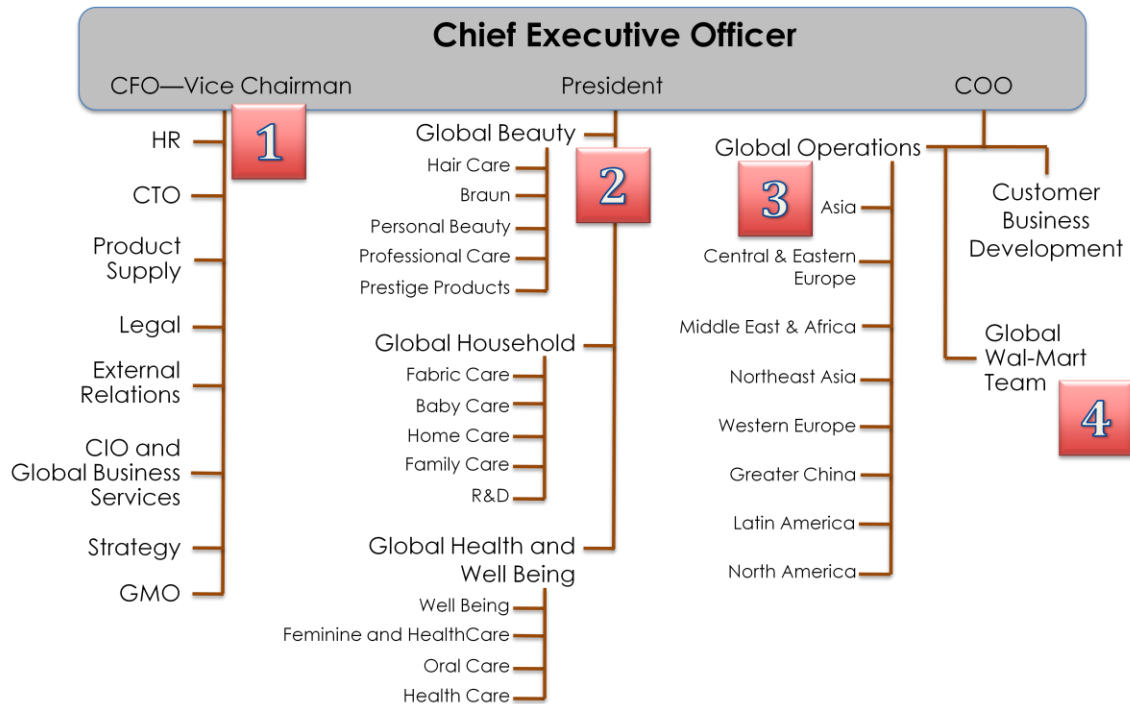


Figure 2. Procter & Gamble's Four Pillars Structure

The left side of the chart is familiar. It shows the global functions that make up pillar one, and the global business units (GBUs) for pillar two. If these two pillars were the entire structure, we would recognize the organization as the two-dimensional M-Form. But P&G has pulled apart the value chain. The upstream, or back-end of the value chain is organized by product lines or brands (such as Tide) that are gathered into global business units (like Fabric Care) and global business groups (Global Household). The business units consist of the product development, product supply (supply chain) and product marketing functions. They also have the usual corporate functions of finance, HR and IT as well as a sales liaison group. The downstream, or front end of the value

chain is organized by customers. The third, or regional, pillar serves local customers. The fourth, or global customer pillar serves global customers like Wal-Mart. This structure arises because customers can buy products from all global business units and many want a single interface at P&G to support their central buying. The regions and customer teams are comprised of the product supply function (from factory to retailer), the regional and customer marketing function, and the sales function (they call it Customer Business Development).

The front end of the organization – the regions and customer – reports into the Chief Operating Officer. The back end – the GBUs – reports into the President. The global functions, which form the corporate center in Cincinnati, report into the Vice-Chairman and CFO, and to the CEO. The top four executives form a top executive team. The P&G structure thus shows another feature of these multi-dimensional structures. The organization's complexity exceeds the capability of a single CEO to run it. So very often there are offices of two, three or four executives to manage the entire enterprise.

As mentioned above, these Four Pillars are not independent groups reporting into a chief executive office. They are all interdependent dimensions that work together. How do they do that? P&G manages the complexity through a four-dimensional matrix organization, a company wide career system, a matrix culture that builds on the company's long history of working in teams, and the evolving management processes.

It is impossible to visually represent the P&G matrix. We can get an idea with an example. Part of the matrix is illustrated in figure three. It shows the Four Pillars structure. On the left side of the chart, the usual global function-global business unit matrix is shown for the Chief Technical Officer (CTO or R+D head). The head of R+D for the Global Household Group works for both the Group head and the CTO as is shown. Indeed, members of all of the global functions working in the businesses report to both their function heads and their business heads, as they have for the last 35 years.

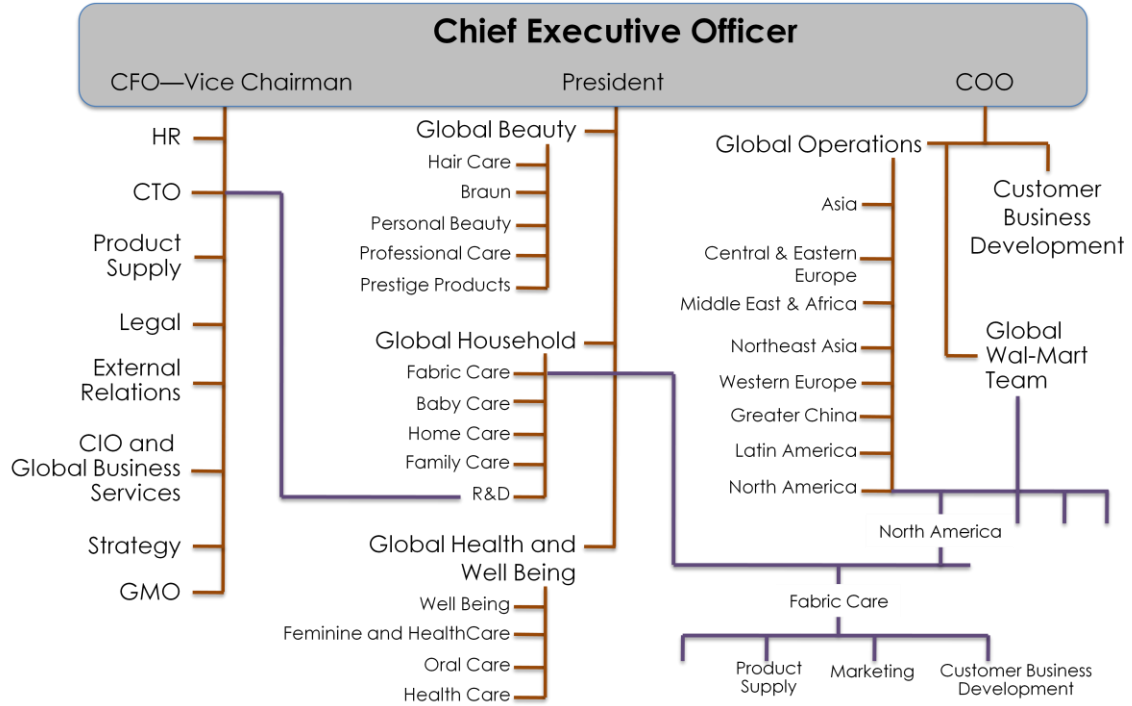


Figure 3. Some Matrix Examples at Procter & Gamble

The global Wal-Mart Team matrix is illustrative of how the complexity is managed. Recall that Wal-Mart accounts for something like one-third of P&G’s revenues. A global team of about 250 people manages that revenue. The head of the Wal-Mart team reports to the COO. The team organization is based on global functions (not shown on the chart) and regions where Wal-Mart has retail operations. The largest operation is in North America and it is shown reporting into the team leader. The North American head also reports into the North American regional head. The North American Wal-Mart team is organized around the business units whose products they sell to Wal-Mart. The Fabric Care business unit is shown on the chart. A sales manager specializing in Fabric Care brands like Tide and Dash manages it. The sales manager reports to the head of the North American Wal-Mart team and to a North American head in the Fabric Care GBU. So the Wal-Mart team is a mirror image of the P&G structure of functions, regions and business units. At each level, the Wal-Mart team reports to the next manager in the team and to a manager in their unit in the rest of P&G. To complete the team structure, there are functions that report into the Fabric Care

sales manager. They also report into their respective functional head in the Wal-Mart team. In this manner the customer dimension is well integrated into the other three dimensions of the P&G structure.

The integration of the four dimensions is facilitated by the company-wide career system. If you ask someone from P&G about her or his reporting relationship, the answer is, "I report to my functional boss and to my line boss." So people enter P&G by joining a function, but then move from business unit to region to customer team and back again. The leaders develop an understanding of the company and all its dimensions, and how they work together. They also develop networks across the company to facilitate lateral coordination at the interfaces. This process continues at the top levels. For example, the head of the Baby Care business unit moved to become the Asia Region head. If successful there, she could return and run a bigger business unit and then go back to run a larger region.

A third facilitator of multi-dimensional integration is P&G's long history of working in cross-unit teams. Starting with high-performance work teams in the factories in the 1960s, P&G extended the team concept to cross-functional business teams in the 1980s. They became global business unit teams in the 1990s when the cross-functional teams also worked across regions. In the 1980s, P&G started creating customer teams in the United States. Starting with Wal-Mart, these teams were cross business and cross-function. More recently, the customer teams were extended to become cross-business unit, cross-region as well as cross-function. The teams have been introduced for ten global retailers. In this way, P&G has created a capability of integrating multiple dimensions.

The final integrating mechanism is the planning and budgeting process. This process will be more completely described in the next section. P&G has been perfecting their process by starting in North America and then extending it on a global basis.

ORGANIZATIONAL INFRASTRUCTURE

It is the development of organizational infrastructures that makes the multidimensional structure work. The successful ones have created common business processes and defined roles and responsibilities. They have adopted common new product development processes, supply chain processes, pricing processes, and so on. If all dimensions are to work together, they have to use common processes. Then when implementing these processes, they define who does what by using decision rights tools or responsibility charts. The real design work, however, focuses on the management processes for allocating resources, the performance management process and the process of selection and development of managers. In the next sections we will examine each of those processes.

Management Processes

The management processes are implemented to allocate the scarce resources, such as money and talent, in an organization. These processes usually result in targets and commitments from the leaders of the different dimensions. The planning and budgeting process is usually the primary one. If all four dimensions at P&G followed their own plan, there would be chaos. Instead, each dimension prepares a plan for the coming year, as well as the next three. Then a reconciliation process takes place to see that the goals of all the dimensions are aligned. The challenge here is to execute the reconciliation in a timely and non-bureaucratic fashion.

Most multi-dimensional companies execute something like the following process. P&G could start its process in the regions after receiving corporate strategy guidelines. The North American region would prepare plans both by customer and by business. The spreadsheet shown in Figure Four demonstrates how the results would be displayed and reconciled. For each column there is a customer team like the one shown for Wal-Mart in figure three. This team prepares its plan for the year ahead after conferring with the customer. The North American businesses for Fabric Care, Oral

Care, Baby Care, and so on also prepare their plans. A key role in the planning and reconciliation processes is the sales leader for the business. This leader sits on the customer team. The Fabric Care sales leader and team were shown in figure three. This Fabric Care sales leader is a member of both the business and the customer teams. The sales leaders work with both teams and team leaders to reconcile their plans and goals. Many of the issues are resolved in this manner. If not, many companies resort to the large-scale meeting. In these meetings, the customer and business team members gather in a room for a day to work through their issues. Specialists run the large-scale meetings. One group runs something called a “Decision Accelerator,” which is a fast-track form of large-scale meeting that is particularly useful in the case of contentious issues. The specially trained facilitators are very skilled at getting groups of 20 or more people to come to an agreement. The reconciliation results in the plan and budget for North America and the regional component of the businesses.

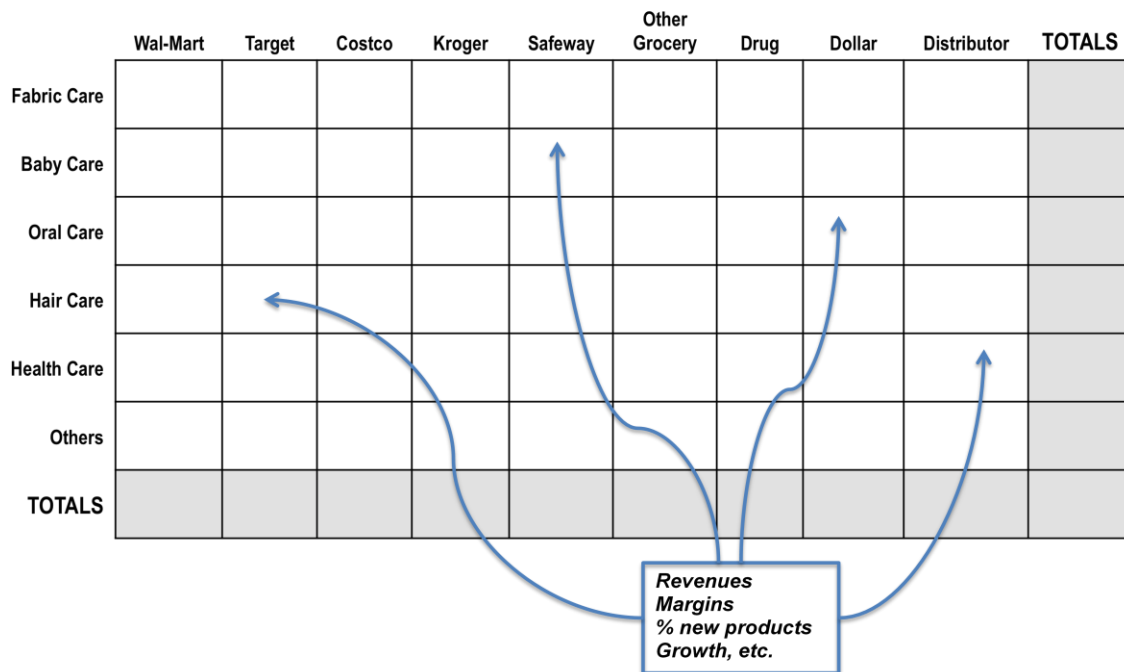


Figure 4. Procter & Gamble Regional Spreadsheet

The regional and business totals in the columns are then added up and displayed on a larger spreadsheet for the company. The company spreadsheet is shown in figure five.

The businesses are indicated in the rows and regions in the columns. There are usually some issues to reconcile at the corporate level as well. Sometimes business heads and regional leaders can reach a decision. Other times a Decision Accelerator is used for this purpose. Some companies use a capstone meeting to accentuate and celebrate the completion of the enterprise plan. Canon, for example, has a “Summit Meeting” of the top 150 people. They gather in Japan for about a week to reconcile their issues and announce the plan for the coming year. So through processes such as these, companies are implementing multi-dimensional organizations but with an aligned set of goals and an integrated enterprise plan.

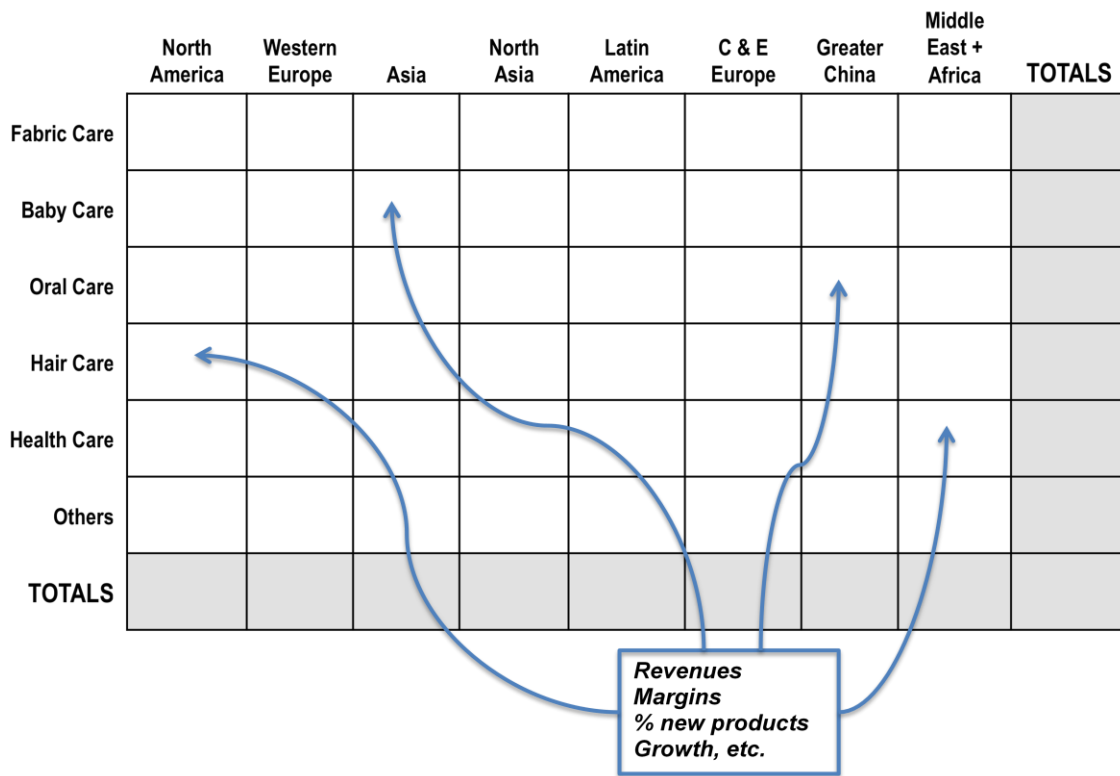


Figure 5. Procter & Gamble Enterprise Spreadsheet

To be sure, the multi-dimensional companies are still struggling with the reconciliation process in an effort to make it inclusive, timely and aligned. Many are streamlining their process and adopting mechanisms like the Decision Accelerator. They are also trying to make the resource allocation process timelier. Nokia still prepares long-term plans, but

commits for only six months rather than the usual annual targets. They want their speed of decision making to match the speed at which the business moves. The multi-dimensional companies' management processes will continually evolve and be a source of organizational innovation.

Performance Management Process

The multi-dimensional companies also assess and reward performance in new ways. The behaviors that were successful when running autonomous business units in an M-form are not the same as the behaviors that are needed to complete a successful reconciliation process. The companies still want their leaders to deliver their numbers and meet their commitments. But in addition, they need leaders who contribute to the reconciliation process and work well with their peers. As a result, the performance management process is being redesigned to produce a **full** and **fair** assessment of their leaders' performance. By "full" they mean assessments of whether the goals were met, whether the manager lived the values of the company, whether the leaders collaborated in the reconciliation process and so on. The trend is toward valid, subjective performance assessments.

The issue is that it takes a lot of hard work to produce valid subjective performance assessments that can stand up in court. The professional services firms like McKinsey, Goldman Sachs and Latham & Watkins do the best job. They free up a partner who takes a week or more of her or his time to produce an assessment. The partner interviews the person being assessed, as well as that person's clients, peers and others who have worked on projects led by that person. The partner reads the exit interviews of former associates who worked for the person being assessed. The assessment considers revenue generated, whether relationships were built with clients, if the person contributed to the intellectual property of the firm, whether the person contributed to recruiting and developing talent and so on. It is a full and thorough assessment. It is facilitated by people taking the process seriously. Peers take the time

and give thoughtful views of the person in question. They are asked to give actual examples of behaviors and avoid off hand remarks.

The assessments are fair and equitable because they are standardized across the company, and then thoroughly debated. Each evaluator has a list of tested and standardized questions to use. The results are then vetted and discussed in performance committees across the regions and at the firm level. The assessors need to be able to defend their assessments before a jury of their peers. And finally, the process is made as transparent as possible. The overall results are reported while preserving individual privacy. It is very easy for partners in other countries to perceive that the home country partners get more than their fair share.

Few companies go to the lengths of the professional services firms. But most of them are moving toward more valid subjective performance assessments. Multi-dimensional organizations run on collaboration and contributions to the enterprise above making your own numbers. So full and fair performance assessments are being developed and deployed across these companies.

Selection and Development Processes

As mentioned above, the multi-dimensional structures require different behaviors from an M-form using autonomous business units. The behaviors must be more collaborative, and thus a more subjective assessment process is needed to reward and develop those behaviors. Companies can also increase their chances of uncovering these behaviors if they bring in people who are more naturally collaborative in the first place. As a result, we are seeing greater efforts at recruiting, developing and promoting people with these kinds of mind and skill sets. Companies search for people who fit in with the ways of working in the multi-dimensional firm. Like the subjective assessment, these efforts require more time and effort. The mantra today is “hire hard, manage easy.”

Many companies are creating an employee value proposition (EVP). An EVP, like a customer value proposition, describes what employees can expect to receive and what they are expected to contribute. They search widely for people who will respond to their EVP. For the top candidates, companies send their senior managers and partners to woo and recruit. Candidates can see the company's leaders face-to-face and determine if these are the kind of people they want to work with. Many companies have extensive interviewing processes. They have multiple interviews and interviews with teams. Often the interviews are based on "critical behavior" interviewing techniques. So the companies invest in processes to get the right players on the field.

The development process follows many of the usual practices, but also employs rotational assignments. Recall the example of P&G where people join a function and then rotate between regions, business units and customer teams. BMW has a career system based on what they call "knights' moves." People move through the organization like the knight piece moves on a chessboard. First they move up the hierarchy and then over to a new function. The process of up and over repeats itself several times throughout the career. As a result, people learn the entire company; know people at various levels and form lasting networks. Schlumberger, the oil services firm, is another company that rotates talent. They have made a virtue of necessity. They hire capable engineers who are then assigned to work with oil companies at drilling sites. These sites, however, are located in some of the least desirable places on earth. So for example, after a couple of years of working on the North Slope of Alaska, the engineers are brought back to New York and work in human resources. They might next go to a site in the Niger Delta. After a couple of years in Nigeria, they go to Paris and work for a few years in finance. In this manner they move from line operating jobs to staff headquarters jobs and back again. They learn how to manage with authority in the line jobs, and without authority in the corporate staff roles. They learn about the various regions of the world where Schlumberger operates. These people stay a long time with their organizations and develop company-specific skills. Most importantly, they learn how to navigate in these multi-dimensional structures.

Summary of Multi-dimensional Structures and Processes

The three- and four-dimensional structures are evolving due to pressures to grow and adapt to environmental fragmentation. These multi-dimensional structures are interdependent as new dimensions are integrated into existing structures. Such organizations are managed through multi-level matrix designs and with infrastructures that use redesigned processes for resource allocation, performance management, and talent selection and development. The processes are continuously being improved and enhanced as these companies gain experience with multiple dimensions. Other companies are developing yet more processes as they reconfigure their multi-dimensional structures.

THE RECONFIGURABLE MULTI-DIMENSIONAL ORGANIZATION

Companies have become multi-dimensional organizations by adding relatively permanent new dimensions to their structures. P&G has chosen to focus strategically on ten global retailers. While the top ten customers may change, the global customer segment is a relatively permanent addition to the structure. Other companies, such as IBM and Cisco, face large opportunities that are attractive, but temporary. IBM with its "Smart Planet" strategy has projects like the traffic system in the City of London, a smart electric grid for the island of Malta, and a personalized medicine program with the Mayo Clinic. Cisco is interested in infrastructure projects like the wiring of King Abdullah City in Saudi Arabia, and the wiring of sports stadiums for the National Football League teams. In order to respond to these opportunities, IBM and Cisco need to assemble hundreds of people into capture teams to win the business. Then they need to assemble even more resources to form execution teams if they win the bidding. So the companies must constantly assemble and disassemble global teams of large numbers of people. This assembly-disassembly process amounts to constant reorganizations. As a result, they have designed organizations that can be quickly and easily reconfigured to respond to large opportunities. They have designed reconfigurable organizations.

The reconfigurable organization, as mentioned above, consists of both stable portions and dynamic portions, which configure and reconfigure themselves around opportunities. There are two main stable parts of the organization. The first stable part is the basic structure. For consulting firms and investment banks, the basic structure is the collection of offices around the world. People join an office, which is then responsible for provisioning them with equipment and a desk, assigning them to projects, and developing their talents and careers. The people in that office then work on engagement or deal teams for a local, regional or global customer. At the completion of the project, they return to their home office for the next engagement or deal.

More recently, firms like IBM, Cisco and others have transitioned to a reconfigurable organization. They too have people in offices and “centers” but use a functional structure as the stable axis. As they do at P&G, people join a function, which is responsible for developing and managing their careers. This stable part of the organization serves as a home for some people and a host for others on rotational assignments.

The second stable part of the organization is the collection of common business processes. As people move from one team assignment to another, the processes are common and stay the same. The financial systems, the new product development process, the customer relationship process, the performance management process and so on, are the same everywhere. Certainly there are process owners who constantly try to improve them. But business processes are relatively stable and common throughout the organization.

The variable parts of the organization are the teams that form and reform, and the management decision making groups that allocate resources and determine priorities. The teams are formed by gathering people from the functions across the company. The teams are to design and launch a new product or solution, generate a customer proposal, enter a new country, build a new distribution channel, improve a

business process, implement a solution and so forth. The teams are continuously reconfigured to address the set of opportunities facing the company.

The teams also prepare business plans for their product line, customer segment and country. These plans are channeled into the planning and budgeting process to be reconciled and to produce an aligned set of goals for all the dimensions. But usually the process is not straightforward and difficult choices need to be made. For example, a computer company put together an e-commerce plan for Europe. Everyone signed on to the plan until they became aware of the fact that there were only ten people in Europe who knew how to do secure transactions over the Internet. So while many customers wanted to order e-commerce solutions, no customer would sign a contract until they saw which of the ten experts was to be assigned to their project. The company had some tough decisions to make. On which projects would the ten experts work? And which customers would get an e-commerce solution and which ones would not?

The company used the decision accelerator. They gathered 37 people including the ten experts to decide the best allocation of talent to customers for the company. These 37 people were those who had the knowledge, information and a stake in the outcome. On other occasions, it took 17 people, 51 people and sometimes more to reach the best priority decisions. So these companies also reconfigure the decision making body to fit the circumstances. In summary, the reconfigurable organization consists of a structure that is part stable and part dynamic. It consists of business processes, most of which are stable, and management processes and a decision making body, which are both reconfigurable. The reward systems and career systems are similar to the other multi-dimensional organizations.

IBM's Multi-Dimensional and Reconfigurable Organization

IBM began assembling teams when they chose to focus on solutions, services and software in the late 1990s. Gerstner, the CEO at the time, chose to listen to his customers rather than his investment bankers. The customers' advice was not only to keep IBM's businesses together but also to integrate them more tightly in order to get all the

hardware and software to work together. The customers wanted integrated and customized solutions. Gerstner obliged and reorganized IBM into a front-back structure very much like P&G. There was a customer-facing front end that was organized by region and customers, which were segmented by industry groups. The back end was organized into business units, which were collected into groups for hardware, software and services. The usual corporate functional groups were matrixed across both the front and back structures. The structure is shown below in figure 6.

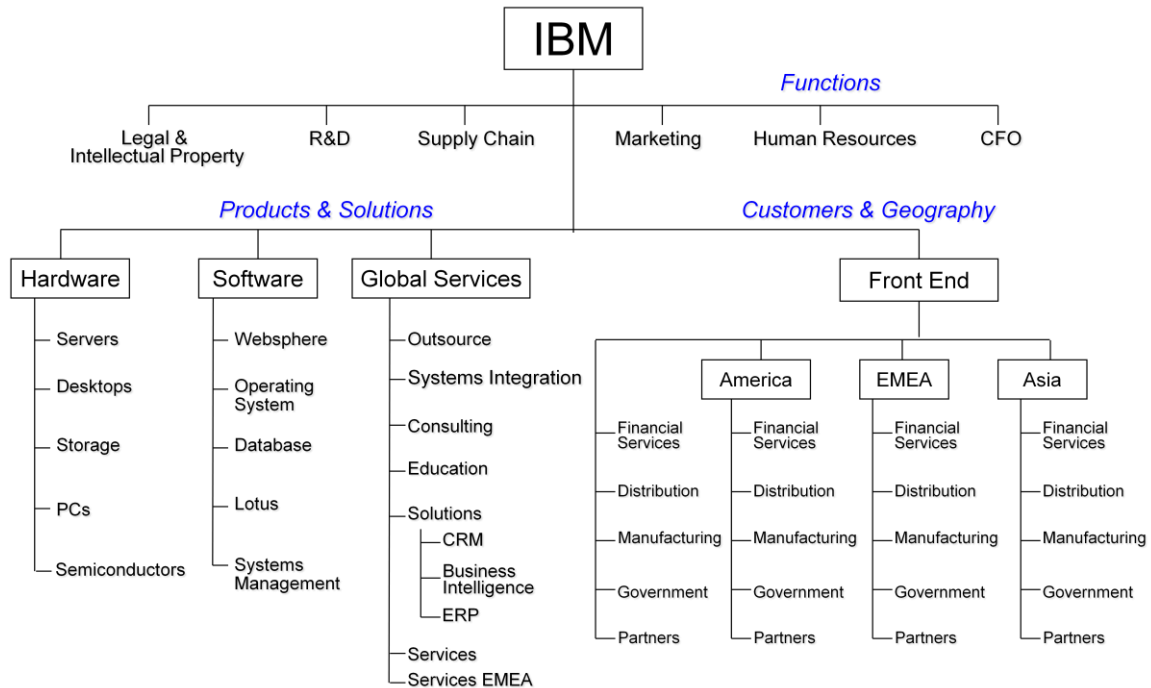


Figure 6. IBM Structure

The IBM structure then evolved into a five-, then six-dimensional matrix design. The fifth dimension was generic solutions like Enterprise Resource Planning (ERP) solutions, e-commerce solutions and so on. These generic solutions consisted of all products and were used across all customer segments. These solutions units were part of the Global Services organization. Then the front end added a channels structure shown as “Partners” in figure six. IBM sells directly to customers (about 1000 global customers) through its customer segment regional matrix organization. It sells indirectly to others through partners who are independent software vendors (ISVs), value added resellers

(VARs) and so on. With these additions IBM became the world's most complex organization. One must ask, "How in the world do they get anything done?" The answer is through a companywide infrastructure, which is massively horizontal and reconfigurable. It consists of a stable set of common global business processes, a reconfigurable set of teams that are organized around the ever changing portfolio of opportunities and a reconfigurable set of decision forums for resolving conflicts and setting priorities. In the following sections, I will describe in more detail exactly how IBM manages this vast and complex organization.

Global Business Processes

One of the first things that Gerstner did after changing the organization structure was to implement thirteen global business processes to hold the structure together. All managers in IBM went through a one-week training program on the use of these horizontal processes. Multi-dimensional organizations, in general, and reconfigurable ones, in particular, are process intense. They have all the processes that one would find in an M-Form plus several others. They have a business unit planning process, like an M-Form, plus a segment and a regional planning process. They also have a reconciliation process, which works through overlapping memberships and collaboration. A reconfigurable decision making body will resolve the remaining conflicts.

Solutions providers are also process intense. They have a new product development process as in an M-Form plus a new solutions development process and a portfolio management process. The portfolio process is needed because all of the products, hardware, software and services, must work together in an integrated solution. So when IBM launches a new mainframe it must also launch new compatible software and services products to complete the solution. IBM competes not just on a product-by-product basis but also on an integrated portfolio basis.

A key horizontal process is the customer relationship management (CRM) process. It is into this process that all customer plans, priorities and opportunities are entered. Each opportunity must be acknowledged and a response entered from all product lines within 24 hours. The customer account manager is the opportunity owner and coordinates across the businesses through the account team made up of sales people from all of the businesses. For large opportunities like solutions, the opportunity owner may move from the account manager to the regional or even the global segment manager. So the size of the opportunity is matched with the authority of the process owner.

The other essential business process is the project management (PM) process. Everything in a reconfigurable organization is a project. A common global project management system is essential as people from around the world move from one project to another. The other essential ingredient is project management talent. No organization has enough project managers.

So a key means of coordination across IBM's multi-dimensional organization is a large set of robust horizontal business processes. These processes are global and represent a stable component in the reconfigurable organization.

Assembly and Disassembly of Teams

The reconfigurable portion of the structure is the formation and reformation of teams to address opportunities. The opportunities are of three types. They can be new product development opportunities coming from the businesses. They can be new emerging business opportunities (EBOs), which are managed out of the strategy group. Or they can be customer opportunities that can originate with customer account teams in the segments or from emerging market customers. Let me focus on the segment account teams and how they work.

The segments are broken into industries and then into customer accounts. The large accounts like P&G and BMW may do \$1 billion of business per year with IBM.

These customers have an account manager assigned to them who is a general manager of a billion dollar business. As mentioned above, the account managers have account teams of sales people from all of the businesses whose products the customer buys. There are also software and support engineers who are assigned to the account. There is a project management unit to manage all the projects that are taking place at the account. The sales people are like the P&G sales people on the Wal-Mart team. They report to the account team and to their business units. The organization of the account teams is the IBM structure in microcosm.

The segment business plans are built from the account up. The normal orders for products are processed automatically through the business process. But when the customer becomes interested in a big solution, it is then that the company configures large teams to first win the business, and then to implement the project when it is won. The solution is usually anticipated and put into the customer and segment business plans. From there, the team members see that it is also in all of the business unit plans. The account team members and the project manager line up and educate their counterparts in the businesses about the customer opportunity. These counterparts are the ones that will join a capture team when the customer issues a formal Request For Proposal. They will return to their business unit when the proposal is completed. If the proposal is accepted, many of the same people will rejoin the customer account team to form an implementation team that will deliver the solution to the customer. When their work is completed, these people will return to their business units. In this manner, there is a continual assembly and disassembly of solution teams around customer opportunities.

There is also a continual setting of priorities in gathering the types and amounts of talent to staff the solutions teams. There are three levels of escalation to attain the proper staffing. First the team members and the project manager line up talent in the business units from which the account team members come. They are guided by company priorities when conflicts arise. Customers are given priorities by the segments.

Top priority customers are the most profitable, have the most potential or can provide the most information for IBM's learning. There are also solution priorities. If a solution is a "first of a kind" (FOAK), it is staffed with R+D people who will help design the solution so that it can be replicated at other customer sites. Many talent allocations can be achieved at this level.

The next level of resolution when two or more account teams need the same resources is the regional or global segment team. If the conflict is within a segment it can be resolved at the segment level. Those conflicts that are cross-segments go to the Regional Operating Committees. These committees meet once or twice per week to balance opportunities with resources within a region. Failing resolution at the regional level, there is the option of going to the third level, which is the company Operating Committee.

Reconfigurable Decision Forums

Opportunities at IBM, as mentioned above, can come from the existing businesses, new future business, segment customers and emerging market customers. These opportunities easily exceed the resources of even IBM. AS a result, priority choices are a challenge to the leadership. When the opportunity set is constantly changing, the priority decision making process needs to be fluid as well. Previously at IBM, these decisions went to the Management Committee consisting of a few of the top managers. When Palmisano became CEO, he disbanded the Management Committee and put in its place three decision forums. The Technical Committee, chaired by the Chief Technical Officer, managed the new product programs and product portfolio. The Chief Strategy Officer chaired the Strategy Committee. And finally, the CFO chaired the Operations Committee.

The unique feature of these bodies is their membership. On each one there is a core team of seven or eight top managers. The core team is like the old Management Committee, as they are members of all three teams. But the rest of the members come

from different levels and parts of the organization. Each committee consists of about 25 members. The other members are not core team members and the composition of this group changes regularly. Different views and knowledge can be brought to bear on the issues. The body is reconfigurable and can match the changing set of issues facing IBM. Since most talent is mobile within a region, the Regional Operating Committees are responsible for the staffing of solution teams.

Thus IBM has created an organization that can reconfigure itself to address a changing set of global opportunities. It consists of a stable structure shown in figure 6 and a stable set of horizontal processes. The organization reconfigures itself by constantly assembling and disassembling large teams to capture and execute opportunities. And in order to resolve the many priority conflicts, there is a set of decision forums. These forums have reconfigurable memberships to address the varying set of issues on the agendas.

Recent Changes in IBM's Structure

Several changes have been made to the IBM organization over the years in preparation for the Smart Planet strategy. These changes have moved IBM from a front-back structure to a functional or U-form structure. The front end (the sales and distribution function) is roughly the same region-customer segment matrix as before. However, the regions are North America, Western Europe, Japan and the new Emerging Markets region. Emerging Markets, which is only 10 percent of the revenue, will now get full attention from the regional leaders and a focus on infrastructure projects. The biggest changes have been made to the Global Services Group and the Hardware Group. Global Services has split into three units as it has grown. The business units are divided between Global Technology Services (outsourcing of data centers, repair and installation, and technical consulting) and Global Business Services (business process outsourcing and business consulting). But all of the people who deliver the services have been consolidated into a Services Delivery function. IBM thinks of this function as a supply chain for services. It is the services operations function. It is also the function to

innovate and automate the delivery of services. In addition, it can allocate service resources to the ever-changing portfolio of Smart Planet opportunities. Most of the Services Delivery function is structured like a consulting company with no permanent positions.

A similar change was made to the Hardware Group of business units. The manufacturing and engineering design resources were consolidated into a functional structure. The talent was then shared across the server, mainframe and storage product lines. In addition, IBM has provided its functional manufacturing and design capabilities to other companies that want to outsource those functions. So rather than locking up resources in business unit silos, IBM has created flexible talent pools in functions that can meet the changing staffing needs of opportunity capture and execution teams.

The return to a functional structure by IBM seems to be very strange. One of the most consistent relationships in organization design is that the greater the diversity of the portfolio of businesses, the greater the decentralization to the business units. IBM has a very diverse portfolio consisting of semiconductor components, hardware products, software products, financial services, several other services, and an array of solutions. If these were stand alone businesses, IBM would be categorized as a conglomerate. But rather than leaving these businesses independent and manage them through a holding company, IBM combines them into large integrated solutions. The IBM organization is less strange when one notices that Cisco, with an equally diverse portfolio, has also reintroduced a functional structure. Cisco, like IBM, manages all cross-functional business opportunities through teams called "councils." So something must be going on. What follows is my hypothesis.

Both of these companies provide digital solutions. The technology functions are therefore active to see that all products use common architecture and work together. All products and services must easily combine into integrated solutions. The strength of a functional organization is that it drives commonality across the company and reduces duplication. The human resources are then gathered into functional pools so that they

can be easily assigned to teams, which cover a constantly changing portfolio of opportunities. In this way, IBM reduces the multi-dimensional complexity. They approximate a two-dimensional structure consisting of functions and opportunities. There is still interdependence among the dimensions, but much of the coordination of interdependent linkages is programmed into the horizontal business processes. The coordination is mostly automatic.

The coordination that is not automatic is managed by cross-functional teams. These teams focus on “first of a kind” (FOAK) activities. FOAKs can be solutions, products, future businesses, channels, processes, customers or countries. But they are all treated as opportunities regardless of the dimension that they represent. The teams create the new product, solution or whatever and embed it into the business processes. From the processes it can be reused and continuously improved. In this way, IBM has converted itself back into a two-dimensional and reconfigurable organization. It can reconfigure itself to address opportunities of every dimension. This hypothesis needs some further testing over time.

IMPLICATIONS

There are both theoretical and managerial implications of the ideas expressed in this article. Let us look first at the theoretical ones.

One of the theoretical issues raised in this paper is, “What is a new form of organization?” The editors in their introductory chapter describe five forms that have emerged over time. They focus on forms that emerge *de nouveau* from green field sites. These new forms emerge unencumbered by any legacy systems. In contrast, I focus on the large existing companies that continually modify their organizations to capitalize on new opportunities. In this way, I am following Chandler’s notion that new forms of organization result from a concatenation or joining together of different forms of organization. P&G’s Four Pillars structure is an example. It is a concatenation of four forms of organizations, function, business unit (product), geography and customer. The

structure has twelve management challenges. P&G must manage four portfolios of dimensions and the two-way, three-way and four-way interactions among them. By contrast, the M-Form has only three management challenges. In order to succeed with this new organizational form, P&G has developed new business and management processes to hold all of the interdependent dimensions together.

IBM is a concatenation of all of the forms that the editors present in the introduction. Each Smart Planet solution consists of a network of partners. There are over 30 partners for the Stockholm traffic system. There are over 30 for the London system, some of which are the same and some of which are different. If the editors' new community form is viable, I think that we can count on IBM to adopt it and integrate it into its organization.

IBM also raises the issue of limits to complexity. Certainly there must be a limit to the complexity that a human organization can manage. IBM gives us an example of how an organization can increase its capacity for coordination. It is probably IBM's ability to convert the complexity and coordination into business processes, which are then put into software. In this manner, IBM automates much of the coordination required. Indeed, IBM sees this automation of services as a competitive advantage. It both uses these automated services itself and sells them for use by others. Tellingly, IBM is increasing its R+D funding for projects that reduce the labor intensity of services and patenting the company's results. It is staking its future on automated services that can be downloaded into solutions.

P&G elaborates on creating coordination capacity. It too has built business and management processes like IBM. But it has also built a capability of working in teams. People are selected and developed for team working skills. P&G has created a culture that supports the management of complexity through team work.

The other implications of this paper are for management practice. One of these practices follows directly from the theoretical implications. Few managers embrace complexity. Indeed, most try to avoid it. But P&G and IBM have shown us that they can

create value by adding and managing more complexity in their organizations. These companies actually achieve an advantage by doing so. That is another implication. Companies can gain competitive advantage with their superior and more effective organizations. Few leaders think of organization as a source of advantage. Yet it fits all the definitions. It is difficult to manage multidimensional organizations that create value. They are difficult to copy. New organizational designs deserve a place in our arsenals of competitive weapons.

Those managers who adopt this thinking will be wise to focus on horizontal processes. While P&G's Four Pillars structure represents an intricate weaving of dimensions into a matrix, it is the business processes and management decision processes that are key. The star of the show for the design of new organizational forms will be process design.

And finally, the creation of multi-dimensional and reconfigurable organizations is based on the development of organizational capabilities over time. P&G is the best example. It has developed the ability to work in cross-functional teams over decades. The result is a team working culture. By contrast, many companies today are pursuing strategies that far exceed the capabilities of their organizations to implement such strategies. Christopher Bartlett of Harvard has said that today, "we are pursuing third generation strategies using second generation organizations that are staffed with first generation human resources." We need to develop the capabilities of our people and organizations before we can master today's complex organizations.

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