G

GAP ANALYSIS

Gap analysis generally refers to the activity of studying the differences between standards and the delivery of those standards. For example, it would be useful for a firm to document differences between customer expectation and actual customer experiences in the delivery of medical care. The differences could be used to explain satisfaction and to document areas in need of improvement.

However, in the process of identifying the gap, a before-and-after analysis must occur. This can take several forms. For example, in lean management we perform a Value Stream Map of the current process. Then we create a Value Stream Map of the desired state. The differences between the two define the "gap". Once the gap is defined, a game plan can be developed that will move the organization from its current state toward its desired future state.

Another tool for identifying the gap is a step chart. With the step chart, various "classes" of performance are identified—including world-class status. Then, current state and desired future state are noted on the chart. Once again, the difference between the two defines the "gap".

The issue of service quality can be used as an example to illustrate gaps. For this example, there are several gaps that are important to measure. From a service quality perspective, these include: (1) service quality gap; (2) management understanding gap; (3) service design gap; (4) service delivery gap; and (5) communication gap.

Service Quality Gap. Indicates the difference between the service expected by customers and the service they actually receive. For example, customers may expect to wait only 20 minutes to see their doctor but, in fact, have to wait more than thirty minutes.

Management Understanding Gap. Represents the difference between the quality level expected by customers and the perception of those expectations by management. For example, in a fast food environment, the customers may place a greater emphasis on order accuracy than promptness of service, but management may perceive promptness to be more important.

Service Design Gap. This is the gap between management's perception of customer expectations and the development of this perception into delivery standards. For example, management might perceive that customers expect someone to answer their telephone calls in a timely fashion. To customers, "timely fashion" may mean within thirty seconds. However, if management designs delivery such that telephone calls are answered within sixty seconds, a service design gap is created.

Service Delivery Gap. Represents the gap between the established delivery standards and actual service delivered. Given the above example, management may establish a standard such that telephone calls should be answered within thirty seconds. However, if it takes more than thirty seconds for calls to be answered, regardless of the cause, there is a delivery gap.

Communication Gap. This is the gap between what is communicated to consumers and what is actually delivered. Advertising, for instance, may indicate to consumers that they can have their cars's oil changed within twenty minutes when, in reality, it takes more than thirty minutes.

IMPLEMENTING GAP ANALYSIS

Gap analysis involves internal and external analysis. Externally, the firm must communicate with customers. Internally, it must determine service delivery and service design. Continuing with the service quality example, the steps involved in the implementation of gap analysis are:

- Identification of customer expectations
- Identification of customer experiences
- Identification of management perceptions
- Evaluation of service standards
- Evaluation of customer communications

The identification of customer expectations and experiences might begin with focus-group interviews. Groups of customers, typically numbering seven to twelve per group, are invited to discuss their satisfaction with services or products. During this process, expectations and experiences are recorded. This process is usually successful in identifying those service and product attributes that are most important to customer satisfaction.

After focus-group interviews are completed, expectations and experiences are measured with more formal, quantitative methods. Expectations could be measured with a one to ten scale where one represents "Not At All Important" and ten represents "Extremely Important." Experience or perceptions about each of these attributes would be measured in a similar manner.

Gaps can be simply calculated as the arithmetic difference between the two measurements for each of the attributes. Management perceptions are measured much in the same manner. Groups of managers are asked to discuss their perceptions of customer expectations and experiences. A team can then be assigned the duty of evaluating manager perceptions, service standards, and communications to pinpoint discrepancies. After gaps are identified, management must take appropriate steps to fill or narrow the gaps.

THE IMPORTANCE OF SERVICE QUALITY GAP ANALYSIS

The main reason gap analysis is important to firms is the fact that gaps between customer expectations and customer experiences lead to customer dissatisfaction. Consequently, measuring gaps is the first step in enhancing customer satisfaction. Additionally, competitive advantages can be achieved by exceeding customer expectations. Gap analysis is the technique utilized to determine where firms exceed or fall below customer expectations.

Customer satisfaction leads to repeat purchases and repeat purchases lead to loyal customers. In turn, customer loyalty leads to enhanced brand equity and higher profits. Consequently, understanding customer perceptions is important to a firm's performance. As such, gap analysis is used as a tool to narrow the gap between perceptions and reality, thus enhancing customer satisfaction.

PRODUCT APPLICATIONS

It should be noted that gap analysis is applicable to any aspect of industry where performance improvements are desired, not just in customer service. For example, the product quality gap could be measured by (and is defined as) the difference between the quality level of products expected by customers and the actual quality level. The measurement of the product quality gap is attained in the same manner as above. However, while service delivery can be changed through employee training, changes in product design are not as easily implemented and are more time consuming.

Gap analysis can be used to address internal gaps. For example, it is also applicable to human resource management. There may be a gap between what employees expect of their employer and what they actually experience. The larger the gap, the greater the job dissatisfaction. In turn, job dissatisfaction can decrease productivity and have a negative effect on a company's culture.

Ford Motor Co., for example, utilized gap analysis while developing an employee benefit program. While management may believe it has a handle on employee perceptions, this is not always true. With this in mind, Ford's management set out to understand employee desires regarding flexible benefits. Their cross-functional team approach utilized focus groups, paper and pencil tests, and story boards to understand employee wants and needs. Their team, consisting of finance, human resources, line managers, benefits staff, and consultants, identified gaps in benefit understanding, coverage, and communications. As a result of gap analysis, Ford implemented a communications program that gained employee acceptance.

Gene Brown

Revised by Gerhard Plenert

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GENERIC COMPETITIVE STRATEGIES

Three of the most widely read books on competitive analysis in the 1980s were Michael Porter's *Competitive Strategy, Competitive Advantage,* and *Competitive Advantage of Nations.* In his various books, Porter developed three generic strategies that, he argues, can be used singly or in combination to create a defendable position and to outperform competitors, whether they are within an industry or across nations. Porter states that the strategies are generic because they are applicable to a large variety of situations and contexts. The strategies are (1) overall cost leadership; (2) differentiation; and (3) focus on a particular market niche. The generic strategies provide direction for firms in designing incentive systems, control procedures, and organizational arrangements. Following is a description of this work.

OVERALL COST LEADERSHIP STRATEGY

Overall cost leadership requires firms to develop policies aimed at becoming and remaining the lowest-cost producer and/or distributor in the industry. Company strategies aimed at controlling costs include construction of efficient-scale facilities, tight control of costs and overhead, avoidance of marginal customer accounts, minimization of operating expenses, reduction of input costs, tight control of labor costs, and lower distribution costs. The low-cost leader gains competitive advantage by getting its costs of production or distribution lower than those of the other firms in its market. The strategy is especially important for firms selling unbranded commodities such as beef or steel.

Figure 1
Competitive Advantage Through Low Cost Leadership

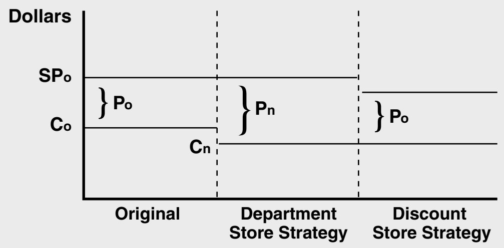

Figure 1 shows the competitive advantage firms may achieve through cost leadership. *C* is the original cost of production. *C* is the new cost of production. *SP* is the original selling price. *SP* is the new selling price. *P* is the original profit margin. *P* is the new profit margin.

If we assume our firm and the other competitors are producing the product for a cost of *C* and selling it at *SP,* we are all receiving a profit of *P.* As cost leader, we are able to lower our cost to *C* while the competitors remain at *C.* We now have two choices as to how to take advantage of our reduced costs.

1. Department stores and other high-margin firms often leave their selling price as *SP,* the original selling price. This allows the low-cost leader to obtain a higher profit margin than they received before the reduction in costs. Since the competition was unable to lower their costs, they are receiving the original, smaller profit margin. The cost leader gains competitive advantage over the competition by earning more profit for each unit sold.
2. Discount stores such as Wal-Mart are more likely to pass the savings from the lower costs on to customers in the form of lower prices. These discounters retain the original profit margin, which is the same margin as their competitors. However, they are able to lower their selling price due to their lower costs (*C*). They gain competitive advantage by being able to under-price the competition while maintaining the same profit margin.

Overall cost leadership is not without potential problems. Two or more firms competing for cost leadership may engage in price wars that drive profits to very low levels. Ideally, a firm using a cost leader strategy will develop an advantage that is not easily copied by others. Cost leaders also must maintain their investment in state-of-the-art equipment or face the possible entry of more cost-effective competitors. Major changes in technology may drastically change production processes so that previous investments in production technology are no longer advantageous. Finally, firms may become so concerned with maintaining low costs that needed changes in production or marketing are overlooked. The strategy may be more difficult in a dynamic environment because some of the expenses that firms may seek to minimize are research and development costs or marketing research costs, yet these are expenses the firm may need to incur in order to remain competitive.

DIFFERENTIATION STRATEGY

The second generic strategy, differentiating the product or service, requires a firm to create something about its product or service that is perceived as unique throughout the industry. Whether the features are real or just in the mind of the customer, customers must perceive the product as having desirable features not commonly found in competing products. The customers also must be relatively price-insensitive. Adding product features means that the production or distribution costs of a differentiated product may be somewhat higher than the price of a generic, non-differentiated product. Customers must be willing to pay more than the marginal cost of adding the differentiating feature if a differentiation strategy is to succeed.

Differentiation may be attained through many features that make the product or service appear unique. Possible strategies for achieving differentiation may include:

- warranties (e.g., Sears tools)
- brand image (e.g., Coach handbags, Tommy Hilfiger sportswear)
- technology (e.g., Hewlett-Packard laser printers)
- features (e.g., Jenn-Air ranges, Whirlpool appliances)
- service (e.g., Makita hand tools)
- quality/value (e.g., Walt Disney Company)
- dealer network (e.g., Caterpillar construction equipment)

Differentiation does not allow a firm to ignore costs; it makes a firm's products less susceptible to cost pressures from competitors because customers see the product as unique and are willing to pay extra to have the product with the desirable features. Differentiation can be achieved through real product features or through advertising that causes the customer to perceive that the product is unique.

Differentiation may lead to customer brand loyalty and result in reduced price elasticity. Differentiation may also lead to higher profit margins and reduce the need to be a low-cost producer. Since customers see the product as different from competing products and they like the product features, customers are willing to pay a premium for these features. As long as the firm can increase the selling price by more than the marginal cost of adding the features, the profit margin is increased. Firms must be able to charge more for their differentiated product than it costs them to make it distinct, or else they may be better off making generic, undifferentiated products. Firms must remain sensitive to cost differences. They must carefully monitor the incremental costs of differentiating their product and make certain the difference is reflected in the price.

Firms pursuing a differentiation strategy are vulnerable to different competitive threats than firms pursuing a cost leader strategy. Customers may sacrifice features, service, or image for cost savings. Customers who are price sensitive may be willing to forgo desirable features in favor of a less costly alternative. This can be seen in the growth in popularity of store brands and private labels. Often, the same firms that produce name-brand products produce the private label products. The two products may be physically identical, but stores are able to sell the private label products for a lower price because very little money was put into advertising in an effort to differentiate the private label product.

Imitation may also reduce the perceived differences between products when competitors copy product features. Thus, for firms to be able to recover the cost of marketing research or R&D, they may need to add a product feature that is not easily copied by a competitor.

A final risk for firms pursuing a differentiation strategy is changing consumer tastes. The feature that customers like and find attractive about a product this year may not make the product popular next year. Changes in customer tastes are especially obvious in the apparel industry. Polo Ralph Lauren has been a very successful brand in the fashion industry. However, some younger consumers have shifted to Tommy Hilfiger and other youth-oriented brands.

Ralph Lauren, founder and CEO, has been the guiding light behind his company's success. Part of the firm's success has been the public's association of Lauren with the brand. Ralph Lauren leads a high-profile lifestyle of preppy elegance. His appearance in his own commercials, his Manhattan duplex, his Colorado ranch, his vintage car collection, and private jet have all contributed to the public's fascination with the man and his brand name. This image has allowed the firm to market everything from suits and ties to golf balls. Through licensing of the name, the Lauren name also appears on sofas, soccer balls, towels, tableware, and much more.

COMBINATION STRATEGIES

Can forms of competitive advantage be combined? Porter asserts that a successful strategy requires a firm to aggressively stake out a market position, and that different strategies involve distinctly different approaches to competing and operating the business. An organization pursuing a differentiation strategy seeks competitive advantage by offering products or services that are unique from those offered by rivals, either through design, brand image, technology, features, or customer service. Alternatively, an organization pursuing a cost leadership strategy attempts to gain competitive advantage based on being the overall low-cost provider of a product or service. To be "all things to all people" can mean becoming "stuck in the middle" with no distinct competitive advantage. The difference between being "stuck in the middle" and successfully pursuing combination strategies merits discussion. Although Porter describes the dangers of not being successful in either cost control or differentiation, some firms have been able to succeed using combination strategies.

Research suggests that, in some cases, it is possible to be a cost leader while maintaining a differentiated product. Southwest Airlines has combined cost cutting measures with differentiation. The company has been able to reduce costs by not assigning seating and by eliminating meals on its planes. It has then been able to promote in its advertising that one does not get tasteless airline food on its flights. Its fares have been low enough to attract a significant number of passengers, allowing the airline to succeed.

Another firm that has pursued an effective combination strategy is Nike. When customer preferences moved to wide-legged jeans and cargo pants, Nike's market share slipped. Competitors such as Adidas offered less expensive shoes and undercut Nike's price. Nike's stock price dropped in 1998 to half its 1997 high. However, Nike reported a 70 percent increase in earnings for the first quarter of 1999 and saw a significant rebound in its stock price. Nike achieved the turnaround by cutting costs and developing new, distinctive products. Nike reduced costs by cutting some of its endorsements. Company research suggested the endorsement by the Italian soccer team, for example, was not achieving the desired results. Michael Jordan and a few other "big name" endorsers were retained while others, such as the Italian soccer team, were eliminated, resulting in savings estimated at over $100 million. Firing 7 percent of its 22,000 employees allowed the company to lower costs by another $200 million, and inventory was reduced to save additional money. While cutting costs, the firm also introduced new products designed to differentiate Nike's products from those of the competition.

Some industry environments may actually call for combination strategies. Trends suggest that executives operating in highly complex environments such as health care do not have the luxury of choosing exclusively one strategy over the other. The hospital industry may represent such an environment, as hospitals must compete on a variety of fronts. Combination (i.e., more complicated) strategies are both feasible and necessary to compete successfully. For instance, DRG-based reimbursement (diagnosis related groups) and the continual lowering of reimbursement ceilings have forced hospitals to compete on the basis of cost. At the same time, many of them jockey for position with differentiation based on such features as technology and birthing rooms. Thus, many hospitals may need to adopt some form of hybrid strategy in order to compete successfully, according to Walters and Bhuian.

FOCUS STRATEGY

The generic strategies of cost leadership and differentiation are oriented toward industry-wide recognition. The final generic strategy, focusing (also called niche or segmentation strategy), involves concentrating on a particular customer, product line, geographical area, channel of distribution, stage in the production process, or market niche. The underlying premise of the focus strategy is that a firm is better able to serve a limited segment more efficiently than competitors can serve a broader range of customers. Firms using a focus strategy simply apply a cost leader or differentiation strategy to a segment of the larger market. Firms may thus be able to differentiate themselves based on meeting customer needs, or they may be able to achieve lower costs within limited markets. Focus strategies are most effective when customers have distinctive preferences or specialized needs.

A focus strategy is often appropriate for small, aggressive businesses that do not have the ability or resources to engage in a nationwide marketing effort. Such a strategy may also be appropriate if the target market is too small to support a large-scale operation. Many firms start small and expand into a national organization. For instance, Wal-Mart started in small towns in the South and Midwest. As the firm gained in market knowledge and acceptance, it expanded throughout the South, then nationally, and now internationally. Wal-Mart started with a focused cost leader strategy in its limited market, and later was able to expand beyond its initial market segment.

A firm following the focus strategy concentrates on meeting the specialized needs of its customers. Products and services can be designed to meet the needs of buyers. One approach to focusing is to service either industrial buyers or consumers, but not both.

Martin-Brower, the third-largest food distributor in the United States, serves only the eight leading fast-food chains. With its limited customer list, Martin-Brower need only stock a limited product line; its ordering procedures are adjusted to match those of its customers; and its warehouses are located so as to be convenient to customers.

Firms utilizing a focus strategy may also be better able to tailor advertising and promotional efforts to a particular market niche. Many automobile dealers advertise that they are the largest volume dealer for a specific geographic area. Other car dealers advertise that they have the highest customer satisfaction scores within their defined market or the most awards for their service department.

Firms may be able to design products specifically for a customer. Customization may range from individually designing a product for a customer to allowing customer input into the finished product. Tailor-made clothing and custom-built houses include the customer in all aspects of production, from product design to final acceptance. Key decisions are made with customer input. However, providing such individualized attention to customers may not be feasible for firms with an industry-wide orientation.

Other forms of customization simply allow the customer to select from a menu of predetermined options. Burger King advertises that its burgers are made "your way," meaning that the customer gets to select from the predetermined options of pickles, lettuce, and so on. Similarly, customers are allowed to design their own automobiles within the constraints of predetermined colors, engine sizes, interior options, and so forth.

Potential difficulties associated with a focus strategy include a narrowing of differences between the limited market and the entire industry. National firms routinely monitor the strategies of competing firms in their various submarkets. They may then copy the strategies that appear particularly successful. The national firm, in effect, allows the focused firm to develop the concept, then the national firm may emulate the strategy of the smaller firm or acquire it as a means of gaining access to its technology or processes. Emulation increases the ability of other firms to enter the market niche while reducing the cost advantages of serving the narrower market.

Market size is always a problem for firms pursing a focus strategy. The targeted market segment must be large enough to provide an acceptable return so that the business can survive. For instance, ethnic restaurants are often unsuccessful in small U.S. towns, since the population base that enjoys Japanese or Greek cuisine is too small to allow the restaurant operator to make a profit. Likewise, the demand for an expensive, upscale restaurant is usually not sufficient in a small town to make its operation economically feasible.

Another potential danger for firms pursuing a focus strategy is that competitors may find submarkets within the target market. In the past, United Parcel Service (UPS) solely dominated the package delivery segment of the delivery business. Newer competitors such as Federal Express and Roadway Package Service (RPS) have entered the package delivery business and have taken customers away from UPS. RPS contracts with independent drivers in a territory to pick up and deliver packages, while UPS pays unionized wages and benefits to its drivers. RPS started operations in 1985 with 36 package terminals. By 1999 it was a $1 billion company with 339 facilities.

GENERIC STRATEGIES AND THE INTERNET

Porter asserts that these generic competitive strategies were not only relevant for the old economy, but are just as vital today. Indeed, he goes on to say that terms such as "old economy" and "new economy" may be misguided, and the concept of a firm's Internet operation as a stand-alone entity preclude the firm from garnering important synergies. Furthermore, the Internet may enhance a firm's opportunities for achieving or strengthening a distinctive strategic positioning. Therefore, effective strategy formulation at the business level should pay off, not in spite of the Internet, but in concert with it.

Porter describes how companies can set themselves apart in at least two ways: operational effectiveness (doing the same activities as competitors but doing them better) and strategic positioning (doing things differently and delivering unique value for customers). "The Internet affects operational effectiveness and strategic positioning in very different ways. It makes it harder for companies to sustain operational advantages, but it opens new opportunities for achieving or strengthening a distinctive strategic positioning." Although the Internet is a powerful tool for enhancing operational effectiveness, these enhancements alone are not likely to be sustained because of copying by rivals. This state of affairs elevates the importance of defining for the firm a unique value proposition. Internet technology can be a complement to successful strategy, but it is not sufficient. "Frequently, in fact, Internet applications address activities that, while necessary, are not decisive in competition, such as informing customers, processing transactions, and procuring inputs. Critical corporate assets—skilled personnel, proprietary product technology, efficient logistical systems—remain intact, and they are often strong enough to preserve existing competitive advantages."

Consistent with the earlier discussion regarding combination strategies, Kim, Nam, and Stimpert found in their study of e-businesses that firms pursuing a hybrid strategy of cost leadership and differentiation exhibited the highest performance. These authors concluded that cost leadership and differentiation must often be combined to be successful in e-business.

Porter's generic business strategies provide a set of methods that can be used singly or in combination to create a defendable business strategy. They also allow firms that use them successfully to gain a competitive advantage over other firms in the industry. Firms either strive to obtain lower costs than their competitors or to create a perceived difference between their product and the products of competitors. Firms can pursue their strategy on a national level or on a more focused, regional basis.

Clearly, Michael Porter's work has had a remarkable impact on strategy research and practice. The annual Porter Prize, akin to the Deming Prize, was established in 2001 in Japan to recognize that nation's leading companies in terms of strategy. Porter's ideas have stood the test of time and appear to be relevant both for profit-seeking enterprises and not-for-profit institutes in a variety of international settings. Torgovicky, Goldberg, Shvarts, and Bar Dayan have found a relationship between business strategy and performance measures in an ambulatory health care system in Israel, strengthening Porter's original theory about the non-viability of the stuck-in-the-middle strategy, and suggesting the applicability of Porter's generic strategies to not-for-profit institutes.

SEE ALSO: Strategic Planning Failure; Strategic Planning Tools; Strategy Formulation; Strategy Implementation; Strategy in the Global Environment; Strategy Levels

Joe G. Thomas

Revised by Bruce A. Walters

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GLOBALIZATION

Globalization refers to the process of integration across societies and economies. The phenomenon encompasses the flow of products, services, labor, finance, information, and ideas moving across national borders. The frequency and intensity of the flows relate to the upward or downward direction of globalization as a trend.

There is a popular notion that there has been an increase of globalization since the early 1980s. However, a comparison of the period between 1870 and 1914 to the post-World War II era indicates a greater degree of globalization in the earlier part of the century than the latter half. This is true in regards to international trade growth and capital flows, as well as migration of people to America.

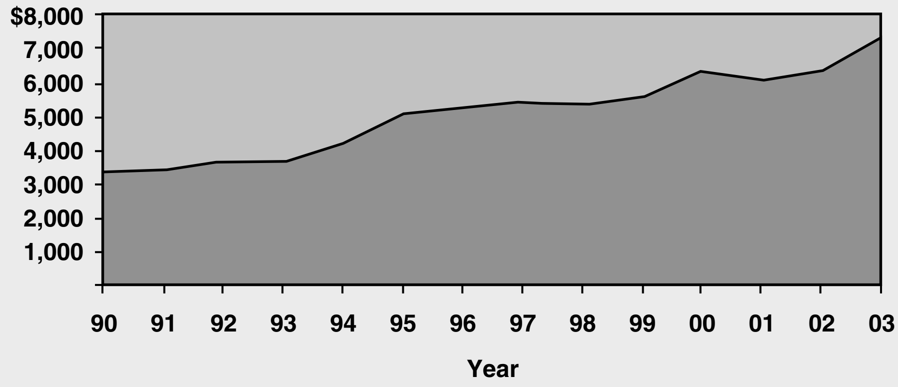
If a perspective starts after 1945—at the start of the Cold War—globalization is a growing trend with a predominance of global economic integration that leads to greater interdependence among nations. Between 1990 and 2001, total output of export and import of goods as a proportion of GDP rose from 32.3 percent to 37.9 percent in developed countries and 33.8 percent to 48.9 percent for low- to middle-income countries. From 1990 to 2003, international trade export rose by \$3.4 to \$7.3 trillion (see Figure 1). Hence, the general direction of globalization is growth that is unevenly distributed between wealthier and poorer countries.

RATIONALE

A primary economic rationale for globalization is reducing barriers to trade for the enrichment of all societies. The greater good would be served by leveraging

Figure 1

International Export Trade, 1990-2003 (in billions of US dollars)



comparative advantages for production and trade that are impeded by regulatory barriers between sovereignty entities. In other words, the betterment of societies through free trade for everyone is possible as long as each one has the freedom to produce with a comparative advantage and engage in exchanges with others.

This economic rationale for global integration depends on supporting factors to facilitate the process. The factors include advances in transportation, communication, and technology to provide the necessary conduits for global economic integration. While these factors are necessary, they are not sufficient. Collaboration with political will through international relations is required to leverage the potential of the supporting factors.

HISTORICAL BACKGROUND

Globalization from 1870 to 1914 came to an end with the World War I as various countries pursued isolationism and protectionism agendas through various treaties—the Treaty of Brest-Litovsk (1918), the Treaty of Versailles (1918), the Treaty of St. Germain (1919), and the Treaty of Trianon (1920). U.S. trade policies —the Tariff acts of 1921, 1922, 1924, 1926, and the Smooth Hawley Tariffs of 1930—raised barriers to trade. These events contributed to the implosion of globalization for more than forty years.

Toward the end of World War II, forty-four countries met in an effort to re-establish international trade. The milestone is referred to as Bretton Woods, named after the New Hampshire country inn where the meeting was held. Results of Bretton Woods included the creation of the International Monetary Fund (IMF), the World Bank, and subsequently, the General Agreements on Tariffs and Trade (GATT).

In 1948 the International Trade Organization (ITO) was established as an agency of the United Nations, with fifty member countries and the Havana Charter to facilitate international trade but it failed. As a result, GATT rose to fill the void as a channel for multilateral trade negotiations and recognition of "Most Favored Nation" status that applied the same trading conditions between members that applied to other trading partners with "most favored" partner standing.

GATT involved a number of different multilateral rounds of trade negotiations to reduce trade barriers and facilitate international trade. In the first round, the twenty-three founding members of GATT agreed to 45,000 tariff concessions affecting 20 percent of international trade worth $10 billion. Many of GATT's trade rules were drawn from the ITO charter. Subsequent trade rounds involved more members and additional issues, but the basic foundation of GATT remained the same.

In the second round, the Kennedy Round of the mid-1960s, the focus continued with tariff reductions.

In the third round, the Tokyo Round (1973–1979), 102 countries participated to reform the trading system, resulting in tariff on manufactured products reduced to 4.7 percent from a high of 40 percent at the inception of GATT. Important issues revolved around anti-dumping measures, and subsidies and countervailing measures. The reduction of trade barriers enabled about an average of 8 percent growth of world trade per year in the 1950s and 1960s.

In the fourth round, the Uruguay Round (1986 to 1993), 125 countries participated to develop a more comprehensive system.

On April 15, 1995, in Marrakesh, Morocco, a deal was signed to create the World Trade Organization (WTO), which replaced GATT with a permanent institution that required a full and permanent commitment.

The WTO encompasses trade in goods, services, and intellectual property related to trade with a more efficient dispute settlement system.

COMPLEXITIES AND CONTROVERSIES

The increase of globalization surfaced many complex and controversial issues as economies and societies became more interdependent with greater frequency of interactions between one another. A number of important trends make up globalization including: (1) location of integration activities; (2) impact upon poorer societies; (3) flow of capital; (4) migration of labor and work; (5) diffusion of technology; (6) sustainability of the natural environment; (7) reconfiguration of cultural dynamics; and (8) development of organizational strategies for global competition.

Many authors specialize in exploring each issue with much greater depth. The purpose of reviewing the different trends in this essay is to provide some highlight concerning the interrelated complexities underlying globalization.

LOCATION OF INTEGRATION ACTIVITIES. The extent of globalization unfolds in an uneven fashion to the degree that the question is raised whether international trade is more focused on regional rather than global integration. Trading blocs, such as the North American Free Trade Agreement (NAFTA), the European Union (EU), the Asia-Pacific Economic Co-operation (APEC), Mercosur (South American trading bloc), the Association of South East Asian Nations (ASEAN), and the East Africa Community (EAC), support regional cooperation between geographical neighbors.

Georgios Chortareas' and Theodore Pelagidis' research findings on openness and convergence in international trade indicate that intra-regional trade increased more than global trade in most situations. They stated that " . . . despite the positive international climate resulting from important reductions in transportation costs, the development of new technologies and trade liberalization markets continue to be determined, to a large extent, regionally and nationally. . ."

Within NAFTA, intra-regional exports rose from 34 percent in the 1980s to more than 56 percent in 2000; exports between Asian country members amounted to 48 percent in 2000; and exports within the EU were sustained at about 62 percent.

An example of limitations to fair market access for developing countries is that developed countries subsidize agricultural producers with about $330 billion per year, which creates a significant disadvantage for poorer economies without such subsidies. The impact is exacerbated because 70 percent of the world's poor population lives in rural communities and depends heavily on agriculture. Hence, one of the concerns with uneven distribution of globalization is its impact on poorer economies by perpetuating systems of inequality.

IMPACT ON POORER SOCIETIES. A challenge to globalization is that inequality arises from imbalances in trade liberalization where the rich gain disproportionately more than the poor. Ajit K. Ghose examined the impact of international trade on income inequality and found that inter-country inequality increased from 1981 to 1997, in a sample of ninety-six national economies, but international inequality measured by per capita GDP declined. The ratio of average income for the wealthiest 20 percent compared to the poorest 20 percent rose from 30 to 74 from the early 1960s to the late 1990s.

In 2004, one billion people owned 80 percent of the world's GDP, while another billion survives on a $1. However, during the same period, when average income is weighted by population, income inequality dropped by 10 percent in the same period. Also, global income distribution became more equal with other measures such as purchasing power parity or the number of people living in poverty.

The World Development Indicators for 2004 showed a drop in absolute number of people living on $1 per day from 1.5 billion in 1981 to 1.1 billion in 2001 with most of the achievements taking place in the East Asia region. Thus, the impact of globalization on inequality is a complex issue depending on the particular measures. More specific examination needs to account for other contributing factors, such as how regionalism increases concentration of trade between countries that are wealthier and leaving poorer countries at the margin.

FLOW OF CAPITAL. The flow of capital relates to both regionalism and inequality issues. Two forms of capital flow are foreign direct investments (FDI) made by business firms and investment portfolios, diversified with foreign assets or borrowers seeking foreign funding. Data from the World Bank indicated that FDI grew from an average of $100 billion per year in the 1980s to $370 billion in 1997. Net private capital flow amounts to about $200 billion in 2004.

Also, some economies have significant remittance flows from labor migration, which were approximately $100 billion in 2003 and $126 billion in 2004 for ninety developing countries. Some Caribbean countries receive more than 10 percent of their GDP from remittances. While developing countries are the primary recipients of remittances, transaction costs can amount to 10 to 15 percent per transaction. Reducing such obstacles would benefit poorer countries with heavy dependencies on remittances. The flow of money across national borders relates to the migration of both labor and work.

MIGRATION OF LABOR AND WORK. An important dimension of globalization is the migration of people. While the proportion of migration was greater during the earlier mercantilism period, sovereign border controls to a large extent create a filtration process for migration. About 175 million people lived in a different country than their birth country in 2000. They can be separated into three categories: 158 million international migrants, 16 million refugees, and 900,000 asylum seekers.

An important global trend in the future is the movement of labor from developing to developed countries because of the latter's need for labor with an aging population. Family-sponsored migration makes up 45 to 75 percent of international migrants who mainly originate from developing countries to countries in Europe and North America.

Even before 9/11, legal migration of labor needed to overcome substantial bureaucracy in the border control process. The number applying for entry into developed countries often far exceeds the number permitted. Due to extensive legal processes, some migrants enter illegally, while others become illegal with expiration of legal status.

Anti-terrorism measures imposed shortly after the 9/11 attacks resulted in a minor shift in the flow of migrants away from the United States toward other developed countries. With the aging of baby boomers in many developed countries, future globalization of migrant labor flows is receiving more attention, especially in education, health care, retirement funding, and housing, as well as meeting workforce needs to sustain business competitiveness.

Although migrant labor often entails the movement of people in search of work, a related globalization trend is the migration of work to different geographical location. While multinational corporations (MNCs) often seek low-cost labor, innovation advances in computer technology, satellite communication infrastructures, internet developments, and efficient transportation network enable companies to distribute work in ways not possible before.

Compression of time and space with internet technology allows for the distribution of work to take place around the world with global virtual teams. The phenomena of outsourcing and offshoring expand on the earlier sourcing of low-cost manufacturing. During the 1960s and 1970s, MNCs migrated to low-wage labor to manufacture products that entailed significant labor costs.

Expansion of MNCs in the 1990s encompassed highly skilled workers, service work, and global virtual teams. Firms started to outsource information technology (IT) functions as early as the 1970s, but a major wave of outsourcing started in 1989 with the shortage of skilled IT workers in developed countries. At the same time, the trend of shifting work around the globe to leverage the different time zones began with the financial industry's ability to shift trading between the various stock exchanges in New York, Tokyo, and Hong Kong, and London.

Technological innovations in computers and the internet enabled other industries, such as software engineering, data transcription, and customer service centers to also shift work around the globe. Higher education and high-skill health care jobs are also embarking on global outsourcing.

In 2001, outsourcing expenditures amounted to $3.7 trillion and the estimation for 2003 is $5.1 trillion. The impact of global outsourcing is not just a relocation of jobs, but also a dampening of employee compensation levels in more developed economies. For example, in 2000, salaries for senior software engineers were as high as $130K, but dropped to about $100K at the end of 2002; and entry-level computer help-desk staff salaries dropped from about $55K to $35K. For IT vendor firms in countries like India, IT engineering jobs command a premium Indian salary that is at a fraction of their U.S. counterparts. In sum, migration of labor and work create complex globalization dynamics.

DIFFUSION OF TECHNOLOGY. Innovations in telecommunication, information technology, and computing advances make up key drivers to support the increase of globalization. In 1995, the World Wide Web had 20 million users, exploded to 400 million by late 2000 and had an estimated one billion users in 2005. However, the rapid growth and adoption of information technology is not evenly diffused around the world.

The gap between high versus low adoption rates is often referred to as the digital divide. In 2002, the number of users per 1000 people was highest in Iceland at 647.9; others in the top five ranks of internet users included Sweden at 573.1, the United States at 551.4, Denmark and Canada both at 512.8, and Finland at 508.9. In comparison, countries at the low end of internet use were Tajikistan and Myanmar at 0.5 per 1000, Ethiopia at 0.7, the Congo at 0.9, Burundi at 1.2, and Bangladesh at 1.5.

The digital divide reflects other disparities of globalization. Globalization of computer technology also entails a growing trend of computer crimes on an international basis, which requires cross-border collaboration to address it. Additional globalization trends related to computer technology include developments in artificial intelligence, high-speed connections such as wireless applications, and integration with biotechnology.

SUSTAINABILITY OF THE NATURAL ENVIRONMENT. The impacts of globalization on environment sustainability are hotly contested, with major environmental protests held at international economic meetings or prominent multilateral trade forums. The United Nation's 1987 publication of the *Brundtland Report* (named for Gro Brundtland, Prime Minister of Norway), galvanized international attention on sustainable development. A major assumption was that the degradation of the environment in developing countries was due primarily to poverty.

Some advocates of globalization consider free trade to be a solution to alleviate poverty and subsequently, reduce pollution. However, the arguments depend upon corporate social responsibility, managerial knowledge of environmental sustainability, and a level of ignorance in the developing community.

Critics find that often large MNCs have greater financial resources than some developing countries, which can be used to compromise and derail regulatory regimes from protecting the environment. For example, while a MNC may not produce or sell certain environmentally damaging products in a country with tight regulatory controls, they may find their way to markets with fewer environmental regulatory constraints—"pollution havens." This line of logic leads to the notion of globalization becoming a "race to the bottom" as countries compete with lowering of environmental standards to attract foreign capital for economic development.

One of the landmarks on environmental globalization is the Kyoto Accord, an international treaty to reduce greenhouse gas emissions based on exchanging limited pollution credits between countries. After lengthy multilateral complex negotiations, the Kyoto Accord was concluded in December, 1997 for ratification by national governments. On February 16, 2005, the date for the Kyoto Protocol to take effect, 141 nations ratified the agreement. Even though the United States is the world's largest polluter in volume and per capita output of greenhouse gases, the Bush administration refused to ratify the Kyoto Accord.

RECONFIGURATION OF CULTURAL DYNAMICS. Culture is another area of complex controversies with globalization. Competing perspectives about how globalization affects cultures revolve around the debates of cultural homogenization versus cultural diversification. The optimistic view of cultural globalization is that cultural diversity focuses on freer cultural exchanges with broader choices and enrichment of learning from different traditions. People have greater choices of globally produced goods, in addition to local offerings, without being bound by their geographical location. Alternatively, critics of cultural globalization present evidence demonstrating the depletion of cultural diversity through processes referred to as "Disneyfication" or "McDonaldization."

Furthermore, not only is cultural diversity diminished but cultural quality is as well with mass produced goods being directed toward a common denominator. The criticisms are related to a sense of "Americanization" of the world, rather than globalization. The process involves a sense of far-reaching, anonymous cultural imperialism. Debates from each perspective are intense with substantial evidence that also reveals complex ties to social and political dynamics within and between national borders.

Cultural globalization continues into the foreseeable future with many more controversial dynamics related to three important issues: 1) the impact of extractive industries on the socio-economic, cultural exclusion and dislocation of indigenous peoples and their traditional knowledge; 2) international trading of cultural goods and knowledge; and 3) inflow of immigration impacts on national culture, which creates a tension between a sense of threat to the national culture and migrant demands for respect to their traditions in a multicultural society.

DEVELOPMENT OF ORGANIZATIONAL STRATEGIES FOR GLOBAL COMPETITION. The multiple dynamics of globalization—regionalism, inequality, financial flows, migration of labor and work, technological innovations, environmental sustainability, and cultural dynamics—form a turbulent and complex environment for managing business operations. While seven trends were highlighted to provide a brief sketch of interrelated complexities and controversies globalization, it also surfaced other significant issues.

Global concerns revolve around terrorism, rapid transmission of pandemic diseases and viruses, the rise of China's and India's economies, an aging population in wealthier northern countries versus younger growing populations in the southern hemisphere, and advances in biotechnology are intricately embedded in globalization processes.

COMPETING IN THE GLOBAL ECONOMY

Globalization entails both opportunities and threats for creating and sustaining competitive strategies. Emerging economies offer resources in terms of labor, as well as expanding market opportunities. However, geopolitical relationships and backlashes from perceptions of cultural imperialism, such as the tensions between the United States and the European Union during the Iraq war create challenges for business operations.

Global managers have a wide range of options to deal with globalization. Organizational strategies for international operations involve two related demands—the need for local orientation and the need for integration (as shown in Figure 2). Firms with low need for local orientation, but high need for integration require a global strategy that centralizes core operations with minor modifications for local adaptation. However, firms with a need for high local orientation, but low need for integration, require a multinational strategy that decentralizes significant operations to respond to local market conditions. Firms integrating a high need for both local orientation and organizational integration should strive for a transnational strategy.

In addition to selecting a strategy for global competition, managers also need to make decisions regarding the internationalization process. Two processes are important. First, the development of innovations in a home market and as products moves along the product life cycle stages, firms can take products entering into the plateau of a mature stage to new international markets. Often the flow moves from developed to developing countries.

Second, stages of internationalization with foreign entry modes that involve increasing resource commitment and risks start with exporting to licensing or joint ventures to wholly owned subsidiaries. The stage approach to internationalization takes time, which is a challenge within a global environment where information moves around the world in nanoseconds.

Alternatively, Kenichi Ohmae argued that the speed and complexities of globalization require firms to rethink their internationalization process because incremental stage models are too slow. Given the rate and quantity of knowledge flows in global competition, firms are likely to face competition in their home markets, with comparable innovations to their own before they are able to establish a foothold in the international market.

The incremental stage models are too slow for competing in an increasingly integrated global economy. Ohmae suggested that firms form global strategic alliances with partners established in three major markets—North America, Europe, and Asia, particularly Japan. Development of global competitive intelligence and innovation among the partners provide for rapid market development and the establishment of strategic positions in multiple locations.

Basically, globalization into the twenty-first century creates a fundamentally different competitive environment that shifted from incremental internationalization processes to almost simultaneous deployment of innovations. This internationalization process also shifts the work of global managers from managing a field of expatriates to collaborating with strategic partners across national borders and managing global offshore outsourcing vendors in multiple geographical locations.

Figure 2

Skill Profile of the Effective Global Manager

The ability to envision and implement the strategy of thinking globally while acting locally

Being able to manage change and transition

Being able to manage cultural diversity

The ability to design and function in flexible organizational structures

Being able to deal with stress and ambiguity

Having the skills required to work with others-especially in team setting

Being able to communicate well, and having a command of more than one language

Having the ability to learn and transfer knowledge in a organization

Entering into trusting alliances and operating with personal integrity and honesty

Being able to turn ideas into action

Having a stateless perception of the world

Being willing to take risks and to experiment

Globalization is a culmination of complex and controversial trends that include degree of geographical integration, inequalities, financial flows, labor and work, technological innovations, environmental sustainability, cultural dynamics, and organizational strategies for global competition. Given a historical perspective, globalization has fluctuated over time and many indicators support a trend of increasing globalization since the 1980s.

While the United States is the dominant superpower in the global economy, the rise of both China and India is an important consideration for international business. Global managers have options for strategies and structures, as well as different internationalization processes. In sum, globalization creates a competitive arena where MNCs evolve into global networks with collaboration and controversial differences as necessities to sustain a competitive strategy.

SEE ALSO: International Business; International Cultural Differences; International Management; Organizational Culture

Diana J. Wong-MingJi

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GOALS AND GOAL SETTING

Goals and objectives provide organizations with a blueprint that determines a course of action and aids them in preparing for future changes. A goal can be defined as a future state that an organization or individual strives to achieve. For each goal that an organization sets, it also sets objectives. An objective is a short-term target with measurable results. Without clearly-defined goals and objectives, organizations will have trouble coordinating activities and forecasting future events.

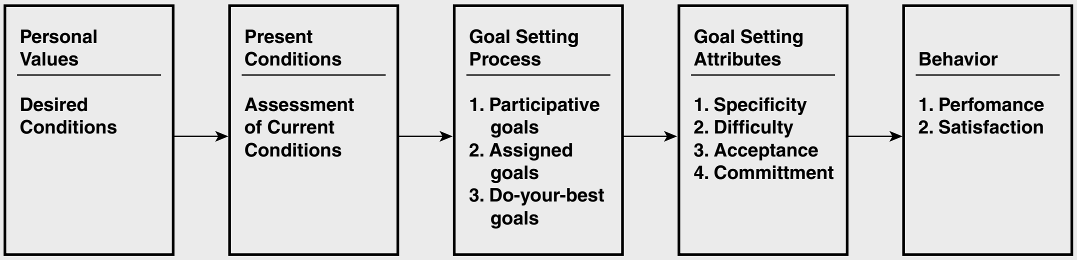
According to Barney and Griffin, organizational goals serve four basic functions; they provide guidance and direction, facilitate planning, motivate and inspire employees, and help organizations evaluate and control performance. Organizational goals inform employees where the organization is going and how it plans to get there. When employees need to make difficult decisions, they can refer to the organization’s goals for guidance. Goals promote planning to determine how goals will be achieved. Employees often set goals in order to satisfy a need; thus, goals can be motivational and increase performance. Evaluation and control allows an organization to compare its actual performance to its goals and then make any necessary adjustments.

According to Locke and Latham, goals affect individual performance through four mechanisms. First, goals direct action and effort toward goal-related activities and away from unrelated activities. Second, goals energize employees. Challenging goals lead to higher employee effort than easy goals. Third, goals affect persistence. Employees exert more effort to achieve high goals. Fourth, goals motivate employees to use their existing knowledge to attain a goal or to acquire the knowledge needed to do so.

The elements of goal-setting theory are shown in Figure 1. The goal-setting model indicates that individuals have needs and values that influence what they desire. A need is defined as a lack of something desirable or useful. According to Maslow’s hierarchy of needs, all individuals possess the same basic needs. Individuals do, however, differ in their values. Values are defined as a group of attitudes about a concept that contains a moral quality of like or dislike and acceptable or unacceptable. Values determine whether a particular outcome is rewarding. Employees compare current conditions to desired conditions in order to determine if they are satisfied and fulfilled. If an employee finds that he or she is not satisfied with the current situation, goal setting becomes a way of achieving what he or she wants.

Research suggests that individual differences play a role in determining goal effectiveness. Individuals may

Figure 1



Source: Adapted from Cherrington, D.J., *Organizational Behavior* (Boston, MA: Allyn and Bacon, 1994) pg 117

differ in their goal orientations, priorities, and self-regulation ability. Research suggests that an individual's goal orientation may influence goal effectiveness. Employees with a learning orientation desire to acquire knowledge and skills, whereas employees with a performance goal orientation focus on the outcome rather than the achievement process. While employees with a learning goal orientation view goals as a challenge, employees with a performance goal orientation may view goals as a threat. Studies provide some support that assigned goals are more effective for individuals with a learning goal orientation. Personal and organizational goals are not always congruent. For example, as the number of two-income families increases, work-family conflicts increase. Employees now have to balance professional and personal goals. An employee's desire to achieve personal goals may affect his or her motivation to achieve organizational goals. When organizational and personal goals are not aligned, it may have a detrimental effect on performance. Self-regulation is also important in goal setting and goal achievement. Research has shown that employees improved self-regulation when they were trained in self-management. Self-regulation training can provide employees with an opportunity to set specific high goals, to monitor ways the environment may hinder goal attainment, and to identify and administer rewards for making goal progress, as well as punishments for failing to make progress.

GOAL ATTRIBUTES

Goal-setting attributes have been the subject of extensive research. The four attributes are; specificity, difficulty, acceptance, and commitment. Studies show that there is a direct relationship between goal specificity and employee performance. The more specific the goal, the less ambiguity involved and the higher the performance. When employees are given do-your-best goals, they do not have an external reference by which they can measure their own performance. For example, telling a salesperson to "do the best you can" is an extremely vague goal that may not increase performance. However, "increase sales by 10 percent" is much more specific and encourages high performance because the employee has past sales as a reference point.

Goal difficulty also has a direct relationship with performance. Research shows that more difficult goals lead to higher performance, as long as the goals do not become so difficult that employees perceive them as impossible. Unreasonable goals frustrate, rather than motivate, employees. On the other hand, difficult but realistic goals lead to increased performance and motivation. Research suggests that employees are highly motivated when the probability of achieving a specific goal is 50 percent.

Goal acceptance is the degree to which employees accept a goal. Employees need to feel that the goal is fair and consistent in order to make it their own. Even if a goal is specific and attainable, individual acceptance is still necessary for effectiveness. Employees may reject goals for a multitude of reasons; they feel the work is meaningless, they do not trust the organization, or they do not receive feedback regarding their performance.

Finally, employees must be committed to the goal in order for it to be achieved. Commitment refers to the degree to which employees are dedicated to reaching the goal, and is determined by both situational and personal variables. Commitment to a goal can be increased by developing goals that appeal to employees's values and needs. Employees must be convinced that the goal is important. It should be relevant and significant to some personal value. For example, goals that are tied to company success, and therefore job security, often appeal to employees's need for security. It is also important that a leader or manager who is respected and credible convey the goal to employees. Goals must be attainable for employees to be committed. While goals may be challenging, employees should be convinced that goals are within reach. Research shows that commitment to goals increases when employees have the opportunity to participate in goal setting. Additionally, developing strategies is useful in helping employees achieve goals. Organizations that provide continuous training for employees build confidence and increase commitment to organizational goals.

TYPES OF GOALS AND OBJECTIVES

Goals should be closely tied to an organization's mission and vision statement. The strategic goals, tactical goals and objectives, and operational goals and objectives support the mission statement of the organization.

STRATEGIC GOALS. Strategic goals are set at the top of an organization and directly support the mission statement. Strategic goals are related to the entire organization instead of any one department. There are eight types of strategic goals found in organizations. The first type of strategic goal affects market standing, for example "to control 45 percent of the market share in the United States by the year 2011." Strategic goals regarding market standing help position a company as a market leader in any given industry. An example of the second strategic goal, innovation, is "to develop three new applications for use in businesses in the United States over the next three years." Productivity, the third type of strategic goal, involves reductions in manufacturing costs or increases in output. The fourth type of strategic goal is the efficient use of physical assets and financial resources, such as human resources. The fifth type of strategic goal involves the organization's profits and is usually defined in terms of return on assets or market value of stocks. Management development and performance is the sixth type of strategic goal, which concerns the conduct of managers as well as their continuing development. An example of this type of strategic goal is "to increase the number of hours offered in management training courses by 15 percent over the next year." The seventh type of strategic goal addresses the conduct of employees, as well as the concern for their attitudes and performance. An example of this type of strategic goal is "to reduce turnover by 12 percent over the next two years." Finally, the eighth type of strategic goal is concerned with the public and social responsibility of the organization. These types of goals might be concerned with reducing pollution or contributing to different charities.

TACTICAL GOALS. Tactical goals and objectives are directly related to the strategic goals of the organization. They indicate the levels of achievement necessary in the departments and divisions of the organization. Tactical goals and objectives must support the strategic goals of the organization. For example, if a strategic goal states that the organization is going to reduce total costs by 15 percent next year, then the different departments of the company would set tactical objectives to decrease their costs by a certain percentage so that the average of all departments equals 15 percent.

OPERATIONAL GOALS. Operational goals and objectives are determined at the lowest level of the organization and apply to specific employees or subdivisions in the organization. They focus on the individual responsibilities of employees. For example, if the department's tactical goal is related to an increase in return on assets by 5 percent, then the sales manager may have an operational objective of increasing sales by 10 percent.

SUPER-ORDINATE GOALS. Super-ordinate goals are those goals that are important to more than one party. They are often used to resolve conflict between groups. Through cooperating to achieve the goal, the tension and animosity between groups is often resolved. Feelings of camaraderie are created along with trust and friendship. Super-ordinate goals can be powerful motivators for groups to resolve their differences and cooperate with one another. In order for them to be successful, the parties must first perceive that there is mutual dependency on one another. The super-ordinate goal must be desired by everyone. Finally, all parties involved must expect to receive rewards from the accomplishment of the goal.

GOAL-SETTING APPROACHES

When choosing goals and objectives, there are several approaches an organization can take. Three common approaches are; the top-down approach, the bottom-up approach, and the interactive approach. In the top-down approach, goal setting begins at the top of the organization. Management by objectives (MBO) is a commonly-used top-down approach. This approach focuses on coordinating goal setting, incentives, and feedback. Studies suggest that approximately 50 percent of large organizations currently use or have used MBO. First, upper level managers (such as the CEO and other executives) establish the organizational mission and then determine strategic goals. The strategic goals determine the tactical goals and objectives as they are passed down to the next level of management.

The tactical goals in each department dictate the operational goals and objectives to individual employees. On the lowest level, the supervisor and employee agree upon performance objectives, as well as how goal attainment will be measured. This gives the supervisor a chance to address employee concerns or potential obstacles to goal achievement. When the next evaluation occurs, the supervisor and subordinate meet to assess to what extent performance objectives have been met. The top-down approach has several advantages. It helps guarantee that the goals and objectives of the organization are directly tied to and support the mission statement. It increases the likelihood that ambitious goals set by upper-level managers will trickle down to lower levels of the organization; thus, ambitious goals will be set for everyone in the organization. However, the top-down approach has several disadvantages. Oftentimes, members of upper-level management are so far removed from the day-to-day activities of the employees that the goals may be overly ambitious and unrealistic. Goals set at the top of the organization do not change as quickly with the organization, so they are not as flexible as goals set at the bottom of the organization. Finally, the top-down approach does not always involve employee participation in the goal-setting process. Thus, employees may not have a sense of ownership.

The bottom-up approach begins at the lower levels of the organization. Individuals at the bottom of the organization's chart set the goals and objectives for members directly above. Operational goals and objectives determine the tactical objectives, which in turn determine the strategic goals and objectives. Finally, the organizational mission is defined according to the guidelines set by the employees. Goals determined by bottom-up goal setting are likely to be more realistic than those set at the top of the organization. They are more flexible and reflect the current situation of the organization. Finally, goals created by all levels of the organization, and by all types of employees, are more likely to encourage employee commitment. There are disadvantages to bottom-up goal setting. Goals and objectives formulated by bottom-up goal setting are not always in line with the organization's mission. Often, organizations that use a bottom-up approach lack clear direction and focus. There is no hierarchical alignment with the goals of the organization. Another disadvantage of this type of goal setting is that the goals created by employees are not always challenging and ambitious. Studies have shown that challenging (yet realistic) goals are more motivational than those that are not.

The third approach to goal setting is interactive. It is a process by which employees at different levels of the organization participate in developing goals and objectives. Top levels of the organization begin by developing a mission statement. Managers at different levels and departments of the organization then come together and determine the strategic goals. Next, discussions regarding the tactical goals and objectives are decided upon by including lower-level managers and supervisors. Finally, individuals contribute to the process by defining their own operational goals and objectives.

This approach to goal setting involves the consensus of many different levels of management and frontline employees. Interactive goal setting involves discussion and cooperation among management and employees. The interactive approach enjoys the same advantages as bottom-up goal setting without many of the disadvantages. Goals are more realistic and current than in the top-down approach. Because it involves cooperation at all levels, employees feel valued and important. Their commitment to the organization, as well as the goals, is increased. Input from upper management helps to ensure that the goals are challenging and ambitious, which increases motivation. There are, however, a few disadvantages to the interactive approach. It is very time consuming because of the cooperation and consensus involved. It is also difficult to manage and maintain. If managers do not stay actively involved, it can quickly turn into a top-down or bottom-up approach with the disadvantages of each.

FEEDBACK AND EVALUATION

Employees should be provided with specific performance-related feedback to help them determine if they are achieving their goals. Frequent feedback is beneficial because it allows employees to adjust their level of effort to achieve their goals. Feedback from management should consistently be provided. However, feedback can also come from coworkers or customers. It may be in the form of tallies, charts, or graphs that depict performance over time. Feedback not only allows employees to assess their accomplishments, but it also provides them with the continued motivation to achieve their goals.

Not only should the employees be evaluated, but goals should be evaluated periodically. Because organizations face many changes, goals need to be flexible enough so that organizations can respond to dynamic environments. Goals that were set at the beginning of the year may not be realistic at the end of the year. When organizations set goals that are unattainable or unrealistic in the long or short run, employees become unmotivated. When evaluating the appropriateness of a goal, managers should determine whether or not the goal covers the most important aspects of performance. Are the goals realistic yet ambitious enough to motivate employees? Objectives should be measurable and specific. Objectives that are not measurable are often not directly tied to the organization's overall mission. They should be linked to rewards that are valued by employees and associated with specific time periods.

Goal setting is a commonly used motivational approach. Numerous studies have shown that that goal setting is related to profit and performance. In one study, goal setting led to improved productivity in 95 percent of the organizations. It also led to a 16 percent increase in worker productivity. Additionally, 61 percent of organizations surveyed used goal-setting theory specifically to increase performance. Organizations that set goals experienced higher levels of annual profit than those that did not. Therefore, goal setting is a powerful way to increase organizational effectiveness and employee performance.

While goal setting is advantageous to organizations, as well as employees, it is not an easy process to undertake. Managers sometimes underestimate the difficulty involved in setting goals. They are attracted to the benefits without understanding the limitations. Often beneficial are training courses on how to set goals, as well as a continuous follow-up process that involves all areas of the organization. Follow-up and refresher courses are often necessary to keep employees and managers focused on the goal-setting process. By offering courses that involve both managers and frontline employees, organizations are able to increase the level of consensus when it comes time to define goals.

SEE ALSO: Feedback; Management Styles; Mission and Vision Statements; Strategy Formulation; SWOT Analysis

Laura E. Marler

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GOVERNMENT-UNIVERSITY-INDUSTRY PARTNERSHIPS

Since the 1970s the United States has seen the rise of various forms of collaboration among the sectors of government, academia, and industry. These forms include industry-specific inter-firm research consortia, government-industry technology transfer, and university-industry research centers. Yet the emergence of government-university-industry strategic partnerships is relatively recent, and often fostered by specific federal government programs. This new organizational form owes its development to recent trends in the U.S. research environment in industry, academia, and government.

Industrial research is facing pressures to decrease time-to-market for new inventions, and to conduct research aimed at specific, identifiable customer needs. As a result, traditional basic research activities in corporate laboratories have been scaled back. A survey conducted in 1997 by *R&D Magazine* found that much of this is directed basic research, closely linked to related applied research activities, rather than exploratory basic research aimed at the creation of new scientific knowledge.

To compensate, most U.S. firms now form extensive relationships with other organizations for research, including small businesses and universities. Partnerships are a way to identify and capture innovations produced by those organizations that have not been implemented by other companies.

The decline in federal research funding has had a great impact on universities, which are the major recipients of extramural federal research support. As a result, more universities have become interested in forming relationships with industry, such as conducting research for specific companies, housing collaborative research facilities, and licensing university inventions to firms.

The academic sector sees industry R&D funding as a potential replacement for federal funding, especially in view of the new interest among corporations in partnering with universities. Universities are also under pressure from another major funding source, the parents of undergraduate students, to address the perceived imbalance between research and teaching in academia. University administrators in turn are placing more pressure on professors to link research to their educational programs, and also to integrate real-world concerns into both teaching and research. These pressures may also force academia to become more applied in its research focus.

These developments mean that the United States government now shoulders more of the burden for funding fundamental, long-term research aimed at producing new knowledge. However, this responsibility is contradicted by calls from the Congress and from taxpayers for greater accountability for government, and formal measurements of program outcomes under the Government Performance and Results Act of 1993 (the GPRA).

One mechanism to link government R&D to tangible outcomes is to form closer relationships, including collaborative research efforts, with industrial and academic research organizations. Collaboration among these sectors brings many benefits, including:

- Sharing of risk and cost for long-term research.
- Access to complementary capabilities.
- Access to specialized skills.
- Access to new suppliers and markets.
- Access to state-of-the-art facilities.
- Creating new opportunities for technological learning.

U.S. agencies are becoming direct participants in R&D collaboration by forming partnerships between agency research facilities and external research organizations. This increase in collaboration calls for new mechanisms for R&D management that take into account the dynamics of working with extramural research organizations as partners rather than grantees or contractors.

SIGNIFICANCE OF GUI PARTNERSHIPS FOR INNOVATION

Government-university-industry (GUI) strategic research partnerships represent an organizational form designed to integrate disparate pools of intellectual capital. In these cases, participants in the partnership bring to the table very different skills, capabilities, and organizational contexts. The alliance evolves into a shared community of innovation, where each participant retains the legacy of its origins, but joins a network of researchers that evolves its own common values, norms, and vocabulary. The knowledge from each organization can then be integrated within the new context of a community of innovation, and applied by each participant toward its own learning goals.

GUI partnerships play a role of growing significance in national innovation systems. The total process model of innovation outlined by Professor Richard Rosenbloom of Harvard and Dr. William Spencer of SEMATECH emphasizes the importance of flows and linkages between firms and external sources of knowledge. As the global economy evolves toward knowledge-based competition, GUI partnerships are a mechanism for facilitating revolutionary innovation through knowledge fusion.

At the same time this diversity may mean that members lack a shared language of knowledge necessary for effective knowledge sharing. Viewed in the context of dynamic organizational learning, however, even such cultural gaps among GUISP participants can become an advantage. Organizations involved in successful strategic alliances engaged in learning not only at the level of technical knowledge, but also at the level of organizational structure, with participants adopting some of the organizational routines of their partners leading to greater efficiency in learning. Thus, as the gap in relative absorptive capacity narrows among participants in a GUI partnership, they face greater potential to experience radical changes in organization and culture that can lead to more radical innovation.

GUI partnerships may also tend to foster the formation of trust more readily than purely private sector alliances. Multiple industry participants in a GUI partnership are not racing to gain strategic resources from the alliance, as occurs in some industry alliances. Two firms involved in a GUISP could receive the same knowledge from the partnership, but will use it to build very different firm-specific strategic capabilities.

One indication of the special significance of GUI partnerships is that this new organizational form is emerging in different nations and different economies. This suggests that there are strong driving forces motivating these partnerships that are common across different national cultures, political structures, and economic systems. While GUI partnerships in different countries have certain unique characteristics shaped by their national environment, they tend to share processes and structures of membership, governance, and interaction that point to the existence of universal critical success factors which apply to all such partnerships.

CASES OF GUI STRATEGIC RESEARCH PARTNERSHIPS

NSF ENGINEERING RESEARCH CENTERS PROGRAM. An illustrative case of a GUI research collaboration is the Engineering Research Centers (ERC) Program administered by the U.S. National Science Foundation. The ERC program was developed based on a 1983 study by the National Academy of Engineering, initiated at the request of the NSF Director at that time, which recommended the establishment of a new cooperative program with the following two goals:

- To improve engineering research so that U.S. engineers will be better prepared to contribute to engineering practice; and
- To assist U.S. industry in becoming more competitive in world markets.

Establishment of the ERC program was motivated by the perception that significant engineering advances were occurring through the integration of new developments across traditional disciplinary boundaries, and that engineering education in universities no longer prepared students properly for the way in which engineering research was conducted in industry. This required that the centers established by the programs share the following objectives:

- Provide continual interaction of academic researchers, students, and faculty with their peers, namely, the engineers and scientists in industry, to ensure that the research programs in the centers remain relevant to the needs of the engineering practitioner and that they facilitate and promote the flow of knowledge between the academic and industrial sectors;

- Emphasize the synthesis of engineering knowledge; that is, the research programs should seek to integrate different disciplines in order to bring together the requisite knowledge, methodologies, and tools to solve problems important to engineering practitioners; and
- Contribute to the increased effectiveness of all levels of engineering education.

The ERC Program is managed out of NSF's Engineering Education and Centers (EEC) Division of the Directorate for Engineering. The ERC Program issues solicitations for the establishment of ERCs, each with a specific technological focus, such as Data Storage Systems or Telecommunications Research. Universities submit proposals to host an ERC; these proposals are peer-reviewed by technical researchers and executives from academia and industry.

There were twenty-six ERCs in this program in 1999. Each ERC is funded by the NSF for eleven years, over which time each center is expected to generate funding from sources outside the NSF, so that the center is self-sufficient by the end of the grant period. To illustrate, in fiscal year 1994, the twenty-one centers then in the ERC program received $51.7 million from the ERC Program Office; $53.7 million from industry in cash, in-kind donations, and associated grants and contracts; and $73.5 million from university, nonprofit, and other U.S. government sources.

Each ERC forms several consortia involving university faculty, staff, and students, and multiple industrial firms (and on occasion government research facilities) to pursue specific research projects under the ERC's focus area. By this structure, projects tend to focus on more fundamental research of broad interest to industry, rather than on development of specific product technologies for individual firms.

The academic and industrial researchers exchange knowledge regarding the needs of industry in the research area, relevant developments across engineering disciplines, and the processes of academic and industrial research.

The outputs of the ERCs measured by the ERC Program include the numbers of partnerships formed, patents filed and awarded, licenses granted to industry, and undergraduate and graduate degrees awarded to students involved in ERC projects.

MARCO AND THE FOCUS CENTER RESEARCH PROGRAM. The Microelectronics Advanced Research Corporation (MARCO) is a not-for-profit research management organization chartered with the establishment and management of a new Focus Center Research Program (FCRP) to fund pre-competitive, cooperative, long-range, applied microelectronics research. This initiative was launched in cooperation with the Defense Advanced Research Projects Agency (DARPA) of the U.S. Department of Defense, the Semiconductor Industry Association, and SEMI/SEMATECH, an organization of semiconductor equipment manufacturers.

The FCRP concentrates on technical challenges very different from those addressed by firms and other organizations in the semiconductor industry. The parameters these challenges must meet include:

- Emphasis on the elimination of barriers via more revolutionary approaches, paradigm shifts, and the creation of multiple options.
- Long-range (beyond eight years to commercialization) research.
- Broader, less granular objectives.
- Fewer industrial business practices applied.
- Heavy emphasis on research efforts with faculty, post-docs, visiting scientists, and students.

The Focus Centers funded by the program will be virtual (or distributed) centers that span multiple universities. This will tap the best expertise across many institutions in order to build the greatest overall capability in a particular technology area.

Rather than depending on only one institution to manage research in a given technology area, the FCRP will create communities of innovation linking researchers at multiple universities. The research will be long-range but still linked directly to industry imperatives by setting priorities through the National Technology Roadmap for Semiconductors, an industry-wide strategic-planning process. Industry and government support can lead to direct interaction between the university researchers and the end-users of the knowledge generated under the FCRP, contributing to a common view of technical challenges and wider dissemination of new knowledge.

MEDEA. The Microelectronics Development for European Applications (MEDEA) initiative, based in Paris, was launched on July 1, 1996 as a collaborative project under the EUREKA program. The initiative integrates microelectronics into application systems to foster the market-oriented and industry-driven needs of the electronics systems industry.

Funding for MEDEA projects is split between the European Union Commission, the member states, and firms, with participating firms providing at least 50 percent of the program's budget. These member nations are Germany, France, The Netherlands, Italy, Belgium, and Austria. Nearly two-thirds of MEDEA funding will support development of applications.

The MEDEA structure ensures that governmental decision making on research priorities supports the needs of industry, cementing the link between the two through its cost-sharing requirements. Also, the moderate subsidy from the European Commission leverages that investment across national borders, encouraging further collaborative research. By involving multiple firms, universities, and research institutions in MEDEA, the program can facilitate the wide diffusion of new innovations.

THE FRAUNHOFER GESELLSCHAFT. The leading organization focused on applied research in Germany is the Fraunhofer Gesellschaft (FhG) and its 47 worldwide institutes. Founded in 1949, FhG conducts applied research for industry on a contract basis, using the facilities and personnel of regional polytechnics or universities.

By forging a stronger bond between academia and business, FhG aims to speed the commercial application of new technologies. The institutes receive all their financial support from industry and the German government, both paying equal shares. All contracts must be worth at least DM100,000 to receive government support. Furthermore, the exact level of funding is dependent upon the technical and economic risks of the proposal. Finally, the projects must be perceived as potentially profitable.

The FhG, as a contract research body partnering with sources of research capabilities, serves as a neutral organization for coordinating flows of knowledge among and between its clients and research affiliates. The Institutes of the FhG themselves comprise the transorganizational knowledge management infrastructure for each technical field by managing the interactions between diverse research partners. The FhG also has the influence to spark learning in a GUI setting through this interaction.

LESSONS LEARNED ABOUT GUI PARTNERSHIP MANAGEMENT

A cross-sectional analysis of empirical findings from representative case studies fields a preliminary list of key considerations and respective strategic management skills that firms must develop to participate in useful GUI alliances (see Table 1).

TASK DEFINITION. Government, university, and industry have different strengths in the conduct of R&D, and differing priorities that drive their participation in GUI alliances. Therefore, firms must recognize both the strengths and limitations of each type of partner in a GUI alliance, and negotiate appropriate roles for each. For example, a university-industry research center at Case Western Reserve University focusing on materials science met with success when industry partners asked their university counterparts to focus on long-term, fundamental research that still had practical importance to firms but were beyond their research

Table 1

Defining Attributes of the Key Sucess Factors in GUI Partnerships

Key Success Factors in GUI Partnerships	*Focus (External vs. Internal)*	*Nature (People-vs. Technology-Driven)*	*Bias (Positive-sum vs. Zero-sum*	*Outlook (Strategic vs. Tactical)*
Task Definition	Both	Both	Positive-sum	Tactical
Leadership & Authority	External	People-driven	Positive-sum	Strategic
Allocation of Benefits	External	People-driven	Positive-sum	Strategic
Stakeholder Management	External	People-driven	Positive-sum	Tactical
Lifecycle Management	Both	Both	Positive-sum	Strategic

time horizons. The center conducted research into biodegradable polymers, which had enormous long-term potential impact in the plastics industry, but which no firm could afford to pursue.

LEADERSHIP AND AUTHORITY. A GUI alliance also requires the identification of a lead player who has the authority and legitimacy to make fundamental decisions about the direction of the alliance and its operations. Although the lead player must enjoy the support and confidence of the other partners in the alliance, that entity must also be able to act without requiring the unanimous consent of the entire alliance for every operational decision.

GUI alliances operating as pure democracies will tend to degenerate into factions, due to the polarizing differences in organizational objectives among the partners. Often, the lead player emerges due to personalities and individual roles, not at the organizational level. For example, one GUI alliance organized under a Defense Department program ended up with a leader whose technical expertise garnered the respect of other researchers in the alliance, but whose organizational position also provided him with the authority and influence to work the management structures of the different partners.

ALLOCATION OF BENEFITS. A key issue for GUI alliance management is the creation of processes for the fair and appropriate allocation of the benefits from the alliances to the various partners. The most critical aspect of this is in the division of intellectual property rights from research.

A major stumbling block to numerous GUI alliances is the fundamental contradiction between the importance of well-defined and protected rights for industry partners, and the desire for the open dissemination of information by researchers. Today, the success of university technology transfer also means that some academic partners may want to own some of the IPRs that they can then market to outside organizations. For example, agreements that require universities to assign all patent rights from an alliance to the industry members will cause universities to at least hesitate, and often to refuse participation in an alliance. Creating processes for distributing these benefits to satisfy all partners is more art than science, given the competing priorities of the partners.

STAKEHOLDER MANAGEMENT. Related to the above point, firms that take a lead role in GUI alliances must be skilled at stakeholder management, especially in answering the concerns of stakeholders who are not direct members of the alliance. For example, one GUI alliance sponsored by the Defense Department required the lead industry partner to take into consideration how to communicate the benefits of the alliance to Congress. This helped to assure the alliance of continued funding with minimal interference from the oversight committees involved in national security.

LIFE-CYCLE MANAGEMENT. Since GUI alliances are dynamic entities, industry participants must be sensitive to how the alliance and each of its members evolves over time, and how that evolution may change the motivations for the alliance. For example, alliances must have clear processes for members to enter and exit as needed, as the alliance expands or moves into new areas and away from old ones. Also, firms must recognize that GUI alliances in general are highly situation-specific.

Changes in the underlying conditions of the alliance may render the alliance obsolete or moot. Therefore, alliances must also be managed as a dynamic, evolutionary process, with the clear recognition up-front that the alliance may outlive its usefulness and therefore must have processes in place for the graceful termination of the alliance at such a time.

Using a framework developed by Carayannis and Alexander (1998), GUI partnerships can be categorized along four variables:

- R&D Agreement (R&DA), structured as a grant, cooperative agreement, or contract;
- R&D Focus (R&DF), looking at the time-frame and nature of research outputs;
- R&D Performer (R&DP), where research is primarily conducted (among university, industry, government, or other organizations);
- R&D Location (R&DL), at the program and project levels, in terms of geographic location and organizational location (centralized or decentralized).

The resulting categorization is shown in Table 2. This analysis shows that among these three examples, GUI partnerships are intended to leverage the capabilities and resources of different research performers to address research agendas of varying time horizons and using a range of governance mechanisms. The key design issue in structuring GUI partnerships is matching the governance mechanisms, and in particular the interface mechanisms for facilitating knowledge transfer, with the capabilities and research focus of the partnership.

Some pertinent factors to consider in the structure of GUI partnerships are the differing time horizons and cultures of partners from government, university, and industry. These examples of GUI collaborations raise two significant points about this new mode of research support and conduct.

First, global pressures on national and corporate innovation provide a common motivation for the formation of the collaborative efforts, indicating that the

Table 2
Characteristics of GUI Partnerships

	ERCs	MARCO	MEDEA	FhG
R&DA	Cooperative Agreement	Cooperative Agreement	Cooperative Agreement	Contract
R&DF	Long-range, applied	Long-range, basic	Medium-range, applied	Short-to-medium range, applied
R&DP	Primarily university	Primarily university	Primarily industry	For-profit independent institutes
D&DL: program project	US-centered Centralized	US-centered Distributed	EU-centered Distributed	Global Centralized

globalization of R&D has a comparable impact across nations. Implementing transorganizational knowledge management through GUI partnerships will reengineer some aspects of the national science and engineering enterprise, as barriers to knowledge sharing across economic sectors are broken down through repeated instances of collaboration.

Second, the design of GUI partnerships and their intelligent transorganizational knowledge interfaces is influenced by the past history and current structure of the science and engineering enterprise in each company. Therefore, cross-national comparisons are somewhat difficult, as knowledge-management practices in one culture may not apply in another setting. This suggests that further research is necessary to understand the extent to which GUI partnerships are a tool for international as well as national transorganizational innovation.

The lessons learned from GUI partnerships show that there are distinct skill sets that firms must develop if they are to derive the full benefits of the alliances from participation. GUI strategic R&D alliances constitute an ongoing process of learning, introspection, and discovery.

Case studies of GUI partnerships can show the importance of learning proper alliance management skills to firm success, particularly given the specific pressures and dynamics introduced by knowledge-based competition. It can also show how these alliances are useful tools in initiating and accelerating learning at all levels within and across organizations, enabling firms to maneuver more nimbly in the complete game of business.

For these partnerships to contribute effectively to firm-level and national competitiveness and innovation, the participants must develop new competencies in the mechanisms and processes for managing GUI partnerships, which are different from other forms of inter-organizational alliances.

SEE ALSO: Joint Ventures and Strategic Alliances; Licensing and Licensing Agreements; Product Life Cycle and Industry Life Cycle; Stakeholders; Strategy Formulation; Technology Management; Technology Transfer

Elias G. Carayannis and Jeffrey Alexander
Revised by Debbie Hausler

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GROUP DECISION MAKING

Group decision making is a type of participatory process in which multiple individuals acting collectively, analyze problems or situations, consider and evaluate alternative courses of action, and select from among the alternatives a solution or solutions. The number of people involved in group decision-making varies greatly, but often ranges from two to seven. The individuals in a group may be demographically similar or quite diverse. Decision-making groups may be relatively informal in nature, or formally designated and charged with a specific goal. The process used to arrive at decisions may be unstructured or structured. The nature and composition of groups, their size, demographic makeup, structure, and purpose, all affect their functioning to some degree. The external contingencies faced by groups (time pressure and conflicting goals) impact the development and effectiveness of decision-making groups as well.

In organizations many decisions of consequence are made after some form of group decision-making process is undertaken. However, groups are not the only form of collective work arrangement. Group decision-making should be distinguished from the concepts of teams, teamwork, and self managed teams. Although the words teams and groups are often used interchangeably, scholars increasingly differentiate between the two. The basis for the distinction seems to be that teams act more collectively and achieve greater synergy of effort. Katzenback and Smith spell out specific differences between decision making groups and teams:

- The group has a definite leader, but the team has shared leadership roles
- Members of a group have individual accountability; the team has both individual and collective accountability.
- The group measures effectiveness indirectly, but the team measures performance directly through their collective work product.
- The group discusses, decides, and delegates, but the team discusses, decides, and does real work.

GROUP DECISION MAKING METHODS

There are many methods or procedures that can be used by groups. Each is designed to improve the decision-making process in some way. Some of the more common group decision-making methods are brainstorming, dialetical inquiry, nominal group technique, and the delphi technique.

BRAINSTORMING. Brainstorming involves group members verbally suggesting ideas or alternative courses of action. The "brainstorming session" is usually relatively unstructured. The situation at hand is described in as much detail as necessary so that group members have a complete understanding of the issue or problem. The group leader or facilitator then solicits ideas from all members of the group. Usually, the group leader or facilitator will record the ideas presented on a flip chart or marker board. The "generation of alternatives" stage is clearly differentiated from the "alternative evaluation" stage, as group members are not allowed to evaluate suggestions until all ideas have been presented. Once the ideas of the group members have been exhausted, the group members then begin the process of evaluating the utility of the different suggestions presented. Brainstorming is a useful means by which to generate alternatives, but does not offer much in the way of process for the evaluation of alternatives or the selection of a proposed course of action.

One of the difficulties with brainstorming is that despite the prohibition against judging ideas until all group members have had their say, some individuals are hesitant to propose ideas because they fear the judgment or ridicule of other group members. In recent years, some decision-making groups have utilized electronic brainstorming, which allows group members to propose alternatives by means of e-mail or another electronic means, such as an online posting board or discussion room. Members could conceivably offer their ideas anonymously, which should increase the likelihood that individuals will offer unique and creative ideas without fear of the harsh judgment of others.

DIALETICAL INQUIRY. Dialetical inquiry is a group decision-making technique that focuses on ensuring full consideration of alternatives. Essentially, it involves dividing the group into opposing sides, which debate the advantages and disadvantages of proposed solutions or decisions. A similar group decision-making method, devil's advocacy, requires that one member of the group highlight the potential problems with a proposed decision. Both of these techniques are designed to try and make sure that the group considers all possible ramifications of its decision.

NOMINAL GROUP TECHNIQUE. The nominal group technique is a structured decision making process in which group members are required to compose a comprehensive list of their ideas or proposed alternatives in writing. The group members usually record their ideas privately. Once finished, each group member is asked, in turn, to provide one item from their list until all ideas or alternatives have been publicly recorded on a flip chart or marker board. Usually, at this stage of the process verbal exchanges are limited to requests for clarification—no evaluation or criticism of listed ideas is permitted. Once all proposals are listed publicly, the group engages in a discussion of the listed alternatives, which ends in some form of ranking or rating in order of preference. As with brainstorming, the prohibition against criticizing proposals as they are presented is designed to overcome individuals' reluctance to share their ideas. Empirical research conducted on group decision making offers some evidence that the nominal group technique succeeds in generating a greater number of decision alternatives that are of relatively high quality.

DELPHI TECHNIQUE. The Delphi technique is a group decision-making process that can be used by decision-making groups when the individual members are in different physical locations. The technique was developed at the Rand Corporation. The individuals in the Delphi "group" are usually selected because of the specific knowledge or expertise of the problem they possess. In the Delphi technique, each group member is asked to independently provide ideas, input, and/or alternative solutions to the decision problem in successive stages. These inputs may be provided in a variety of ways, such as e-mail, fax, or online in a discussion room or electronic bulletin board. After each stage in the process, other group members ask questions and alternatives are ranked or rated in some fashion. After an indefinite number of rounds, the group eventually arrives at a consensus decision on the best course of action.

ADVANTAGES AND DISADVANTAGES OF GROUP DECISION MAKING

The effectiveness of decision-making groups can be affected by a variety of factors. Thus, it is not possible to suggest that "group decision making is always better" or "group decision making is always worse" than individual decision-making. For example, due to the increased demographic diversity in the workforce, a considerable amount of research has focused on diversity's effect on the effectiveness of group functioning. In general, this research suggests that demographic diversity can sometimes have positive or negative effects, depending on the specific situation. Demographically diverse group may have to overcome social barriers and difficulties in the early stages of group formation and this may slow down the group. However, some research indicates that diverse groups, if effectively managed, tend to generate a wider variety and higher quality of decision alternatives than demographically homogeneous groups.

Despite the fact that there are many situational factors that affect the functioning of groups, research through the years does offer some general guidance about the relative strengths and weaknesses inherent in group decision making. The following section summarizes the major pros and cons of decision making in groups.

ADVANTAGES. Group decision-making, ideally, takes advantage of the diverse strengths and expertise of its members. By tapping the unique qualities of group members, it is possible that the group can generate a greater number of alternatives that are of higher quality than the individual. If a greater number of higher quality alternatives are generated, then it is likely that the group will eventually reach a superior problem solution than the individual.

Group decision-making may also lead to a greater collective understanding of the eventual course of action chosen, since it is possible that many affected by the decision implementation actually had input into the decision. This may promote a sense of "ownership" of the decision, which is likely to contribute to a greater acceptance of the course of action selected and greater commitment on the part of the affected individuals to make the course of action successful.

DISADVANTAGES. There are many potential disadvantages to group decision-making. Groups are generally slower to arrive at decisions than individuals, so sometimes it is difficult to utilize them in situations where decisions must be made very quickly. One of the most often cited problems is groupthink. Irving Janis, in his 1972 book *Victims of Groupthink,* defined the phenomenon as the "deterioration of mental efficiency, reality testing, and moral judgment resulting from in-group pressure." Groupthink occurs when individuals in a group feel pressure to conform to what seems to be the dominant view in the group. Dissenting views of the majority opinion are suppressed and alternative courses of action are not fully explored.

Research suggests that certain characteristics of groups contribute to groupthink. In the first place, if the group does not have an agreed upon process for developing and evaluating alternatives, it is possible that an incomplete set of alternatives will be considered and that different courses of action will not be fully explored. Many of the formal decision-making processes (e.g., nominal group technique and brainstorming) are designed, in part, to reduce the potential for groupthink by ensuring that group members offer and consider a large number of decision alternatives. Secondly, if a powerful leader dominates the group, other group members may quickly conform to the dominant view. Additionally, if the group is under stress and/or time pressure, groupthink may occur. Finally, studies suggest that highly cohesive groups are more susceptible to groupthink.

Group polarization is another potential disadvantage of group decision-making. This is the tendency of the group to converge on more extreme solutions to a problem. The "risky shift" phenomenon is an example of polarization; it occurs when the group decision is a riskier one than any of the group members would have made individually. This may result because individuals in a group sometimes do not feel as much responsibility and accountability for the actions of the group as they would if they were making the decision alone.

Decision-making in groups is a fact of organizational life for many individuals. Because so many individuals spend at least some of their work time in decision-making groups, groups are the subjects of hundreds of research studies each year. Despite this, there is still much to learn about the development and functioning of groups. Research is likely to continue to focus on identifying processes that will make group decision-making more efficient and effective. It is also likely to examine how the internal characteristics of groups (demographic and cognitive diversity) and the external contingencies faced by groups affect their functioning.

Tim Barnett

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GROUP DYNAMICS

A group can be defined as several individuals who come together to accomplish a particular task or goal. Group dynamics refers to the attitudinal and behavioral characteristics of a group. Group dynamics concern how groups form, their structure and process, and how they function. Group dynamics are relevant in both formal and informal groups of all types. In an organizational setting, groups are a very common organizational entity and the study of groups and group dynamics is an important area of study in organizational behavior.

The following sections provide information related to group dynamics. Specifically, the formation and development of groups is first considered. Then some major types or classifications of groups are discussed. Then the structure of groups is examined.

GROUP DEVELOPMENT

As applied to group development, group dynamics is concerned with why and how groups develop. There are several theories as to why groups develop. A classic theory, developed by George Homans, suggests that groups develop based on activities, interactions, and sentiments. Basically, the theory means that when individuals share common activities, they will have more interaction and will develop attitudes (positive or negative) toward each other. The major element in this theory is the interaction of the individuals involved.

Social exchange theory offers an alternative explanation for group development. According to this theory, individuals form relationships based on the implicit expectation of mutually beneficial exchanges based on trust and felt obligation. Thus, a perception that exchange relationships will be positive is essential if individuals are to be attracted to and affiliate with a group.

Social identity theory offers another explanation for group formation. Simply put, this theory suggests that individuals get a sense of identity and self-esteem based upon their membership in salient groups. The nature of the group may be demographically based, culturally based, or organizationally based. Individuals are motivated to belong to and contribute to identity groups because of the sense of belongingness and self-worth membership in the group imparts.

Group dynamics as related to development concerns not only why groups form but also how. The most common framework for examining the "how" of group formation was developed by Bruce Tuckman in the 1960s. In essence, the steps in group formation imply that groups do not usually perform at maximum effectiveness when they are first established. They encounter several stages of development as they strive to become productive and effective. Most groups experience the same developmental stages with similar conflicts and resolutions.

According to Tuckman's theory, there are five stages of group development: forming, storming, norming, performing, and adjourning. During these stages group members must address several issues and the way in which these issues are resolved determines whether the group will succeed in accomplishing its tasks.

1. Forming. This stage is usually characterized by some confusion and uncertainty. The major goals of the group have not been established. The nature of the task or leadership of the group has not been determined (Luthans, 2005). Thus, forming is an orientation period when members get to know one another and share expectations about the group. Members learn the purpose of the group as well as the rules to be followed. The forming stage should not be rushed because trust and openness must be developed. These feelings strengthen in later stages of development. Individuals are often confused during this stage because roles are not clear and there may not be a strong leader.
2. Storming. In this stage, the group is likely to see the highest level of disagreement and conflict. Members often challenge group goals and struggle for power. Individuals often vie for the leadership position during this stage of development. This can be a positive experience for all groups if members can achieve cohesiveness through resolution. Members often voice concern and criticism in this phase. If members are not able to resolve the conflict, then the group will often disband or continue in existence but will remain ineffective and never advance to the other stages.
3. Norming. This stage is characterized by the recognition of individual differences and shared expectations. Hopefully, at this stage the group members will begin to develop a feeling of group cohesion and identity. Cooperative effort should begin to yield results. Responsibilities are divided among members and the group decides how it will evaluate progress.
4. Performing. Performing, occurs when the group has matured and attains a feeling of cohesiveness. During this stage of development, individuals accept one another and conflict is resolved through group discussion. Members of the group make decisions through a rational process that is focused on relevant goals rather than emotional issues.
5. Adjourning. Not all groups experience this stage of development because it is characterized by the disbandment of the group. Some groups are relatively permanent (Luthans, 2005). Reasons that groups disband vary, with common reasons being the accomplishment of the task or individuals deciding to go their own ways. Members of the group often experience feelings of closure and sadness as they prepare to leave.

GROUP TYPES

One common way to classify group is by whether they are formal or informal in nature. Formal work groups are established by an organization to achieve organizational goals. Formal groups may take the form of command groups, task groups, and functional groups.

COMMAND GROUPS. Command groups are specified by the organizational chart and often consist of a supervisor and the subordinates that report to that supervisor. An example of a command group is an academic department chairman and the faculty members in that department.

TASK GROUPS. Task groups consist of people who work together to achieve a common task. Members are brought together to accomplish a narrow range of goals within a specified time period. Task groups are also commonly referred to as task forces. The organization appoints members and assigns the goals and tasks to be accomplished. Examples of assigned tasks are the development of a new product, the improvement of a production process, or the proposal of a motivational contest. Other common task groups are ad hoc committees, project groups, and standing committees. Ad hoc committees are temporary groups created to resolve a specific complaint or develop a process. Project groups are similar to ad hoc committees and normally disband after the group completes the assigned task. Standing committees are more permanent than ad hoc committees and project groups. They maintain longer life spans by rotating members into the group.

FUNCTIONAL GROUPS. A functional group is created by the organization to accomplish specific goals within an unspecified time frame. Functional groups remain in existence after achievement of current goals and objectives. Examples of functional groups would be a marketing department, a customer service department, or an accounting department.

In contrast to formal groups, informal groups are formed naturally and in response to the common interests and shared values of individuals. They are created for purposes other than the accomplishment of organizational goals and do not have a specified time frame. Informal groups are not appointed by the organization and members can invite others to join from time to time. Informal groups can have a strong influence in organizations that can either be positive or negative. For example, employees who form an informal group can either discuss how to improve a production process or how to create shortcuts that jeopardize quality. Informal groups can take the form of interest groups, friendship groups, or reference groups.

INTEREST GROUPS. Interest groups usually continue over time and may last longer than general informal groups. Members of interest groups may not be part of the same organizational department but they are bound together by some other common interest. The goals and objectives of group interests are specific to each group and may not be related to organizational goals and objectives. An example of an interest group would be students who come together to form a study group for a specific class.

FRIENDSHIP GROUPS. Friendship groups are formed by members who enjoy similar social activities, political beliefs, religious values, or other common bonds. Members enjoy each other's company and often meet after work to participate in these activities. For example, a group of employees who form a friendship group may have an exercise group, a softball team, or a potluck lunch once a month.

REFERENCE GROUPS. A reference group is a type of group that people use to evaluate themselves. According to Cherrington, the main purposes of reference groups are social validation and social comparison. Social validation allows individuals to justify their attitudes and values while social comparison helps individuals evaluate their own actions by comparing themselves to others. Reference groups have a strong influence on members' behavior. By comparing themselves with other members, individuals are able to assess whether their behavior is acceptable and whether their attitudes and values are right or wrong. Reference groups are different from the previously discussed groups because they may not actually meet or form voluntarily. For example, the reference group for a new employee of an organization may be a group of employees that work in a different department or even a different organization. Family, friends, and religious affiliations are strong reference groups for most individuals.

GROUP STRUCTURE

Group structure is a pattern of relationships among members that hold the group together and help it achieve assigned goals. Structure can be described in a variety of ways. Among the more common considerations are group size, group roles, group norms, and group cohesiveness.

GROUP SIZE. Group size can vary from 2 people to a very large number of people. Small groups of two to ten are thought to be more effective because each member has ample opportunity to participate and become actively involved in the group. Large groups may waste time by deciding on processes and trying to decide who should participate next. Group size will affect not only participation but satisfaction as well. Evidence supports the notion that as the size of the group increases, satisfaction increases up to a certain point. In other words, a group of six members has twice as many opportunities for interaction and participation as a group of three people. Beyond 10 or 12 members, increasing the size of the group results in decreased satisfaction. It is increasingly difficult for members of large groups to identify with one another and experience cohesion.

GROUP ROLES

In formal groups, roles are usually predetermined and assigned to members. Each role will have specific responsibilities and duties. There are, however, emergent roles that develop naturally to meet the needs of the groups. These emergent roles will often replace the assigned roles as individuals begin to express themselves and become more assertive. Group roles can then be classified into work roles, maintenance roles, and blocking roles.

Work roles are task-oriented activities that involve accomplishing the group's goals. They involve a variety of specific roles such as initiator, informer, clarifier, summarizer, and reality tester. The initiator defines problems, proposes action, and suggests procedures.

The informer role involves finding facts and giving advice or opinions. Clarifiers will interpret ideas, define terms, and clarify issues for the group. Summarizers restate suggestions, offer decisions, and come to conclusions for the group. Finally, reality testers analyze ideas and test the ideas in real situations.

Maintenance roles are social-emotional activities that help members maintain their involvement in the group and raise their personal commitment to the group. The maintenance roles are harmonizer, gatekeeper, consensus tester, encourager, and compromiser. The harmonizer will reduce tension in the group, reconcile differences, and explore opportunities. Gatekeepers often keep communication channels open and make suggestions that encourage participation. The consensus tester will ask if the group is nearing a decision and test possible conclusions. Encouragers are friendly, warm, and responsive to other group members. The last maintenance role is the compromiser. This role involves modifying decisions, offering compromises, and admitting errors.

Blocking roles are activities that disrupt the group. They make take the form of dominating discussions, verbally attacking other group members, and distracting the group with trivial information or unnecessary humor. Often times the blocking behavior may not be intended as negative. Sometimes a member may share a joke in order to break the tension, or may question a decision in order to force group members to rethink the issue. The blocking roles are aggressor, blocker, dominator, comedian, and avoidance behavior. The aggressor criticizes members' values and makes jokes in a sarcastic or semi-concealed manner.

Blockers will stubbornly resist the group's ideas, disagree with group members for personal reasons, and will have hidden agendas. The dominator role attempts to control conversations by patronizing others. They often interrupt others and assert authority in order to manipulate members. Comedians often abandon the group even though they may physically still be a part. They are attention-getters in ways that are not relevant to the accomplishment of the group's objectives. The last blocking role, avoidance behavior, involves pursuing goals not related to the group and changing the subject to avoid commitment to the group.

Role ambiguity concerns the discrepancy between the sent role and the received role, as shown in Exhibit 1. Supervisors, directors, or other group leaders often send (assign) roles to group members in formal groups. Group members receive roles by being ready and willing to undertake the tasks associated with that role. Ambiguity results when members are confused about the delegation of job responsibilities. This confusion may occur because the members do not have specific job descriptions or because the instructions regarding the task were not clear. Group members who experience ambiguity often have feelings of frustration and dissatisfaction, which ultimately lead to turnover.

Role conflict occurs when there is inconsistency between the perceived role and role behavior. There are several different forms of role conflict. Interrole conflict occurs when there is conflict between the different roles that people have. For example, work roles and family roles often compete with one another and cause conflict. Intrarole conflict occurs when individuals must handle conflicting demands from different sources while performing the tasks associated with the same role.

GROUP NORMS. Norms are acceptable standards of behavior within a group that are shared by the members of the group. Norms define the boundaries of acceptable and unacceptable behavior. They are typically created in order to facilitate group survival, make behavior more predictable, avoid embarrassing situations, and express the values of the group. Each group will establish its own set of norms that might determine anything from the appropriate dress to how many comments to make in a meeting. Groups exert pressure on members to force them to conform to the group's standards. The norms often reflect the level of commitment, motivation, and performance of the group.

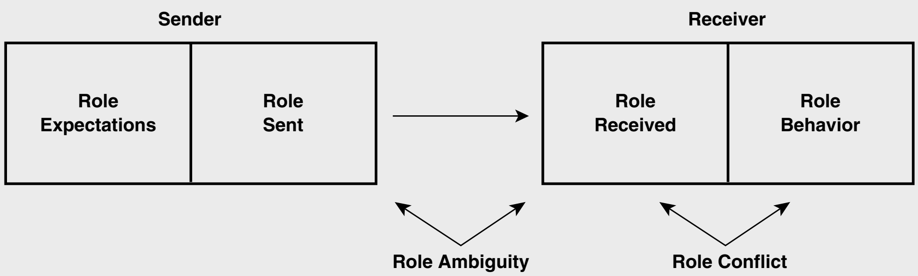
Performance norms determine how quickly members should work and how much they should produce. They are created in an effort to determine levels of individual effort. They can be very frustrating to managers because they are not always in line with the organization's goals. Members of a group may have the skill and ability to perform at higher levels but they don't because of the group's performance norms. For example, workers may stop working a production machine at 20 minutes before quitting time in order to wash up, even though they produced fewer items that day than management intended.

Reward-allocation norms determine how rewards are bestowed upon group members. For example, the norm of equality dictates equal treatment of all members. Every member shares equally so rewards are distributed equally to everyone. Equity norms suggest that rewards are distributed according to the member's contribution. In other words, members who contribute the most receive the largest share of the rewards. Members may contribute through effort, skill, or ability. Social responsibility norms reward on the basis of need. Members who have special needs therefore receive the largest share of the reward.

The majority of the group must agree that the norms are appropriate in order for the behavior to be accepted. There must also be a shared understanding

Exhibit 1

Role Ambiguity and Role Conflict



that the group supports the norms. It should be noted, however, that members might violate group norms from time to time. If the majority of members do not adhere to the norms, then they will eventually change and will no longer serve as a standard for evaluating behavior. Group members who do not conform to the norms will be punished by being excluded, ignored, or asked to leave the group.

GROUP COHESIVENESS. Cohesiveness refers to the bonding of group members and their desire to remain part of the group. Many factors influence the amount of group cohesiveness. Generally speaking, the more difficult it is to obtain group membership the more cohesive the group. Groups also tend to become cohesive when they are in intense competition with other groups or face a serious external threat to survival. Smaller groups and those who spend considerable time together also tend to be more cohesive.

Cohesiveness in work groups has many positive effects, including worker satisfaction, low turnover and absenteeism, and higher productivity. However, highly cohesive groups may be detrimental to organizational performance if their goals are misaligned with organizational goals. Highly cohesive groups may also be more vulnerable to groupthink. Groupthink occurs when members of a group exert pressure on each other to come to a consensus in decision making. Groupthink results in careless judgments, unrealistic appraisals of alternative courses of action, and a lack of reality testing. It can lead to a number of decision-making issues such as the following:

1. Incomplete assessments of the problem,
2. Incomplete information search,
3. Bias in processing information,
4. Inadequate development of alternatives, and
5. Failure to examine the risks of the preferred choice.

Evidence suggests that groups typically outperform individuals when the tasks involved require a variety of skills, experience, and decision making. Groups are often more flexible and can quickly assemble, achieve goals, and disband or move on to another set of objectives. Many organizations have found that groups have many motivational aspects as well. Group members are more likely to participate in decision-making and problem-solving activities leading to empowerment and increased productivity. Groups complete most of the work in an organization; thus, the effectiveness of the organization is limited by the effectiveness of its groups.

SEE ALSO: Brainstorming; Group Decision Making; Teams and Teamwork

Amy McMillan
Revised by Tim Barnett

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H

HANDHELD COMPUTERS

Handheld computers—also known as personal digital assistants (PDAs)—are small, portable devices that offer users many of the same features and capabilities as desktop computers at a fraction of the size. Although the terms "handheld computer" and "PDA" are often used interchangeably, handhelds tend to be larger and feature miniature keyboards, while PDAs tend to be smaller and rely on a touch screen and stylus for data entry.

Since their introduction in the late 1990s, handheld computers have become standard equipment for many professionals, providing them with tiny, versatile electronic alternatives to paper day planners. "Once the domain of early adopting gadget lovers, handhelds now organize and update millions of mobile business professionals," reports Mike Brown at HandheldComputerDepot.com. Users have found PDAs to be particularly helpful tools for organizing and maintaining personal data, such as address books, appointment calendars, project lists, and expense reports. Later incarnations of the technology have also offered users mobile access to electronic mail, news, and entertainment through connectivity to the Internet.

When shopping for a handheld computer, experts recommend that users start by identifying their needs. They should consider, for example, whether they require only personal information management (PIM) functions, or whether they also wish to take notes during meetings, download e-mail and other information from the Internet, and connect with other users through a company computer network. Considering such needs, as well as the available budget, will help users decide among the basic options in handheld computers, including size, display, memory, operating system, and power source.

The size of handheld computers ranges from credit card to small notebook computer, and the available features and power generally increase with greater size. The most popular size for the devices is palm size-which falls somewhere between a calculator and a paperback book. Most handheld computers utilize a liquid crystal display (LCD), which acts as both an input and an output device. Only the larger PDAs feature keyboards, and most others require users to enter information on a touch screen, either by tapping letters with a stylus or by writing letters on the screen, which the device interprets using handwriting-recognition software. In the future, many handheld units are expected to incorporate voice-recognition technology.

Many handheld computers are designed to work closely with a desktop computer or network. In order to maintain up-to-date information in both places, a process known as synchronizing data must occur—users must perform frequent uploads and downloads between their PDA and desktop systems. This process can take place through cables, wireless connections, or over telephone lines via modem. Rather than downloading from PCs, however, some of the more sophisticated handheld devices allow users to connect directly to the Internet for downloading e-mail, Web magazines and news services, and audio programs.

In an article for *Computerworld,* Matt Hamblen and Sharon Gaudin warned that many corporate information technology (IT) managers were unprepared to deal with the proliferation of handheld computers among employees. They found that some companies ignored the devices, while others simply banned them from connecting to corporate networks. Instead, Hamblen and Gaudin recommended that IT managers embrace the new technology, helping employees choose products and find ways to use them to increase productivity. They argued that businesses should take an active role in deciding which handheld platforms and software applications their networks will support. They cautioned that businesses should also be aware of the security threats posed by handheld devices and take steps to protect the corporate network by establishing software synchronization standards.

Experts predict that the next evolution in handheld computers will be the "smartphone," which combines the most popular functions of PDAs (storing addresses and phone numbers, taking down notes or messages, and browsing the Internet remotely) with wireless phone service. Some analysts believe that the market for straightforward PDAs has become saturated. They claim that future growth will come in the form of phone units, because users will no longer be willing to carry both a PDA and a cellular phone.

SEE ALSO: Computer Security; Knowledge Management; Knowledge Workers; Technology Management; Technology Transfer; Telecommunications; Time-Based Competition; Virtual Organizations

Laurie Collier Hillstrom

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HEALTH SAVINGS ACCOUNTS

A health savings account (HSA) is an investment vehicle from which individuals can withdraw funds to pay qualified medical expenses as defined by the Internal Revenue Code. Accumulated funds can be used to pay current medical expenses or can be saved for medical expenses incurred in the future. The account can be set up by an employee in conjunction with his or her employer, but may also be set up by individuals through participating insurance companies and banks. To participate, an individual must have a high-deductible health insurance plan as their only form of health insurance and must not be eligible for Medicare. Generally, a high-deductible health care plan is one with at least a $1,000 deductible for an individual or $5,000 for a family. Participants contribute to the HSA and pay a premium for the high-deductible medical insurance, which is usually lower than the premium for conventional medical insurance. Also, an eligible individual cannot be a dependent of another taxpayer.

The individual's contributions to the account are tax deductible and, if an employer contributes to the account on behalf of an employee, the contribution is not taxable to the employee and the employer's taxable income is reduced by the amount of the contribution. Money placed in the account may be invested in a variety of investment vehicles, including stocks, bonds, and mutual funds. Investment gains are nontaxable, as long as money withdrawn from the fund is used for qualified medical expenses. There are maximum annual contributions, which are adjusted for inflation annually. In 2004, the maximum contribution is $2,000 for an individual plan and $5,150 for a family plan. However, those over age 55 are allowed to make so-called "catch-up" contributions.

PURPOSE

Most individuals in the United States who are not self-employed and who are not eligible for Medicare or Medicaid obtain their health insurance through their employers. There are two major problems with the current system of employer-sponsored health care coverage. First, since the employer usually pays some or all of the insurance premiums and bears the brunt of health care cost increases; the true cost of coverage is hidden from individuals, who therefore have little incentive to manage their health care efficiently. Second, employer-sponsored insurance creates a link between employment and health care that may be broken when an employee loses his or her job. These facts, combined with the tremendous increase in health-care costs in the U.S. experienced since the 1980s, has led the government and employers to look for ways to deliver health care insurance more efficiently and effectively.

Health maintenance organizations (HMOs), adopted by many employers in the 1980s, addressed the cost problem by allowing employers to make arrangements with health care providers to deliver health care services to their employees on a fixed-fee basis. In return for price concessions, employers essentially restricted the choices of participating employees to participating providers. HMOs were successful in reducing health care cost inflation, but their lack of flexibility and perceived over-emphasis on cost containment led to widespread dissatisfaction. Less restrictive preferred provider organizations, which allowed employees more freedom of choice if they were willing to pay a higher portion of costs, became the dominant form of employer-sponsored plan in the 1990s. But PPOs appear to be less successful in restraining health care costs. Thus, the government and employers continue to search for alternatives.

Attention focused on attempting to de-couple health insurance from employment and increasing consumer involvement in health care decisions. Such consumer-driven approaches place greater responsibility on individuals to choose and manage their health care. The goal of such approaches is to encourage individuals to be more careful consumers of health care. Flexible spending accounts and medical savings accounts are both consumer-driven approaches.

Health savings accounts overcome many of the difficulties with the earlier approaches to consumer-driven health care. For example, flexible spending accounts require the individual to use all contributed funds annually or lose the funds. Accumulated funds in HSAs carry over from year to year and can be held for life. Medical savings accounts are available only to the self-employed or those employed by small businesses. HSAs are available to anyone, regardless of employment status.

SEE ALSO: Employee Benefits; Employment Law and Compliance; Human Resource Management

Tim Barnett

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HUMAN RESOURCE INFORMATION SYSTEMS

Human Resource Information Systems (HRIS) have become one of the most important tools for many businesses. Even the small, 20-person office needs to realize the benefits of using HRIS to be more efficient. Many firms do not realize how much time and money they are wasting on manual human resource management (HRM) tasks until they sit down and inventory their time. HRIS is advancing to become its own information technology (IT) field. It allows companies to cut costs and offer more information to employees in a faster and more efficient way. Especially in difficult economic times, it is critical for companies to become more efficient in every sector of their business; human resources (HR) is no exception.

HRIS refers to software packages that address HR needs with respect to planning, employee information access, and employer regulatory compliance. The following text begins with a discussion of human resource planning, followed by human resource management systems.

HUMAN RESOURCE PLANNING

American companies must now operate in a rapidly changing business environment. These changes have important implications for HRM practices. To ensure that management practices support business needs, organizations must continually monitor changing environmental conditions and devise HRM strategies for dealing with them. The procedure used to tie human resource issues to the organization's business needs is called human resource planning. Also known as HR planning, this procedure is defined as the "process of identifying and responding to [organizational needs] . . . and charting new policies, systems, and programs that will assure effective human resource management under changing conditions."

The purposes of HR planning are to enable organizations to anticipate their future HRM needs and to identify practices that will help them to meet those needs. HR planning may be done on a short- or long-term (three or more years) basis. Its aim is to ensure that people will be available with the appropriate characteristics and skills when and where the organization needs them. The use of HR planning enables companies to gain control of their future by preparing for likely events. That is, they can anticipate change and devise appropriate courses of action. When companies learn how to capitalize on future events, their own future improves.

As valuable as HR planning is, many companies ignore this opportunity. Some see it as too difficult and frustrating, while others simply do not see the need for it. However, when failing to properly plan for their human resources, employers are forced to respond to events after they occur, rather than before; they become reactive, rather than proactive. When this outcome occurs, an organization may be unable to correctly anticipate an increase in its future demand for personnel. At best, such a company would be forced to recruit personnel at the last minute and may fail to find the best candidates. At worst, the company may become seriously understaffed.

If a company remains understaffed for a prolonged period, it may ultimately suffer a variety of

Exhibit 1
HR Trend Analysis for a Manufacturing Firm

	2006	2007	2008	2009	2010
Projected sales (thousands of dollars)	10,200	8,700	7,800	9,500	10,000
Number of employees	240	200	165	215	?

consequences. For instance, the understaffing could cause existing employees to experience a great deal of stress as they attempt to meet additional demand without adequate resources and assistance. If required work is not getting done, the firm ultimately may experience an increase in back orders, which could cause a decrease in customer goodwill, an increase in competition, and a loss of market share.

When engaged in human resource planning, a company derives its human resource needs by first forecasting its demand for human resources (i.e., the number and types of people needed to carry out the work of the organization at some future point in time), and then its supply (i.e., the positions that are expected to be already filled). The difference between the two forecasts signifies the firm's HR needs. For example, if a firm estimates that it will demand 12 accountants during the next fiscal year and expects to retain its supply of nine who are already on staff, its HR need would be to hire three additional accountants. Following is a closer look at how a company can determine its HR needs and devise plans to meet them.

DEMAND FORECASTING

Demand forecasting involves predicting the number and types of people the organization will need at some future point in time. There are two general approaches to demand forecasting: statistical and judgmental. Using a statistical approach, an organization predicts its needed workforce size on the basis of certain business factors. A business factor is an attribute of the business, such as sales volume or market share, which closely relates to the size of the needed workforce. For example, a hospital could use the business factor of projected patient load to predict the number of nurses it would need at some point in time.

A statistical approach to demand forecasting typically is used when an organization operates in a stable environment, where an appropriate business factor can be predicted with some degree of certainty. For example, a statistical approach may be appropriate for a hospital located in an area with little population growth. Organizations operating in less stable environments (e.g., a hospital in an area experiencing explosive growth and change) are more likely to rely on a judgmental approach.

STATISTICAL APPROACHES. The most commonly used statistical methods of demand forecasting are trend, ratio, and regression analysis. In *trend analysis,* the future demand for human resources is projected on the basis of past business trends regarding a business factor. An example of a trend analysis is illustrated in Exhibit 1, which depicts the relationship between a business factor (namely, sales volume) and workforce size. As one can see from the exhibit, if the company expects its 2010 sales to be $10 million, it will need to increase its workforce to a size of nearly 240, which is the number of employees it had in 2006 when sales were $10.2 million.

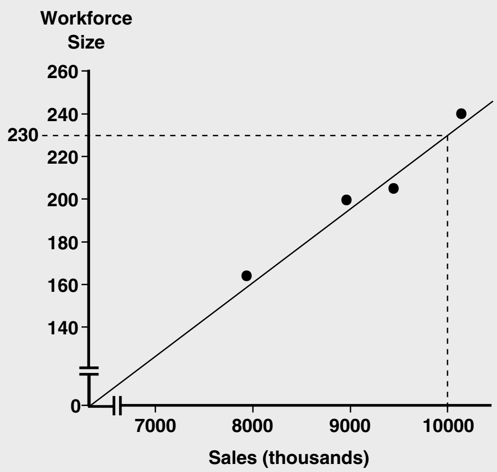
Ratio analysis is the process of determining future HR demand by computing an exact ratio between the specific business factor and the number of employees needed. It thus provides a more precise estimate than trend analysis. For instance, the demand for professors at a university could be forecast on the basis of the student-faculty ratio. Suppose that a university has 10,000 students and 500 professors; the student-faculty ratio is thus 10,000:500 or 20:1. This ratio means that for every 20 students, the university needs 1 professor. If the university anticipates a student enrollment increase of 1,000 for next year, it would need to hire 50 (1000/20) new professors. This is in addition to any hiring needed to fill vacancies from existing faculty who might leave in the meantime.

Regression analysis is similar to both trend and ratio analyses in that forecasts are based on the relationship between a business factor and workforce size. However, this method is more statistically sophisticated. Using statistical software, the analyst first creates a scatter diagram depicting the relationship between the business factor and workforce size. The software can then calculate a regression line, which cuts right through the center of the points on the scatter diagram. (The regression line is mathematically determined using a formula found in most statistical texts.) By inspecting values along the regression line, one can see how many employees are needed at each value of the business factor. Both ratio analysis and regression analysis are aspects of human resource management systems (HRMS) packages, and therefore provide the business with the capabilities to calculate more accurate and timely forecasts.

An example of how regression analysis can be used to project HR demand is shown in Exhibit 2. In this example, the figures used in the trend analysis (Exhibit 1) are now depicted in the form of a scatter diagram. The line running through the center of the points plotted on the scatter diagram is the regression line. To determine the number of employees needed when the sales volume is $10 million, one would follow the path indicated by the dashed line. One would start at the point on the X axis reading "10,000," and then move up vertically until reaching the regression line. The value on the Y axis corresponding to that point (i.e., 230) reflects the needed workforce size.

Exhibit 2

Regression Line Depicting Relationship Between Sales Volume and Workforce Size



Statistical methods of demand forecasting assume that the relationship between workforce size and the business factor remains constant over time. If this relationship were to change unexpectedly, the forecast would become inaccurate. For example, the forecast of needed professors based on the student-faculty ratio would be inaccurate if the university decided to change its teaching approach and institute distance learning classes. This approach to teaching involves the use of video equipment, which can beam the professor's lectures to many different locations, thus allowing many more students to enroll in the class. Consequently, the 20:1 ratio would no longer apply; the university would now be able to function with fewer professors (or at least more students per professor).

JUDGMENTAL APPROACHES. Judgmental approaches to demand forecasting involve the use of human judgment, rather than a manipulation of numbers. Two of the most commonly used judgmental techniques are group brainstorming and sales force estimates. The group brainstorming technique of demand forecasting uses a panel of experts (i.e., people within the organization who collectively understand the market, the industry, and the technological developments bearing on HRM needs). These experts are asked to generate a forecast through the process of brainstorming. A variety of brainstorming techniques exist. Most involve a face-to-face discussion among group members, who are asked to reach a consensus.

When using a *group brainstorming* technique to forecast human resources demand, participants must make certain assumptions regarding the future. That is, they must examine the firm's strategic plans for developing new products or services, expanding to new markets, and so forth, and then try to predict such things as:

- Future marketplace demands for the organization's products and services
- The percentage of the market that the organization will serve
- The availability and nature of new technologies that may affect the amounts and types of products or services that can be offered

The accuracy of the forecasts depends on the correctness of these assumptions. Of course, the future is very difficult to predict because it is subject to many uncertainties. Therefore, the organization must continually monitor its demand forecasts in light of any unexpected changes. HRMS packages facilitate the calculation and monitoring of demand forecasts.

The use of *sales force* estimates represents another judgmental approach for forecasting HR demand. This approach is most appropriately used when the need for additional employees arises from the introduction of new products. When a new product is launched, sales personnel are asked to estimate the demand for the product (i.e., expected sales volume) based on their knowledge of customer needs and interests. The organization then uses this information to estimate how many employees will be needed to meet this demand. One drawback of this approach is the possibility of bias. Some sales personnel may purposely underestimate product demands so they will look good when their own sales exceed the forecasts. Others may overestimate demand because they are overly optimistic about their sales potential.

SUPPLY FORECASTING

Once a demand forecast has been made, an organization has a relatively good idea of the number and nature of positions it will need to carry out its work at a particular point in time. It then estimates which of these positions will be filled at that time by individuals who already are employed by the company. The process used to make this estimation is called supply forecasting.

Supply forecasting is a two-step process. HRMS packages provide the employer with the means to automate much of these two steps. In the first step, the organization groups its positions by title, function, and responsibility level. These groupings should reflect levels of positions across which employees may be expected to advance. For instance, the HRM group might include the job titles of HR assistant, HR manager, and HR director. The secretarial group might include secretarial clerk, principal secretary, senior secretary, and administrative assistant.

The second step of supply forecasting is to estimate, within each job group, how many current employees will remain in their positions during the planning period, how many will move to another position (e.g., through transfer, promotion, or demotion), and how many will leave the organization. These predictions are partially based on past mobility trends (e.g., turnover and promotion rates). The organization also should consider any plans for mergers, acquisitions, unit or division divestitures, layoffs, retrenchments and downsizing, and even hostile takeovers. When making its supply forecast, the organization also should look at specific individuals. Some may have already announced, for instance, that they are retiring at the end of the year, returning to school in the fall, or getting married and planning on moving to a different part of the country.

Computerized statistical packages are available to help estimate the flow of employees through an organization. The estimates generated by these packages can be fairly accurate in stable environments. When the environment is unstable, of course, these estimates are suspect. For instance, an organization may base its estimates on past turnover rates, which have been about 10 percent during each of the past five years. If the turnover rate were to change drastically because of factors such as job dissatisfaction or downsizing, the organization would severely underestimate its future staffing needs.

ESTIMATING FUTURE HUMAN RESOURCE NEEDS

Combining the results of the supply and demand forecasts within each job group derives specific staffing needs. For example, consider a firm that currently employs twenty-five secretaries. As the result of its supply forecast, the firm predicts that five of these secretarial positions will become vacant by the end of the planning period because of retirements, promotions, and so forth. Its demand forecast predicts that three new secretarial positions will be needed during the coming period because of an increased demand for the company's product. By combining these two estimates, the firm now realizes that it must hire eight new secretaries (five to replace those expected to vacate their positions, plus three to fill the newly created positions).

OUTCOMES OF THE HR PLANNING PROCESS

When the HR planning process is completed, a firm must establish and implement HRM practices in order to meet its human resource needs. Following is a brief overview of how HRM practices can help organizations to deal with anticipated oversupplies and undersupplies of personnel.

The trend toward organizational restructuring usually results in a smaller workforce. Therefore, when an organization's strategic plan calls for restructuring, the HRM response usually is one of downsizing. Downsizing usually results in layoffs. Because of the negative outcomes that are often associated with layoffs, employers are encouraged to seek alternatives, such as hiring freezes, early retirements, restricted overtime, job sharing, and pay reductions.

When the results of demand and supply forecasting project an undersupply of personnel at some future point in time, the organization must decide how to resolve this problem. The solution may involve hiring additional staff, but there are other options. When HR plans indicate an undersupply of employees, firms can recruit personnel to staff jobs with anticipated vacancies. HRMS packages provide employers with capabilities to carry out recruitment in all of its steps. The first step is to conduct a job analysis to determine the qualifications needed for each vacant job.

The next step is to determine where and how to recruit the needed individuals. For instance, a company must decide whether to fill its vacancies externally (i.e., from the external labor market) or internally (i.e., from its own current workforce). When recruiting externally, an organization should first assess its attractiveness in the eyes of potential applicants; unattractive employers may have trouble generating a sufficiently large applicant pool. Such employers should attempt to increase the number of people who are attracted to the organization and thus interested in applying for a job there. This may be accomplished by increasing starting pay levels and/or improving benefit packages. Another option is to target certain protected groups whose members may be underemployed in the local labor market, such as older, disabled, or foreign-born individuals.

Internal recruitment efforts can be improved through the use of career development programs. When designing such a program, the organization should collect work history and skill level information on each of its employees. Such information would include age, education level, training, special skills (e.g., foreign language spoken), and promotion record, and should be stored on a computer. This employee information allows the organization to identify current employees who are qualified to assume jobs with greater responsibility levels. For instance, in departments where skilled managers are in short supply, a management replacement chart can be prepared that lists present managers, proposes likely replacements, and gives an estimate of when the replacement candidate will be trained and available to fill an open position.

Instead of hiring new workers to meet increasing demands, an organization may decide to improve the productivity of the existing workforce through additional training. Other options include the use of overtime, additional shifts, job reassignments, and temporary workers. Another option is to improve retention rates. When this aim is met, firms will have fewer job vacancies to fill.

Retention rates can be improved at the outset of the employer/employee relationship, when applicants are first recruited. Retention rates are likely to improve when applicants are given a realistic preview of what their jobs would actually be like (warts and all), rather than an overly glowing one.

Workers want to feel valued and needed by their organization. In a climate characterized by mergers, acquisitions, and layoffs, many workers feel very insecure about their jobs. Employees with such feelings often begin shopping around for other jobs. These fears can be eased by implementing HR plans for training and cross-training. Such plans allow workers to perform a variety of functions, thus ensuring that they have the necessary skills to continue making contributions to the firm. Management training also is crucial in this regard. Organizations must train managers to be good supervisors. Poor "people management" is a primary cause of voluntary turnover. Managers at all levels should know what is expected of them, in terms of managing people instead of just managing budgets.

Companies also can improve retention rates by creating a work environment that encourages employees to participate actively in the company's total welfare. Workers want recognition for their contributions to organizational progress, but this recognition must be tailored to the workers' individual needs. While some workers may be motivated by monetary rewards, others seek recognition by peers and managers, feelings of accomplishment, or job satisfaction.

Workers now demand more flexible schedules to best fit their lifestyles. Organizations can improve retention rates by implementing programs to accommodate these needs, such as job sharing, shortened workweeks, and telecommuting via computer and modem.

Finally, companies also can improve retention rates by offering attractive benefit packages, such as generous retirement plans, stock ownership, health and dental insurance, and employee discount programs. Many firms are now offering "cafeteria plan" benefit packages, which are tailored to the specific needs of each of their employees.

HUMAN RESOURCE MANAGEMENT SYSTEMS

Several major software companies provide HRMS packages. SAP, PeoleSoft, Oracle, and ADP are the largest. Depending on the company's needs and size, package options may include some or all of the following services:

- Employee career cycle management
- 24/7 data access to authorized managers
- Customized levels of access to confidential data
- Pre-populated forms and templates
- Access to real-time data—with instantaneous updates
- Employee administration
- Benefits administration
- Compliance
- Recruitment
- Performance and development
- Safety and health
- Succession planning
- Time-off management
- Organization management
- Payroll
- Training
- 401k plan administration

The opportunities to add more services are endless and continue to improve.

For most companies, the hardware and software needed to run these programs are fairly standard. Hardware and software is dependent on the complexity of the HRMS package; more complex HRMS packages require more hardware (e.g., server space and speed).

HRMS technology costs vary considerably, depending on the size of the company and its HR needs. Costs for deploying a comprehensive HRMS package include license fees, implementation, technology, training, and maintenance. Costs typically range from $300 to $700 per employee as an initial investment for companies with more than 1,000 employees. Smaller companies may decide it is better to rent the application than buy it. Research has found that most companies can recoup HRMS costs within three years of system launch, based on process efficiencies alone.

The value of HRMS results from a reduction in HR support costs, based on efficiency improvements. "Hackett's benchmark for the average annual cost of HR services per employee is approximately $1,900, with a best practice goal of less than $1,200" (Hamerman). By eliminating paper and process inefficiencies, companies can expect additional cost reductions while improving service and becoming more efficient. There are many other benefits of HRMS. Giga Information Group believes that HR departments can reduce time spent on administrative work by 40 percent to 50 percent, resulting in either the elimination of headcount or the redeployment of effort to higher value tasks, such as decision support and employee development.

Another benefit of HRMS includes allowing HR to transition from an administrative department to a strategic management department. The strategic value aspect of the HRMS investment focuses on managing human capital by supporting functions such as recruitment, performance/competency management, employee development, and employee customer service. By executing well in these areas, companies can reduce employee turnover, reduce hiring costs, and improve individual performance.

ADP offers a comprehensive suite of software that can run on almost all modern operating systems. A major player in the HRMS business is PeopleSoft. Acquired by Oracle Corp. in January 2005, PeopleSoft puts it focus on one complete HRM product line. This suite not only works in the HRM arena, it also allows employers to buy modules for CRM, SCM, and many other areas. There are three versions of the company's Enterprise suite: Enterprise, EnterpriseOne, and PeopleSoft World.

According to PeopleSoft, the Enterprise program is designed with the Internet in mind, and allows employers to:

- Plan the workforce needed to carry out an organization's business objectives, attract the right people, and provide them with the tools they need to be productive.
- Assess workforce skills and design learning and performance programs that develop people in alignment with their career paths and corporate objectives.
- Optimize a global workforce by putting the right people in the right jobs at the right time. This includes tracking the workforce and monitoring performance.
- Plan compensation and reward structures that align the workforce with corporate objectives. This includes linking the right employees with the right types of compensation, and rewarding them with a total package that maximizes efficiency, reduces costs, and increases overall performance.

EnterpriseOne works with the original Enterprise program and also let employers:

- Maintain a database of employee skill sets and competencies, as well as information about outside applicants.
- Track approved positions and headcount by company and department.
- Track recruitment data, such as where a company is finding employees, how long they stay, qualifications, and recruitment costs.
- Simplifying the employee evaluation process through automated workflow, which automatically alerts employees and managers about scheduled performance reviews.
- Helping managers to understand discrepancies between employees' expected and actual performance through built-in competency gap analysis tools.
- Providing true exception reporting with flexible reporting tools that summarize data, embed workflow messaging, and populate spreadsheets.

Finally, PeopleSoft's PeopleSoft World program was developed to help small businesses cope with the cost of changing hardware; it is built to work with the IBM iSeries.According to PeopleSoft, this system offers:

- Flexible and affordable pricing. Pre-integrated applications optimized on an IBM iSeries means lower implementation costs and ongoing IT needs. At the same time, users get a flexible architecture that enables them to tailor menus, security, and reporting to the specific needs of their business without costly modifications.
- Self-service capabilities: Web browser-based access to applications enables employees, customers, and suppliers to access relevant information quickly and easily, with less training.
- Full, robust solution: PeopleSoft World is a comprehensive, but low-maintenance solution for small businesses. It offers the same

functionality available to larger enterprises, not a stripped-down version of a larger solution. It supports multicurrency, multi-language, and multi-company requirements and provides integration with other key PeopleSoft technologies.

All PeopleSoft Software is built on a Web-based platform, enabling "portal" technology. For both Enterprise and EnterpriseOne, portals are available to connect with employees over the Web. Technology continues to evolve, and HR is no exception. One of the fastest growing trends in HRMS is Web-based training/e-learning. E-learning tends to be far more affordable than classroom learning, and a higher degree of focus results in time savings. Not all e-learning is the same: some courses are self-paced with tutors available, some are instructor-led in real time, and some allow for student interaction.

Another HRMS trend is the use of online surveys. This allows companies to get fast information on their employees, policies, procedures, competition, and anything else they decide to survey. This also gives employees a sense of belonging and contributing to their company. Online employee surveys usually have an 80 percent return ratio, which is much higher than paper surveys.

Employees are becoming more self sufficient in the workplace because of HRMS and the growth of technology. They are able to answer questions, download forms, enroll in benefits, change payroll options, and complete training on their own. This saves both time and money. An employee does not have to make several phone calls in order to speak with the one person who knows the answer to their questions. Answers are readily available, usually on the company intranet. This also frees up HR to focus on more profitable activities for the company, such as recruiting and employee development.

Another growing trend includes improved methods for monitoring and managing employees' use of the Internet. This helps management to improve productivity, reduce legal liabilities, and control IT costs. Companies are blocking e-mail that may be offensive in order to reduce legal liabilities. They also are blocking Web sites that are inappropriate for workplace viewing. This has improved productivity by reducing non-productive activities.

HRMS providers have products for companies of all sizes. These providers profit by maximizing the services they offer. Therefore, they are going to target large companies that need more support. However, providers are still interested in small companies, and those that will need more support as they grow.

As the need for corporate cost-cutting, efficiency, and productivity becomes more important, the HRMS industry is going to continue to have strong growth potential. Not only can HRMS help with employee administration from recruiting to benefits, it can save companies thousands of dollars by lowering workforce and employee turnover levels. By 2005, the corporate world had only seen the beginning potential of HRMS.

SEE ALSO: Human Resource Management

Lawrence S. Kleiman

Revised by Badie N. Farah

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HUMAN RESOURCE MANAGEMENT

Human resource management (HRM), also called personnel management, consists of all the activities undertaken by an enterprise to ensure the effective utilization of employees toward the attainment of individual, group, and organizational goals. An organization's HRM function focuses on the people side of management. It consists of practices that help the organization to deal effectively with its people during the various phases of the employment cycle, including pre-hire, staffing, and post-hire. The pre-hire phase involves planning practices. The organization must decide what types of job openings will exist in the upcoming period and determine the necessary qualifications for performing these jobs. During the hire phase, the organization selects its employees. Selection practices include recruiting applicants, assessing their qualifications, and ultimately selecting those who are deemed to be the most qualified.

In the post-hire phase, the organization develops HRM practices for effectively managing people once they have "come through the door." These practices are designed to maximize the performance and satisfaction levels of employees by providing them with the necessary knowledge and skills to perform their jobs and by creating conditions that will energize, direct, and facilitate employees' efforts toward meeting the organization's objectives.

HRM DEVELOPMENT AND IMPLEMENTATION RESPONSIBILITIES

While most firms have a human resources or personnel department that develops and implements HRM practices, responsibility lies with both HR professionals and line managers. The interplay between managers and HR professionals leads to effective HRM practices. For example, consider performance appraisals. The success of a firm's performance appraisal system depends on the ability of both parties to do their jobs correctly. HR professionals develop the system, while managers provide the actual performance evaluations.

The nature of these roles varies from company to company, depending primarily on the size of the organization. This discussion assumes a large company with a sizable HRM department. However, in smaller companies without large HRM departments, line managers must assume an even larger role in effective HRM practices.

HR professionals typically assume the following four areas of responsibility: establishing HRM policies and procedures, developing/choosing HRM methods, monitoring/evaluating HRM practices, and advising/assisting managers on HRM-related matters. HR professionals typically decide (subject to upper-management approval) what procedures to follow when implementing an HRM practice. For example, HR professionals may decide that the selection process should include having all candidates (1) complete an application, (2) take an employment test, and then (3) be interviewed by an HR professional and line manager.

Usually the HR professionals develop or choose specific methods to implement a firm's HRM practices. For instance, in selection the HR professional may construct the application blank, develop a structured interview guide, or choose an employment test. HR professionals also must ensure that the firm's HRM practices are properly implemented. This responsibility involves both evaluating and monitoring. For example, HR professionals may evaluate the usefulness of employment tests, the success of training programs, and the cost effectiveness of HRM outcomes such as selection, turnover, and recruiting. They also may monitor records to ensure that performance appraisals have been properly completed.

HR professionals also consult with management on an array of HRM-related topics. They may assist by providing managers with formal training programs on topics like selection and the law, how to conduct an employment interview, how to appraise employee job performance, or how to effectively discipline employees. HR professionals also provide assistance by giving line managers advice about specific HRM-related concerns, such as how to deal with problem employees.

Line managers direct employees' day-to-day tasks. From an HRM perspective, line managers are mainly responsible for implementing HRM practices and providing HR professionals with necessary input for developing effective practices. Managers carry out many procedures and methods devised by HR professionals. For instance, line managers:

- Interview job applicants
- Provide orientation, coaching, and on-the-job training
- Provide and communicate job performance ratings
- Recommend salary increases
- Carry out disciplinary procedures
- Investigate accidents
- Settle grievance issues

The development of HRM procedures and methods often requires input from line managers. For example, when conducting a job analysis, HR professionals often seek job information from managers and ask managers to review the final written product. Additionally, when HR professionals determine an organization's training needs, managers often suggest what types of training are needed and who, in particular, needs the training.

HISTORICAL MILESTONES IN HRM DEVELOPMENT

Table 1 identifies some of the major milestones in the historical development of HRM. Frederick Taylor, known as the father of scientific management, played a significant role in the development of the personnel function in the early 1900s. In his book, *Shop Management,* Taylor advocated the "scientific" selection and training of workers. He also pioneered incentive systems that rewarded workers for meeting and/or exceeding performance standards. Although Taylor's focus primarily was on optimizing efficiency in manufacturing environments, his principles laid the groundwork for future HRM development. As Taylor was

Table 1

Milestones in the Development of Human Resource Management

1890-1910	Frederick Taylor develops his ideas on scientific management. Taylor advocates scientific selection of workers based on qualifications and also argues for incentive-based compensation systems to motivate employees.
1910-1930	Many companies establish departments devoted to maintaining the welfare of workers. The discipline of industrial psychology begins to develop. Industrial psychology, along with the advent of World War I, leads to advancements in employment testing and selection.
1930-1945	The interpretation of the Hawthorne Studies' begins to have an impact on management thought and practice. Greater emphasis is placed on the social and informal aspects of the workplace affecting worker productivity. Increasing the job satisfaction of workers is cited as a means to increase their productivity.
1945-1965	In the U.S., a tremendous surge in union membership between 1935 and 1950 leads to a greater emphasis on collective bargaining and labor relations within personnel management. Compensation and benefits administration also increase in importance as unions negotiate paid vacations, paid holidays, and insurance coverage.
1965-1985	The Civil Rights movement in the U.S. reaches its apex with passage of the Civil Rights Act of 1964. The personnel function is dramatically affected by Title VII of the CRA, which prohibits discrimination on the basis of race, color, sex, religion, and national origin. In the years following the passage of the CRA, equal employment opportunity and affirmative action become key human resource management responsibilities.
1985-present	Three trends dramatically impact HRM. The first is the increasing diversity of the labor force, in terms of age, gender, race, and ethnicity. HRM concerns evolve from EEO and affirmative action to "managing diversity." A second trend is the globalization of business and the accompanying technological revolution. These factors have led to dramatic changes in transportation, communication, and labor markets. The third trend, which is related to the first two, is the focus on HRM as a "strategic" function. HRM concerns and concepts must be integrated into the overall strategic planning of the firm in order to cope with rapid change, intense competition, and pressure for increased efficiency.

developing his ideas about scientific management, other pioneers were working on applying the principles of psychology to the recruitment, selection, and training of workers. The development of the field of industrial psychology and its application to the workplace came to fruition during World War I, as early vocational and employment-related testing was used to assign military recruits to appropriate functions.

The Hawthorne Studies, which were conducted in the 1920s and 1930s at Western Electric, sparked an increased emphasis on the social and informal aspects of the workplace. Interpretations of the studies emphasized "human relations" and the link between worker satisfaction and productivity. The passage of the Wagner Act in 1935 contributed to a major increase in the number of unionized workers. In the 1940s and 1950s, collective bargaining led to a tremendous increase in benefits offered to workers. The personnel function evolved to cope with labor relations, collective bargaining, and a more complex compensation and benefits environment. The human relations philosophy and labor relations were the dominant concerns of HRM in the 1940s and 1950s.

HRM was revolutionized in the 1960s by passage of Title VII of the Civil Rights Act and other anti-discrimination legislation—as well as presidential executive orders that required many organizations to undertake affirmative action in order to remedy past discriminatory practices. Equal employment opportunity and affirmative action mandates greatly complicated the HRM function, but also enhanced its importance in modern organizations. As discussed more fully in a later section, these responsibilities continue to comprise a major part of the HRM job. Finally, changes in labor force demographics, technology, and globalization since the 1980s have had a major impact on the HRM function. These factors also are discussed in more detail in a later section.

PRE-HIRING, HIRING, AND POST-HIRING

PRE-HIRE PHASE. The major HRM activities in the pre-hire phase are human resource planning and job analysis. These activities form the cornerstone upon which other HRM practices are built. Human resource planning helps managers to anticipate and meet changing needs related to the acquisition, deployment, and utilization of employees. The organization first maps out an overall plan called a strategic plan. Then, through demand and supply forecasting it estimates the number and types of employees needed to successfully carry out its overall plan. Such information enables a firm to plan its recruitment, selection, and training strategies. For example, assume that a firm's HR plan estimates that 15 additional engineers will be needed during the next year. The firm typically hires recent engineering graduates to fill such positions. Because these majors are in high demand, the firm decides to begin its campus recruiting early in the academic year, before other companies can "snatch away" the best candidates.

Job analysis is the systematic process used for gathering, analyzing, and documenting information about particular jobs. The analysis specifies what each worker does, the work conditions, and the worker qualifications necessary to perform the job successfully. The job analysis information is used to plan and coordinate nearly all HRM practices, including:

- Determining job qualifications for recruitment purposes
- Choosing the most appropriate selection techniques
- Developing training programs
- Developing performance appraisal rating forms
- Helping to determine pay rates
- Setting performance standards for productivity improvement programs

For example, an organization may decide to use a mechanical aptitude test to screen applicants because a job analysis indicated that mechanical aptitude is an important job skill. Or, a firm may raise the pay of one of its employees because a job analysis indicated that the nature of the work recently changed and is now more demanding.

HIRING PHASE. The hiring phase of human resource management is also called staffing. Staffing involves policies and procedures used by organizations to recruit and select employees. Organizations use recruitment to locate and attract job applicants for particular positions. They may recruit candidates internally (i.e., recruit current employees seeking to advance or change jobs) or externally. The aim of recruitment practices is to identify a suitable pool of applicants quickly, cost-efficiently, and legally. Selection involves assessing and choosing among job candidates. To be effective, selection processes must be both legal and technically sound, accurately matching people's skills with available positions.

POST-HIRING PHASE. Training and development are planned learning experiences that teach workers how to effectively perform their current or future jobs. Training focuses on present jobs, while development prepares employees for possible future jobs. Training and development practices are designed to improve organizational performance by enhancing the knowledge and skill levels of employees. A firm must first determine its training needs and then select/develop training programs to meet these needs. It also must also take steps to ensure that workers apply what they have learned on the job.

Through the performance appraisal process, organizations measure the adequacy of their employees' job performances and communicate these evaluations to them. One aim of appraisal systems is to motivate employees to continue appropriate behaviors and correct inappropriate ones. Management also may use performance appraisals as tools for making HRM-related decisions, such as promotions, demotions, discharges, and pay raises.

Compensation entails pay and benefits. Pay refers to the wage or salary employees earn, while benefits are a form of compensation provided to employees in addition to their pay, such as health insurance or employee discounts. The aim of compensation practices is to help the organization establish and maintain a competent and loyal workforce at an affordable cost.

Productivity improvement programs tie job behavior to rewards. Rewards may be financial (e.g., bonuses and pay raises) or nonfinancial (e.g., improved job satisfaction). Such programs are used to motivate employees to engage in appropriate job behaviors, namely those that help the organization meet its goals.

CONTEMPORARY ISSUES

HRM departments within organizations, just as the organizations themselves, do not exist in a vacuum. Events outside of work environments have far-reaching effects on HRM practices. The following paragraphs describe some of these events and indicate how they influence HRM practices.

As mentioned previously, the enactment of federal, state, and local laws regulating workplace behavior has changed nearly all HRM practices. Consider, for instance, the impact of anti-discrimination laws on firms' hiring practices. Prior to the passage of these laws, many firms hired people based on reasons that were not job-related. Today, such practices could result in charges of discrimination. To protect themselves from such charges, employers must conduct their selection practices to satisfy objective standards established by legislation and fine-tuned by the courts. This means they should carefully determine needed job qualifications and choose selection methods that accurately measure those qualifications.

Social, economic, and technological events also strongly influence HRM practices. These events include:

- An expanding cultural diversity at the workplace
- The emergence of work and family issues
- The growing use of part-time and temporary employees
- An increased emphasis on quality and teamwork

- The occurrence of mergers and takeovers
- The occurrence of downsizing and layoffs
- The rapid advancement of technology
- An emphasis on continuous quality improvement
- A high rate of workforce illiteracy

These events influence HRM practices in numerous ways. For example:

- Some firms are attempting to accommodate the needs of families by offering benefit options like maternity leave, child care, flextime, and job sharing.
- Some firms are attempting to accommodate the needs of older workers through skill upgrading and training designed to facilitate the acceptance of new techniques.
- Some firms are educating their employees in basic reading, writing, and mathematical skills so that they can keep up with rapidly advancing technologies.

Unions often influence a firm's HRM practices. Unionized companies must adhere to written contracts negotiated between each company and its union. Union contracts regulate many HRM practices, such as discipline, promotion, grievance procedures, and overtime allocations. HRM practices in non-unionized companies may be influenced by the threat of unions. For example, some companies have made their HRM practices more equitable (i.e., they treat their employees more fairly) simply to minimize the likelihood that employees would seek union representation.

Legal, social, and political pressures on organizations to ensure the health and safety of their employees have had great impacts on HRM practices. Organizations respond to these pressures by instituting accident prevention programs and programs designed to ensure the health and mental well-being of their employees, such as wellness and employee assistance programs.

Today's global economy also influences some aspects of HRM. Many firms realize that they must enter foreign markets in order to compete as part of a globally interconnected set of business markets. From an HRM perspective, such organizations must foster the development of more globally-oriented managers: individuals who understand foreign languages and cultures, as well as the dynamics of foreign market places. These firms also must deal with issues related to expatriation, such as relocation costs, selection, compensation, and training.

EMPLOYMENT

Someone wishing to enter the HRM field may choose one of two routes: generalist or specialist. Entry-level HRM generalist positions are most often found in small or mid-sized organizations that employ few HR professionals—one or two people who must perform all functions. Because of their many responsibilities, HRM generalists have neither time nor resources to conduct in-depth studies or projects. They usually hire outside consultants who specialize in these kinds of services. For example, consultants might help the organization to revamp its compensation system, validate its selection practices, or analyze its training needs.

In larger organizations, each HR professional's area tends to be more focused, zeroing in on particular HRM tasks. Individuals holding these positions are called HRM specialists. Exhibits 1a and 1b describe some traditional and newer HRM specialty areas.

In most professions a direct path leads to entering the field. For instance, someone aspiring to be a lawyer, physician, accountant, or psychologist enrolls in appropriate educational programs and enters the field upon receiving a degree or license. HRM is atypical in this regard; people may enter the profession in a variety of ways. For instance, most of today's HR professionals enter the field through self-directed career changes. Approximately one-third of these individuals entered HRM by transferring from another part of the company; the remainder entered from other fields such as education, social services, accounting, sales, and administrative secretarial positions.

HR professionals entering the field directly out of college (about one-third of all HR professionals) traditionally come from a variety of academic backgrounds, including business, psychology, and liberal arts. More recently, however, HRM new hires have earned degrees in some area of business, such as HRM, management, or general business. For instance, when it hires recent graduates for entry-level HRM positions, Bell Atlantic considers business school graduates with concentrations in business administration, finance and commerce, management, or industrial relations. A survey of HR professionals revealed the following college majors: HRM (17 percent), business administration (23 percent), management (13 percent), psychology (12 percent), and labor/industrial relations (10 percent).

As one might expect, large organizations provide the greatest opportunities for HRM career growth. Most senior-level HR professionals take one of two paths up the corporate ladder. Some begin their careers as specialists and eventually become managers of their specialty units. To advance beyond this level, they must broaden their skills and become HRM generalists. The other path to securing a senior-level HRM position is to begin as an assistant HRM generalist at

Exhibit 1a
HRM Specialty Areas

TRADITIONAL SPECIALTY AREAS

Training/Development

Conducts training needs analysis; designs/conducts/evaluates training programs; develops/implements succession planning programs.

Compensation/Benefits

Develops job descriptions; facilitates job evaluation processes; conducts/interprets salary surveys; develops pay structure; designs pay-for-performance and/or performance improvement programs; administers benefits program.

Employee/Industrial Relations

Helps resolve employee relations problems; develops union avoidance strategies; assists in collective bargaining negotiations; oversees grievance procedures.

Employment/Recruiting

Assists in the HR planning process; develops/purchases HR information systems; develops/updates job descriptions; oversees recruiting function; develops and administers job posting system; conducts employment interviews, reference checks, and employment tests; validates selection procedures; approves employment decisions.

Safety/Health/Wellness

Develops accident prevention strategies; develops legal safety and health policies; implements/promotes EAP and wellness programs; develops AIDS and substance abuse policies.

EEO/Affirmative Action

Develops and administers affirmative action programs; helps resolve EEO disputes; monitors organizational practices with regard to EEO compliance; develops policies for ensuring EEO compliance, such as sexual harassment policies.

HRM Research

Conducts research studies, such as cost-benefit analysis, test validation, program evaluation, and feasibility studies.

(cont. Exhibit 1b)

a small plant or unit within the organization and advance into an HRM managerial role at successively larger plants or units. An HRM career in manufacturing might progress as follows:

1. The individual is hired as an HRM assistant at a manufacturing plant.
2. Within five or six years, the individual advances to the HRM manager's post at the plant.
3. Between six and ten years, the HR professional becomes the HRM manager at a larger plant.
4. During the eleven-to-fifteen-year range, the person reaches a senior-level HRM position at the divisional level and has several HRM generalists and/or specialists reporting to him or her.
5. Between fifteen and twenty years, the person reaches a senior-level executive position, such as vice president of human resources.

ORGANIZATIONAL ETHICS

HR professionals primarily are responsible for developing HRM practices that enhance a firm's competitive advantage. HR professionals also have the responsibility to ensure that employees are treated ethically. Almost all HRM decisions have ethical consequences. Despite the abundance of laws designed to ensure fair treatment at the workplace, employees often are treated in an unethical manner. In some instances, employers skirt the law; in others, the letter of the law is followed, but employees are nonetheless

Exhibit 1b

HRM Specialty Areas (cont.)

NEW HRM SPECIALTY AREAS

Work and Family Programs

Develops and administers work and family programs including flextime, alternative work scheduling, dependent-care assistance, telecommuting, and other programs designed to accommodate employee needs; identifies and screen child- or elder-care providers; administers employer's private dependent-care facility; promotes work and family programs to employees.

Cross-Cultural Training

Translate the manners, mores, and business practices of other nations and cultures for American business people. Other cross-cultural trainers work with relocated employees' families, helping them adjust to their new environment.

Managed-Care

As a company's health-care costs continue to escalate, employers are embracing managed-care systems, which require employees to assume some of the costs. Employers hire managed-care managers to negotiate the best options for employees.

Managing Diversity

Develop policies and practices to recruit, promote, and appropriately treat workers of various ages, races, sexes, and physical abilities.

treated unfairly by management or by other employees. One survey revealed that the most serious ethical problems involve managerial decisions regarding employment, promotion, pay, and discipline that are based on favoritism, rather than ability or job performance.

HR professionals play three roles in the area of workplace ethics. One role is monitoring: they must observe the actions of organizational members to ensure that all individuals are treated fairly and legally. Second, HR professionals investigate complaints bearing on ethical issues, such as sexual harassment or violations of employees' privacy rights. Third, HR professionals serve as company spokespeople by defending the company's actions when confronted by a regulatory agency or the media.

Furthermore, HR professionals should act ethically themselves. When faced with ethical dilemmas, HR professionals must be willing to take a strong stand, even if it means putting their jobs at risk. If they choose to turn a blind eye, they become part of the problem and thus must assume some of the blame.

HR professionals should be guided by the Society for Human Resource Management Code of Ethics, which dictates that HR professionals should always:

- Maintain the highest standards of professional and personal conduct
- Encourage employers to make fair and equitable treatment of all employees a primary concern
- Maintain loyalty to employers and pursue company objectives in ways consistent with the public interest
- Uphold all laws and regulations relating to employer activities
- Maintain the confidentiality of privileged information

SEE ALSO: Human Resource Information Systems

Lawrence S. Kleiman
Revised by Tim Barnett

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HYPOTHESIS TESTING

Social science research, and by extension business research, uses a number of different approaches to study a variety of issues. This research may be a very informal, simple process or it may be a formal, somewhat sophisticated process. Regardless of the type of process, all research begins with a generalized idea in the form of a research question or a hypothesis. A research question usually is posed in the beginning of a research effort or in a specific area of study that has had little formal research. A research question may take the form of a basic question about some issue or phenomena or a question about the relationship between two or more variables. For example, a research question might be: "Do flexible work hours improve employee productivity?" Another question might be: "How do flexible hours influence employees' work?"

A hypothesis differs from a research question; it is more specific and makes a prediction. It is a tentative statement about the relationship between two or more variables. The major difference between a research question and a hypothesis is that a hypothesis predicts an experimental outcome. For example, a hypothesis might state: "There is a positive relationship between the availability of flexible work hours and employee productivity."

Hypotheses provide the following benefits:

1. They determine the focus and direction for a research effort.
2. Their development forces the researcher to clearly state the purpose of the research activity.
3. They determine what variables will not be considered in a study, as well as those that will be considered.
4. They require the researcher to have an operational definition of the variables of interest.

The worth of a hypothesis often depends on the researcher's skills. Since the hypothesis is the basis of a research study, it is necessary for the hypothesis be developed with a great deal of thought and contemplation. There are basic criteria to consider when developing a hypothesis, in order to ensure that it meets the needs of the study and the researcher. A good hypothesis should:

1. Have logical consistency. Based on the current research literature and knowledge base, does this hypothesis make sense?
2. Be in step with the current literature and/or provide a good basis for any differences. Though it does not have to support the current body of literature, it is necessary to provide a good rationale for stepping away from the mainstream.
3. Be testable. If one cannot design the means to conduct the research, the hypothesis means nothing.
4. Be stated in clear and simple terms in order to reduce confusion.

HYPOTHESIS TESTING PROCESS

Hypothesis testing is a systematic method used to evaluate data and aid the decision-making process. Following is a typical series of steps involved in hypothesis testing:

1. State the hypotheses of interest
2. Determine the appropriate test statistic
3. Specify the level of statistical significance
4. Determine the decision rule for rejecting or not rejecting the null hypothesis
5. Collect the data and perform the needed calculations
6. Decide to reject or not reject the null hypothesis

Each step in the process will be discussed in detail, and an example will follow the discussion of the steps.

STATING THE HYPOTHESES. A research study includes at least two hypotheses—the null hypothesis and the alternative hypothesis. The hypothesis being tested is referred to as the null hypothesis and it is designated as H It also is referred to as the hypothesis of no difference and should include a statement of equality (=, ≥, or ≤). The alternative hypothesis presents the alternative to the null and includes a statement of inequality (≠). The null hypothesis and the alternative hypothesis are complementary.

The null hypothesis is the statement that is believed to be correct throughout the analysis, and it is the null hypothesis upon which the analysis is based. For example, the null hypothesis might state that the average age of entering college freshmen is 21 years.

H_0 The average age of entering college freshman = 21 years

If the data one collects and analyzes indicates that the average age of entering college freshmen is greater than or less than 21 years, the null hypothesis is rejected. In this case the alternative hypothesis could be stated in the following three ways: (1) the average age of entering college freshman is not 21 years (the average age of entering college freshmen ≠ 21); (2) the average age of entering college freshman is less than 21 years (the average age of entering college freshmen < 21); or (3) the average age of entering college freshman is greater than 21 years (the average age of entering college freshmen > 21 years).

The choice of which alternative hypothesis to use is generally determined by the study's objective. The preceding second and third examples of alternative hypotheses involve the use of a "one-tailed" statistical test. This is referred to as "one-tailed" because a direction (greater than [>] or less than [<]) is implied in the statement. The first example represents a "two-tailed" test. There is inequality expressed (age ≠ 21 years), but the inequality does not imply direction. One-tailed tests are used more often in management and marketing research because there usually is a need to imply a specific direction in the outcome. For example, it is more likely that a researcher would want to know if Product A performed better than Product B (Product A performance > Product B performance), or vice versa (Product A performance < Product B performance), rather than whether Product A performed differently than Product B (Product A performance ≠ Product B performance). Additionally, more useful information is gained by knowing that employees who work from 7:00 a.m. to 4:00 p.m. are more productive than those who work from 3:00 p.m. to 12:00 a.m. (early shift employee production > late shift employee production), rather than simply knowing that these employees have different levels of productivity (early shift employee production ≠ late shift employee production).

Both the alternative and the null hypotheses must be determined and stated prior to the collection of data. Before the alternative and null hypotheses can be formulated it is necessary to decide on the desired or expected conclusion of the research. Generally, the desired conclusion of the study is stated in the alternative hypothesis. This is true as long as the null hypothesis can include a statement of equality. For example, suppose that a researcher is interested in exploring the effects of amount of study time on tests scores. The researcher believes that students who study longer perform better on tests. Specifically, the research suggests that students who spend four hours studying for an exam will get a better score than those who study two hours. In this case the hypotheses might be:

> H_0 The average test scores of students who study 4 hours for the test = the average test scores of those who study 2 hours.
> H_1 The average test score of students who study 4 hours for the test > the average test scores of those who study 2 hours.

As a result of the statistical analysis, the null hypothesis can be *rejected* or *not rejected.* As a principle of rigorous scientific method, this subtle but important point means that the null hypothesis cannot be *accepted.* If the null is rejected, the alternative hypothesis can be accepted; however, if the null is not rejected, we can't conclude that the null hypothesis is true. The rationale is that evidence that supports a hypothesis is not conclusive, but evidence that negates a hypothesis is ample to discredit a hypothesis. The analysis of study time and test scores provides an example. If the results of one study indicate that the test scores of students who study 4 hours are significantly better than the test scores of students who study two hours, the null hypothesis can be rejected because the researcher has found one case when the null is not true. However, if the results of the study indicate that the test scores of those who study 4 hours are not significantly better than those who study 2 hours, the null hypothesis cannot be rejected. One also cannot conclude that the null hypothesis is accepted because these results are only one set of score comparisons. Just because the null hypothesis is true in one situation does not mean it is always true.

DETERMINING THE APPROPRIATE TEST STATISTIC. The appropriate test statistic (the statistic to be used in statistical hypothesis testing) is based on various characteristics of the sample population of interest, including sample size and distribution. The test statistic can assume many numerical values. Since the value of the test statistic has a significant effect on the decision, one must use the appropriate statistic in order to obtain meaningful results. Most test statistics follow this general pattern:

$$\frac{\text{Sample statistic} - \text{Hypothesized parameter value}}{\text{Standard error of statistic}}$$

For example, the appropriate statistic to use when testing a hypothesis about a population means is:

$$Z = \frac{\bar{X} - \mu_0}{\sigma / \sqrt{\eta}}$$

In this formula Z = test statistic, $\bar{X}$ = mean of the sample, μ = mean of the population, σ = standard deviation of the sample, and η = number in the sample.

SPECIFYING THE STATISTICAL SIGNIFICANCE SEVEL. As previously noted, one can reject a null hypothesis or fail to reject a null hypothesis. A null hypothesis that is rejected may, in reality, be true or false. Additionally, a null hypothesis that fails to be rejected may, in reality, be true or false. The outcome that a researcher desires is to reject a false null hypothesis or to fail to reject a true null hypothesis. However, there always is the possibility of rejecting a true hypothesis or failing to reject a false hypothesis.

Rejecting a null hypothesis that is true is called a Type I error and failing to reject a false null hypothesis is called a Type II error. The probability of committing a Type I error is termed α and the probability of committing a Type II error is termed β. As the value of α increases, the probability of committing a Type I error increases. As the value of β increases, the probability of committing a Type II error increases. While one would like to decrease the probability of committing of both types of errors, the reduction of α results in the increase of β and vice versa. The best way to reduce the probability of decreasing both types of error is to increase sample size.

The probability of committing a Type I error, α, is called the level of significance. Before data is collected one must specify a level of significance, or the probability of committing a Type I error (rejecting a true null hypothesis). There is an inverse relationship between a researcher's desire to avoid making a Type I error and the selected value of α; if not making the error is particularly important, a low probability of making the error is sought. The greater the desire is to not reject a true null hypothesis, the lower the selected value of α. In theory, the value of α can be any value between 0 and 1. However, the most common values used in social science research are .05, .01, and .001, which respectively correspond to the levels of 95 percent, 99 percent, and 99.9 percent likelihood that a Type I error is not being made. The tradeoff for choosing a higher level of certainty (significance) is that it will take much stronger statistical evidence to ever reject the null hypothesis.

DETERMINING THE DECISION RULE. Before data are collected and analyzed it is necessary to determine under what circumstances the null hypothesis will be rejected or fail to be rejected. The decision rule can be stated in terms of the computed test statistic, or in probabilistic terms. The same decision will be reached regardless of which method is chosen.

COLLECTING THE DATA AND PERFORMING THE CALCULATIONS. The method of data collection is determined early in the research process. Once a research question is determined, one must make decisions regarding what type of data is needed and how the data will be collected. This decision establishes the bases for how the data will be analyzed. One should use only approved research methods for collecting and analyzing data.

DECIDING WHETHER TO REJECT THE NULL HYPOTHESIS. This step involves the application of the decision rule. The decision rule allows one to reject or fail to reject the null hypothesis. If one rejects the null hypothesis, the alternative hypothesis can be accepted. However, as discussed earlier, if one fails to reject the null he or she can only suggest that the null may be true.

EXAMPLE. XYZ Corporation is a company that is focused on a stable workforce that has very little turnover. XYZ has been in business for 50 years and has more than 10,000 employees. The company has always promoted the idea that its employees stay with them for a very long time, and it has used the following line in its recruitment brochures: "The average tenure of our employees is 20 years." Since XYZ isn't quite sure if that statement is still true, a random sample of 100 employees is taken and the average age turns out to be 19 years with a standard deviation of 2 years. Can XYZ continue to make its claim, or does it need to make a change?

1. State the hypotheses.

$H_0 = 20$ years
$H_1 \neq 20$ years

2. Determine the test statistic. Since we are testing a population mean that is normally distributed, the appropriate test statistic is:

$$Z = \frac{\overline{X} - \mu_0}{\sigma / \sqrt{\eta}}$$

3. Specify the significance level. Since the firm would like to keep its present message to new recruits, it selects a fairly weak significance level ($\alpha = .05$). Since this is a two-tailed test, half of the alpha will be assigned to each tail of the distribution. In this situation the critical values of $Z = +1.96$ and -1.96.

4. State the decision rule. If the computed value of Z is greater than or equal to +1.96 or less than or equal to −1.96, the null hypothesis is rejected.

5. Calculations.

$$Z = \frac{31 - 30}{2 / 10}$$
$$= 2.5$$

6. Reject or fail to reject the null. Since 2.5 is greater than 1.96, the null is rejected. The mean tenure is not 20 years, therefore XYZ needs to change its statement.

SEE ALSO: Research Methods and Processes; Statistics

Donna T. Mayo
Revised by Marcia Simmering

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