



## FUNCTIONS OF MANAGEMENT AND TECHNOLOGY IN THE NEW MILLENNIUM

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### ABSTRACT

This essay discusses how technology has changed the way managers perform the four functions of management (i.e., planning, organizing, leading, and controlling). Alvin Toffler's wave theory, as described in his book *The Third Wave* published in 1981, was used to compare and contrast traditional versus new roles, as well as their specific issues and challenges. Technology introduced new challenges to managers that made it essential for the success of any organization to recognize and successfully implement the best technology that works for each organization and business in particular. It is equally important to find the right balance between innovation and adequacy to specific corporate and strategic goals, otherwise technology will only hinder as opposed to foster productivity and growth.

## Introduction

Alvin Toffler's wave theory explains that society evolved based on specific patterns or waves (Toffler, 1981). The first wave of transformation began when the first human planted a seed and nurtured its growth. In this era, people moved from one place to another to take advantage of soil conditions as well as hunting. The first villages and groups started to be formed and cultures emerged.

The second wave started in the 18<sup>th</sup> century with the Industrial Revolution. This era reflected the time when people started to leave the farms and head to cities to get jobs in factories. It was when the infrastructure of the companies as known today started to take shape.

The final wave started after the Second World War and is the era of information and technology. In this new wave, technology has been leading the way to new economic and political systems, family structures and configurations, and use of our environment. This would be the informational era in which we would be living now. The key of success is no longer focused on producing massive quantities of products, but in doing this in a smart way.

The transition from the industrial era to the informational era has been offering specific challenges to modern management. In this new millennium, companies and their management are dealing with new paradigms in terms of the best practices to manage changes as they happen on a more discontinuous and faster pace never seen before (Finley, 2001). Additionally, while the second wave focus was human-centric, competitive, capital-oriented and reactive, the third wave moved to a more cooperative, truth-centered, human capital appreciative and proactive corporate environment (Gunn, 1995).

To discuss specific management areas affected by this transition in eras or waves, this essay will compare and contrast the second and third waves in view of the four Functions of Management, as defined below:

1. **Planning.** Planning is setting goals and deciding on courses of action, developing rules and procedures, developing plans (both for the organization and for those who work in it), and forecasting (predicting or projecting what the future holds for the firm).
2. **Organizing.** Organizing is identifying jobs to be done, hiring people to do them, establishing departments, delegating or pushing authority down to subordinates, establishing a chain of command (in other words, channels of authority and communications), and coordinating the work of subordinates.
3. **Leading.** Leading means influencing other people to get the job done, maintaining morale, molding company culture, and managing conflicts and communication
4. **Controlling.** Controlling is setting standards, such as sales quotas or quality standards, comparing actual performance with these standards, and then taking corrective action as required. (Dessler, 2001, p.3)

Each traditional function of management as described above will be discussed next by comparing and contrasting roles and issues in the second and third waves.

## Planning

The industrial era saw managers being responsible for a factory system that needed to develop procedures for automation, assembly lines, cheap labor, and so forth in the interest of mass production of standardized goods. The main objective of planning was to find new rules and techniques to decrease costs and increase production through efficient economies of

scales. This objective led to organizations that used specialized equipment, simplified jobs and high volume techniques to mass produce goods (Gunn, 1995).

In traditional businesses, planning consisted basically of setting up policies, procedures, programs, policies, and rules that would enforce a more rigid management process fed by a hierarchy of planning (Dessler, 2001). With a hierarchical system in place, certain layers of management would be in charge of specific plans to each area of the organization. For example, upper management would develop strategic plans that would set the direction the company would go; middle management would cover the tactical plans which carried out the views of the strategic plans in real terms to the operational level; then, the operational plans would execute.

In the third wave, managers at all levels operate at a more challenging and unpredictable territory. The new mantra now is not to increase mass production, but create value, optimize profit and win over the competition.

Planning takes new forms as the goal of profit maximization led to financial planning processes guided by techniques and empirical methods (Gunn, 1995). Planning has become more focused on reducing as much as possible any risk to the organization. The company is divided into business units with their own budget. Each one is responsible for managing efficiency and contributing with results to the corporate bottom line.

Although strategic planning still happens in higher levels of management, the remaining types of planning happen more on a situational or as needed basis. The hierarchy is not as well defined as in the second wave. Goals and objectives are set on a short-term basis with measurable outcomes and flexibility to allow for changes in technology and innovation (Dessler, 2001). To support and create any type of planning, managers need to be able to understand how technology can help them achieve their proposed goals and objectives. Even more importantly, managers need to comprehend the meaning of technology to their particular context to be able to detect its effects to their corporate and social environments (Fleck & Howells, 2001).

Additionally, managers have to be able to understand that technology creates a paradox to their decision-making. On one side, technology allows managers to react to market changes more quickly as it offers companies solutions to deal with the modern business environments. However, on the other side, technology increases the complexity of operations and also creates a relationship of dependency between the information technology systems and the company results (Lucas & Olson, 1994). This paradox can only be resolved when managers become proactive in understanding the technology they are implementing and the best ways to incorporate it in their organizational design during planning.

Starting in the 1990s, companies have been investing heavily on the internet, web sites, software packages, teleconferencing equipment, networks, digital technologies, wireless systems, and other information systems. To match this acquisition of new technology to their corporate strategic planning, managers need to be able to identify which technology is the most relevant to their businesses in order to obtain the best return to their investment.

While planning their information technology infrastructure, third wave managers are required to recognize what is driving their market and industry (Andal-Ancion, Cartwright, & Yip, 2003). Market or industry drivers include areas such as customization, standardization benefits, and information intensity requirements which can help managers establish the best timeline and implementation plans for their specific business.

In addition to considering these drivers in their strategic planning, managers have also to familiarize themselves with one of the biggest risk to their success: security. The problem is that in the third wave, managers can no longer expect their Information Systems department to take care of security in their company. They have to be able to understand how security can affect the company's efficiency and reliability of their products and services.

Therefore, it is extremely important for third wave managers to have a strong focus on the best ways to consider security while planning policies and procedures for their systems. As a result, it is important to understand the three dimensions of security (Dutta & McCrohan, 2002) as follows:

1. Security is not a technical but a management issue.
2. There is no total and permanent security.
3. Customers lose faith in companies that do not show clear signs of the most secure system available in the market to operate their transactions.

These three dimensions bring new challenges to managers who see themselves in constant need to update their technological skills to be up to speed with the most efficient infrastructures. They also need to include specific plans to ensure secure operating procedures to all activities in the company.

As in the third wave era information is power, any breach of security in any area of the company can lead to losses to important and strategic areas in the organization.

As a result, managers have to constantly educate and train themselves to identify the best security system assets to implement in the company as well as be able to conduct risk assessment and cost/benefit analyses. Additionally, managers need to plan on processes that engage everybody in the company to effectively adopt secure ways to work through passwords and reliable systems (Dutta & McCrohan, 2002).

Technology also brought new tools for managers to improve their planning skills and performance. As computers became more user-friendly, new tools called planning support systems (Townsend, DeMarie, Hendrickson, & Whitman, 2000) are now helping managers better adapt quickly to the changing conditions in the marketplace. With great capabilities for data mining, analysis, charting, and relational databases, these tools and systems have been helping management gain a competitive advantage to predict and prepare for changes in the marketplace.

## **Organizing**

In the second wave, companies had hierarchies composed of superiors and subordinates. The main objective was to make sure that there was a bureaucracy in place to support different levels of power. Those performing as superiors would use their authority to use the bureaucracy to prevent from any change that could affect the status quo of the power structure. The purpose was to assure job security to a minority elite with power to control all organizational aspects of the company in lieu, many times, of higher productivity goals (Gunn, 1995).

To support this hierarchical structure, second wave companies would organize themselves following a strict observance of a predetermined chain of command supported by highly specialized jobs and vertical communications (Dessler, 2001). Superiors would punish anyone who would violate or deviate from the norm.

The third wave brought new approaches to organizing companies. The focus now is on being able to respond fast to changes in the market as well as consumers' taste and preferences. Managers need to be able to develop systems to help the company to adapt to rapid and accelerating changes in the environment (Gunn, 1995).

In the third wave era, companies have become organic organizations with flexible lines of authority, less specialized jobs, and decentralized decision-making. In this organic environment, managers need to operate on a more democratic and consensual level to keep employees motivated and productive. Management is more participative to include knowledge from all organizational layers in the decision-making process (Dessler, 2001).

An interesting aspect facing third wave managers has been to determine how changes come from and their specific effects to their organizations. Dramatic changes can happen in moments of crisis when an opportunity for improvement arises. They can also happen in a more systematic and slower way which allows company to be more prepared for when they come. However, a third type of change called organic is more anarchical, arising from ranks without formal management or plans in place to deal with them (Huy & Mintzberg, 2003).

Although all changes need a management support that can efficiently deal with them, organic changes can be seen as the most natural of them and the one that needs very skilled management to make it work for the company, not against it. In the organic organization of the third wave, each person is responsible for his or her own actions. There is no longer a superior to blame or to take orders from. In this context, management systems need to include checkpoints to minimize the negative effects of human error and maximize the validity of human knowledge to resolve problems (Gunn, 1995).

## Leading

The second wave leading style depended heavily on the bureaucratic infrastructure. In this mode, leaders used to adopt an attitude which included ignoring problems, not following up on critical issues, and refraining from intervening. In this bureaucratic system, superiors would make the decisions and subordinates just needed to follow and execute. Leaders could manipulate the rule system to better fit their own interests and would not consider their subordinates' ideas, feelings, and needs. Poor reward systems, in addition to lack of empowerment, would slow down organizations as they fostered conformism and inability to learn from past mistakes (Gill, Levine, and Douglas, 1998).

In the third wave, the organic organizations require managers to be able not only to lead, but also to create changes for the business to survive and be competitive. Hierarchies have been replaced by a network of power and influence with horizontal relationships supporting a flat organizational structure. Leaders now need to be able to build trust relationships with their reports to deal with constant changes and uncertainties. While building trust relationships with subordinates, third wave managers create new organizational cultures based on teams, external focus, empowerment, and calculated risk taking (Gill et al, 1998).

As a consequence of a new culture with a greater emphasis on empowerment and inspirational leadership, women found themselves with more opportunities to take on higher management positions. While in the second wave the industrial worker was primarily male, the informational worker can be either. In this new job market, the criteria changed to include a more diversified workforce and mixed gender workforce.

The reasons for this higher number of women in leadership positions can vary for an actual demand for more people in leadership positions who can understand technology and keep up with the constant pace of changes, to the new gender-neutral market brought in by e-business and internet companies. As the web-related companies operate in a result-oriented environment with a great emphasis on project management and marketing, women find themselves with unprecedented higher management job opportunities (Klein, 2000).

Another new dimension to leadership introduced in the third wave era involves leading virtual teams. Virtual leaders need to have outstanding communication skills to get their message across through teleconference or videoconference equipment, chat rooms, instant messaging systems and others, especially when dealing with global businesses with different time zones and languages.

The leadership skills to manage virtual teams tend to be the same as with on-site teams, although with a greater emphasis on a mentoring role (Kayworth & Leidner, 2001).

Effective mentoring is extremely important as electronic communication can be tricky when virtual members feel less accountable or connected with their leaders, and can behave on a more aversive or reactive way.

Members of virtual teams need to be proactive and work closely with their leaders to resolve any problem or clarify any confusion regarding assignments or tasks. On their side, virtual leaders need to be able to express a high level of empathy toward all virtual team members (Kayworth & Leidner, 2001) so that all feel like they can trust each other.

Another issue that managers need to be aware is “temporal synchronicity” (Tyler, 2002, p. 3). When communicating electronically, there is a timing issue in terms of expected responses from other people versus the actual time the responses come through. When communication happens on a face to face basis, both sides can see each other, so the response is instantaneous. When communication happens electronically, a delay from minutes to days makes it even more important for virtual leaders to be proactive and clearly establish the communication rules with the virtual team members.

Regardless of where communication happens (onsite or online), managers need to be able to establish good relationships with their subordinates. Technology currently offers options to improve the temporal synchronicity factor with resources such as instant messaging and chat rooms. In any case, it is up to the managers and leaders to learn about these resources and make the best use of them for their businesses and communication purposes.

## **Controlling**

During the second wave era, managers would use traditional control methods such as setting standards, comparing results against these established standards, taking corrective measures, and include diagnostic systems. Controlling was closely related to setting targets and making sure they were met at all costs (Dessler, 2001).

In the third wave, organizations need to function on a commitment-based control system (Gill et al, 1998). Traditional methods can no longer work in modern organizations as they operate with higher flexibility, innovation, and creativity. In this new era, managers have to be able to count on employee’s involvement and commitment with the overall mission and vision of their business to make sure everybody in the company wins. In addition to that, as there are no rigid lines separating superiors and subordinates, all share equal responsibility for the success of the company.

In the third wave, empowerment makes employees feel individualized and intellectually stimulated. The resistance to a hierarchical and bureaucratic structure is now shifted to a commitment based attitude. Managers’ role is now focused on being able to inspire employees to perform at their best (Gill et al, 1998).

In this environment, the new spotlight of control is not so much on people on a one-on-one basis, but on systems to protect the best interests of the company. Some of these systems have been considered invasive and created debates on privacy issues. For example, through computer monitoring done through proxies in the network system, companies can check employee’s performance and their use of their online resources such as internet (Crampton & Mishra, 1998).

In other cases, managers use technology to control and monitor the information flow in the company to make sure their assets are secure. With the proliferation of handheld and wireless devices, corporate information needs to be protected with specific data control systems as well as policies to rule their usage. As a result, control happens through computerized systems designed to deal with online threats such as hacking, virus, corporate espionage, and cyber-terrorism (Dutta & Mcchohan, 2002).

## Future of Management

A recent study on companies that have been performing above the average, regardless of the economic environment or recession, found that there is a relationship between innovation and success (Chandy, Prabhu, & Andia, 2003). The study concluded that for companies that have been successful in the last ten years, dominance has a positive impact on investment in radical innovation. Another interesting finding of this study is that managers who believe that new technology is likely to increase sales of existing products are less likely to invest in new technology than managers who believe otherwise. In other words, the fear of being obsolete is a stronger driver to innovation than the possibility of gains.

These results demonstrate that as we move further into the third wave, managers have less and less of a baseline to use in their decision-making process. Old systems or ways of doing things might not work tomorrow because market trends are different from one day to another. In the same way, technology can only lead to a competitive advantage when proven to add value to the company and its products. Innovation in itself is only valid when there is a meaning and a purpose to its choice and implementation.

Third wave management needs to learn fast to keep up to speed in the technological trends and options to be able to use their best judgement and expertise to the overall benefit of the company and its stakeholders. Managers still need to be able to plan, organize, lead, and control. However, the third wave brought new paradigms to evaluate their success or failure while performing those functions.

Examples of these new paradigms include best management practices which include strategy, execution, culture, and structure (Nohria, Joyce, & Robertson, 2003). In terms of strategy, managers must devise and maintain a clearly stated, focused strategy. For execution, management needs to develop and maintain flawless operational execution. The culture must be performance-oriented and the structure should be fast, flexible, and flat. In addition to understanding and mastering new paradigms, organizations in the new millennium must be able to retain talented employees as well as find leaders who are committed to the business and its people (Nohria et al, 2003).

With smart practices and while performing the four functions of management either in the traditional or new ways depending on their organizational contexts, third wave managers in the new millennium will be have more focus, clarity, certainty, and direction for success. Finally, with well-planned and appropriate technology on their side, these managers can create win-win solutions to the benefit of their organizations, employees, and themselves.

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