A CONCEPTUAL MODEL FOR ASSESSING MANAGERIAL IMPLICATIONS OF CHANGES IN INFORMATION TECHNOLOGIES

BİLİŞİM TEKNOLOJİLERİNDEKİ DEĞİŞİMLERİN YÖNETSEL SONUÇLARININ DEĞERLENDİRMESİ İÇİN KAVRAMSAL BİR MODEL

Yıldız SEZGİN[1]   **Nihat KASAP**[2]   **Burçin BOZKAYA**[3]

Sabancı Üniversitesi, Yönetim Bilimleri Fakültesi
[1]yildizsezgin@sabanciuniv.edu; [2]nihatk@sabanciuniv.edu; [3]bozkaya@sabanciuniv.edu

ABSTRACT: Information Technologies (IT) and business processes should be considered together to get the best results in business life. Therefore their integration and reflections on each other are very important in managing institutional changes due to changes in the IT world. Change is a very sensitive concept that must be managed very carefully. In this article, a framework for managing IT based changes by protecting the business leverage and through all levels of hierarchy in the company is proposed.

Keywords: IT Management; Change Management

JEL Classifications: M15; O39

ÖZET: *İş dünyasında en iyi sonuçları elde etmek için bilişim teknolojileri (BT) ve işletme süreçleri birlikte göz önünde bulundurulmalıdır. Dolayısıyla ikisinin entegrasyonu ve birbirleri üzerindeki yansımaları, BT dünyasındaki değişimler sonucu oluşan kurumsal değişimlerin yönetilmesinde çok önemlidir. Değişim, çok iyi şekilde yönetilmesi gereken çok hassas bir kavramdır. Bu makalede, BT tabanlı değişimlerin yönetilmesi için bir şirkette hem işin niteliğini ve gelişimini hem de bütün yönetim kademelerindeki hiyerarşiyi koruyan bir çerçeve önerilmiştir.*

Anahtar kelimeler: *IT Yönetimi; Değişim Yönetimi*

JEL Sınıflaması: *M15; O39*

1. Introduction

In today's business environment, it is a very critical skill for managers to be able to overcome the possible negative effects on business resulting from changes in Information Technologies (IT). Such effects typically result from not following up with the developments effectively or from implementing them inefficiently. Managing IT in an organization in the right way is required first for the organization's survival and then to transcend the company into a better future. Therefore, employee and customer satisfaction, and the profitability of the company depend on how well the company takes advantage of IT and the company's ability to respond to the changes in IT. The key to success is not to think of IT and business management as two separate functions.

The existence of IT in a company is very important for measuring the efficiency of operations or service departments. First of all, managers should take care of an initial step and push the organization to re-structure itself according to this perspective of performance assurance. Secondly, the middle managers' perception and their response play an important role because they are the bridge between employees working in the

operations and the top management. Although the process of managing change due to changes in IT may seem as a top-down process, the phenomenon may also be viewed with a bottom-up perspective. In this case, the customers or the way competitors are acting should be a signal for the needs and requirements of the market. Companies, their service and product vendors as well as employees should all perceive this signal as a driving force to change; by following the new advances in IT, managers should take advantage of new technologies to change their strategies that are linked to IT requirements. A very impressive example is the acquisition of PayPal by eBay, not based on the recommendation of its Wall Street investment bankers, but instead, on the recommendation of its users (Friedman, 2006: 86).

Throughout the process of creating a framework for the managers to handle and manage organizational changes due to changes in the IT world, the second step for managers should be adopting the strategy resulting from the framework in such a way that even the lowest level employees, who need the new technologies for their job, understand the pros and cons of the new applications. Otherwise the enthusiasm to follow new technologies, and later implement and enhance them would not originate from the employees.

In this study, we identify and propose the basic steps of a framework that will be a guide for managers in implementing a change process related to changes in the IT world. The technological changes we specifically consider are those that have profound impact on today's business practices. There are so many changes going on with the IT sector every year, and day after day our work is becoming more dependent on IT. IT services and products that reach a certain level of maturity typically become commoditized, but this still poses a challenge for many companies as they do not necessarily know how to benefit from them. The reason is that people are reluctant to face with the implications on the IT environment when they need to implement new systems and new ways of doing work. The main concern is about losing one's current competencies. Our study goes into a deep analysis of the reasons for these concerns, and how to cope with them with the help of management.

The remainder of this study is organized as follows: In Section 2, the changes due to IT developments within organizations are discussed. In Section 3, the roles of the management in this process are discussed. This is followed by a framework presented in Section 4, showing how all the parties in an organization are affected from the same factors at different levels. Finally, we share our concluding remarks in Section 5.

2. Understanding Change within an Organization

Change is happening all the time and it is like Heraclites once said "*You cannot step into the same river twice, for fresh waters are ever flowing in upon you.*" Therefore, it would be misleading for anyone to perceive change as something from another planet. In this regard, it is especially a responsibility on the part of current and future leaders of an organization to be able to view the whole picture, realize what lies ahead, and communicate their vision within the organization. It is the leaders' job to mobilize all parts of businesses, networks, societies to perform better adaptations.

Adaptation should not be perceived as a sudden transformation. Transformation typically means a complete break-off from the past and creating a future state without any connection with the past. In adaptation, on the other hand, good practices from the

past are carried over and are blended with the new and emerging technologies and processes. What if we only concentrate on carrying our old values and do not see the real advantage of the new happenings? This is the crucial part where organizations should focus in an effort to adopt changes for creating new processes and business value.

An organization as a whole must set its priorities right. Some organizations are so deeply involved in daily work that they are unable to see the future opportunities, and have no time to invent new ideas or processes. This is a real danger for an organization. This type of organization will sooner or later have to leave the playground. On the other hand, the premise that people are resistant to change may not always be true. People generally welcome changes that have positive impact on their lives, but resist changes where they cannot clearly see how they fit themselves into the new future state. For example, if a person wins lottery and becomes rich, that person's entire life style is likely to change but he or she would not resist to that change. On the other hand, if a new technology will be implemented in a company and the result will be such that some people's jobs will become useless or obsolete, then those people would be facing the danger of losing their job. This of course is a good reason for resistance. When people fear from a loss of any kind, they show resistance to change. The leaders in an organization who assume a visionary role and who are leading technology adaptations must understand that if someone perceives something as precious, he or she would hold on to it and would like to keep it forever, at least until it loses its value.

When the work environments change, or even at the first signal of a possible change, employees fear, especially in case of a new technology implementation, the new ways of doing their job. At this stage, a two-way communication between management and personnel is extremely crucial. For some people in the organization, change could mean a positive future and those people would welcome change. Other employees might feel threatened, because their background and skills do not match with the new conditions, and they will show resistance to change. It is the management's responsibility to clearly lay out the road ahead, and provide opportunities to this second group of employees to adjust themselves to the new conditions.

2.1. Organizational Culture and Creating a Change-Adaptive Organization
Due to the speed of change, organizations are ready to cope with it at different levels and capabilities by spending more time on strategic activities than on administration. Leaders face a big challenge so they need to have adaptive skills and be 100% up for change. Some of the reasons which require leaders to be adaptive can be listed as below;

- Changes happen considerably faster compared to the old days, and less time is required to reach millions of users. "*Where it took the fax machine 22 years to get 10 million users, in contrast, online company Napster took just six months. Company leaders no longer have 'reasonable' amounts of time to adapt and assimilate these changes.*" (Blazek and Stevens, 2007),
- As the speed of change increases, organizations should try to adapt their organizational structure first. This is considered the basic requirement in an organization to handle the change. This way, an organization will be more welcoming and open to change. However, "*The ability to execute meaningful change in an organization is becoming increasingly difficult. In response to*

the speed of change, a flatter organizational chart or a matrix reporting structure is often built- decision making authority becomes decentralized. When change occurs, resistance is met because employees often assume someone is at fault, fear some loss of power, or will be embarrassed from uncovering their "dirty laundry" Project teams gathered to perform change are temporary and cannot sustain change. Structural conflict results in defensive behaviours, turf wars and political blame games." (Blazek and Stevens, 2007),

- Organizations are now more aware that everything is "globalizing" and even the way we work in our companies change. Especially large corporations with global networks experience this very clearly. Outsourcing and continuous work using different time zones are all results of globalization. This means in some cases we are even more in touch with people from other countries and time zones than with people in our local area. "*Increased social complexity of the work place is making effective communications more difficult. Globalization, cultural differences, outsourcing, multiple time zones, different cultural priorities, personality preferences and individual work styles are all contributors. Additionally, email and other new technologies are replacing interactive communication at a time when social complexity requires more interaction to achieve understanding and agreement.*" (Blazek and Stevens, 2007),

- Referring to above examples, it is easy to see that we are in a technology-driven century and change occurs so rapidly that it presents its own challenges when it comes to managing it. The speed of change has clearly increased compared to past decades because of the IT revolution. The dot-com boom has changed the speed of how everything is perceived, accepted, digested and dropped out of fashion. What is needed is first to adapt the organization to this trend.

2.2. Managing Change Due to Changes in the IT World

The speed of change in the technological world is expressed in exponential speed compared to the last decade and so the reactive speed of an organization to catch up with this change has become of great importance. In this respect, today, all organizations are facing a great opportunity which should not be missed and should be used effectively for generating new businesses. There are things to leave out and there are new things to adopt for a better future. IT related changes automatically force people to stop using the old ways of doing their job and start using tools that are completely new and relatively more complicated as well. Also, whenever there is a new thing to learn, much concentration and extra time on top of daily work is required. For this reason, it is very important to involve people who will be using the new way because they will be the ones to own and use the new system. For the new adaptations to work smoothly, people among the users should be chosen as part of the implementation team right at the beginning of the design process (Friedman, 2006:49).

Sometimes people resist to change without even thinking about the pros and cons of a new system. This kind of resistance may be just because of the way the change is implemented. In other words, if the change comes as a top-down mandate, with an aggressive manner and without involving the potential users from the very beginning of the change process, then the implementation phase will be very tough. There will be hard boundaries between people resisting to change and people who want to bring

change. During the change process, expertise of people who are doing their job in the old way but who are also completely professional in their jobs should not be underestimated. For instance, when the Systems department is preparing a new system, it is very important to convince the users as well as the top management. The extent to which this can be done effectively will improve efficiency and effectiveness of the organization and thus decrease costs and improve performance. Very few companies have a legitimate framework to identify, track and follow the changes. Change should be recognized *and* predicted so that a change process can be implemented. Change management covers the physical applications plus the usage of these applications in production and operations. Companies have to manage any type of IT asset, software, content, materials, and people. While managing them, the effects will be seen on HR, operations, product research and development, sales and marketing, and so forth. Looking at the current examples of how companies manage IT and the effects of change, there are various models and concepts related with this issue. One of them is offered by The Institute of Configuration Management: the Configuration Management II model that offers organizations to create and implement their own approach. This provides an enormous value to companies. ITIL (IT infrastructure library) is another concept which is a guide for IT infrastructure building. The evaluation of these two and other examples is outside the scope of this text, but is nevertheless necessary from an organizational point of view. In this study, we are more focused on the management perspective of the issue. The critical point is to figure out how companies act towards buying in of such models and working to make them operational.

IT investments have strategic importance. Nowadays, there is an agile business environment which welcomes change and to be fully ready for any kind of change, organizations need an adaptive infrastructure to avoid disruption and excessive costs. However, in Figure 1 as reported by Gartner (2002), we can observe that in year 2002, there was still no framework settled for the companies. IT has no constant connection and regular support for business processes.

In a company that operates in an environment interrelated with the market and the competitor, the managers should be acting very fast in order to be the leader of their market. Returning to the starting point, there are some steps to be taken before dealing with a deeper consideration of managing change due to changes in the IT world. Every party in the company has a different role with different scalability and power influence.
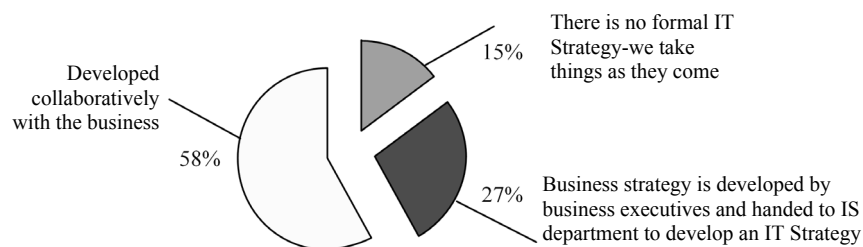

Figure 1. IT Strategy Scenarios[*]

---

[*] Source   : Gartner Dataquest (July 2002)

According to Fullan (2001), leaders and organizations have to develop five core themes or capabilities: moral purpose, understanding change, relationship building, knowledge creation and sharing, and coherence making. To understand this structure, we must first define the stakeholders of an organization. An assessment of stakeholders and stakeholder issues is necessary to identify the range of interests that need to be taken into consideration in planning change and to develop the vision and change processes in a way that generates the greatest support. The stakeholders of an organization can be listed as follows:

- Customers
- Owners/shareholders/investors
- Suppliers
- Strategic business partners
- Employees
- Management
- Yourself
- Your project team members
- Community

These stakeholders are all affected by the role of IT in the company at different levels. Below, the responsibility of each party for managing IT-induced changes is defined in a top down structure.

- Top management should be well aware of the importance of IT, and be able to clearly define its existence and the need for it in the company structure. The important fact is that IT is a business enabler and catalyst for innovation.
- Chief Technology Officer (CTO) and Chief Executive Officer (CEO) should be working in a well-integrated manner in order to manage the IT and business operations in coherence as a whole.
- Middle management should be realistic and idealistic at the same time. They are the very important factors in order to overcome the challenge of dealing with change.
- The need of every business unit should be identified well enough so that right actions would be taken.
- A pro-change mindset should be encouraged with every employee who requires very professional trainings.
- The shop floor workers, sales people, operations people should be well aware of their environment which means they should be working in passion to compete in the market developed further with the support of advances in the IT world. Vendors, partners, consultants and contractors should also be assisting this structure in order to benefit more.
- While doing all this, the cost control is very important in the company which is the key point to success in handling this challenge.

While all parties have different responsibilities as listed above, there are some actions to take in order to actualize those responsibilities. Although, changes in organizations best applied in a bottom-up way, first the top management should take steps to delegate this bottom-up change management task to the employees.

- The fears and concerns of workers must be identified and removed. An environment which is open to change must be created with clear and honest two-way communication.
- No greedy, adversarial approach is accepted because management will face with stronger resistance, and even rejection.
- Starting from the beginning of the design stage, representatives of all affected parties should be involved so that from the beginning all problems would be solved and every party would feel a part of what is going on.
- Management must show how it accepts and supports change.
- Middle managers should approach to reactions of the employees as they would like the top management to approach to their own.

While taking actions, strategic steps should be followed. Defining those strategic steps is the responsibility of the top management. Here are some general rules determined for top and middle managers.

- People need to know how new IT functionality will change their way of working,
- People need to understand what is in it for them and have incentives to act differently,
- People need to understand what they are working towards and how they will achieve it,
- The right people need to buy in to the change and know what is going on

To manage all these challenges regarding employees, a strategic path should be devised and followed. Thus, management could act in a very organized manner with a step by step planning. Every step should be applied with using control and performance measures, or else, big changes are likely to be spoiled with the planned projects never showing success. There must be a framework identified for the company; a general overall framework and another one which is customized to that specific company depending on its structure and form. In this paper, our focus is on the general framework, but every company should take this framework and its steps as a guide, and try to roll its own approach.

The steps listed below can be considered as an initial guide for management to start managing "change" in an effective way:

- *Arranging interviews / focus groups*: Identification of stakeholders' reactions to change and its effects on the project. Identification of potential blockers and supporters of the change.
- *Analysis of organization charts:* Allowing a more complete understanding of political barriers to implementation.
- *Stakeholder mapping:* Establishing key inputs for a communication strategy.
- *Stakeholder involvement planning*: Motivating people in the organization to change by changing how they are recognized and rewarded.

Performing all these steps is the initial stage of implementing the change concept. However, a more important issue is the top management and board of directors' commitment to the change concept. As stated above, a bottom-up implementation of change is more preferable as an ideal way of implementing the tasks, but this could

be done only when top management has full commitment. In the next section, we go into more detail about today's important management parties.

3. Managers' Roles

3.1 Board of Directors
A board of a company represents a very important position especially if the company is open to public. The relation of the board to IT is yet changing due to changes in the IT world. Until very recently, because of no standards and no IT governance frameworks, the board was far from IT and was avoiding the importance of IT. On the other hand, there were scary scenarios like the Y2K and other technological threats.

In today's world, when IT is considered as a commodity but to some extent still being an effective factor of innovation, the board members should not avoid the importance of IT. This is a sensitive issue and there are no real borders drawn to specify the responsibility of the board about IT. The level of attraction for the boards in relation to IT is changing according to the industry which the company is operating. The important thing for the board is to avoid lack of oversight for IT activities.

The board should support the top management for IT related strategies and at the same time, should perform a control function. If this control function could not be handled by the board, it should be handled by an IT committee. The need for this committee depends on the company's need for IT investments. For instance, if the company is a high-tech manufacturing company, a deeper involvement for IT might be required which may force a separate governance committee to be deployed. However, for a company in the retailing sector, a different setup would be required to manage IT-related changes. The key issue is that starting at the very top, every single person should be aware of and accountable for the IT practices in the company. This requires a close control of IT in order to manage it effectively.

3.2 The Role of Chief Information Officer (CIO)
The role of the CIO has changed due to the developments of Information Systems (IS) and in relation to how much our business is dependent on information use. Today, the business executives perceive technology as a strategic tool and position the CIO at a very important level. The CIO should have sufficiently strong managerial skills to build the relation between the forces affecting this role. Unlike in the past, IS will no more be a back-office in companies, but instead a somewhat strategic tool. Moreover, IS will act as a profit centre rather than a cost centre. Hence, the CIO should manage IS-related factors and the relationships with the other executives of the company.

The second issue about the CIO is that being an Information Officer is very much different from being a Knowledge or Technology officer. In every organization, various forms of data are captured and then processed to produce information. Information is then used to create knowledge. In this respect, the information step is a critical step to reach for which one needs the right tools on hand. The CIO, being at the top, understands the importance of information and acts in a very critical position to mobilize the company towards this goal. The CIO also works in close

relationship with the CEO to ensure the top-most level of understanding and commitment.

While the business world is not staying steady, the CIO has a lot to do to understand and follow the pace of developments in business as well. Making all the decisions about e-business, outsourcing, use of technology as a competitive advantage is not to be underestimated and needs a lot of background about the business itself. In this respect, the relationship between a CEO and CIO is even more pressing. This means the CEO should have the ability to understand and accept the role of the CIO. It may be hard though to set clear borders of responsibilities; the CIO should manage other officers in the board while keeping up with the advances in IS and IT. At the same time, the effects of the relationship must also be reflected on the company overall. The CIO should be managing the CEO so well that the decisions made at the top level feeds the company in a positive way.

How IT is becoming a commodity rather than being an asset may not be as important, when the attention should be more on avoiding useless IT spending and the positioning of IT in the wrong place. Besides the hardware used and the money spent for servers, there may be much unimagined discoveries in the IT world that would do well in our life. For different types of companies or for competitors, this kind of central usage would not be realistic at the moment compared to an electricity power. On the other hand, when we look at the issue from a global perspective, there really is a big waste and overcapacity created out of IT. So, sooner or later, some components of IT will be commoditized and companies will utilize it via central resources. Companies facing this controversy will be affected depending on how big they are, so large companies should be more careful and prepared for this change. This is a serious warning to all boards of directors of all companies, CIO and CEOs. Nowadays, every little investment about IT should be evaluated and filtered very carefully.

In today's world, day after day, not only companies and governments but all people, for instance a little child or an old lady, are all dealing with IT in some part of their daily lives. No one can deny the need for IT to handle daily work. In that sense, the fierce competition in the business world forces executives and strategy teams to handle IT with a close follow-up and also every company tries to create its own technology through their Research and Development units. IT is said to be a ubiquitous input for commodity production, but IT could be a scarce input as soon as a great discovery is made in the era.

IT is now the core input of commerce; it is the backbone. The resources such as capital, human and time spent for IT are still increasing. Managers need to ask if they are receiving a satisfying return from these resources, whether or not IT expenditures make the company go one step further, and how the company could take advantage of IT to be the leader in its sector. In this sense, companies should spend more money on IT to reach a better position but there should be a leverage between the daily IT needs of today's end users, consumers and the needs of innovators inside a company. Companies may need to be stricter on the way their employees internally use IT or the way their end users use their products and services. We know that after some level that can be reached with little difficulty, IT

is not scarce. However, like any non-scarce resource, it may have a level where it does not provide any further use than harming the organization.

In this era of IT, a company can still, without doing a great discovery in IT, create value out of IT by offering an innovative product or service. The innovation meant here can be something that is special to the company's culture and structure, which might be something hard for another company to imitate no matter how strong an IT infrastructure the other company has. Still this innovative product or service would not have high costs if the company cleverly uses IT.

Companies may invest a lot in IT but nowadays the money spent on IT are mostly for security needs and for handling the load of inefficient users. Therefore, companies have to be aware that IT should not be totally treated as an input commodity because it has an important characteristic of being a "change" initiator concept. Nonetheless the CIO with the strategic teams of the company should very well be able to adopt IT in their own business so that they can handle IT without sacrificing too much.

4. Framework for Information Technology Management

In this framework, which is depicted in Figure 2, we portray a general concept regarding the company's business environment in which change management is applied as a consequence of the advances happening in the IT world.

The aim of this framework is to show how different parties inside a company are interrelated with each other and how each of them is affected by the change concept. For most business cases, without characterizing such a framework and considering the whole picture, it would be difficult to identify what is going on. Hence, the framework assists managers to create better solutions when managing change due to changes in IT.

The framework in Figure 2 shows a factor from outside the company, yet a factor within the business environment of the company, namely the world of IT. We argue that this factor mostly effects the top management of the company. Strategic management, technology management and middle level management are the other parts of the organization that are in close relationship with the top management and are influenced by IT in an interrelated internal environment and also by IT as an outside world factor. The framework suggests that the top management (CEO, CIO and the board of directors) works with the strategic management team, technology management team and the middle management throughout the process of change management.

The technology management team, which is directed by the CTO, is always aware of the outside world and aims to grasp the IT related applications that could be valuable to the company. On the other hand, the business infrastructure is always in the heart of the management, affected by the decisions made. The IT infrastructure and technology management issues alone would not help to manage the company through a rapid change process, so the business infrastructure is the main dynamic which absorbs the happenings from the world of IT. The change management policy then facilitates application of the changes in IT in the departments of the company through the reflection of middle management.

Middle management should be perceived as a very critical part of the organizational cycle. Middle management is like a bridge and like every bridge it has arms that reach the two sides of a gap. It is very important how middle management perceives the position and how the employees are influenced by middle management. In this respect, the way top management treats middle management also becomes critical.

There must be a strong trust to middle management but at the same time a tight control mechanism looking after middle management. In managing change, middle management should implement the process and handle the stress in a very positive way. Otherwise, there will be a lot of employees which would be negatively affected by the change factor and it will be hard for the top management to overcome the consequences.
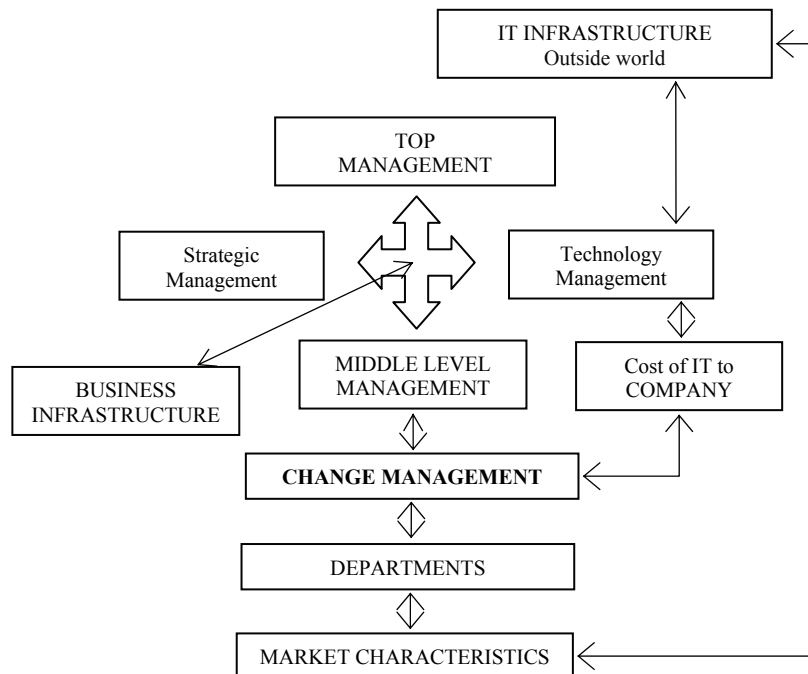

Figure 2. Framework for Information Technology Management

The market characteristics influence this change management through the lowest level of the company, namely the employees. Depending on the sector that the company is operating in, the developments in the market affect the way employees work and respond to client requests. Market characteristics may force employees to become agile to developments. This is an assumption that employees' interaction with the customers, and the departments that are working in integration should be passionate enough to contribute to this IT change process. The changes in market characteristics are also related with the world of IT and both are forcing the organization to change. This framework is open to changes and may be developed as an IT view of the company changes.

5. Conclusion

In this study, we have analyzed the first steps of change management due to changes in IT. This is a wide topic which requires dedicated observation of different companies in different industries. It is helpful to observe how the board and the top management make decisions, and how the top-down mechanism works. This is especially relevant for large and global companies. A general framework is prepared to show how managers and employees should contribute to the change process. It also shows the different parties involved with the effects of IT on them and the flow of their integration cycle. The roles of the top management are also analyzed in order to measure the success of change management due to the rapid changes in the IT world.

Overall, not only employees but also the top management have a risk of perceiving IT and change as something to be afraid of. However, this view should be cleared out and a new, change-adaptive view should be established. After all parties are ready to accept change, there should be interaction and a successful two-way communication. This is also the most important theme of this study. It is not so important if the business structure favors a top-down or bottom-up communication channel. If there is open communication between management and employees, then everything would be perceived on a flat platform and problems would be resolved very fast.

The study covers the basic concepts of a framework that are applicable to all companies. For future study, a more detailed version could be analyzed, which could help companies to capture what they need when customizing the framework.

References

FRIEDMAN, T. L. (2006). *The World is flat: a brief history of the twenty-first century*. 1st ed., London: Penguin Books.

BLAZEK, P., STEVENS, D. (2007). Adaptive to change: developing the skill set of tomorrow's leaders. [Access Address]: <*http://www.synaptus.com /resources-articles/69-adaptive-change.html*>, [Access Date: 07.09.2009].

FULLAN, M. (2001). *Leading in a culture of change*. 1st ed., London: Jossey-Bass.