

New Trends for Re-design the IT Companies

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***Abstract.** As it is known, the management adaptability to the changes taking place in the environment where it is acting represents a key factor for survival and development of an organization. As a reaction to the external signals, the internal change may be superficial when it affects only the development of activity in different sectors, or might be profound, when it changes the main processes and rules of the business and even the philosophy of the company's existence. Speaking about structural changes, one of the most common approaches of the modern management is the re-design of the business architecture. The new architectural models such as Service Oriented Architecture (SOA), presented in this paper, come with important advantages, but their implementation is not always very easy.*

This paper tries to present some of the most common encountered contextual characteristics which are able to start the implementation of Service Oriented Architecture, some advantages of this concept as well as some practical approaches of implementing.

Key words: service oriented architecture; business process management (BPM); governance tools of service oriented architecture; OODA loop; service oriented architecture philosophy.

JEL Codes: C8, M15.

REL Codes: 5C, 14B, 14K.

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1. Organizational change

The change within an organization might be both an impartial process when it spontaneously occurs following to the development of the company external environment as well as following to its new position within the social-economic system, and a partial process when it has been occurred and controlled through managerial decisions. In fact, those two types of changes are correlated and interdependent between them. While the changes following to the evolution of the social-economic system tend to determine the loss of stability related to the organization objectives according its strategy, those changes that have been occurred due to the decisions of the management will annihilate the result of the first category of disturbances either by measures on short-term (tactical changes) as it is shown in figure 1, or by complying with the whole strategy with the new realities (strategic changes).

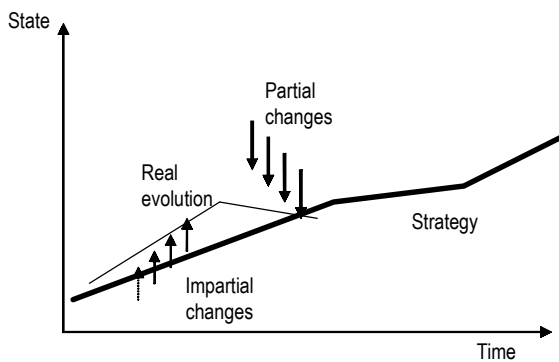


Figure 1. Interactions between impartial and partial changes

In category of partial changes, which are determined by external occurrences and further on they will be named external disturbances, are included several occurrences and situations following to the

evolution of the market, technology, complexity of superstructure, globalization, growth of external stakeholders power or due to political and social changes, such as the consolidation of the European framework. Speaking about IT&C field of activity, we might exemplify the above stated situations with the organizational changes that have been determined by the appearance and development of the electronic commerce, or related to software production, by the evolution of the well known company, Netscape, producer of Internet navigation applications which has followed the Microsoft decision to incorporate in its own products, free, its own browser, Internet Explorer.

Relating to the impartial or the internal changes, this process might imply either restricted changes, so called “made up changes”, or profound changes related to the working mode or working philosophy of the company or enterprise, in other words, its reorganization. If, in the case of “surface” changes, it is trying to modify the mode in which the organization manages its business processes (the effectiveness of some activities, reduction of costs, change of suppliers or the improvement of technology), the reorganization is a profound modification such as the extension or restriction of the field of activity, the change of strategy and re-designing of the main processes.

The main elements of a company’s activity that should be taken into consideration for determining the response to the significant external disturbances are:

- *Mission and objectives of the company.* They determine all subsequent options, organization’s strategy as well as all its undertaken actions. The specialists

recommend a periodical review of the mission which the company's proposed to be able to determine its feasibility in relation with the scheduled evolutions of the field of activity. In the same context, the company should establish its fundamental proposed objective (for example operational excellence or the leader on market of its products), as well as the derived objectives, if any.

- *Time scheduled taking into account.* It is considered that three distinct situations might be, namely: 1) development to take into account the obtaining of some results at present and in the near future; 2) providing measures on short term for increasing the company's attractiveness to be purchased by a competitor or through public offer of shares; 3) approach of durable development principle.

- *Management style.* The top management in order to define its undertaken politics should answer to the question if its team has in view to cause or to follow the change and when the optimal moment for the said change is. The IT&C companies are developing in a dynamic economical environment where sometimes the decisions should be undertaken under risk conditions and the opinion of its own customers is not always a certain solution. It is a notoriety the example of the well known IMB companies, Compacq and DEC, which failed a considerable chance to gain the market with a new product, a minicomputer at a low cost dedicated to some educational objectives. This failure was due to the fact that the questioned customers have not been aware by the necessity of a fundamental change related to products orientation of those

companies and they have not known the benefits of the new products and services offered. Consequently, the results of the questionnaires showed that the questioned customers have not agreed as those products to enter on market. On the other hand, Apple, a not significant company, has understood the moment and entering on the market with a product based on XEROX technology became in a short time one of the most significant actor on the international market related to computer equipment.

- *Stability and adaptability of the company.* A structural and procedural structure should be taken into consideration allowing a quick response to external disturbances, as well as a changeable infrastructure to ensure the possibility to make a change, without to be necessary the re-designing of the whole company's system. One of the most important elements that contribute to the stability of an organization refers to its relation with stakeholders and mainly with the customers. Therefore, their confidence, defined to be the belief of partners that any commitment of the company will be exactly fulfilled according to settled conditions by common agreement (explicit, implicit or induced), represents the support of a relationship on the long term, even if the environment where the both partners cooperate is turbulent. A modality to generate the confidence to partners is to determine and fulfil fair rules governing the relation supplier-beneficiary and to conclude a Protocol agreed by both parties as Terry Winograd and Fernando Flores proposed in 1993, whose scheme we present herein below in Figure 2.

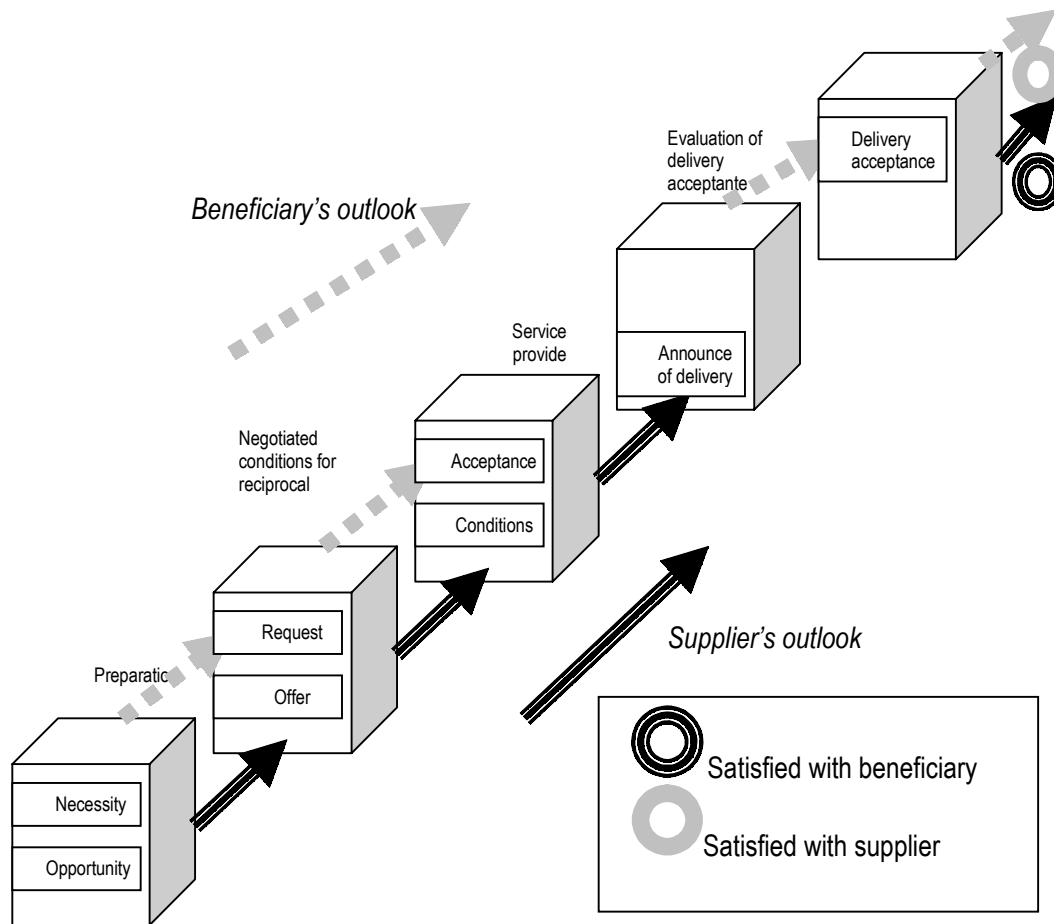


Figure 2. Management model of customer- related process

The presented approach includes several actions to be undertaken by supplier, respectively by beneficiary within all those five steps of the above management model. Those actions are the foundation for realizing and maintaining the equity in relation between supplier and beneficiary (customer) and are detailed presented in herein below Table 1.

- *Motivation of employees.* The level of motivation and specific organizational key motivation factors are very important elements determining in a certain way the organization's response to the occurred

disturbances within its field of activity. It must be taken into account that any good decision can reach its target only if it is applicable accordingly and, therefore, the carrying out an order or a decision is finally an executive task and it should be fulfilled by executive personnel of the company. The capability executive personnel to response to the management requirements as well as the quality of their work are determined in a great extent by the quality and control of their motivation which are very important elements of the present management.

Undertaken actions stated in Protocol between supplier – beneficiary

Table 1

Step of Protocol	Beneficiary (Customer)	Supplier
1. Preparation	-He determines the requirements; if and in what way he issues an order related to the required service/product (who, what, when, where, why, how) based on the previous experiences he had with supplier or depending on his reputation.	-He identifies or discerns the customer's requirement or the opportunity and decides if and how he supplies his services to customer (who, what, when, where, why, how) based on the previous experiences he had with customer or depending on his reputation.
2. Negotiation	-He issues the request (order). -He rejects the offer or accepts the initial proposal that will be the object of negotiation. -He negotiates the terms and conditions of co-operation, he accepts them or he takes away from negotiation. -His confidence in relation with supplier increases.	- He issues the offer. - He rejects the request or accepts the initial proposal that will be the object of negotiation. - He negotiates the terms and conditions of co-operation, he accepts them or he takes away from negotiation. - His confidence in relation with customer increases
3. Carrying out	-He follows how the supplier is carrying out the order according to the negotiated terms and conditions with him. -The confidence granted to relation with supplier increases or decreases.	-He supplies the services. -Communication with beneficiary. - He proposes finalization of delivery. - The confidence granted to relation with customer increases or decreases.
4. Estimation	- He analyses the received service and the interaction with supplier. - The confidence granted to relation with supplier increases or decreases.	- He follows the progress of customer analyze process. - The confidence granted to relation with customer increases or decreases.
5. Evaluation	-He evaluates the level of supplier's performance. -He evaluates the got confidence in relation with supplier for further possible interactions with him. - The confidence granted to relation with supplier increases or decreases.	- He evaluates the level of customer's performance. - He evaluates the got confidence in relation with beneficiary for further possible interactions with him. - The confidence granted to relation with customer increases or decreases.

The experience shows that, in the most of cases, the key motivation factors indifferently of their form are connected with the competence level and the decisional power granted to executive personnel. The results of those applicable key motivation factors are positive only when the employees may supervise the consequences of their work at the level of ways out from the company y (final products and services).

In addition, there are other aspects that should be taken into consideration when it

is talking about the response to the external changes, such as: kind of serving the customers and stakeholders, the attitude of personnel towards their work, their roles and job positions as well as the organization structure of the company, the mode and the level of knowledge's utilization within the work process and the integration extent of information. A significant category of changes within the organization is represented by the changes of macro level that influence the whole company.

In his work, Hines deals with the subject of these wide changes (Enterprise-Wide Change or EWC), showing that they have a wide impact towards the organization and they generally have a strategic, chaotic, complex and radical character and they can have into view (Hines et al., 2005, p. 11):

- Implementation of ERP system within organization.
- Creation of a new organizational culture of high performance.
- Orientation to business and to operational excellence.
- Achievement of fusions, procurements, alliances or joint ventures.
- Use of new technologies.
- Execution of strategic and business plans.
- Use of orientation to customer.
- Organization's globalization.
- Improvement of services supplied to customers.
- Settlement of development and expansion objectives.
- Reduction of activity and externalization of some activities.
- Improvement of 6 Sigma system application and introduction of quality management system.
- Modification in the distribution channel.
- Development and introduction on market of new representative products.
- Integral transformation of enterprise.
- Significant development of employees' creativity and innovation
- Reorganization and re-design of organization re-designing the business processes.

Further on, we shall deal with some aspects related to the new concept, Service Oriented Architecture (SOA), showing the importance of this concept for IT companies.

2. Service Oriented Architecture and its implementation within the modern IT organizations

Having a considerable organizational flexibility, high work productivity and a high technological level, the organizations with IT&C field of activity might be considered a real vector of change due to the fact that they offer ways to growth the performance of processes. At the same time, the rapid evolution of technologies used in self-acting data processing field of activity, variation of infrastructure's costs as well as the biting competition on the market requires a wide flexibility of such an entity which, without capability of rapid adaptability to the environment of its field of activity will be eliminated from the market.

Moving those above mentioned to the organizational chain-loops with informatics activity within other organizations with different fields of activity, we might say – and experience confirms – that those organizations should be adaptable and flexible and the mission of those chain-loops is to facilitate the change within the companies where they are taking part, if not, they will be externalized or included in bigger chain-loops.

Within organizational design context of companies, enterprises or organizational chain-loops with IT field of activity it is more and more talking about architecture to provide the above mentioned characteristics.

The main characteristic has in view the well-marked orientation towards third entities, or in case of directions or informatics services of companies with other field of activity, towards other chain-loops of the same organization. In specialized literature this is named Service Oriented Architecture (SOA).

Service Oriented Architecture (SOA) represents, according to⁽¹⁾, an organizational design style influencing all aspects related to creation and utilization of processes from the company, called services too, within the whole duration of their life. In addition, this style influences the defining and effective procurement of informatics and communications infrastructure allowing to some different applications to change information between them and to participate to the progress of some organizational processes, removing restrictions related to the operational system or software used for

those applications (Newcomer, Lomow, 2005).

The mentioned architecture could be considered a model too, where the global functionality of a system (an organization) is divided into elementary units that are able to combine each other in different ways, entering into the processes or applications which are specific to organization or its undertaken activity (Erl, 2005). The mentioned services communicate between them either by transfer of data, or by coordination of activity between two or more services, this concept being considered a new stage related to the evolution of terms for distributed processing or modular programming.

In Figure 3 it is presented synthetically the content of a Service Oriented Architecture which was defined by Dirk Krafzig, Karl Banke and Dirk Slama in their work “Enterprise SOA” (Krafzig et al., 2005).

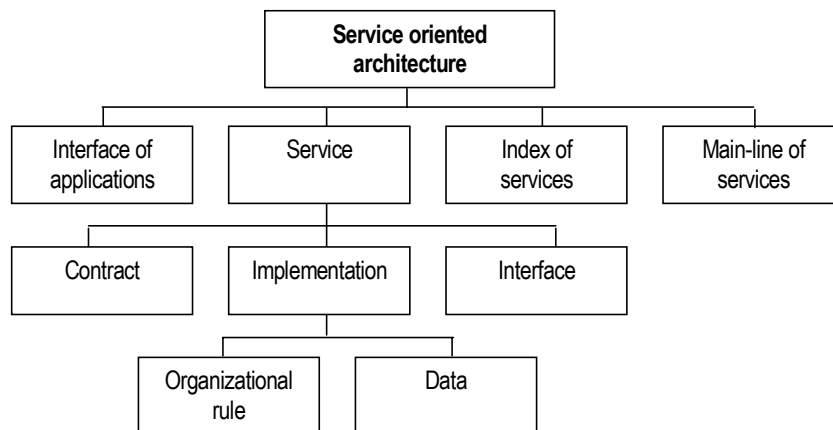


Figure 3. Structure of Service Oriented Architecture

Specialists show more main principles which defined design, development, usage and maintenance of the SOA system and herein below we mention some of them:

- re-use, granularity, modularity, composability, componentization and interoperability;
- compliance to standards;

- services identification and categorization, provisioning and delivery, monitoring and tracking.

In addition, the SOA philosophy includes the following architectural principles for design and service definition focus on specific themes that influence the intrinsic behaviour of a system and the style of its design.⁽¹⁾

- *Service encapsulation* – many web-services are consolidated to be used under the system, even if they have not been planned to be used in this purpose.
- *Service loose coupling* – services create a relation that minimizes dependencies and only requires that they maintain an awareness of each other.
- *Service contract* – services adhere to a communications agreement, as defined collectively by one or more service description documents.
- *Service abstraction* – Beyond what is described in the service contract, services hide logic from the outside world.
- *Service reusability* – business rules functionality and implementation is deliberately divided into services with the intention of promoting reuse the same services into different processes.
- *Service composability* – collections of services can be coordinated and assembled to form composite services.
- *Service autonomy* – services have full control over the logic they encapsulate.
- *Service optimization* – all else, high quality services are generally considered preferable to low-quality ones.

- *Service discoverability* – services are designed to be outwardly descriptive so that they can be found and assessed via available discovery mechanisms.

When it is going to re-design the organization under the SOA principles, the followings should be taken into account:

- Use of re-designing techniques and methods that are specific to Organizational Processes Management (Business Processes Management – BPM) correlated with SOA ensures a high flexibility and adaptability to the company. At the same time, this action conducts to create or underline some interdependencies between sub-systems, processes and component services. Under these circumstances, a proper management will be ensured in comply with the complexity of created system, implementation of a governance process from the beginning.

- The absolutely required measure that should be taken before to start the re-design process of organization under SOA principles is the integration of the IT system. For example, when the decision is taken to re-design the company and to introduce the SOA system within the organization, the IT system is composed of heterogeneous applications (either produced in the company by its own IT department, or procured from other producers). In this situation, the IT department should recommend to the top management to procure an integrated system from a software service supplier, SaaS-Software as a Service. After implementation of this system, the responsible of IT system should urgently extent and adapt the integrated solution within all business processes of the company as well as the integration of all used data in IT system.

3. Financing and governance of the Service Oriented Architecture

The implementation within an organization of Service Oriented Architecture is determined by the management belief that this approach has a potential value for the business in progress, and it should be supported by specialised companies or organizations providing organizational design or IT consultancy. When it was decided to implement the Service Oriented Architecture into the company, two aspects should be taken into consideration: the required financing and the effective management of the new system.

Related to financing, the IT companies use in a great extent a financing model concerning to the required funds (for passing to the new architectural system) which classify the services based on three main financing categories, depending on their specification (Figure 4). The first level, the basic one, is relating to the common IT services such as e-mail or network services. Such kind of services is financed by many companies based on subscriptions or other similar facilities. The second level relates to other IT services that might be used together with other several companies and they are paid by all the said companies. The third level includes specific services supplied to only one company which pay all the costs.

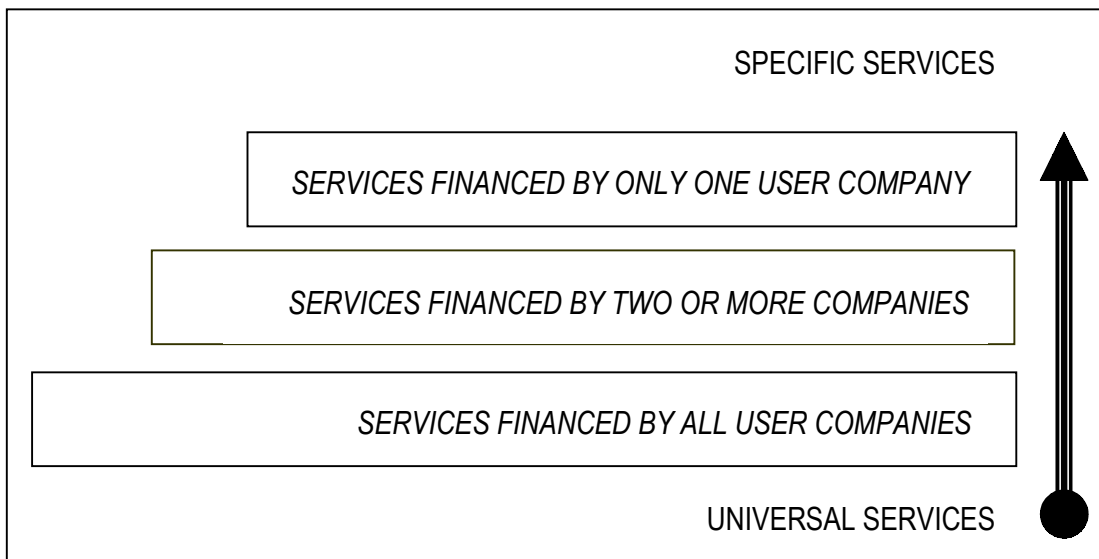


Figure 4. Services financing model of SOA system

The implementation and effective management of the SOA requires, as it is showed by experience of specialists and consulting IT companies that promoted this concept, to use some specific governance tools, such as Business Process Management or the Repository ones. The purpose to make use of those management techniques and

methods is to be able to accustom to the management processes of organization and to eliminate, as much as possible, the redundancy of used services. Most of the software suppliers provide the packages of governance tools for SOA, as well as guides to practice in this field of activity. Nevertheless, it is recommended to minimize

the use of those successful tools and networks in the first stage of design and further on each organization to accustom to use them during the development of the Service Oriented Architecture, depending on each field of activity.

There are some requirements which any system of SOA governance should fulfil. According to the specialists' opinion, one of the most important characteristic of such tools is the capacity to particularize the governance process based on the effective necessities and the field of activity of the company, the independence of the management methods towards the services to be manage, as well as the integration with financial-accounting applications and with the management system of applications' portfolio.

4. Observation – orientation – decision-actions – (OODA) cycle

The use of BI techniques in commercial activity of organizations has to carry out efficiently some planning objectives on short, medium and long-term using some modern decisional methods to allow both a complex analysis of the available data and the application of some anticipated performant methods.

More over, when it's about the durable development of a company, organizations or group of organizations, the right estimation of the future results relating to application of some decisions is a very important strategic element.

The activities performed by individual persons, companies or enterprises shall produce in a large or limited extent some

“reverberations” within the systems where they are developing. Therefore, if the whole range of secondary results caused by an undertaken action is not taken into consideration, is not correctly evaluated or is not integrated accordingly in the initial strategy, the response of the environment might be as more as complex than it has been anticipated at the beginning and the results will be rather negative than positive.

The history of politics, business, science and war or any other human activity shows several examples of disasters occurred due to the lack of analysis related to results based on previous planning strategy before to be implemented.

A lot of papers have been written in the specialised literature about the strategic decision and leadership, and the newspapers specialised in research furnished a wide range of scientifically considerations and clarifications related to those concepts. Nevertheless, the emphasizing of the main processes involved in taking decisions and leadership, settlement a rigorous analytical framework applicable in any situation and in any environment has been realised later. Such an approach made John Boyd, an eminent pilot mathematician, philosopher and analyst of the human character, who in 1984 proposed a method with a wide applicability in business, medicine, theory of conflicts and conflict management which is known as OODA Cycle (Observation - Orientation-Decision-Action) or as it is known in English-Saxon specialised literature, OODA Loop or Boyd's Loop.

The importance of this technique consists in the extended field of applicability

and in providing a general background for a wide range of decisional processes that refers both to undertake quick decision under complex environments which are in a continuous change and to the multidimensional analysis based on knowledge. Under these circumstances, the quality of decisional action depends on providing in due time decisions and right focused actions, whose execution determines both the rhythm and evolution direction of all environment.

The OODA Cycle concept consists of four consecutive phases such as:

- Observation
- Orientation
- Decision
- Action.

■ *Observation phase* is that one for picking up the information from internal and external sources towards the operational environment. The inputs inside of organization depend on the pertinent historical knowledge and represent the “static” support for the observation phase, and inputs outside of organization consist both of very recent information related to the general condition where the managed system is developing and of data which, even if apparently are not relevant in decisional process, contribute to realise a complete image of reality. Consequently, within the observation phase the gross information is provided from external environment and it is correlated both with minimum knowledge already existing in system, and with the evaluated knowledge.

The analysis of picked up information in this phase characterizes in due time the environment including the current events and

the performed actions into this environment, determining the critical level of *informational superiority*. This concept coming from the military theory and practice, consisting in relative capability of some known or unknown factors of operational framework (characterized as it is know, through the quantity of information).

■ *Orientation phase* is the most important one of the whole cycle, determining the evolution of the next actions. In this phase, information and knowledge obtained in the previous phase are finally analysed, which is a complex process whose quality is certainly influenced by impartial factors, such as: experience, cultural background and review capability. The scope is to determine what in military language is called penetration or point of maximum vulnerability of the enemy where the future action should concentrate to get a maximum efficiency and effectiveness. The approach in a partial and fair manner of all processes included in this stage of the cycle is critical related to the success of the further stages.

■ *Determination phase* defines the further actions, determining exactly both their kind and type of resources needed to successfully completion. Their concentration range shall be determined and, after that, the resources will be allocated and provided. Therefore, the Determination phase is a preparative one, pointing out the preparation grade for development of action through the level of all available resources, both the human and material resources needed to manage a complex event. At the level of this phase the previous processes which are cognitive will be transformed under a

tangible form, a logistic form for re-orientation and re-distribution of resources.

- *Action phase* completes the cycle and now the planning and prepared actions into the previous stages will be finalized. According to the military theory, the actions should be quickly, and firmly executed and focused on the penetration point, taking permanently into account the economic principle of forces as a large quantity of resources should be concentrated when the action is on the penetration point. The dissipate of forces in this phase might have catastrophic results, because it is known that lack of resources at the level of penetration point is the most encountered reason for failure.

The point for starting the next OODA cycle coincides with the completion point of Action phase. At this moment, the consequences of all previous executed actions will be identified and correlated with the recent information and in this way each stage of the cycle has a direct influence upon the next ones until the final objective is fulfilled and all activities are completed.

Thinking based on cycled processes is advantageous for planning successful strategies in different field of activity as reality shows and it supports the competitiveness creating an effective and effectiveness background for anticipation, evaluation, and control of critical situations.

Note

⁽¹⁾ According to www.wikipedia.org

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