



THE SHIP PERCEPTION AS VIRTUAL ORGANIZATION IN THE PROJECT MANAGEMENT

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Abstract: *The ship design as a virtual organization is based on the cooperation among many organizations and on the designing team members' activity that are in different locations, the communication being eased by IT technology by the possibility to establish network type relationships among the project partners. In this paper are presented the scope and the advantages belonging to the organization pattern of the ship design as virtual organization. Specific aspects of the virtual organization are comparing them with shipbuilding requirements and taking into account the latest methodologies of approaching the project management and the use of the network type relationships among the cooperation partners to the ship design. It is presented a project organization chart of an integrated project organization which is developed based on the knowledge of the partners within the ship design.*

Key words: *virtual organizations, ship perception, project management, informatics' integrated systems, network relationships.*

1. INTRODUCTION

The project management, as science and profession is in a continuous development, under the pressure of the economical environment which is more and more competitive and project oriented, and the new project management methodologies use become vital for any organization. A good methodology applied to the projects supplies the working frame, the processes, recommendations and the techniques required to lead the project involved people and to assign them with activities, increasing the chances to obtain success and adding value to the organization and to the project.

Goldman, Nagel and Preiss consider virtual organizations as a situational alliance of complementary core competencies which are distributed over a number of organizational units of a company or group of companies [4]. Bullinger defines virtual organizations as "temporary horizontal and/or vertical location-independent cooperation of different companies". Through the combination of the core competencies different companies can cross over organizational boundaries [1].

In this paper is presented a superior organizational model of ship design, in modern vision of project management. The model which is presented approaches the ship design, as a virtual organization, taking into account the area practices and competencies, the complexity and the project particularities in general. In this project organization model new managerial developments such as integration of partners and virtual communication structures are considered.

The major advantages of the project virtual organization are connected by any partner possibility to intervene in any moment in the project, these advantages leading to increased quality and technological performances of the designed ship, its decreased costs and the reduction of

the building time, essential conditions to increase the ship market competition.

The actual projects performed in the shipbuilding field in Romania, involving their technological complexity, the competition among the world greatest builders, as well as a higher respect for the value of the project manpower, bring into attention the need to approach the project as a virtual organization, the superior organization shape of the project management classic patterns.

The shipbuilding project approach, from the modern methodologies perspective, shows multiple advantages, mainly when compared to the complex and innovative issues which the contemporary organizations are facing [2]. The ship design brings together the needs and ideas of many functions from the ship operator, ship owner, planner, procurer and producer. Without proper integration and collaboration, the end product may not satisfy anyone. Design is a process of synthesis and integration covering many disciplines. Successful design depends on knowing what information is required, how to get it, and how to use it.

The current configuration is likely to be a 3-D computer model that all design team members have access to by means of a network, but that can only be updated with the approval of the team leader.

2. THE SHIP DESIGN PERCEPTION PERSPECTIVES AS VIRTUAL ORGANIZATION, IN THE ROMANIAN ACTUAL CONTEXT, COMPARED TO THE WORLD TENDENCIES

The world ship industry is in a very quick progress, science and technological build-up being more and more accelerated. This situation led to separate company consortium with the same program, inter-coordinated, meant to achieve the ship-product [5].

The consortium consists of shipyards, engineering organizations, suppliers, contractors etc., which are partners and work together to draw a project by means of an IT network, based on the individual experience of project development. This was possible due to a good management development that imposes the use of integrated IT systems, starting from the engineering phase (production preparing) and is based on the Product IT Pattern concept.

The design is an iterative process, especially in the early stages, being a team effort in the same time. The team will always include naval architects, engineers with CAD skills for 3-D modelling using the computer, structural, mechanical, and electrical engineers. Shipyard personnel with expertise in ship construction and production planning are needed, as are equipment suppliers with specialized expertise regarding the systems and equipment they offer, as well as the one or more ship owner's representatives [6].

Good relationships between the design team, the ship owner-to-be and the design team's management can foster mutual understanding, speed up the design process by getting critical design decisions made more quickly, and produce a better product.

It is important to mention the fact that, some activities package externalization, such as production preparing, respectively the process and product research, ship-product design and the fabrication technology, is nowadays used at a large scale in Europe and worldwide.

Starting from the idea of drawing some building and technological documentation which will allow complete projects supply and according to the designing specifications of the ship owners, in present times there are in our country engineering organizations, endowed with hi-tech means for theoretical and experimental research, having the required resources to design different ship-types.

Having this background and knowing that to achieve engineering foreign designers are bringing their share, by means of the documentation brought by the ship owner, the designing offices of the Romanian shipyards, the research organizations, the classification registers, equipments suppliers and contractors, appears compulsory their integrated co-participation by achieving some permanent connections through the IT networks. In this way, some equipments and installations selection can be done, taking into account the their technical features, the price and the delivery deadline, starting from the beginning phases, respectively the moment in which the general conception is drawn and based on that, bidding the ship product. Thus, the key suppliers represent an important part in the ship design.

Significant role have the classification societies which can be very helpful in suggesting technical alternatives and establishing the rules that must be obeyed. The designers should confer with the revising classification societies during the design period. It is very important for the design team to identify all the applicable design standards at the beginning of the design effort [7].

The ship designer is considered as an integrator of countless sub-systems in only one - called the ship. In order to make this integration, it has to have in the designing phase the communication freedom with all the production levels. This communication is the first and a

must condition for designing/ production to be successful.

In the designing process trial ideas are drawn as a sort of pre-projects. These have to be analyzed and checked to correspond to the requests. Based on these checking results, the variants are corrected, the new ones are evaluated and the whole process is repeated until the desired features are obtained, that means a good project for more detailed further analysis.

Up to the final analysis of the main project variant, it is often required to check simultaneously several variants.

The decision to place on the project base one or another option is the result of some comparative analysis having in mind economic criteria or of other nature, therefore sketching the phase called preliminary design. In order to analyse the project it is necessary to precisely determine the data and conditions system that describes the running of a new ship and the criteria towards which the design is heading. At the first designing stages, it is necessary to find out which is the designing purpose, therefore justifying the research-designing amplification effort.

The design process is subdivided into phases. One reason for this is that the nature of the work done, the design skills required, the number of persons participating in the design effort, the level of detail of the design deliverables and other features of the design process change over time as the design is developed. Design management is facilitated if the effort is divided into phases separated by intervals, which permit design reviews to occur, along with planning and preparation for the next design phase. Another reason for phasing a design effort is the major milestones in the typical ship development process.

The phases of the ship design are shown in Fig. 1.

Thus, after completing the feasibility study of the shipbuilder, drawn in co-operation with a special consultant, the general optimum choices have to be picked, to comply with the ship owner's market study and evaluating the builder's possibilities. The conceiving study follows in which the actual building and technological choices are explored, studying the effects on the ship performance and manufacturing efficiency and than it goes to the preliminary design. In continuation, the technical design drawn as a stage from the gathering of all the documentations required by the classification registers, establishes all the main building choices. This way, a common working frame is created, respectively it can be organized the building designing by spreading the components to the specialized teams on different fields (hull, machines, installations, electrics, arrangements, etc.) [8].

It can be referred to as a building and technological phases melting, with the same procedure, so that to be able to perform as frequently as required a technological-building recurrence, in order to improve the choices.

The phase term in the ship research-designing is determined by the fact that at each of them, with continuous increasing detailing degrees, a complete ship analysis can be performed as a whole; all the components are added and the result become every time an iteration a new product configuration with its features and performances,

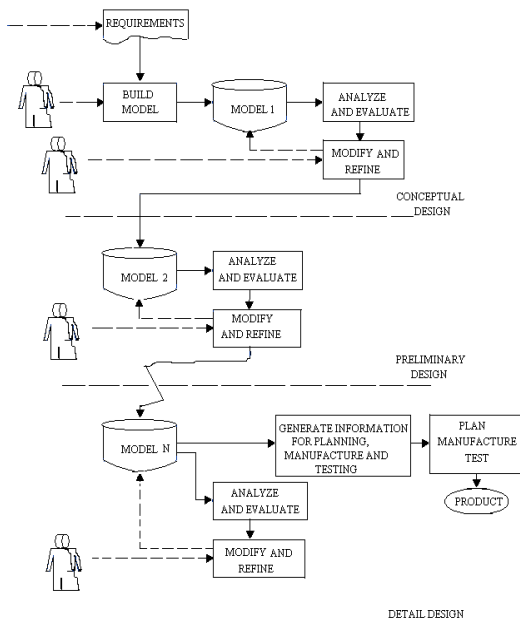


Fig. 1. Ship design phases.

finally ensuring the reach of the project initial strategic objectives.

The process structure of the ship design is done through this continuous repetition, progressively refining the dimensions both in quantity and quality.

On short, it results that stressing on taking into account the engineering process features, its cyclic nature of passing the phases, in a continuous search for the optimum choice, each of the engineering stages stand for a “a new project”, vaster, more developed, in the sense of gradual evolution up to the final ship design.

Presenting these aspects regarding the ship designing, anticipates the opportunity of considering the project as a virtual organization

3. THE SHIPBUILDING PROJECT APPROACH AS A VIRTUAL ORGANIZATION

The perception of a project as a virtual organization promotes the fulfilment of integration functions through [3]: the adequate distribution of tasks between the cooperation partners which leads to the optimal use of core competencies, a conscious development of the project culture, the development of a common ICT infrastructure and the qualification of the members of project organization for virtual cooperation.

The virtual characteristics of projects place new requirements on the members of the project organization: corresponding ICT know-how, social competencies for team work with new cooperation partners and the willingness to apply core competencies without redundancies.

Team work in virtual projects have to taking into account the fact that team members are in different locations without a common workspaces, that supposes combination adequate communication forms at a distance (fax, e-mail, telephone conference, video conference), as well as, establishing special rules for communication (immediate confirmation of e-mails, visiting team members by the project manager every 2-3 weeks).

The prerequisites for virtual project organizations are network relationships between potential cooperation partners. The social network serves as a basis for the temporary project organization and delivers a frame of reference which makes an efficient and rapid establishment, problem solving and following dissolution possible, without having to enter into time-consuming negotiations beforehand.

The tasks of networks are, among others, the admission of new network partners, the development of a culture of trust between the network partners, the development of a common ICT infrastructure and the development of common rules of play. The processes of common product development as well as acquisition and fulfilment of contracts are to be described, questions of liability for defects and damage are to be clarified, common conditions and practices are to be laid down. Common objectives of all partners, a common terminology and common standards, such as project and programme management approach are to be agreed upon.

A decisive factor for the success of virtual project organizations is the availability of a flexible ICT infrastructure which enable a quick adaptation of new products, processes of ICT systems of changing cooperation partners. The ICT infrastructure should, on one hand, fulfil the prerequisite for decentralized access to information which is stored centrally and, on the other hand, support the rapid bringing together of expert knowledge which is distributed. In addition, the simultaneous distribution of information to all partners. The simultaneous distribution of information contributes to the building up of trust.

In the Fig. 2 is presented the project organization chart of an integrated project organization, which is developed taking into account the involved organizations in the ship design.

An “integrated project organization” is a project organization whose are representatives of different organizations. The members can be: the specialists of the project team (steel and structural designer, interior designer, electrical designer), the representatives of the ship owner (naval architect, operations supervisor, subcontractors’ representative) and the representatives of the shipyard (outfitting designer, machinery designer, production engineer).

The representatives of the different organization take on different roles, in the design of the project organization. Thus, a representative of the ship owner together with a representative of the main subcontractor, make up the project customer team, and the project manager can be a member of the ship design institute, which is the project contributor.

This organizational design, even without contractual obligations, results in the application of a uniform project management approach, the use of a single project manager and the development of common, integrated project plans. All these require a high level of openness and trust among the cooperating organizations [7].

The way the partners of the different organizations perceive their roles must include the apprehension of a holistic project view, the assumption of the entire responsibility for the project and the fulfilment of project marketing tasks.

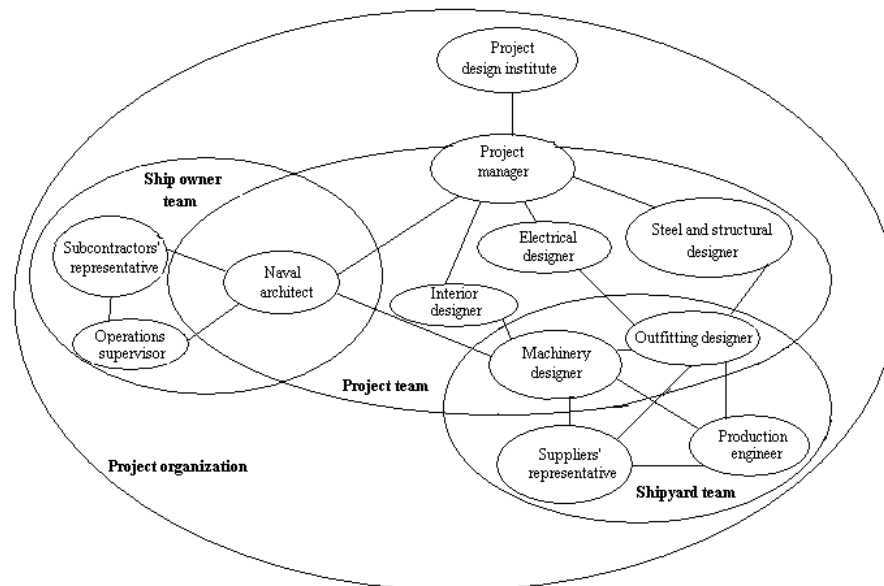


Fig. 2. Project organization chart of an “empowered” and “integrated” project organization.

For this, the empowerment of the project team members, the project team and the project is required.

The empowerment of the project team comes about through the inclusion of the project team in project management decisions and through the transfer of the authorities of WHAT?, WHEN? and HOW MUCH? to the project team.

The project team takes over the responsibility for the project success. The project manager, as a special role in the project team, is responsible for the professional project management.

4. CONCLUSIONS

The idea of cooperation networks is to gain more efficiency as each partner is concentrating on its core competencies.

Today, ICT can support both a more efficient integration and co-ordination of activities and the geographical distribution of the involved parties by:

- shortening communication lines;
- improving visibility in progress;
- increasing controllability of scope, time and cost.

The advantages that are worth mentioning in respect of the ship design as a virtual organization are as follows:

- partnership-oriented organization, poor in hierarchy and with little formalism;
- the existence of a culture of trust;
- integration of core competencies along a value-added chain;
- cooperation of organizations at different locations;
- temporary cooperation between independent organizations;
- only one project manager;

- common project plans;
- common and formal communication structures;
- problem solving and following dissolution possible, without time-consuming negotiations;
- common organization of the project, in which the representatives of the different organizations take on different roles.

REFERENCES

- [1] Bullinger, H.J. (1996). *Lernende Organisationen*, Schaffer-Poeschel, Stuttgart.
- [2] Calvano, C. N., Jons, O. and Keane, R.G. (2000). *Systems Engineering in Naval Ship Design*, ASNE Naval Engineers Journal, Virginia.
- [3] Gareis, R. (2005). *Happy Projects!*, MANZ Edit., Vienna.
- [4] Goldman, S.L., Nagel, R.N., Preiss, K., Warnecke, H.J. (1996). *Die Strategie der virtuellen organization zum Nutzen des Kunden*, Springer, Berlin, Heidelberg.
- [5] Jons, O. P., Ryan, J. C., and Jones, G. (1994). *Use of Virtual Environments in the Design of Ships*, ASNE Naval Engineers Journal, Virginia.
- [6] Lock D. (2000). *Project Management*, Sixth Edition Gower Publishing, UK.
- [7] *** (2006). *Virtual Ship Project*, available at <http://www.virtualshipproject.com>
- [8] *** (2007). *Virtual Design-Build Organizations: Enabling Process Change in the Building Industry*, available at http://www.jcarchitects.com/virtual_orgs.html.

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