MANAGERIAL CHALLENGES AND LIMITATIONS TO INNOVATION AND GROWTH IN ROMANIAN PROJECT BASED COMPANIES IN THE ICT SECTOR

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Abstract: *One of the fastest growing and most productive sectors of Romanian economy is the ICT sector. Romania has historically had a relatively large pool of well-educated IT engineers to organize this industry around. Consequently, both Romanian and foreign owned ICT companies, have been opened and growing at a fast rate. Nevertheless, the sector faces challenges to its ability to climb up the value chain and international competitiveness. Some of these are external challenges such as international competition or the national supply of software engineers which has been reaching its limits. Others are internal managerial/organizational limitations related to how companies in Romania are able to adapt and innovate. This paper focuses on the later: internal challenges and limitations that project and technology-based companies in Romania face' which may their competitiveness and ability to grow. Christensen's theoretical framework is employed in looking at organizational limitations at three levels: the management of resources, processes and values. We also rely on management literature related to project based organizations (PBOs). Suggestions of such limitations and challenges faced by project-based firms operating in the Romanian ICT sector are developed based the authors' experience of working with such companies in the last 10+ years. This paper concludes that oftentimes some specific basics of project and organizational management are systematically ignored or misapplied, fact that may lead to significant inefficiencies. Overcoming these limitations is essential for companies to succeed and grow in the medium to long term.*

Keywords: *Project based firms; project management; Information and Communication Technology (ICT); Innovation*
JEL Codes: *M100 Business Administration: General*

INTRODUCTION

The Information and Communications (ICT) sector has been one of the most dynamic in the Romanian economy and in comparison to EU ICT sectors, as Figure 1 below shows. In the interval 2000-2017 the sector has registered 251% growth which translates to an annualized average compounded growth of 7.2% well above the average growth of the Romanian economy.

This sustained growth was much due to the existence of a well-qualified and, proportionally to the population, numerous workforce, given a strong tradition of education in technical universities in Romania. This pool of ICT engineers enabled Romanian companies in the sector to grow and attracted numerous foreign companies. Large multinational players in the field such as Microsoft, Intel, Oracle, etc. have opened branches in Romania. Romania itself has produced some "unicorns" through companies like UiPath or Bitdefender.

However, there are significant challenges to this sector. Some of these challenges are related to the international competition. Others link back to the domestic supply of qualified IT personnel: despite the proportionally large workforce, the demand is even higher. Still other kind of challenges are managerial and relate to Romanian companies' abilities to manage their activities efficiently.

This paper focuses on managerial challenges and limitations for Romanian companies in the ICT sector. Much of the work in the ICT sector is project based. We therefore look at the suggested managerial issues from a project management, but also from a "meta-project management" perspective, i.e. the management of the project-

based organization. Our suggestions of managerial issues are based on a combined decades long experience in working for or with such organizations. Since this experience was not planned and structured for the purpose of this paper, it does not have the character of a case study. However, we see this as a useful exercise in hypothesis generation for what may be some managerial challenges and limitation in Romanian IT, project-based companies.

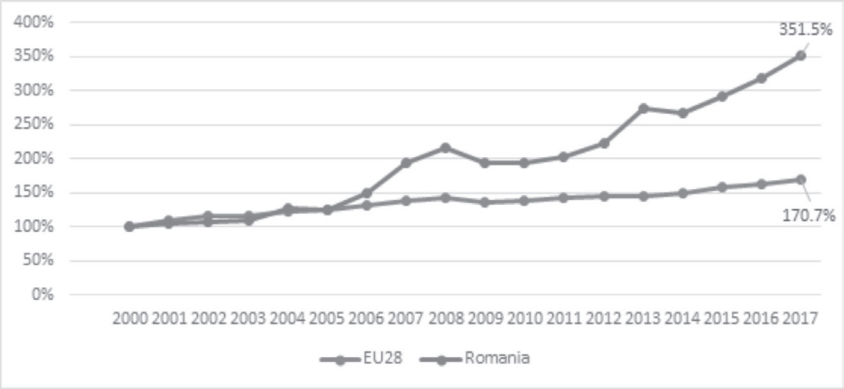

Figure 1: ICT Sector Growth in Romania and EU28 (constant 2019 Euros at PPP, 2000=100%).

THEORETICAL FRAMEWORK

Projects are understood as "planned set of interrelated tasks to be executed over a fixed period and within certain cost and other limitations"(BusinessDictionary.com, n.d.). Unlike other work organized as processes, projects have unique goals and take place over a defined period of time (Scarlat, 2014). Project work is increasingly important in a modern neo industrialized economy (Ekstedt et al., 1999). For many firms/organizations, projects represent a large part, a majority or even the totality of their economic activity. This has led to an increasing focus of the management literature on project-based firms or organizations (PBOs). Project work tends to be more prevalent in industries producing complex products or services (CoPS) (Hobday, 2000, 1998). Such sectors are the film industry (Baker and Faulkner, 1991; Ferriani et al., 2009), music (Lorenzen and Frederiksen, 2005), construction (Eccles, 1981), biotechnology (Powell et al., 1996), etc.

Project work is very widespread also in the IT sector, be it hardware, software, multimedia or IT related business services (e.g. consultancy) (Ibert, 2004; Sydow et al., 2004). While some work in the IT sector is organized around providing Commercial-off-the-shelf (COTS) products (e.g. selling hardware products like laptops or mobile phones, or software packages, etc.)– and this can be a very lucrative business especially for large scale production, much of the rest of the IT sector produces integrated and customized solutions (for private or public organizations). Integrated and customized solutions are usually built on various hardware and software technologies which require integration (interconnection and working together), customization and often significant software code writing. The later kind of products and services are more amenable to project work.

A PBO means more than simply having most of one's work organized a projects. PBOs may also refers to how a firm/organization is organized to manage projects. "In contrast to the matrix, functional, and other forms, the PBO is one in which the project is the primary unit for production organization, innovation and competition" (Hobday, 2000). Depending on how much of their business is based on projects, organizations/firms may be structured differently from the more classical functional shapes to the pure PBO. Based on prior literature distinctions, Hobday proposes a typology of 6 types of organizational forms from pure functional to PBO:

A. Functional;
B. Functional Matrix;
C. Balanced Matrix;
D. Project Matrix;
E. Project-led Organization;
F. Project Based Organization.

In the following we employ the concepts of the project-based organization literature to analyze some challenges and limitations of Romanian IT sector project-based firms. We also find it useful to employ Christensen and colleagues' (Christensen, 1997; Christensen and Overdorf, 2000) threefold distinction between: resources, processes and values to structure the focus of our analysis. While their attention was rather more focused on disruptive changes and innovations, we find this framework useful even if we talk of more gradual changes.

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Resources

Human resource planning and allocation.

Because of the temporary nature of projects planning and allocating human resources PBOs in general and IT PBOs in particular is specifically challenging. At peak times the demand may stretch the internal resources of a firm, while at other times low demand may lead to unused resources and inefficiencies. This is why careful attention to resource planning and allocation is a must in such companies. Yet, many of the companies we encountered had a rather casual approach to this aspect.

Although formally it was recognized that this was an important aspect, in practice there was little systematic approach to resource planning. This happened at both project management and meta-project management levels. At project management level, human resource planning is often vitiated by the fact that the project managers themselves are overworked often having to manage several projects at the same time. In addition, key senior resources such as technical leaders or senior analysts are not allocated early in the project such that work, and resource planning would be as realistic as possible. At meta-project level the approach tends to be rather less systematic than it needs to be, partly because people in charge of taking an overall picture of project needs are not the same as the actual decision makers. The work of the former is not given the attention it needs, as the later tend to be overwhelmed by current issues and emergencies (often for lack of earlier planning).

An additional issue in human resource planning is that often management tend to underplay the actual resource needs of projects. Absent a systematic view of projects' needs and trust in the needs evaluation process, the view of management is that downplaying the resource needs is not just a reflection of lack of available resources at times, but it is viewed (often wrongly) a means to achieve efficiency by telling project managers to do with less. Some managers are hesitant to committal of resources thinking that maybe they can do without and thus save – in the end – financial resources. Sometimes that lack of understanding from management of some project work, or the work of some specialists, or of the scaling of work with an increased complexity of projects, may reinforce this attitude.

The end result is that projects, either encounter delays (and resources still need to be involved later), or the end result may lack in quality which may jeopardize the relationship with the client. The paradox is that not allocating resources in time and sufficient quantity may result in more resources having to be used in the end since some work done in a hurry and understaffed may need to be redone.

The lack of a systematic approach to resource planning an allocation leads to a domino effect in such companies. Projects and project managers are always scrambling for qualified human resources. Many allocations are provisional, PMs may be promised resources on paper, but when it comes to their actual involvement they may nor receive them as scheduled (delays, different people than promised doing the work, etc.) PMs have to waste time as they need to lobby the human resources or management to actually obtain the needed personnel to do their work. Conflictual dynamics may arise also as PMs compete for resources in an environment with unclear rules for resource allocation. This may lead to a domino effect between projects. If one project is in crisis (because of lack of appropriate planning) then resources may be taken from other projects to mitigate that crisis, but this may lead other projects to enter a crisis situation. To cope with the ongoing resource allocation issues, managers/ decision makers end up not having much time for systematic planning, which leads to the whole cycle repeating.

Technological resources

IT services companies never work from scratch. They need other technologies supplied by other IT companies to complete their work. Whether they use them as base/platform technologies on which they build, or they use

them as tools to manage various internal core work (code writing, testing) or auxiliary functions (accounting, document management, etc.). Our experience with the use of such resources is that while such companies do indeed use such various technologies, the approach to their use is unsystematic and often unbudgeted at company level, except for project specific budgets for licenses needed for those specific projects.

It is most often employees in an ad hoc manner that decide which software solutions to use for coding, testing, specifications writing, graphical design, etc. Most often is open source solutions are satisfactory then they are downloaded and installed without hesitation (which may pose other problems of security, compatibility, etc.). The problem appears when such solutions are not satisfactory. For few such technologies a company wide approach is taken for example for purchasing office packages which all employees use. However, the renewal of licenses is rare, leading to the internal use of obsolete versions.

Other technologies which are not so widely used such as expensive graphics packages require a complicated back and forth between employee and management, with that technology being either rejected (or their purchase and installation indefinitely postponed) or their purchase significantly delayed. Some solutions for internal auxiliary functions such as internal document and process management solutions are often not used at all, leading to internal requests and various other processes being handled in the old paper-based manner.

Knowledge resources

Learning and knowledge management are inherent problems for PBOs (Hobday, 2000; Scarbrough et al., 2004), and Romanian IT companies seem to be no exception here. But it seems that many problems can be avoided through a more systematic approach to knowledge management.

In the cases we worked with, there was usually little systematic approach to building on previous knowledge. This partly relates to planning technological work within projects. The choice of technologies used was often made in an ad hoc manner by experts, however without a wider view of what work had been already carried out by the company. Little reuse of prior work was done leading to both waste of human resources in “reinventing the wheel” but also to little knowledge building and valuing prior knowledge and experience.

Further on, and more directly related to knowledge management, the mechanisms for reusing knowledge are usually rather ad hoc and not based on a comprehensive and technology supported approach to knowledge management. Knowledge about work carried out in prior projects is held by the teams who worked on those projects and documentation, while stored in an electronic format in a network folder, access to those files is not systematically managed and searchable. Accessing old files requires usually informal ad hoc discussions with project managers or other members of the team to identify possible relevant information and then obtaining more detailed files if they are identified as relevant. The unavailability of the PM or other senior team members (temporary or permanent, if the person left the firm) leads to the almost impossibility to find out that relevant information. Despite this problem, it is rare that such companies implement an internal searchable project knowledge system.

Process and organization

Larger Romanian IT companies doing significant project work tended to be organized in ways that reflected some degree of departure from classical functional organizations, but far from having made significant steps toward the organizational style of a PBO. Wider departments tend to reflect some functional lines and account types depending on the type of clients (e.g. education, healthcare, etc.) but the kind of experts working within those departments are most of the time the same across departments with some variations and some experts having a need to be more specialized in that specific are, while others’ competences being completely transferable across areas and departments. Planning and allocation decisions belong to departmental managers. Project managers have little autonomy and control over resources which contributes to the problems described above. Some departments such as financial, marketing or legal tend to be mostly organized like classical departments, seeing themselves as serving the company, while their project involvement is seen as secondary and limited. Project managers have little to no control over resources coming from these departments. For every task they need to make a specific request, and this request is answered depending on overall availability of personnel in such departments.

Related to overall processes in such companies, there tend to be some disconnect between formal processes and the way actual activities take place. As mentioned with regard to human resource planning, some degree of formal resource planning takes place and is done by specialized personnel. However, many of the shorter-term personnel allocation decisions tend to trump formal planning, as many urgencies are seen to take precedence. Similarly, as mentioned, technology management is rather unsystematic and unplanned. Where larger Romanian companies often "excel" is in having a multitude of paper-based procedures and forms for internal bureaucratic work, but little effort is made towards their digital implementation.

Values

Many of problems illustrated earlier, have their manifestations and lessons at the values level. The rather unsystematic approach to planning human or other resources illustrates a certain attitude toward systematic management. On the one hand there is a certain complacency with regard to what carefully planned management can achieve, and an abandonment in the face of chaotic circumstances. One cannot do much in long term planning, rather one is bound to deal with problems as they appear short term. On the other hand there is some pretense or "realism" of this style of management: management as dealing with chaos is good "realistic" or "real world" management, while management based on principles, planning instruments, etc. is rather theoretical and belongs in the books.

Other issues discussed, especially issues related to the management of technology tools and knowledge management illustrate a *gap between predicated and practiced values*. Romanian IT companies like to perceive themselves as innovative and modernizers of their clients. However, all too often, such companies fail to modernize themselves in the process, forgetting the adage that change comes from within. This may also lead to a *culture of cynicism and disengagement among employees.*

CONCLUSIONS AND LIMITATIONS

This paper has reflected on some managerial challenges and limitations of the management of Romanian project-based IT companies at the level of resources, processes, and values.

The main limitation of our paper is that of being the result of a rather post factum reflection of the author's experiences of working for or with Romanian companies in the ICT sector. As such the study lacks the systematic pre-planned nature of a comparative case study analysis. Nevertheless, we believe our analysis is a good beginning of studying this area and may be a source of hypothesis generation for future more systematic approaches to empirical data collection. We think that our experiences expose some relevant challenges and limitations of management in the Romanian IT sector. Overcoming these may enable this sector to further advance and become more innovative and competitive. That said, much work is needed in the research and practice of management in this sector to achieve such results.

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