

# TRIANGLE OF INNOVATION IN IT INDUSTRY

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## ABSTRACT

In last decade, Romanian IT sector register a sustained grown up, accordingly with official statistics. Also, by Romanian adhesion to EU, the emergent market to this sector is growing to entire European coverage. So, new technologies must be applied, together with relative low cost for labor, in order to maintain advantages in front of competitors. In this case some innovation and R&D structure has been shaped, bringing together enterprises, education organisms and government subsidiaries. So, in this article we will debate three different R&D structure types, in context of innovation, structures that are working in Romanian-American University.

**Keywords:** innovation management, information systems, R&D management, knowledge management.

## 1. INTRODUCTION

IT last period development produces a large scale movement, from old style of manufacturing to e-business concept. A more refined view, offer an image of IT usage, among the product and business lifecycle. This, together with the globalization process, having no commercial border for large, emerged to special developed sustaining effort for SME's in early stage of development. Many of this, accordingly with current studies, considering the Total Cost of Ownership (TCO) for the services offered by IT, and also the lack of knowledge about the targeted market (because of high costs implied to realize effective market studies, as principal source of failure.

Large companies, with a larger IT budget extensively use sophisticated informatics tools to sustain their activity, such as CRM (Customer Relationship Management), ERP (Enterprise Resource Planning) or PLM (Product Lifecycle Management). Also, the software suppliers propose large training and customization process, many of this being unsuccessful or are not accomplish the required ROI. The benefits of large e-support for business and manufacturing is indubitable, but in early stage of SME development, the resources immobilized for achieving this technology could be used for other purposes, as potential for needed growth.

As a result of large automation of governance activities, more data became available, as a support for specific decisions. The funding R&D activities, assured from public budget implies rules, strategies, policies and target domains, which together are used to define R&D funding governance policy. Similarly, we define Governance Performance Management (GPM) as a set of processes used by government to sustain the funding decision from public funds in different fields.

GPM involves various activities, starting from data collecting from different sources and consolidation, querying and set an analysis method, in order to offer efficient structured information, which will be used in funding decision-making activity [3]. Also, another role of GPM is to discover, in early stage, anomalies in funding process, before that can seriously affect the entire funding program.

Furthermore, the same system can be used to establish the R&D budget, for specific programs or fields, in accordance with previously efficiency of funding. So, the main GPM responsibilities' is to discover, to predict and to deliver useful information in decision-making funding process.

By excellence, R&D is an activity having a major risk coefficient, so preliminary risk evaluation must be made, in sense to be assured that the R&D funding contractor has the financial and technical potential to develop the R&D project, Other direction of risk evaluation is to evaluate the R&D project itself, as a set of activities developed by a contractor or a consortium of contractors.

Contractors' evaluation is made by analyzing a set of mandatory documents presented in original once, by recording the institution in Potential Contractors Register. Those checks are mainly oriented to R&D contractor capacity and have no debts to state budget [1].

Romanian research system covers more then 700 private and public entities, having R&D as principal domain of activity. So, are registered 74 universities (56 public universities and 18 private universities), 38 R&D national institutes, 327 public entities subordinated to Ministry of Education and Research or other ministries, Romanian Academy and over 270 enterprises with R&D main domain of activity.

As R&D personal, last record published by Romanian Ministry of Education and Research, present as being 39 985 persons, with 25 785 researchers and 6 400 PhD's. The majority of researchers (53%) are in Engineering and Technical Sciences. As age repartition, 1-2% decreasing is registered for 30-49 years old and 2-3 increasing for over 50, comparatively with last year records. The main age group is 40-49 and less than 30 years old is relatively constant, having 14% from total researchers [4].

The main funding instrument of Romanian R&D is Research, Development & Innovation National Plan, launched in 1999 (RDINP I), covering the period 1999-2006. In 2005, have been released another funding instrument, Research of Excellence Program, with main objective to increase the competitiveness and strengths of Romanian Area of Research, having as imminence the adhesion of Romania to EU. In 2007, is preserved to launch another research program, as a continuity of RDINP I, named RDNIP-II, for the national funding period of 2007-2013.

In 2010 is estimated an increased for R&D funding up to 3% of National Budget, where 1% will be assured from Romanian Budget and 2% from external sources.

## **2. THREE WAYS TO REACH INNOVATION**

So in this, context more efforts must be made by funding managers, in hope to a better spending character and to assure an increased ROI for each project funded from public sources. A solution for SME support is the business incubators, as growth catalyst, space where, 20-30 SMEs are developing together and use in common information and resources. So, first advantage to be incubated is a preferential rent for bureaus and manufacturing facilities. Second advantage is to have for free business and manufacturing consultancy and technological transfer. A third is advantage is the usage of IT infrastructure and common knowledge database (Botezatu, 2006). The incubation is divided in two periods. First sixth months for incubation, the rent and all other services are for free, only new SMEs being approved for incubation. In the next period the price for above mentioned service is increased, for each month. The purpose of incubation is not to funding indirectly the SMEs, but with this facilities granted, the objective is to assure a better rate of survival in the most critical period of development for an enterprise.

A second structure for reach innovation is Innovation Centers, where new IT technologies released on market, are sustained by training oriented to industry users such as: enterprises employees, academic staff and students, assuring in that way the knowledge consolidation. The Microsoft Innovation Center (MIC) is set inside of Faculty of Computer Science for Business Management, being a link between academic environment and industry, increasing the efficiency of innovation transfer.

Worldwide it exist more than 60 Microsoft Innovation Centers, the mentioned one being the first of its kind opened in Romania oriented business software applications. Microsoft Innovation Centers are training, innovation and research, being opened in high education institutes, assuring a large set of programs and services for students, teachers, researchers and partners. The center objectives are to assure

a better education by technology, accelerating innovation and facilitating the link between academic environment and industry [5].

Beside education and new technology new products and services must be injected into the market. So, as third way to reach innovation is to assemble researchers on Research Centers. Those structures are assembled usually in universities or other similar organizations. Research centers are oriented to funded research, from RDNIP-II, FP7 or other similar funding structures. In our case, we will detail later RAU-INFORTIS Research Center.

### 3. INCUBATOR STRUCTURE AND SERVICES

The Business Incubator (RAU-ITA) is set inside of Romanian-American University with the support of Romanian R&D Ministry INFRATECH Program. The IT infrastructure project is covered by a wired network connecting 40 computers and 2 servers, all together with a database system which will detailed in figure 1 [2].

Furthermore, a over 800 sqm. building space is offered for SME activity, encouraging by low rent prices and annexed services the SME incubation. The incubator will offer technical support for at least 20 SME, from industrial domains such as: automation, IT and applied informatics. Another target share is services for those above mentioned domains, including long life learning. The Incubator facilities and services are:

- Entrepreneurs and employees training;
- Manufacturing facilities, including industrial equipments;
- Administrative and secretariat services;
- Support for SME registration and preparing the business plan;
- Equipment acquisition and technological transfer;
- Technical/economical evaluation of products and services produced by incubated SME;
- Industrial lobby or other promotion service to develop new products or services;
- Management strategy and administrative planning to achieve objectives in different domains: manufacturing, technological transfer, sells / acquisition, marketing, finance;
- Funding and financial guarantees for SME, international cooperation a “joint venture”.

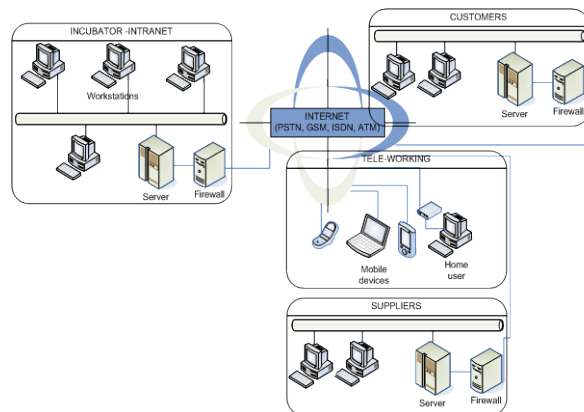


Fig. 1. Incubator IT infrastructure

### 4. INNOVATION CENTER

Microsoft Innovation Center offer programs, essential for software industry development, grouped by:

- skills and intellectual capital development (software development courses, business skills, professional certifying programs and training for juniors' employment). Universities use MIC to

achieve continuous teachers learning programs, to develop new curricula adapted to market changes;

- industry partnerships (implying software companies into training curricula, software quality certification, research programs for students). MICs consolidate the connection between academic environments, software industry and Microsoft. Microsoft partner companies and local representative prepare training curricula, pilot programs, workshops, opening new horizons regarding initiative and opportunities for professional carrier for future graduate;
  - MIC accelerate the innovation through pilot programs (e.g. RAU is oriented to business application developing, with Microsoft Business Division and ISV partners;

First Romanian MIC set inside of RAU is clearly focused on business applications, being the result of collaboration between RAU and Microsoft Romania, having as goal to rise the students competences in business applications domain. Beside, MIC where the Microsoft partners are meeting with the students, sharing their experience, to develop new applications, testing programs into different hardware and software architectures. RAU is part of Microsoft Dynamics Academic Alliance Agreement – EMEA.

Through this initiative, Faculty of Computer Science for Business Management, which has undergraduate and graduate in Economics Informatics, reconfirmed by RAQAHE (Romanian Agency for Quality Assurance in Higher Education), propose:

- to create new connection between academic learning and professional skills from labor market, helping to develop those computer abilities to have success on employment market;
- to offer a new and actual technological platform and curricula, with modern on-line large learning facilities on Microsoft site. It is proposed to design and develop and to implement of an e-Campus platform;
- to organize courses, workshops, labs and seminars, accordingly with international standards of academic education;
- direct implication of employers in students practice period;

This collaboration starts in 2005, when students from faculty mentioned above follow the course named Business Software Application having as study Dynamics products (Microsoft Dynamics NAV and Microsoft Dynamics CRM). At this course has participated 180 in 2006, 250 in 2007 and for 2008 is expected more then 350.

On graduate academic programs (Economic Informatics and Business Management Integrated Systems) is mandatory the ERP and CRM Integrated System which will use as software platform Microsoft Dynamics NAV and Microsoft Dynamics CRM. The same course is also introduced in curricula of Management Faculty and International Economic Relationship Faculty starting with 2007-2008 academic year, estimated students number being over 400.

A second activity is summer practice period. In 2008, two such stages where experienced, one dedicated to Dynamics product and second to Windows 2008 network platform.

## **5. RAU INFORTIS RESEARCH CENTER**

The third way to reach innovation is to push new product and services into market using incubators or other sells channels. In this case, the funding research, from public or private budgets, is covered by teams formed by researchers, teachers and students, the basic form being the research project. The mission of RAU INFORTIS RC is:

- to develop scientific theoretical and applicative research;
- to offer consultancy for economic processes;
- to disseminate the research results, as is provides in contract, by organizing and participating on scientific conferences or others similar channels;
- Establishing a more close cooperation with the national and international scientific research excellence.

In order to perform the best of contractual obligations RAU INFORTIS RC and has set the main lines of action:

- formation of collective research, which interact to achieve the objectives of contracts;
- orientation of research to cover some areas in accordance with the documents prepared by authorized institutions (CNCSIS, the European Commission - the FP7, etc.).
- design and development of a database required in providing advice on various economic processes;
- streamline business research to create a good reputation in the case of entities like the existing national / international;
- increased relevance of scientific work, the visibility of the act of research at the international, and as a first step of this process, the Center aims to enhance / enhancing the transfer of managerial know-how in the U.S. and the developed countries of the European Union in Romania.

Following the mission and objectives of the Center for Economic Research, are established following fields:

- formation of an organization as a virtual enterprise in the manufacture of globalization;
- modeling activities, processes and material flows, information and knowledge / innovation;
- management and engineering enterprise virtual;
- information systems and decision support systems based on IT technologies and type Internet / Extranet / Intranet;
- application-specific architecture of modern enterprises operating in a digital economy, on the basis of relations B2B, B2C and IB (Business - to - Business, Business - to - Customer and Intra - Business) and e-commerce;
- developing specifications and sizing infrastructure to support virtual enterprises;
- project management for information systems and engineering software used in virtual enterprises;
- training, specialization and improvement of human resources in industry, using technologies and methods of e-learning, distance-learning and multimedia;
- insurance under the outsourcing, certain services in the areas referred to using the facilities of the center.

In domestic competitions research during the period July 3 2007-9 October 2007 were completed 7 of the proposals that 1 project contracted by a cumulative budget of USD 160 000 during 2007-2010, 4 unfunded with scores over 70 points and 1 project declared ineligible. In 2008 where submitted other 8 project proposals.

It was signed 3 agreements of cooperation: technological platforms of Robotics in Romania EUROP\_RO, DAAAM International and Microsoft Romania (Microsoft Innovation Center), are currently drafting agreements with the other 2: INPRO, and UPB.

## **7. CONCLUSIONS**

Business Incubator is an economic development means, created to accelerate the growth and success of small innovative enterprises, by supporting resources and services in the phase of constituting as legal entities and defining innovative pursuits. The main purpose of an incubation centre is producing successful firms that shall approach autonomous and financially viable programs, which will sustain the activity after the incubation period.

Incubation centers are created in order to support and be part of a national strategic framework based on economic developing priorities (e.g. regional development). They constitute an efficient financial instrument for stimulating the SME foundation, the most efficient entities in a market economy.

“Graduator” firms of Business Incubators create jobs, give life to the communities, put new technologies on the market and give power to national and local economies. TBIC owns the facility of offering a reduction of risks present within the economic procedures to new or already existent business: rentals below the market price, access to administrative support services, management, technical and financial assistance etc.

The digital era offer new ways to making business. Their success consists in obtaining the needed information, their refinement and the possibility to execute transaction in real time, together with new risk evaluation methods.

What is new, in the presented study case, is using of a common informational system for the incubated firms, that no longer connect the incubation process with incubation space, meaning that the limitation imposed by physical space could be breached by out-house incubation, possible now by using common IT structure.

Furthermore, this solution offer a request on demand system covering a large volume of information, being offered only the information requested.

In order to sustain the SME in early development and other highly risk activities, which include new technologies involvement more concentrated must be made. Large IT support offer boundless opportunities for manufacturing and business. New technologies are highly costing for SME or independent workers. So, an Application Service Provider structure (ASP), which offer access for many type of users is needed. The main advantages of IT outsourcing is a low TCO, highly quality of services available all the time, having technical support from ASP, conducting to smaller price at TCO (Căruțașu2, 2007).

The second issue, Microsoft Innovation Center, offer access to technology to incubated firms. Also, education for employees and student, teacher or researchers is present at low prices, by concentrating into a single structure. To complete this schema, new product for incubated firms or for wide IT industry are available from the third type of innovation structure, the RAU-INFORTIS RC.

In this context, innovation is sustained by three axes: business incubation, education and research. To do so, is vital to have a concentration of innovation structure, formed by different structures, with complementary capabilities. The authors are managers of above mentioned structures, claiming in this paper the triangle of innovation: business incubation, education and research, in separate structures. The modeling of economic and technical phenomena, implied by a business activity, must be based on Romanian experience but also on EU experience in order to assure more accurate results.

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