

# RCI ICT Activities Introducing the RCI ICT Competitiveness Activities, Benefits and Results

## UTILIZING THE GLOBAL SOFTWARE DEVELOPMENT MODELS FOR INCREASED ICT COMPETITIVENESS IN EASTERN EUROPE

The ICT sectors of the East European countries have gone through significant transformations for the last two decades. A shift from capital-intensive hardware production to knowledge-intensive software production has taken place simultaneously with the creation and development of private ICT sectors. The relevantly well-educated human resources and the long-lasting traditions in ICT, in combination with the competitive labor costs, have been the main success factors that contributed to the rapid growth of the ICT Sectors in the region. The firms in the region, most of which are SMEs, faced global competition with several times larger outsourcing destinations such as India, China, Russia and others.

An important new perspective for the countries, that did not exist when the program was initiated, was the opportunity for small firms and new entrepreneurs to build effective cooperation based on quality, using the latest models for organization and management of software engineering processes such as the Capability Maturity Model Integration (CMMI). The CMMI model is well recognized by the ICT leaders as a de facto standard for advanced software development and delivery of complex ICT services. The complexity of the products and the influence of internal and external requirements and pressures indicate that, in the future, organizational prosperity will be highly influenced by the willingness of the organizations in the region to address process improvement across the entire product development life cycle – from conception through delivery and maintenance. Getting the people-process-technology triad working at its best, is a must for those organizations in the region that want to compete on the global market.

Successful CMMI implementation, particularly in small and medium-sized firms, results in numerous advantages and thus increases the competitiveness of the ICT sector and the whole economy.

Through CMMI process improvement organizations could gain five primary types of benefits:

- **Cost:** reduction in the cost to find and fix a defect; improved average costs for software development;
- **Schedule:** increased percentage of milestones met and predictability of meeting schedules;
- **Quality:** improvement in quality, related to reducing defects over time or across product life cycle;
- **Customer Satisfaction:** recognition on the global market, improvement in customer satisfaction and increased business base;
- **Return on Investment:** positive return on investment from CMMI-based process improvement.

In many cases CMMI is considered as strong advantage for subcontracting in the value chain of multinational corporations such as Boeing, Siemens, Motorola, Toyota, General Motors, JPMorgan and government agencies such as the Department of Defense and the Department of Energy. Therefore CMMI implementation becomes an important step towards increased competitiveness on the global market for high-quality software solutions.

## ADDRESSING REGIONAL CHALLENGES

The initial analysis of the emerging IT markets in the region has identified a number of challenges coming from the specifics of the newly established ICT firms and immature markets in the region. ESI Center Bulgaria as a part of the RCI team had to develop a program concept that can effectively address the challenges and can be implemented in the region. The key challenges are summarized in the table below:

Challenge	Solution	Expected Results
Low level of Process Improvement (PI) benefits awareness at firm, national and regional levels	Implementation of cluster type of projects performed by multiple stakeholders as public-private partnership initiatives.	Creation of sustainable community of practices.
Most companies in the SEE region are micro or small-sized and could not easily allocate expert resources for complex process improvement.	Providing measurable roadmap to customized (simplified) multiple-model process improvement implementation through IT Mark (ESI) service. IT Mark includes improvement and certification guidelines for software process based on CMMI, information security processes based on ISO 27001 and business management processes based on 10sq.	Strong commitment from all relevant stakeholders to an affordable, measurable and achievable process improvement program.
Small and Medium Enterprises (SMEs) are not able to allocate financial resources to initiate comprehensive SPI programs.	Co-funding from business support programs for increased competitiveness of SMEs clusters, step-by-step approach to ensure intermediate business benefits and stronger commitment from the sponsors.	Providing multiple sources for funding of the initiative, including at least 30% of the direct costs for SPI provided by the firms.
Fragmented market with limited experience in PI implementation, lower visibility of ICT/SW industry brand and capacity.	By implementing the "ICT Competitiveness Pyramid" in the countries, even the smallest of them receive the opportunity to collaborate, participate and benefit from the regional brand.	Creation of regional ICT brand recognized on the international and local markets.

## BUILDING ICT COMPETITIVENESS PYRAMID

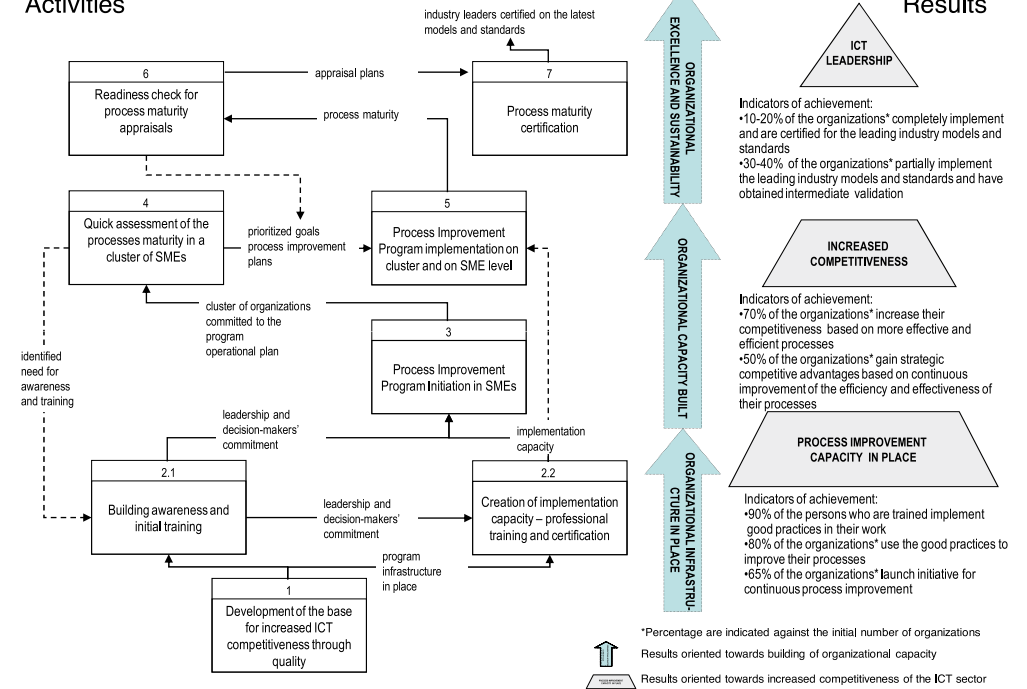
In the framework of the RCI project ESI Center Bulgaria planned a comprehensive software process improvement program named "ICT Competitiveness Pyramid" that addressed the above mentioned challenges. The goals of the program were:

- To build organizational capacity for planning and execution of a process improvement program in the ICT Sector.
- To build expert capacity for process improvement using the latest management and engineering models and standards.
- To support large number of SMEs to increase their competitiveness and cooperate through implementation of process improvement initiatives.
- To support industry leaders to certify their processes according the world recognized models and standards.
- To extend the regional ICT market through promotion of ICT as a tool for increased competitiveness in other economic sectors.
- In order to achieve the Program goals, several groups of activities were planned and executed. A short description of each phase has been provided in the Table below. The overall program is illustrated in fig. "Program Architecture – Sample".

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Activity Group	Short Description
Group 1 Development of a base for increased ICT competitiveness through quality	Analysis of the ICT sector in each country and on regional level. Identification of public-private partnership models, stakeholders, donors and most appropriate interventions.  Building the fundamentals of the program and obtaining strong commitment from stakeholders from the Government, Business and international development programs.
Group 2 Building awareness and training in software corporate excellence , IT security and CMMI	Capacity building through awareness, training and certification of experts and stakeholders.  Creation of management leadership and commitment that are key drivers for a successful and sustainable improvement program, together with providing personnel training in process improvement concepts.
Group 3 Process improvement program implementation on cluster and SME level	Technical and management support to the organizations during the implementation of their improvement plans to ensure that the improvement actions are being implemented effectively and efficiently.  Perform periodical quantitative and qualitative evaluations of the implementation progress and take corrective actions when the actual performance deviates significantly from the plan, in order to ensure that the organization is prepared to undergo a formal evaluation.  The topics that are common for many organizations that participate in the program are discussed in a group session. Exchange of know-how and good practices between the organizations will be facilitated.
Group 4-7 Appraisal of the processes maturity	Review the processes in each organization to determine the degree of implementation and institutionalization of the selected process areas with the objective to identify the potential gaps that must be addressed by the organization to satisfy the goals of the improvement initiative.  Certification against the international standards and models.
<b>Parallel capacitybuilding services:</b>	
Strengthening of the regional market for ICT solutions	Positioning of local ICT products and services on the regional market and development of cross-border cross-sector cooperation in the region. <a href="http://www.IT2Business.org">www.IT2Business.org</a>
Strengthening of the regional capacity for IT quality models implementation	Development of training and certification centers and training and certification community of practices. <a href="http://www.Quality2IT.org">www.Quality2IT.org</a>

## Program Activities



## SUSTAINABLE FINANCIAL MODEL

One of the major objectives of RCI is to ensure sustainability of the ICT activities and to obtain commitment from other stakeholders in the region to the activities performed. The general approach to the funding of the activities includes several levels of funding:

- The initiation activities such as awareness, elaboration of analyses and studies, project planning and management are almost completely funded by RCI (80%- 100%).
- Human resources strengthening activities such as training and qualification are funded in cooperation with other business support programs and the firms that benefit from the respective trainings. The RCI contribution in these activities is in the range of 30%-50%.
- Certification and consultancy activities provided to the firms in the region are supported up to one third by RCI.
- As soon as the programs are successfully piloted in a certain country, external - in many cases non-USAID - funds are used in order to ensure continuation and leverage of the programs initiated by RCI.

## BENEFITS OF THE SPI PROGRAM ORIENTED TOWARDS INCREASED COMPETITIVENESS OF SMALL FIRMS

### Firm level benefits

Four main types of business models are used individually or in combination by the firms supported by RCI. The software improvement program was aligned with the specific objectives of the business model used by the respective company.

- Cost-efficient software outsourcing

The outsourcing model is used by companies focused primarily on software development based on well defined client requirements. The main competitive advantage is the cost efficiency of the production. Companies are able to produce good quality software with less expenses compared to the development in other locations. Some companies following this model participate in the architecture design and management activities but usually their orientation is on the development of product parts/modules according to the requirements defined by the client. The RCI SPI program has built capabilities in the firms for providing

efficient and effective outsourcing services using this model.

- **Value-added software development and partnership**  
This business model includes activities focused on the complete life-cycle development process for the clients such as business analysis requirements development, software development testing and deployment. The companies using this business model are focused on bringing value to the business productivity of the solution and not just to the software development. The SPI program has supported those firms in order for them to be able to optimize the production and design process for small size projects (around 8 – 30 developers), integrate their teams into large scale projects and complete separate activities in correspondence with the overall project implementation process.
- **Own products**  
In addition to outsourcing and value-added services, some of the companies that were supported by the RCI activities developed and marketed their own products such as ERP systems for small businesses in specific economic sectors, banking systems, CRM systems, document management, web design and others that targeted local or regional market niches. Many of the companies had leading position in their niche markets in the region. The RCI ICT program supported those firms in optimizing the development process and in better positioning of their products
- **System integrators and consultants**  
A few of the participants in the SPI activities were system integrators building relatively complex IT systems. RCI activities were aimed towards improvement of the processes related to value added services such as deployment and support of ICT systems.

ESI Center Bulgaria conducted a special survey among the companies that participated in the SPI program (2006-2009). 22 companies from Armenia, Bulgaria, Bosnia and Herzegovina, Croatia, Macedonia, Romania and Moldova participated in the survey. All of the firms were small size - average number of employees per company was 57, and 9 of the companies have less than 25 employees.

The observed companies included CMMI and ITMark certified companies, companies that were in process of CMMI and ITMark certification and some that didn't manage to fulfill all the requirements for ITMark certification at the time the interview was conducted. The questionnaires were filled out by senior managers or owners of the companies.

The conclusions of the survey are summarized below:

- 82 % of the companies increased their competitiveness with more than 20 %
- 85 % of the firms reported increased client satisfaction and 58% of the companies reported decreased "time to market"
- 37% of companies reported sales increase of 20%-50% due to CMMI/ITMark implementation program

Each company that participated in the survey highlighted specific benefits related to their own business. Examples of such benefits were:

- **Company 1 (Macedonia) – development and implementation of ERP solutions**
  - "The most visible result we have seen is having real-time reporting on what is really happening within our company. Our managers have online access to all of their projects and can instantly see which tasks are on time, which are lagging behind schedule so they can push the team or add more resources to the team to get the task done on time."
  - "Processes are planned, documented, performed, monitored and controlled at the project management level."
  - "The pressure created by insufficiently well defined requirements was decreased and we reduced the time needed for their implementation."
  - "Before the ITMark implementation "the deadlines were set only as a wish", because they could not be objectively estimated".
  - Subsequently the company continued its SPI initiative and at the present moment is in preparation for advanced ITMark certification.

- **Company 2 (Moldova) – development and implementation of banking systems**  
"When implementing ITMark and as recommended by CMMI we introduced a new practice in our work with Banks: When we receive requirements we create a prototype of our vision of the product and then discuss it again with the client. In 80% of the cases our vision appeared to differ a lot from the client's vision. Previously this created a lot of rework. Now we can assure a correct vision of the requirements and final product that are understood correctly by us and the clients."
- **Company 3 (Bulgaria) – a Small Bulgarian IT company, offering a broad range of hardware and software solutions.**
  - The company has received a number of awards over the years, in particular from their main client – a big multinational company for many years.
  - The Company has been working with ESI and ESI Center Bulgaria to implement its software process improvement initiative, with the objective of reaching CMMI Maturity Level 2.
  - To keep the company's clear and strategic business objectives at the forefront of all activities during the complete SPI initiative, ESI Center Bulgaria suggested carrying out an intermediate evaluation based on ITMark. The evaluation helped the company to sustain and further develop its business with its main client- a division of Siemens.
  - The Company passed all the three areas of the ITMark evaluation and was CMMI certified.
  - Subsequently the company continued its SPI initiative at its own expenses and has already successfully achieved new CMMI certification.

### Regional level benefits

One of the most important result from the "ICT Competitiveness Pyramid" approach on regional level was that the companies and associations from different countries in the region covered by RCI created a regional community of practice and launched several joint initiatives in order to increase the ICT competitiveness of the whole region. With the support of RCI, the associations which had initially recognized and committed to the pyramid model such as Bulgarian Association of Software Companies (BASSCOM) and Macedonian Association of ICT Companies became regional leaders in promoting ICT competitiveness. They were able to launch regional projects in which to transfer their experience to other associations in the region.

### ICT INDICATORS 2005-2009

In 2009 RCI started new regional activities aiming at enlarging the regional market for IT solutions, developing training and certification network and building the foundation of the "ICT Competitiveness Pyramid" in new countries such as Georgia and Ukraine. Therefore indicators such as PROGRAM DESIGN AND LEARNING ELEMENT-NUMBER OF SPECIAL STUDIES and EG 2.2: TRADE AND INVESTMENT CAPACITY-NUMBER OF CAPACITY-BUILDING SERVICE PROVIDERS RECEIVING USG ASSISTANCE achieved the most significant development in 2009. While the RCI direct support for training and certification significantly decreased in 2009, the relevant indicators stayed in the normal annual average values for the period due to the support received by other stakeholders.

The overall cumulative indicators for the time period 2005-2009 are provided in the table below:

GENERAL ELEMENT/INDICATOR	CORRESPONDING ESIBG INDICATORS	Cumulative total 2005 -2009
PROGRAM DESIGN AND LEARNING ELEMENT-NUMBER OF SPECIAL STUDIES	N of methodologies (ICT Competitiveness Pyramid, ICT2business Concept and others )	5
PROGRAM DESIGN AND LEARNING ELEMENT-NUMBER OF SECTOR ASSESSMENTS	N of ICT sector analyses;	12
EG 2.2: TRADE AND INVESTMENT CAPACITY-NUMBER OF CAPACITY-BUILDING SERVICE PROVIDERS RECEIVING USG ASSISTANCE	N of SMEs in the IT Business Solutions Network <a href="http://www.IT2Business.org">www.IT2Business.org</a> ; No of SMEs in the IT Training and Certification Network <a href="http://www.Quality2IT.org">www.Quality2IT.org</a>	50
EG 2.2: TRADE AND INVESTMENT CAPACITY-NUMBER OF FIRMS RECEIVING USG ASSISTANCE THAT OBTAIN CERTIFICATION WITH INTERNATIONAL QUALITY CONTROL, ENVIRONMENTAL AND OTHER PROCESS VOLUNTARY STANDARDS OR REGULATIONS	N of SMEs successfully appraised and/or certified;	26
EG 2.2: TRADE AND INVESTMENT CAPACITY-NUMBER OF FIRMS RECEIVING CAPACITY BUILDING ASSISTANCE TO EXPORT	N of SMEs that participated in CMMI/ITMark trainings;	395
EG 2.2: TRADE AND INVESTMENT CAPACITY-NUMBER OF USG SUPPORTED TRAINING EVENTS ON TOPICS RELATED TO INVESTMENT CAPACITY BUILDING AND IMPROVING TRADE	N of training events;	63
EG 2.2: TRADE AND INVESTMENT CAPACITY-NUMBER OF PARTICIPANTS IN USG SUPPORTED TRADE AND INVESTMENT CAPACITY BUILDING TRAININGS	N of trainees in CMMI/ITMark trainings;	1210
EG 6.1 BUSINESS ENABLING ENVIRONMENT -NUMBER OF INSTITUTIONS/ORGANIZATIONS UNDERTAKING CAPACITY/COMPETENCY STRENGTHENING AS A RESULT OF USG ASSISTANCE	N of associations that contributed/participated in the programs;	10
EG 6.1 BUSINESS ENABLING ENVIRONMENT -NUMBER OF FIRMS RECEIVING USG SUPPORTED ASSISTANCE TO IMPROVE THEIR MANAGEMENT PRACTICES	N of SMEs that participated in CMMI/ITMark trainings;	395
EG 6.3 WORKFORCE DEVELOPMENT-NUMBER OF PERSONS PARTICIPATING IN USG-FUNDED WORKFORCE DEVELOPMENT PROGRAMS	N of trainees in CMMI/ITMark trainings; No of participants in appraisals and practical workshops;	1633
EG 6.3 WORKFORCE DEVELOPMENT-NUMBER OF PERSONS COMPLETING USG-FUNDED WORKFORCE DEVELOPMENT PROGRAMS	N of people qualified in CMMI and IT mark;	811
EG 7.3 STRENGTHEN MICRO ENTERPRISE PRODUCTIVITY - NUMBER OF MICRO ENTERPRISES RECEIVING BUSINESS DEVELOPMENT SERVICES FROM USG ASSISTED SOURCES	N of SMEs that participated in CMMI/ITMark trainings; No of SMEs in the IT Business Solutions Network <a href="http://www.IT2Business.org">www.IT2Business.org</a> ; No of SMEs in the IT Training and Certification Network <a href="http://www.Quality2IT.org">www.Quality2IT.org</a> .	445

## REGIONAL IT B2B MATCHMAKING SUMMIT - APRIL 2010



From left to right: Mr. Neal Nathanson, Mr. Tim Donnay, Mr. Boris Zitnik, Mr. Branislav Djurkovic



The RCI IT B2B Matchmaking Summit took place on April 7-8, 2010 in Skopje, Macedonia. More than 80 companies and 15 IT associations have attended the event, including countries out of the RCI focus like Bulgaria, Croatia, Norway, Netherlands, Romania and Slovenia. Such broad presentation helped the expansion of the potential business network of the participants. The average number of meetings for one company was between six and ten, which is an excellent result for a B2B Matchmaking initiative.

Based on the received feedback and evaluation, the RCI team believes that this type of events attracts a lot of business and therefore will definitely continue this type of activities in the future.