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I3E focuses on:

- Embedded Systems
- Industrial Informatics

I3E main outputs are:

- A Strategic Research Agenda
- A Methodology Guide on Innovation

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I3E Final Conference 4

Promoting Innovation in the Industrial Informatics and Embedded Systems—I3E

Newsletter

April 2012

Issue 5

Methodology Guide on Innovation

Innovation represents a challenge for research teams, Small and Medium Enterprises (SMEs), large industries and economies in general, as it is viewed as a catalyst for competitiveness in an increasingly competitive world. Reaching significant research results and achieving technological progress does not by each own create a competitive advantage. A further step is needed in order to transform research to innovation and turn research results into innovative products and services. The Methodology Guide on Innovation ([pdf](#)) aims at providing the necessary guidelines for assisting in the accomplishment of this difficult task. It focuses on two knowledge intensive sectors: Embedded Systems and Industrial Informatics, yet it could be also read from a broader audience.

The Guide starts by presenting the difference between invention and innovation, explaining in rough terms what innovation is and what its classification is, and defining the phases of innovation process in relation with technical, business, and market aspects. Later on, the role of the Innovation Support Framework in the overall effort of research transformation into innovation is described in more detail. Issues concerning Intellectual Property and the notion of Open Innovation are also dealt sufficiently. Furthermore, an innovation model is presented along with the associated innovation process and a description of the process different steps, the needed skills at each step and the expected outputs. Finally, the guide describes the business aspects of the innovation process and especially the financing of innovation. Several examples are provided throughout the document derived from Best Practices, which have been identified mainly in the European space in the context of the I3E project, and assist in improving the understanding of the prospective readers. Some of the topics dealt in the Methodology Guide on Innovation are described briefly in the rest of this newsletter.

Innovation Process Fundamentals

Moving from invention to innovation may be analyzed into different stages, discerned by the progress towards bringing innovative products, services or methods and processes to the market. The first stage in this process is relevant to the conceptualization of innovation and is the stage that leads from an interesting idea or research result to an engineering prototype. The second stage advances from the engineering prototype to production comprising the analytical design, development and testing of the innovation. Finally, the third stage is relevant to full scale production and is relevant to achieving a high level of market penetration. There are actually three axes that these steps are classified into: the technology axis,





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the market axis and the business axis. The **technology axis** is relevant to the technical



development of the innovation, starting from an idea, which could be based on research results or identified market needs, and leading to an engineering prototype during the conceptualization stage, moving to product or service during the second stage and to full scale production during the last stage. The **market axis** is relevant to the interaction with the market throughout the development of the innovation starting from a preliminary analysis during the first stage, moving to full market analysis, sales and distribution during the second stage and increasingly complex marketing, distribution and market response

during the last stage. Finally, the **business axis** is relevant to the business steps needed including IPRs protection, commercialization and business scheme selection during the first stage, business formulation and access to financing during the second stage and business development during the third stage.

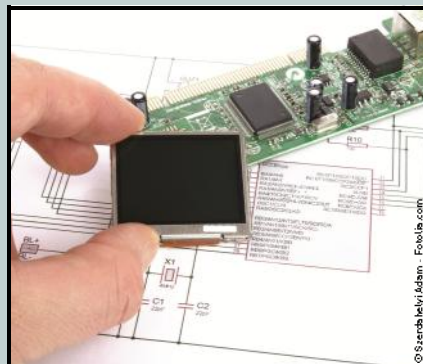
Moving from Research Result to Innovation

The inventor/researcher and the innovator may be the same or different entities. The innovator, called the “entrepreneur” by Schumpeter, should combine all necessary factors for the transformation of a novel idea/research result into innovation. There are different alternatives with reference to the commercialization of an invention and generation of innovation with different envisaged roles for the inventor. Firstly, the inventor/researcher can sell the invention/research result to a third party. Secondly, he/she can license his/her intellectual assets.



Thirdly, the inventor/researcher can seek partnerships in order to succeed in the commercialization of his/her invention/research results. Finally, the inventor can create a start-up and therefore undertake the full task of transforming his/her work to innovation.

Innovation Modeling



Innovation is quite an important asset for an enterprise as it enables it to withstand market competition more effectively. Formalizing and modeling the generation of innovation is thus quite important for building up a common understanding of the path that needs to be followed for the transformation of an invention to innovation.

The Methodology Guide on Innovation presents an Innovation model based on the “chain-link” model proposed by Kline and Rosenberg. The model envisages interactions between the innovator and the real world, i.e. the market, while it views research as a form of problem solving rather than as a source of inventive ideas. All available knowledge on the innovator side is used in the process of developing a product, process or method out of an existing research result. In case of problems this knowledge base is enriched through research.



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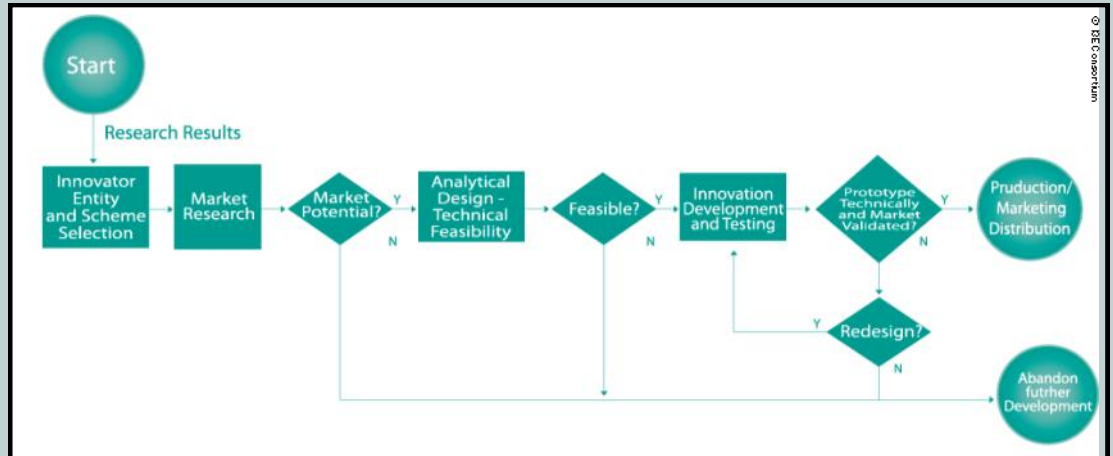
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The distinct stages of the proposed model follow:

- **Innovation Entity and Scheme Selection.** Concerns the selection of the initial scheme for the exploitation of the invention/research results.
- **Market Research.** It is necessary to determine whether there is indeed a market and that the product, process or method may effectively penetrate. It should be noted that although an early step in the innovation process, Market Research should accompany the innovation development process throughout its evolution.
- **Analytical Design and Technical Feasibility.** An Analytical Design has to take place detailing the functional specifications of the expected innovation and providing the needed input for the elaboration of a Technical Feasibility study of the innovation.



- **Detailed Design and Test.** This stage concerns the actual development of the innovation and its testing.
- **Redesign and Production.** If the outcome of the previous phase is a validated production prototype, the innovator moves to full scale Production. Otherwise, he/she decides to Redesign it.
- **Distribution and Marketing.** At this last phase of the innovation process, the innovation is available and it needs to be officially launched to the market.

Financing Innovation

Depending on the type of the innovation entity that will enroll in the process of developing an innovation out of a research result, different types of financing are available. Moreover, the funding scheme depends also on the stage in which the company is, concerning the innovation enterprise lifecycle. In general four stages may be distinguished and are the seed stage, the start-up stage, the early-growth stage, and the expansion stage.

A fundamental distinction has to be done with reference to the size of the enterprise that has this role. Financing mechanisms are completely different when innovation is pursued from a large and well established enterprise that has acquired a research result or has formed a partnership with the





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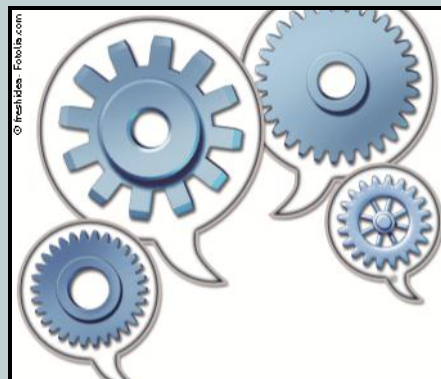
Business Angels.

investing/research team or a start-up innovative enterprise or an innovative SME. Large and well established enterprises may have easier access to needed financial resources through traditional financial mechanisms offered by e.g. banks. On the other hand innovative start-ups lack many of the criteria needed to have access to similar mechanisms. Focus of this Guide is placed on the special financing mechanisms employed for financing innovative start-ups or SMEs. Briefly, the identified mechanisms are Feasibility Grants, Microcredit, Venture Capitals, and

I3E International Conference

"Research and Innovation in High Added Value Sectors Paradigm for Competitiveness and Growth"

The final conference of the I3E project will take place in Athens on May 28th, 2012. The conference will be held at the Corallia, Athens InnoCentre located in Marousi, Athens. The conference aims at disseminating the main project results, i.e. the Strategic Research Agenda in the sectors of Embedded Systems and Industrial Informatics and the Methodology Guide on Innovation, built during the three year long project duration. The conference will open with the keynote speech of SEE Project Officer Steve Halligan that will present the SEE initiative activities promoting research and innovation in South East Europe area. A second keynote speech will be given by EC Head of Unit Erastos Filos relevant to the Factories of the Future initiative of the European Commission, an initiative strongly related both with the areas of Industrial Informatics and Embedded Systems. Two keynote speeches will be given on the Embedded Systems sector by Athanasios Poulakidas from the Hellenic Aerospace Industry and Gerhard Fohler from the Technical University of Kaiserslautern presenting the challenges and vision in the sector. A second conference session will present the project results: the Methodology Guide on Innovation will be presented by Project Coordinator Athanasios Kalogeras from the Research Centre ATHENA, the Strategic Research Agenda will be presented by Aleksey Bratukhin from the Austrian Academy of Sciences and the overall networking and capacity building activities of the project will be shown by Dejan Gradisar from Josef Stefan Institute.



The conference will pursue networking with successful experiences and projects in South East Europe. In this context Professor George Chryssolouris will present the Laboratory of Manufacturing Systems and Automation at the University of Patras and its research results in manufacturing systems, Professor Vesna Mandic will present the Virtual Manufacturing Network formulated in Serbia and Western Balkan counties, Peter Statev will present Bulgarian ICT Cluster and Professor Vasilios Makios will present Corallia, the Hellenic Technology



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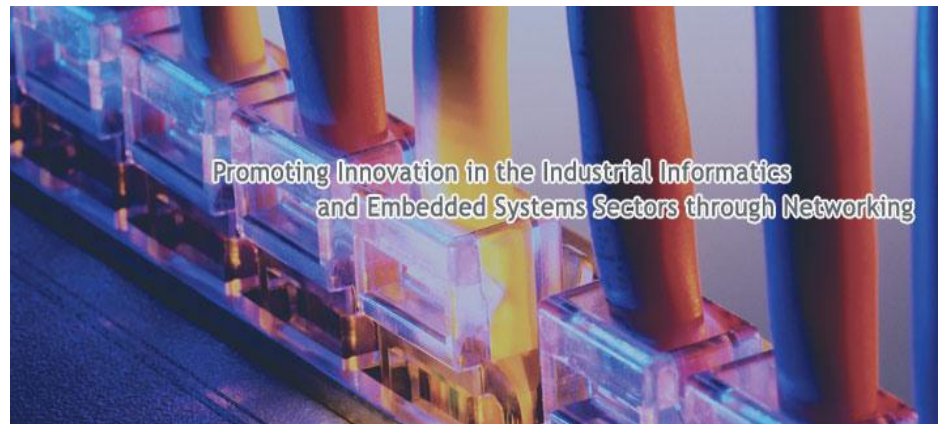
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Clusters Initiative. Project SEENECO, South East Europe Network of Excellence for Cluster Organizations will be presented by Julia Phoca from Corallia, FORSEE and its RTDI Foresight will be presented by Effie Dalakiouridou from the University of Macedonia, Greece, ENSEMBLE and its vision on Enterprise Interoperability will be presented by Fenareti Lampathaki from the Greek Interoperability Centre of the National Technical University of Athens. The conference will close with a round table discussion on the status and vision of innovation in South East Europe and a visit to the Corallia Athens InnoCentre Exhibition area. Attendance to the conference is free of charge, yet registration in advance has to be made [here](#).

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Upcoming Events

- Project Capacity Building Activities, January-May 2012
- Final Conference, Athens, Greece, May 2012
- End of I3E Project, May 2012

Check our web portal regularly for
our project news, events and
deliverables