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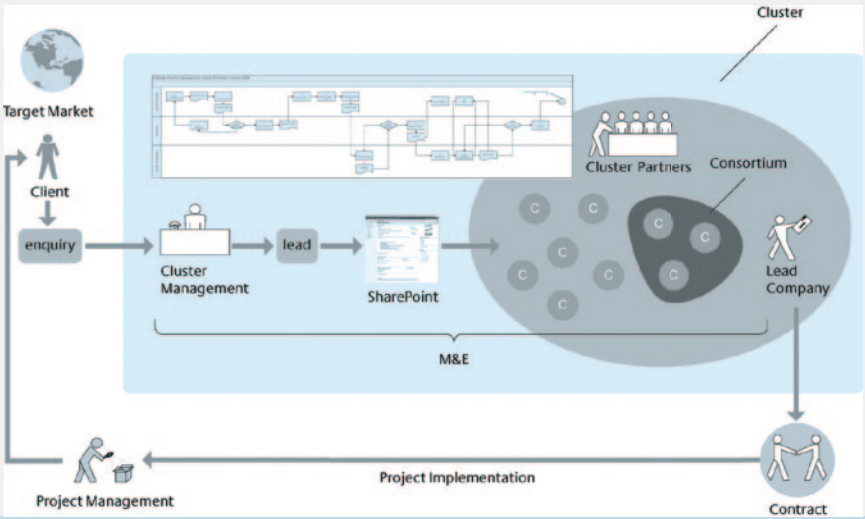
IT Sector Promotion in Developing and Emerging Countries

Manual



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Content

Acronyms and Abbreviations

ASC	Albanian Software Cluster
ASP	Application Service Provider
BASSCOM	Bulgarian Association of Software Companies
BI	Business Intelligence
BITKOM	Federal Association for Information Technology, Telecommunications and New Media
BMWi	German Federal Ministry for Economics and Technology
BMZ	German Federal Ministry for Economic Cooperation and Development
CMMI	Capability Maturity Model Integration
CMS	Content Management System
DAAD	German Academic Exchange Service
EICTDA	Ethiopian Information and Communication Technology Development Agency
EITO	European Information Technology Observatory
ERP	Enterprise Resource Planning
ETA	Ethiopian Telecommunication Agency
EU	European Union
FDI	Foreign Direct Investment
FOSS	Free and Open Source Software
FP7	EU's 7th Framework Programme for Research and Technological Development
FTA	Free Technology Academy
GDP	Gross Domestic Product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HR	Human Resources
HTML	Hypertext Mark-up Language
IT	Information Technology
ICT	Information and Communication Technologies
ICT4D	Information and Communication Technologies for Development
ITICM	IT Industry Capability Model
ITIL	Information Technology Infrastructure Library
LAMP	Linux Apache MySQL PHP
M&E	Monitoring & Evaluation
MASIT	Macedonian ICT Chamber of Commerce
MDE	Model Driven Engineering
MDG	Millennium Development Goal
MNC	Multinational Corporation
NASSCOM	National Association of Software and Services Companies of India
NIC	Newly Industrialised Country
NPD	New Product Development
OECD	Organization for Economic Cooperation and Development
OSS	Open Source Software
R&D	Research & Development
RUP	Rational Unified Process
RUSSOFT	Russian Software Cluster
SaaS	Software as a Service
SCM	Supply Chain Management
SME	Small and Medium-sized Enterprise
SOA	Service Oriented Architecture
SSC	Serbian Software Cluster
SWOT	Strengths Weaknesses Opportunities Threats
ToT	Training of Trainers
TVET	Technical and Vocational Education and Training

1 Executive Summary

This Manual for IT Sector Promotion was prepared by GIZ's Sector Project "Information and Communication Technologies for Development (ICT4D)" on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). The strategic importance of the IT industry is widely acknowledged in developed as well as in developing and emerging countries. Many governments have recognised the key role of this exceptionally dynamic sector that enables income generation and employment promotion, has a substantial export potential and significantly contributes to improving productivity, efficiency and innovation in the public and private sectors.

In terms of **economic development,** supporting the establishment of a national IT industry can notably contribute to

- **Economic growth:** Countries such as India, Vietnam, the Philippines, Mexico and Bulgaria have demonstrated the significant potential of the IT industry to trigger economic growth, thereby inducing job creation and income generation.
- **Increase in exports:** Increasing exports is all the more important for developing countries which often suffer from severe trade balance deficits as well as from small and underdeveloped domestic markets.
- **Increase in investments:** Developing and emerging countries with a strong national IT industry usually score higher in attracting foreign direct investment (FDI).
- **Employment creation:** The positive effect of the IT industry on job creation is amplified by the fact that IT is a labour-intensive and skill-intensive industry.
- **Competitiveness:** An important economic benefit of the IT industry is its positive impact on efficiency and productivity in other industries through spill-over effects.

- **Innovation:** As a cross-cutting technology, the IT industry is a driver of both product and process innovation.
- **Branding & positioning:** A developmental benefit which often goes unnoticed is that IT sector promotion can often make a valuable contribution to repositioning the image of developing and emerging countries and improving their "branding".

Objective

The Manual and the Toolbox on IT Sector Promotion in Developing and Emerging Countries seek to address the following question: how to maximise the contribution of the IT industry in developing and emerging countries towards sustainable economic development and poverty reduction?

In order to achieve this, the Manual analyses the obstacles impeding the competitive development of this innovative industry in developing and emerging countries. They can be attributed to three major factors:

- Specific structural problems of developing countries such as lack of efficient support structures, deficiencies in managerial, financial and technological skills, negative brand and country of origin effects (image).
- Challenges related to internationalisation and export, such as lack of market intelligence and export capabilities as well as the absence of international linkage.
- Specifics of the IT industry including technical as well as quality standards, high competitive pressure and short innovation cycles.

The manual and the toolbox introduce a **methodology** and a **set of practical tools** to address these obstacles and promote the IT industry in developing and emerging countries. Their **purpose** is to

- Provide a **practical guideline** for designing and implementing projects for promoting the IT sector in developing and emerging countries.
- Develop a **specific methodology** to enable effective and sustainable IT sector promotion based on the practical experience of German development cooperation.
- Elaborate **concrete procedures, processes and tools** to promote the IT industry in developing and emerging countries.
- Provide **advice on actions and measures** to improve the international competitiveness of IT sectors.
- Provide **best practices** of IT sector promotion in developing and emerging countries.

In short, manual and toolbox provide a strategic "roadmap" for IT sector promotion which can be flexibly adapted to accommodate future changes in resources, global markets and technologies.

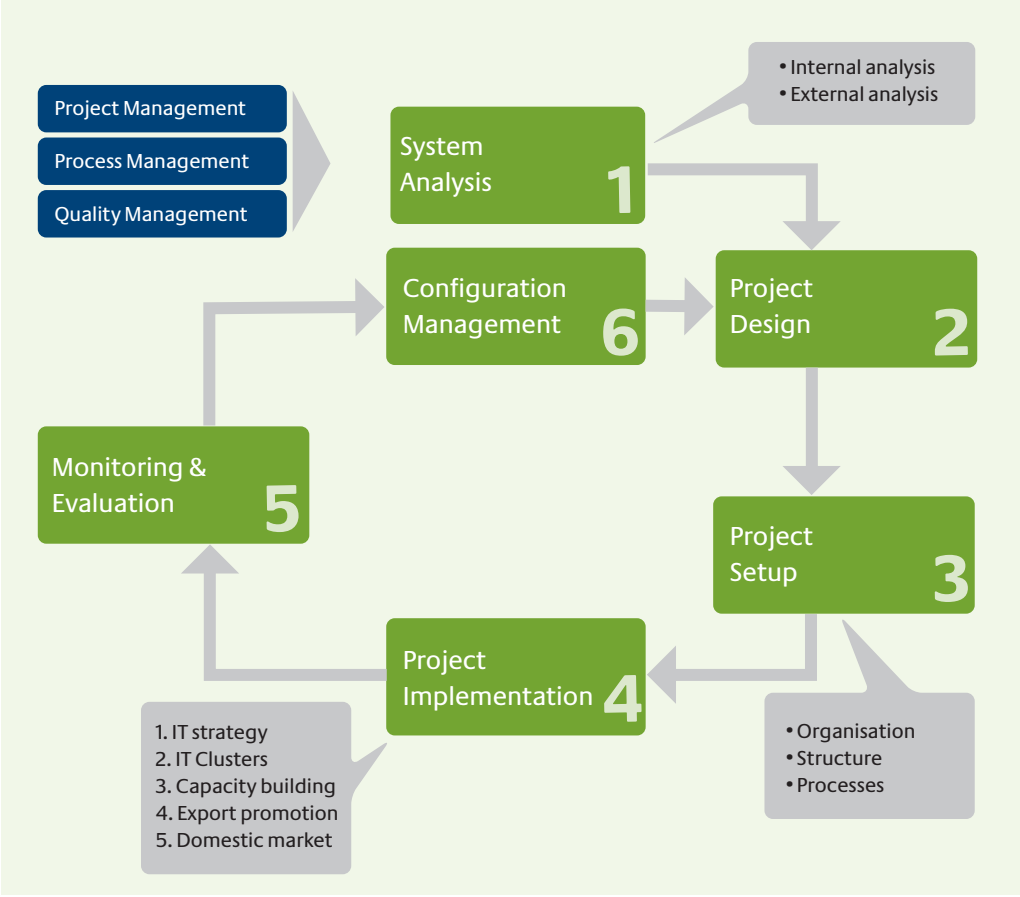
The manual and the toolbox have primarily been designed for the staff of ministries and agencies involved in economic development, for managers and staff members of IT clusters, associations, networks, communities of practice and chambers of commerce. They should serve as orientation for staff of donor organisations involved in private

sector development, economic development, and employment promotion as well as in information and communication technologies for development (ICT4D)/development informatics.

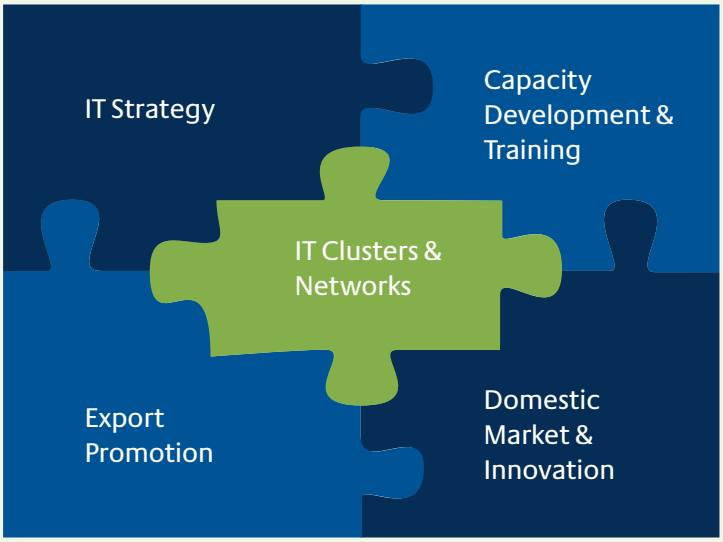
Methodology

The manual and the toolbox recommend **an integrated approach** for IT sector promotion in developing and emerging countries. The methodology detailed in the manual is based on **three pillars** – "systemic competitiveness", "cyclical model" and "modular structure" – and a **cross-cutting element** permeating the entire approach – "collaboration".

- **Systemic competitiveness**: the international competitiveness of a local IT industry can only be improved if all relevant stakeholders on the three systemic levels (i.e. the so called "macro", "meso", and "micro" levels) are included in the project design and implementation.
- **The cyclical model** addresses the specific challenges of the IT industry such as short innovation cycles, global competition and technological change. According to this model, IT sector promotion is not a linear process but a cycle of iterative development phases where feedback and suggestions from different stakeholders as well as the results of monitoring & evaluation feed into adjusting and improving the project implementation.



- The **modular structure** includes five support modules: IT strategy, IT clusters & networks, capacity development & training, export promotion, and domestic market development & local innovation. These **modules represent the actual core intervention measures** for promoting the IT industry in developing and emerging countries.



The modular structure allows the stakeholders and the project team to adjust the sequence and intensity of the support measures to the specific needs and conditions on the ground. In the toolbox, **well-proven instruments and tools for IT sector promotion are comprehensively described and categorized** for each of the above modules.

- **Collaboration** is a central cross-cutting element, which is crucial for the successful implementation of IT sector promotion projects. Challenges of IT sector promotion in developing and emerging countries can only be effectively tackled by a collaborative approach involving all relevant stakeholders ranging from ministries to donors, industry associations, academia, clusters and companies. Collaboration and close interaction between stakeholders is needed to design and implement viable support measures for the local IT industry, to allow exchange of relevant information, knowledge transfer and capacity development.

Contacts

If you would like to receive more information, make suggestions, give us feedback or contribute to our work on IT sector promotion, please contact the Sector Project ICT4D per email at: ict@giz.de or visit our Blog: http://ict.ez-blogs.de

2 Introduction

This Manual for IT Sector Promotion was prepared by GIZ's Sector Project "Information and Communication Technologies for Development (ICT4D)" on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ).

2.1 Document Purpose and Objectives

Following the success stories of India, Vietnam, Kenya, Russia or Bulgaria, governments in many developing and emerging countries have recognised the strategic importance of the IT industry for economic development and structural transformation towards a knowledge-based economy.

Its strategic importance can mainly be attributed to the following factors:

- Being a skill-intensive key industry, IT provides ample opportunities for **income generation and employment promotion**.
- The growing trend of Western European and American companies to outsource IT-related tasks to lower-cost destinations, in combination with significant comparative advantages of developing countries such as lower labour costs, has created a substantial **export potential** for developing and emerging countries.
- IT being a **cross-cutting technology**, promoting the IT industry leads to **productivity and efficiency** increase in other industries; since IT has penetrated almost every part of the value chain in almost every economic sector ranging from manufacturing to agriculture, health and service industries. IT provides the technological foundation for the knowledge-based economy.
- Contrary to most "traditional industries", the IT industry is knowledge-intensive rather than capital-intensive, thereby providing a high **economic value addition.**
- IT provides the technological basis for **product and process innovations** as well as for the establishment and further development of other knowledge-intensive industries.
- A functioning IT sector is the basis for **reducing the digital divide** and providing **access to information and knowledge** for the population in developing and emerging countries.

To summarise: IT is **more than just another industry**. It is a **growth driver and important source of innovation and industrial transformation**.

Therefore, it does not come as a surprise to find IT sector promotion as a top priority on the agendas not only of many developing country governments and donor organisations, but also of NGOs, the local private sector and business associations. Many industrial development strategies of developing and emerging countries postulate the establishment and promotion of a national IT industry. While technology and innovation are moving back up the **development agenda**, many donors regard IT as indispensable for achieving the Millennium Development Goals (MDGs). This is being reinforced by the frequently cited success stories of the NICs (newly-industrialised countries like Korea and Taiwan) and BRICs (Brazil, Russia, India, China), which have placed great emphasis on IT sector promotion as a central pillar of their industrial development strategies.

However, despite the above mentioned success stories, establishing and promoting competitive IT sectors in developing and emerging countries is a complex task, involving many challenges and obstacles. These challenges can be attributed to three major factors:

- The specific **structural problems of developing countries** such as lack of efficient support structures, deficiencies in managerial, financial and technological skills, negative brand and country of origin effects (image).
- The **challenges related to internationalisation and export**, such as lack of market intelligence and export capabilities as well as the absence of international linkage.
- The **specifics of the IT industry** including technical as well as quality standards, high competitive pressure and short innovation cycles.

Based on the above considerations about the opportunities and challenges of the IT industry for development cooperation, the **overall objective** of this document can be defined as follows:

> **!** **To provide a practical manual and toolbox for IT sector promotion in developing and emerging countries, with a focus on the software and IT services industry.**

With a clear emphasis on software and IT services (and leaving aside telecommunication infrastructures and services), the **purpose** of this manual and toolbox is to

- Provide a **practical guideline** for designing and implementing projects for promoting the IT sector in developing and emerging countries.
- Develop a **specific methodology** to enable effective and sustainable IT sector promotion based on the practical experience of German development cooperation.
- Elaborate **concrete procedures, processes and tools** to promote the IT industry in developing and emerging countries.
- Provide **advice on actions and measures** to improve the international competitiveness of IT sectors.
- Provide **best practices** of IT sector promotion in developing and emerging countries.

The underlying idea of this manual is that IT sector promotion requires a **collaborative approach** involving all relevant stakeholders such as companies, clusters, ministries, universities and donors on the different systemic levels. Furthermore, the methodology takes into consideration the **structural characteristics** and challenges of developing countries as well as the **specifics of the IT industry**.

The IT industry is an **exceptionally dynamic sector** characterised by very short innovation cycles. Therefore, the document intends to provide a strategic guideline and "roadmap" for IT sector promotion which can be flexibly adapted to accommodate future changes in resources, global markets and technologies. Consequently this manual defines a system of proactive and future-oriented policies and measures which will have to be constantly reviewed, adapted and improved to ensure its effectiveness for IT sector promotion.

In short, the manual and the toolbox intend to provide a suitable answer to this **central question**:

> **?** **How should IT sector promotion in developing and emerging countries be designed and implemented in order to maximise its contribution to sustainable economic development and poverty reduction?**

2.2 Target Group

The manual and toolbox for IT sector promotion in developing and emerging countries have been designed for the following **stakeholders**:

- Staff of ministries and agencies involved in economic development (e.g. Ministries of Economy, ICT Agencies, etc.).
- Managers and staff members of IT clusters, associations, networks, communities of practice and chambers of commerce.
- Staff of donor organisations involved in private sector development, economic development, and employment promotion as well as in information and communication technologies for development (ICT4D)/development informatics.
- IT industry and policy practitioners.
- Development and management consultants.
- Scientists and researchers active in the area of development economics, ICT4D/development informatics and innovation policy.

Ideally, representatives of all relevant stakeholders should make use of this manual collaboratively when designing and implementing projects for IT sector promotion in developing and emerging countries. This would help to establish a common understanding of the topic and to coordinate policies and activities more effectively.

2.3 How to Use This Manual

The manual as well as the corresponding toolbox have been structured according to the purpose and objectives of this document.

Following the executive summary and the introduction, **Section 3** analyses the relevance of the IT sector for development cooperation and suggests a classification of the IT industry.

Section 4 describes the integrated methodology for IT sector promotion in developing and emerging countries. This section forms the core of the manual and sets the frame and structure for the toolbox.

Finally, the annex includes an overview of German development cooperation's experience in the area of IT sector promotion as well as a bibliography on IT sector promotion.

The manual, especially Section 4, as well as the toolbox have been designed in a **modular manner** so that the user can go directly to any given chapter. Within each chapter of Section 4, the following elements have been introduced to make the manual as practical and user-friendly as possible:

- Key questions.
- Practical examples and case studies.
- Useful tools (cross-reference to the toolbox).
- Useful links for further information and reading.

To ensure that the manual addresses the practical needs and challenges of IT sector promotion in developing and emerging countries, an explorative inductive approach, which combines theory and practice, has been adopted. This approach includes a thorough analysis of existing academic literature as well as an in-depth analysis of case-studies and practical experience from German development cooperation's IT sector promotion projects.

3 Relevance of the IT Sector for Development Cooperation

3.1 The IT Industry: Classification and Structural Characteristics

3.1.1 Classification of the IT Industry

There are many different classifications and definitions for the IT industry. One widely used and accepted is the classification system of the European Information Technology Observatory (EITO) which will also be used for this manual.[1]

The following table provides an overview of the IT industry classification according to EITO.

IT industry	
Software	• System infrastructure software • Tools • Application software
IT services	• Hardware maintenance • Project services • Outsourcing services
IT equipment	• Detail segments • Servers • Storage • Workstations • PCs - Netbooks - Portable PCs Consumer Portable PCs Business Portable PCs - Desktop PCs Consumer Desktop PCs Business Desktop PCs • Printers and MFP Printers Multifunction printers • Copiers • Monitors • Other IT equipment

Source: European Information Technology Observatory (2011).

1 *EITO: http://www.eito.com/definitionsICT.*

Based on the following considerations, this manual will focus on **software** and **IT services**:

- The IT equipment/hardware industry is capital-intensive and dominated by large-scale multinational corporations (MNCs). Domestic hardware companies in developing and emerging countries are mostly engaged in sales and distribution. Thus, the added value of this industry segment in most developing and emerging countries is very low and its contribution to economic development limited.
- Software development and IT services are skill-intensive and knowledge-intensive. The required capital investment, including hardware and software development tools are comparatively low and do not constitute an entry barrier as in other areas of information technologies (notably hardware and telecommunications). Hence, software and IT services generate a high economic added value and enable economic growth, income generation and employment promotion in developing and emerging countries.

According to the above mentioned EITO classification, **software** encompasses the following three sub-segments:

- **System infrastructure software:** proprietary as well as open operating system and system-level software; network, system, storage, and security management software for all types of hardware (from mainframe to PC).
- **Tools** including collaboration and content tools; database engines; business intelligence infrastructure; development tools; integration platforms.
- **Application software**[2] encompasses office automation, business applications and other applications. Business applications are process-oriented applications that include horizontal applications such as Enterprise Resource Planning (ERP), Customer Relationship Management (CRM) and Supply Chain Management (SCM), as well as industry-specific solutions such as billing (telecom, utilities), core banking systems, etc. Other applications encompass graphical software, embedded systems, and other technical software.

The segment **IT services** comprises the following sub-segments according to the EITO classification:[3]

- **IT maintenance** including hardware and system software installation, repair and support for all types of hardware (from mainframe to PC) and related system software (proprietary or open source systems).
- **Project services** encompassing IT consulting (e.g. planning, specification and design of information systems), software development and maintenance, implementation/customisation of software products (applications and/or tools), system integration, and IT training.

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2 *Application software products can be either out-of-the-box solutions, such as most productivity software products and business applications for the small office/home office market, or more complex process-oriented solutions that require implementation and customising services, such as business applications for the mid-market and for large enterprises.*

3 *EITO: http://www.eito.com/definitionsICT.*

- **Outsourcing services** including complete outsourcing (outsourcing of a company's central infrastructure and central application management), application-related outsourcing (webhosting and ASP/SaaS, application outsourcing, Business Process Outsourcing (BPO)), infrastructure-related outsourcing (data centre management, desktop outsourcing, other infrastructure-related outsourcing), and application management (maintenance and enhancement of existing applications).

Many publications and policy papers, particularly in the area of ICT4D, base their analysis and classification of the IT industry on a sharp distinction between software and IT services. While in some cases this distinction makes sense for strategic analysis, it becomes increasingly difficult to maintain because software and IT services are often closely integrated and the boundaries between these two segments become increasingly blurred. Hence, it does not come as a surprise that many IT companies are active in both categories. This also holds true for many IT companies in developing and emerging countries. For instance, in the Macedonian IT industry in 2010, more than 70% of the companies provided both software and IT services.[4]

For reasons of clarity and simplification, we will use the term **IT industry** in this manual referring to software as well as IT services.

3.1.2 Structural Characteristics

The IT industry is characterised by several specifics which have to be taken into account when promoting the IT sector in developing and emerging countries. These specifics include the nature of digital goods, globalised industry structure, network effects and the role of standards.

Contrary to physical goods, **software is a digital good** with unique characteristics. While the development of a software application typically results in high costs, which are sunk costs, the variable costs for its reproduction are usually minimal. This of course only holds true for software products (not for IT services).

The IT industry is also characterised by its **globalised industry structure**. Due to its digital nature and intangibility, software can be developed in distributed locations and easily disseminated through the Internet. Transport infrastructure and logistics play only a negligible role. This makes software an ideal industry for exporting and internationalisation.

Network effects exist when the benefit which the user derives from a software application depends upon the number of other users who use the same application. Typical examples of this effect are social networks such as LinkedIn, Xing or Facebook. For the provider of the software, it is therefore important to acquire as many users as possible because the company with the largest user base is likely to dominate the market. In some industry segments, such as operating systems, network effects can cause near monopolies due to market consolidations. Therefore, smaller software companies often need to develop products which are compatible with the products of large-scale market players such as Microsoft or to focus on open source technologies which provide new business

4 *Macedonian ICT Chamber of Commerce (MASIT): www.masit.org.mk.*

opportunities and market niches, particularly for small and medium-sized IT enterprises.

Technology standards are another characteristic of the IT industry. On the one hand, standards help reduce integration costs and enable provision of interoperable systems to customers. Also, standardisation of production tools such as programming languages have allowed companies from developing countries to quickly integrate into global markets. On the other hand, technical standards (particularly non-open standards) can also form entry barriers for smaller companies if complying with the standard or acquiring the corresponding technical capabilities involves substantial investments. Furthermore, quality standards such as ISO or CMMI[5] play an increasingly important role in the IT industry, in particular for software exporters from developing and emerging countries. The diffusion of quality standards raises barriers to entry, while the issue of quality management is likely to become an important competitive factor in the industry. An indication of this development is the substantial investment of Indian software companies in quality management, and particularly in CMMI certification.[6] As a consequence, software companies interested in exporting need to attain the quality standards required by their customers.

3.1.3 Key Trends

IT is one of the most dynamic industries. In recent years, several key trends have emerged which directly affect the structure of the industry and which have important implications for IT companies from developing and emerging countries. These trends need to be taken into consideration when formulating policies and measures for IT sector promotion.

Four major trends, which will be briefly presented in the following section, are: industrialisation of IT industry, fragmentation and differentiation of the value chain, outsourcing and offshoring, and free and open source software (FOSS).

5 *Capability Maturity Model Integration (CMMI) is a quality standard for software engineering developed by the Carnegie Mellon Software Engineering Institute (SEI).*

6 *See National Association of Software and Services Companies of India: www.nasscom.org.*

1. Industrialisation of the IT industry

- The term "industrialisation" describes increasing standardisation of products and processes as well as incremental specialisation and automation within the IT industry.
- It refers to the introduction of concepts and technologies for automating software development processes.
- A key driver of industrialisation in the IT industry is component-based engineering where individual software components are combined into a system that can be reconfigured and reused.
- This trend is likely to have substantial impacts on the IT industry by increasing productivity and reducing costs.

! Potential implications for IT companies from developing and emerging countries

- IT companies need to become familiar with new software engineering methodologies such as model-driven engineering or component-based engineering.
- The trend of industrialisation will lead to increasing competition within the global IT industry.
- The trend towards component-based engineering provides ample opportunities for smaller software companies from developing and emerging countries to specialise in the production of specific software components.

2. Fragmentation and differentiation of the software industry value chain

- This trend describes the increasing differentiation and specialisation within the software development value chain in terms of providers and technologies.
- For large-scale software producers from industrialised countries, this trend provides the opportunity to reduce their manufacturing depth and to subcontract and outsource the development of software components to specialised providers.
- The transformation from a monolithic software development process to component-based software development within a value chain of several IT companies facilitates outsourcing and subcontracting in the IT industry.

! Potential implications for IT companies from developing and emerging countries

- As the IT industry is highly globalised, the increasing differentiation of the value chain and specialisation are likely to provide substantial market potential for software exporters from developing countries.
- To exploit this market potential, firms from developing and emerging countries need to specialise in relevant technologies and have to integrate their companies into global value chains.
- Differentiation and specialisation become important competitive factors for IT firms from developing and emerging countries.

3. Offshoring

- According to the German Federal Association for IT, Telecommunication and New Media (BITKOM), offshoring can be defined as a special form of outsourcing where software development and other IT services are transferred to lower-cost destinations.[7]
- The divisibility and modularisation of the software development process allows outsourcing of certain elements such as coding and testing with relative ease. This circumstance, in combination with the increasing competitive pressure on software producers and the availability of skilled software experts in lower-cost destinations, has spurred the trend towards offshoring.
- Many multinational corporations in Western Europe and the US continue to experiment with new methods of managing global software development. Therefore, it is likely that the share of software work that can be modularised and produced away from the actual location of product design and architecture will increase.
- India has emerged as the leading offshoring destination but in recent years several other developing and emerging countries mainly from Asia and Eastern Europe have also positioned themselves in the offshoring market.
- A special trend within the offshoring market is the so-called nearshoring. Nearshoring describes offshoring to nearby destinations. This trend is discernable in many Western European companies which are using nearshore destinations such as Bulgaria or Romania for software development. Similar patterns of nearshoring can be found between US firms and IT companies in Latin American countries like Mexico and Costa Rica.
- As a matter of fact, outsourcing has become one of the fastest growing segments of the global IT market, reaching a total market value of US$ 66 billion in 2010.[8]

! Potential implications for IT companies from developing and emerging countries

- Offshoring service providers from developing and emerging countries will have to customise their service offerings and delivery models according to global technology and market trends.
- Given the trend towards global software value chains and intensifying competitive pressure, it is very likely that the importance of offshoring will substantially increase in the future.
- The growing demand of industrial countries for offshoring services provides substantial export potential for IT companies from developing and emerging countries.

7 *BITKOM (2005): 6.*

8 *TPI Information Services Group (2011): http://www.tpi.net/pdf/index/1Q11-TPI-Index.pdf.*

4. Free and Open Source Software (FOSS)

- FOSS is following the model of "open innovation", most importantly by opening up the "core" of software, which is the source code of a computer program, its DNA. For FOSS, this source code is open for access and more importantly, the licence of the software gives each user (and developer) the following freedoms:
  - Freedom to run the program in any place, for any purpose and for everything
  - Freedom to study how it works and to adapt it to the needs of each user
  - Freedom to redistribute copies
  - Freedom to improve the program and to release improvements to the public
  - The success stories of FOSS solutions, such as the database system MySQL or the operating system Linux illustrate the growing importance of FOSS on the global IT market.
- The trend towards using open source software has several implications for the IT industry, the most important being the reduction of market power of proprietary software manufacturers, and the increasing importance of methodologies and technologies supporting collaborative software development.
- Demand from European as well as US companies for expertise in the so-called LAMP-technologies (Linux, Apache, MySQL, PHP) is increasing, which is also affecting the market for offshoring services.

! Potential implications for IT companies from developing and emerging countries

- The competitiveness of industries will be strengthened through local value creation, local innovation and SME promotion.
- For IT companies from developing and emerging countries, FOSS provides the chance to develop innovative software products which are independent of the technical standards of large-scale software manufacturers.
- FOSS enables particularly small and medium-sized IT companies to establish new niche markets.
- IT firms in developing and emerging countries will have to invest in acquiring know-how on FOSS technologies and business models.

3.2 Benefits of IT Sector Development

The developmental benefits of promoting the IT industry in developing and emerging countries can be subsumed under 6 different categories: economic development, social development, good governance, education, health as well as ecology and sustainability. The following diagram provides an overview of the benefits of IT sector promotion.

In terms of **economic development**, supporting the establishment of a national IT industry can notably contribute to

- **Economic growth**: Countries such as India, Vietnam, Philippines, Mexico and Bulgaria have experienced the significant potential of the IT industry as a trigger of economic growth; thereby inducing job creation and income generation. Economic growth in turn is of paramount importance for developing and emerging countries in terms of poverty alleviation.
- **Increase in export**: IT sector growth in developing and emerging countries has been mostly driven by exports. India, for instance, exported more than US$ 57 billion worth of software and IT services in 2010, which accounted for 23% of its total exports.[9] The Bulgarian software industry achieved an export rate of more than 60%.[10] In 2010, the global market for IT outsourcing accounted for US$ 66 billion[11] and is projected to grow rapidly in the next couple of years, thus providing significant growth potential for developing and emerging countries. Increasing exports is all the more important for developing countries which often suffer from severe trade balance deficits as well as from small and underdeveloped domestic markets.

9 *Source: EXPORT HUB: http://export-hub.com/en/news-asia/217-south-central-asia-india/1404-exports-india-india-s-tech-exports-hit-64-67b*

10 *Bulgarian Association of Software Companies (BASSCOM): www.basscom.org.*

11 *TPI Information Services Group: http://www.tpi.net/pdf/index/1Q11-TPI-Index.pdf*

- **Increase in investments**: Developing and emerging countries with a strong national IT industry usually score higher in attracting foreign direct investment (FDI). This is not only due to the growing trend towards outsourcing/offshoring but also to the fact that promoting the IT industry helps increase the attractiveness of a country by improving its technical business climate and its skills-base.
- **Employment creation:** The positive effect of the IT industry on job creation is amplified by the fact that IT is a labour-intensive and skill-intensive industry. In the software and IT services industry, scale is achieved by qualifying and hiring more people. In terms of employment, IT sector development has two positive effects: a **quantitative** one by increasing the number of jobs and a **qualitative** one by generating employment for higher skilled people.
- **Competitiveness:** An important economic benefit of the IT industry is its positive impact on efficiency and productivity of other industries through spill-over effects. This way, even traditional sectors such as manufacturing or agriculture can improve their international competitiveness by using modern software applications. By adopting latest technologies and providing modern software applications, local IT industries are able to support the integration of SMEs into international markets and supply chains. In addition, the IT industry can induce growth effects in related industries through multiplier effects.
- **Innovation**: As a cross-cutting technology, IT is a driver of product and process innovation. Accordingly, IT plays a crucial role in increasing the capacity for innovation of developing and emerging countries, particularly with regards to open innovation.
- **Branding & positioning**: A developmental benefit which often goes unnoticed is that IT sector promotion can often make a valuable contribution to repositioning the image of developing and emerging countries and to improve their "branding". In Bulgaria and Romania, the establishment of competitive IT industries has helped to diversify their industrial images in terms of technology, capability and quality. The success of the Bulgarian and Romanian IT industry in Western European export markets points to this effect.

Promoting the IT industry in developing and emerging countries can also have a positive impact on **good governance**; the IT industry playing the role of an "enabler" for **e-government** applications. A case in point is India, where the government made use of its national IT industry to introduce e-government services on a massive scale. By developing, implementing and maintaining e-government applications on behalf of public institutions, IT companies in developing and emerging countries can make a valuable contribution to

- **Access**: Introducing innovative e-government solutions can improve citizens' access to relevant information and effective use of public services. It enables inclusion and promotes participation in administrative as well as political decision making on the local as well as national level.
- **Administrative efficiency**: E-government applications which have been developed by local IT companies can help streamline administrative processes, rationalise public expenditures and modernise financial management systems. They can also improve organisational capacities of public institutions.

- **Administrative transparency**: By providing solutions for e-procurement and tracking public expenditures, local IT firms can contribute to increasing administrative transparency as well as public accountability. IT applications supporting two-way information flows between government and citizens should increasingly improve the quality and accountability of public services.

In terms of **social development**, IT provides the technical platform for access to information, social inclusion as well as for the transformation towards an information society. Promoting the local IT industry in developing and emerging countries can thus improve

- **Technical capabilities**: The local IT industry can provide citizens with modern IT applications in order to formulate social and political opinions within a community and to disseminate it to a broader audience via the Internet ("crowd voicing"). The revolutions in Tunisia and Egypt demonstrated the power of online-magazines, blogs and social networks.
- **Organisational capacity**: A local IT industry is needed to improve the organisational capacity of relevant institutions and NGOs in developing countries by providing IT solutions customised to local conditions and requirements.
- **Access to information:** This is crucial for empowerment of citizens and social inclusion. Local IT industries play an important role in connecting people to information on economic, political as well as social issues.

Education, science and research are cornerstones for development and the transformation towards the knowledge-based economy. A local IT industry would largely contribute to this transformation.

- **Education**: In primary, secondary and higher as well as in vocational education, IT plays an important role as an enabling technology, mainly in the form of e-learning, blended learning, mobile learning and web2.0-enabled learning within social networks. Such IT-enabled forms of learning have substantial advantages for developing countries with regards to cost savings and providing knowledge independently of time and location (ubiquity). Accordingly, local IT companies can improve the effectiveness of education systems by providing IT-enabled learning solutions which are customised to the specific needs of developing and emerging countries.
- **Human capacity development**: Being a knowledge-intensive industry with short innovation cycles, IT companies invest heavily in training and qualification. Thereby, promoting the local IT industry in developing and emerging countries will also support skills development.
- **Science & research**: As a cross-cutting technology, IT has a significant impact on science and research in various disciplines ranging from engineering to biotechnology (e.g. through bioinformatics). In other words, IT is the key to modern technologies and an efficient science and research system. Thus, for developing and emerging countries, establishing their own IT industry is a prerequisite for managing technology transfer and conducting research and development (R&D).

Another developmental key topic where the promotion of a local IT industry can make an important contribution is **health**. Local IT companies could improve the access to health services as well as their quality by developing and implementing suitable e-health applications. Such applications could include electronic health records, telemedicine applications for remote areas, m-health, or healthcare information systems.

In view of climate change and the rapid population growth in many developing and emerging countries, **ecology** has become a critical issue for sustainable economic development. By providing suitable applications, IT companies could help detect and monitor environmental pollution and save energy. Furthermore, IT is an integral part of many "green technologies". In order to develop and implement applications and technologies adapted to their needs, developing and emerging countries could benefit from establishing and promoting their own IT industry.

3.3 Challenges of IT Sector Development

In order to ensure an effective and sustainable promotion of the IT industry, an understanding of the challenges facing the IT industry is indispensable.

They can be attributed to **three major factors**: specific structural problems of developing and emerging countries, obstacles to internationalisation and exports, and specifics of the IT industry.

1. Specific structural problems of developing and emerging countries

Contrary to industrialised countries, developing and emerging countries face specific structural problems which challenge an effective IT sector development. These problems include:

- **ICT infrastructure deficiencies**: Despite massive investments into ICT infrastructure, the development of the local IT industry is often hampered by problems with power supply, connectivity and bandwidth.
- **Institutional capacities & support structures**: Unlike most industrialised countries, developing countries often neither posses the necessary economic planning and support structures (e.g. ICT agencies, R&D institutes) nor the capabilities to develop and implement IT sector promotion activities fully and effectively.
- **Company capabilities**: IT companies in developing countries often lack the necessary managerial as well as technical skills to improve their competitiveness. This is mostly due to lack of access to adequate learning and training offers. The problem is exacerbated by the absence of suitable process models and quality management standards.
- **Lack of Cooperation**: Coordination and cooperation between relevant stakeholders, such as ministries, universities, chambers and companies, is traditionally weak in most developing countries. Organisational structures and representative bodies like associations or clusters, which support interaction and coordination, often do not exist. This impedes the design and implementation of effective sector development measures.

- **Brain drain**: The IT industry is skill-intensive and qualified IT experts are highly sought after in industrialised nations. As a consequence, many developing countries lose their much-needed IT experts to Western countries paying higher salaries.
- **Image problems**: Due to their economic and political problems, many developing countries have a negative image which often adversely affects their reputation among potential export clients. Western clients could express doubts as to the quality and reliability of IT firms from developing countries. These problems are often exacerbated by the widespread use of pirated software and copyright infringements in many developing and emerging countries.
- **Lack of branding**: As the Indian success illustrates, country image and branding play an important role in the IT market and particularly in the offshoring market. Many developing countries lack a suitable branding or image which is associated with excellence in software development and IT services. This makes their marketing and positioning in international markets difficult.
- **Domestic demand**: Domestic markets for software and IT services are often very limited with respect to market size and maturity. This constrains the growth potential for local IT industries and limits the effectiveness of import substitution strategies in IT sector development.

2. Obstacles to internationalisation and exports

Internationalisation and exports induce growth and support technology transfer. In general, exporting and internationalisation raise a serious challenge for companies, as they substantially increase the level of complexity with regards to management, information and know-how. As Grant formulated it, "Moving from a national to an international business environment represents a quantum leap in complexity."[12] In this context, IT sector development faces the following challenges:

- **Lack of export experience**: Most IT companies in developing and emerging countries lack experience with exports which reduces their chances to successfully penetrate foreign markets.
- **Marketing barriers**: Marketing barriers for software exporters from developing countries are twofold. Firstly, lack of export marketing skills presents a serious obstacle for potential exporters. Secondly, the marketing of software and software services in foreign markets comes at a cost which many SMEs from developing and emerging countries cannot afford.
- **Cultural and language barriers**: Lack of knowledge on business practices and cultural aspects as well as lack of sufficient foreign language capabilities could constitute a serious obstacle to exporting. This is particularly relevant for exporting offshoring services.
- **Lack of market intelligence**: Precise knowledge on market structures, customer requirements, cultural issues and competitors is a prerequisite for successful exporting. This requires a systematic exploration and internalisation of relevant market information by companies as well as by relevant export support organisations. In most developing countries, neither companies nor support institutions conduct market research to generate the necessary market information.

12 *Grant (2008): 389.*

- **Lack of international linkage**: In many developing and emerging countries, IT companies and support institutions such as agencies or universities are not linked to international cooperation and research networks. Yet, such international linkages are required for technology transfer and exchange of knowledge to occur in a highly-globalised IT industry.

3. Specifics of the IT industry

The IT industry is characterised by very specific features. Some of these features present significant obstacles to IT sector growth:

- **Standards:** Technical as well as quality standards form a substantial obstacle for IT companies from developing countries since these standards require substantial investments. Particularly in the software segment, these standards (unless they are "open standards") represent entry barriers and support the establishment of virtual monopolies.
- **Competitive pressure:** The IT industry is highly globalised, leading to intense competition. Competition on export markets is further intensified by network effects and a general trend towards offshoring. Besides, several segments of the global software market are dominated by big multinational corporations (e.g. Microsoft, Oracle), a fact that can largely be attributed to network effects.
- **Skills development:** Being a knowledge-intensive industry, qualification and training are of paramount importance for IT sector development. However, education systems in many developing and emerging countries are often inefficient in terms of quantitative and qualitative output of IT graduates. In addition, specialised training services for further qualification of local IT experts are often not available.
- **Short innovation cycles:** The IT industry is characterised by short innovation cycles requiring companies to invest constantly in enhancing their capabilities through technical trainings and skills development. This represents a formidable challenge for companies from developing and emerging countries.

The manual and the toolbox introduce a methodology and a set of practical tools to address these obstacles and promote the IT industry in developing and emerging countries.

4. Methodology: The Integrated Approach

4.1 The Integrated Approach and Its Key Elements

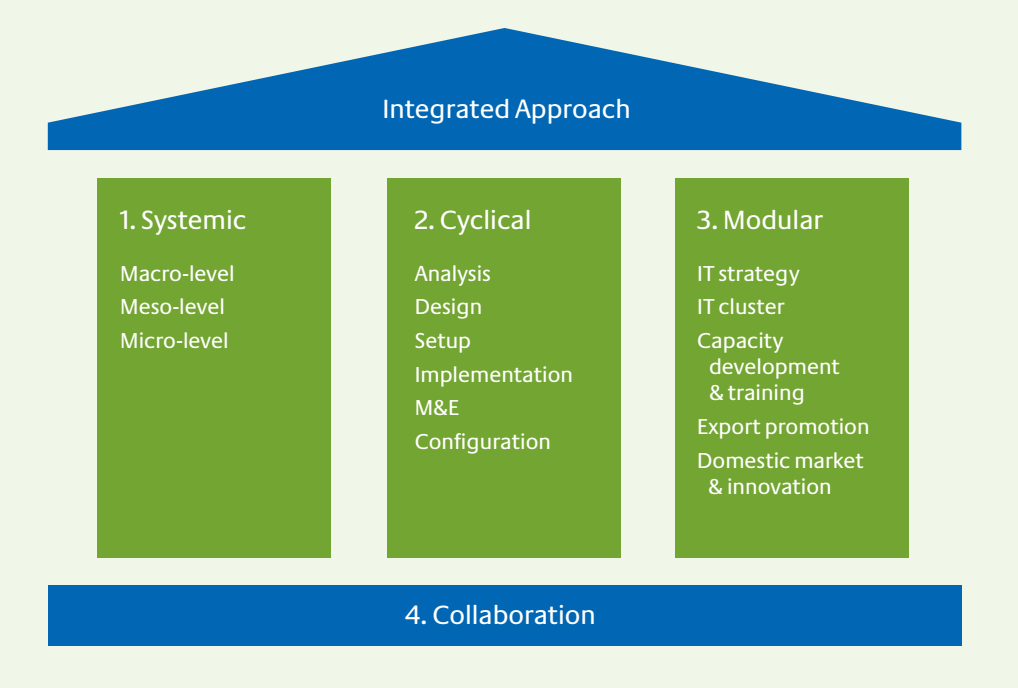
Key questions

1. **What is the integrated approach for IT sector promotion?**
2. **What are the key principles of the approach?**
3. **What are the four key elements of the integrated approach?**

The integrated approach has been derived from the practical experience of German development cooperation (an overview of German development cooperation's experience in the field of IT sector promotion can be found in the annex). It takes into account the specific challenges of supporting the IT industry in developing and emerging countries. It is based on the following **key principles**:

- **Adaptability**: The IT industry is highly dynamic, competitive and globalised. In an industry environment which is characterised by constantly changing technology and market trends, the only sustainable competitive advantage is the ability to stay flexible, adapt to new technologies and to upgrade capabilities. By adaptability we mean the ability of the promotion approach to flexibly react to new market and technological trends and to generate new sources of competitive advantages for IT companies in developing and emerging countries.
- **Market orientation**: An effective promotion approach needs to be based on market mechanisms. Market orientation means that the approach needs to support local IT industries in bridging the gap between their capabilities and the requirements and demand structures of potential markets.
- **Sustainability**: Sustainability refers to a project approach which is based on a realistic appraisal of existing capabilities and resources in developing countries and the implementation of measures leading to competitiveness and economic growth on a long-term basis. Furthermore, sustainability implies capacity development of all relevant stakeholders.

The following chart illustrates the suggested **integrated approach** for IT sector promotion in developing and emerging countries. It consists of **three pillars** ("systemic competitiveness", "cyclical model" and "modular structure") and a **cross-cutting element** permeating the whole approach ("collaboration").



1. **Systemic competitiveness**: the international competitiveness of a local IT industry can only be improved if all relevant stakeholders on the three systemic levels (i.e. the so called "macro", "meso", and "micro" levels) are included into project design and implementation.
2. **The cyclical model** addresses the specific challenges of the IT industry such as short innovation cycles, global competition and technological change. According to this model, IT sector promotion is not a linear process but a cycle of iterative development phases where feedback and suggestions from different stakeholders as well as the results of monitoring & evaluation feed into adjusting and improving the project implementation. This cyclical model has been developed in analogy to agile methods in software engineering.
3. **The modular structure** includes five support modules: IT strategy, IT clusters & networks, capacity development & training, export promotion, and domestic market development & local innovation. These **modules represent the actual core intervention measures** to promote the IT industry in developing and emerging countries. The modular structure allows the stakeholders and the project team to adjust the sequence and intensity of the support measures to the specific needs and conditions on the ground. In the Toolbox, the support measures are comprehensively described and categorised per module.

4. **Collaboration** is a central cross-cutting element, which is crucial for the successful implementation of IT sector promotion projects. Challenges of IT sector promotion in developing and emerging countries can only be effectively tackled by a collaborative approach involving all relevant stakeholders ranging from ministries to donors, industry associations, academia, clusters and companies. Collaboration and close interaction between stakeholders is needed to design and implement viable support measures for the local IT industry, to allow exchange of relevant information, knowledge transfer and capacity development.

Combining cyclical, iterative project implementation with close cooperation and interaction between stakeholders can support the establishment of a "learning system" within the IT industry. Such a learning system can help to disseminate relevant technological and managerial know-how and to generate sustainable competitive advantages. Furthermore, the learning system facilitates continuous improvement and adaptation of the project approach in an industrial environment which is characterised by intense global competition and short innovation cycles.

Effective collaboration in IT sector promotion in turn requires the establishment of appropriate **organisational structures** as well as **project and process management** according to the specific requirements and challenges of the IT industry in developing and emerging countries.

The methodology has been designed with the idea to provide stakeholders with a **guideline and roadmap** for IT sector promotion which can be flexibly adapted to different country settings as well as to changing market conditions and technology trends. When implementing IT sector promotion projects, all four key elements should be taken into account since eliminating individual elements would reduce their effectiveness.

4.2 Key Element 1: Systemic Competitiveness

Key questions

1. **What is systemic competitiveness?**
2. **What are the benefits of systemic competitiveness?**
3. **How to apply systemic competitiveness to IT sector promotion?**

The concept of systemic competitiveness has been developed by the German Development Institute (DIE). It is a heuristic model that combines findings from economics, business administration, political science and sociology in order to better understand the driving forces of economic development and competitiveness. The objective of this concept is to provide a theoretical framework for the analysis of national industries and for the formulation of policy recommendations and development strategies in order to improve the international competitiveness of these industries. Unlike many other theories on competitiveness and development strategies, this model takes into consideration the specific problems and challenges of emerging and developing countries[13].

[13] *A similar model has been developed by the OECD, called "structural competitiveness". However, this model is more general and does not take into account the specific challenges in developing and emerging countries.*

The central idea of this concept is that **competitiveness results from the interaction of different competitive factors and actors on the different levels of an economic system.** The different levels are defined as follows:

- The **meta-level** describes the basic orientation of a society and the overall political and social framework.
- The **macro-level** consists of the relevant institutions shaping the business environment in a country, such as ministries or state agencies.
- The **meso-level** describes organisations and institutions on the industry level, such as clusters, associations or chambers of commerce.
- The **micro-level** comprises the companies, including SMEs as well as large-scale enterprises.

For the purpose of this manual only the macro, meso, and micro-level are relevant. The meta-level is beyond the scope of IT sector development projects.

Today's IT industry being highly dynamic, competitive and globalised, **knowledge-based and technology-based competitive advantages** play an increasingly important role. Accordingly, only those national IT industries will thrive, which are able to organise **swift and effective learning as well as transformation processes among all relevant actors** on the different levels of the economic system.

	Actors	Factors
Macro-level	• Ministry of Economy • ICT Ministry • Ministry of Transport & Communications • Ministry of Education & Science • ICT Agency • Agency for SMEs • Export Promotion Agency • Investment Promotion Agency	• ICT Strategy • Institutions • Investment • Support programmes • ICT infrastructure • Intellectual property (IP) • Education system • Domestic market framework
Meso-level	• IT associations • IT clusters • Chambers of commerce • Universities • Research institutes • Secondary education institutes • Financial sector institutes	• Organisation level • Education and human resources • Research & development (R&D) • Capital & financing • Linkages & networks
Micro-level	• Large-scale IT companies • Small and medium-sized IT enterprises (SMEs)	• Number of companies • Average size of companies • Structure • Wages • Company capabilities • Image & branding

In order to **increase systemic competitiveness** of the IT industry and to facilitate interaction between the relevant actors, it is advisable to implement the following activities:

- Supporting the establishment of **organisational structures and processes to support the formulation of ICT policies on a national basis**, including a "vision" and "overall strategy" for ICT.
- **Integrating all relevant stakeholders** from the macro, meso, and micro-level in each phase of the project cycle for IT sector promotion (see key element 2).
- Designing **support measures which address all three systemic levels** (see key element 3). This is particularly relevant for the issue of capacity development and training.

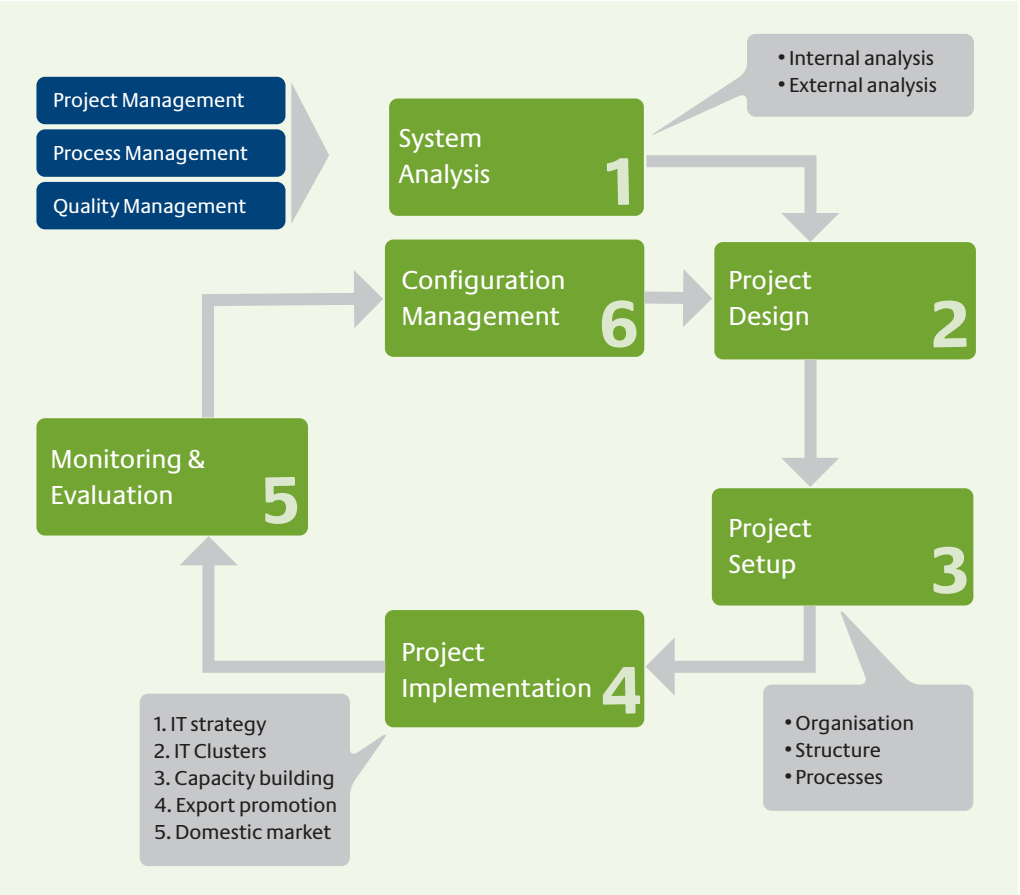
Useful Links	
Systemic Competitiveness	http://www.systemic-competitiveness.de/
MIT System Dynamics Group	http://mitsloan.mit.edu/faculty/research/dynamics.php
National IT Summit of Germany	http://dict.leo.org/ende?lp=ende&lang=de&searchLoc=0&cmpType=relaxed&sectHdr=on&spellToler=&search=gipfel
National Chief Information Officer	http://www.cio.gov/
Ministry of Communications & Information Technology of India	http://www.mit.gov.in
Ministry of Information Society and Administration of Macedonia	http://www.mio.gov.mk
Ministry of Communications and Information Society of Romania	http://www.mcsi.ro
Albanian National Agency for the Information Society	http://www.e-albania.al/web/Our_Mission_National_Agency_for_Information_Society_55_2.php

4.3 Key Element 2: Cyclical Model

Key questions

1. **What does the cyclical model imply?**
2. **What are the benefits of this model?**
3. **How to apply the different phases of the project cycle for IT sector promotion?**

The second key element of the integrated approach for IT sector promotion is the **cyclical model**. At the centre of this model stands the idea that IT sector promotion needs adaptive approaches in order to react to quickly changing market conditions and technology trends. Similar to software development, where traditional sequential methods have been abandoned in favour of so-called agile, incremental methods, this model applies a cycle of iterative project phases following the logic of a PDCA (Plan-Do-Check-Act) cycle:



The model consists of **six different project phases**. Once the support measures have been implemented (phase 4), the whole cycle starts again based on the results from the monitoring and evaluation phase.

Benefits of the cyclical model for IT sector promotion in developing and emerging countries

- The model addresses the specific challenges of the IT industry such as short innovation cycles, global competition and technological change by facilitating adaptability and improving rapid reaction capabilities within IT industries.
- Feedback from monitoring and evaluation as well as from stakeholders on the different systemic levels allow the adjustment and continuous improvement of the IT sector promotion project.
- Breaking down the project into several smaller project phases allows easier and more efficient project management.
- A cyclical model consisting of several project phases and feedback-loops enables better resource allocation and controlling. This is particularly relevant to developing and emerging countries which usually have very limited resources for IT sector promotion at their disposal.

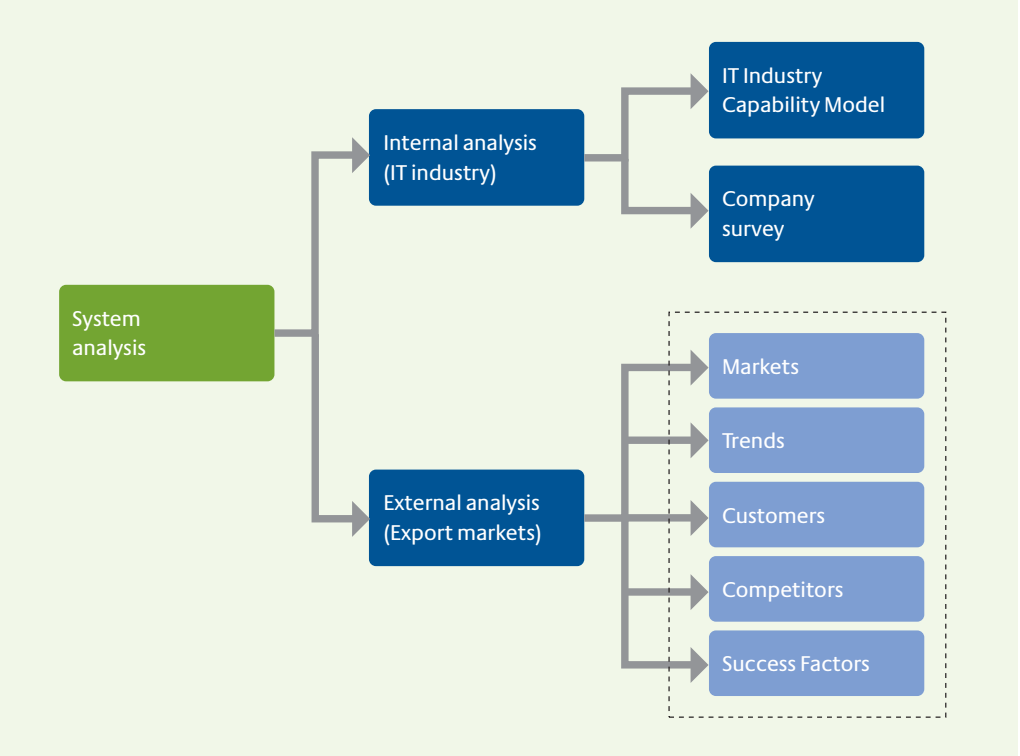
There are different models and procedures that can be used for managing projects in development cooperation. While we recommend Capacity WORKS[14] as an overall project management model, the management of the project cycle of IT sector promotion projects requires some specific approaches and tools, which will be outlined in the subsequent six subchapters.

4.3.1 Phase 1: System Analysis

According to the integrated model, the cycle for IT sector promotion projects should start with a thorough **analysis** of the whole system which determines the competitiveness of the IT industry. Therefore, the analysis phase needs to comprise an internal as well as an external analysis.

The **internal analysis** is targeted at assessing the structures, resources and capabilities of the IT industry, while the **external analysis** implies the analysis of potential export markets in order to identify the relevant key success factors. Thereby, the analysis phase forms the basis for the subsequent phases and particularly for the project design by providing the relevant information for decision making. Without basing the whole project cycle upon a sound analysis, the entire IT support project would be prone to failure due to a lack of consistency with either the internal situation of the IT industry or the external conditions on international markets. The following chart displays the two major aspects of the system analysis as well as the corresponding tools:

14 *Capacity WORKS is GIZ's management model for sustainable development. Further information on Capacity WORKS can be obtained from: http://www.gtz.de/en/unternehmen/31610.htm.*



4.3.1.1 Internal Analysis

The internal analysis encompasses two different elements, the **IT Industry Capability Model (ITICM)** and the **Company Survey**.

Competitive advantages are generated when an organisation is able to match its **resources and capabilities** with the **key success factors** of the industry. Accordingly, establishing competitive advantages for a national IT industry in a developing or emerging country requires support measures that take into account the resources and capabilities on the three systemic levels, the IT-specific national environment factors and the international key success factors of the global IT industry.

In order to achieve a thorough analysis and understanding of the IT industry and its capabilities, we need a model taking into account the structures and challenges of the IT industry in developing and emerging countries.

For that purpose, a special analytical concept has been developed by GIZ, the **IT Industry Capability Model (ITICM)**[15]. This model consists of seven software export capability dimensions which are subdivided into several capability factors. These factors have a direct impact on the international competitiveness and capabilities of a national IT industry. The capability dimensions and factors can be attributed to the three systemic levels (macro, meso, and micro-level).

15 *The IT Industry Capability Model (ITICM) draws on the Software Export Success Model (SESM) developed by Heeks and Nicholson (2004).*

The model postulates that sustainable competitiveness depends on a complex system of interconnected capabilities and factors on the different systemic levels.

The following table describes the IT Industry Capability Model with its capability dimensions and factors as well as the corresponding systemic levels.

Capability Dimensions	Capability Factors	Systemic Level		
		Macro-level	Meso-level	Micro-level
State Institutions	Strategy	x		
	Institutions	x		
	Investment	x		
	Support programmes	x		
ICT Infrastructure	Energy supply	x		
	Telecommunications	x		
	Internet	x		
Demand	Export market			x
	Domestic market	x		x
Structural characteristics of the industry	Number of companies			x
	Average size of companies			x
	Structure			x
	Wages			x
	Organisation level and associations		x	
	Cluster		x	
Company capabilities	Management skills			x
	Export skills & references			x
	Technology skills			x
	Quality management, processes and standards			x
Academia & support institutions	Education and human resources		x	
	Continuous education & training		x	
	Research & development		x	
	Capital & financing		x	
International linkage & branding	Image & branding	x	x	x
	Offshore/ Nearshore factors (geography, language, culture)			x
	Intellectual property (IP)	x		x
	Linkages & networks		x	x
	Diaspora			x

The **analysis of the IT Industry Competitiveness** is conducted in **three steps**:

1. Collecting and analysing all available reports and publications on the national IT industry.
2. Conducting qualitative interviews with relevant stakeholders on all three systemic levels, covering the capability dimensions and factors of the IT Industry Capability Model.
3. Summarising the results of the analysis according to the structure of the IT Industry Capability Model (Output: a master document containing all relevant information).

For more detailed information on the application of the IT Industry Capability Model, please refer to the Toolbox.

It is worth mentioning that the results of the IT Industry Competitiveness Model analysis provide mostly aggregated **qualitative information**. Therefore, one needs to complement the analysis of the IT industry competitiveness with a **quantitative analysis** on the company level. This should be done by a company survey.

A **company survey** should be conducted in order to better understand the existing structures, capabilities and problems on the **enterprise level (micro-level)**. This is particularly important in developing and emerging countries where, usually, there is only very little data and information available on the IT industry. Furthermore, the survey serves as a cross-check for microeconomic aspects (e.g. structural characteristics of the industry) which were examined within the IT industry capability analysis. To implement the survey, it is advisable to follow these steps:

1. Develop a questionnaire for the company survey.
2. Fine-tune and finalize the questionnaire by conducting pre-tests with selected companies.
3. Send out the questionnaire to local IT companies. If possible it should be conducted in the form of an online survey.
4. Collect and analyse the data. The data from the online survey need to be exported and analysed by using appropriate software programmes like spreadsheet or statistics applications (e.g. SPSS).
5. Elaborate a detailed report, which presents the results of the survey in detail. The key findings of the survey should be summarised in a presentation.

For more detailed information on how to conduct the IT company survey, please refer to the Toolbox.

It should be pointed out that the company survey is also a very valuable tool for monitoring and evaluation. Firstly, the results of the survey can be used as a baseline. Secondly, the structure and processes of the company survey can be used to establish a so-called "Industry Barometer" to assess and evaluate the performance of the IT industry on a regular basis (see phase 5 "Monitoring & Evaluation").

4.3.1.2 External Analysis

The third step within the system analysis phase is the **external analysis**, which comprises the assessment of relevant export markets. The goal of this external analysis is to provide information on the size, structure, and trends of potential export markets and to identify customer requirements as well as key success factors. This information is essential for the local IT industry to bridge the gap between their existing capabilities and the requirements and demand of international markets. This information is critical because

- Export markets often provide a much higher growth potential for IT companies from developing and emerging countries than their domestic markets. In many cases domestic IT markets in developing countries are rather small and underdeveloped.
- Working for international clients helps local IT companies to acquire latest technologies and management know-how. It thereby supports technology transfer.
- The IT industry is highly globalised, thus making international export markets the main reference point for IT companies from developing and emerging countries.

The **external analysis** should be conducted as follows:

1. Screen potential export markets and identify the most relevant markets for further analysis.
2. Conduct market research based on existing reports and publications. Particularly useful are the European Information Technology Observatory (EITO), publications of specialised market research companies such as Forrester and Gartner as well as the publications of national IT associations such as BITKOM. Furthermore, some qualitative interviews should be conducted to identify trends and key success factors.
3. Elaborate the analysis of relevant export markets including a thorough assessment of the overall economic situation, market structures and trends in the software and IT services industry, customers, competitors and key success factors.

This approach for the external analysis of potential export markets can also be applied to the analysis of the domestic market.

The final step within phase 1 "System Analysis" is to merge the results of the internal and the external analysis to lay a sound foundation for the project design. Accordingly, the results should be summarised and the key findings should be presented to all stakeholders of the local IT industry, including IT companies. This is important to create awareness and common understanding among all stakeholders, and to make well-informed decisions on project design and the corresponding support measures on a collaborative basis.

Useful Links	
QuestionPro	http://www.questionpro.com
SurveyMonkey	http://www.surveymonkey.com

4.3.2 Phase 2: Project Design

The next phase of the cyclical model is to **design a project** on the basis of the system analysis' results. This should be done in a collaborative manner by including all relevant stakeholders as early as possible.

This subchapter will provide an example of project design as can be used for an overall project for IT sector promotion. In practice, such a project could also be divided into a number of "sub-projects", and the project design phase could be applied to each separate sub-project. Designing an IT sector support project involves the following **steps**:

1. **Establishing a working group** for project design. This working group should include representatives of all relevant stakeholders from the different systemic levels, particularly from the following organisations:
   - Ministries: Ministry of Economy, ICT Ministry, Ministry of Transport & Communication.
   - State agencies: ICT Agency, SME Agency, Export & Investment Promotion Agency.
   - Donor organisations active in ICT promotion.
   - Universities and other relevant institutions of IT educations.
   - IT associations, clusters, networks and chambers of commerce.
   - IT companies.

   A useful reference framework for identifying relevant stakeholders is provided by the capability dimensions of the IT Industry Capability Model (see chapter 4.3.1). Complex project environments might require a detailed stakeholder analysis.

2. **Creating awareness**: A workshop should be organised with the members of the working group in order to increase their awareness of the importance of IT sector promotion in terms of economic development. The workshop should also familiarise them with the specific approach, methods and tools for supporting the IT industry in developing and emerging countries. Such a workshop should cover the following topics:
   - Role and importance of IT sector promotion for economic development;
   - Benefits of IT sector promotion;
   - Methods and tools for IT sector promotion;
   - Best practice examples from other countries.

3. **Capacity development in project management**: In some cases, it might be useful to conduct capacity development in the planning and management of IT industry support projects. This enables stakeholders to play a more active role within the project and ensures its sustainability. Capacity development could be organised in the form of training workshops.

4. Conducting a **project planning workshop** with the members of the working group. Within this workshop, the cornerstones of the project need to be discussed and agreed upon. This implies the following points:
   - Overall project goal and impact (In this context even the results chain needs to be defined);
   - Development of indicators;
   - Definition of support measures based on the project goals;
   - Project beneficiaries and partners;
   - Discussion of risks and assumptions;
   - Project duration;
   - Project budget and resources.

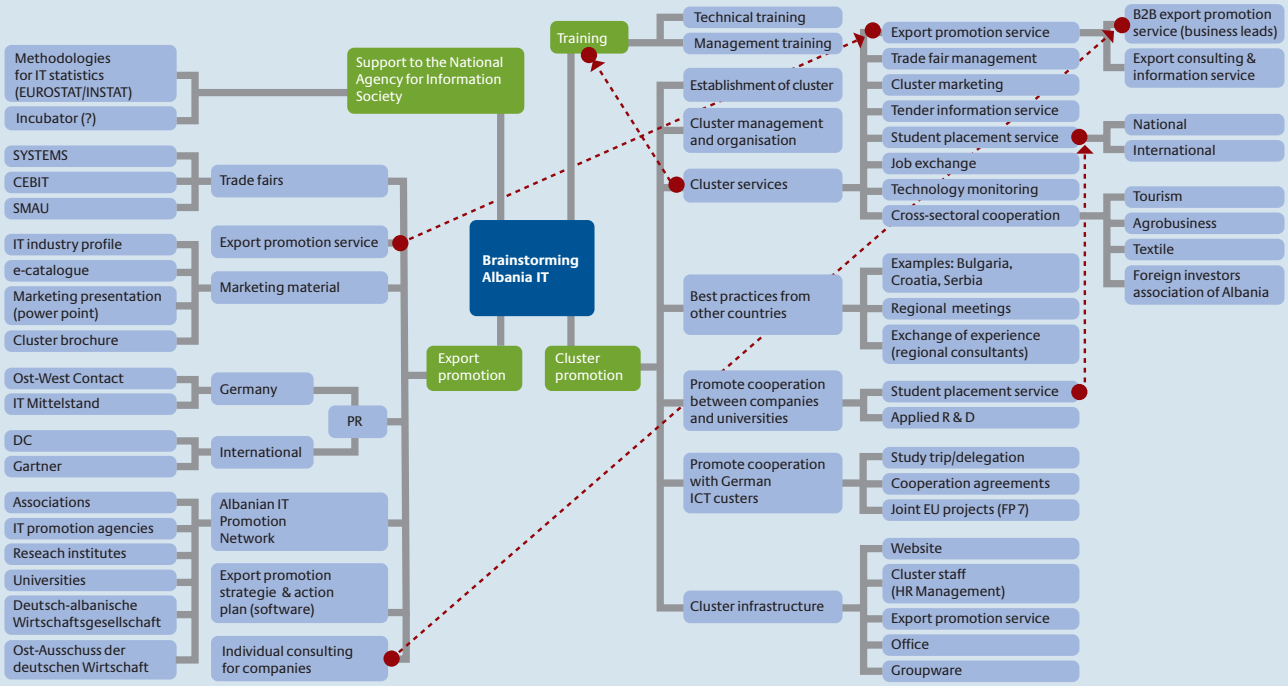
5. Based on the results of the joint project planning workshop, the organisation driving the project should elaborate **draft Terms of Reference (ToR)** for project implementation. While the exact content of ToR will clearly vary depending on the scope of the project, a generic format is suggested, namely:
   - Project background & problem analysis;
   - Project objectives;
   - Project description & approach;
   - Project tasks & outputs;
   - Expertise required;
   - Reporting requirements;
   - Project duration;
   - Available budget.

6. **Finalising the ToR**: The draft ToR should be discussed with the members of the working group and a final version should be elaborated based on their feedback. The ToR represent the central project document, outlining the project design. They also serve as point of reference for all involved stakeholders.

7. **Tendering and contracting**: Based on the ToR, the organisation driving the process needs to conduct a tender and contract a suitable consulting company/implementation body for project implementation.

Practical Example:

In 2007, a joint workshop was organised by German development cooperation together with all relevant stakeholders in order to plan and design a project for promoting the Albanian IT/software industry. One of the key issues on the agenda was to elaborate specific support measures for the industry. For that purpose, a brainstorming session was conducted using the MindMap technique. The following chart illustrates the results of the session:



Source: .

Key success factors

- When forming the working group, one should assess the specific needs, interests and capabilities of stakeholders
- The working group should be organised and structured in an open manner to facilitate active participation and influx of ideas and suggestions
- IT companies, since they represent the actual target group of the IT sector promotion project, need to play a key role in the project structure
- It is crucial to present and communicate the benefits of the project as well as the corresponding expectations and requirements
- Relevant national development strategies and policies (e.g. national strategy papers) need to be taken into account
- Close coordination and cooperation with other donors and ICT projects is required
- One should use participatory working techniques and respect local knowledge and skills
- Stakeholders should take a lead role in project design
- One should allow ample time for consultation and for building consensus
- The project budget should promote appropriate cost-sharing arrangements

4.3.3 Phase 3: Project Setup

The **project setup** phase involves setting up organisational structures, processes and tools needed for the implementation of IT sector support projects. It comprises the following **steps**:

1. **Establishing organisational structures** for project implementation: There are different possible organisational forms such as networks, partnerships, forums or clubs. Selecting the most suitable one depends on the project scope and the situation on the ground. Due to the multi-stakeholder setting in IT sector promotion, it is advisable to apply organisational forms which focus on coordination and collaboration rather than control.

2. **Defining processes**: Implementing a project in close cooperation with different stakeholders requires well-defined processes. The key processes that need to be defined consist of
   - Project management processes (who is doing what and when);
   - Information and communication processes (internal and external);
   - Knowledge management and learning processes;
   - Documentation and reporting processes;
   - Monitoring and evaluation (M&E) process.

3. **Operationalisation of ToR**: This includes the definition and specification of concrete support measures, tasks and activities of the project. For that purpose the organisation driving the process should organise an operational planning workshop that includes all stakeholders. During the workshop, the support measures determined in the ToR have to be operationalised into individual tasks and activities. Resources and responsibilities have to be assigned to these tasks and a timetable with milestones has to be defined.

4. **Elaboration of project management tools**: based on the results and inputs of the operational planning workshop, a project presentation for marketing and communication purposes as well as an operational work plan should be prepared. The **operational work plan** contains the following elements:
   - Support measures;
   - Tasks;
   - Activities;
   - Responsibilities;
   - Resources & budgets;
   - Timetable;
   - Milestones.

The operational work plan subdivides the project into manageable components (measures, tasks, activities) in terms of size, duration and responsibility. It serves as a key management instrument and roadmap for structured planning and implementation of an IT sector support project. Furthermore, the operational work plan provides a common framework for effective coordination and communication among all stakeholders involved in the project. It is recommended to develop the operational work plan with MS Excel to support budget calculation and overall clarity. Alternatively, one can also use so-called Work Packages (WPs).

Further concrete recommendations on how to design organisational structures and processes for IT industry support projects will be made in key element 4 "Collaboration" (chapter 4.5).

4.3.4 Phase 4: Project Implementation

Phase 4 consists of the actual **implementation** of the support measures, tasks and activities defined in the ToR and the operational work plan. Implementation of an IT sector support project requires the following **actions**:

1. **Implementation of the support measures (modules)**: According to the integrated approach, IT industry support projects usually envisage specific support measures in five strategic areas.

a.	IT Strategy Development
b.	IT clusters & networks
c.	Capacity development & training
d	Export promotion
e.	Domestic market development & local innovation

The underlying idea of this structure is **modularity**, meaning that there is no predefined sequence or weighting with regards to the five support modules. The set of modular support measures and activities can be customised to the specific challenges and requirements of the IT industry in a certain country. Depending on the initial situation on the ground, it might be necessary to establish an IT cluster first in order to have an organisational structure for collaboration and further project implementation. While this modular structure increases adaptability and "customer orientation", it also requires flexible project implementation through reconfiguration and calibration of the five support modules.

2. **Project coordination**: Parallel to implementation, one should ensure the coordination of stakeholders, the project team and resources.
3. **Project communication**: The basis for efficient project implementation and coordination is comprehensive internal and external project communication. This also includes project marketing in order to ensure that the project receives sufficient media coverage and public support.
4. **Project administration** includes the administration of the project staff, the project infrastructure as well as project documentation and reporting.
5. **Change management**: Since IT sector support projects need to flexibly adapt to changing environments, requirements and market conditions, change management needs to be integrated within the project implementation.

The five different support measures or modules will be detailed in chapter 4.4. "Modular Structure".

4.3.5 Phase 5: Monitoring & Evaluation

Monitoring & Evaluation (M&E) plays an important role within the cyclical model and the overall integrated approach. IT sector promotion is not a linear process but a cycle of iterative development phases, where the results of monitoring & evaluation feed into each new project phase and into the whole project approach.

- M&E helps to find out whether project implementation is still on track and reveals information on the effectiveness of the project and its measures.
- It provides valuable feedback which can be used as lessons learned and as a basis for continuous improvement of the project approach and implementation before restarting the next project cycle. This feedback function constitutes an important element of a "learning system" for IT sector promotion and facilitates institutional learning as well as the creation of organisational knowledge.
- Since public institutions and resources are usually involved in the implementation of IT sector promotion projects, M&E is important in terms of accountability to the general public and particularly to the tax payers. Thereby M&E also helps to ensure public support for IT sector promotion.
- M&E provides the basis for making informed decisions among stakeholders within the project implementation process.
- Last but not least, M&E increases the strategic response capabilities of stakeholders and the IT industry towards changing market conditions and technology trends. Thereby it also contributes to improving the international competitiveness of a national IT sector.

We recommend establishing an M&E system according to the following **steps**:

1. **Defining the overall project goal**: The overall project goal defined in the ToR (project design phase) represents the first level of the M&E system.
2. **Setting milestones**: Milestones are set as "interim targets". These milestones are closely related to the different support measures and can thus be verified quickly and easily. These milestones form the second level of the M&E system. They are logically related to the achievement of the desired overall goal. Thus, the overall goal of the IT sector promotion project is to be achieved as a consequence of the milestones having been accomplished. Usually, the milestones are defined during project design and should be included in the ToR.
3. **Developing Indicators**: Indicators can be defined as quantitative or qualitative variables that allow the changes caused by projects, strategies or activities to be measured in a simple and reliable way.[16] They help to simplify complex, IT industry-related issues and to reduce them to an observable dimension. Typical indicators for IT sector support projects include:

- Job creation in the IT industry
- Women employed in the IT industry (% of IT workforce)
- Increase in export-led revenues
- Business opportunities for local IT companies (number of business leads generated)
- IT sector development strategy officially approved by the Ministry of Economy or by legislative body (e.g. parliament)
- Public tenders won by local IT companies
- Amount and type of software products/ services provided by IT companies (export market and domestic market)
- Number of member companies of IT clusters or networks
- Number of companies using cluster services
- Number of companies/ persons participating in capacity development and training activities
- Number of international cooperation agreements signed (e.g. with IT clusters in other countries, universities, research institutes, etc.)
- Number of companies certified according to international standards (e.g. CMMI, ISO)

16 *Institut für Strukturforschung und Planung (2007): 6.*

Practical Example:

As part of the project of German development cooperation "Promotion of the Macedonian IT/ Software Industry", an export promotion strategy was developed. For the implementation of the strategy, a special M&E-system was elaborated. The following chart shows the corresponding goal and indicator system:

Source: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

7. **Elaborating a baseline study**: The indicators need to be related to the initial situation in the IT industry before the implementation of the project. Therefore a baseline study will have to be conducted at the project start. Quite often, the results of the company survey which has been conducted during the system analysis phase (see chapter 4.3.1) can be used as a baseline.

8. **Selecting tools for gathering information**: These tools typically include interviews and surveys. For monitoring & evaluation of IT sector support projects, GIZ developed a special tool called "Industry Barometer".[17] The industry barometer is a web-based tool to gather and analyse quantitative and qualitative information on the performance of an IT industry and to identify market and industry trends. The barometer covers topics such as general company information, statistics (e.g. turnover), human resources (e.g. employment, salary structures), forecast, and current subjects (feedback function for companies). The industry barometer is therefore not only a suitable tool for M&E but can also be used for statistical purposes. Besides, it can also serve as an "early warning system" for the industry.

Practical Example:

For the Bulgarian software cluster BASSCOM the Bulgarian IT Industry Barometer was developed in 2008. Today, this barometer has become the major M&E as well as forecasting tool for the cluster. Furthermore, it provides detailed and reliable statistical data on the Bulgarian IT industry. This is particularly important since official sources offer only very little statistical data and information on the Bulgarian IT industry.

Source: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

9. **Evaluation** should take place at least once a year in the form of joint evaluation workshops with all relevant stakeholders. During these workshops, stakeholders should evaluate the monitoring results, lessons learned and decide on improvement measures for the further development of the project. Evaluation of the implementation of the project should be conducted according to the following criteria:

1.	Relevance	Are we doing the right things? (National policy, company needs)
2.	Effectiveness	Are we achieving the goals/objectives of the strategy?
3.	Efficiency	Do we reach the goals/objectives of the strategy in an economical prudent and cost-effective way?
4.	Impact	Does the strategy implementation contribute to attaining (higher) goals? (National economic development)
5.	Sustainability	Will the positive effects/benefits last?

[17] *As a conceptual basis for developing an industry barometer, the company survey (see system analysis phase) can be used.*

4.3.6 Phase 6: Configuration Management

The main goal of this phase is to adjust and improve the project approach and content according to the results of monitoring & evaluation, before the next project cycle starts. The configuration management phase implies the following steps:

1. **Assessment of M&E results**: Together with the stakeholders a project assessment workshop should be organised in order to conduct a final evaluation of the whole project cycle including the design, setup, implementation and results (outcome, outputs, achievement of goals and possibly also impact). Lessons learned, best practices and recommendations should be derived from the project assessment.

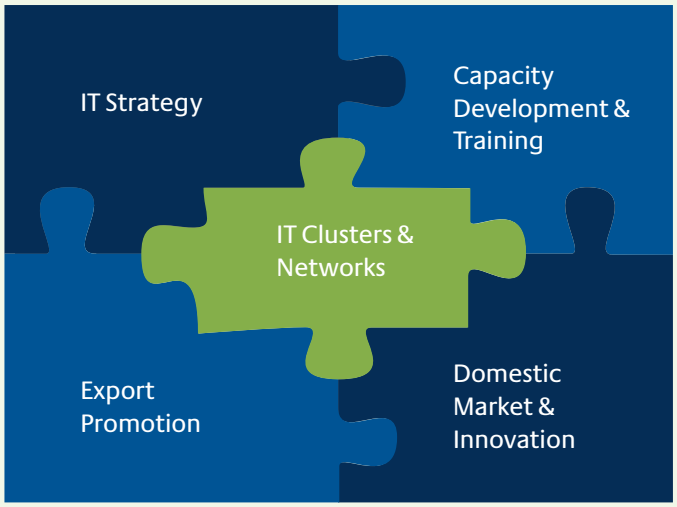
2. **Formulating recommendations:** Based on the results of the project assessment workshop, the project team should elaborate concrete suggestions on how to improve project implementation for the next project cycle. This is particularly important for the configuration of the support measures (five modules). Typically, the support modules need to be reconfigured in terms of weighting, e.g. moving the focus of consulting activities from capacity development to export promotion.

3. **Restarting the project cycle:** If an agreement with the stakeholders has been reached on the actions for improvement, the project has to be reconfigured and the next cycle has to be started.

Analogous to cyclical or spiral models in software engineering, reconfiguring the project approach allows continuous improvement of IT sector promotion projects and increases adaptability, flexibility and effectiveness.

4.4 Key Element 3: Modular Structure

The **modular structure** comprises five modules of support measures, which were developed and tested within several IT sector support projects over a period of more than eight years. The modules were developed to cover all aspects influencing the competitiveness of an IT industry, ranging from the specific business environment on the macro-level to structural issues and capabilities on the micro-level. The modular structure consists of the following support modules:



The sequence and relative intensity of the five modules can be reconfigured and weighted. However, it is not recommended to implement only isolated, individual modules as this would adversely affect the effectiveness of the approach.

The five modules were designed to systemically complement and reinforce each other. The modular structure brings the following benefits:

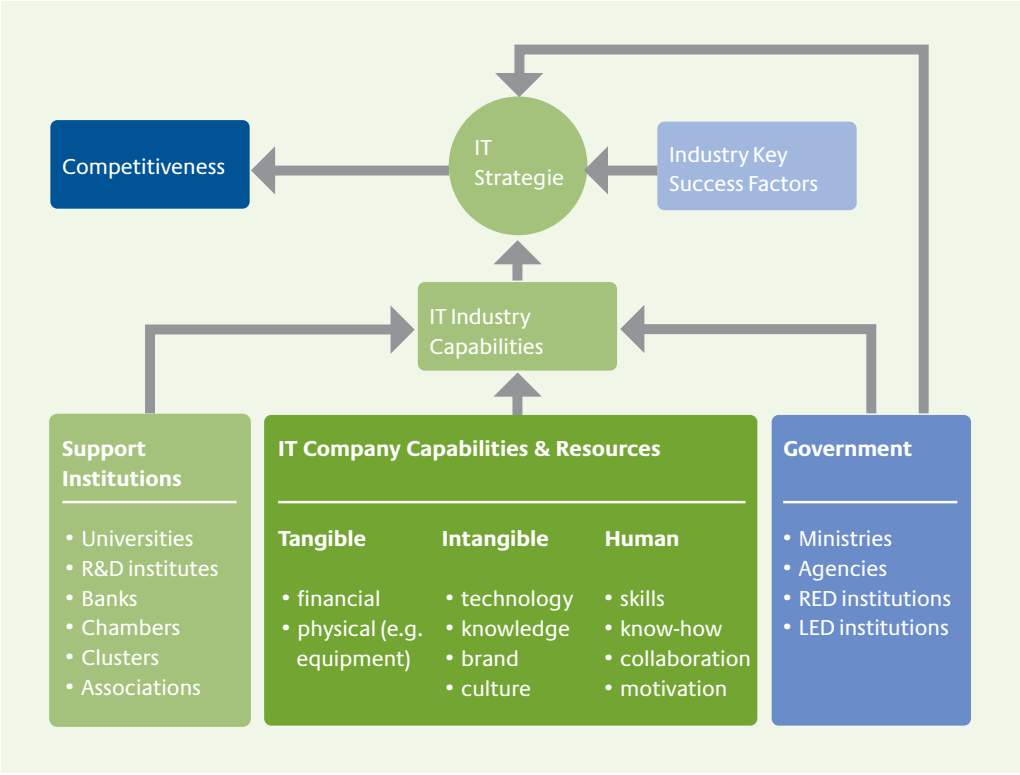
- It allows the stakeholders and the project team to adjust the sequence and intensity of the support measures according to the specific needs and conditions on the ground (flexible adaptation).
- The specific composition of the modules generates economies of scale and synergy effects.
- The modular structure supports effective resource allocations within the project.
- The specific structure enables easy integration and coordination with relevant development strategies, programmes and projects.

4.4.1 IT Strategy Development

Key questions

1. **Why develop an IT strategy?**
2. **What kind of methodology should be used for IT strategy development?**
3. **What is collaborative strategy development?**
4. **How to manage the IT strategy development process?**
5. **How should an IT strategy be structured?**
6. **What kind of content should the strategy include?**
7. **What is a generic strategy and what is "strategic fit"?**
8. **What are the key success factors of strategy development and implementation?**

Strategy development in IT sector promotion is a coordination device that brings together all relevant stakeholders and helps define policies, measures and actions in order to increase the IT industry's international competitiveness.



However, developing and implementing strategies for the IT industry constitutes a challenge. This holds true particularly for developing and emerging countries, where effective strategy development and implementation is often hampered by limitations in terms of financial resources and organisational capabilities. As a matter of fact, only few developing countries managed to elaborate consistent strategies for their IT industry and only a fraction of these countries were able to effectively implement them. Then why develop an IT strategy at all?

Having a well-defined strategy can generate the following benefits for IT sector promotion:

- It provides a guideline and roadmap for results-oriented cooperation in the IT industry.
- It establishes a common direction for goal-oriented collaboration in order to improve competitiveness.
- A strategy makes it possible to moderate and plan the process of shaping the future of the IT industry.
- Tasks which individual businesses could never tackle alone can be planned and implemented together.
- A joint strategy can improve resource allocation and efficiency.

Of course, whether to develop a strategy for the IT sector of a developing country always depends on the initial situation on the ground and the available resources. In some cases, for instance when the available resources are very limited or the current stage of the IT industry requires swift action, it is better to start with another support measure and directly move into action.

Moreover, depending on the business environment and challenges on the ground, the focus of an IT strategy can vary greatly. Some strategies lay emphasis on education and HR development while others focus on investment promotion. Within IT sector promotion projects implemented by German development cooperation, **export-oriented strategies** have proven particularly effective.

Strategy development at industry level requires coordination and strategic alignment of different stakeholder groups. Therefore, GIZ has designed a special **methodology for collaborative IT strategy development and implementation.**

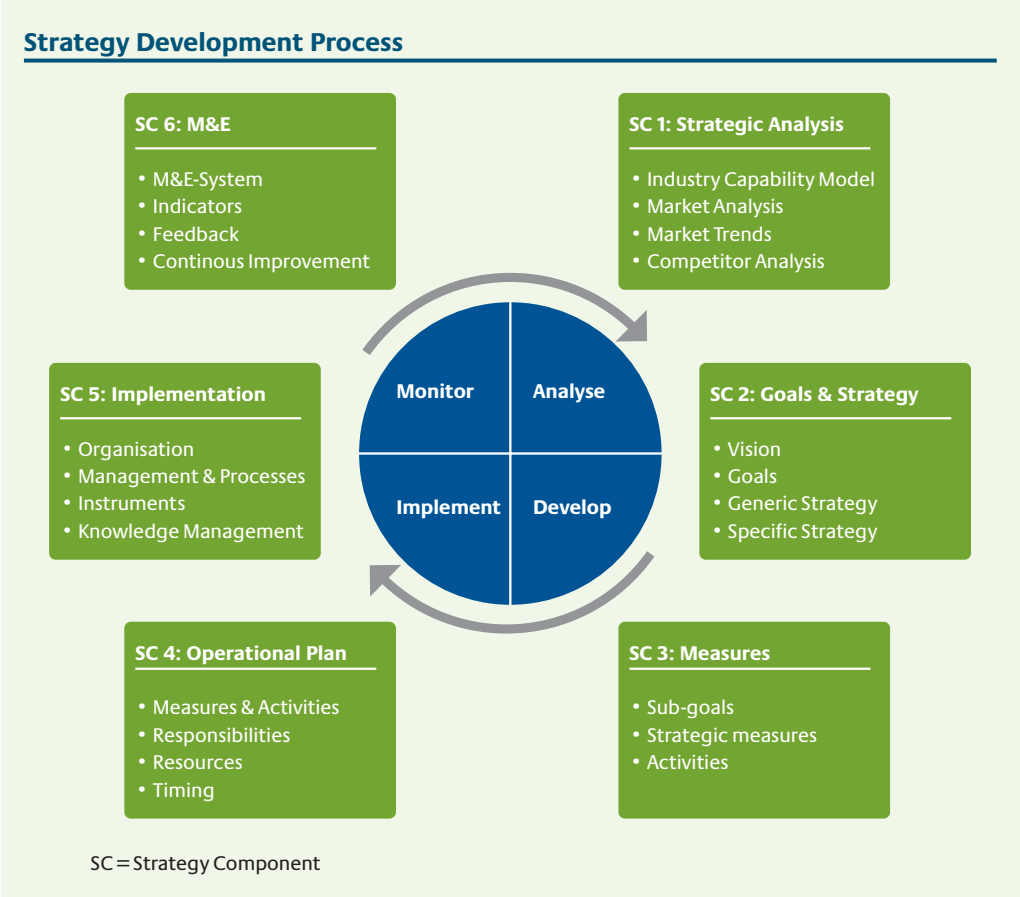
Mirroring the integrated approach for IT sector promotion, this methodology is based on a combination of close collaboration among stakeholders and cyclical strategy development in four phases.

These phases are:

1. Analysis;
2. Strategy development;
3. Implementation;
4. Monitoring & feedback.

Collaboration being paramount, we recommend that representatives of all relevant stakeholder groups of the IT industry form a **working group** moderated by the organisation managing the strategy development process. This working group is responsible for the overall process.

In order to render the management of the **strategy development process** more efficient, the four phases are subdivided into individual **strategy components**. Each of these components contains a specific set of topics and tasks that need to be elaborated by the working group within a specific timeframe. The following chart shows the four phases and the corresponding six strategy components (SCs) of the overall strategy development process.



The strategy components will be used to structure the content of the strategy document:

1. **SC 1: Strategic Analysis:**
   The Strategy Component 1 comprises an internal and external analysis by using tools and frameworks such as the IT Industry Capability Model, market analysis and competitor analysis. The internal analysis is targeted at assessing the structures, resources and capabilities of the local IT industry, while the external analysis implies the analysis of potential export (as well as domestic) markets in order to identify the relevant key success factors. The strategy component 1 forms the basis for the subsequent strategy development process by providing the relevant information. Without basing the strategy development process upon a sound analysis, the strategy development would be prone to failure.

2. **SC 2: Goals & Strategy**
   SC 2 is mostly concerned with formulating a vision and setting the goals of the strategy. Furthermore, it encompasses the definition of the generic strategy as well as the specific strategy depending on its particular focus (e.g. HR development, export promotion).

3. **SC 3: Measures**
   Based on the goals and strategies defined in SC 2, Strategy Component 3 defines concrete measures and activities according to agreed milestones. Support measures should include activities on the macro, meso, and micro levels.

4. **SC 4: Operational Plan**
   The operational plan includes measures and activities, responsibilities, resources and timing.

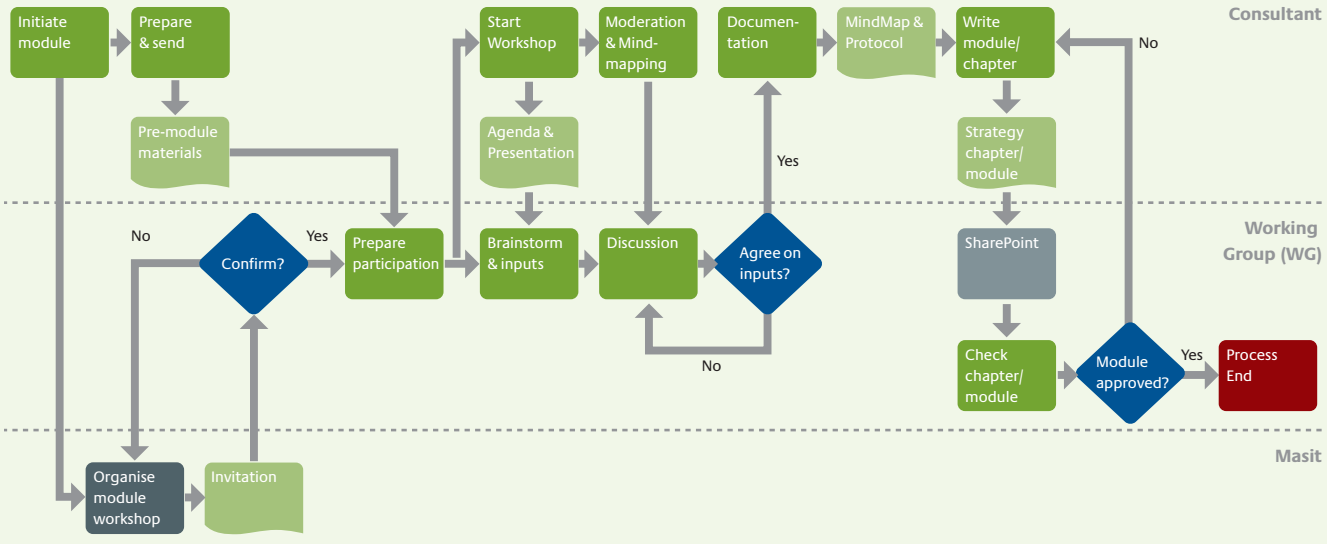
5. **SC 5: Implementation**
   In SC 5, the necessary organisational structures, processes and instruments for the implementation of the strategy are developed.

6. **SC 6: Monitoring & Evaluation (M&E)**
   SC 6 includes the definition of indicators and the development of an M&E system in order to evaluate the effectiveness of the measures, to provide feedback and to ensure continuous improvement of the strategy.

It is advisable to define **sub-processes** for each of the strategy components. Each component consists of pre-component activities, workshop-activities and post-component activities.

The pre-component activities include the dissemination of articles and information material on the subject of the particular strategy component to the members of the working group, as well as the agenda for the workshop. The workshop activities consist of one or two workshop sessions on the respective subject of the component including short presentations, brainstorming sessions, group work and discussions. The workshops are followed by the post-component activities which, depending on the particular phase, comprise writing, revision and final approval of strategy elements and documents discussed in the working group. The following example has been taken from the strategy development process of the export promotion strategy for the Macedonian software industry. It illustrates the sub-processes for each of the strategy components from initiating the component to the approval of the results.

Process for Strategy Components



As the diagram indicates, the activities of the working group should be coordinated by a lead organisation such as an IT association or cluster, which also provides the organisational infrastructure for the workshops, such as location, support staff, etc.

The **structure of an IT strategy** should reflect the different phases of the strategy development process. The following structure can generally be suggested as an orientation for the IT strategy document.

Executive Summary

1. Introduction
- 1.1 Background
- 1.2 Document Purpose and Objectives
- 1.3 Structure and Approach

2. Methodology for Strategy Development
- 2.1 Approach and Phases
- 2.2 Organisational Aspects (members of the working group)
- 2.3 Processes
- 2.4 Tools

3. Analysis
- 3.1 Internal Analysis
- 3.2 External Analysis

4. Strategy Development
- 4.1 Vision
- 4.2 Definition of Goals
- 4.3 Generic Strategy
- 4.4 Specific Strategy
- 4.5 Strategic Measures

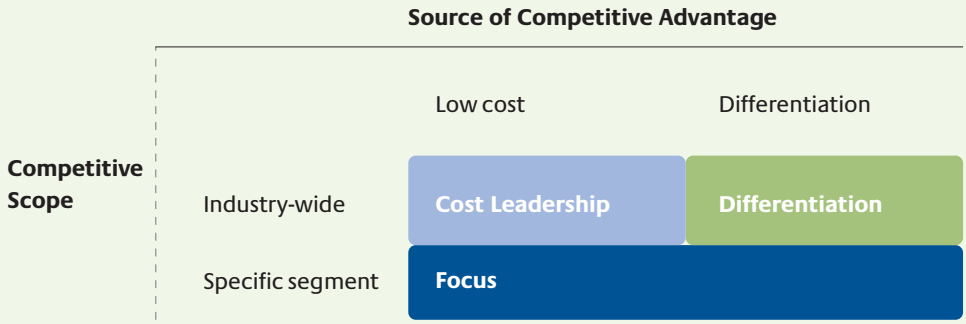
5. Strategy Implementation
- 5.1 Operational Plan
- 5.2 Timetable
- 5.3 Organisational Structure and Processes
- 5.4 Information and Knowledge Management

6. Monitoring and Evaluation

The **content of an IT sector strategy** largely depends on the specific focus of the strategy and the challenges that need to be addressed.

A key element of IT sector strategies is the formulation of the **generic strategy**. Based on the two main sources of competitive advantage (cost advantage, differentiation advantage) and the market scope (broad versus narrow market scope), Porter defined three generic strategies which are cost leadership, differentiation and focus.[18] In view of the intense competition within the global IT industry and the structural challenges of developing and emerging countries, identifying the appropriate generic strategy for IT sector development becomes a fundamental issue. The three generic strategy options are shown in the following diagram.

18 *Porter (1980).*



Source: diagram based on Grant (2008): 219.

The following three tables give an overview of each of the three generic strategies including their rationale, advantages and disadvantages.

Cost Leadership	
• Provision of a product or service which is comparable to that of a competitor at a lower cost • Based on: economies of scale, experience curve effects, cost minimisation • Companies from India, Vietnam and Russia have at least partly adopted cost leadership strategies • Mostly applied in offshoring services • Sources of cost leadership ⧫ key cost drivers: economies of scale, economies of learning, production techniques, product design, input costs, capacity utilisation, residual efficiency • Major cost driver in the software industry: labour costs	
+	−
• Simple, straightforward option • Supports rapid market penetration • Compatible with customer expectation/ perceptions	• Problems with sustainability and long-term effectiveness • Costs are important, but there are several other offshoring selection factors • Cost advantages can quickly erode due to increasing labour costs and exchange rates • Decreasing profit margin & low-quality image

Differentiation

- Differentiation strategy is aimed at the broad market and involves the creation of a product or a service that customers perceive as unique
- Goal of a differentiation strategy: build customer loyalty and create entry barriers to potential competitors
- Due to loyalty created for a brand, demand is less price-elastic, leading to higher profit margins
- Technically complex products and services like software offer much greater scope for differentiation
- Differentiation is about understanding the interactions between an organisation and its customers and how these interactions can be designed to deliver additional customer value
- Due to rising labour costs, the Indian software industry started to introduce elements of a differentiation strategy (process quality, customer service)

+	-
• Important strategy due to increasing competition and commoditisation • Allows for higher profit margins • Sustainable competitive advantages • More difficult to copy	• For small software industries and SMEs often not viable due to substantial investments required by a differentiation strategy on a broad market scope

Focus

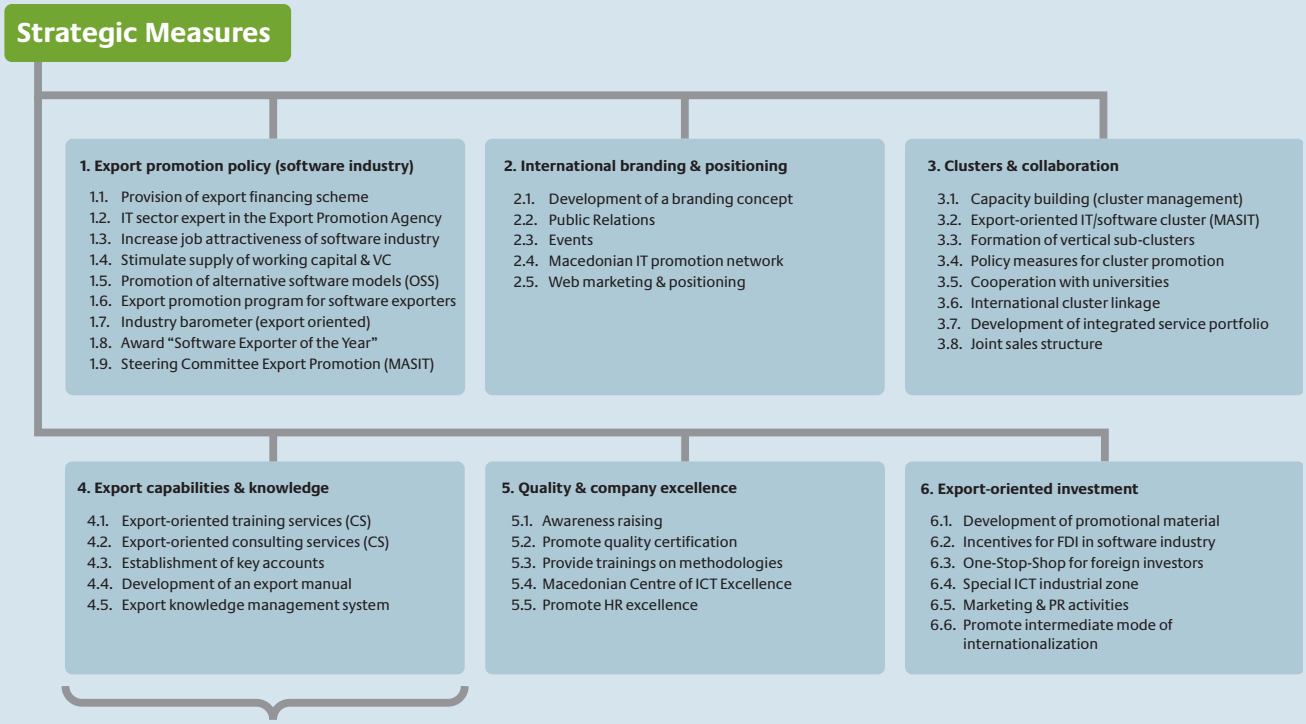
- Concentration on a few selected target markets / niches
- Due to concentration, the organisation knows the target customer group so well that it meets their needs better than their competitors
- Organisation can charge a substantial mark-up over costs because of the value added
- Several software exporting countries have adopted a focus strategy, concentrating on areas in which competition is less intense and in which they have comparative advantages
- Examples: Philippines (data entry services), Ireland (specialised services), Israel (niche software products)
- First mover as well as late entrant strategy
- To succeed on export markets: companies need to specialise in the same specific niches

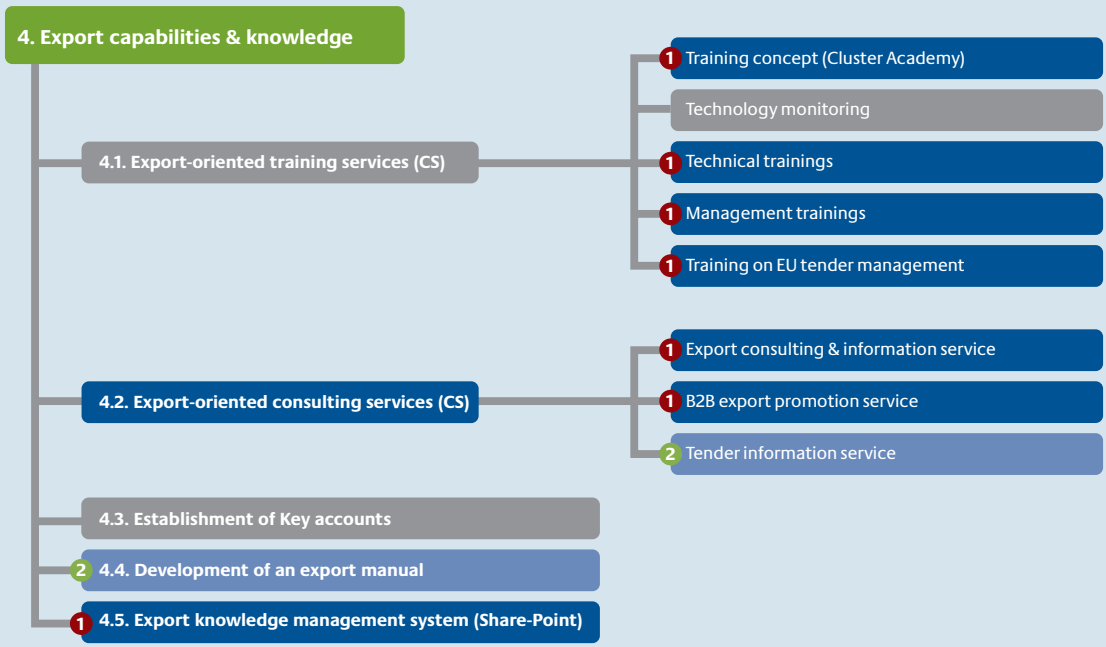
+	-
• Cluster effects through specialisation: facilitates national branding • First mover advantages • Higher profitability & less competition • Suitable for small-scale software industries • Important in view of increasing competition, industrialisation and differentiation	• In-depth market and customer knowledge required • Flexibility and adaptability required • Professional marketing skills • Narrow scope (risk)

With regards to the formulation of concrete **support measures**, the following practical example illustrates possible strategic measures and activities for an export-oriented IT strategy.

Practical Example:

The Export Promotion Strategy for the Macedonian Software and IT Services Industry defines support measures, tasks and activities in 6 different areas including export promotion policy, international branding and positioning, clusters & collaboration, export capabilities & knowledge, quality & company excellence, and export-oriented investment.



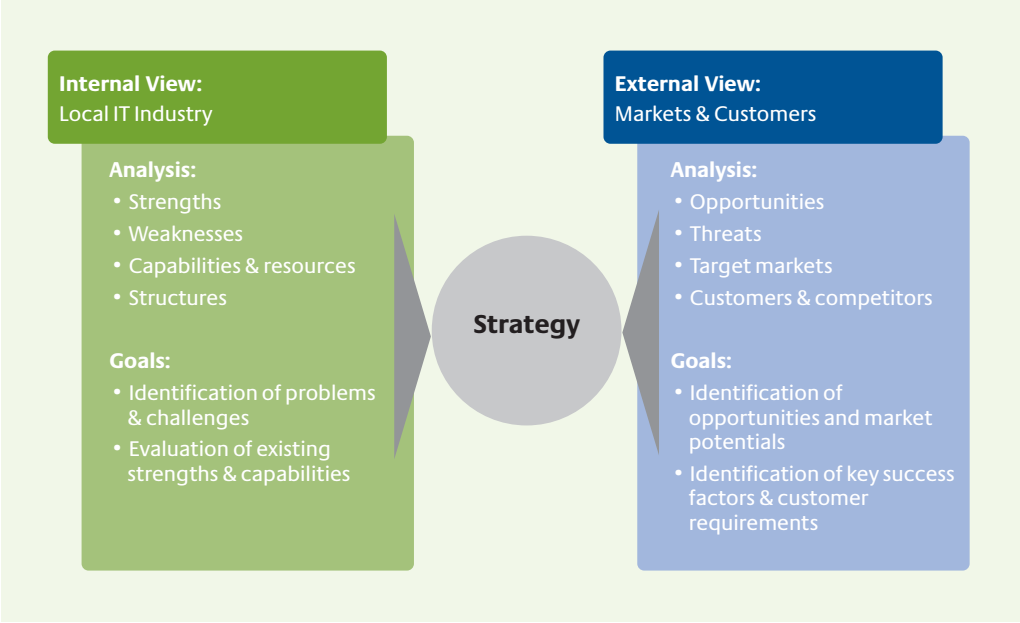


Source: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

Other practical examples of strategic support measures include:

- The Software Technology Parks of India (STPI) initiative which was launched by the Indian government within the framework of a national IT sector development strategy in 1991.
- In 2001, the Romanian government suspended income taxes on salaries for software companies which employed certified programmers. This has proven to be an effective tool to attract qualified staff to local software companies and to tackle the problem of brain drain.
- China reduced income tax to 10% for key software companies identified by the government, while Malaysia introduced 100% tax exemption for qualifying IT companies for 10 years.

An important methodological key concept for developing IT strategies in developing and emerging countries is the so-called **strategic fit**. It describes the idea of designing an IT strategy which bridges the capabilities of a local IT industry (internal view) with the requirements and key success factors of the target markets (external view) in order to generate sustainable competitive advantages and to successfully position the industry in international markets. With this approach it is possible to overcome the dichotomy often found in many IT industry development strategies between "resource-based strategy" and "market-focused strategy" by combining and integrating both approaches.



Strategic fit provides the basis for developing effective and sustainable strategies for the IT industry in developing and emerging countries.

Key success factors

- IT strategy development should always be based on a thorough internal and external analysis (strategic fit).
- The consistency and feasibility of the IT strategy should be secured.
- The methodology which was used for developing the IT strategy should always be described in the strategy document (in order to serve as a benchmark for future evolutions).
- One should ensure the adaptability of the strategy to the changing market conditions and technology trends in the IT industry.
- The strategy should support IT sector institutions' (e.g. ICT agencies) capacity development efforts.
- A strategy should not be static but enable the partners to respond flexibly as a learning organisation to changing market conditions.
- The focus of the strategy should be less on a visionary approach but rather on the formulation of concrete, practical steps and measures to improve the competitiveness of the IT industry (operational strategic orientation).
- The goals of the strategy should be formulated as precisely as possible, to permit derivation of concrete measures and activities.
- The implementation of the strategy should proceed in small but very operational steps which do not overstrain the resources of the partners involved.
- One should start with implementing measures which quickly deliver concrete results for local IT companies ("quick wins") to motivate partners and ensure the "buy in" of stakeholders on the micro-level.

Useful Tools

Tool 1.1	IT Industry Capability Model
Tool 1.2	IT Company Survey
Tool 1.3	Checklist Differentiation Strategy
Tool 1.4	Operational Plan for IT Strategy Implementation

For further information please refer to the Toolbox.

Useful Links

World Bank ICT Strategy Consultations	http://www.worldbank.org/ict/strategy
Kenya ICT Strategy	http://www.ictvillage.com/Downloads/2006_Kenya_ICT_Strategy.pdf
Macedonian ICT Chamber of Commerce (MASIT)	http://www.masit.org.mk

4.4.2 Promotion of IT Clusters and Networks

Key questions

1. What are IT clusters?
2. What role do clusters play in IT sector promotion?
3. What are the benefits of IT clusters?
4. How to establish an IT cluster?
5. Which cluster model should be applied in the IT sector?
6. How to manage an IT cluster?
7. What is the importance of cluster services?
8. What are the key success factors of IT cluster promotion?
9. What are networks?
10. What role do networks play in IT sector promotion?
11. What are the benefits of networks?
12. What are the core principles for establishing & sustaining networks?

Collaboration among all relevant stakeholders is a prerequisite for improving systemic competitiveness in the IT sector. There are two approaches for supporting collaboration in the IT sector which will be discussed in this manual: **clusters** and **networks**.

IT Clusters

Clusters are a well-proven and effective approach for promoting collaboration within the IT industry of developing and emerging countries. According to Porter, industry clusters can be defined as follows:

> *"Clusters are geographic concentrations of interconnected companies, specialised suppliers, service providers, firms in related industries, and associated institutions in particular fields that compete but also cooperate."*[19]

IT industries from several emerging and developing countries have impressively demonstrated the value of clusters for IT sector promotion. Examples of highly successful IT clusters include the Bulgarian Software Cluster BASSCOM, the Serbian Software Cluster (SSC), and the Russian cluster RUSSOFT. Several IT clusters can also be found in India (Bangalore, Mumbai, and Chennai). In Western Europe, clusters have been successfully employed as tools for promoting the IT industry (for instance in Germany with the Software Cluster Rhein-Main-Neckar or in Ireland with the Irish ICT Cluster).

The promotion of IT clusters constitutes a key support module of IT sector support in German development cooperation. The strategic **importance** of this module can be attributed to several factors:

- Firstly, clusters facilitate the **organisational integration** of all relevant stakeholders on the different systemic levels including ministries, agencies, universities and IT companies.

[19] *Porter (1998): 197.*

- Secondly, by pooling IT firms and institutions within a cluster, support measures are more **effective and cost-efficient**.
- Thirdly, establishing IT clusters supports **organisational learning and sustainability**.

In summary, clusters provide the **organisational platform** for planning, coordinating and implementing the support modules of the integrated approach. Once an IT cluster is established, it should become a strategic lead partner and main beneficiary of IT sector promotion projects. The cluster should play a key role in the working group for coordinating project implementation (see chapter 4.3).

For the IT industry of developing and emerging countries and in particular for SMEs, clusters provide a broad range of benefits

- They allow effective collaboration between IT companies and relevant stakeholders such as ministries and universities. Thereby, clusters become "innovation systems" within the IT industry and enable "networked development" of the sector.
- Clusters improve policy advocacy and lobbying towards government institutions in order to acquire public support.
- They generate economies of scale through cooperation.
- They achieve synergy effects through collaboration of companies with different technological capabilities.
- They provide a better visibility in international markets through joint marketing and branding.
- They raise the marketplace profile.
- They develop and implement specialised consulting and training services (business development services) for cluster member companies.
- Clusters increase competitive and innovative strength through bundling of competences and resources.
- They enhance productivity by providing better access to input factors and rapid exchange of information on new technologies and management techniques.
- They can implement joint R&D activities and thus promote innovation.
- They can foster a diversification of product and service offerings through cooperation amongst companies (integrated value chain).
- They improve access to relevant information on potential export markets.

It is worth mentioning that IT clusters not only generate advantages for IT firms but also for their potential clients in domestic or international markets. Serving as "one-stop shops" for clients, IT clusters can help to reduce search and transaction costs. Furthermore, they can **contribute to improving productivity and competitiveness in other industries** (e.g. tourism) by jointly developing cost-effective solutions which meet the special demand of local companies (e.g. specialised booking systems). Thus the cluster becomes a driver for local product and process innovation.

Identifying and clearly communicating the specific advantages of clusters for the IT industry is an important issue to motivate IT firms and to successfully establish IT clusters in developing and emerging countries.

Practical Example:

Within the project of German development cooperation "Promotion of the Macedonian IT/ Software Industry", the following benefits were identified for the members of an IT cluster as well as for its potential clients:

Cluster Members

- Joint marketing & positioning
- Economies of scale
- Bundling of resources & competences
- Provision of cluster services
- better access to input factors & knowledge
- Cost optimisation
- Efficient lobbying & public support
- Cluster as "innovation system"

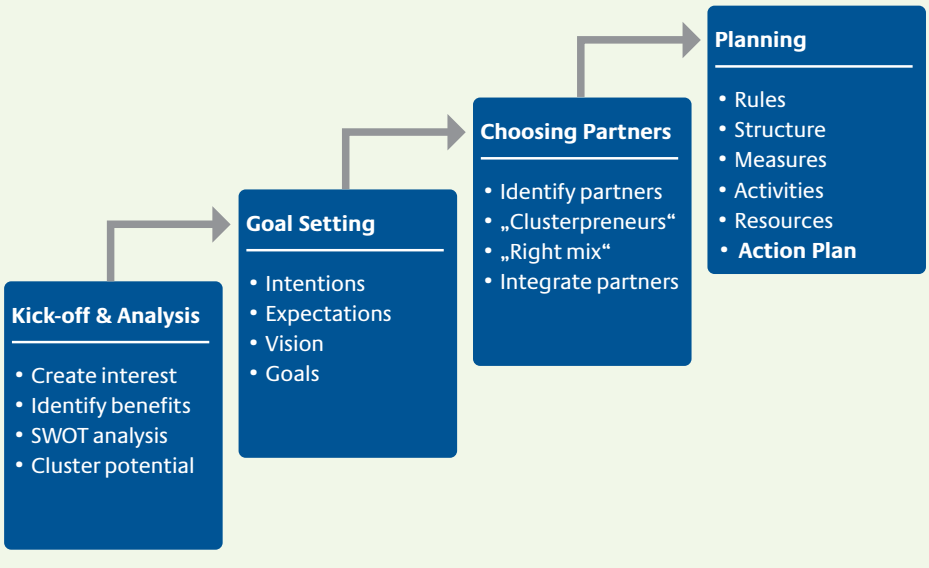
Cluster Clients

- One-Stop-Shop for clients (offshoring)
- "One-Sourcing": scale + technology
- Better market overview
- Resource pool (HR)
- Integrated service portfolio
- Cost reduction & flexibility
- Rapid reaction capabilities (T2M)
- Process & quality management

Cluster = strategic tool for promoting Macedonian software exports

Source: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

Based on the practical experience of German development cooperation projects it is advisable to **establish clusters in four steps** as displayed in the following chart.



Step 1: Kick-off & Analysis

Usually, the first step is to organise a kick-off workshop and to invite IT companies as well as stakeholders that could be useful and relevant for the cluster (e.g. universities). The goal of the workshop is to analyse the strength and weaknesses of the IT companies, to identify their key problems and to determine how a cluster could help them solve these problems and generate strategic benefits. Companies need to be convinced that establishing a cluster will promote their own business as well as the whole industry. A useful tool is to present best practice examples of IT clusters from other countries. Furthermore, a test of the cluster potential needs to be conducted. Normally this first step starts with a small group of interested companies forming the "nucleus" of the cluster.

Step 2: Goal Setting

The next step is to create a joint vision for the cluster and to define the cluster goals. The goal setting should take place as a moderated, bottom-up process involving all potential cluster members and stakeholders, thereby enabling "buy-in" and identification with the cluster. Typical goals of IT clusters include innovation/joint R&D, joint marketing and export promotion.

Step 3: Choosing partners

This step involves identifying and integrating suitable partners for the cluster by gradually extending the nucleus group of the cluster. It is essential to identify the so-called "clusterpreneurs", meaning key persons who are really interested in cooperation and are committed to the idea of establishing a cluster. Furthermore, it is important to achieve the "right mix" of partners including companies, support institutions, academia, and public actors.

Step 4: Planning

Within this step, all the measures and activities needed to render the cluster operational should be planned (including organisational structure, resources, responsibilities, etc.). These measures and activities ought to be operationalised in the form of a cluster action plan. The IT cluster can then start its operations based upon this action plan.

To be effective, IT sector support projects rely upon partners and counterparts which provide stable, reliable and professional organisational structures. An IT cluster can very well be such a counterpart. Therefore, it is advisable to establish a professional IT cluster as early as possible in order to jointly implement the other support measures on a sustainable basis.

The German development cooperation favours the establishment of so-called **"service-based IT clusters"**[20] in developing and emerging countries. Service-based IT clusters are characterised by the following constituting elements.

---

20 *This service-based cluster model has been specifically designed by GIZ to support the establishment and management of clusters in the IT sector.*

- **Bottom-up approach:** The initiative is taken by the IT firms themselves. The clusterpreneurs play an important role and the cluster displays a horizontal, lean structure. The cluster manager is nominated by the cluster members.
- **Market and business orientation:** The cluster is based on market principles and is designed to maximise the economic benefit and competitiveness of its members.
- **Cluster services:** Developing and providing specialised consulting and training services stands at the very heart of this cluster concept in order to generate concrete benefits for member companies and to ensure the cluster's sustainability.
- **Professional organisation:** To operate effectively on the market and to represent the members' interests to the public, the cluster is based on a professional organisation. This includes a business oriented organisational structure, legal form, rules for cooperation (statute) and a clearly defined process model.

This cluster model has proven to be an effective tool for IT sector promotion as it takes into account the specific challenges of developing and emerging countries. Being market driven, the IT clusters which have been established according to this model have demonstrated a high level of sustainability.

Once established, the question of cluster management arises. In the context of IT sector promotion, **cluster management** can be defined as follows:

> **Cluster management** implies the development and implementation of appropriate organisational structures, processes, tools and capabilities to effectively run a cluster. Its main objective is to maximise the cluster members' **economic benefit** as well as their **competitiveness** through
>
> 1. Increasing **innovative strength** by bundling of competences and resources.
> 2. Enhancing **productivity** through providing better access to production factors and dissemination of the latest production technologies and management tools.
> 3. Facilitate **commercialisation** through joint marketing and distribution.

Managing IT clusters implies a broad range of activities ranging from business planning and marketing to knowledge management and change management. Besides, these activities need to be managed throughout the lifecycle of an IT cluster including the three phases - initiation & establishment, growth & maturity, and stagnation & transformation.

- Phase 1: Initiation & Establishment
- Phase 2: Growth & Maturity
- Phase 3: Stagnation & Transformation

	Phase 1	Phase 2	Phase 3
Strategy & Business Plan	x		
Organisational Structure	x		
Cluster Services	x	x	x
Project & Process Management	x	x	x
Marketing & Communication		x	x
Information & Knowledge Management		x	x
HR Management		x	x
Financing	x	x	x
Monitoring & Evaluation		x	x
Change Management			x

Covering all of these activities would clearly exceed the scope of this manual.[21] We will instead focus on two key topics which are of particular importance for the management of IT clusters:

- **Organisational structure** and
- **Cluster services**.

Because clusters are heterogeneous systems, consisting of a number of different member firms and partners, a well-defined **organisational structure** is crucial to ensure an effective cooperation within the cluster.

The choice of legal and organisational form of a cluster depends mostly on its goals and strategy, and on how closely the members want to cooperate. Thus, the rule "structure follows strategy" also holds true for IT clusters. The possible legal forms for clusters are:

- Association (non-profit or for-profit);
- Sectoral chambers (often found in some formerly socialist countries);
- Private limited company (Ltd.);
- Joint stock company;
- Hybrid forms (mix of association and private limited company);
- Foundation.

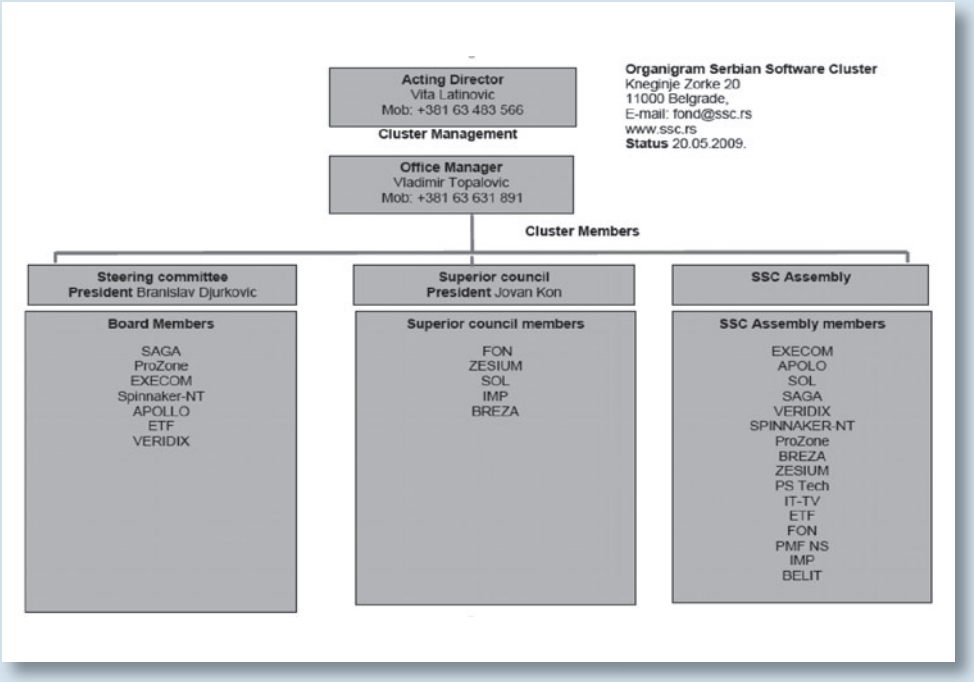
Beyond the legal status, it is important to determine the competence and the communication pathways, i.e. who in the cluster is responsible for what, and how does information flow between the various organisational units and members.

21 *For a more detailed discussion of cluster management topics please refer to the Cluster Management Manual provided by GIZ (see useful links).*

The following example shows a simple organisational structure that could be used by clusters in an early stage of development:

Practical Example:

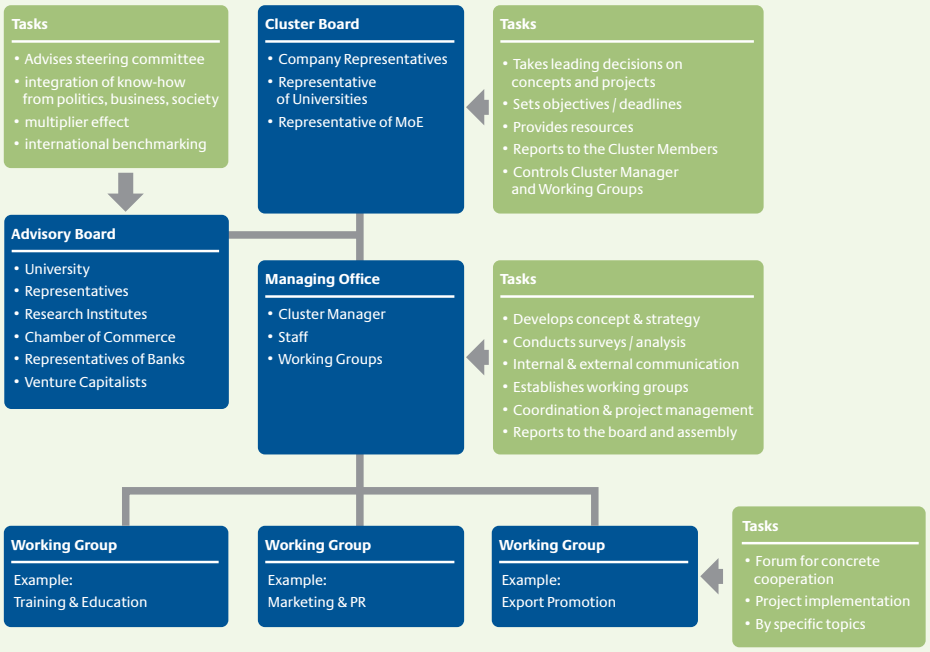
After its foundation, the Serbian Software Cluster (SSC) applied a simple organisational form with an assembly, a steering committee and a director. After a merger with another IT cluster, the organisational structure was altered accordingly.



Source: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

Based on practical project experience, we would however recommend the following **organisational structure** for IT clusters in developing and emerging countries. This structure allows an operational and transparent management of the cluster. It consists of a cluster board, managing office led by the cluster manager, working groups and an advisory board. The most important body is the membership meeting or assembly electing the cluster board as well as the cluster manager. The following diagram illustrates the structure and the main tasks of the different bodies.

Recommended Organisational Structure for IT Clusters



Since they are responsible for the implementation of cluster activities, the cluster manager and the working groups are particularly important. The cross-functional and interdisciplinary composition of the working groups facilitates collaboration, joint learning and innovation.

For further information on the cluster manager's job profile, please refer to the Toolbox.

The second key issue in terms of cluster management is the development and implementation of **cluster services** which stand at the core of the service-based cluster model. Cluster services are of decisive importance for the following reasons:

- In the form of specialised consulting and training services they generate concrete, tangible benefits for the cluster members such as increased sales, higher productivity and quality improvement.
- They help to increase the competitiveness of IT firms and thus of the whole sector.
- They boost the attractiveness of IT clusters and help to attract and retain member companies.
- By generating income and funding for the cluster, these services also help to ensure sustainability of the cluster.

Cluster services are to be designed according to the specific needs and requirements of the cluster member companies and the local IT industry. They should be integrated into a service system or portfolio, whereby the cluster serves as a one-stop shop for service provision. Typically, IT clusters in developing and emerging countries provide the following range of cluster services:

Cluster Service Portfolio

Service Category	Example services
Marketing & Branding	• Trade fair participation programme • Organisation of B2B match-making events • Online catalogues • Joint brochures • Joint branding & positioning concept
Export Promotion	• Export information service (market intelligence) • B2B export promotion service (generating business leads) • Individual export consulting service
Training & Qualification	• Technical training services • Management training services • Quality management & certification service
HR Services	• Joint job exchange (web-based) • Student placement service • Joint recruiting days at universities
Applied R&D	• Joint research projects with universities • Joint participation in FP7 projects
Policy Action	• Round tables with government institutions • Provision of IT statistics (industry barometer) • Acquisition of public funding
Tender Information	• Tender information service (web-based) • Training in IT tender management & acquisition of EU projects
Access to Capital	• Provision of special loans schemes for cluster members in cooperation with banks and public institutions • Match-making with venture capitalists (VCs)

These cluster services will be discussed in greater detail within the corresponding support modules (e.g. export promotion, capacity development & training).

Cluster services can be provided by cluster members and partners (companies, universities, etc.), external service providers (e.g. banks, consultants, etc.), or donor organisations. Usually, costs for providing cluster services can be substantially lowered through demand bundling within the cluster, negotiation of special rates/conditions, and subsidisation by donors. However, financial sustainability of cluster services needs to be ensured right from the start.

Key success factors

- Secure a complementary mix of stakeholders including IT companies, support institutions such as universities and R&D institutes, as well as government institutions.
- Ensure "Cultural embedding", i.e. use existing structures and traditions of cooperation (e.g. "gotong royong" in Indonesia).
- Identify and support "clusterpreneurs".
- Develop and implement needs-oriented cluster services on a sustainable basis.
- Support the establishment of an effective organisational structure for the IT cluster.
- Promote the establishment of export-oriented clusters in order to maximise income generation and technology transfer for the member companies.
- Introduce measures to promote trust and collaboration among cluster members such as workshops, code of conduct, cooperation rules and transparent processes.
- Support the engagement of professional, full-time cluster managers and corresponding support staff.
- Provide advice on establishing a business environment conducive to IT cluster development (e.g. public support schemes for cluster start-ups).

Networks

Depending on the IT industry's level of organisation, clusters might not always be the most suitable form of organisational structures. A complementary tool which has proven to be effective is the establishment of networks (it could also be helpful to use such networks as a basis or core group in the cluster development process, the network becoming the nucleus for the IT cluster).

Networks can be defined as a social structure made up of companies and individuals that are connected through a common interest. Such networks can have a regional focus or a functional focus, like innovation or a certain type of software.

Contrary to clusters, networks are based on a rather loose and informal organisational structure (whereas clusters possess a formalised organisational structure with defined processes and responsibilities). While IT clusters typically have a more local or national focus with regards to their members, networks allow organising cooperation among different partners on a regional (e.g. Western Africa) or international level. Accordingly, networks can be particularly useful for IT sector promotion projects with a regional or multidisciplinary scope.

Regional and international networks are growing, and this intensified global exchange at all levels of society can strengthen economic development particularly in the IT industry. Collaborative communication technologies foster this trend by allowing ever greater numbers of people and organisations to network in an increasingly simple and inexpensive way.

Virtual communication and network building also open up a wide range of ever expanding opportunities for learning and knowledge transfer within the IT sector of developing and emerging countries. Networks offer excellent opportunities for life-long learning of IT professionals and institutions: networks support sustainable dialogue and advanced

training and create a space for international institutional communication beyond local markets. In this context, tools and communities based on online social networks are rapidly gaining momentum as a way to build networks.

Based on the longstanding expertise of German development cooperation in creating, facilitating and sustaining such networks, the following **core principles** have proven crucial to empower and sustain networks as a tool for IT sector promotion.

- **Equality and self-organisation:** A culture that encourages participation and free, open communication results in efficient networks based on peer leadership and peer learning.
- **A culture of fairness, recognition and collaboration:** Sustainable development requires individuals to assume social and economic responsibility. Therefore, many sustainable networks of IT professionals are characterised by a culture of sharing knowledge, volunteer spirit and mutual support.
- **Network-driven innovation for sustainable development:** Local IT experts as network participants set their own priorities. They apply their experience and expertise to jointly create public goods or other specific knowledge within their network to address the needs or demands of a community. Networks provide a "global creative potential" for sustainability and open innovation.
- **Transparency and openness:** Respect and trust are key success factors for a professional network. All roles and expectations need to be transparent, and access to the network needs to be kept open. The "open" technologies of the Web 2.0 promote such a "culture of freedom".
- **A sense of belonging and trust:** The principle of stakeholder participation, supported by instruments such as advanced training, dialogue and building of networks, encourages a sense of identification, belonging and trust within a professional network. While virtual tools are important for network building, network on-site events are crucial to creating a space in which professionals and other stakeholders can develop and intensify connections face-to-face.

Depending on the situation on the ground and the scope of the IT sector promotion project, it is advisable to promote **different types of networks**, such as

- Thematic networks that address a specific topic within the IT sector.
- Regional networks that focus on professionals from multiple countries within a region.
- International networks that concentrate on global cooperation, policy making and exchange within the IT sector.

Practical example:
Peer-to-peer learning in Southeast Asia within the it@foss networks

Financed by BMZ, GIZ's it@foss programme supports the development and application of local innovative software solutions and business models based on free and open source software (FOSS) in the ASEAN region. Within its financing phase (2005 to 2009), it@foss has reached out to more than 13.000 decision makers and IT experts and developers from the public and private sector. The programme now comprises more than 12 regional expert networks of FOSS multipliers from Indonesia, Cambodia, Laos, Vietnam and the Philippines, which are exchanging experiences of their respective IT sectors in Southeast Asia (peer-to-peer learning). A majority of the virtual networks has been kick-started through more than 30 training courses bringing together IT professionals from all countries and resulting in a broad range of shared training products in local languages.

Source: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

Useful Tools	
Tool 2.1	Sample IT Cluster Statute
Tool 2.2	Job Profile for IT Cluster Manager
Tool 2.3	Requirement Specification for IT Cluster Website
Tool 2.4	IT Cluster Promotion Fund
Tool 2.5	IT Industry Barometer

For further information please refer to the Toolbox.

Useful Links	
Cluster Management – A Practical Guide	http://www2.gtz.de/dokumente/bib/07-1496.pdf
Networks	http://www.inwent.org/capacity_building/netzwerke/index.php.en
Bulgarian Software Cluster (BASSCOM)	http://www. www.basscom.org.
Croatian ICT Cluster (CroICT)	http://www.cro-ict.net
Albanian Software Cluster	http://www.albaniansoftwarecluster.com
Russian Software Cluster (RUSSOFT)	http://www.russoft.org
European Cluster Alliance	http://www.proinno-europe.eu/eca
it@foss networks	http://www.it-foss.net/e3076/index_eng.html
GIZ Alumni Portal Germany	http://www.alumniportal-deutschland.org/index-en.html
Sharing Knowledge, Fostering Action –Building networks as an Instrument of Development Policy	http://www.inwent.org/imperia/md/content/a-internet2008/capacitybuilding/100818_netzwerk_en_1_.pdf

4.4.3 Capacity Development and Training

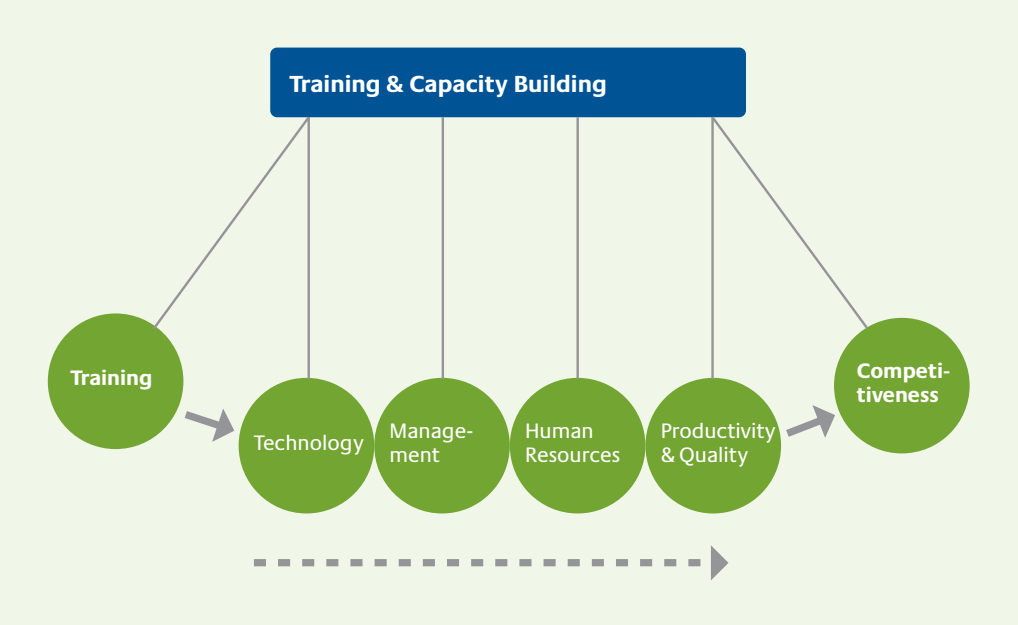
Key questions

1. **Why is capacity development and training so important within IT sector promotion?**
2. **What are the key problems and obstacles concerning capacity development and training?**
3. **How to tackle these problems and obstacles?**
4. **What are training-of-trainer (ToT) networks?**
5. **How does collaborative building of local curricula and training material contribute to capacity development?**
6. **What is a Cluster Academy and how to implement it?**
7. **What topics should be covered in trainings?**
8. **How to use development partnerships with the private sector for capacity development and training?**

In developing and emerging countries, capacity development and training are of paramount **importance** for the following reasons:

- The IT industry is a knowledge and skill-intensive industry; thus making skills development and training a key issue for every IT company.
- The availability of qualified talent/HR is one of the most important determinants for the growth of the IT industry.
- The international competitiveness of a local IT industry depends almost exclusively on the capabilities and the expertise of its workforce as well as on the institutions which are building such skills (local providers of IT education and training).
- Whether the IT industry of a developing country is successful in terms of export as well as investment promotion is to a large extent determined by the qualification of its human resources.
- Training and capacity development are the key requirement for moving up the value chain as well as for industrial transformation towards the knowledge-based economy.

The following diagram illustrates the importance of training and capacity development for improving the competitiveness of the IT sector in developing and emerging countries.



Despite its strategic importance, developing and emerging countries are facing significant **obstacles** impeding capacity development and training in the IT field.

a. General deficiencies in the IT education and training system:

- There is a lack of suitable IT education and training institutions in developing and emerging countries.
- The "output" of IT education in terms of quality and quantity of IT graduates is often insufficient due to a lack of financial resources and capacities.
- Aligning technical education with the needs and requirements of the industry is a serious problem in many countries.
- IT educators and trainers are not always linked to international learning networks. There is also a high risk of brain drain.

b. Insufficient capabilities and skills on the company level:

- IT firms often lack the necessary managerial as well as technical skills to compete in international markets.
- In many cases, IT companies are not even aware of their deficiencies concerning skills and qualification as they do not have access to current information on markets and technologies. This in turn often leads to mismatches with market requirements and to outdated skills profiles.
- Specialised training services for further qualification of local IT experts are often not available.

- Most IT companies in developing and emerging countries are SMEs that often lack the necessary scale and resources to invest into training and capacity development of their employees.
- However, since innovation cycles in the IT industry are shortening, the pressure on IT enterprises to invest into training and to constantly upgrade their capabilities is increasing.
- Global competition and the "war for IT talent" exacerbate the skills shortage in developing and emerging countries through brain drain.

c. **Lack of institutional capabilities:** Public institutions and support organisations such as ministries or IT agencies often do not have the necessary skills to support IT companies effectively.

German development cooperation offers specific measures in the support module "capacity development & training" to address these three types of obstacles.

1. Measures to address general deficiencies in the IT education and training system

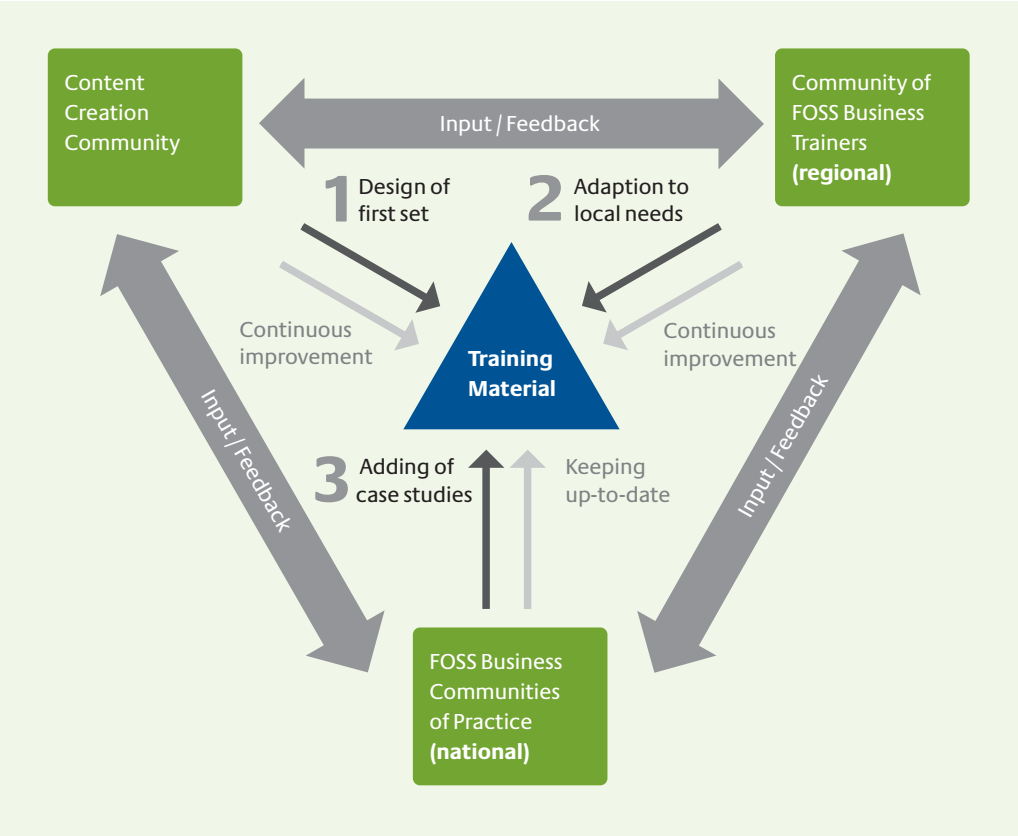
Direct interventions within the higher education system are generally beyond the scope of IT sector promotion projects. However, several support measures were developed to address challenges in the IT education and training system. These measures include:

- **Capacity development for IT education and training institutions through training-of-trainer (ToT) networks** and upgrading of skills of core personnel of IT educational institutions. Such Training of Trainer courses target representatives of different training institutions (universities, technical schools, training providers, etc.), IT SMEs with outreach potential, and other change agents. The courses are entirely needs-driven (through open calls). The main goal is for IT training institutions and other change agents of the IT sector to learn about regional best practices and compile examples of adapted IT knowledge such as technical knowledge, business models and marketing-related skills. In turn, it enables them to communicate best practices and skills to IT SMEs. ToT networks could be sub-national, national or regional. The pan-African IT-learning and trainer network ict@innovation is an example of such a regional capacity development network. It brings together more than 80 African IT faculties and IT training centres with more than 200 private sector IT groups from Africa for joint capacity development and training.

For further information on how to establish such training-of-trainer networks, please refer to the Toolbox.

- **Collaborative building of locally relevant curricula and open training material.** IT educational institutions engage in an inclusive process to create hands-on training material together with experts from different backgrounds with the objective of building an expert community and ensuring local ownership for the training materials. This creation process is not a mere gathering of materials but is to be understood as a joint learning process for a community of people involved in the selection, creation and refinement of open learning materials. It should be set up according to a three-phase model involving multiple communities, including the "content creation community", the "community of regional trainers" and the national IT education's communities of practice.

The following diagram illustrates this collaborative process.



- **Direct integration of universities** into IT clusters as members or partners. The main goal is to align higher IT education content with industry needs. The exchange and alignment is organised as roundtable discussions or as special working groups within the clusters. A case in point is the so-called EDU-Group of the Bulgarian software cluster BASSCOM which focuses on university relations, organises lectures by cluster members at the universities and promotes IT education in Bulgaria though PR campaigns and contests (e.g. national programming contest).

- **Student Placement Services (SPS)**. The core feature of the SPS is the active search and identification of students and graduates suited to IT companies' requirements. The student placement service and its match-making mechanism are based on a close co-operation between IT clusters, the industry and student associations. Students/graduates are thus supported to find suitable internships or jobs. The SPS could comprise a web-based job exchange hosted by the IT cluster as well as information and networking events at selected universities. The service also addresses students studying abroad. Thus, the SPS does not only provide IT firms with suitable job candidates but also tries to reverse the so called brain drain.

For detailed information on the SPS, please refer to the Toolbox.

- **Recommendations for improving IT education**. Within the scope of German development cooperation projects, IT clusters have analysed local IT higher education and formulated recommendations on how to align curricula with latest technology trends and industry needs. The recommendation on curricula for computer science/informatics of the German Society for Informatics (GI) and BITKOM were used as a reference.
- **Academic cooperation**: Whenever possible, within the scope of German development cooperation projects, students and professors are directly integrated into the training activities of the "Cluster Academy" (see below). Furthermore, in close collaboration with the German Academic Exchange Service (DAAD), German development cooperation promotes the academic cooperation between universities in developing and emerging countries and universities in Germany (e.g. TH Karlsruhe – Technical University Sofia, TU Darmstadt – Polytechnic University of Tirana). In the field of open collaboration, exchange between European and African educational providers, networking of African and European IT specialists and joint building of advanced training materials was achieved through a partnership of the BMZ-financed ict@innovation programme of GIZ with the Europe-wide Free Technology Academy (FTA).

In this context, it is worth mentioning that the Indian Software Association NASSCOM has created a special assessment and certification programme which aims at becoming an industry standard for recruitment of entry level talent. The idea behind this assessment and certification programme is to identify the level of talent which is available across India and to provide feedback to the universities on areas they need to work on to further improve the employability of their graduates.[22]

22 *See: http://www.nac.nasscom.in/nactech/.*

2. Measures to improve capabilities and skills on the company level

The **"Cluster Academy"** is a well-proven instrument for capacity development and training within IT sector promotion projects. The main objective of the Academy is to identify concrete training needs of IT cluster member companies and to organise and coordinate corresponding training activities. As a one-stop shop for its members, the Cluster Academy organises training events and conducts quality control, while the actual training sessions are mostly implemented by external training providers.

Ideally, cluster academies should work closely together with ToT and learning networks, which could provide suitable trainers for technical as well as management trainings.

The Cluster Academy bundles the training activities and provides the following **benefits**:

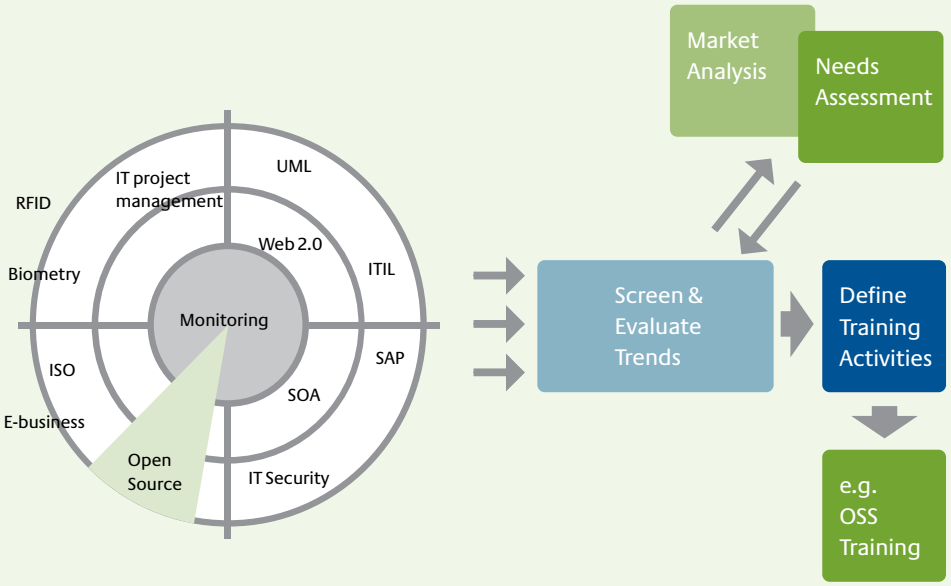
- Establishing a Cluster Academy facilitates the development of training services according to the specific needs of the cluster's member companies.
- By bundling the demand of the members within the Academy, trainings can be provided at lower costs.
- Participating in the trainings of the Academy promotes collaboration among companies as well as joint learning.
- Providing trainings through the Cluster Academy increases the attractiveness of a cluster to potential as well as to existing member companies.
- Training and capacity development activities of donors or implementing organisations of development cooperation can be delivered more effectively through a Cluster Academy.
- By providing the necessary organisational structures, manpower and processes, a Cluster Academy can make a valuable contribution to ensuring the sustainability of training measures.

Based on project experience of German development cooperation in IT sector promotion, a Cluster Academy could be established in **four steps**.[23]

- **Step 1: Set-up of the organisational structure** as well as the corresponding processes and tools for the Cluster Academy. Usually, the Cluster Academy is directly integrated into the structure of the cluster and is managed by the cluster manager or specially designated support staff.
- **Step 2: Assessment of specific training needs**. This can be done in the form of a company survey or a moderated focus group workshop. It is worth pointing out that the principle of "strategic fit" is also relevant for needs assessment and developing of training programmes. This means that one also needs to take into account the specific requirements of potential export markets. The results of the external analysis in project phase 1 (see chapter 4.3.1) can be used for that purpose. Furthermore, it is advisable to analyse and monitor technological trends on a regular basis in order to identify relevant topics for technical trainings. This can be done in cooperation with universities or research institutes in the framework of a cluster's **"technology monitoring service".**

[23] *This is typically being done with support of international consultants.*

Identification of Training Topics



- **Step 3: Development of the training programme/curriculum.**

  The following examples of training programmes have proven to be particularly useful for IT companies in developing and emerging countries.

Training & Capacity Development Programme

Technical Trainings	Management Trainings
Software Engineering	HR Management in the IT Industry
Software Process Improvement & Quality Management	IT Project Management (PMI)
Capability Maturity Model Integration (CMMI) and ITMark	Marketing & Sales for Export
Free and Open Source Software (FOSS)	Business Development & Trade Fair Management
Service-oriented Business Models for IT companies	IT Tender Management & Acquisition of EU Projects
Server Administration (Linux)	FOSS Training as a Business
Introduction to Enterprise Resource Planning Software (ERP)	Start-up, Financing, Incubation

Some of the trainings, especially on technical topics, could be open to students and university staff. This facilitates cooperation between IT companies and academia (aligning skill development with industry requirements) and supports proactive workforce development.

Training on business process analysis and modelling, technical documentation, ITIL, OSS technologies (e.g. Apache, MySQL, PHP) and specific programming languages could also be useful.

For more detailed information on the content, structure and method of the particular trainings, please refer to the Toolbox.

- **Step 4: Implementation of the training programme**. Beyond their organisation and execution, and in order to ensure their continuous improvement, trainings need to be evaluated by the participants. Trainings can be implemented by local as well as international experts/trainers. If possible, trainings should be subsidised, particularly for small-scale companies. However, they should not be provided free of charge. Over the course of the project, training prices of the Cluster Academy should be gradually increased to ensure sustainability.

Development partnerships with the private sector (the so called "public private partnerships") are a useful tool to finance training and capacity development in more complex technical topics. There are several examples of how development partnerships can be used to establish training facilities. A best practice example is the partnership for the establishment of a CMMI Training Centre in Bulgaria which has been supported by German development cooperation. Coordinated by the Bulgarian software cluster BASSCOM, this project helped software companies to address the crucial issue of quality management and software process improvement. In the meantime, the Bulgaria ESI Centre emerged from the development partnership and became one of the leading providers for trainings in software engineering and quality management in the Balkan region.

It should be noted that the above mentioned training and capacity development programme could be delivered through a learning network. This is particularly relevant for IT sector promotion projects with a regional scope. Furthermore, it deserves mentioning that both approaches, the Cluster Academy as well as the learning networks are based on the training of trainers (ToT) concept, meaning that local trainers are being qualified to provide technical as well as management trainings to IT companies.

3. Measures for promoting institutional capacity development

On the institutional level, it is advisable to focus on building strategic capabilities for IT sector promotion in the following sectors:

- Strategy development.
- Promotion of IT clusters (cluster policy).
- Promotion of alternative software models (FOSS).
- Promotion of IT incubators.
- Public IT procurement & e-procurement.
- Design of financial support measures.

Useful Tools	
Tool 3.1	Training-of-Trainer (ToT) Networks
Tool 3.2	Student Placement Service
Tool 3.3	IT Cluster Academy
Tool 3.4	Training: Software Engineering
Tool 3.5	Training: Software Process Improvement & Quality Management
Tool 3.6	Training: Performance & HR Management in the IT Industry
Tool 3.7	Training: Trade Fair Management & Business Development
Tool 3.8	Training: IT Tender Management & Acquisition of EU Projects
Tool 3.9	Advanced Training on “Free and Open Source Software” (FOSS) Business Models for IT-SMEs
Tool 3.10	Advanced e-learning courses: Open Source & More IT for African Business
Tool 3.11	FOSS Bridge: Joint Business through Free & Open Source Software
Tool 3.12	FOSS4SMEs – Free and Open Source Software guide for SMEs
Tool 3.13	it@coops – IT-training for cooperatives
Tool 3.14	Training on Linux System Administration, LPI Certification Level 1
Tool 3.15	IT Cluster Management Training
	**For further information please refer to the Toolbox.**

Useful Links	
Gesellschaft für Informatik e.V.	http://www.gi.de
BITKOM	http://www.bitkom.org
TH Karlsruhe	http://www.uni-karlsruhe.de
TU Darmstadt	http://www.tu-darmstadt.de/
OpenIT@giz	http://www.it-inwent.org/index_eng.html
ict@innovation	http://www.ict-innovation.fossfa.net/
Open training material:	http://www.proinno-europe.eu/eca
1) FOSS Business Models: http://www.ict-innovation.fossfa.net/wiki/public-wiki/ictinnovation-training-materials	http://www.it-foss.net/e3076/index_eng.html
2) Linux System Administration: http://www.ict-innovation.fossfa.net/wiki/public-wiki/foss-certification-training-material/lpi-testing-engines	http://www.alumniportal-deutschland.org/index-en.html
it@ab e-learning course “"Open Source & More IT for African Business" -	https://shop.gc21-eacademy.org/ICT-and-E-Learning-Skills/Open-Source-More-IT-for-African-Business-Self-Study.html
NASSCOM Assessment of Competence-Technology	http://www.nac.nasscom.in/nactech/
Development Partnerships with the Private Sector (GIZ)	http://www.developpp.de/en/index.html
ESI Center Bulgaria	http://www.esicenter.bg

4.4.4 Export Promotion

Key questions

1. **What is the importance of exports in IT sector promotion?**
2. **How to support IT exports on the strategic level?**
3. **How to promote IT exports on the operational level?**

The example of India has shown the enormous potential of export-led IT sector development. Several developing and emerging countries have followed the Indian example of export-oriented IT sector development. The most prominent examples include Vietnam, Costa Rica, Guatemala, Russia, Bulgaria, and Romania.

Export promotion plays a crucial role in the German development cooperation’s integrated approach for IT sector development.

- Export is a major growth driver for the IT industries in developing and emerging countries, generating revenue streams and inducing job creation.
- On the demand side, the global market for IT services (particularly outsourcing/offshoring) is growing rapidly, thus creating substantial market opportunities for IT companies from developing and emerging countries. Being one of the fastest growing segments of the global IT market, outsourcing reached a total market value of US$ 66 billion in 2010.[24]

24 *TPI: http://www.tpi.net/pdf/index/1Q11-TPI-Index.pdf*

- On the supply side, many developing and emerging countries have significant comparative advantages to offer, such as lower labour costs and skilled human resources.
- Many developing and emerging countries have very limited domestic IT markets due to low disposable incomes, low investment and underdevelopment of IT applications. Therefore, export becomes an issue of paramount importance for the development and growth of the industry.
- IT exports facilitate technology transfer. Through developing software for international enterprises, IT companies in developing countries acquire latest technologies and management methods.
- In general, international clients place more innovative pressure on IT companies from developing countries than domestic clients would do. Thus export promotion helps to promote innovation and competitiveness.
- Exports of high-value added services and products such as IT can make a valuable contribution to reducing the trade balance deficits of developing countries through foreign exchange earnings.
- IT export promotion is a useful tool to reduce risks through market diversification.
- IT export promotion is an important means to accelerate the integration of developing countries into global value chains and markets.
- Export promotion has proven very useful in initialising strategic collaboration and clusters in the IT industry. International business opportunities usually arouse great interest among businesses and there is less direct competition between a cluster's member companies than in the local market.

As already mentioned in chapter 3, export represents an enormous challenge to IT firms from developing and emerging countries. These challenges include inter alia:

- Lack of export know-how.
- Lack of market intelligence.
- Missing resources.
- Lack of international branding and positioning.

Taking into account the strategic importance of exports for IT sector promotion in developing and emerging countries, German development cooperation has designed **measures for promoting IT exports** on the **strategic level** as well as on the **operational level**.

Export promotion on the strategic level

Export promotion on the strategic level is mostly concerned with supporting the development and implementation of export-oriented strategies. Typically, German development cooperation supports collaborative strategy development according to the methodology presented under support module 1 (see chapter 4.4.1). This involves the formulation of the generic export strategy, market entry strategy as well as the design of concrete strategic measures for export promotion.

The **generic export strategy** defines the competitive strategy on the export market based on the three options cost leadership, differentiation and focus (see chapter 4.4.1). It sets the framework for the market entry strategy and the strategic measures.

Practical example:

In the framework of the export promotion strategy for the Macedonian software and IT services industry a generic strategy was formulated, called "focused differentiation". It consists of the four cornerstones focus, differentiation, responsiveness and cost-efficiency.

1. Focus

- Concentration on niche markets
- Specific target markets (nearshoring) & SMEs
- Vertical & functional specialisation

2. Differentiation

- Differentiation within selected niches
- Differentiation: HR skills, nearshoring, quality
- Innovative offshoring services (customer value)

3. Responsiveness

- Flexibly responding to markets trends
- Using the small size and flexibility of our SMEs
- Market intelligence & new organisational forms

4. Cost-efficiency

- Excellent price-performance ratio & cost efficience
- investing into skills & SPI
- Penetration strategies

This generic strategy takes into account the results of the internal and external analysis. As the Macedonian software industry is comparatively small and very limited in terms of scale and resources, concentration on specific niche markets is required. Within these niches, the Macedonian software industry needs to differentiate itself from competitors on the basis of highly skilled employees, nearshoring as-pects and quality.

Source: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

It is worth mentioning that such generic strategies should not remain carved in stone but need to be regularly reviewed and flexibly adapted to changing technology trends and market conditions.

When formulating the **market entry strategy,** there are **two central questions** which need to be discussed and answered.

- Firstly, should we enter the export market with products or with services?
- Secondly, where to position ourselves in the value chain?

Concerning the **question on whether to enter an export market with IT/software products or services**, one needs to carefully analyse the pros and cons of both strategic alternatives.

The following two tables provide an overview on each of the alternatives including their advantages and disadvantages as well as practical examples.

Product Strategy	
+	–
• Higher value added in the exporting country • Greater potential for profitability • Innovation: software products are still the major drivers for research and development • Potential for bundling with services	• Highly complex and challenging • Costs for product development • Requires substantial investment into mar-keting and after-sales service • Higher level of management and marketing skills required (in comparison to exporting IT services) • Intense competition in software product markets • Higher risk due to investments involved • Slower market penetration
Examples	
• Israel has successfully pursued a product strategy, focussing on exporting specialised niche products such as communication applications and information security software • But: the success of this strategy has been enabled to a large extent by the availability of VC from the US and Israel's strong diaspora in key export markets	

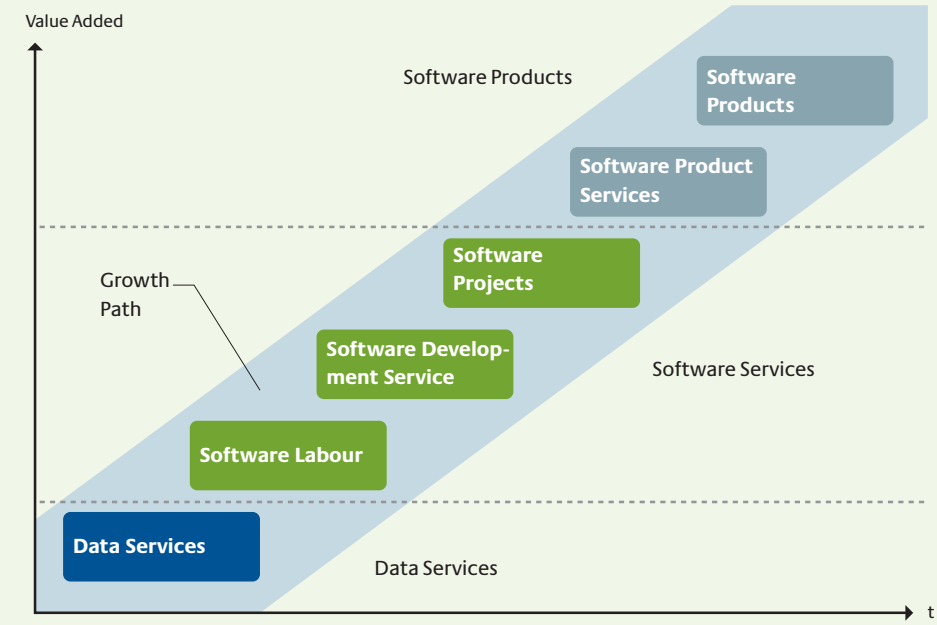
Service Strategy	
+	–
• Easier market entry • Less capital investment required • Risk involved is considerably lower • Entry barriers are lower • Usually suppliers do not have to establish a distribution network	• Lower value added • Less potential for innovation and R&D
Examples	
• Most prominent example: India has successfully positioned itself in several export markets by providing IT services (outsourcing/offshoring) • Indian companies have originally started with short-term low-level programming activities (body shopping) • Later on, Indian companies gradually moved up the value chain by upgrading technical and managerial skills as well as process maturity and quality	

With regards to the **second question on the position within the IT export value chain**, one should differentiate between three different kinds of services.

- The first category could be described as "software **labour**" involving short-term, low-level programming activities at the customer's premises. Many Indian companies have originally started their export activities based on this model of "body shopping".
- Secondly, there are the "software development services", comprising higher-level software development services which also require software design and engineering capabilities.
- The third category which is "software project services" includes the implementation of complex software projects for the client encompassing the whole offshoring software project cycle from system analysis to software development and testing. This kind of service requires high-level technical skills as well as the capability to manage large-scale projects. Depending on the contractual arrangement with the client, this category could involve development of customised software applications, software development in the framework of subcontracting arrangements, or the establishment of offshore software development units as joint ventures with foreign companies.

Analysing the export strategies of software exporting developing and emerging countries such as India, Vietnam, Bulgaria and Russia reveals a certain evolutionary pattern which is illustrated in the following chart (IT/software export value chain).

IT/Software Export Value Chain



Most developing countries started with low-level data entry services and then gradually moved up the value chain to software services and partly also to software products. This process of moving up the value chain included upgrading technical as well as managerial skills, process maturity and higher value added. In most cases, it was also accompanied by increasing labour costs and competitive pressure, which forced software companies as well as national industries to upgrade to the next level.

But this pattern does not apply to all countries. Although India has moved up the value chain to more highly-skilled offshoring services and higher software process maturity, it is unclear whether Indian IT companies will ever pursue a product strategy. So far, product development as well as software research activities are quite limited in India.

Therefore, depending on the specific capabilities and environmental conditions of a country, different development patterns might emerge and different strategies might be adequate. Thus, the two strategic approaches (software products vs. software services) discussed above may be viewed as alternatives or as different stages in an evolutionary process.

In general, IT industries from developing and emerging countries should rather focus on a service-oriented market entry strategy, since product strategies usually require a very complex skill set and massive investments into marketing and sales. Hence, a product strategy is often beyond the capabilities of companies from developing and emerging countries. However, in the medium to long term, IT industries from these countries should not pursue a pure service strategy but should try to promote specialised niche software products in export markets.

Similar to the formulation of the market entry strategy, the design of **strategic measures for export promotion** always depends on the specific goals of the export strategy and the situation of the IT industry in a particular country. Based on practical project experience with the design of IT export promotion strategies, it is recommendable to define strategic measures covering the following areas.

- IT export promotion policy.
- International branding & positioning.
- IT clusters & collaboration.
- IT export capabilities & knowledge.
- Quality & company excellence.
- Export-oriented investment.

Export promotion on the operational level

On the operational level, German development cooperation supports the development and implementation of concrete, specialised export promotion measures for the local IT industry. Usually, these operational measures are embedded in an export promotion strategy, meaning that they have been designed within a collaborative strategy development process.

Typically, these measures are being designed and implemented as cluster services, meaning that the IT cluster provides the services in close cooperation with donor organisations and public institutions. Providing operational export promotion measures as cluster services helps to increase their effectiveness and sustainability. In the following section we will present and discuss **four export-oriented cluster services** including export information service, B2B export promotion service, individual export consulting and cluster marketing.

1. Export information service

The objective of the export information service is to provide member companies of IT clusters in developing and emerging countries with precise and up to date information on potential export markets ("market intelligence"). This is particularly important for small and medium-sized IT enterprises which normally neither possess the know-how nor the resources to conduct extensive market research. The export information service provides market analysis of a particular export market on a regular basis (at least annually), covering the following topics:

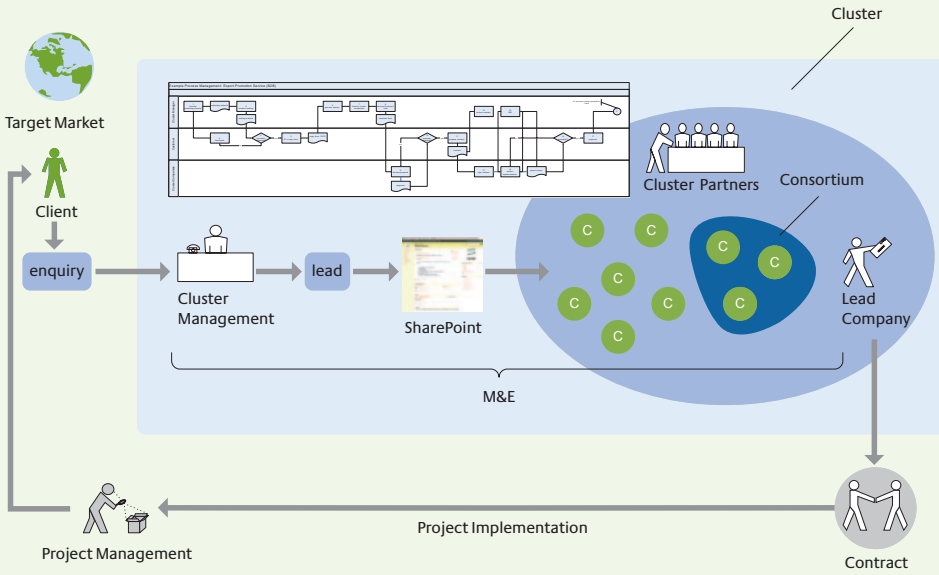
- Macroeconomic overview.
- Overview ICT market.
- Software market analysis.
- IT service market analysis.
- Outsourcing market analysis.
- Key success factors.
- Future IT trends.

Project experience shows that IT companies are particularly interested in information on market structure and value, customer requirements, rates as well as technology trends. This cluster service also encompasses the provision of reports, special events on foreign markets, databases as well as useful sources for further information and research.

2. B2B export promotion service

The B2B export promotion service is probably the most operational export promotion measure. It aims at directly generating business opportunities and export revenues for member companies of IT clusters. The following chart describes the functionality of the service:

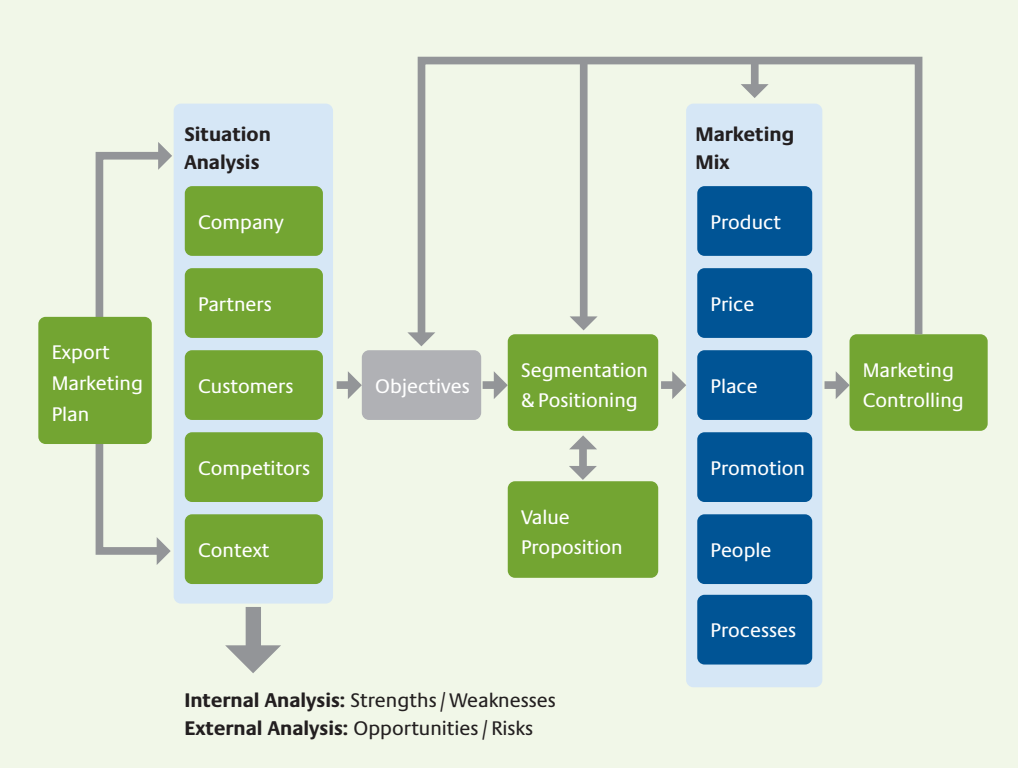
B2B Export Promotion Service



The cluster manager, supported by a consultant, generates a business lead from a potential export client according to a predefined business development process. Then the lead is communicated to the cluster members via e-mail or a groupware application (e.g. eGroupWare, FOSWIKI, or SharePoint). Based on the information contained in the business lead the IT firms can make a follow-up on the lead individually or as a consortium. If one of the member companies successfully acquires the lead, it has to pay a commission of 3% of the contract value to the cluster, where the money is used for financing the service as well as additional joint marketing activities. This service has shown its value in German development cooperation projects and generated substantial export earnings not only for IT companies but also for the corresponding IT clusters.

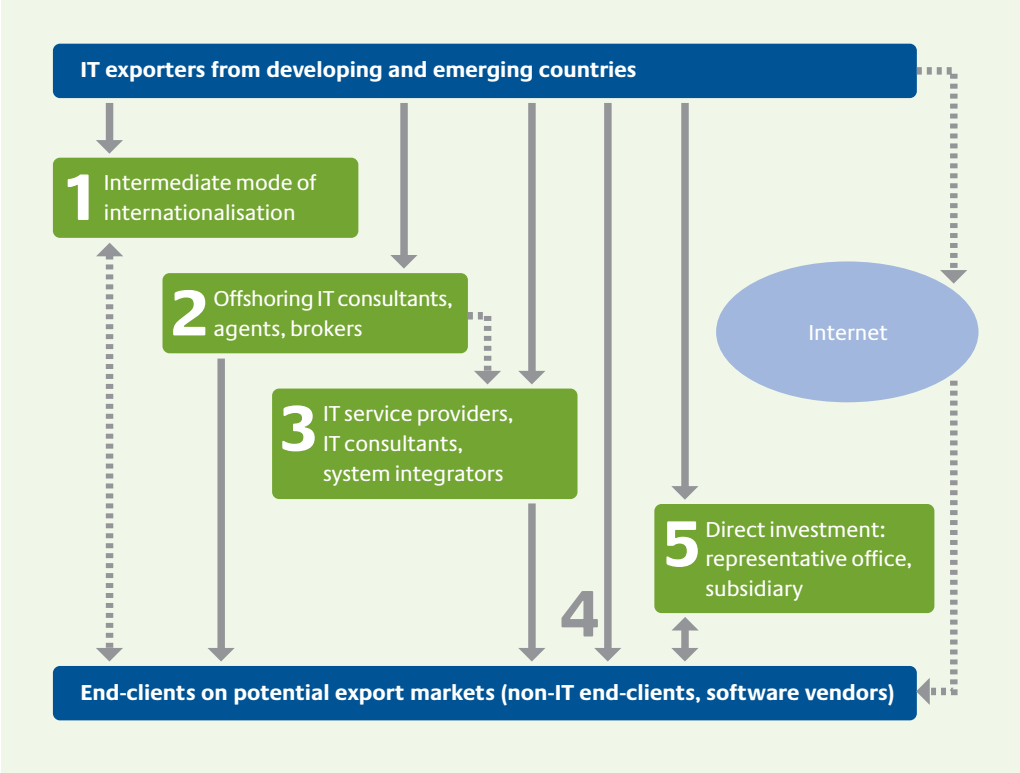
3. Individual export consulting

The individual export consulting service has been designed to address the need of IT SMEs for specific, in-depth advice on internationalisation. Based on a joint situation analysis, an export marketing plan (including objectives, segmentation and positioning, definition of marketing-mix as well as marketing controlling) is developed together with the company.



This plan serves as a strategic guideline for structuring export marketing activities at the company level (micro-level).

Another important topic within the scope of individual export consulting is the provision of advice to IT SMEs on how to enter potential export markets. In general, there are five different export market entry options for IT companies from developing and emerging countries, ranging from the so-called intermediate mode of internationalisation to establishing a representative office in a particular target market.



In the above diagram, the different options have been arranged according to the required degree of the companies' resource commitments.

Each of the five market entry options/modes has its advantages and disadvantages. The task of the individual export consulting service is to advise IT companies on choosing the right option according to their objectives, capabilities and resources.

It is worth mentioning that sometimes, when firms have complementary product/service portfolios, the export consulting service can also be delivered to a group of companies.

4. Cluster marketing service

Cluster marketing is the most comprehensive and complex service in terms of operational export promotion. Examples from Bulgaria (BASSCOM) and Russia (RUSSOFT) demonstrate that cluster marketing is a very effective tool for export marketing and branding.

The **importance of cluster marketing** for IT companies in developing and emerging countries can be attributed to the following factors:

- Cluster marketing and joint business development help generate sales and income for member companies.
- IT SMEs often lack the resources and know-how for an effective marketing.
- Through clustering and collaborative marketing, small companies can increase their visibility on international markets.
- Joint marketing reduces costs (economies of scale).

- By combining complementary competences of cluster members, an integrated service/product portfolio ("turn-key solution") can be marketed.
- Joint marketing facilitates integration of local IT companies into global supply chains.
- Cluster marketing allows joint branding and positioning on export markets.

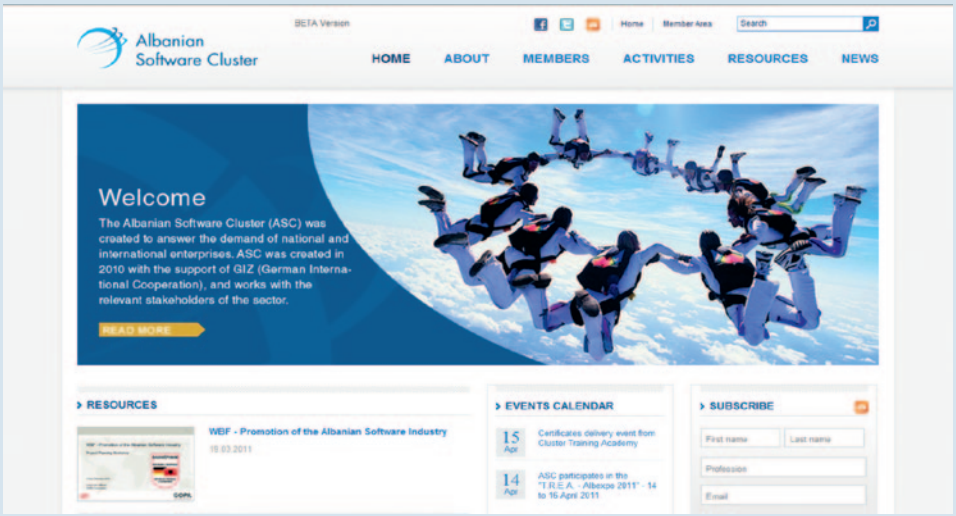
Cluster marketing comprises **different components and measures** including cluster branding concept, web-marketing, integrated service portfolio, trade fair participation, as well as international linkage. In the following section, we will briefly describe these measures.

- **Branding concept**
  Lack of branding has been identified by companies as well as governments as one of the primary obstacles to IT exports. Branding represents an important source of differentiation and is important in order to create awareness and recognition among potential export clients.
  In order to improve their international branding and marketing, IT clusters in developing and emerging countries need to develop and implement branding concepts which are based on clearly defined core brand values such as quality or company excellence. Typically, such branding concepts include an assessment of the existing brand equity, as well as a brand strategy and marketing programme.

- **Web marketing & marketing material**
  Web marketing is a useful and cost-effective tool for export promotion, and the website of the IT cluster stands at its core. Special attention should therefore be given to developing a professional website and online catalogue, presenting the capabilities of the cluster's member companies and including international reference clients, testimonials and best practice examples of IT projects implemented by the member companies. Furthermore, design and functionality of the website should be customised to the needs of potential export clients (English version, search function, online enquiries, contact-us form, etc.). Search engine optimisation is particularly important to ensure that potential customers could easily find the website.

Practical Example:

The following screenshot shows the website of the Albanian Software Cluster (ASC). With the support of German development cooperation, a cluster website was designed including features such as an online catalogue to support cluster marketing and to address potential export clients.



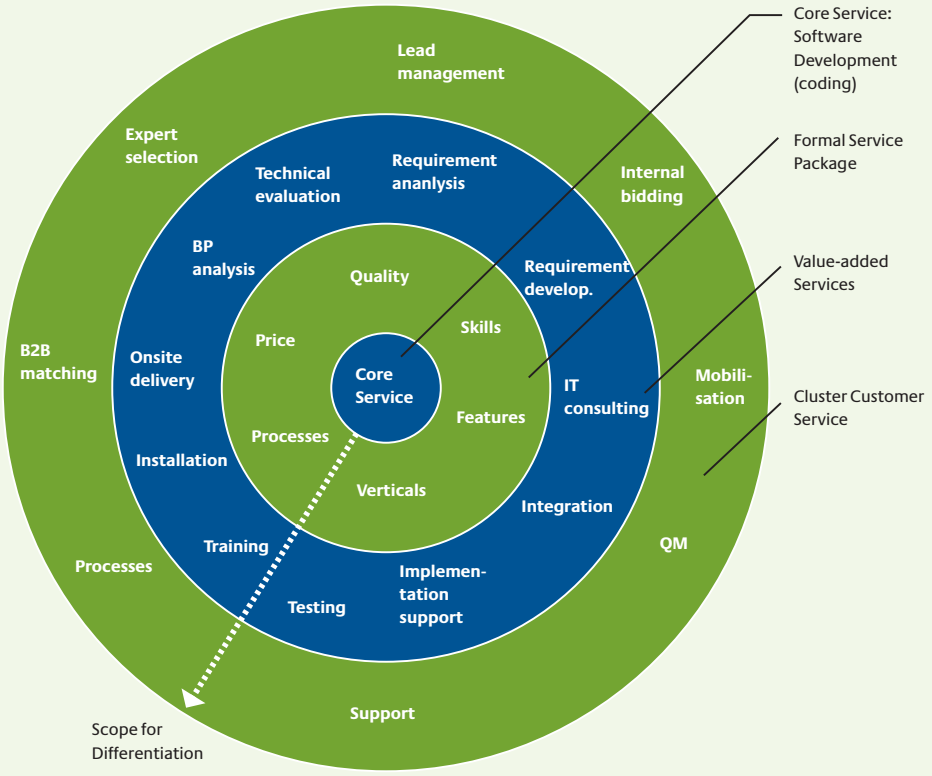
Source: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

In addition to the website, cluster marketing could integrate Web 2.0 applications (e.g. blogs, Twitter) and social networks such as LinkedIn, XING and Facebook.

Besides web-marketing, traditional marketing material such as brochures and presentations (PowerPoint) could support the export marketing of the cluster and its member companies.

- **Integrated service portfolio**
  The basic idea of this cluster marketing measure is to create a unique service portfolio by integrating the different capabilities and resources of the cluster member companies. Through the cluster approach, foreign clients get access to a large pool of qualified and experienced IT specialists, who are able to cover a broad range of technologies and programming languages, at highly competitive prices. Thus, the cluster becomes a one-stop shop providing complete IT and offshoring services ("one-sourcing") for foreign clients. By bundling and aligning the different capabilities of the companies along the software development value chain, the cluster is able to offer its clients innovative IT services which cover the complete software development cycle ranging from design and specification to coding and testing. The following diagram illustrates this cluster-based, integrated service portfolio.

Integrated Service Portfolio of an IT Cluster



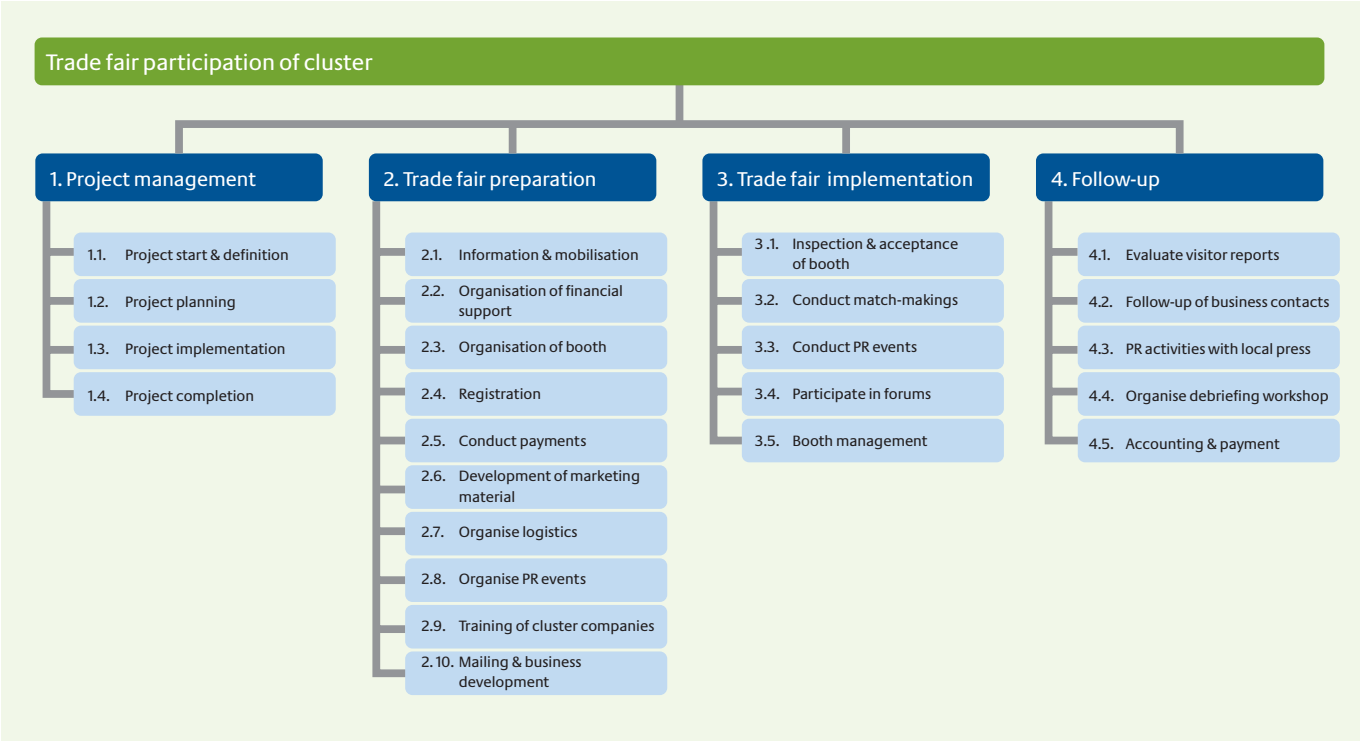
The diagram describes how the traditional core offshoring service of coding is augmented by value added services such as IT consulting, testing and training as well as by additional cluster-specific services like expert selection and quality management. The goal of this integrated service portfolio is to match the specific needs of international clients for "turn-key" IT services and to provide a unique customer value. This approach also helps to reduce the transaction costs usually involved in offshoring, thereby creating an additional customer benefit.

Furthermore, this special service portfolio is a valuable instrument to differentiate the IT cluster from its competitors.

Yet, providing such an integrated service portfolio will require substantial investments into the organisational structure of the cluster, as well as into methodologies, processes and quality management. In addition, it requires a high level of trust and "collaborative culture" among the member companies. Thus, it is rather a marketing measure for well-established, mature IT clusters.

- **Trade fair participation:**
  Participation in international trade fairs such as CeBIT, Linux Day Berlin or GITEX is a classical tool for marketing IT companies on international markets. Moreover, these

events are also suitable for marketing IT clusters abroad. The companies can use the cluster as an "umbrella brand" for joint marketing during the trade fair. Furthermore, coordination of the trade fair participation by the cluster can reduce costs and improve efficiency. However, practical experience from German development cooperation shows that thorough planning and preparation is required to ensure tangible outputs. Therefore, GIZ developed a special process model with corresponding activities in order to manage the participation of IT clusters at international trade fairs more effectively. Furthermore, it is advisable to provide trainings on trade fair management and business development for the member companies of the IT cluster.



For additional information on this process model, please refer to the Toolbox.

- **International linkage**
  Last but not least, cluster export marketing should also involve the establishment of strategic cooperation with other IT clusters abroad (e.g. IT clusters in Germany) to foster international linkage. Activities include match-making events, delegation trips and the joint implementation of projects (e.g. FP7 projects). Such a strategic cooperation with other clusters can be used to facilitate B2B cooperation on the company level as well as to increase the international visibility of IT clusters. Furthermore, IT institutions, experts, CEOs, offshoring consultants, diasporas, etc could establish special promotional networks abroad. The members of these networks are intended to serve as multipliers and promoters of the IT cluster abroad. Special emphasis should be placed on the inclusion of diasporas (expatriates).

Practical Example:

Financed by the EU and BMZ, the FOSS Bridge EU-Vietnam network of GIZ has focused on international linkages by promoting cooperation of Southeast Asian software industries with Europe through innovative collaboration on FOSS. Up to 2009, the programme has brought together more than 50 IT companies from Vietnam and Europe for matchmaking and joint FOSS projects through dedicated twinning workshops and an online platform. Over 13 concrete joint projects and business partnerships between Europe and Vietnam have been implemented, e.g. providing Vietnamese-language adaptation to European FOSS software. FOSS Bridge EU-Vietnam thereby allowed Vietnamese IT companies to update their knowledge on how to create business with FOSS and to provide new applications and services to the public as well as private sector.

Source: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

To summarise, export promotion is crucial to support the development of the IT sector in developing and emerging countries. However, it is a complex issue that requires a well-coordinated approach involving a broad range of support activities on the strategic as well as on the operational level.

Useful Tools	
Tool 4.1	Export Information Service
Tool 4.2	B2B Export Promotion Service
Tool 4.3	Export Market Entry Options
Tool 4.4	Template Export Branding Concept
Tool 4.5	Process Model and Checklist for IT Cluster Trade Fair Participation

For further information please refer to the Toolbox.

Useful Links	
Albanian Software Cluster (ASC)	http://www.albaniansoftwarecluster.com
FOSS Bridge EU-Vietnam	http://www.foss-bridge.org
CeBIT	http://www.cebit.de
GITEX	http://www.gitex.com/
Software Cluster Rhein Main Neckar	http://www.softwarecluster-rheinmainneckar.de
IT Cluster Regina Aachen	http://www.regina.rwth-aachen.de
Bavarian ICT Cluster	http://bicc-net.de

4.4.5 Domestic Market Development & Local Innovation

Key questions

1. **What are the benefits of domestic market development and local innovation?**
2. **How to promote domestic market development and local innovation?**
3. **What is the importance of public tenders for domestic market development?**
4. **What is the importance of open innovation and free and open source software?**
5. **What are the key advantages of free and open source software for promoting local innovation in developing and emerging countries?**

Despite the fact that export markets are the main drivers for growth for many IT industries, one should not underestimate the importance of domestic IT markets.

This support module has been designed with two main intentions. Firstly, to open up the growth potential of domestic markets to local IT companies; thus creating an additional source of income and revenue streams. Secondly, to provide companies from other more traditional industries (e.g. textile, food, tourism), with innovative IT products and services in order to improve their efficiency and productivity.

In this context, local innovation means the development of new, IT-related products, services and processes which improve the innovation capacity and competitiveness of the domestic industry and generate economic growth.

Promoting domestic market development and innovation creates **benefits** for both local IT companies and enterprises from other sectors.

Benefits for local IT companies	Benefits for firms from other industries
• Building of a local client base • Competitive advantage as a local player vis-à-vis outside competitors (local market knowledge, close customer relationship, etc.) • Sustainable growth potential • Reducing dependency on export markets (risk reduction) • Using demanding, globally-linked domestic customers as a "bridge" into the global market (indirect internationalisation) • Less marketing and sales costs in comparison to export markets • Local source for product and service innovation	• Direct access to innovative IT products and services • IT services and applications which are customised to match local user requirements ("localised" solutions) • Using local IT products and services to increase productivity and effectiveness • Using local IT products and solutions to improve quality • Less dependency on costly international IT solutions and know-how (import substitution) • Access to domestic, more cost-effective IT solutions • Possibility to actively participate in "customer-driven" development of IT applications

Furthermore, fostering domestic market development and innovation also generates benefits for the country as a whole, as more revenue and business streams remain within the local economy. In this regard, Free and Open Source Software (FOSS) has a high potential for local economic development: Rather than purchasing software licences and services abroad, local FOSS development, sales and services keep resources within the local economy, avoid dependencies, and provide opportunities for income generation and employment. Developing countries can develop their own software market, fostering their own technical capacities, and supporting ICT applications in sectors such as government, education, or health.

In order to generate the above mentioned benefits, German development cooperation developed a **specific approach** for domestic market development and local innovation. Understanding the specific requirements and problems of users lies at the core of domestic market development and local innovation. Therefore, the approach favours a **participative, user-engaged development process** that includes the following steps:

1. Identify relevant industries

The first step is to identify suitable industries for domestic market development and local innovation. Typically, these should be industries which are of strategic importance for the national economy (e.g. in terms of employment, exports, etc.) and have a substantial demand for IT solutions. Wherever possible, it is advisable to select sectors (e.g. tourism, textiles) which are also supported by development cooperation projects in order to generate synergy effects.

2. Needs assessment

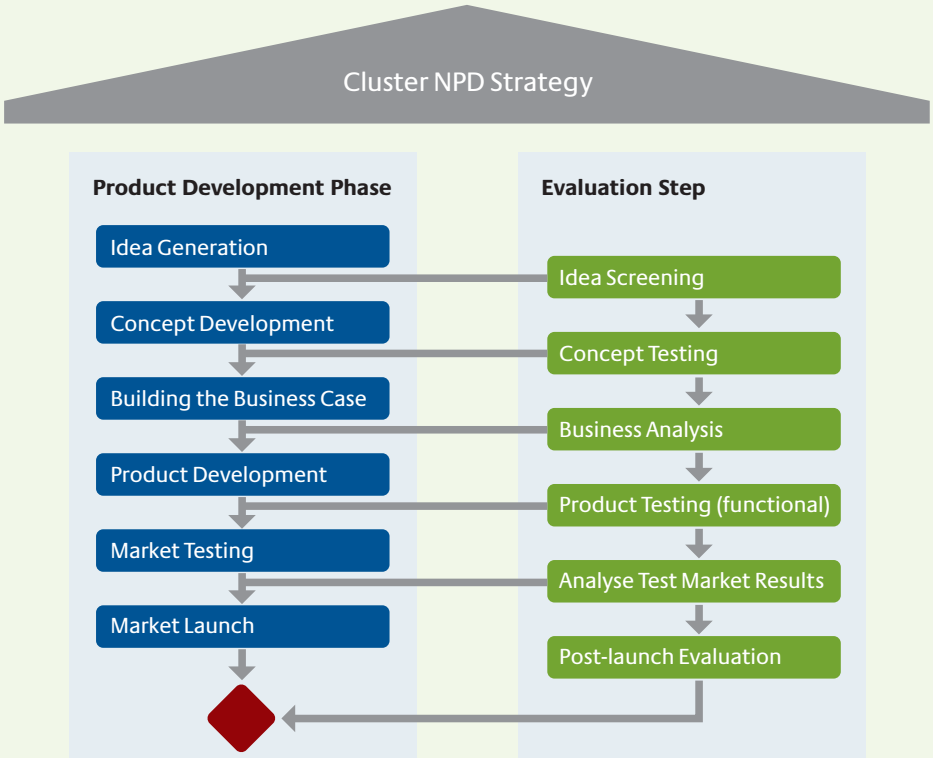
Once a relevant target industry has been selected, a thorough needs assessment of the companies has to be conducted. First, a suitable questionnaire (including questions on the company, on the existing level of IT usage as well as questions on the concrete needs of the company in terms of IT) has to be designed. The questionnaire should be pretested and discussed with industry experts to ensure that it takes into account all industry-specific factors. The needs assessment can be conducted through an online survey or offline in the form of interviews. After collecting and analysing the survey data, a detailed report with the results of the needs assessment should be elaborated.

3. Presentation of results

The next step is to organise a joint workshop with the member companies of the IT cluster and representatives of the respective target industry association or cluster. The goal of this workshop is to present the result of the needs assessment and to enable the IT companies to understand the concrete needs and requirements of their potential clients from the target industry.

4. Joint product/service development

The IT companies should start developing innovative IT products and services based on the results of the needs assessment and discussions with representatives from the target industry. The whole process could be coordinated and moderated by the IT cluster. In order to catalyse the process, we recommend to present international best practices and to promote further interaction with representatives from the target industry (e.g. in the form of focus group meetings). If required, one could offer trainings on new product/service development and innovation management. Ideally, the IT cluster member companies bundle their resources and competences to develop joint product/service offerings as turnkey solutions. The following chart illustrates the process of cluster-based new product development (NPD) and innovation:



Source: design based on NPD model by M. Baker and S. Hart (2007).

5. Match-making

The next step involves the organisation of a match-making event. Companies from the target industry interested in participating in the event need to specify their concrete IT demands in the registration form. Usually, the event consists of two parts. In the first part, IT companies present their product and service offerings and in the second part, the actual match-making between IT companies and companies from the target industry takes place. The whole event should be managed by an experienced moderator.

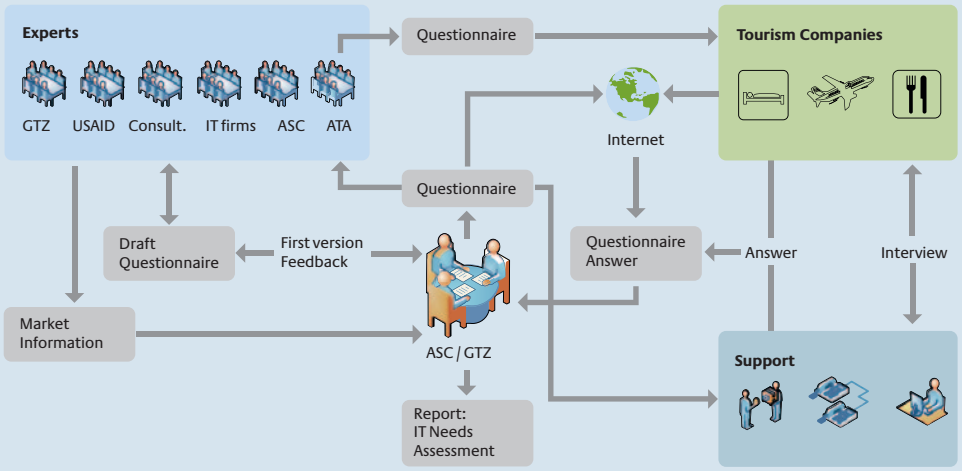
6. Business development support

The last step includes supporting the IT companies in the follow-up of the match-making event and helping them with business development. Depending on the situation on the ground, it can be useful to introduce financial support schemes to subsidise the acquisition of innovative IT applications by SMEs from the target industry. Finally, the whole process and its output should be evaluated to allow joint learning and constant improvement. The IT cluster should support further business development by marketing innovative IT products/services to a broader audience (see also "cluster marketing" in chapter 4.4.4)

Based on project experience, it is advisable to conduct the whole process in close cooperation with the particular association or cluster of the target industry (e.g. tourism). It is also recommended to design the whole process as a service of the IT cluster. The following example from Albania illustrates the whole process.

Practical Example:

The following screenshot describes the process which was applied for promoting domestic market de-velopment and innovation with the Albanian tourism industry. The process was implemented in close cooperation with the Albanian Software Cluster (ASC) and the Albanian Tourism Industry Association (ATA).



Source: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

In the context of domestic market development, it should be noted that **public tenders** provide substantial market potential for IT companies. In many developing and emerging countries, public demand (often donor funded) is the major driver of the domestic IT market. To enable local IT companies to tap this market potential, German development cooperation has been

- supporting the establishment of tender information systems within IT clusters and providing trainings for companies on IT tender management (proposal writing) and acquisition of IT projects financed by international donors (e.g. EU projects);
- implementing a FOSS Advocacy Initiative and creating a FOSS market and brand in the public sector;

- supporting public entities in creating "level playing field" conditions for SMEs participating in tenders. This covers issues such as public-private dialogue, quality management, security standards and interoperability of IT solutions.

IT clusters play a central role in the above mentioned approach. They provide the organisational platform for collaboration and coordination. In fact, the IT cluster serves as an **innovation system** that generates innovation through interaction between the IT industry, government and research institutions. IT clusters are also a useful tool to support **open innovation,** in particular when it comes to participatory, user-engaged innovation. The rise of the internet as a participatory platform facilitates this approach.

Free and Open Source Software (FOSS) follows the model of open innovation. The **key advantages of FOSS** for promoting local innovation in developing and emerging countries can be summarised as follows:

- **Local open innovation and value creation**: A key benefit of FOSS-based local open innovation is that everyone can translate the interface of a FOSS program into a local language and release it. This has led to localisation of software in many countries, including developing countries with local-language Linux such as Kilinux (for Swahili) or KhmerOS (for Khmer). Using FOSS, local software companies neither have to depend on products tailored to foreign requirements, nor have to develop their own software from scratch. The advantage of such local open innovation lies in the fact that the "upgraded" product (such as a Khmer OpenOffice) is automatically a collectively owned good secured by liberal licensing models and geared towards the freedom to innovate.

- **New business models** for developing and emerging countries can be established, which would not be possible with proprietary software and which are based on the integration of software and services.
- **Independence**: FOSS offers the chance to develop innovative software products which are independent of the technical (proprietary) standards of large-scale software manufacturers.
- **Learning by coding**: FOSS allows for practical learning experiences, as everyone can look into its source code. This "learning by coding" embodies classical reverse engineering, but goes far beyond it, as it allows for a form of creative innovation by imitation and appropriation through re-writing of code.
- **Legality**: Experts estimate that in many developing countries more than 70% of all software is non-licensed, i.e. illegally copied proprietary software. The liberal FOSS licences allow copying, sharing, and modifying of software programs. FOSS guarantees legality without the need to buy extra software licences for each computer that runs a copy of the programme.
- **Cost**: As FOSS programs can be freely shared, users do not incur licence fees. A program can be freely installed on an endless number of computers. While costs for system support and services remain, FOSS is seen by many experts as a cost-effective solution.

Typically, **support measures** of German development cooperation to promote innovation through FOSS include

- Raising awareness on FOSS by supporting international policy and expert exchanges.
- Supporting the establishment of local innovation systems through FOSS capacity development.
- Fostering dialogue between European, Asian and African companies and users to inspire and strengthen the development of viable and sustainable FOSS-based business solutions (networking, online communities of practice, etc.).
- Enabling decision-makers, companies and software developers to make sound assessments about the benefits and risks of FOSS solutions.
- Providing trainings on FOSS business models and key technologies, and conducting training of trainers.

Practical Example:

Financed by BMZ, the ict@innovation programme of GIZ builds capacities in African small and medium sized IT enterprises and supports FOSS-powered businesses. Ict@innovation aims at encouraging the growth of African IT industries, particularly in Southern and Eastern Africa, through four capacity development priorities:

1. Spreading FOSS business models for IT enterprises in Africa.
2. Fostering FOSS certification and quality management.
3. Supporting innovative local FOSS applications for social and economic development.
4. Promoting regional networking and international exchange.

Source: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

Despite its advantages, promoting local innovation in the IT sector in developing and emerging countries needs to be based on a balanced approach between FOSS and proprietary technologies. It also needs to focus on a clear business and market orientation and should take into account customers' requirements in terms of total cost of ownership, technical support and liability.

Useful Tools	
Tool 5.1	IT Needs Assessment
Tool 5.2	Template IT Project Plan
Tool 5.3	IT Product Profile

For further information please refer to the Toolbox.

Useful Links	
OpenIT@GIZ – Open Innovation for Development	http://www.it-inwent.org
ict@innovation	http://www.ict-innovation.fossfa.net
it@foss	http://www.it-foss.net/
Taxonomy of FOSS Business Models	http://www.ict-innovation.fossfa.net/og/co-editors/wiki/module-28-taxonomy-floss-business-models
African FOSS Business Models	(http://www.ict-innovation.fossfa.net/products).
OECD – Open Innovation in Global Networks	http://www.oecd.org/document/43/0,3343,en_2649_33703_41441387_1_1_1_1,00.html
MIT / Eric von Hippel on Innovation	http://web.mit.edu/evhippel/www/index.html
OpenInnovation.eu	http://www.openinnovation.eu
Innovationsagentur für IT und Medin Baden-Württemberg	http://innovation.mfg.de
Open Innovation Community	http://www.openinnovation.net

4.5 Key Element 4: Collaboration

Key questions

1. **What is the importance of collaboration for IT sector promotion?**
2. **What are the benefits of collaboration?**
3. **How to establish an appropriate organisational structure which facilitates effective collaboration in IT sector promotion?**
4. **What are useful tools and methods to support collaboration in IT sector promotion?**
5. **How to support collaboration through knowledge management?**

Collaboration among all relevant stakeholders and partners is the basis for effectively planning and implementing IT sector support projects. Thus, it is a *sine qua non* for promoting systemic competitiveness and growth of the IT industry in developing and emerging countries.

Benefits of collaboration for IT sector promotion

- Collaboration allows the integration of all relevant stakeholders and increases ownership.
- It enables a more effective coordination and implementation of support measures.
- It facilitates joint learning.
- It supports knowledge transfer, knowledge sharing and capacity development.
- Collaboration allows a regular influx of new ideas and know-how from all stakeholders involved in the project; thus promoting continuous improvement of IT sector promotion projects.
- It enables innovation within the project approach.
- By integrating and actively involving all relevant actors, collaboration supports sustainability.

Since the situation of the IT industry and the corresponding business environment greatly varies between countries, it is not advisable to provide a standard solution on how to effectively support collaboration. However, based on practical project experience, we provide some general recommendations on how to **organise collaboration** within IT sector promotion projects. They include suggestions on **organisational structure**, **tools** and **knowledge management**.

Organisational Structure

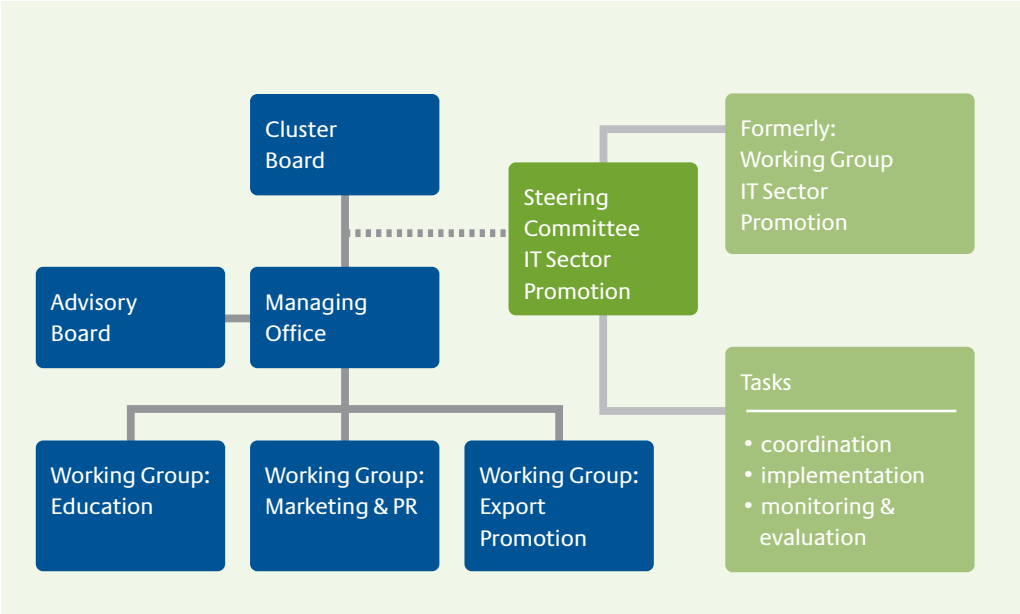
An appropriate **organisational structure** facilitating effective collaboration and stakeholders' coordination should be designed and implemented. Contrary to the corporate level, there is no central unit or hierarchy which facilitates the execution of the strategy. Thus, one has to design an organisational structure which allows collaborative project implementation in a multi-stakeholder setting. Furthermore, the organisational structure needs to reflect the specific project approach, its goals and its activities ("structure follows strategy").

At early stages of project design and implementation, it is advisable to use a **multi-stakeholder working group** as the organisational platform for collaboration and coordination. Project experience shows that collaboration within working groups should always take place on the basis of an open but structured dialogue throughout the whole project cycle. Besides promoting dialogue, it is essential for collaborative project implementation to share knowledge, ideas and commitment to the project.

In the course of project implementation, the organisational structure should be progressively formalised in order to increase efficiency and sustainability. As previously mentioned, **clusters** have proven to be particularly suitable for supporting collaborative IT sector promotion. While focusing on voluntary coordination and collaboration rather than on hierarchical control, they still provide a stable and formalised structure allowing project implementation on a sustainable basis. The IT cluster serves as a kind of "system integrator" for the implementation of the different support measures of the project (e.g. training activities).

Choosing the cluster as "lead organisation" for collaborative project implementation makes sense, as it usually represents IT companies i.e. the actual target of IT sector promotion. Moreover, the cluster provides the necessary operational infrastructure and resources.

The initial working group could be integrated into the IT cluster in the form of a **steering committee.** Thereby, all stakeholders already involved in the project design would be directly integrated into the project implementation process; thus securing consistency and continuity. The following diagram illustrates the proposed organisational structure.



As already mentioned, implementation of concrete support measures and activities should be conducted by individual working groups or task forces dedicated to particular topics (e.g. export promotion).

Each working group/task force is responsible for the implementation of all corresponding measures and is headed by a member of the steering committee (working group/task force manager). Thereby, the individual working groups operate as self-managing teams. The steering committee in turn orchestrates the different working groups/task forces and monitors the implementation of the activities.

The organisational structure outlined above intends to facilitate effective collaboration. Furthermore, embedding the working group as a steering committee in the cluster aims at establishing a sustainable collaborative platform for project implementation and IT sector promotion.

Tools

Some **tools and methods** can support collaborative project implementation within a multi-stakeholder setting.

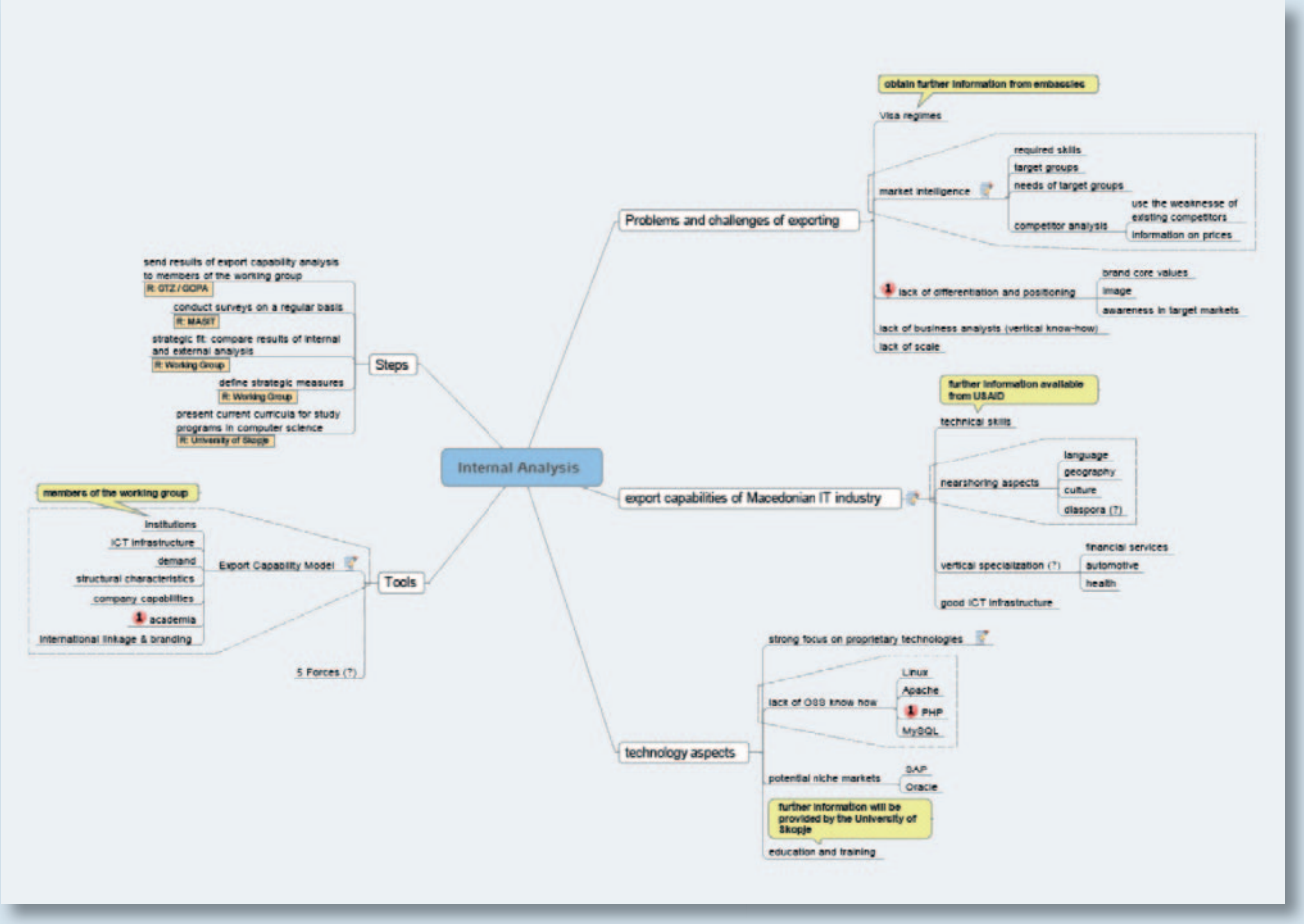
Besides classical moderation techniques such as group discussions, the **MindMap technique** is a useful method for organising collaboration in IT sector promotion. This technique supports the structuring and organisation of collaborative brainstorming and planning activities by using special software applications like FreeMind, MindMeister or MindManager.

Using the MindMap technique for supporting collaborative processes provides the following benefits:

- Ideas and information can be presented and visualised in a radial, non-linear manner by using key ideas, branches and sub-branches.
- Key ideas can be further operationalised into activities and tasks which can be prioritised, organised and assigned to specific organisations or persons.
- MindMap software allows to connect key ideas and branches to other relevant documents, spreadsheets, websites etc. through hyperlinks and a notes function.
- MindMaps are particularly useful to summarise and visualise the concrete outputs and results of workshops, as well as to define next steps and joint activities.

Practical Example:

This MindMap was developed in the framework of a workshop organised in preparation of an internal analysis of the Macedonian IT/software industry. Key issues such as challenges of exporting, capabilities of Macedonian IT companies, and technology aspects were discussed, analysed and structured during the workshop (Screenshot of MindManager to illustrate MindMap structure).



Source: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

To support interaction and collaboration within IT sector promotion, it is also recommendable to introduce a so-called **groupware application**. Groupware applications are special software solutions which support cooperation in a group over time and space. They are usually web-based.

Groupware is particularly suitable for managing complex collaboration processes and joint projects. There are different groupware products available such as eGroupware, phpGroupWare, FOSWIKI or SharePoint.

The above mentioned groupware solutions provide the functionality for supporting collaborative project design and implementation such as

- Discussion boards;
- Announcements;
- Document libraries/document sharing;
- Calendar functions;
- Project and task management;
- Workflow management;
- Evaluation & surveys;
- Search function.

For instance, within the scope of the German development cooperation project for promoting the Macedonian IT/software industry, a groupware application was used to disseminate information to the group members and to facilitate collaborative development of an export promotion strategy for the IT sector. The groupware also helped to establish predictable, repeatable and transparent patterns of collaboration within the project, thereby increasing overall efficiency and productivity.

However, such web-based solutions cannot replace direct face-to-face communication and discussions. One needs to ensure the right combination of direct, personal interaction between stakeholders and virtual collaboration supported by a groupware.

Knowledge Management

As outlined in chapter 4.1, the integrated approach for IT sector promotion aims at creating a "learning system" which facilitates continuous improvement and adaptation. **Knowledge management** is a basic prerequisite to establish a learning system as it enables the integration and utilisation of information from all relevant stakeholders as well as from monitoring and evaluation.

For the purpose of this manual the following definition of knowledge management will be used:

> *"Knowledge management refers to processes and practices through which organizations generate value from knowledge."*[25]

[25] *Grant (2008): 159.*

Concerning the implementation of IT sector promotion projects, we suggest a knowledge management system which pursues the following goals:

- Creating a collaborative learning system (organisational learning)
- Generating organisational knowledge through the transfer of individual stakeholder's knowledge to collective knowledge. Organisational knowledge is generated through interaction and pooling of information between the individuals within an organisation or group.
- Adapting and continuously improving the project approach.
- Supporting communication, information and cooperation among all relevant stakeholders of the IT industry.
- Generating and processing lessons learned & feedback.
- Creating a basis for new, innovative support measures.
- Increasing the international competitiveness of local IT companies.

It is advisable to design a knowledge management system consisting of the following two key processes:

- **Knowledge generation** comprises the generation of IT-relevant knowledge through joint research of technology trends and potential export markets. It also includes lessons learned, feedback and experience, generated from the implementation of support measures (e.g. trainings) and the corresponding monitoring and evaluation. In this context, the working groups/task forces play a crucial role since they feed the lessons learned from the implementation of the corresponding support measures back into the knowledge management system.

- **Knowledge application** is concerned with organising, storing, sharing, disseminating and integrating the generated knowledge.

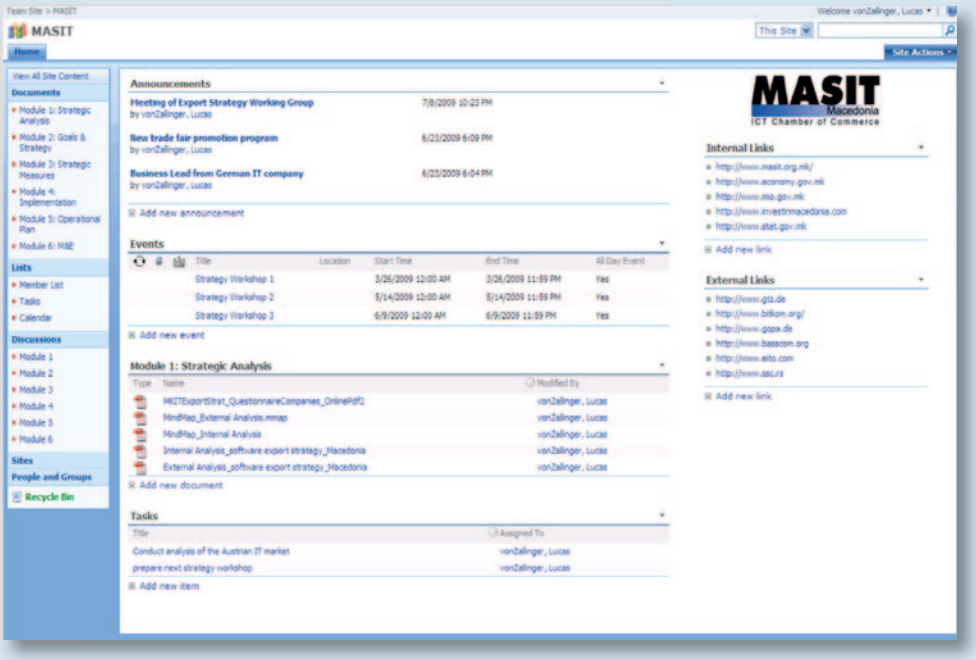
The organisation of generated knowledge should be conducted according to the five support modules. The above-mentioned groupware applications provide the technical infrastructure to store, share and disseminate the generated knowledge.

The following diagram shows an example of a groupware application being used for knowledge management in IT sector promotion. The application provides several interesting features to support knowledge management such as discussion board (knowledge sharing), document library (knowledge storage, organisation and dissemination), document sites (knowledge generation and knowledge sharing) and search (knowledge organisation).

However, an effective knowledge management also involves face-to-face communication and interaction amongst the stakeholders.

Practical Example:

This screenshot shows the groupware application which has been designed within the project "Promotion of the Macedonian IT/Software Industry". Besides supporting collaboration within the Macedonia IT cluster, it also serves as a technical platform for storing, sharing and disseminating knowledge for the cluster members as well as key stakeholders of the IT industry.



Source: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ).

Useful Links	
FreeMind	http://freemind.sourceforge.net/wiki/index.php
MindMap	http://en.wikipedia.org/wiki/Mindmap
MindMeister	http://www.mindmeister.com
FOSWIKI	http://foswiki.org/
eGroupWare	http://www.egroupware.org
phpGroupWare	http://www.phpgroupware.org
MS SharePoint	http://office.microsoft.com/de-de/sharepointserver
BMWi Knowledge Management	http://www.bmwi.de/BMWi/Navigation/Technologie-und-Innovation/Digitale-Welt/Mittelstand-Digital/wissensmanagement.html

5. Annex

5.1 German Development Cooperation's Experience

With a total market value of € 130 billion in 2010, Germany is the largest ICT market in Europe and the fourth largest in the world. The market segment software accounted for a total market value of € 14.6 billion while IT services reached € 32 billion in 2010.[26] There are more than 72,000 ICT companies in Germany employing 843,000 people.[27] Germany is home to some of the world's largest IT clusters like the Software-Cluster Rhein-Main-Neckar, and to leading IT companies such as Siemens, SAP and Software AG. Even in terms of innovation and R&D, Germany plays a prominent role in the global ICT market. With more than 5,000 ICT patent applications, Germany is surpassed only by the USA and Japan.[28] Additionally, Germany is among the leading nations in terms of open source software usage and has the biggest community of OSS developers in Europe. Finally, Germany's Fraunhofer society is Europe's largest ICT research organisation and its universities are well known for their excellence in R&D as well as technical education.

In terms of policy, Germany has long-standing experience with designing and implementing innovative strategies to support the IT industry such as the "High-Tech Strategy" or "Deutschland Digital 2015".

Its in-depth industrial and technological expertise in the area of IT as well as its years of experience in development cooperation make Germany a competent and reliable partner for IT sector promotion in developing and emerging countries. German development cooperation recognised the strategic importance of IT sector promotion for achieving specific development goals such as the MDG 8 quite early. At the very heart of Germany's commitment to IT sector promotion stands the notion that the multiple benefits and development impacts of IT can only be generated on a sustainable basis by **establishing competitive IT industries** in developing and emerging countries. In this context, one of the main objectives is to strengthen the IT industry in developing countries so that local IT firms are able to provide innovative solutions and services to government institutions and the private sector.

Based on this project experience, German development cooperation is able to provide its partners with in-depth expertise in IT sector promotion, well-proven methodologies, tools and instruments as well as with best practices from various regions and countries.

The following section gives a short overview on German development cooperation experience in IT sector promotion in the form of selected project examples.

26 *EITO 2010.*
27 *BITKOM.*
28 *BMWI.*

Project title:	**Economic and Employment Promotion Programme: Promotion of the Bulgarian Software Industry**		
Country:	Bulgaria	**Duration:**	01/2003 – 02/2009 (with interruption in 2005)
Impl. agency:	GIZ	**Partner:**	Bulgarian Ministry of Economy, Energy and Tourism
Project goal	Small and medium-sized enterprises of the Bulgarian software industry have access to sector-specific business development and support services.		
Project activities:	• Elaboration of a sector development strategy for the Bulgarian IT/ software industry • Development of an export promotion strategy for the Bulgarian software industry • Consulting in the area of cluster policy (software industry) • Establishment of the Bulgarian Software Cluster (BASSCOM) • Advisory services in the area of cluster management • Development and implementation of cluster services • Development and implementation of technical trainings as well as management trainings • Provision of advisory services in the area of HR-development as well as IT education • Establishment of a CMMI Training Centre based on a development partnership with the private sector • Provision of management and export consulting services to Bulgarian software companies • Organisation of B2B match-making events with potential export clients (EU) • Trade fair consulting • Investment promotion • Domestic market development: provision of consulting services to Bulgarian software companies concerning the development of innovative software solutions and IT services for local industries (electrical engineering industry, wood & furniture industry) • Concept development for a groupware application for the Bulgarian software cluster • Concept development for a cluster-based CRM system • Organisational and business process management consulting • Change management • Capacity development and training of local consultants and BDS providers • Development and implementation of an industry barometer (statistical monitoring system) for the Bulgarian software industry		

Project title:	**Economic and Employment Promotion Programme: Promotion of the Serbian Software Industry**		
Country:	Serbia	**Duration:**	03/2005 – 11/09
Impl. agency:	GIZ	**Partner:**	Serbian Ministry of Economy
Project goal	Small and medium-sized enterprises in the Serbian software industry increase their revenues and generate economic growth and employment		
Project activities:	• Development of an export-oriented strategy for the Serbian software industry (focus: software and IT services) • Establishment of the Serbian Software Cluster (SSC) • Development and implementation of cluster services • Training and capacity development in cluster management • Organisational and business process consulting • Provision of technical trainings and management trainings • Elaboration of a concept for the establishment of a "Balkan SAP Training Centre" (Development partnership with the private sector) • Provision of management consulting and export consulting to Serbian software companies • Elaboration of a branding strategy for the Serbian software industry • Strategic positioning of the Serbian software industry in Western European markets • Organisation and promotion of trade fair participations (CeBIT, SYSTEMS) • Establishment of cooperation with German IT associations, clusters and institutions • Business match-making: promotion of cooperations between Serbian and German software companies • Investment promotion • Domestic market development • Promotion of product development and local innovation in the software industry		

Project title:	**Promotion of Small and Medium Enterprises – Cluster Management Training: Promotion of the Croatian ICT Cluster (Project Component)**		
Country:	Croatia	**Duration:**	06/2005 – 12/2008
Impl. agency:	GIZ	**Partner:**	Croatian Ministry of Economy
Project goal	Small and medium-sized enterprises improve their international competitiveness through clusters.		
Project activities:	• Consulting of the Croatian Ministry of Economy and selected public institutions concerning cluster policy • Elaboration of a national cluster strategy • Provision of advisory services in the area of cluster management • Implementation of trainings on cluster management • Design of financial support schemes for Croatian technology clusters • Benchmarking and identification of best practice examples in cluster management in the EU • Organisation and implementation of a study trip to clusters in the EU • Development of a manual for cluster managers • Development of a toolbox for cluster managers • Support to the establishment of the Croatian ICT cluster CroICT • Development and implementation of cluster services for the Croatian ICT Cluster • Provision of advisory services to the Croatian ICT cluster in the area of business planning and financial management • Training and capacity development of the Croatian ICT cluster in the area of business process management and quality management • Development of an electronic portal and a groupware application (based on MS SharePoint) for Croatian industry clusters • Export promotion of the Croatian ICT cluster		

Project title:	**Integrated Economic and Employment Promotion Programme: Promotion of the Albanian Software Industry**		
Country:	Albania	**Duration:**	10/2007 – 02/2012
Impl. agency:	GIZ	**Partner:**	Albanian Ministry of Economy, Trade and Energy
Project goal	The international competitiveness of small and medium-sized enterprises in the Albanian software industry is improved		
Project activities:	• Analysis of the Albanian IT/software industry concerning its international competitiveness and export potential • Evaluation of existing ICT strategies • Elaboration of a sector development strategy for the Albanian IT/ software industry • Cluster analysis and cluster mapping • Establishment of the Albanian Software Cluster (ASC) • Capacity development in the area of cluster promotion and management • Consulting in the area of cluster policy (IT industry) • Provision of good practice examples of IT clusters from the region and from the EU • Organisational and business process consulting • Elaboration of a cluster business plan • Development and implementation of cluster services • Development and implementation of a marketing concept for the Albanian Software Cluster • Design and implementation of a website for the Albanian Software Cluster • Development and implementation of a groupware application for the Albanian Software Cluster (based on MS SharePoint) • establishment of the "Albanian Software Cluster Training Academy" in close cooperation with the Polytechnic University of Tirana • Design and implementation of technical and management trainings • Provision of management and export consulting services to Albanian software companies • Organisation of B2B match-making events with potential export clients (EU) • Organisation of business delegations • Domestic market development • Provision of consulting services to Albanian software companies concerning the development of innovative software solutions and IT services for the local textile industry as well as tourism industry		

Project title:	**Investment and Export Promotion Programme – Export Promotion of the Macedonian Software/IT Industry**		
Country:	Macedonia	**Duration:**	10/2008 – 12/2012
Impl. agency:	GIZ	**Partner:**	Macedonian Ministry of Economy
Project goal	The international competitiveness of small and medium-sized enterprises in the Macedonian IT/software industry is improved		
Project activities:	**Sectoral analysis of the Macedonian software/IT industry** • Analysis and assessment of the Macedonian IT/software industry • Elaboration of an IT benchmarking study (Bulgaria and Romania) with a focus on IT promotion strategies and policies • Assessment of the export capability and potential of the Macedonian software/IT industry • Survey on the export activities of Macedonian software/IT companies • Identification of potential export markets for the Macedonian software/IT industry • Market analysis of potential export markets (market segments, market potential, demand structures, main competitors, technical requirements, five forces analysis, key success factors) • Workshop and presentation of the results of the market analysis **Development of a national export promotion strategy for the Macedonian software/IT services industry** • Establishment of a working group for the development of the strategy including all relevant stakeholders • Capacity development in the area of strategy development • Capacity development in the area of export promotion • Development of a methodology for collaborative strategy • Development of the export promotion strategy in close collaboration with Macedonian partners • Development of an operational plan for the implementation of the strategy **Implementation of key measures of the export promotion strategy** • Organisational and business process consulting • Provision of advisory services in the area of export promotion policy • Consulting in the area of international branding & positioning • Consulting in the area of cluster policy and cluster management • Support to the Macedonian IT association (MASIT) in developing and implementing export-oriented cluster services • Export promotion and business development for Macedonian IT/ software companies • Promotion of export-oriented investment • Provision of consulting services in the area of quality management • Design of an export-oriented knowledge management system based on MS SharePoint • Implementation of a statistical M&E-system for the IT industry (industry barometer) • Implementation of the “MASIT Training Academy” • Development and implementation of technical trainings • Development and implementation of management trainings		

Project title:	**Information and Communication Technology Assisted Development (ICTAD) Project**		
Country:	Ethiopia	**Duration:**	06/2005 – 05/2010
Impl. agency:	GIZ	**Partner:**	Ethiopian Information and Communication Technology Development Agency (EICTDA)
Project goal	To increase the use of Information and Communication Technology by communities in project target areas.		
Project activities:	• Support to the development of coherent and well defined locally adapted national ICT standards and national ICT guidelines • Capacity development and human resource development for EICTDA • Licensing of Virtual Internet Service providers under Ethiopian Telecommunication Agency (ETA) Objective • Licensing of community radios • Support e-learning at civil service college • Support community ICT development • Establishment of community radios • ICT Training of Trainers in selected TVET Centres • Provision of training for SME operators • Support to the establishment of ICT Business Incubation Centres • Establishment of a Computer Refurbishment and Training Centre		

Project title:	**Sustainable Economic Development in Central America – Promotion of the Central American IT Industry**		
Country:	Central America	**Duration:**	07/2007 – 12/2012
Impl. agency:	GIZ	**Partner:**	General: Central American Center for the Promotion of MSMEs (CENPROMYPE) IT relevant: IT Associations in El Salvador (Exsource Group), Guatemala (SOFEX) and Honduras (AHTI)
Project goal	General: The political and institutional framework for promoting the commercial and technological competence of innovative MSMEs has improved. Relevant Indicator: The trade and technological competences of MSMEs in the IT sector are improved.		
Project activities:	**Promotion (Institutional strengthening) of the national IT associations** • Establishment of the Honduran IT Association (AHTI) (transfer of the successful Colombian association model "FEDESOFT") • Support in the formulation of strategic and action plans • Support in the definition of a service portfolio • Support in institutional restructuring processes (cluster development) • Consulting in the area of cluster management • Cluster Analysis and Cluster Mapping • Support in international event participation (e.g. ALETI, BIZ FIT) **Export Promotion and Training** • Organisation and promotion of trade fair participations (e.g. EURO EXPO 2010) • Development of training manuals and implementation of technical trainings (e.g. Java and SQL) • Support to the Salvadorian, Guatemalan and Honduran IT associations in developing export-oriented cluster services • Elaboration of (German) Good Practice examples of technological transfer models (cooperation between private and academic sector) **Innovation Promotion** • Implementation of trainings in innovation management • Establishment and strengthening of innovation roundtables including relevant stakeholders of the National Innovation Systems to promote the coordination and cooperation between the private, public and academic sector • Implementation of innovation competitions ("IT Innovation Prize") **Regional Initiatives** • Impulses for regional coordination and cooperation initiatives (e.g. joint trade fair participation – EURO EXPO) • Impulses for regional good practice exchange (learning from more advanced countries p.eg. Costa Rica and Panama) **Monitoring & Evaluation** • Analysis of the IT industry in El Salvador, Guatemala and Honduras • Design and implementation of a statistical M&E-system for the IT industry		

Project title:	**ict@innovation – Creating Business and Learning Opportunities with Free and Open Source Software in Africa**		
Country:	Sub-Saharan Africa	**Duration:**	1/2008 – 12/2012
Impl. agency:	GIZ	**Partner:**	Free Software and Open Source Foundation for Africa (FOSSFA)
Project goal	The objective of ict@innovation is to foster small and medium-sized enterprises (SME) in the field of Free and Open Source Software (FOSS) through regional networking and strengthening of consulting capacities of local ICT associations, ICT training institutions as well as other relevant change agents. Particularly, the programme contributes to qualify SME of the African ICT industry in providing localised and adapted applications and services to public administration and private sector. ict@innovation supports development-oriented, legal and affordable ICT-applications by providing qualifications in key innovations built on Free and Open Source Software. This aims to foster local innovation, technology transfer, local added value as well as pro-poor growth.		
Project activities:	**Pillar A. Training on African FOSS Business Models for ICT-based SME:** Free your IT-Business in Africa! Advanced Training on African FOSS Business Models for IT-SMEs • Training materials including, case studies and best practice business models for „Free and Open Source Software" (FOSS) products, services and training, adapted to the African context • Disseminating such model business approaches and related skills in the African ICT sector through training courses and networking **Pillar B. Quality Management for FOSS Services through Certification:** Linux Admin Certification in Africa – the ict@innovation Training of Trainers Programme • Promotion of internationally recognised quality standards in the field of FOSS by providing access to training in low-cost vendor-neutral Certification for Linux Administration (using Linux Professional Institute's LPI International Certification scheme). • Enlargement of trainings for certification and accreditation of FOSS training courses, tests and materials **Pillar C. Innovative local FOSS Applications for social and economic development:** Coding FOSS in Africa – the mentored internship programme (MIP) of AVOIR & ict@innovation • "Learning by Coding": promoting the application of technical skills in locally relevant software projects • Development and dissemination of FOSS products adapted to the needs of the SME and the public sector **Pillar D. Regional networking and international exchange** • Community building through trainings and the ict@innovation web portal • Strengthening regional organisations and assisting international exchange		

Project title:	**FOSS Bridge EU-Vietnam – Joint Business through Free and Open Source Software**		
Country:	Vietnam	**Duration:**	03/2007 – 2/2009
Impl. agency:	GIZ	**Partner:**	Institute of Information Technology (IOIT), Vietnam National Research Institute in Computer Science and Control (INRIA), France
Project goal	Strengthen Southeast Asian software industries and boost cooperation with Europe through innovative collaboration on free and open source software and business development		
Project activities:	**Training workshops for intermediaries and SME:** • Capacity building for intermediaries and IT-SME on technical regulation: High-Level Trainings for Intermediaries and SMEs • Distance learning and coaching phase • Outreach to larger amount of SME through training conducted by the intermediaries **Twinning projects for SME:** • Training for selected SMEs through twinning between Europe and Asia: face to face matchmaking, twinning and training workshops **Networking activities:** • Building networks of FOSS players and ecosystems: „Connect the FOSS Players“ and „Promote networking through online tools „		

5.2 Bibliography

A

American Society for Quality (2005): The Art and Process of Strategy Development and Deployment. Journal for Quality and Participation, Vol. 28, Iss. 4, pp. 10-17.

Arora, A./ Drev, M./ Forman, C. (2009): Economic and Business Dimensions: The Extent of Globalization of Software Innovation. Communications of the ACM, Vol. 52, Iss. 2, pp. 20-22.

Aulakh, P.S./ Kotabe, M./ Teegen, H. (2000): Export Strategies and Performance of Firms From Emerging Economies: Evidence From Brazil, Chile, And Mexico. Academy of Management Journal, Vol. 43, Iss. 3, pp. 342-361.

B

Baker, M. / Hart, S. (2007): Product Strategy and Management Harlow: Pearson Education Limited.

Balabanis, G./ Spyropoulou, S. (2007): Matching Modes of Export Strategy Development to Different Environmental Conditions. British Journal of Management, Vol. 18, Iss. 1, pp. 45-62.

Barclay, B. (2003): Putting IT All Together. ITC's Template for Strategy-makers. The magazine of the International Trade Centre, Iss. 1, pp. 26-28.

Batory, D. (2006): Multilevel models in model driven engineering, product lines, and metaprogramming. IBM Systems Journal, Vol. 45, Iss. 3, pp. 527-539.

Bragge J./ Merisalo-Rantanen, H./ Nurmi, A./ Tanner, L. (2007): A Repeatable E-Collaboration Process Based on ThinkLets for Multi-Organization Strategy Development. Group Decision and Negotiation, Vol. 16, Iss. 4, pp. 363-379.

Branch, A. (2006): Export Practice and Management. London: Thomson.

Bundesministerium für Wirtschaft und Technologies (2007): Wissensmanagement in kleinen und mittleren Unternehmen und öffentlicher Verwaltung. http://www.wissenmanagen.net.

Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung (2006): Evaluierungskriterien für die deutsche bilaterale EZ. Eine Orientierung für Evaluierungen des BMZ und der Durchführungsorganisationen. Bonn.

Bundesverband Informationswirtschaft, Telekommunikation und Neue Medien (BITKOM) (2005): Leitfaden Offshoring. http://www.bitkom.org.

Business Software Alliance (BSA) (2007): Fifth Annual BSA and IDC Global Software Piracy Study 2007. http://global.bsa.org/idcglobalstudy2007/studies/2007_global_piracy_study.

Buxmann, P./ Diefenbach, H./ Hess, T. (2008): Die Softwareindustrie. Ökonomische Prinzipien, Strategien, Perspektiven. Berlin: Springer Verlag.

C

Carmel, E. (2003): The New Software Exporting Nations: Success Factors. The Electronic Journal on Information Systems in Developing Countries, Vol. 13, Iss. 4, pp. 1-12.

Chan W./ Mauborgne, R. (2005): Blue Ocean Strategy. How to Create Uncontested Market Space and Make the Competition Irrelevant. Boston: Harvard Business School Press.

Collis, D./ Montgomery, C. (1995): Competing on Resources: Strategy in the 1990s. Harvard Business Review, Vol. 73, Iss. 4, pp. 119-128.

Correa, C.M. (1996): Strategies for Software Exports from Developing Countries. World Development, Vol. 24, Iss. 1, pp. 171-182.

Cusumano, M.A. (2006): Envisioning the Future of India's Software Services Business. Communications of the ACM, Vol. 49, Iss. 10, pp. 15-17.

D

De Chernatony, L./ McDonald, M. (2003): Creating Powerful Brands in Consumer, Service and Industrial Markets. Oxford: Elsevier.

Deutsche Bank Research (2008): Präsentation "Offshoring bei deutschen Unternehmen: Nach fernen auch nahe Ufer". Handelsblatt Tagung IT Services 2012 im September 2008.

Deutsche Bank Research/ BITKOM (2005): Offshoring Report 2005 – Ready for take-off. http://www.dbresearch.de.

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) (2007): The World of Words at GTZ. Eschborn: Interne Publikation.

E

Endres, A. (2006): Geschäftsmodelle und Beschäftigungspotentiale der Software-Industrie. Informatik – Forschung und Entwicklung, Vol. 21, Iss. 1-2, pp. 99-103.

Esser, K./ Hillebrand, W./ Messner, D./ Meyer-Stamer, J. (1994): Systemische Wettbewerbsfähigkeit. International Wettbewerbsfähigkeit der Unternehmen und Anforderungen an die Politik. Berlin: Deutsches Institut für Entwicklungspolitik (DIE).

European Commission (2004): Project Cycle Management Guidelines. http://ec.europa.eu/europeaid.

Evangelou, C.E./ Karacapilidis, N. (2007): A Multidisciplinary Approach For Supporting Knowledge-Based Decision Making in Collaborative Settings. International Journal of Artificial Intelligence Tools, Vol. 16, Iss. 6, pp. 1069-1092.

G

Grant, R.M. (2008): Contemporary Strategy Analysis. Malden: Blackwell Publishing.

H

Heeks, R. (1999): Software Strategies in Developing Countries. Communications of the ACM, Vol. 42, Iss. 6, pp. 15-20.

Heeks, R. (2010): Development 2.0: Transformative ICT-Enabled Development Models and Impacts. Development Informatics Short Paper no.11.

Heeks, R./ Nicholson, B. (2004): Software Export Success Factors and Strategies in "Follower" Nations. Competition & Change, Vol. 8, Iss. 3, pp. 267-303.

I

Institut für Strukturforschung und Planung (2007): Evaluating Programme-based Approaches: The Case of Jointly Financed Sector-wide Approaches (SWAps). Working Paper No. 1.

K

Kaplan, R.S./ Norton, D.P. (1992): The Balanced Scorecard: Measures That Drive Performance. Harvard Business Review, Vol. 70, Iss. 1, pp. 71-79.

Kenan Institute Asia (2002): Vietnam's emerging software industry: Competitiveness, positioning, and strategy in a global markets. http://www.kiasia.org.

Kilian-Kehr, R./ Terzidis, O./ Voelz, D. (2007): Industrialization of the Software Sector. Wirtschaftsinformatik, Iss. 49 Special Edition (Sonderheft), pp. 62-71.

L

Leonidou, L.C./ Katsikeas, C.S./ Samiee S. (2002): Marketing strategy determinants of export performance: a meta-analysis. Journal of Business Research, Vol. 55, Iss. 1, pp. 51-67.

Li, M./ Gao, M. (2003): Strategies for Developing China's Software Industry. MIT Information Technologies and International Development, Vol. 1, Iss. 1, pp. 61-73.

Liebowitz J./ Megbolugbe, I. (2003): A Set of Frameworks to Aid the Project Manager in Conceptualizing and Implementing Knowledge Management Initiatives. International Journal of Project Management, Vol. 21, Iss. 3, pp. 189-198.

M

McFarland, K. (2008): Should You Build Strategy Like You Build Software. MIT Sloan Management Review, Vol. 49, Iss. 3, pp. 69-74.

Mintzberg, H. (1978): Patterns in Strategy Formation. Management Science, Vol. 24, Iss. 9, pp. 934-948.

Mintzberg, H. (1994): The Fall and Rise of Strategic Planning. Harvard Business Review, Vol. 72, Iss. 1, pp. 107-14.

N

Nagle, T.T./ Hogan, J. (2006): The Strategy and Tactics of Pricing. A Guide to Growing More Profitably. New Jersey: Pearson Education.

Nicholson, B./ Sahay, S. (2009): Software Exports Development in Costa Rica: Potential for Policy Reform. Information Technology for Development, Vol. 15, Iss. 1, pp. 4-16.

O

Ojala, A./ Tyrväinen, P. (2007): Market Entry and Priority of Small and Medium-Sized Enterprises in the Software Industry: An Empirical Analysis of Cultural Distance, Geographic Distance, and Market Size. Journal of International Marketing, Vol. 15, Iss. 3, pp. 123-149.

P

Porter, M.E. (1980): Competitive Strategy. New York: Free Press.

Porter, M.E. (1986): Competition in Global Industries. Boston: Harvard Business School Press.

Porter, M.E. (1990): The Competitive Advantage of Nations. New York: Free Press.

Porter, M.E. (1996): What is strategy? Harvard Business Review, Vol. 74, Iss. 6, 61-78.

Porter, M.E. (1998): On Competition. Cambridge: Harvard Business School Press.

Prahalad, C.K./ Hamel, G. (1990): The Core Competence of the Corporation. Harvard Business Review, Vol. 68, Iss. 3, pp. 79-91.

S

Saleh, N./ Carmel, E./ Mroczkowski, T. (2004): Becoming Software Exporters? The Cases of Three Central European Nations – Romania, Poland, and the Czech Republic. Journal of East-West Business, Vol. 10, Iss. 1, pp. 43-67.

Scheer, G. / von Zallinger, L. (2006): Cluster Management – A Practical Guide. Deutsche Gesellschaft für Technische Zusammenarbeit (Ed.). http://www2.gtz.de/dokumente/bib/07-1496.pdf.

Spender, J.C. (1996): Organizational knowledge, learning and memory: three concepts in search of a theory. Journal of Organizational Change Management, Vol. 9, Iss. 1, pp. 63-78.

Sudan, R., et al. (2010): The Global Opportunity in IT-Based Services. Assessing and Enhancing Country Competitiveness. Washington: The World Bank.

T

Terjesen, S./ O'Gorman, C./ Acs, Z.J. (2008): Intermediated mode of internationalization: new software ventures in Ireland and India. Entrepreneurship & Regional Development, Vol. 20, Iss. 1, pp. 89-109.

The World Bank (2011): ICT Sector Strategy Approach Paper. http://www.worldbank.org/ict/strategy.

Thompson, A. A./ Gamble J. E/ Strickland A. J. (2004): Strategy: Winning in the Marketplace: Core Concepts, Analytical Tools, Cases. New York: McGraw-Hill.

U

Ukrainian High-Tech Initiative (2008): Central & Eastern Europe IT Outsourcing Review. http://www.hi-tech.org.ua.

V

Verts, W.T. (2008): Open Source Software. http://www.worldbookonline.com/wb/Article - retrieved on: 09.05.09.

W

Watson, G.H. (2005): Design and Execution of a Collaborative Business Strategy. The Journal for Quality and Participation, Vol. 28, Iss. 4, pp. 4-9.

Williams, P. (2003): Measuring Performance. The magazine of the International Trade Centre, Iss. 1, pp. 22-25.

Wolle, B. (2005), Grundlagen des Software-Marketing. Von der Softwareentwicklung zum nachhaltigen Markterfolg. Wiesbaden: GWV Fachverlag.

X

Xu, L./ Brinkkemper, S. (2007): Concepts of product software. European Journal of Information Systems, Vol. 16, Iss. 5, pp. 531-541.

Z

Zou, S./ Stan, S. (1998): The determinants of export performance: A review of the empirical literature between 1987 and 1997. International Marketing Review, Vol. 15, Iss. 5, pp. 333-356.

5.3 Internet Sources

- Albanian Software Cluster (ASC): http://www.albaniansoftwarecluster.com
- Bulgarian Software Cluster (BASSCOM): http://www.basscom.org
- Carnegie Mellon University – Software Engineering Institute: http://www.sei.cmu.edu/cmmi
- Cio.de: http://www.cio.de
- Croatian ICT Cluster (CroICT): http://www.cro-ict.net
- European Information Technology Observatory (EITO): http://www.eito.com
- EXPORT HUB: http://export-hub.com
- Federal Association for Information Technology, Telecommunications and New Media (BITKOM): http://www.bitkom.org
- German Federal Ministry for Economics and Technology (BMWi): http://www.bmwi.de
- Macedonian ICT Chamber of Commerce (MASIT): http://www.masit.org.mk
- Millennium Development Goals: http://www.un.org/millenniumgoals
- National Association of Software and Services Companies of India (NASSCOM): http://www.nasscom.org
- Organization for Economic Cooperation and Development (OECD): http://www.oecd.org
- Russian Software Cluster (RUSSOFT): http://www.russoft.org
- Serbian Software Cluster: http://www.ssc.rs
- The World Bank: http://www.worldbank.org
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