ENGINEERING MANAGEMENT METHODS

BME Electrical Engineering Major and Computer Engineering Major
BMEVITMAK47

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ENGINEERING MANAGEMENT

as a discipline

Engineering Management (EM)

combination of Engineering and Management Sciences, bridge between them concerning with common and typical methods and methodologies developing, managing and getting success in processes, organizations, technologies, products and IT support.

EM on an engineering field: management processes on a special engineering field including the management of the development, application and (technological and managerial) innovation on a concerned professional area.

Here: the concerned area is: *electrical and computer engineering*, particularly: *information and communications technologies (ICT) including internet, electronics and media technologies*.

SUCCESS IN WORKPLACES

Only about 20% of the graduated engineers is working in the R&D&I, the others are **in entrepreneurship, project management, sales and marketing**…where the **management knowledge is indispensable**:

- knowledge of business processes,
- understanding of the market's mechanism,
- practical application of the theoretical knowledge,
- ability of self-management.

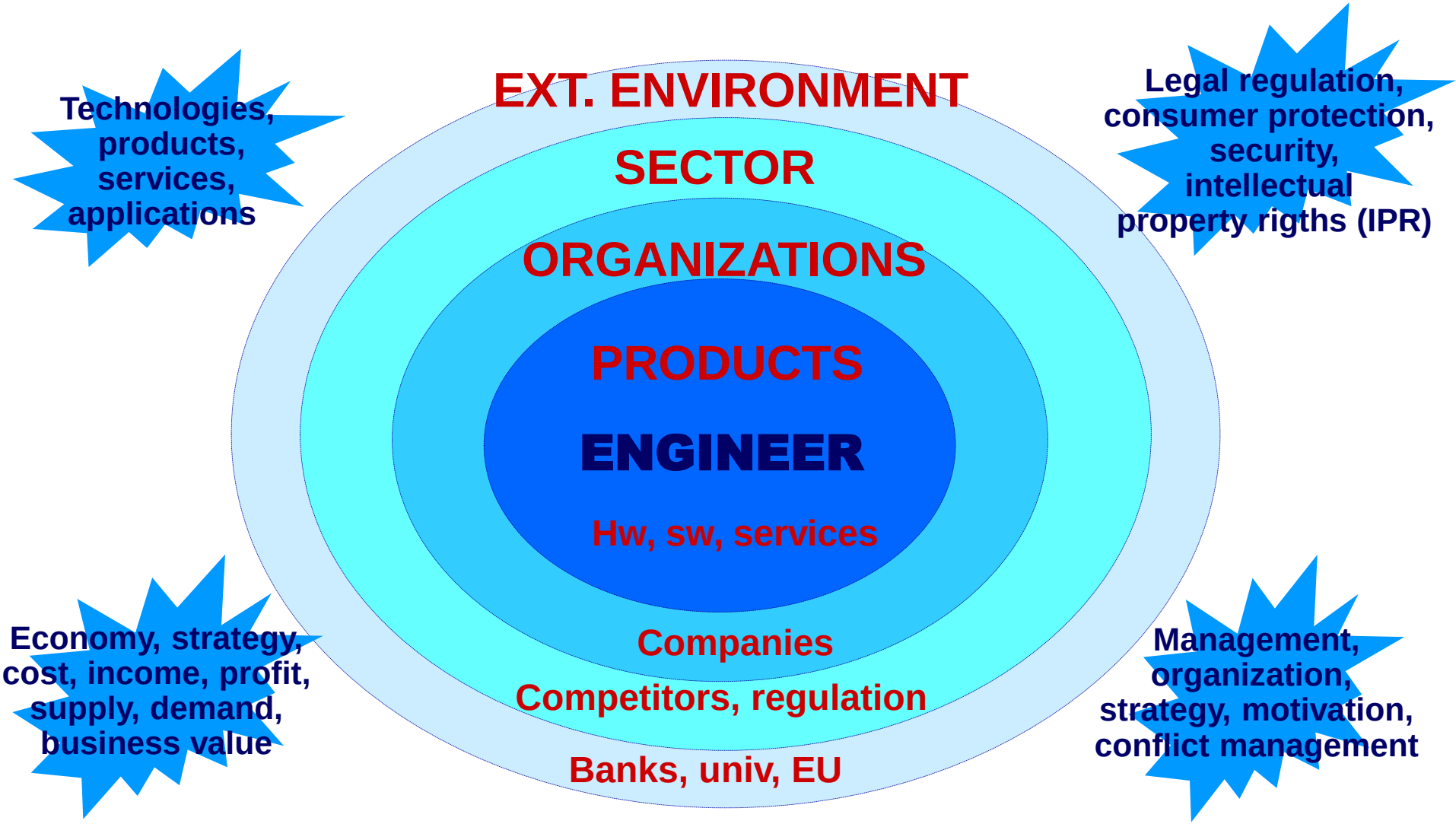
Preferred features in engineering jobs due to a USA employers' survey:

1. Positive, professional work attitude (work ethics)
2. Communication capability:
   oral, written, computer literacy, English
3. Teamwork, cooperation readiness
4. Innovative way of thinking:
   problem-solving skill, critical way of thinking

ENGINEERING ACTIVITIES AND JOBS
(for electrical and computer engineers)

ENGINEERING MANAGEMENT, LEADERSHIP			
RESEARCH, DEVELOPMENT AND INNOVATION (R&D&I) Basic and applied (scientific) research, experimental development; development of technology, products, services, applications; managing patents, standardization	**CONSTRUCTION** Circuit design, planning of systems, networks and services, customization, investment; planning of implementation, realization	**OPERATION** Manufacturing, operation, maintenance, correction, customer care, quality assurance, network/service management, sales support	**SUPPORT** Planning, organization, coordination, business development and innovation, counselling, IPR management, managing contracts

ENGINEERING ENVIRONMENT AND ENGINEERING MANAGEMENT ASPECTS



TOPICS AND PRIORITIES

Focus: Business value from ICT

- The increasing strategic role of ICT in economy
- Convergence of technologies and sectors
- Management functions and roles:
  From project managers to CEO-s (chief executive officers)
- Complex engineering management models and methods in the preparation of techno-economic decisions
- Planning, management and IT-based reengineering of business processes
- Basics of project management
- Areas, means and institutions of innovation management
- Enterprise architecture
- Product management, marketing for ICT development

REFERENCES

***IEEE Engineering Management Review* journal**

IEEE Internat. Engineering Management Conferences

***Harvard Business Manager* journal**

***Morel-Guimaraes, L. Khalil, T.M., Hosni, Y.A.:* Management of Technology. Key success factors for innovation and sustainable development. Elsevier, 2005.**

***IDATE:* DigiWorld2009 Telecom, Internet, Media – The digital world's challenges, 2009.**

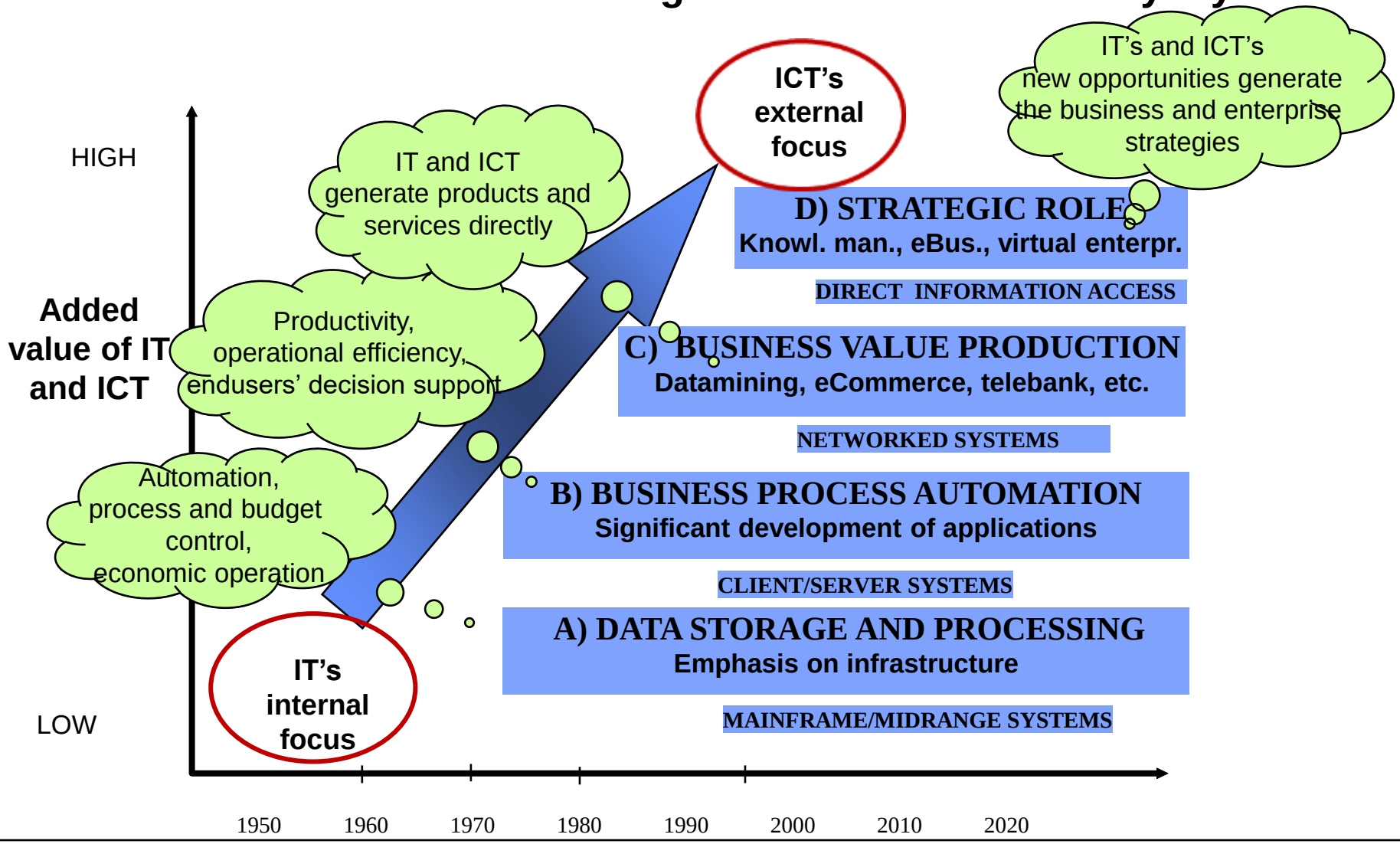
***Bidgoli, H. (editor).:* The Handbook of Technology Management, Wiley, USA, 2010**

***EITO:* European Information Technology Observatory**

***OECD:* Information Technology Outlook**

IT and ICT play more and more significant roles:

- **main source of increase of GDP and productivity**
- **induce transformation in the organizations and our everyday life**



Driving force: Digital convergence

The intensive development and convergence of *information, communications and media technologies* (their synergic integration) are based upon the common digital technology and internet.

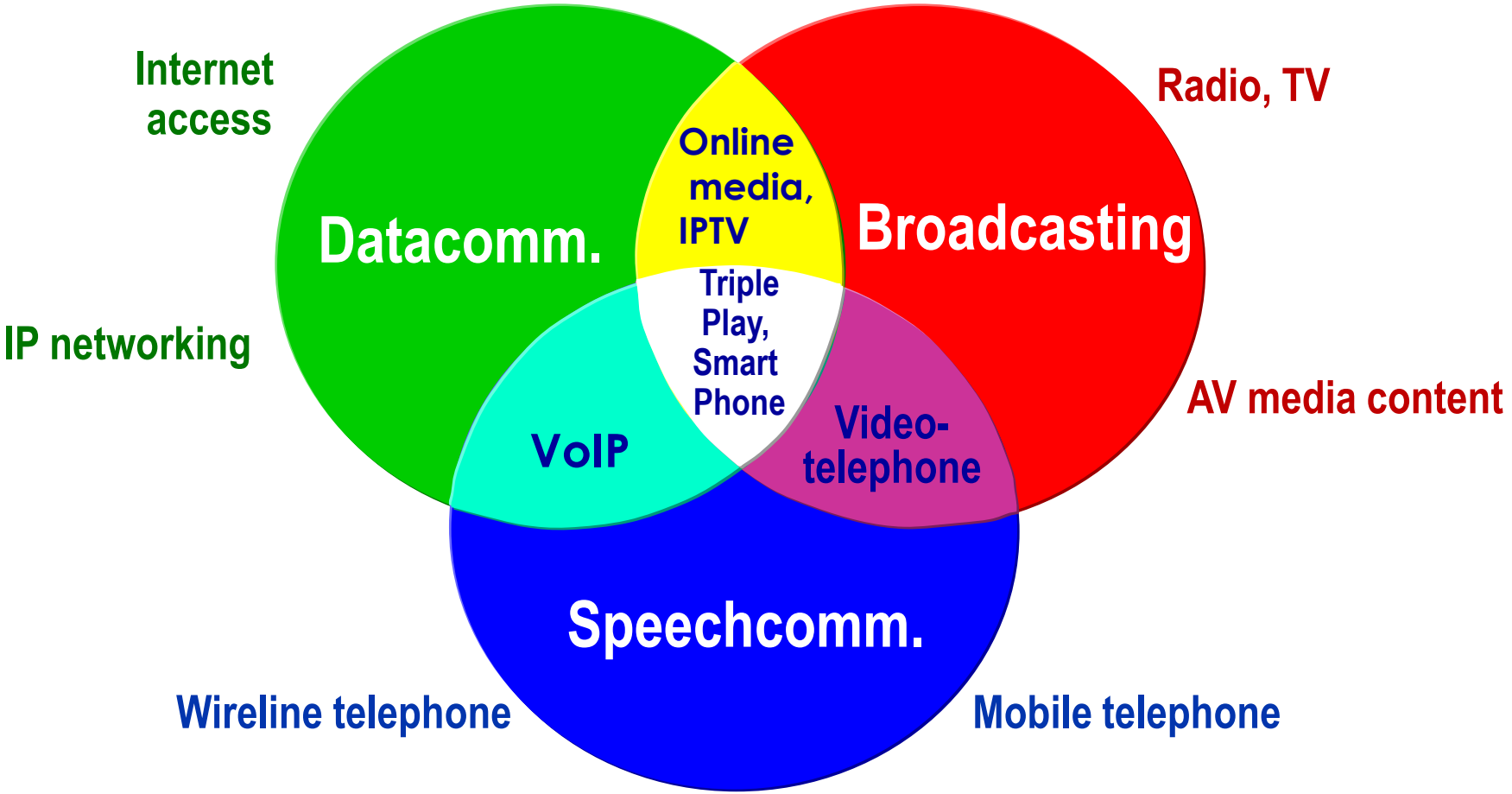
In the products (means, equipment, services) **information processing** (computers**)**, **communications means** and **media and content processing** are combined:

- Software-based solutions in telecommunication
- Networked and embedded computers
- Internet: browsing and searching for information, access to content, content management, on-line content provision (eg.: information services, webportals, IPTV)
- Internet-based services (Information society services, electronic or e-services): e-business, e-government, e-learning, e-health, e-library, online video games etc.
- Social media: content distribution (Facebook, Twitter, Instagram ...)

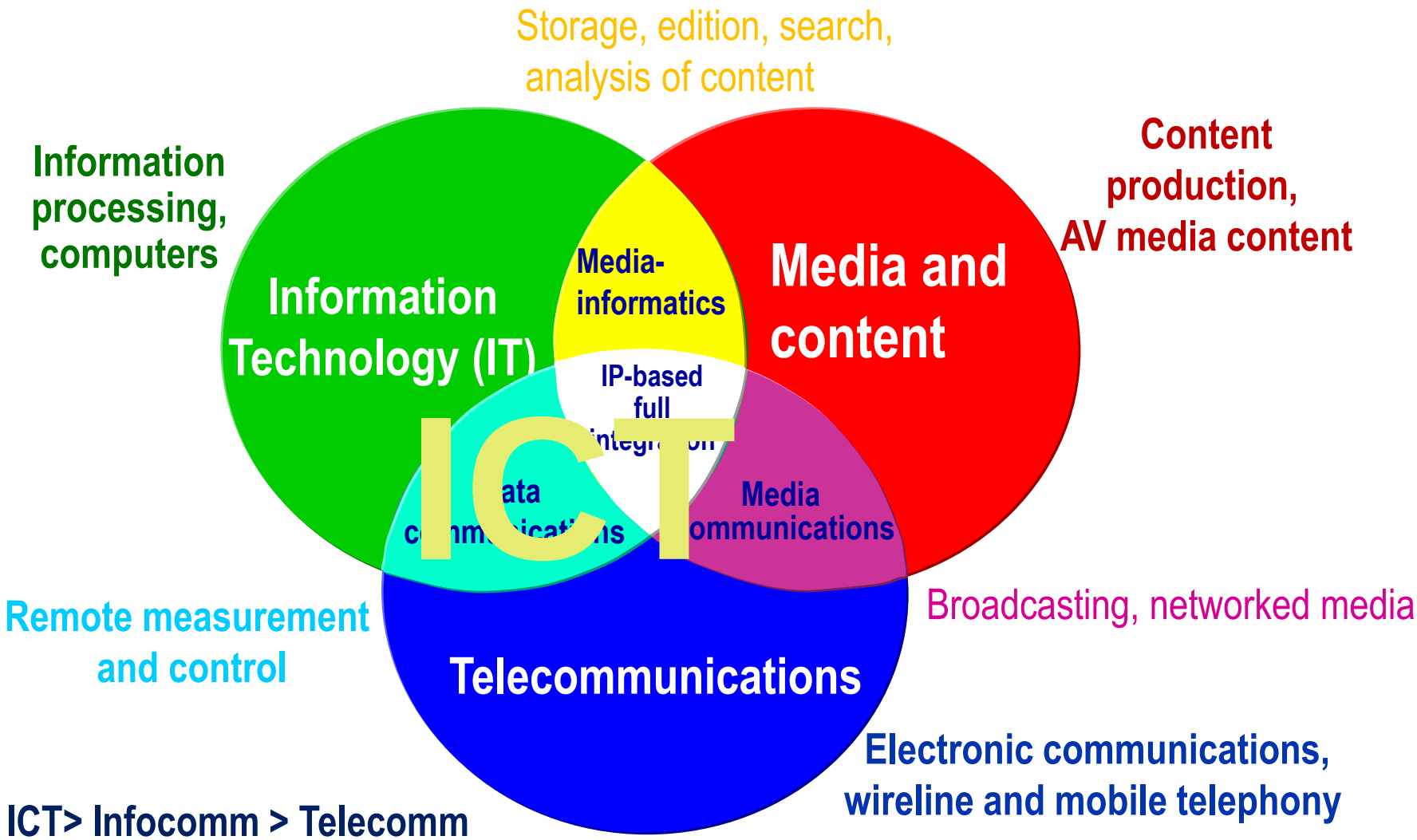
Digital convergence *reacts* to the development of technology, *transforms* the market, *integrates* the **communications-IT-media sectors** (**internet based integrated TIM sector** comes off), *unifies* the environment of regulation, *advances* the globalization, *is* the base of building the information/knowledge-based society.

Convergence and Synergy of Services

The convergence of speech, data and media communications provides new, IP-based multimedia service options

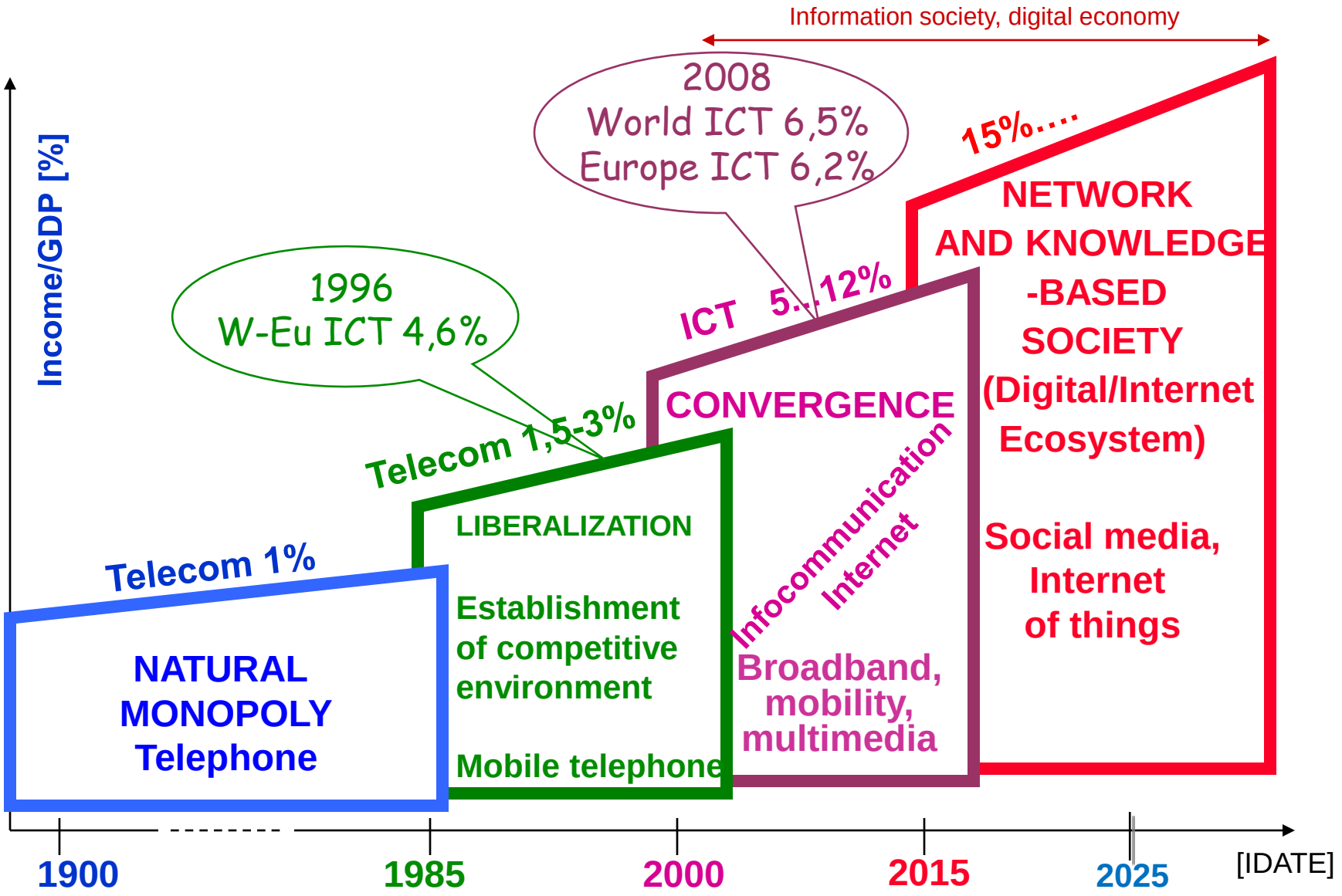


Terminology: convergence of (tele)communications, information and media technologies (TIM)

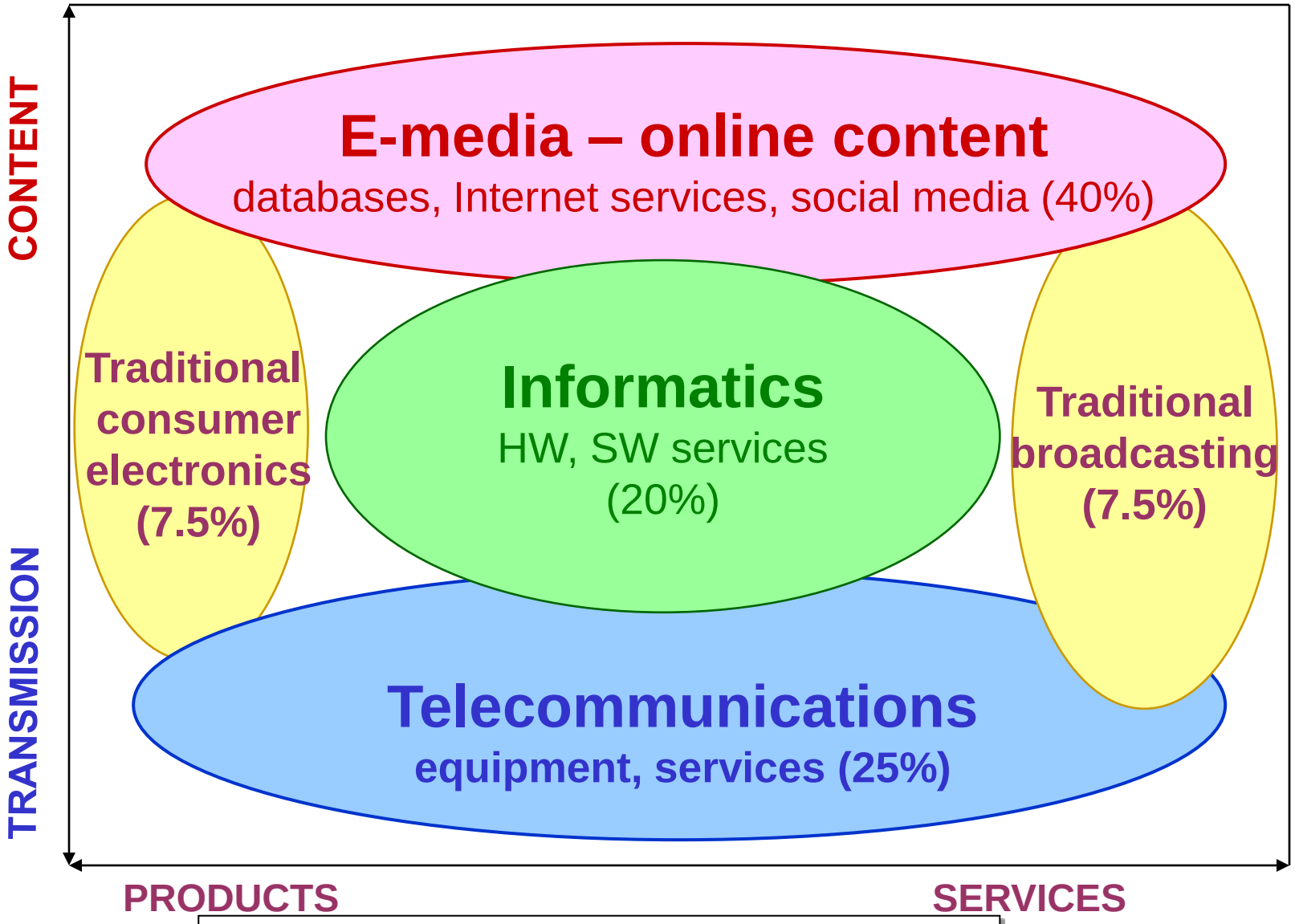


TIM > ICT> Infocomm > Telecomm

Role of ICT in world economy



Components of the TIM sector (>5 billion €) on the world market



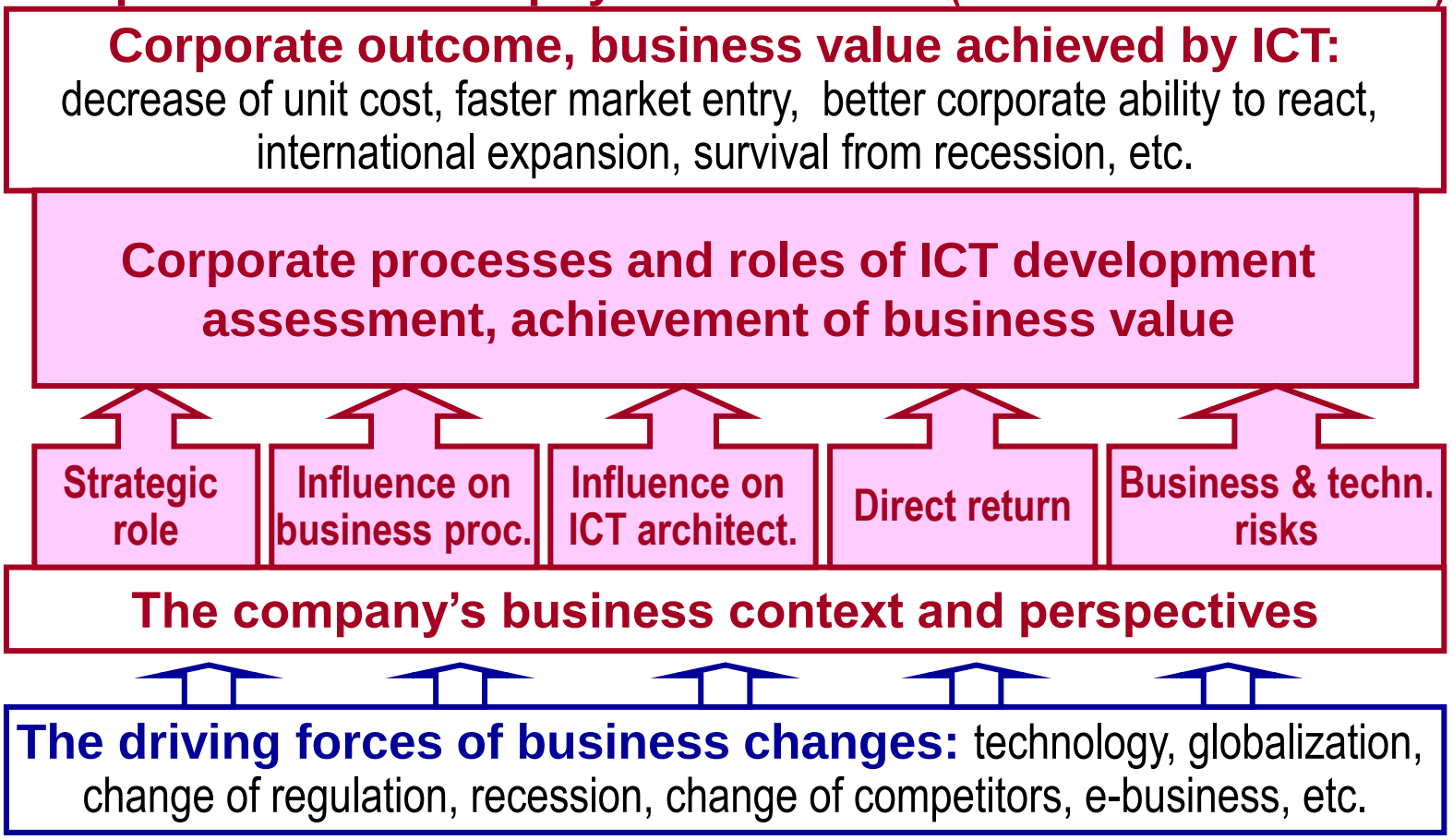
N-America, Europe, Asia-Pacific ca. 30%-30%

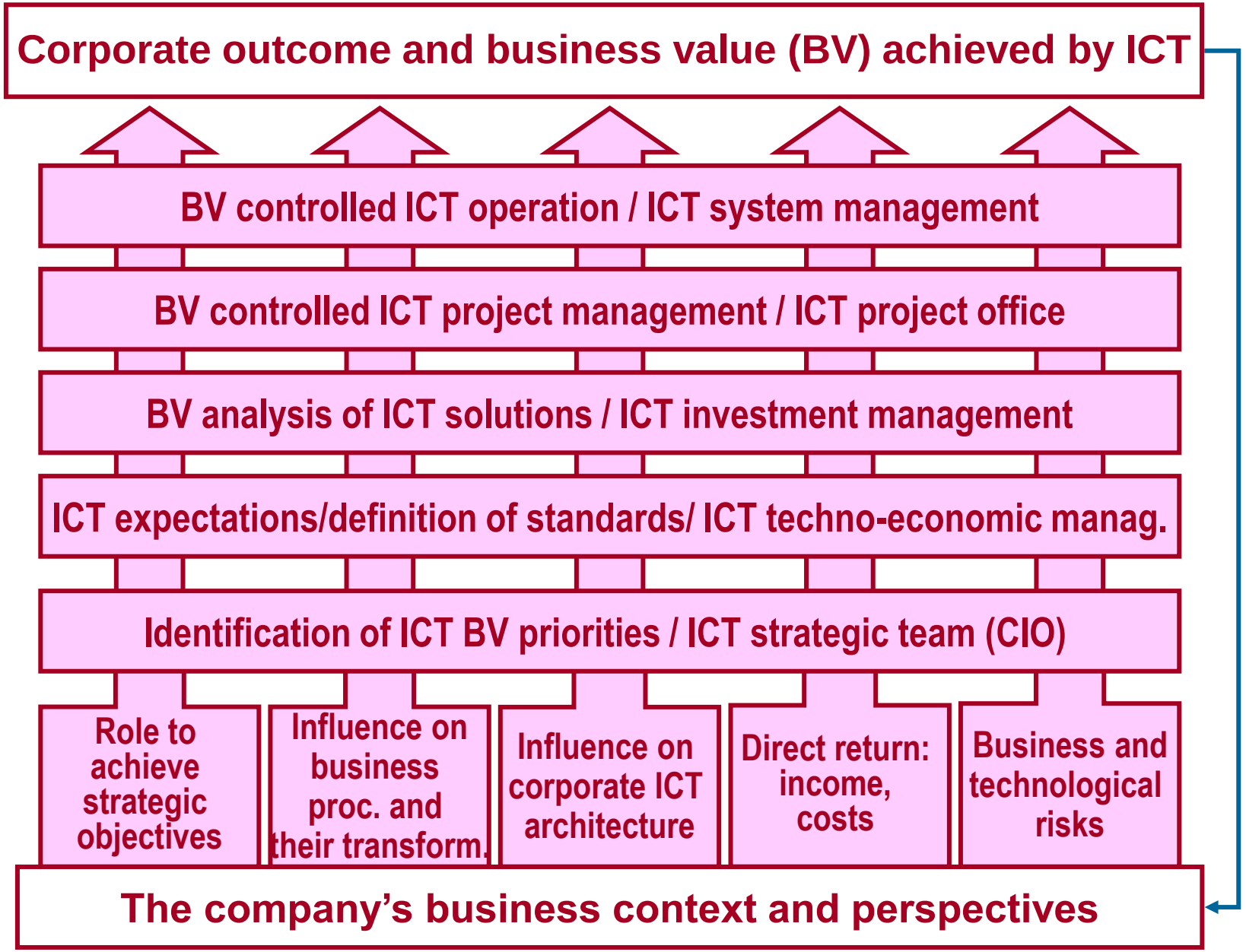
Source: [EITO]

BUSINESS VALUE GENERATION FROM ICT

Objective: optimization of ICT development and investment to business to realize the available advantages, the wide range assessment and the appreciation of the company.

The five-pillar Gartner/Murphy BVICT model (Business Value from ICT):




Corporate outcome and business value (BV) achieved by ICT
BV controlled ICT operation / ICT system management
BV controlled ICT project management / ICT project office
BV analysis of ICT solutions / ICT investment management
ICT expectations/definition of standards/ ICT techno-economic manag.
Identification of ICT BV priorities / ICT strategic team (CIO)
Role to achieve strategic objectives
Influence on business proc. and their transform.
Influence on corporate ICT architecture
Direct return: income, costs
Business and technological risks
The company's business context and perspectives

Thank you for your attention!

See you next Wednesday!