The Delphi methodology and other impact assessment methodologies:

Opportunities and challenges for standardisation and regulation bodies in the telecommunication sector

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Adjusting Forecasting Methods to the Needs of the Telecommunication Sector

ITU 25th of October 2004

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Outline of the talk

- Introduction
- Standardisation and regulatory bodies in a dynamic framework
- Demand for new standards
  - Foresight and Delphi methodology in general
  - First results of ITU Delphi survey
- Impacts of standards
  - Overview of methodologies
  - Results of a European survey on regulation and innovation
  - First results of ITU Delphi survey
- Future steps

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Standardisation and regulatory bodies in a dynamic framework

Part Two

• Impacts of standards and regulations on

New trends in technology, markets and society

Part One

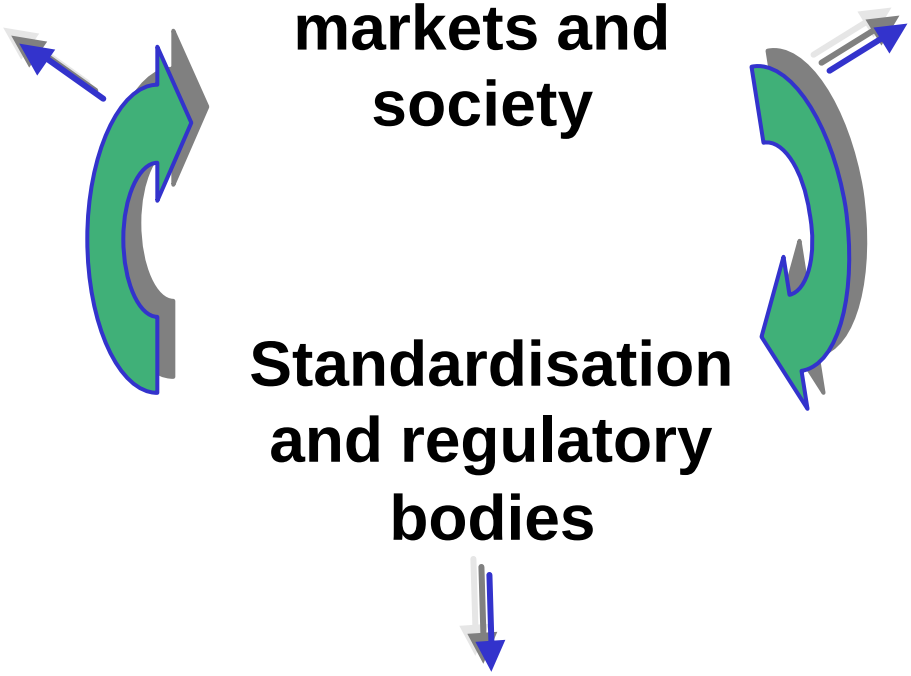
• Challenges for existing standards and regulations

• Demand for new standards and regulations

Standardisation and regulatory bodies

• Adjustment of existing standards and regulations

• Publication of new standards and regulations



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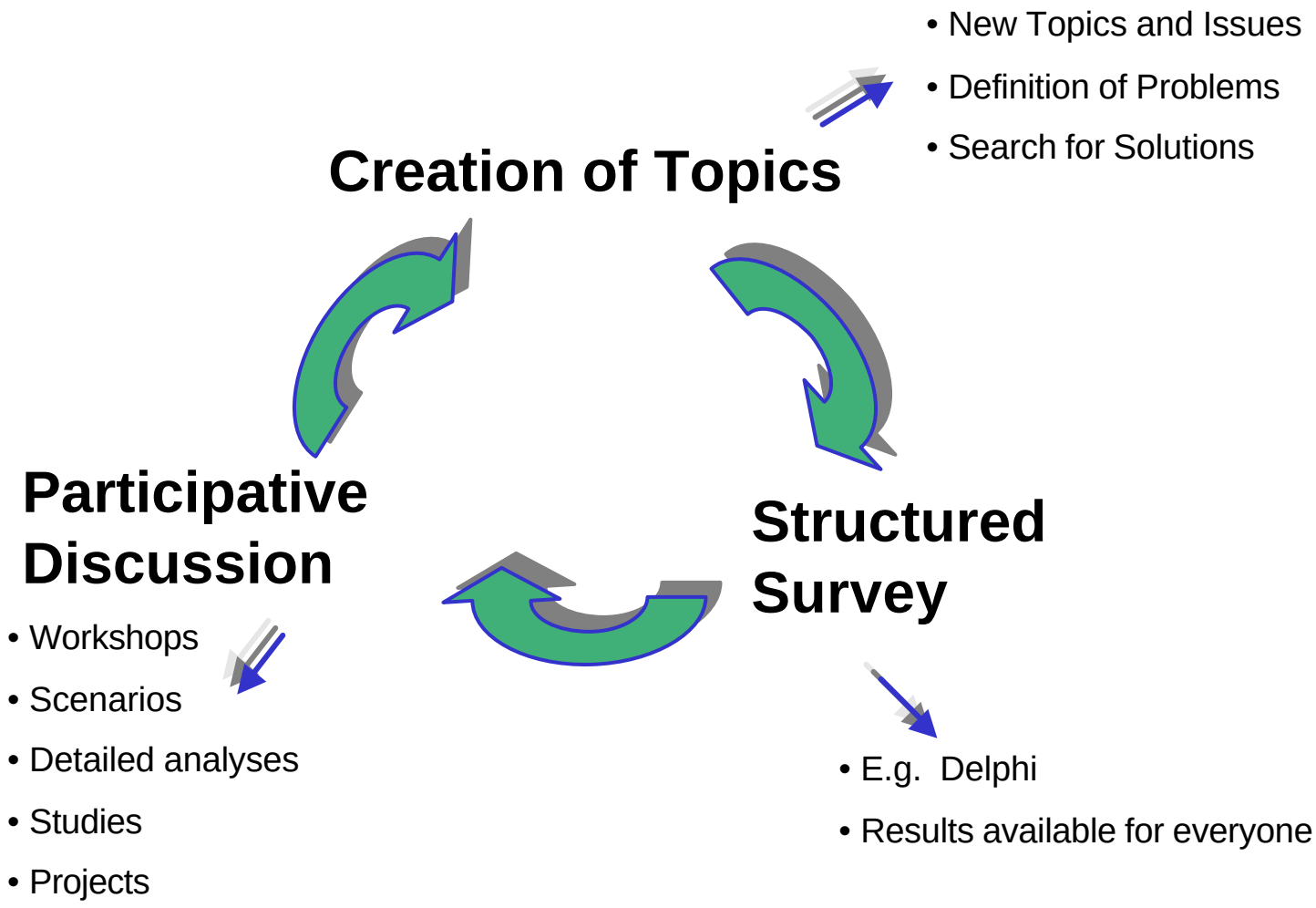
Model of a Foresight Process



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What is Delphi?

- Delphi is an expert survey in two or more "rounds".
- Starting from the second round, a feedback is given (about the results of previous rounds).
- The same experts assess the same matters once more - influenced by the opinions of the other experts.

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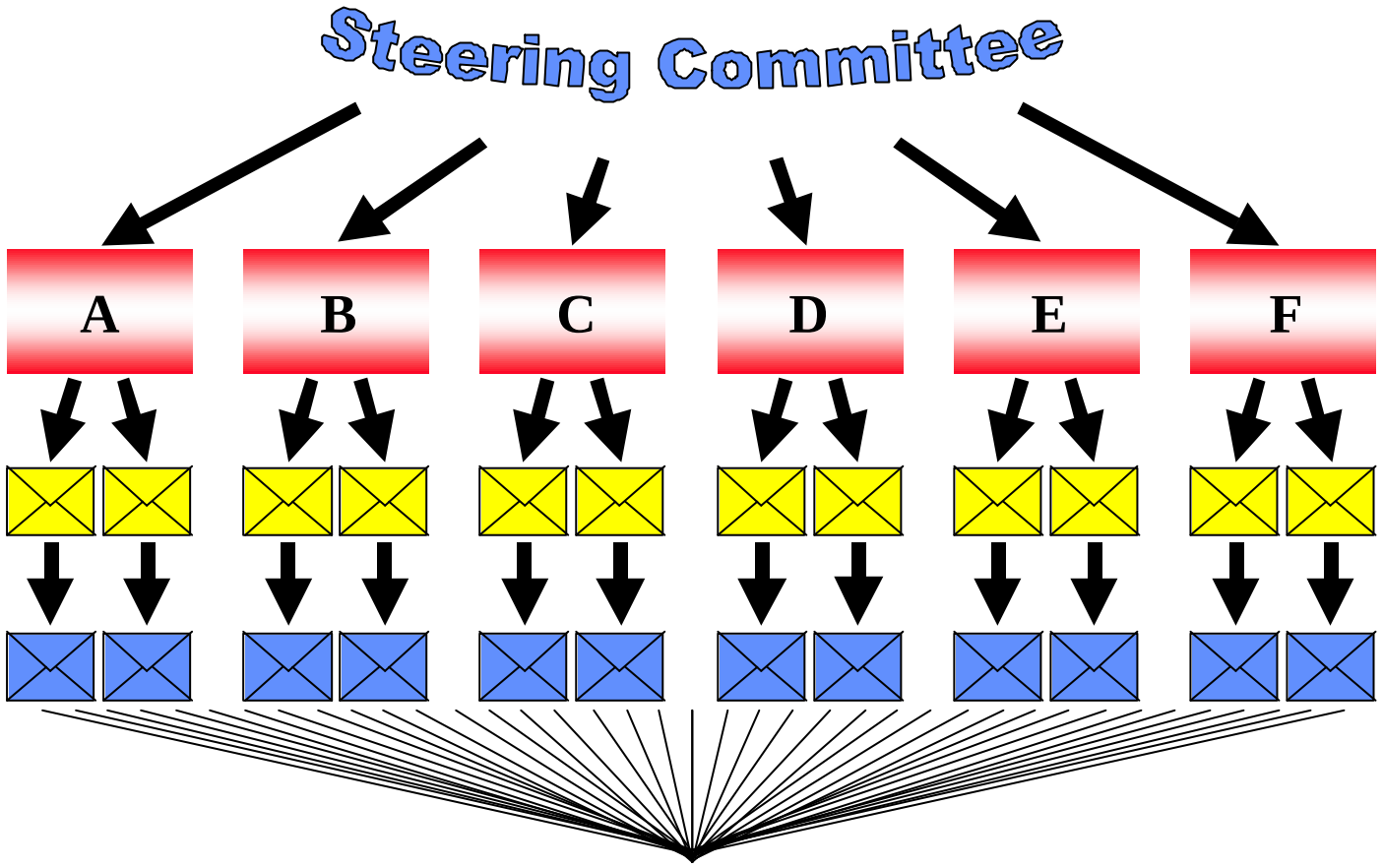
Organisation of Delphi '98 in Germany



Expert Panel,
100 Persons

12 Questionnaires/
7000 Adressees

1. Round
2400 Persons

2. Round
1900 Persons

Results, Analysis, Discussion...

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Fields Delphi ’98

- Information & Communication
- Service & Consumption
- Management & Production
- Chemistry & Materials
- Health & Life Processes
- Agriculture & Nutrition
- Environment & Nature
- Energy & Resources
- Construction & Dwelling
- Mobility & Transport
- Space
- Big Science Experiments

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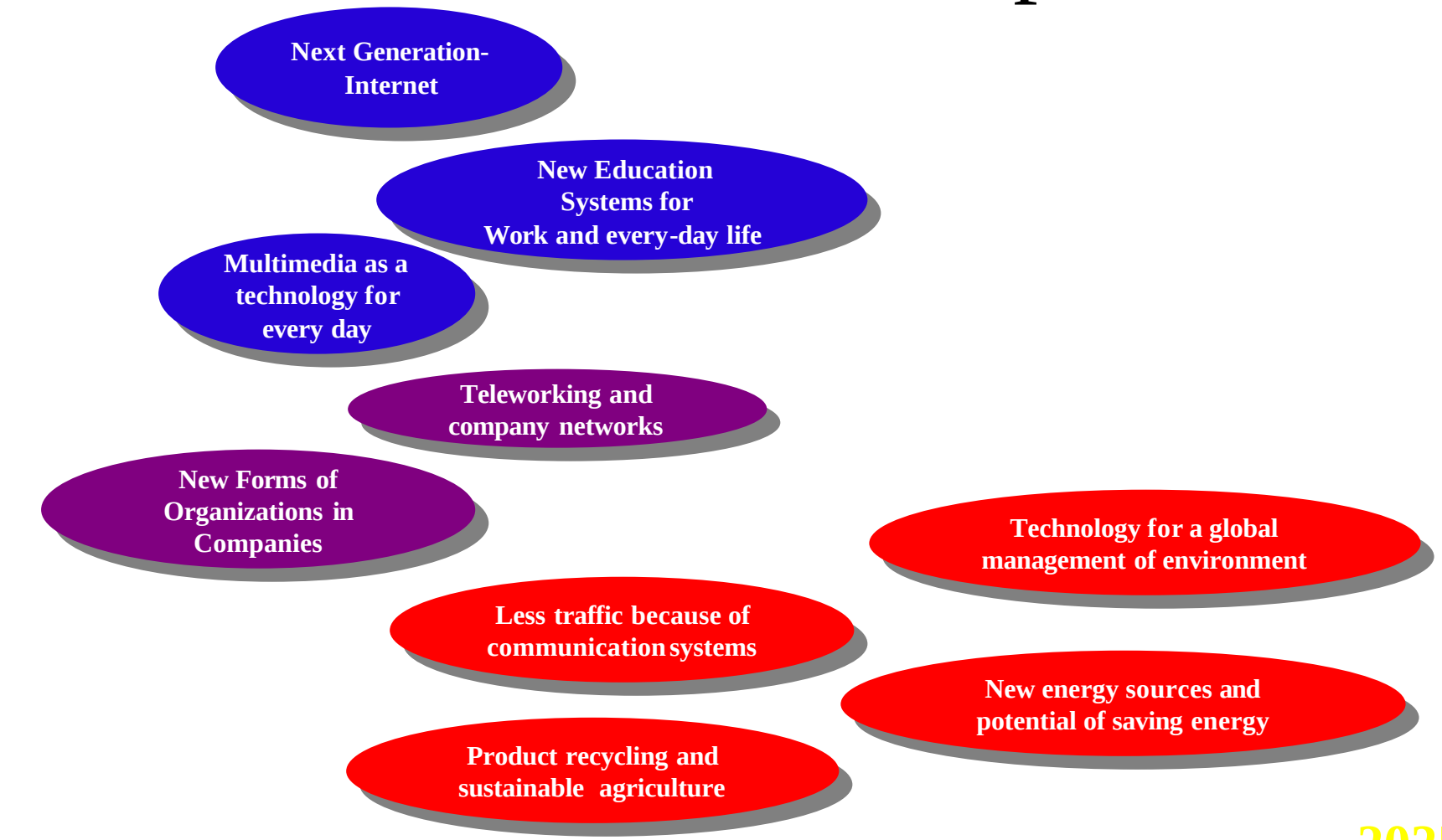
Main results of Delphi ’98



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First results of ITU-Survey

- Selection of 23 important topics from the 7th Japanese Technology Foresight (July 2001)
- 13 respondents in the first round
- categories: expected realisation time, importance (1-5), effectiveness of policy measures (1-5)

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Most important topics

Topics	Time	Importance
Widespread use of highly reliable network systems capable of protecting the privacy and secrecy of individuals and groups from the intrusion of ill-intentioned network intruders.	2011.7	4.82
Development of technology capable of automatically detecting viruses and automatically producing corresponding vaccines.	2010.4	4.55
Development of an optical transmission system capable of high-volume transmission of 1 Peta bps per optical fiber.	2010.8	4.00
A service that evaluates the security of the e-commerce system of individual companies and report the results is used by 80% of consumers who use e-commerce services.	2010.6	4.00
The number of recycled parts in new personal computers, including displays, exceeds 90% of all component parts.	2010.1	4.00

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ITU-Survey vs. Japanese Delphi

Topic	ITU	Japan	Difference
Widespread use at the consumer purchase stage of a cost-plus pricing system in which, unlike current practices, product prices are set based separately on maker price (ex-factory price, producer price) and intermediate distribution service price following	2020.90	2013.00	7.90
Production on order rather than production on estimated demand becomes the norm due to the increased sophistication of e-commerce networks and improved efficiency of business cycle times, resulting in a dramatic reduction of inventory risk for companies.	2013.20	2010.40	2.80
Realization of an environment in which the unlimited utilization of high-capacity networks (150 Mbps) for around 15€/month or less is possible.	2012.20	2009.50	2.70
Practical use of optical communication systems capable of transmitting signals through multiplexed 1,000 channels at 100 Gbps over a single optical fiber.	2013.80	2016.80	-3.00
Development of technology capable of automatically detecting viruses and automatically producing corresponding vaccines.	2010.40	2013.60	-3.20

On average, time of realisation differs only by 0.13 years in relation to the Japanese results!!!

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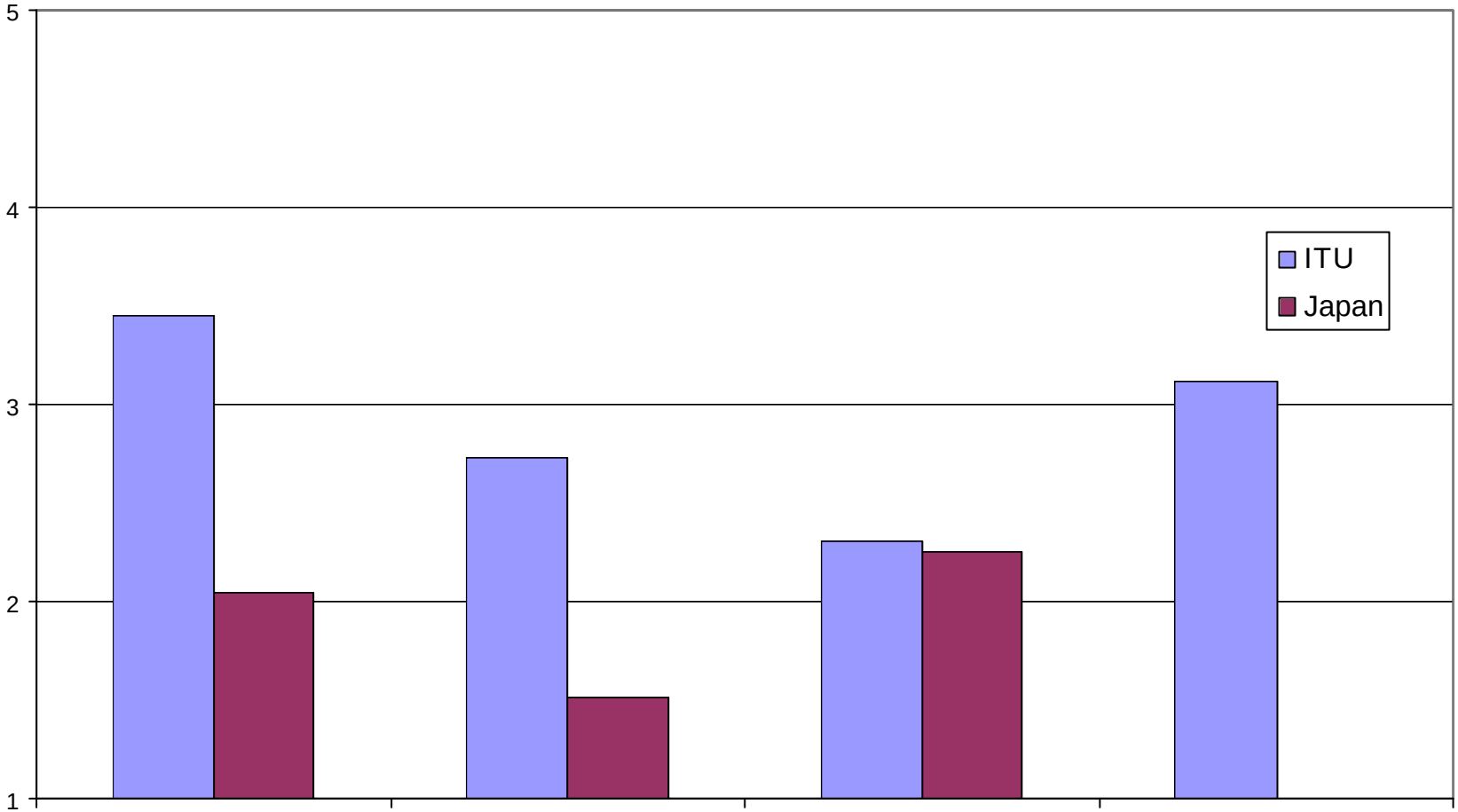
Effectiveness of policy measures



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Highest demand for standardisation

Topics	Effectiveness of standardisation
Widespread use of highly reliable network systems capable of protecting the privacy and secrecy of individuals and groups from the intrusion of ill-intentioned network intruders.	4.73
Widespread use of systems which facilitate multimedia communication from anywhere in the world using pocketbook-size portable terminals.	3.90
Realization of an environment in which the unlimited utilization of high-capacity networks (150 Mbps) for around 15€/month or less is possible.	3.64
Development of an optical transmission system capable of high-volume transmission of 1 Peta bps per optical fiber.	3.50

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Standardisation and regulatory bodies in a dynamic framework

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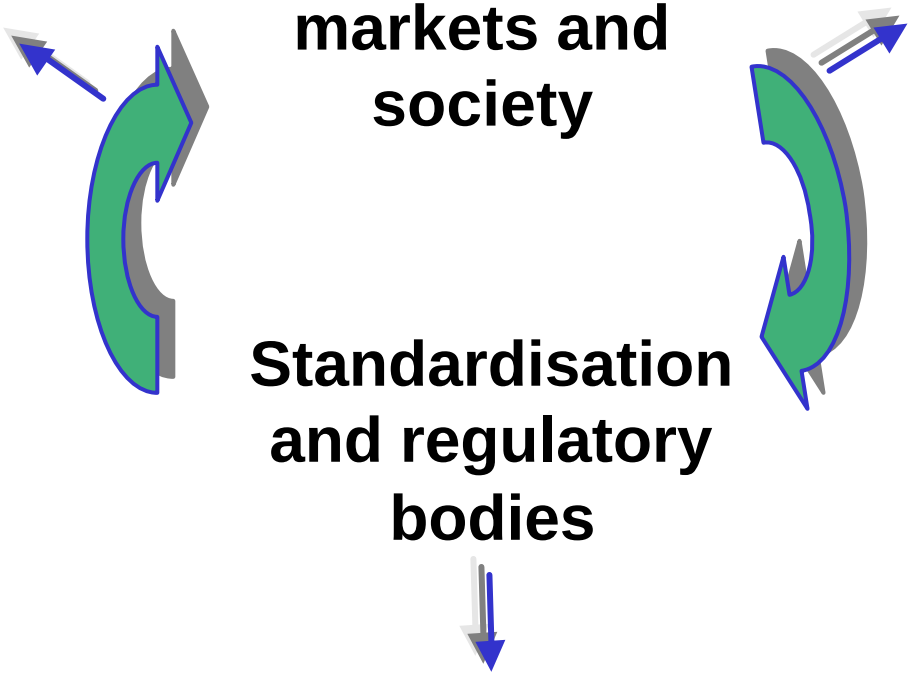

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Overview Impact Assessment Methods

	Innovation Surveys	Econometric Models	Control Group Approaches	Cost Benefit Analysis	Expert Panels/ Peer Review	Field / Case Studies	Network Analysis	Foresight/ Technology Assessment	Benchmarking
Financing R&D	●●●	●●●	●●●	●		●●●		●	●
Provision of R&D infrastructure		●●		●●●	●●●	●●●	●●●	●●	●●●
Technology transfer and innovation diffusion	●●●	●●●	●●●	●●	●	●●	●●●	●●●	●●●
Legal frameworks (IPRs, standards and regulation)	●	●	●	●●●		●●●		●●	●●●
Integrated projects			●	●●●	●●●	●●●	●●●	●●	●●
Networks of excellence					●●●	●●	●●●	●●	●●

Methodology: ●●● *relevant* ●● *somewhat relevant* ● *low relevance*

Source: Fahrenkrog et al.(2002): Evaluation Matrix: Matching policy instruments and methodologies

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Overview of Impact Assessment Methods

- Surveys
- Econometric models
- Control group approaches
- Cost benefit analysis
- Expert panels
- Case studies
- Network Analysis
- Foresight studies
- Benchmarking

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European survey on regulation and innovation

- Project on behalf of DG Enterprise Innovation Policy Unit of the European Commission
- Results of a European survey (31 telecommunication and transport companies out of more than 260 companies)
- Survey period: 2003
- Report available under:
  - http://www.cordis.lu/innovation-policy/studies/gen_study11.htm

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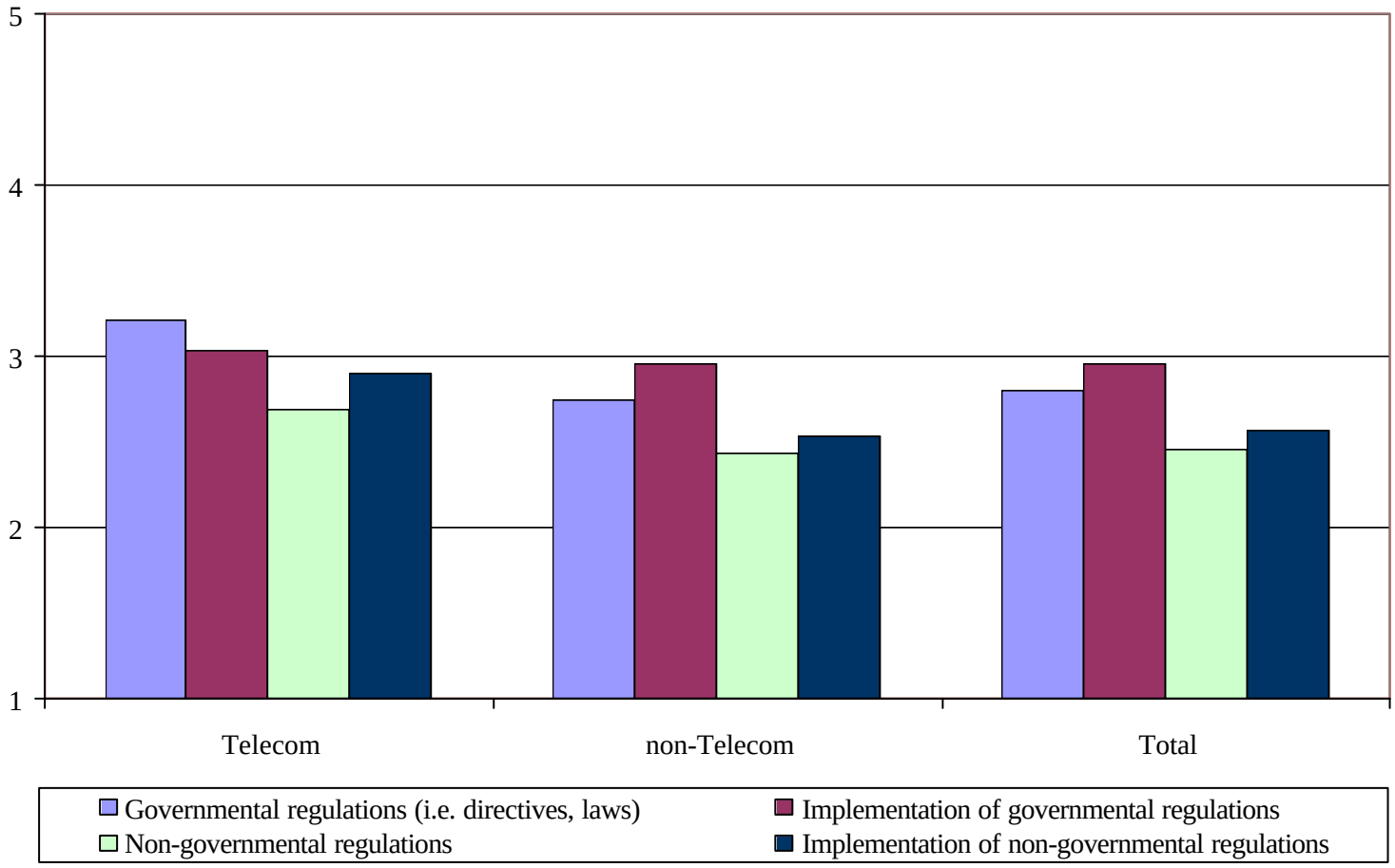
Factors hampering innovation



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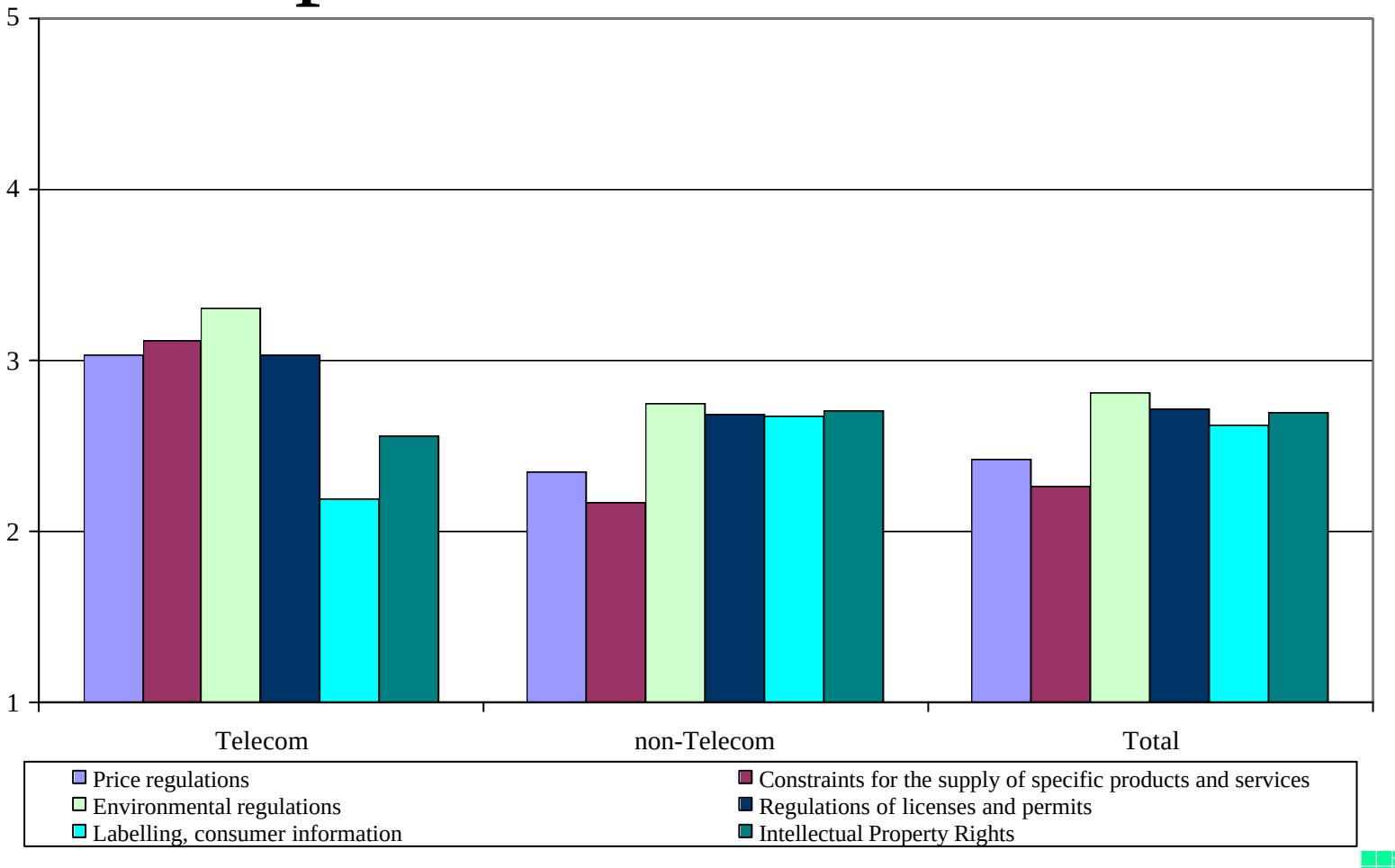
Importance of regulations for new products and services



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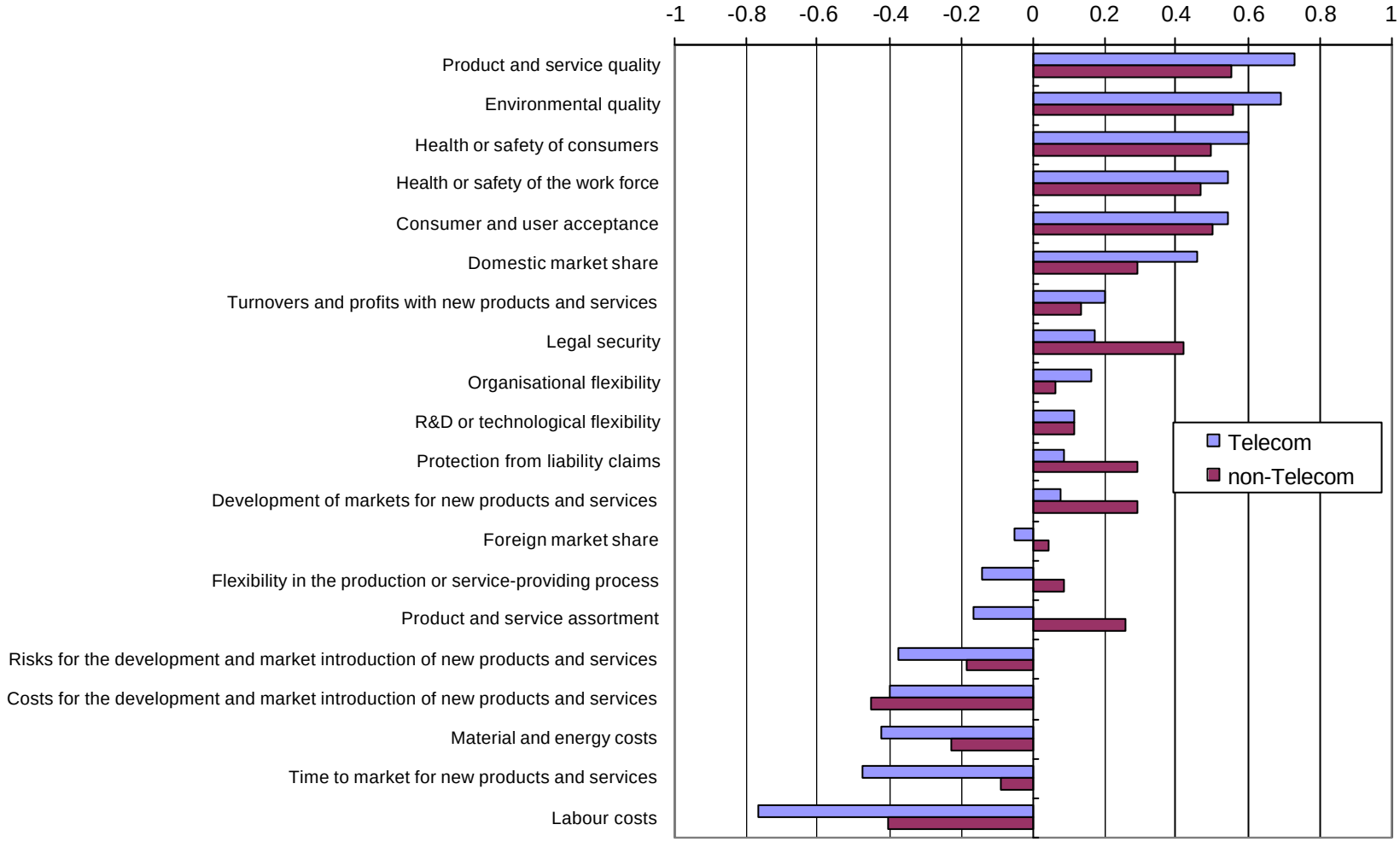
Impact of regulations on new products and services



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General assessment of the regulatory framework

- Approval times are too long and too costly
- SMEs have disadvantages
- Regulations are not transparent enough, and their implementation is not flexible enough
- Public support (e.g. help-desks) is not sufficient regarding the fulfilment of regulation
- **but:** the regulatory framework is essential for the economic development of the sector

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Future expectations regarding the regulatory framework

- Participation during the development of regulations should be extended to more relevant stakeholders, but acceleration of the process
- Information flow between regulatory bodies and the regulated stakeholders should be improved
- Use of plain language in regulations
- Regulations should be shaped according to the risk-cost approach instead of the zero-risk approach

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Assessment of surveys as impact assessment method

- Surveys:
  - quantitative and qualitative impacts
  - ex post and ex ante
  - micro data
  + kind, size and distribution of impacts
  + generalisation of results
  - time consuming
  - difficulties to answer esp. counterfactual questions

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Impact Dimension of Standards

- Investment in R&D
- Innovation
- Market access
- Time to market (industry cycle times by anticipatory standards)
- Success and diffusion of new technology (e.g. by building critical masses)
- Productivity (e.g. economies of scale)
- Product quality (incl. risk and safety aspects)
- Product and system reliability
- Interoperability
- Transaction costs (information costs, performance verification)

Source: based on Tassey 2003

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ITU survey on impacts of standards

- selection of 20 recently published ITU standards
- assessment of importance (1-5) and impact (-3 to +3) on diffusion, productivity, quality, competition and innovation

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Most important ITU standards

Standard	Importance
Internet protocol data communication service (IP packet transfer and availability performance parameters)	4.20
Optical Transport Network (OTN)	4.18
Packet-based multimedia communications systems	4.00
Network performance objectives for IP-based services	4.00
Requirements for each telecommunication network equipment (EMC, resistibility and safety, immunity)	4.00

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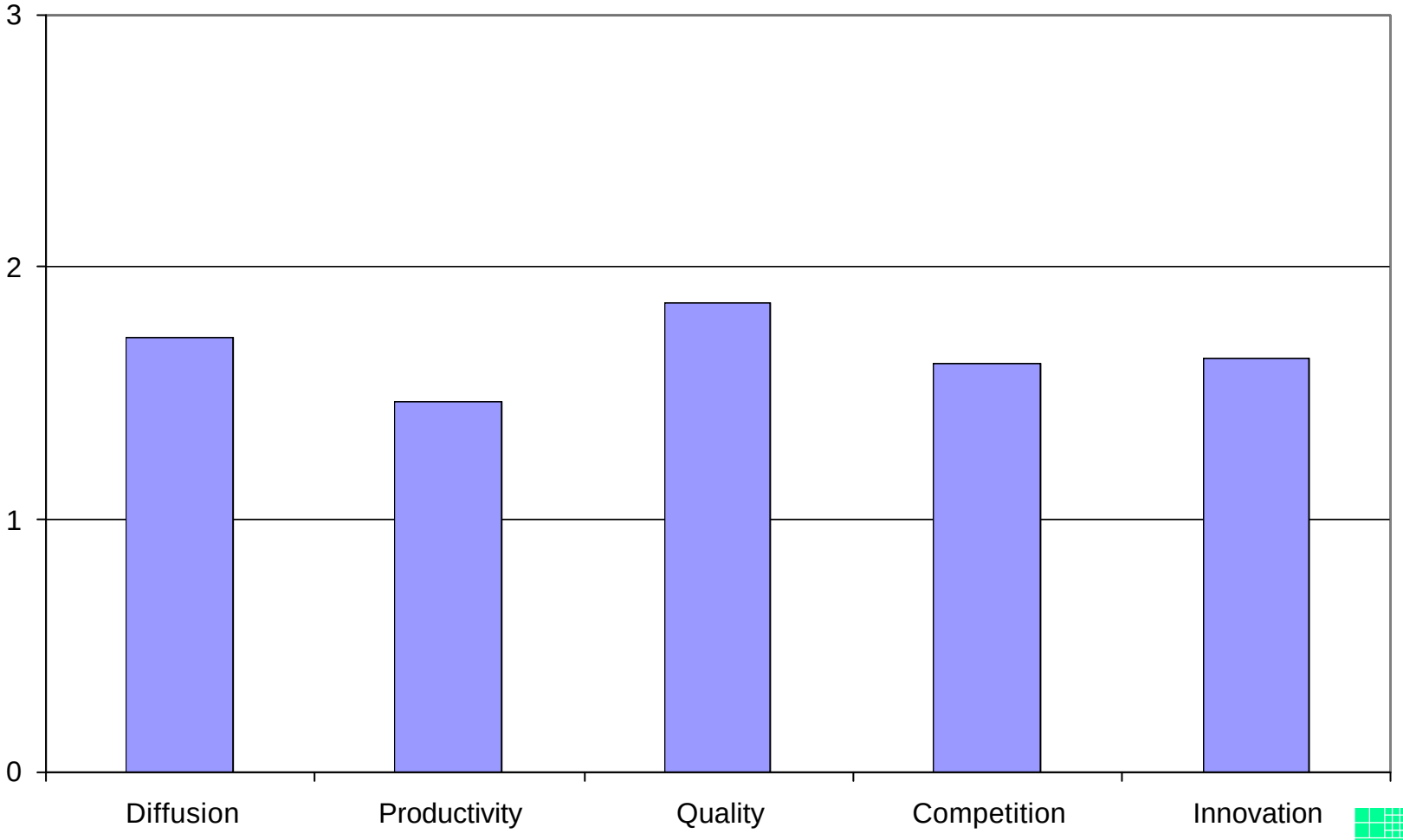
General impacts of ITU standards



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Standards with highest impacts

- Internet protocol data communication service (IP packet transfer and availability performance parameters) (diffusion and productivity)
- Characteristics of fibre and cable (quality)
- Harmonization of procedural content formats for interactive TV applications (competition)
- Optical Transport Network (OTN) (innovation)

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Overview and Assessment of Impact Assessment Methodologies

- Foresight studies:
  - qualitative and semi-quantitative impacts
  - ex ante
  - qualitative and semi-quantitative data e.g. from Delphi surveys
  + consensus building process regarding impacts
  + articulation and road mapping of new technologies
  - impossibility to take into account major technological breakthroughs
  - uncertainty increases with complexity and future time horizon

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Methodological Recommendation

- Depending on
  - technology
  - market
  - impact dimension to be analysed
  - ex ante or ex post analyses

➢ application of different methods or even combinations of approaches

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Future Steps

- Further development and implementation of demand and impact assessments
- Dynamics of standards and consortia activities
- Expansion of IPRs (esp. patents)
- Service standards or standards for the service sector
- Role of standards in the regulatory framework (e.g. New Approach, self-regulation)
- Ongoing Activities
  - NO-REST: Networking Organisation: Research into standards and standardisation within FP 6 IST programme (www.no-rest.org)
  - NO-REST Workshop Brussels 25th November 2004
  - NO-REST Impact of standards survey together with ETSI
  - INTEREST: new EU project on integrating research and standardisation starting in November 2004
- **Last request: please fill out and return the questionnaire of the second round of the ITU survey**

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