

Sharing Best Practices on Reporting R&D Statistics

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Measuring R&D Expenditure in Knowledge Intensive Services (KIS)

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The KIS and R&D

The relationship between R&D and the, so called, **Knowledge Intensive Services** has to be qualified:

1. The first question is whether by KIS we intend some industries with a high R&D intensity; or the services produced in such industries; or, as in the case of ICTs, the technological fields associated with these industries.
2. In all cases, they are – by definition - strongly influenced by the R&D activities which are essential to produce knowledge.
3. Statistics should be provided on the “intensity”, as well as on the nature, of such “knowledge”.

KIS as “industries”

- With reference to some broad guidelines given in the Annex 7 of the FM to identify “high-tech sectors and products”, the OECD and Eurostat have developed a specific sectoral classification aimed at identifying some “knowledge intensive service sectors.

Six groups of industries have been identified:

1. Knowledge-intensive high-technology services
2. Knowledge-intensive market services
3. Knowledge-intensive financial services
4. Other knowledge-intensive services
5. Less-knowledge-intensive market services
6. Other less-knowledge-intensive services

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The classification of KIS

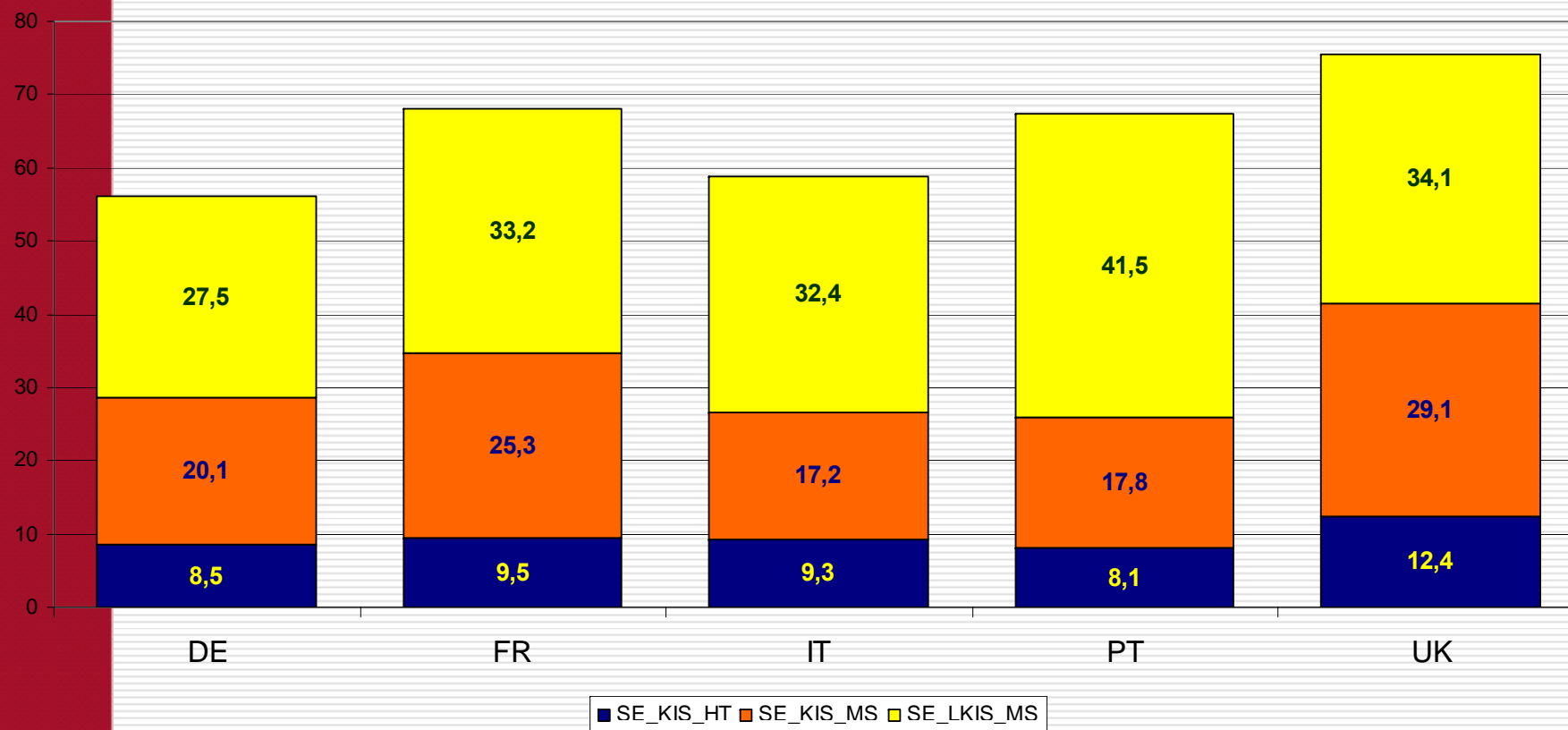
Sectors		NACE Rev. 1.1 codes
S e r v i c e s	K I S	Knowledge-intensive high-technology services
		64 Post and telecommunications; 72 Computer and related activities; 73 Research and development.
		Knowledge-intensive market services (excluding financial intermediation and high-tech services)
		61 Water transport; 62 Air transport; 70 Real estate activities; 71 Renting of machinery and equipment without operator and of personal and household goods; 74 Other business activities.
	Knowledge-intensive financial services	65 to 67 Financial intermediation.
	Other knowledge-intensive services	80 Education; 85 Health and social work; 92 Recreational, cultural and sporting activities
L K I S	Less-knowledge-intensive market services	50 to 52 Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods; 55 Hotels and restaurants; 60 Land transport; transport via pipelines; 63 Supporting and auxiliary transport activities; activities of travel agencies.
	Other less-knowledge-intensive services	75 Public administration and defence; compulsory social security; 90 Sewage and refuse disposal, sanitation and similar activities; 91 Activities of membership organization n.e.c.; 93 Other service activities; 95 to 97 Activities of households; 99 Extra-territorial organizations and bodies

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The economic relevance of KIS

Share of the total value added of the business sector produced by selected groups of service sectors in some EU countries

(Percentages, Year 2005, Source: Eurostat)

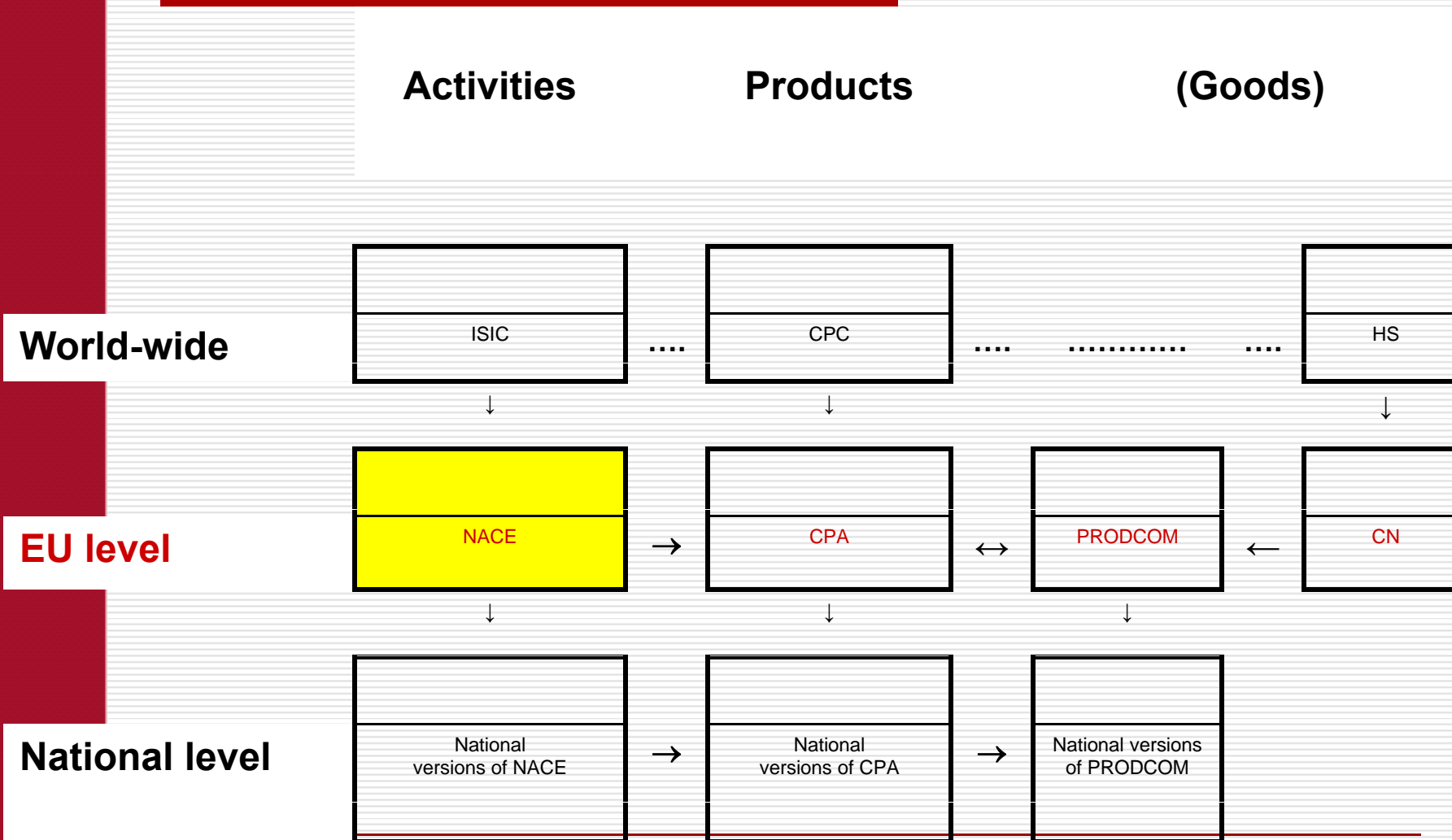


KIS as “services”

- When considering the “R&D contents” of a category of “services”, what can be measured is the investment in R&D which is – on average - needed to develop a new service.
- Some services have a higher contents of R&D than others and are usually (but not necessarily) produced in those industries with a higher R&D intensity.
- Examples include information and communication services, transportation services and their support activities, business services and on their own, financial and insurance services.
- The R&D contents of these services can be only measured by considering the R&D investments in the industry(ies) producing/delivering them.

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The system of economic classifications



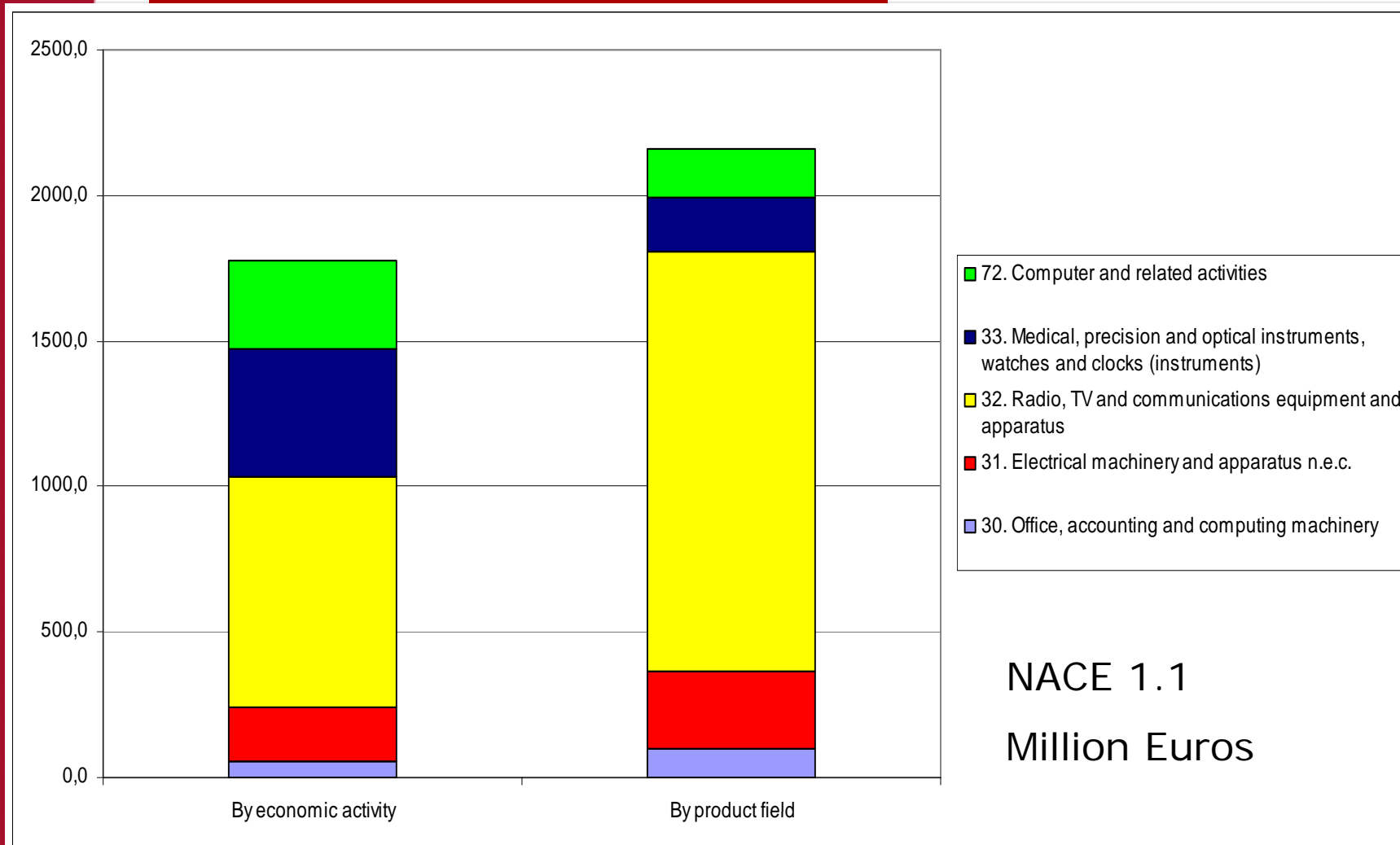
The “product field” approach in FM 2002

271. The “use of product” approach is intended to provide R&D data as comparable as possible with other economic statistics at the establishment level, notably value added. It is therefore particularly useful when dealing with enterprises active in more than one industry.

272.

It is recommended that current intramural R&D expenditure in the business enterprise sector should be distributed by product field for all industry groups. However, if this is not possible for all industry groups, it is at least recommended for ISIC Division 73. It is recommended that the product field distribution should be based on the use of product approach (industry served for ISIC Division 73). The classification outlined in Table 3.1 should be used.

Italian BERD 2006 by selected industries



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Another approach: KISA

In the innovation domain some “knowledge (or even R&D) intensive activities have been identified to have a strong impact on enterprises’ efficiency and productivity.
OECD (2006) “Innovation and Knowledge-Intensive Service Activities”

Renewal services	Directly related to innovation, for instance R&D and strategic management consulting
Routine services	Contribute to improvement of maintenance and management of various subsystems within organisations, e.g. accounting
Compliance services	Help organisations to work within the legal framework and various other regulatory regimes, e.g. auditing and some legal services
Network services	Facilitate communication, knowledge exchange and flexible resource allocation, e.g. informal personal networks and production related networks

KIS as “technologies”

- The availability of new “high-tech” services is closely related to the increasing use of ICTs to produce/deliver them.
- All technologies related to data processing, as well as communication and mobility have an impact (not homogeneous) on the efficiency of most service activities.
- R&D investments in KIS-related technologies should be identified.
- A classification of KIS-related technologies does not exist yet. The Frascati-related FOS classification, (2006) is still science-oriented.

FOS classification 2006

	FOS in FM 2002	Proposed FOS
1. Natural Sciences	1.1 Mathematics and computer sciences 1.2 Physical sciences 1.3 Chemical sciences 1.4 Earth and related environmental sciences 1.5 Biological sciences	1.1 Mathematics 1.2 Computer and information sciences 1.3 Physical sciences 1.4 Chemical sciences 1.5 Earth and related environmental sciences 1.6 Biological sciences 1.7 Other natural sciences
2. Engineering and Technology	2.1 Civil engineering 2.2 Electrical engineering, electronics 2.3 Other engineering sciences	2.1 Civil engineering 2.2 Electrical engineering, electronic engineering, information engineering 2.3 Mechanical engineering 2.4 Chemical engineering 2.5 Materials engineering 2.6 Medical engineering 2.7 Environmental engineering 2.8 Environmental biotechnology 2.9 Industrial Biotechnology 2.10 Nano-technology 2.11 Other engineering and technologies
3. Medical and Health Sciences	3.1 Basic medicine 3.2 Clinical medicine 3.3 Health sciences	3.1 Basic medicine 3.2 Clinical medicine 3.3 Health sciences 3.4 Health biotechnology 3.5 Other medical sciences
4. Agricultural Sciences	4.1 Agriculture, forestry, fisheries and allied sciences 4.2 Veterinary medicine	4.1 Agriculture, forestry, and fisheries 4.2 Animal and dairy science 4.3 Veterinary science 4.4 Agricultural biotechnology 4.5 Other agricultural sciences
5. Social Sciences	5.1 Psychology 5.2 Economics 5.3 Educational sciences 5.4 Other social sciences	5.1 Psychology 5.2 Economics and business 5.3 Educational sciences 5.3 Sociology 5.5 Law 5.6 Political Science 5.7 Social and economic geography 5.8 Media and communications 5.7 Other social sciences
6. Humanities	6.1 History 6.2 Languages and literature 6.3 Other humanities	6.1 History and archaeology 6.2 Languages and literature 6.3 Philosophy, ethics and religion 6.4 Art (arts, history of arts, performing arts, music) 6.5 Other humanities

1.2 Computer and information sciences

Computer sciences, information science and bioinformatics

2.1 Civil engineering

Civil engineering; Architecture engineering; Construction engineering, Municipal and structural engineering; Transport engineering;

3.3 Health sciences

Health care sciences and services (including hospital administration, health care financing); Health policy and services;

5.2 Economics and Business

Business and Management;

5.3 Educational sciences

Education, general; including training, pedagogy, didactics;
Education, special (to gifted persons, those with learning disabilities);

5.7 Social and economic geography

Environmental sciences (social aspects); Cultural and economic geography;
Urban studies (Planning and development); Transport planning and social aspects of transport

5.8 Media and communications

Journalism; Information science (social aspects); library science; media and socio-cultural communication;

Concluding remarks

- The identification of KIS-related R&D should be based on information about the role played by industries which are “R&D providers” and industries which are “R&D users”.
 - A classification of “KI or High-Tech services” would make possible to produce fresh evidence on service-related R&D and its economic impact.
 - A classification of “technological fields” should integrate the FOS approach in order to measure the R&D investments on the technologies which have a stronger impact on service innovation.
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