WEBINAR SERIES on STATISTICAL EXPERIENCE SHARING

INNOVATION STATISTICS

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TurkStat Expert

21.01.2021

- *Why is so important to measure innovation statistics?*
- *What is innovation and how to measure it?*
- *Basic concepts, definitions and perspectives*
- *Questionnaire and background of the field studies*
- *Methodological base and survey process*
- *Recommendations and key aspects*
- *Web based application*
- *Dissemination*
- *Questions and remarks?*

Why is so important to measure innovation statistics?

Think different.

NISSAN
Innovation that excites

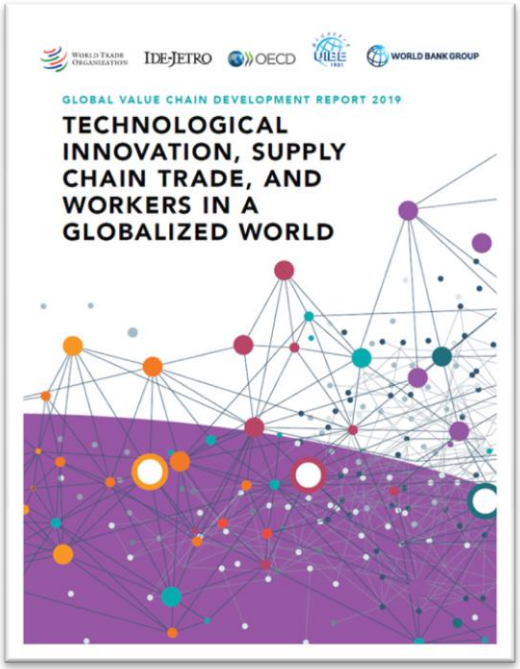
HITACHI
Inspire the Next

Microsoft
Be what's next.

TOSHIBA
Leading Innovation

BOSCH
Invented for life

hp
invent


WORLD TRADE ORGANIZATION
IDE-JETRO
OECD
WORLD BANK GROUP
GLOBAL VALUE CHAIN DEVELOPMENT REPORT 2019
TECHNOLOGICAL INNOVATION, SUPPLY CHAIN TRADE, AND WORKERS IN A GLOBALIZED WORLD


European
Innovation
Scoreboard
2020


G20 INNOVATION REPORT 2016
Report prepared for the G20 Science, Technology and Innovation Ministers Meeting
BEIJING, CHINA,
4 NOVEMBER 2016
OECD


THE WORLD'S MOST
INNOVATIVE
COMPANIES
F


GLOBAL LEADERS IN INNOVATION 2019
Every year, the Global Innovation Index ranks the innovation performance of nearly 130 economies around the world.
THE TOP 5 GLOBAL INNOVATION LEADERS
THE TOP 5 INNOVATION ECONOMIES BY REGION
THE TOP 5 INNOVATION ECONOMIES BY INCOME GROUP
WIPO.INT/GII
#GII2019
WIPO


UNCTAD
TECHNOLOGY AND INNOVATION REPORT 2018
OVERVIEW

The fundamental outcomes of innovation

- ✓ Economic growth
- ✓ Future of jobs
- ✓ Increased well-being
- ✓ Reduced sickness, poverty and hunger
- ✓ Communication and educational accessibility
- ✓ Environmental sustainability
- ✓ Competitive advantage
- ✓ Performance and profitability
- ✓ Increased productivity
- ✓ Positive impact on company culture

What is innovation and how to measure it?

What is the innovation?

- Innovatus

  "do something in a new way"

- to improve or to replace a process, a product, or a service in the dictionary

- Innovation = Invention? / New idea?

- How has the term developed in the past years?

"This really is an innovative approach, but I'm afraid we can't consider it. It's never been done before."

Development of the concept

- Schumpeter, J. (1934), "The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest and the Business Cycle" – ***creative destruction***
- Rogers, E. (1962), "Diffusion of Innovations" - ***communicated and adopted over time***
- Nelson, R. and S. Winter (1982), "An Evolutionary Theory of Economic Change" ***- path dependent process***
- Dosi, G. (1982), "Technological paradigms and technological trajectories: A suggested interpretation of the determinants and directions of technical change" – ***interactions between various actors and then tested on the market***

Development of the concept

- Simon, H. (1969), "The Sciences of the Artificial"
- Simon, H. (1982), "Models of Bounded Rationality: Behavioral Economics and Business Organization" ***- decision-making and problem-solving***

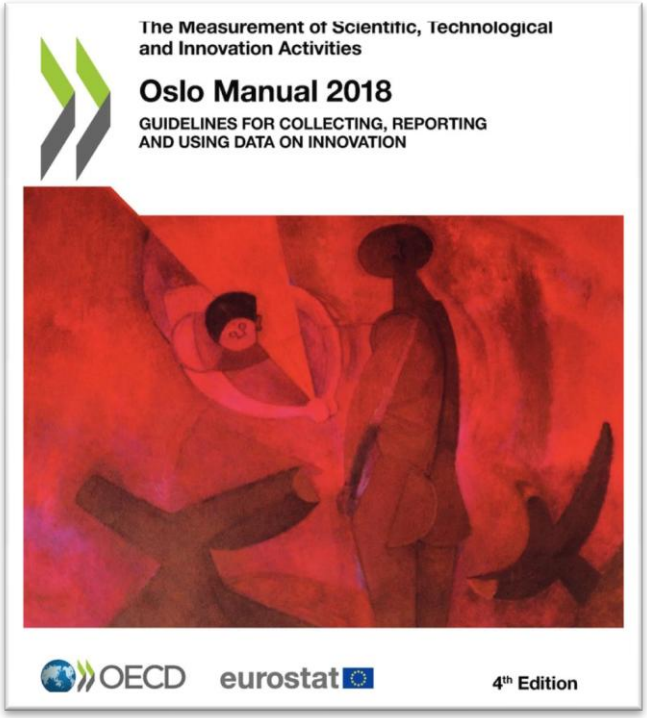
Innovation systems

- Kline, S. and N. Rosenberg (1986), "An overview of innovation"
- Freeman, C. (1987), "Technology Policy and Economic Performance: Lessons from Japan"
- Lundvall, B.-Å. (ed.) (1992), "National Innovation Systems"
- OECD (1997), "National Innovation Systems"

many interactions and feedbacks in knowledge creation and use / based on a learning process

How to measure innovation and what is the Oslo Manual?

- collecting and interpreting data,
- international comparability,
- a platform for measuring innovation,
- support NSOs and other producers,
- direct value to users,



How to measure innovation and what is the Oslo Manual?

- a combination of formal statistical standards,
- advice on best practices,
- proposals for extending the measurement into new domains,
- ***international standard for innovation measurement since 1992***

Previous editions of the Oslo Manual

- ***The first edition (1992):***
  - ✓ covered innovation in manufacturing industries,
  - ✓ EC, Australia and Canada surveys based on this edition.
- ***The second edition (1997):***
  - ✓ updated the concepts, definitions and methodology,
  - ✓ included several service industries,
  - ✓ guide for internationally comparable indicators.
- Both the first and second editions limited innovation ***to new or significantly improved "technological" products and processes.***

Previous editions of the Oslo Manual

- ***The third edition (2005):***
  - ✓ built on a large amount of data from innovation surveys worldwide ,
  - ✓ contained experience gained from data users,
  - ✓ became a pathfinder for different levels of economic development.
  - ✓ The identification of product and process innovation with technological change was abandoned

    << ***in order to include service innovations*** >>
  - ✓ two additional and complementary types of innovation: "organisational and marketing".

What are the main novelties of this edition?

- ***"There were major gaps in the evidence and questions about the role of innovation and what policies can do to influence it."***
- ***Compared to the third edition,***
  - *provides a conceptual framework and a general definition of innovation for all sectors,*
  - *provides extended methodological guidelines and describes methods for analyse,*
  - *extends guidance on the linkage of surveys with other sources,*
  - *updates and streamlines core definitions and taxonomies to reduce the complexity of innovation types,*

!!! PLEASE LOOK INTO 'CIS COMPARISON TABLE'!!

What are the main novelties of this edition?

- *The revised definition **"significant"** change by comparing both new and improved innovations to the firm's existing products or business processes.*
- *extensive discussion of the external environment of firms,*
- *emphasises the value of collecting data on all firms and promotes a broader set of data relevant to both non-innovative and innovation-active firms,*
- *provides guidance on measuring internal and external factors influencing business innovation.*
- *presents a glossary of key terms to facilitate translation efforts.*

Basic concepts, definitions and perspectives

Four dimensions of innovation

1. Knowledge
2. Novelty
3. Implementation
4. Value creation

Four dimensions of innovation

Knowledge

- ✓ *knowledge-based activities,*
- ✓ *understanding of information and the ability to use*
- ✓ *cognitive effort and is difficult to transfer*

Novelty

- ✓ *develop new ideas, models, methods or prototypes*
- ✓ *the characteristics of a product or process compared to alternatives*
- ✓ *the previous experiences*

Four dimensions of innovation

Implementation

- ✓ *to be considered an innovation, it needs to be implemented*
- ✓ *systematic efforts,*
- ✓ *not previously made available*

Value creation

- ✓ *innovation requires resources that could be used for other purposes,*
- ✓ *the realisation is uncertain and can only be fully assessed in some time,*
- ✓ *evolve over time and provide different types of benefits,*

The conceptual foundations for innovation measurement

Management perspective:

how innovation can change a firm's position in the market ?

how to generate ideas for innovation?

***Economic perspectives*:**

why organisations innovate?

the forces that drive innovation?

the factors that hinder it?

the macroeconomic effects of innovation on an industry, market or economy?

Definition of innovation activities and innovation

Innovation activities

- ✓ *include all developmental, financial and commercial activities undertaken by a firm,*
- ✓ *are intended to result in an innovation,*
- ✓ *can result in an innovation be ongoing, postponed or abandoned.*

Business innovation

- ✓ *is a **new or improved** product or business process,*
- ✓ ***differs significantly** from the firm's **previous** products or business processes,*
- ✓ *has been **introduced on the market or brought into use***
- ✓ ***The minimum requirement for an innovation is ---> product or business process must have one or more characteristics that are significantly different from those previously offered by or used by the firm.***

Definition of innovation activities and innovation

Some items need to remind for innovation !

- ✓ *The act of introduction is defined as implementation,*
- ✓ *first made available for use,*
- ✓ *firms make further adjustments ----> **additional innovation***
- ✓ *innovation also includes **diffusion,***
- ✓ *The "significant" difference concept in the definition of **excludes** minor changes or enhancements,*
- ✓ ***not require** an innovation to be a **commercial, financial or strategic success,***
- ✓ ***not require** to have a **positive value** for society or a **positive benefit** for the firm,*

Innovation types

Two major types of innovation:

product and business process

✓ *CIS 2016 based on third edition of the Oslo Manual collected data on*

two types of product innovations,

three types of process innovations,

four types of organisational innovations,

four types of marketing innovations.

complex

structure

Product innovation *is a new or improved good or service that differs significantly from the firm's previous goods or services and that has been introduced on the market.*

Main characteristics:

- ✓ *must provide significant improvements*

quality, *convenience,*

technical specifications, *affordability,*

reliability, *usability,*

durability, *economic efficiency during use,*

user friendliness

- ✓ *can include financial attributes such as affordability and financial convenience,*
- ✓ *New designs or improved design features ,*
- ✓ *New designs or improved design features enchancing the user utility,*
- ✓ *be made available to potential users, but not require the innovation to generate sales,*
- ✓ *use new knowledge or technologies, or be based on new uses or combinations of existing knowledge or technologies.*

rumple proof tech
no wrinkles

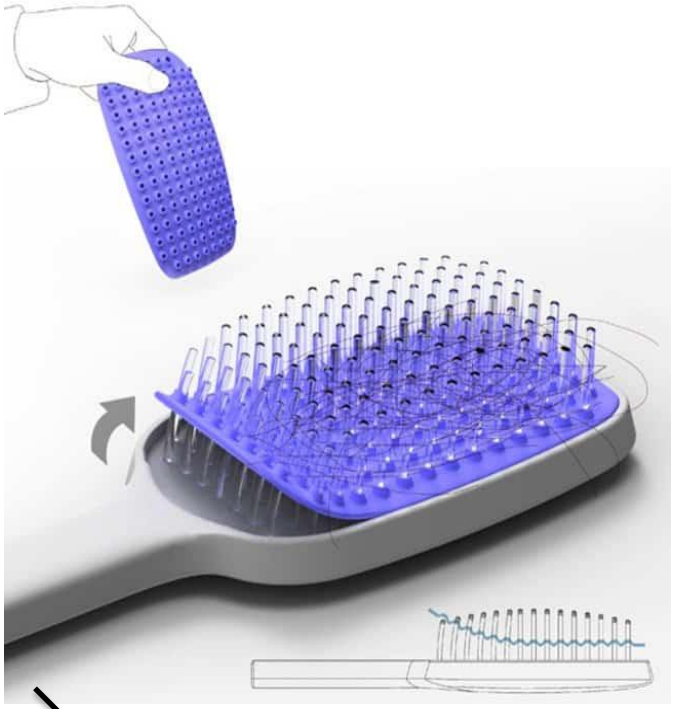
shutters producing electricty

roll up
portability problem

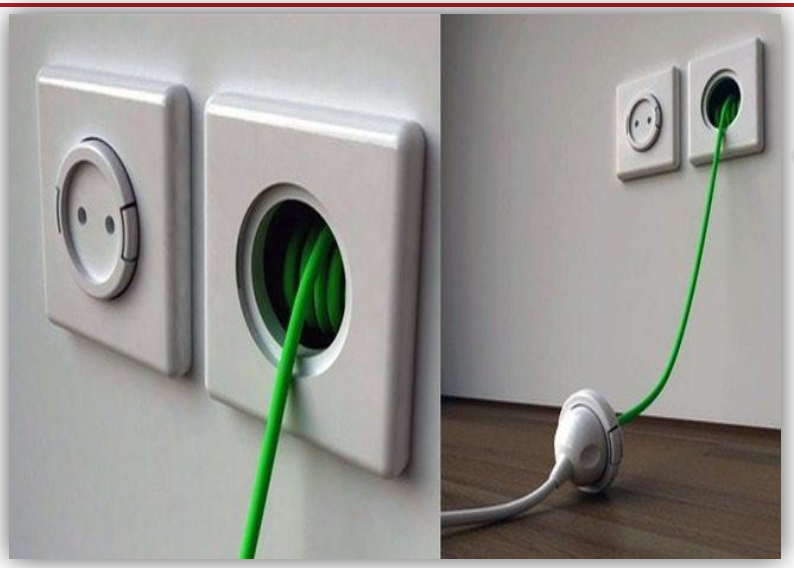
helps cleaning

bacteria-repellent
softer material

protects the pedestrians
provides a little break



user friendliness



offer convenience

charge easily

inspiration
less noise
faster speed

simply
appereance

smart design for children

strollers and airplanes ☺

Business process innovation

- ✓ *A business process innovation is a new or improved business process for one or more business functions that differs significantly from the firm's previous business processes and which has been implemented within the firm.*

Main characteristics:

- ✓ *includes the core business function of producing goods and services and supporting functions,*
- ✓ *greater efficacy, resource efficiency, reliability and resilience, affordability, convenience and usability , reduce costs, improve product quality or working conditions etc.*
- ✓ *be considered as services for which the firm itself is the customer,*
- ✓ *Digital technologies and practices are pervasive and the implementation of business process innovations is often tied to the adoption and modification of techs.*

	Short term	Details and subcategories
1.	Production of goods or services	Activities that transform inputs into goods or services, including engineering and related technical testing, analysis and certification activities to support production.
2.	Distribution and logistics	This function includes: a) transportation and service delivery b) warehousing c) order processing.
3.	Marketing and sales	This function includes: a) marketing methods including advertising (product promotion and placement, packaging of products), direct marketing (telemarketing), exhibitions and fairs, market research and other activities to develop new markets b) pricing strategies and methods c) sales and after-sales activities, including help desks other customer support and customer relationship activities.
4.	Information and communication systems	The maintenance and provision of information and communication systems, including: a) hardware and software b) data processing and database c) maintenance and repair d) web-hosting and other computer-related information activities. These functions can be provided in a separate division or in divisions responsible for other functions.
5.	Administration and management	This function includes: a) strategic and general business management (cross-functional decision-making), including organising work responsibilities b) corporate governance (legal, planning and public relations) c) accounting, bookkeeping, auditing, payments and other financial or insurance activities d) human resources management (training and education, staff recruitment, workplace organisation, provision of temporary personnel, payroll management, health and medical support) e) procurement f) managing external relationships with suppliers, alliances, etc.
6.	Product and business process development	Activities to scope, identify, develop, or adapt products or a firm's business processes. This function can be undertaken in a systematic fashion or on an ad hoc basis, and be conducted within the firm or obtained from external sources. Responsibility for these activities can lie within a separate division or in divisions responsible for other functions, e.g. production of goods or services.

Oslo Manual, 2018

Page 73

Table 3.1

!!!!!!!!!!!!!!!!!!!!!!

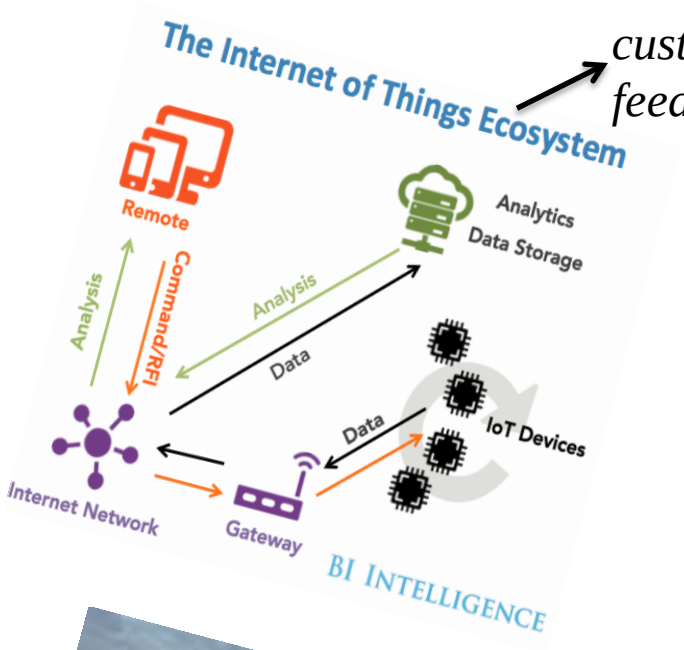
Functional categories for identifying the type of business process innovations

internet banking

social media or custormer services?

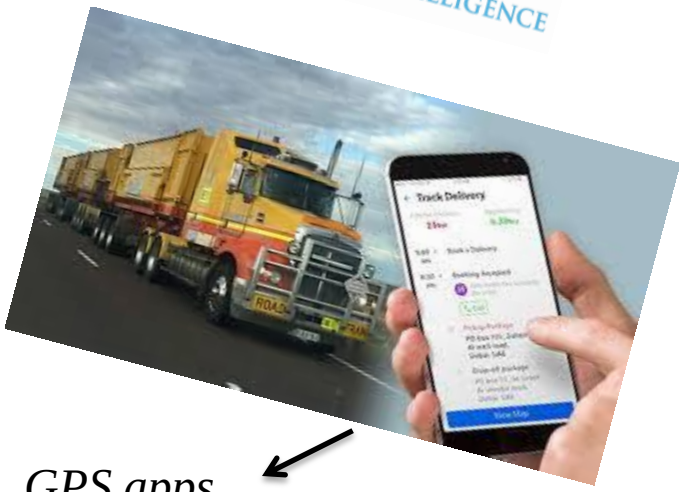
two spaces for each meal

recycling products for packaging



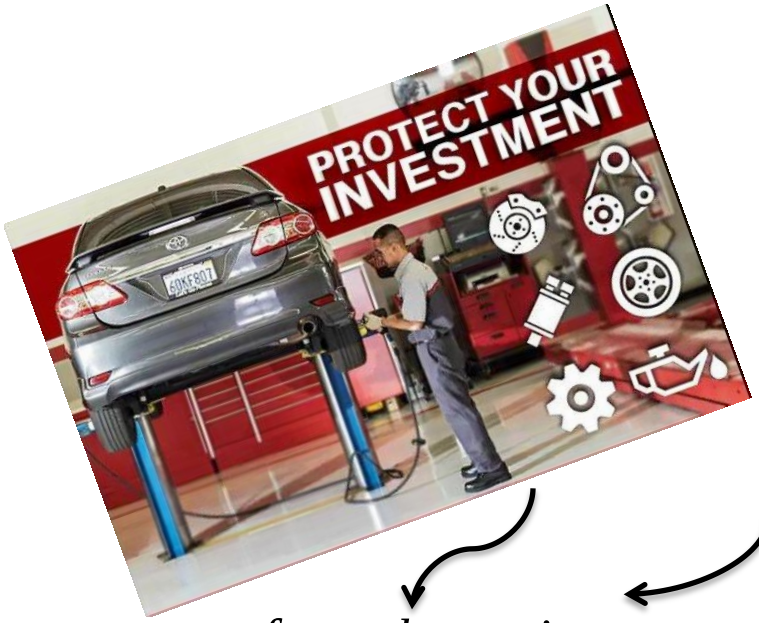
customer feedbacks

reduces risks
productivity +

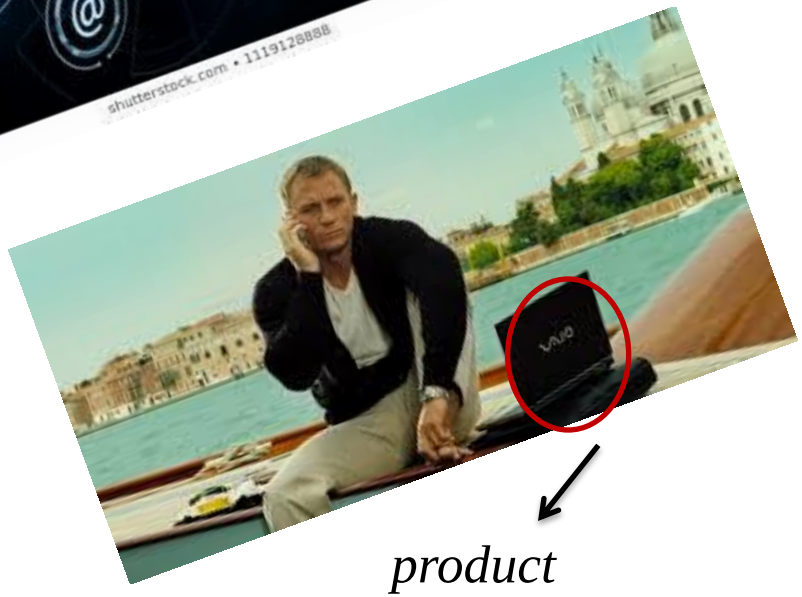


GPS apps

barcode system



after sale services



product placement

Changes that are not innovation

- ✓ *routine changes or updates*
- ✓ *simple capital replacement or extension,*
- ✓ *minor aesthetic changes,*
- ✓ *custom production,*
- ✓ *advertised concept, prototype or model of a product that does not yet exist,*
- ✓ *outputs of creative and professional service firms,*

!!! Oslo Manual page 78-80 / Items 4.65-4.77 !!!

Changes that are not innovation

- ✓ *extend the range of products handled or offered to customers,*
- ✓ *activities of newly created firms,*
- ✓ *mergers or the acquisition of other firms,*
- ✓ *ceasing to use a business process, ceasing to outsource a business process, or withdrawing a product from the market,*
- ✓ *externally determined factor prices,*
- ✓ *corporate or managerial strategy*

!!! Oslo Manual page 78-80 / Items 4.65-4.77 !!!

Activities that can undertake in pursuit of innovation

all scientific, technological, organisational, financial and commercial steps which actually lead, or are intended to lead, to the implementation of innovations.

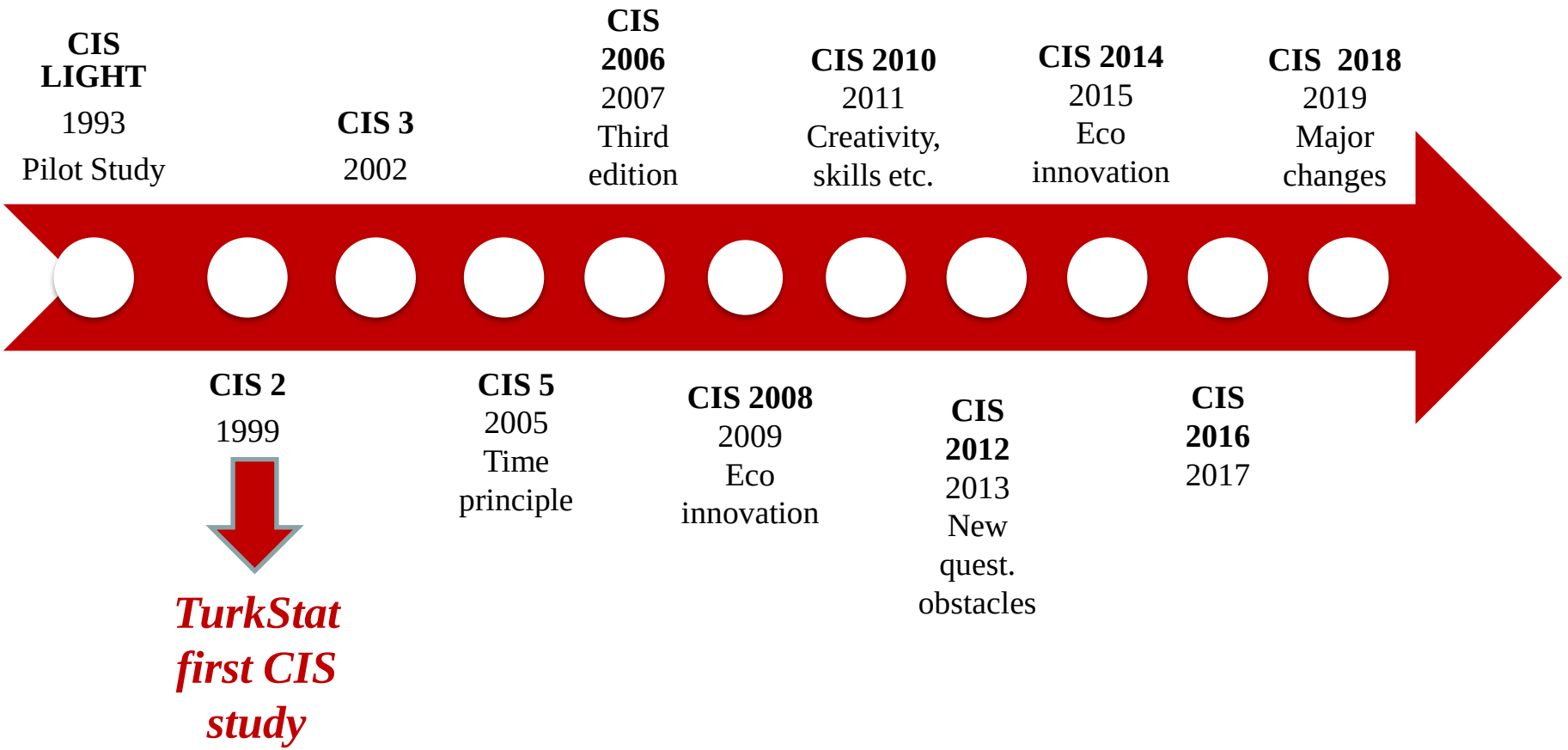
- ✓ *Research and experimental development (R&D) activities*
- ✓ *Engineering, design and other creative work activities*
- ✓ *Marketing and brand equity activities*
- ✓ *IP-related activities*
- ✓ *Employee training activities*
- ✓ *Software development and database activities*
- ✓ *Activities related to the acquisition or lease of tangible assets*
- ✓ *Innovation management activities*

!!! Oslo Manual page 87-91

Items 4.8 – 4.34 !!!

Questionnaire and background of the field studies

Background of innovation statistics in ESTAT

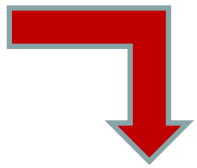


Questions in CIS 2018 (National example)

2 Strategies and Knowledge Flows

2.1 During the three years 2016 to 2018, how important were the following strategies to the economic performance of your enterprise? [STRA]

	Degree of importance				
	High	Medium	Low	Not important	
	3	2	1	0	
Focus on improving your existing goods or services	☐	☐	☐	☐	STRA_FIMPGS
Focus on introducing new goods or services	☐	☐	☐	☐	STRA_FNWGS
Focus on low-price (price leadership)	☐	☐	☐	☐	STRA_FLOWP
Focus on high-quality (quality leadership)	☐	☐	☐	☐	STRA_FHQUAL
Focus on a broad range of goods or services	☐	☐	☐	☐	STRA_FBRGS
Focus on one or a small number of key goods or services	☐	☐	☐	☐	STRA_FSMGS
Focus on satisfying established customer groups	☐	☐	☐	☐	STRA_FESTCUS
Focus on reaching out to new customer groups	☐	☐	☐	☐	STRA_FNWCUS
Focus on standardised goods or services	☐	☐	☐	☐	STRA_FSTDGS
Focus on customer-specific solutions	☐	☐	☐	☐	STRA_FCSOL

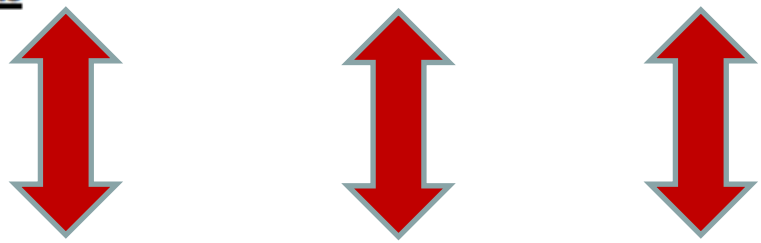


the effects of the strategies adopted and their relationship with innovation activities

Questions in CIS 2018 (National example)

2.5 During the three years 2016 to 2018, did your enterprise:[1] [IPR_OUT]

	Yes (1)	No (0)	
Apply for a patent	☐	☐	IPR_OUT_PAT
Register an industrial design right	☐	☐	IPR_OUT_IDESG
Register a trademark	☐	☐	IPR_OUT_TRDM
Claim a copyright	☐	☐	IPR_OUT_CPR
Use trade secrets	☐	☐	IPR_OUT_TS



competitive advantage gained by innovation guaranteed with effective protection methods.

Utility model was also asked to respondents in terms of national policy needs.

Questions in CIS 2018 (National example)

3 Innovation

A **product innovation** is a new or improved good or service that differs significantly from the firm's previous goods or services and which has been implemented on the market.

Include:

- ✓ significant changes to the design of a good
- ✓ digital goods or services

Exclude: – the simple re-sale of new goods and changes of a solely aesthetic nature

3.1 During the three years 2016 to 2018, did your enterprise introduce any: [INNO_PRD]

	Yes (1)	No (0)	
New or improved goods	☐	☐	INNO_PRD_GD
New or improved services	☐	☐	INNO_PRD_SERV

1: For NSIs: Digital goods and services, see OM4 Chapter 3, paragraph 32 where they are referred to as knowledge-capturing products. These products can have the characteristics of either a good or service and concern the provision, storage, safekeeping, communication and dissemination of digital information that users can access repeatedly.

If 'no' to all options go to question 3.6
Otherwise go to question 3.2

3.2 In the three years 2016 to 2018, did your enterprise introduce any new or improved products (goods or services) that were: [INNO_PRD]

	Yes (1)	No (0)	
Not previously offered by any of your competitors?[2]	☐	☐	INNO_PRD_NEW_MKT
Identical or very similar to products already offered by your competitors?[3]	☐	☐	INNO_PRD_NEW_ENT

Product innovation types

The firms first develop innovations and the followers' adoption / learning processes

Questions in CIS 2018 (National example)

3.3 Please estimate the percentage of your enterprise's total turnover[4] in 2018 from products (goods or services) that were, in the three years 2016 to 2018:[5] [TUR_PRD]

New or improved products		Unchanged products (or with only minor changes)*		*Total turnover in 2018*
__ % TUR_PRD_INN	+	__ % TUR_PRD_NINN	=	100 %

If possible, separate turnover from new or improved products into products that were:

Not previously offered by any of your competitors[6]	=
	__ % TUR_PRD_NEW_MKT
	+
Identical or very similar to products already offered by your competitors	__ % TUR_PRD_NEW_ENT

* Includes the resale of new products purchased from other enterprises.

the impact of innovation on enterprise performance

3.4 Who developed these product innovations? [DEVE_PRD]

Tick all that apply

Your enterprise by itself	☐	DEVE_PRD_ENT
Your enterprise together with other enterprises or organisations*	☐	DEVE_PRD_ENT_OTH
Your enterprise by adapting or modifying products originally developed by other enterprises or organisations*	☐	DEVE_PRD_ADP_ENT_OTH
Other enterprises or organisations*	☐	DEVE_PRD_OTH

innovation drivers, cooperations and follow on activities

Questions in CIS 2018 (National example)

3.6 During the three years 2016 to 2018, did your enterprise introduce any of the following types of new or improved processes that differ significantly from your previous processes? [INNO_PCS]

	Yes 1	No 0	
Methods for producing goods or providing services (including methods for developing goods or services)	☐	☐	INNO_PCS_PRD
Logistics, delivery or distribution methods	☐	☐	INNO_PCS_LOG
Methods for information processing or communication	☐	☐	INNO_PCS_COMM
Methods for accounting or other administrative operations	☐	☐	INNO_PCS_ACCT
Business practices for organising procedures or external relations	☐	☐	INNO_PCS_OPROC_EXTREL
Methods of organising work responsibility, decision making or human resource management	☐	☐	INNO_PCS_WR_DEC_HRM
Marketing methods for promotion, packaging, pricing, product placement or after sales services	☐	☐	INNO_PCS_SLS_SERV

If 'no' to all options go to question 3.9
Otherwise go to question 3.7

3.7 Who developed these process innovations? [DEVE_PCS]

Tick all that apply

Your enterprise by itself	☐	DEVE_PCS_ENT
Your enterprise together with other enterprises or organisations*	☐	DEVE_PCS_ENT_OTH
Your enterprise by adapting or modifying processes originally developed by other enterprises or organisations*	☐	DEVE_PCS_ENT_ADP
Other enterprises or organisations*	☐	DEVE_PCS_OTH

* Include independent enterprises plus other parts of your enterprise group (subsidiaries, sister enterprises, head office, etc.). Organisations include universities, research institutes, non-profits, etc.

Business process innovation types

innovation drivers, cooperations and follow on activities

Questions in CIS 2018 (National example)

3.9 During the three years 2016 to 2018, did your enterprise have any of the following types of innovation activities? (Activities leading to expenditures) [INNA]

	Yes 1	No 0	
Completed activities on product or process innovation[1]	☐	☐	INNA_COMPL
Ongoing innovation activities at the end of 2018	☐	☐	INNA_ONGO
Abandoned innovation activities	☐	☐	INNA_ABDN
In-house research and development (R&D) activities*?	☐	☐	INNA_IH_RND
if 'yes': did your enterprise perform in-house R&D during the three years 2016 to 2018:			
Continuously (your enterprise had permanent R&D staff)	☐		INNA_IH_RND_CONT
Occasionally (as needed only)	☐		INNA_IH_RND_OCC
Contract-out R&D to other enterprises (include enterprises in your own group) or to public or private research organisations)	☐	☐	INNA_RND_CONTR_OUT

1 For NSIs that use an online survey: For all enterprises: For all enterprises that reply 'yes' to any category in any of the questions 3.1 or 3.6, pre-set the answer to 'yes'.

* Please see the annex for definitions of internal and external R&D.

If 'no' to all options go to question 3.12

Otherwise go to question 3.10

innovation activities can result in an innovation be ongoing, postponed or abandoned

Questions in CIS 2018 (National example)

3.10 How much did your enterprise spend on innovation and research and development (R&D) in 2018? [EXP_INNO]

- Please note that question 3.10 refers, exceptionally, **only to the year 2018**, not the three year period 2016 to 2018.
- Please **tick 'none' for all categories** if you enterprise **did not have any expenditure on innovation and/or R&D** in 2018.

	Please estimate if you lack precise accounting data	*Please tick, if there were no such expenditures in 2018*	
R&D performed in-house (Include current expenditures including labour costs and capital expenditures (buildings, machinery, equipment, software etc.) specifically for R&D)	__.___.___,000 €	☐ none	EXP_INNO_RND_IH
R&D contracted out to others (including enterprises in own enterprise group)	__.___.___,000 €	☐ none	EXP_INNO_RND_CONTR_OUT
All other innovation expenditures* (i.e. excluding R&D)	__.___.___,000 €	☐ none	EXP_INNO_INN_XRND
Of which:			
Own personnel working on innovation	__.___.___,000 €	☐ none	EXP_INNO_INN_XRND_OWN_PER
Services, materials, supplies purchased from others for innovation	__.___.___,000 €	☐ none	EXP_INNO_INN_XRND_SMSP
Capital goods for innovation (acquisition of machinery, equipment, software, IPRs, buildings etc.)	__.___.___,000 €	☐ none	EXP_INNO_INN_XRND_CGO

the expenditures for R&D and other innovation activities

Questions in CIS 2018 (National example)

3.12 During the three years from 2016 to 2018, did your enterprise try to obtain the following types of funding? If funding was obtained successfully, was this funding used for R&D or other innovation activities? [FUND]

	Try to obtain funding			If your enterprise obtained funding, was this partly or fully used for R&D or other innovation activities?		
	Yes, successfully obtained some funding of this type	*Tried, but not successfully*	*No*	*Yes* 1	*No* 0	
Equity finance (finance provided in exchange for a share in the ownership of the enterprise)	☐ FUND_EQUIT_SUCC	☐ FUND_EQUIT_NSUCC	☐ FUND_NEQUIT	☐	☐	FUND_EQUIT_SUCC_RNDINN
Debt finance (finance that the enterprise must repay)	☐ FUND_DEBT_SUCC	☐ FUND_DEBT_NSUCC	☐ FUND_NDEBT	☐	☐	FUND_DEBT_SUCC_RNDINN

enterprises try to obtain funding?

Important outputs for the policy makers!!!

if yes, they use into the R&D or innovation activities?

Questions in CIS 2018 (National example)

3.13 During the three years from 2016 to 2018, did your enterprise receive any public financial support from the following levels of government? [FUND]

Include financial support via grants, subsidised loans, and loan guarantees. Exclude revenues from public sector* procurement contracts.

	Yes 1	No 0		If your enterprise received financial support: was part of this used for R&D or other innovation activities? Yes 1	No 0	
Local or regional authorities*	☐	☐	FUND_AUT_LOC_REG	☐	☐	FUND_AUT_LOC_REG_RNDINN
National government*	☐	☐	FUND_GOV_CTL	☐	☐	FUND_GOV_CTL_RNDINN
EU Horizon 2020 Programme for Research and Innovation	☐	☐	FUND_EU_HP2020	☐	☐	FUND_EU_HP2020_RNDINN
Other financial support from a European Union institution*	☐	☐	FUND_EU_OTH	☐	☐	FUND_EU_OTH_RNDINN

* Include financial support via grants, subsidised loans, and loan guarantees. Exclude financing of activities under contract by the public sector*. The public sector includes government owned organisations such as local, regional and national administrations and agencies, schools, hospitals, and government providers of services such as security, transport, housing, energy, etc.

3.14 During the three years from 2016 to 2018, did your enterprise use tax incentives or allowances for the following purposes? [TAX_CRED]

	Yes 1	No 0	
Tax credits or allowances for R&D or other innovation activities *[name of national scheme]*	☐	☐	TAX_CRED_RNDINN
Tax credits or allowances for all other types of activities	☐	☐	TAX_CRED_OTH

Important outputs for the policy makers!!!

→ ***public financial support***

→ ***tax incentives and allowances***

Questions in CIS 2018 (National example)

3.15 During the three years 2016 to 2018, did your enterprise co-operate* with other enterprises or organisations ? [COOP]

	Yes	No	
	1	0	
a) On R&D	☐	☐	COOP_RND
b) On other innovation activities (excluding R&D)	☐	☐	COOP_INN_XRND
c) On any other business activities	☐	☐	COOP_OTH

* Co-operation is active participation with other enterprises or organisations. Partners do not need to commercially benefit. Exclude pure contracting out of work with no active co-operation.

If 'yes' to either option a) or b), go to question 3.16
Otherwise go to question 3.17

the cooperation status and types of partners in terms of national or global level

3.16 Please indicate the type of innovation co-operation partner by location [COOP]

Tick all that apply

Type of co-operation partner	[Your country]	Other EU* or EFTA**	All other countries
Private business enterprises outside your enterprise group	☐ COOP_PRV_NAT	☐ COOP_PRV_EU_EFTA	☐ COOP_PRV_NEU_NEFTA
Consultants, commercial labs, or private research institutes	☐ COOP_PRV_CN_NAT	☐ COOP_PRV_CN_EU_EFTA	☐ COOP_PRV_CN_NEU_NEFTA
Suppliers of equipment, materials, components or software	☐ COOP_PRV_SUPPL_NAT	☐ COOP_PRV_SUPPL_EU_EFTA	☐ COOP_PRV_SUPPL_NEU_NEFTA
Enterprises that are your clients or customers	☐ COOP_PRV_CLCU_NAT	☐ COOP_PRV_CLCU_EU_EFTA	☐ COOP_PRV_CLCU_NEU_NEFTA
Enterprises that are your competitors	☐ COOP_PRV_COMP_NAT	☐ COOP_PRV_COMP_EU_EFTA	☐ COOP_PRV_COMP_NEU_NEFTA
Other enterprises	☐ COOP_PRV_OTH_NAT	☐ COOP_PRV_OTH_EU_EFTA	☐ COOP_PRV_OTH_NEU_NEFTA
Enterprises within your enterprise group	☐ COOP_EG_NAT	☐ COOP_EG_EU_EFTA	☐ COOP_EG_NEU_NEFTA
Universities or other higher education institutions	☐ COOP_UNIV_NAT	☐ COOP_UNIV_EU_EFTA	☐ COOP_UNIV_NEU_NEFTA
Government or public research institutes	☐ COOP_GOV_RI_NAT	☐ COOP_GOV_RI_EU_EFTA	☐ COOP_GOV_RI_NEU_NEFTA
Clients or customers from the public sector***	☐ COOP_PUB_CLCU_NAT	☐ COOP_PUB_CLCU_EU_EFTA	☐ COOP_PUB_CLCU_NEU_EFTA
Non-profit organisations	☐ COOP_NPO_NAT	☐ COOP_NPO_EU_EFTA	☐ COOP_NPO_NEU_NEFTA

The cooperations are crucial for this survey!

✓*innovation circles and team work in innovation projects,*

✓*stimulating informal contacts between employees,*

✓*joint development of innovation strategies across functional areas exchanging innovation ideas openly across the firm,*

✓*mutual support across functional areas to address problems in innovation projects,*

✓*regular meetings of heads of functional areas to discuss innovation issues,*

✓*mechanisms for iterative and interactive project development and delivery,*

✓ *temporary involvement in innovation projects of personnel from different functional areas*

Questions in CIS 2018 (National example)

3.18 During the three years 2016 to 2018, how important were the following factors in hampering your enterprises' decision to start innovation activities*, or its execution of innovation activities* ? [HAMP]

	Degree of importance				
	High	Medium	Low	Not a constraint	
	3	2	1	0	
Lack of internal finance for innovation	☐	☐	☐	☐	HAMP_LFIN_INT
Lack of credit or private equity	☐	☐	☐	☐	HAMP_LCRED_LEQUIT
Difficulties in obtaining public grants or subsidies	☐	☐	☐	☐	HAMP_DIF_SUB
Costs too high	☐	☐	☐	☐	HAMP_HCOST
Lack of skilled employees within your enterprise	☐	☐	☐	☐	HAMP_LQLF_SAL
Lack of collaboration partners	☐	☐	☐	☐	HAMP_LCOLL_PTN
Lack of access to external knowledge	☐	☐	☐	☐	HAMP_LACS_KNOW
Uncertain market demand for your ideas	☐	☐	☐	☐	HAMP_UNC_MKT_DM
Too much competition in your market	☐	☐	☐	☐	HCOMP
Different priorities within your enterprise	☐	☐	☐	☐	OR

internal or external factors that hamper or encourages innovation efforts

Questions in CIS 2018 (National example)

4.1 What was the average number of persons employed* by your enterprise in 2016 and 2018 ?[6] [EMP]

2016	2018
EMP16	EMP18

* Total number of persons (headcount) who work in the enterprise (inclusive of working proprietors, partners working regularly in the unit and unpaid family workers), as well as persons who work outside the enterprise's premises and are paid by it (e.g. sales representatives, delivery personnel, repair and maintenance teams). It excludes manpower supplied to the enterprise by other enterprises, persons carrying out repair and maintenance work in the enterprise on behalf of other enterprises, as well as those on compulsory military service.

Compiled from administrative sources

4.2 Approximately what percentage of the persons employed in your enterprise in 2018 had a tertiary degree[7] ? [EMPUD]

	Tick only one	
0%	☐	EMPUD_PC0
1% to less than 5%	☐	EMPUD_PC1T4
5% to less than 10%	☐	EMPUD_PC5T9
10% to less than 25%	☐	EMPUD_PC10T24
25% to less than 50%	☐	EMPUD_PC25T49
50% to less than 75%	☐	EMPUD_PC50T74
75% or more	☐	EMPUD_PC_GE75

human resource competence of the enterprise

4.3 What was your enterprise's total turnover[8] in 2016 and 2018? [TUR]

2016	2018
TUR16	TUR18

Compiled from administrative sources

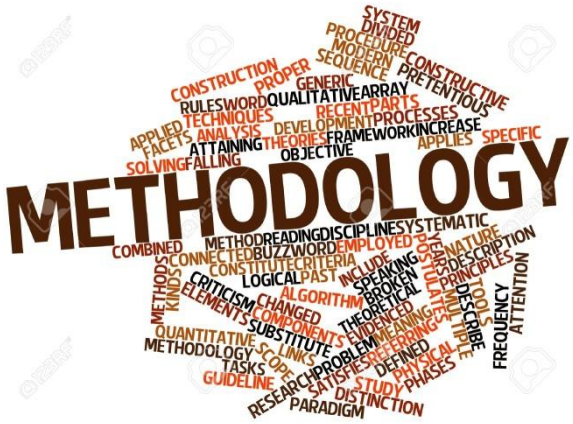
Methodological base and survey process in TurkStat

Methodology

Geographical coverage: *All enterprises in Turkey*

Sectoral coverage: *Core activities recommended in the manual*

- ✓*Mining and quarrying (NACE B: 05-09)*
- ✓*Manufacturing (NACE C: 10-33)*
- ✓*Electricity, gas steam and air conditioning supply (NACE D: 35)*
- ✓*Water supply; sewerage, waste management and remediation activities (NACE E: 36-39*
- ✓*Wholesale trade, except of motor vehicles and motorcycles (NACE 46)*
- ✓*Transportation and storage (NACE H: 49-53)*
- ✓*Information and communication (NACE J: 58-63)*
- ✓*Financial and insurance activities (NACE K: 64-66)*
- ✓*Architectural and engineering activities (NACE 71)*
- ✓*Scientific research and development (NACE 72)*
- ✓*Advertising and market research (NACE 73)*



Methodology

Data Collection Period: *Biennial data collection for 3 years period*

Data collection Method: *Web based questionnaire (2015 and onwards)*

Sampling unit: *Enterprise*

Sampling frame: *TurkStat Business registers system*

Sampling method: *Stratified random sampling*

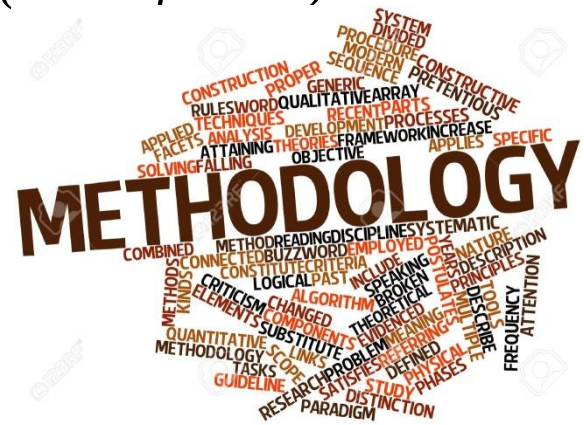
- Economic activities

- Size class (10-49, 50-249), (0-9: Optional)

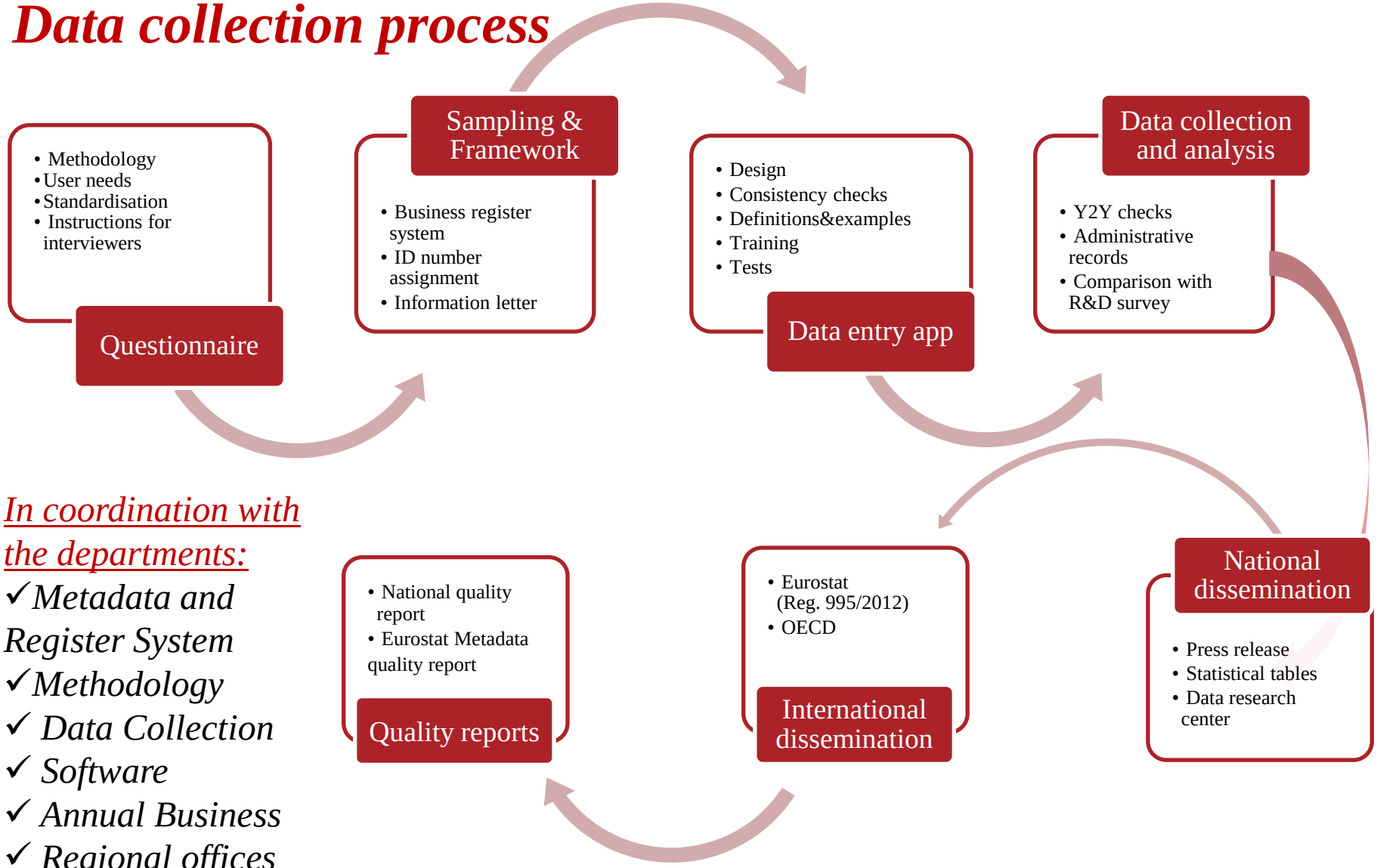
- Census: 250+

Classifications: *NACE Rev. 2/ ISCED, 2011*

All the methodological approach derives from Oslo Manual!!!



Data collection process



In coordination with the departments:

- ✓ *Metadata and Register System*
- ✓ *Methodology*
- ✓ *Data Collection*
- ✓ *Software*
- ✓ *Annual Business*
- ✓ *Regional offices*

Recommendations and key aspects

Recommendations and key aspects - 1

- ✓ *the survey should be filled in by authoritative respondents,*
- ✓ *The choice of questions should be made after consultations,*
- ✓ *all questions need to be carefully adapted and translated,*
- ✓ *Instructions should be short, clear and easy to find,*
- ✓ *consistency and range edits to aid the respondent is crucial,*

Recommendations and key aspects – 2

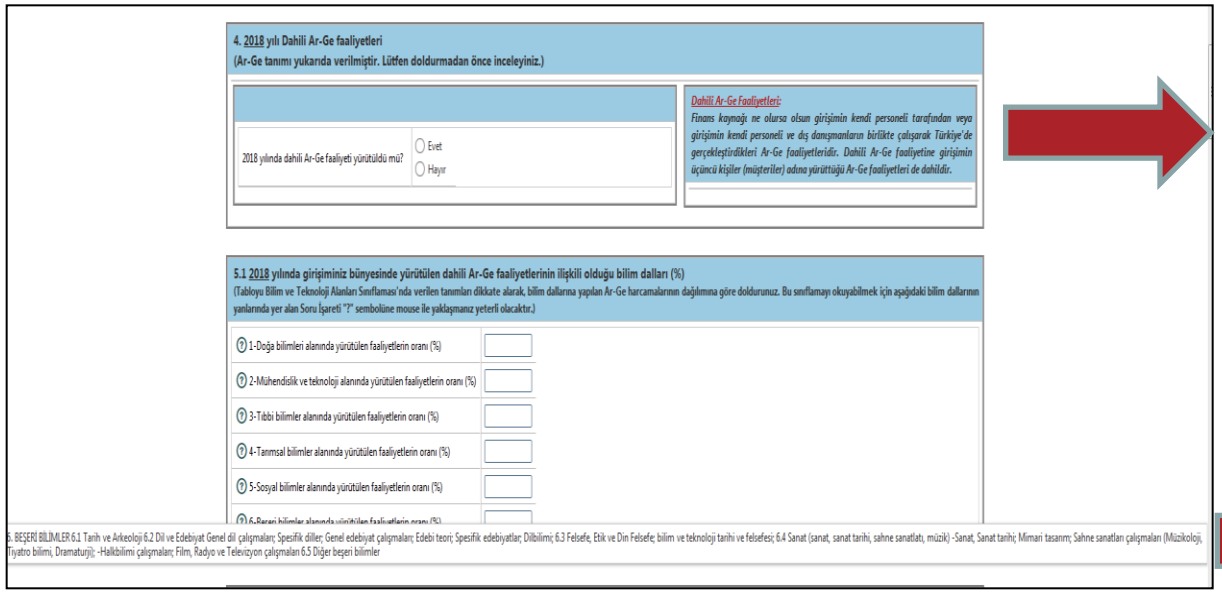
- ✓ *pilot tests for questionnaire and data entry apps before collection,*
- ✓ *A pre-contact may be a useful,*
- ✓ *interviewer manuals and training,*
- ✓ *a preliminary set of edits,*
- ✓ *Response rates should be monitored,*

Recommendations and key aspects – 3

- ✓ *Paradata may be used to assess the effectiveness and cost efficiency,*
- ✓ *a linking key that allows for the datasets to be combined,*
- ✓ *data from innovation surveys should be compared to previous cycles,*
- ✓ *data should be compared with other comparable data sources,*
- ✓ *NSOs should provide indicators of data quality for the published aggregates,*

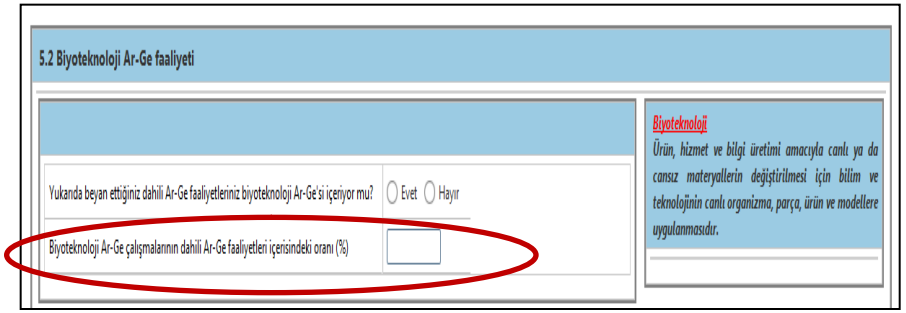
Web based application of TurkStat

Standard perspective



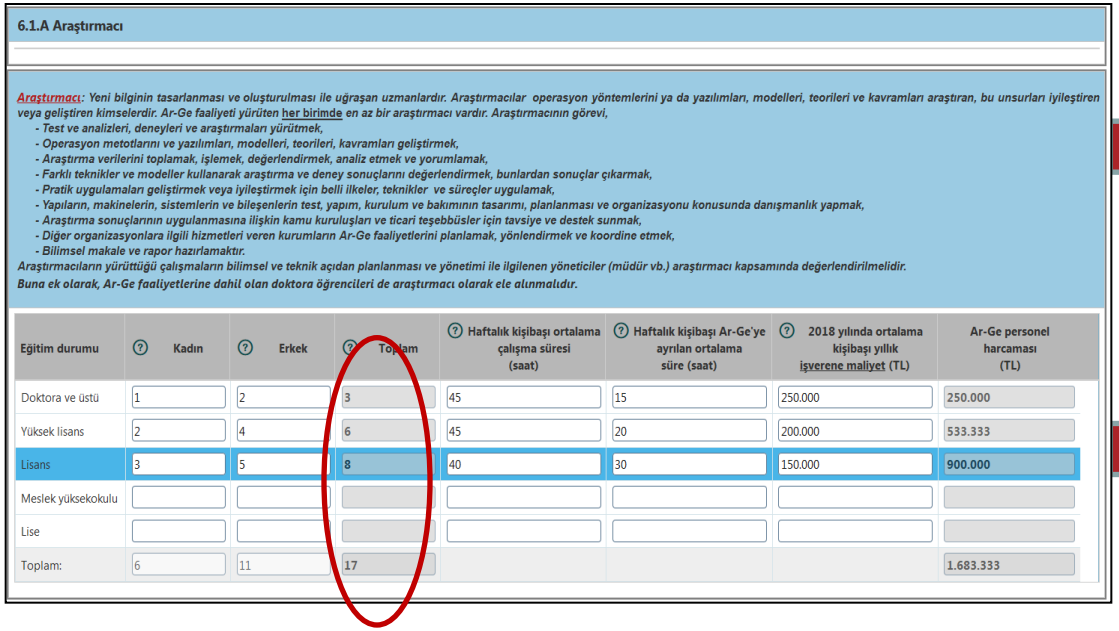
Definitions beyond the questions (nearly all the key and controversial ones)

User friendly pop-ups



Hide & show results for filter questions

Standard perspective



6.1.A Araştırmacı

Araştırmacı: Yeni bilginin tasarlanması ve oluşturulması ile uğraşan uzmanlardır. Araştırmacılar operasyon yöntemlerini ya da yazılımları, modelleri, teorileri ve kavramları araştıran, bu unsurları iyileştiren veya geliştiren kimselerdir. Ar-Ge faaliyeti yürüten her birimde en az bir araştırmacı vardır. Araştırmacının görevi,

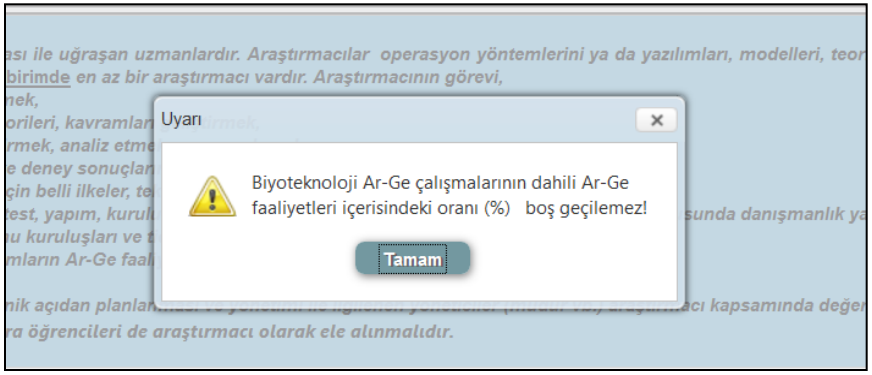
- *Test ve analizleri, deneyleri ve araştırmaları yürütmek,*
- *Operasyon metotlarını ve yazılımları, modelleri, teorileri, kavramları geliştirmek,*
- *Araştırma verilerini toplamak, işlemek, değerlendirmek, analiz etmek ve yorumlamak,*
- *Farklı teknikler ve modeller kullanarak araştırma ve deney sonuçlarını değerlendirmek, bunlardan sonuçlar çıkarmak,*
- *Pratik uygulamaları geliştirmek veya iyileştirmek için belli ilkeler, teknikler ve süreçler uygulamak,*
- *Yapıların, makinelerin, sistemlerin ve bileşenlerin test, yapım, kurulum ve bakımının tasarımı, planlanması ve organizasyonu konusunda danışmanlık yapmak,*
- *Araştırma sonuçlarının uygulanmasına ilişkin kamu kuruluşları ve ticari teşebbüsler için tavsiye ve destek sunmak,*
- *Diğer organizasyonlara ilgili hizmetleri veren kurumların Ar-Ge faaliyetlerini planlamak, yönlendirmek ve koordine etmek,*
- *Bilimsel makale ve rapor hazırlamaktır.*

Araştırmacıların yürüttüğü çalışmaların bilimsel ve teknik açıdan planlanması ve yönetimi ile ilgilenen yöneticiler (müdür vb.) araştırmacı kapsamında değerlendirilmelidir.
Buna ek olarak, Ar-Ge faaliyetlerine dahil olan doktora öğrencileri de araştırmacı olarak ele alınmalıdır.

Eğitim durumu	Kadın	Erkek	Toplam	Haftalık kişibaşı ortalama çalışma süresi (saat)	Haftalık kişibaşı Ar-Ge'ye ayrılan ortalama süre (saat)	2018 yılında ortalama kişibaşı yıllık işverene maliyet (TL)	Ar-Ge personel harcaması (TL)
Doktora ve üstü	1	2	3	45	15	250.000	250.000
Yüksek lisans	2	4	6	45	20	200.000	533.333
Lisans	3	5	8	40	30	150.000	900.000
Meslek yüksekokulu							
Lise							
Toplam:	6	11	17				1.683.333

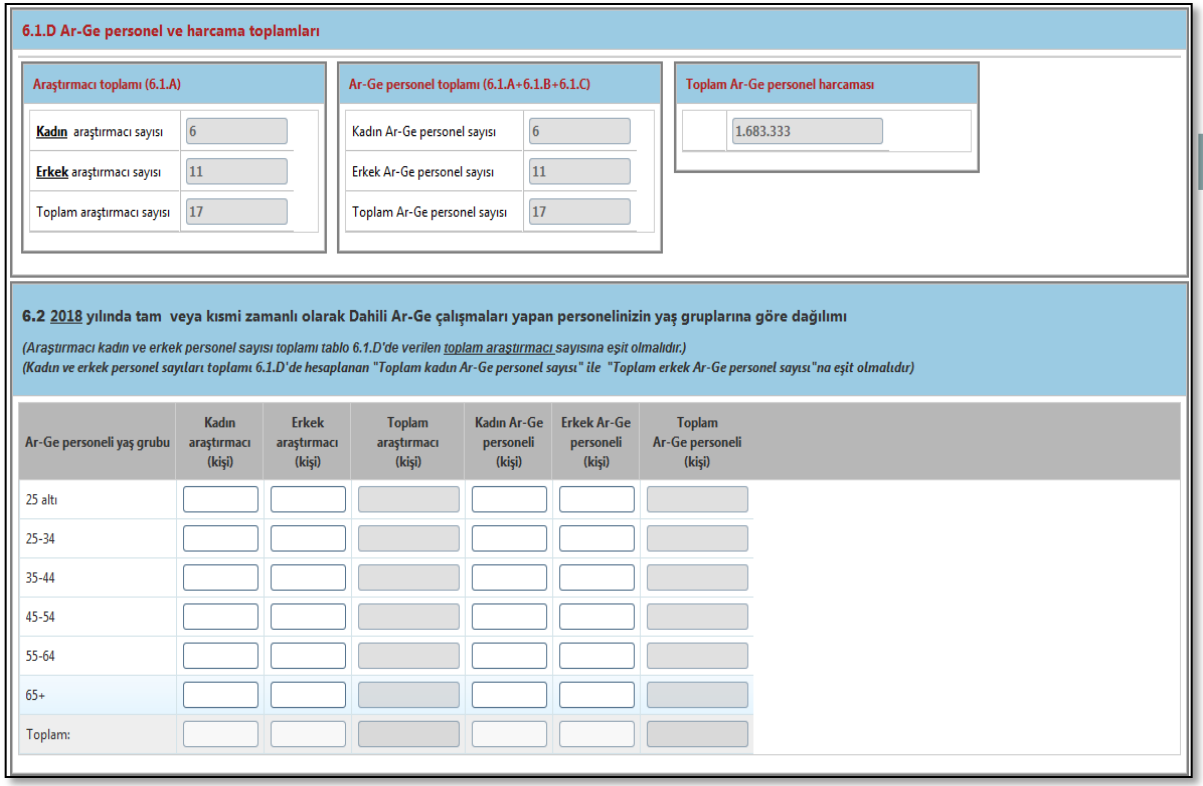
Examples for critical parts

Auto sum structure with read-only view



Simultaneous warnings that affects flow and cross checks in questionnaire

Standard perspective



6.1.D Ar-Ge personel ve harcama toplamları

Araştırmacı toplamı (6.1.A)	
Kadın araştırmacı sayısı	6
Erkek araştırmacı sayısı	11
Toplam araştırmacı sayısı	17

Ar-Ge personel toplamı (6.1.A+6.1.B+6.1.C)	
Kadın Ar-Ge personel sayısı	6
Erkek Ar-Ge personel sayısı	11
Toplam Ar-Ge personel sayısı	17

Toplam Ar-Ge personel harcaması
1.683.333

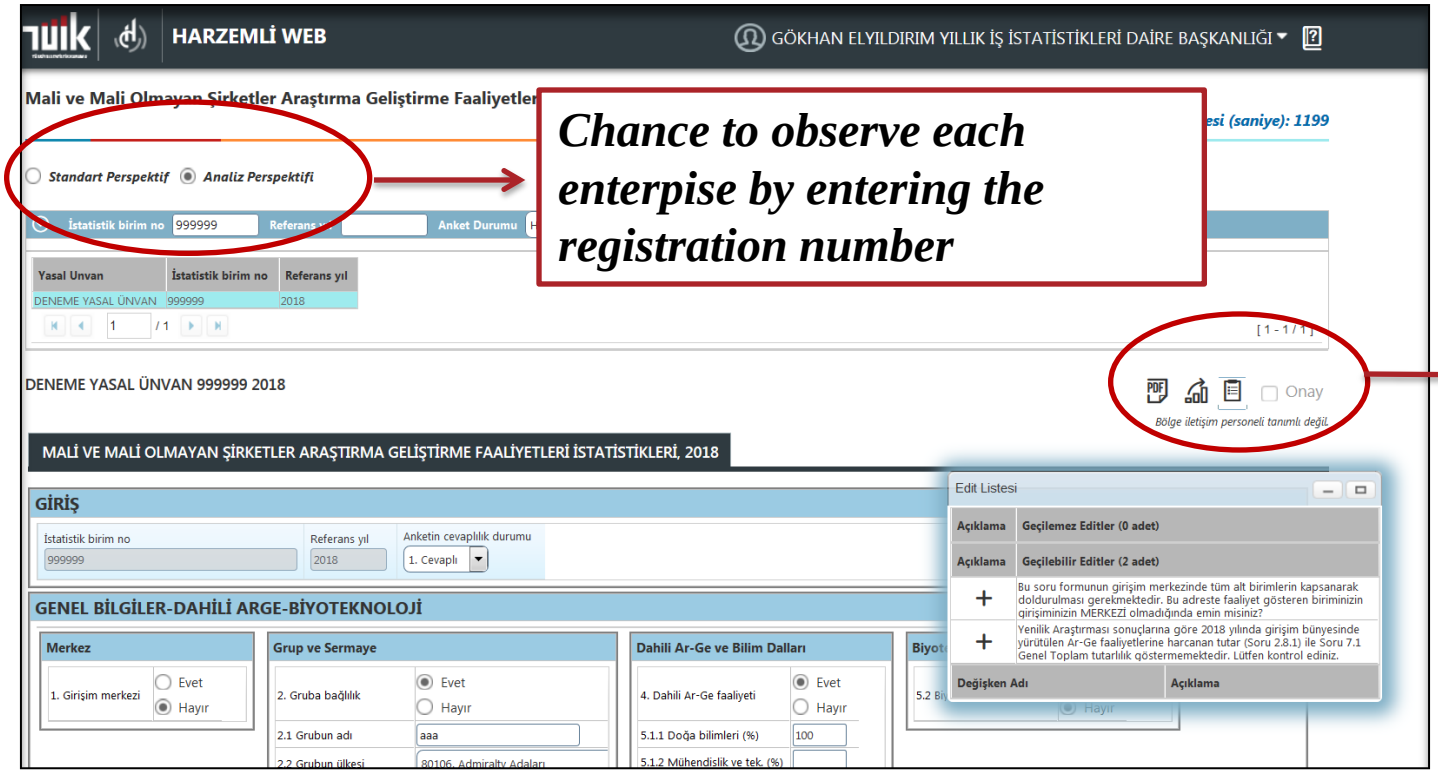
6.2 2018 yılında tam veya kısmi zamanlı olarak Dahili Ar-Ge çalışmaları yapan personelinizin yaş gruplarına göre dağılımı

(Araştırmacı kadın ve erkek personel sayısı toplamı tablo 6.1.D'de verilen toplam araştırmacı sayısına eşit olmalıdır.)
(Kadın ve erkek personel sayıları toplamı 6.1.D'de hesaplanan "Toplam kadın Ar-Ge personel sayısı" ile "Toplam erkek Ar-Ge personel sayısı"na eşit olmalıdır)

Ar-Ge personeli yaş grubu	Kadın araştırmacı (kişi)	Erkek araştırmacı (kişi)	Toplam araştırmacı (kişi)	Kadın Ar-Ge personeli (kişi)	Erkek Ar-Ge personeli (kişi)	Toplam Ar-Ge personeli (kişi)
25 altı						
25-34						
35-44						
45-54						
55-64						
65+						
Toplam:						

Auto filled tables to help users to distribute detailed breakdowns

Analyze perspective

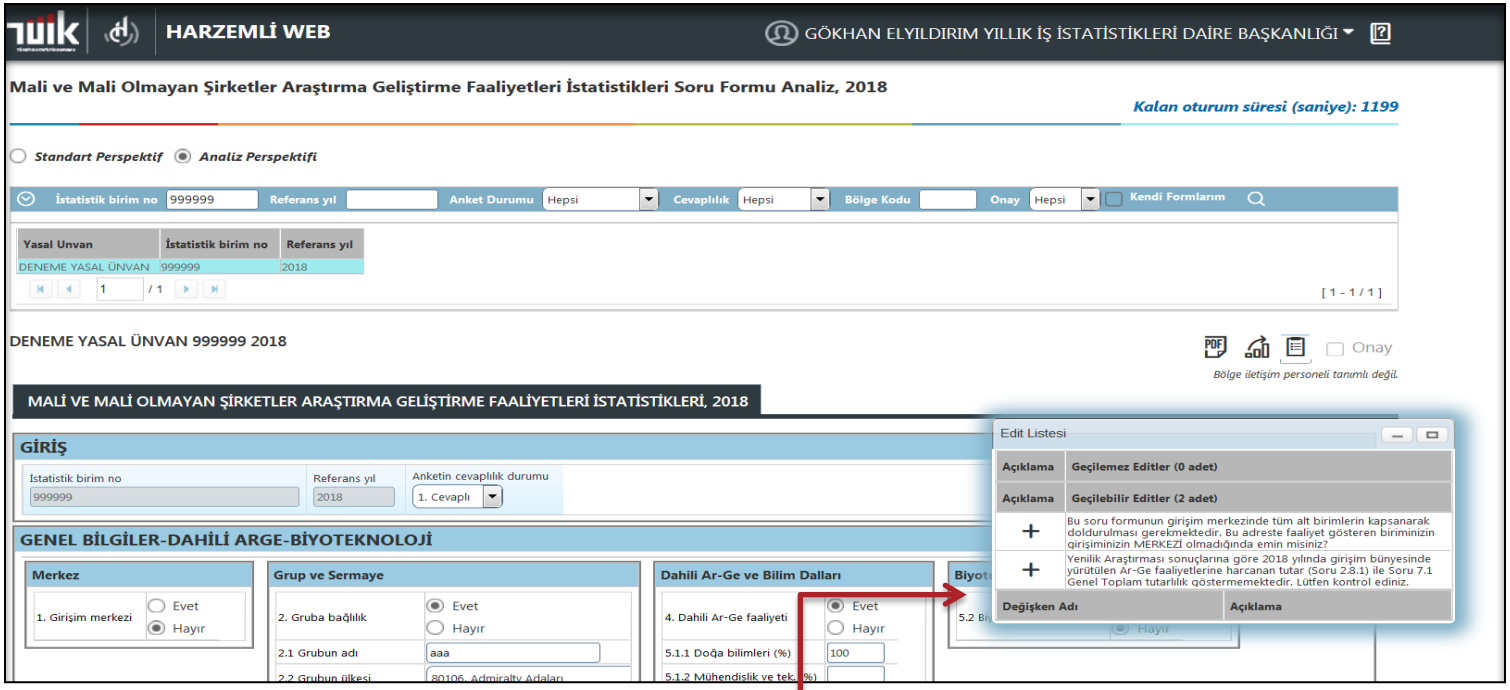


Chance to observe each enterprise by entering the registration number

Analyze & confirmation button, PDF print out option

Control and analyze process for central organization and regional offices. Authorized for specifics dates for offices, reporting option for regional and central bodies of TurkStat

Analyze perspective



Detailed explanations for regional offices about potential / soft and hard errors

Dissemination

Tables

Press release and statistical tables for CIS 2018 results

https://data.tuik.gov.tr/Bulten/Index?p=Innovation-Survey-2018-30581

Innovation Statistics (2016-?.)

- Innovation-active enterprises and types of innovation activities
- Business process innovative enterprises and types of business process innovations
- Product (goods or services) innovative enterprises and types of production innovations

International Organisations (Eurostat/OECD)

✓***CIS Fast Track Data***

Table 1 (PRD innovation)

Table 2 (BPCS innovation)

Table 3 (INN innovation)

Table 4 (Coop)

Table 5 (Non-R&D exp)

Table 6 (Turn new to frm mkt)

Table 7 (Strategies)

Enterprises introducing product innovations as percentage of total enterprises

			CIS 2018	
			NUMERATOR	DENOMINATOR
	Definition		Number of enterprises who introduced a product innovation (cf. question 3.1)	Number of enterprises (both innovators and non-innovators)
	Innovation indicator - tabulated data		INNO_PRD	ENT_POPU18
	Rules		INNO_PRD_GD=1 OR INNO_PRD_SERV=1	
	Unit: Number/Absolute value		NBR	NBR
B-M73_INN	All NACE - Core NACE (NACE Rev 2. sections B, C, D, E, H, J, K and NACE Rev. 2 divisions 46, 71, 72, 73)	10_49 + 50_249		
		250+		
		Total		
B-E	B_C_D_E Total industry (excluding construction)	10_49 + 50_249		
		250+		
		Total		
G-M73_INN	Core Services (NACE sections & divisions 46-H-J-K-71-72-73)	10_49 + 50_249		
		250+		
		Total		

International Organisations (Eurostat/OECD)

✓*Eurostat – OECD Data Transmission*

1	DATAFLOW	TABLEN	FREQ	REF_ARE	TIME_PERIO	UNIT _MEASURE	INDIC_INN	ACTIVITY	NUMBER_EM	TYPE_ENT	CIS_INDICATOR	OBS_VALUE	OBS_
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1955	ESTAT:CIS_OM4_2(1.0)	T5	A	XX	2018	NB	ENT18	GTN	E_GE250	_T	CONC_USR_PRV	XXX	
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2379	ESTAT:CIS_OM4_2(1.0)	T5	A	XX	2018	NB	ENT18	GTN	E10T49	INN	CONC_USR_PUB	XXX	
2380	ESTAT:CIS_OM4_2(1.0)	T5	A	XX	2018	NB	ENT18	GTN	E10T49	NINN	CONC_USR_PUB	XXX	
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2383	ESTAT:CIS_OM4_2(1.0)	T5	A	XX	2018	NB	ENT18	GTN	E50T249	NINN	CONC_USR_PUB	XXX	
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2385	ESTAT:CIS_OM4_2(1.0)	T5	A	XX	2018	NB	ENT18	GTN	E_GE250	INN	CONC_USR_PUB	XXX	
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2805	ESTAT:CIS_OM4_2(1.0)	T5	A	XX	2018	NB	ENT18	GTN	_T	INN	CONC_USR_IND_HH	XXX	
2806	ESTAT:CIS_OM4_2(1.0)	T5	A	XX	2018	NB	ENT18	GTN	_T	NINN	CONC_USR_IND_HH	XXX	
2807	ESTAT:CIS_OM4_2(1.0)	T5	A	XX	2018	NB	ENT18	GTN	E10T49	_T	CONC_USR_IND_HH	XXX	
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2812	ESTAT:CIS_OM4_2(1.0)	T5	A	XX	2018	NB	ENT18	GTN	E50T249	NINN	CONC_USR_IND_HH	XXX	
2813	ESTAT:CIS_OM4_2(1.0)	T5	A	XX	2018	NB	ENT18	GTN	E_GE250	_T	CONC_USR_IND_HH	XXX	
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2815	ESTAT:CIS_OM4_2(1.0)	T5	A	XX	2018	NB	ENT18	GTN	E_GE250	NINN	CONC_USR_IND_HH	XXX	

CIS2018 Tabulation instructions | FORMULAS | NACEx5IZECLAS | Structure transmission file | Example CSV non standard | **Example CSV standard** | Exchange rates | DATAFLOW | TABLENAME | FREQ | REF_A

International Organisations (Eurostat/OECD)

✓CIS Innovation Profiles

Innovation profiles of enterprises (source: CIS 2018); NACE Core all; all size classes

Share in %

Country	Innovators											
	with substantial own innovation capacities									with little or no own innovation capacities		
TURKEY	with market novelties			without market novelties			business process innovators					
TR	Total	with R&D	without R&D	Total	with R&D	without R&D	Total	with R&D	without R&D	Total	with R&D	without R&D
	Profile I	*Profile I.A*	*Profile I.B*	***Profile II***	*Profile II.A*	*Profile II.B*	***Profile III***	*Profile III.A*	*Profile III.B*	***Profile IV***	*Profile IV.A*	*Profile IV.B*

Non-innovators				
with own innovation activities and/or potential				Without ongoing or abandoned innovation activity and without potential
with ongoing or abandoned innovation activity			with innovation potential	
Total	with R&D	without R&D		
Profile V	*Profile V.A*	*Profile V.B*	*Profile VI*	***Profile VII***

"Success on the civilization path depends on innovation."

MUSTAFA KEMAL ATATÜRK

Thank you for your attention…

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Any questions / remarks???