Innovation survey 2018

METHODOLOGY

"Innovation Survey of Enterprises 2016–2018" is the implementation of the Community Innovation Survey (CIS) of the European Union in Estonia. CIS is carried out simultaneously in all European Union countries. The methodology of innovation statistics is based on the OECD handbook "Guidelines for Collecting, Reporting and Using Data on Innovation. Oslo Manual". Previous surveys were based on the methodology of the 1992 edition, and from 2008 onwards, CIS was based on the 2005 version. For CIS 2018, the fourth edition of the Oslo Manual (OM4) was introduced, in connection with which changes have been made in the definition of "innovative enterprise" as well as in the classification of innovative activities. According to the new methodology, neither organisational innovation nor market innovation are separate types of innovation but are covered by process innovation. Also the terms "technologically innovative enterprise" and "non-technologically innovative enterprise" are no longer used. Therefore, when comparing recent data with those from previous studies, differences in concepts need to be closely monitored. For time comparison, we recommend using the number of innovation active enterprises, which ensures comparability of the level of innovation.

The frame of the survey covered all enterprises active in 2018 with at least 10 employees in industry (excl. construction) and selected service activities. Enterprises with at least 50 employees were surveyed totally, and a random stratified sample was used for enterprises with 10–49 employees. To evaluate an enterprise's innovativeness, questions were asked about its activities in 2016–2018. An enterprise was considered non-innovative if it had not introduced innovations during this period or did not have any innovative activities. New enterprises established in 2016 or later could be considered non-innovative only if they were established on the basis of pre-existing enterprises or they separated from such enterprises and this process did not involve any innovation. The products and production processes of completely new enterprises are always innovative.

ANALYSIS

"Innovation Survey of Enterprises 2016–2018" helps to review the innovativeness of enterprises and provides input for developing the business sector and innovation policy. Innovation is defined as the development of a new or improved good or service, and as the use of a new production or business process. It can also be a new or improved combination of existing solutions. Innovation does not need to have a specific end result, as it can be abandoned or suspended before that. The main goal of innovation is to provide competitive advantage for the enterprise. The survey period was a good time for innovation because the economy was doing well in those years. The level of innovation in Estonian enterprises was higher than ever in that period: almost three quarters of enterprises were considered innovative.

In the survey, an innovative enterprise is an enterprise that during the reference period introduced on the market a new or improved product (good or service) that differed significantly from the enterprise's previous products, or introduced a new or improved process (core process, i.e. the production of goods or provision of services; logistics; ICT; administrative process; business process; work organisation; marketing process). An enterprise is also considered innovative if during the reference period it was engaged in in-house or outsourced R&D, started innovation but abandoned or suspended it before the end of the reference period, or whose innovation is still ongoing at the end of the reference period.

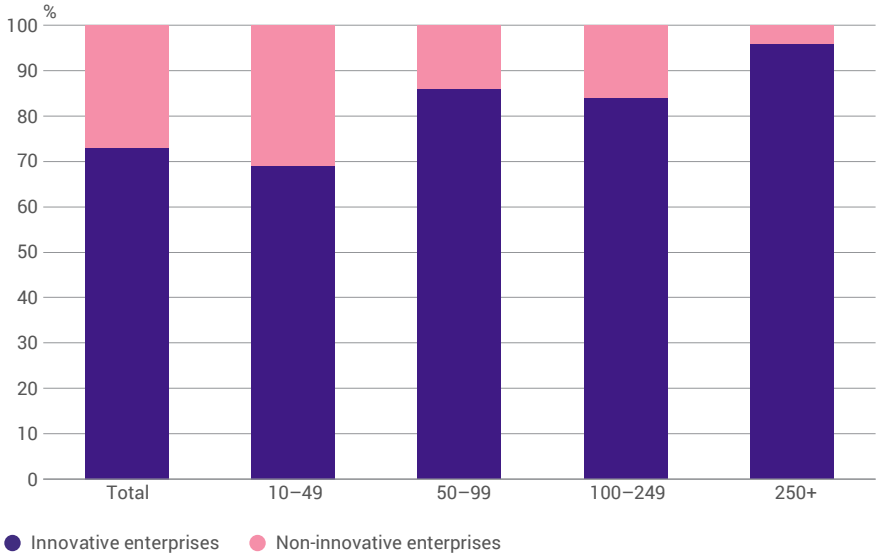
1. Key indicators of innovation

According to "Innovation Survey of Enterprises 2016–2018", 73% of Estonian enterprises were innovative. There were no major differences in innovation by sector – both industry and services sectors accounted for around half of innovative enterprises (industry 50.8%, services 49.2%). By size group, the most innovative were enterprises with over 250 employees – in that group, innovative enterprises accounted for 96%. 84% of the enterprises with 100—249 employees, 86% of the enterprises with 50—99 employees and 69% of the

enterprises with 49 and fewer employees were innovative. Overall, the level of innovation was quite good in all size groups, as more than half of the enterprises in each size group were innovative.

Figure 1. Share of innovative enterprises by number of persons employed, 2016–2018

STATISTICS ESTONIA



Half of the enterprises had abandoned, suspended or on-going innovation, which means that these enterprises did not complete their innovation activity for some reason or their innovation activities are on-going. Completed innovation was reported by 46% of the enterprises, which means that those enterprises had finished their innovation projects of developing new services, goods or processes in the survey period. These indicators do not exclude each other, as one enterprise can have both abandoned and completed innovations. Those indicators also show that innovation is not a one-off rapid change but a much longer process that can take years.

Figure 2. Enterprises by innovation type and sector, 2016–2018

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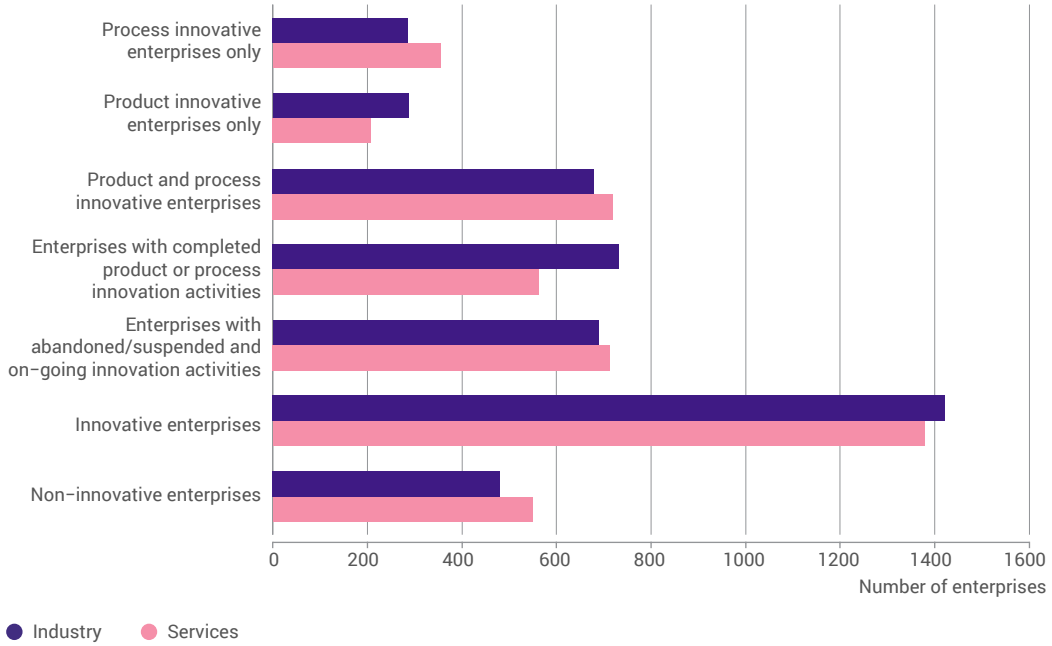

In the innovation survey, a new methodology was used for evaluating innovation, and therefore innovativeness is not fully comparable with previous surveys. In order to compare innovativeness, an indicator “innovation active enterprises – old definition” is used, which is based on the same inputs that were used in the previous

surveys. An innovation active enterprise is an enterprise that during the reference period introduced on the market a new or improved product that differs significantly from the enterprise's previous goods or services, or a new or improved core process, logistics, delivery or distribution method or ICT. An enterprise that was engaged in the reference period in in-house or outsourced R&D is also considered innovation active. Also included are enterprises that started innovation during the reference period but abandoned or suspended it before the end of the period. Compared to the indicator of innovative enterprises, innovation active enterprises exclude enterprises that during the reference period introduced or improved business processes or external relations, human resource management, work organisation or marketing. According to OM3, these process innovations were included partly under separate innovations, such as organisational innovation and market innovation. In OM4, they are included under process innovation. If we compare innovation activeness with previous surveys, it can be said that innovativeness has increased by a fifth compared to the last survey.

Figure 3. Share of innovation active enterprises (old definition) by sector, 2010–2018

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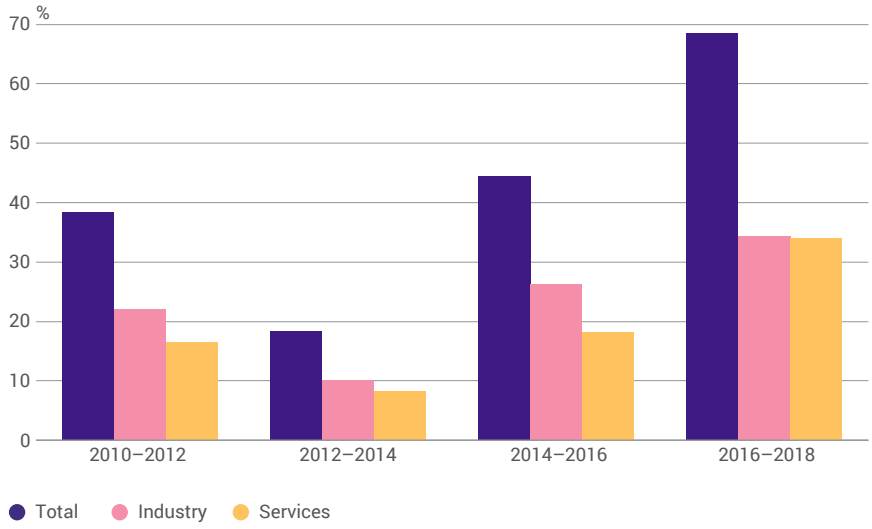

More information:
TDI1601: INNOVATIVENESS OF ENTERPRISES BY ECONOMIC ACTIVITY, 2016–2018
TDI1603: INNOVATIVENESS OF ENTERPRISES BY GROUP OF ECONOMIC ACTIVITIES AND NUMBER OF PERSONS EMPLOYED, 2016–2018

2. Types of innovation

In the reference period, 53.2% of the enterprises were process innovative and 49.4% had product innovation. The most common innovation type within process innovation was core process innovation, i.e. new or improved methods for producing goods or providing services. In terms of product innovation, it was more common to develop improved goods or services, while new goods or services were offered by a third less. Products that were new to the enterprise (innovations new to the enterprise itself but already existing on the market) were offered by 41.2% of the enterprises. Products that were new also for the market were offered by 15.1% of the enterprises.

Almost all kinds of innovation types were slightly more common in large enterprises, which is logical, taking into account the fact that enterprises with 250 and more employees were most innovative. This distribution also shows that it is more common for large enterprises to have many different types of innovation in development at the same time. Small enterprises, however, often need to choose which innovations to spend their resources on. Looking at the information by sector, it is interesting that process innovation is more common in the services sector. Only core process innovation was more used by the industry sector. This shows that enterprises in the industry sector often focus more on product development, while enterprises in the services sector use their resources for various process innovations.

Figure 4. Process innovation types by sector, 2016–2018

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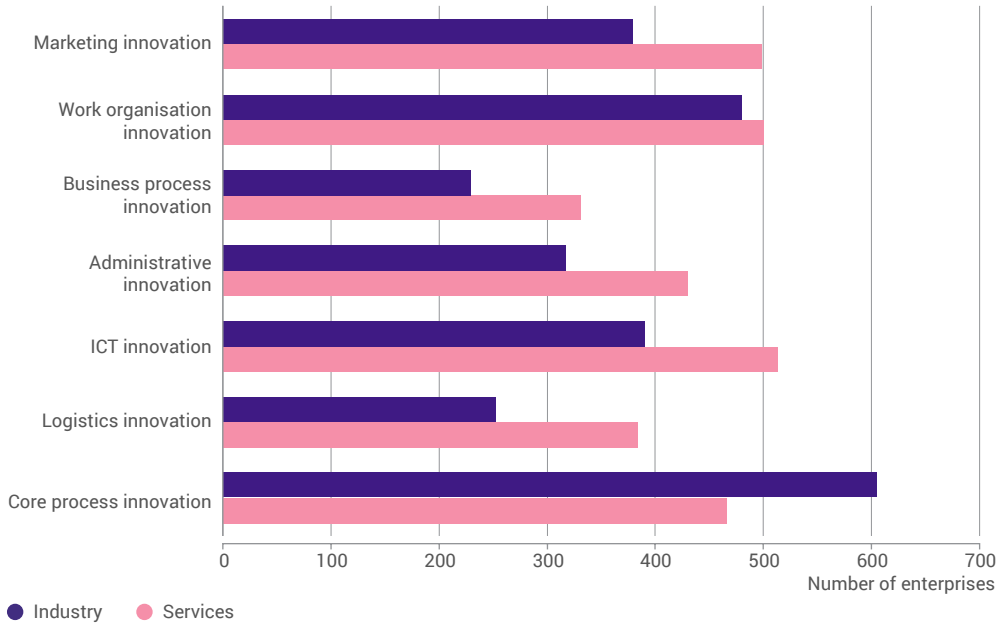

Figure 5. Product innovation types by sector, 2016–2018

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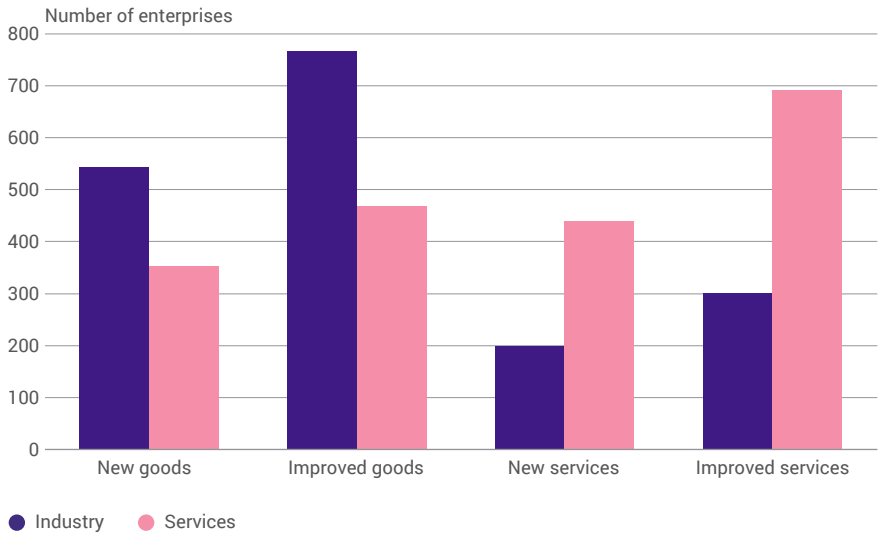

One of the bases for innovation is research and development (R&D), which according the innovation survey is more common in large enterprises – more than half of large enterprises were engaged in R&D activities compared to less than a fifth of small enterprises. 8% of the enterprises had continuous R&D. Most of the enterprises who had outsourced R&D also had in-house R&D activities. R&D is carried out fairly equally in both the industry and services sectors.

Figure 6. Research and development in enterprises by number of persons employed, 2016–2018

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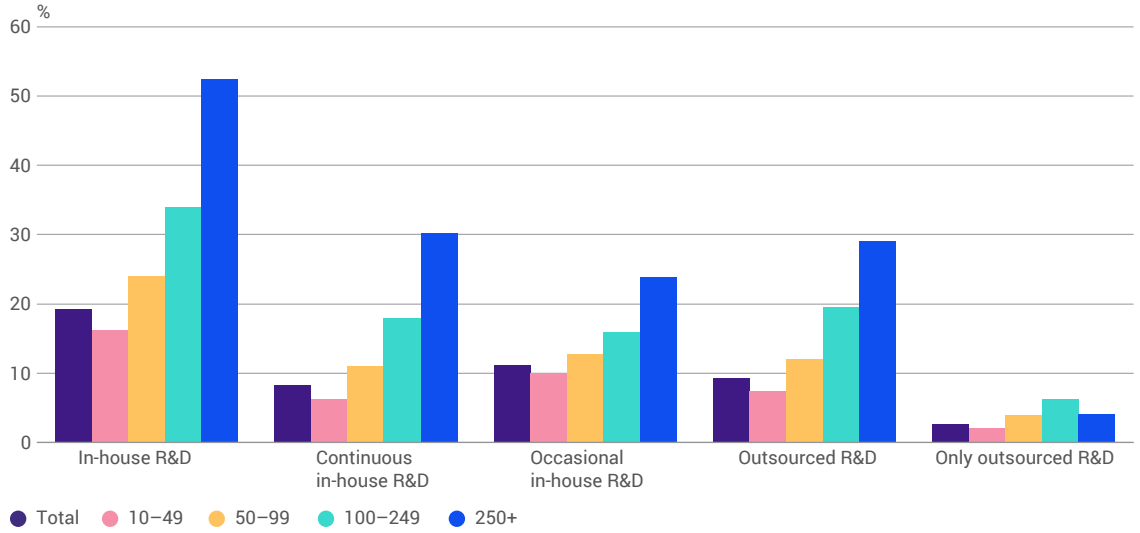

More information:
TDI1605: ENTERPRISES BY TYPE OF INNOVATION (INCLUDING R&D) AND ECONOMIC ACTIVITY, 2016–2018
TDI1607: ENTERPRISES BY TYPE OF INNOVATION (INCLUDING R&D), GROUP OF ECONOMIC ACTIVITIES AND NUMBER OF PERSONS EMPLOYED, 2016–2018

3. Customisation, co-creation and standardised goods

79% of the enterprises focused on standardised goods, which means that they offered ready-made solutions for a wider range of customers. Also co-creation and customisation were used to develop goods and services. Co-creation was used in 35% of enterprises, i.e. those enterprises developed their products together with users or customers by actively including them in the process. Customisation (47% of enterprises) does not include active involvement. In this case, products are developed by the enterprise itself, taking into account the needs of the customers. Customisation and co-creation were mostly used in the industry sector, while standardised goods were most common in the services sector. Customised and co-created products were mostly offered to other enterprises and they accounted for up to 50% of the enterprises' turnover, which means that more than half of the turnover of enterprises came from standardised goods. The share of standardised goods was almost the same in all size groups, but customisation and co-creation were used slightly more in large enterprises that might have more resources for including their customers and considering their needs.

Figure 7. Co-created, customised and standardised products, 2016–2018

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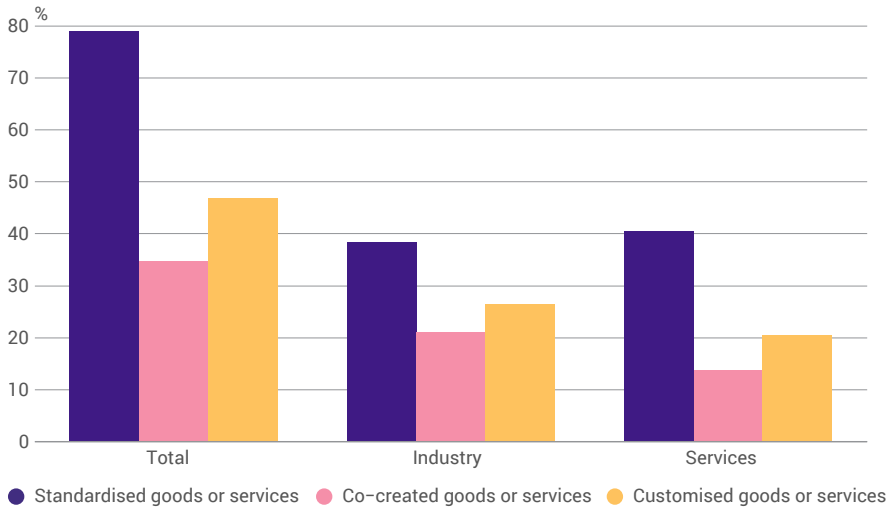

More information:
TDI1609: ENTERPRISES WITH CUSTOMISATION, CO-CREATION AND STANDARDISED GOODS BY GROUP OF ECONOMIC ACTIVITIES AND NUMBER OF PERSONS EMPLOYED, 2016–2018

4. Innovators

Process and product innovations were mostly developed by the enterprise itself. Some product innovations were developed by adapting innovations developed by other enterprises, but this method was not used in process innovation. This is understandable, as processes-related information is kept in-house, while product innovations placed on the market are visible to others outside the enterprise. Nonetheless, new products were usually developed independently by the enterprise itself and co-operation in innovation development was used in only half of the cases.

Figure 8. Innovation development, 2016–2018

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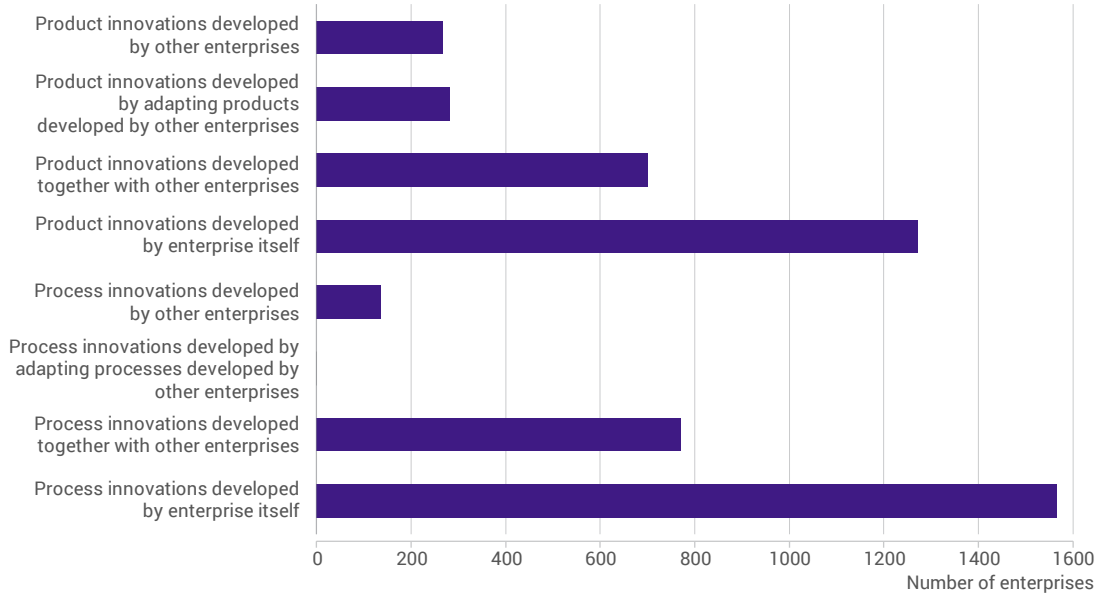


More information:
TDI1611: ENTERPRISES' INNOVATIONS BY INNOVATION DEVELOPER, GROUP OF ECONOMIC ACTIVITIES AND NUMBER OF PERSONS EMPLOYED, 2016–2018

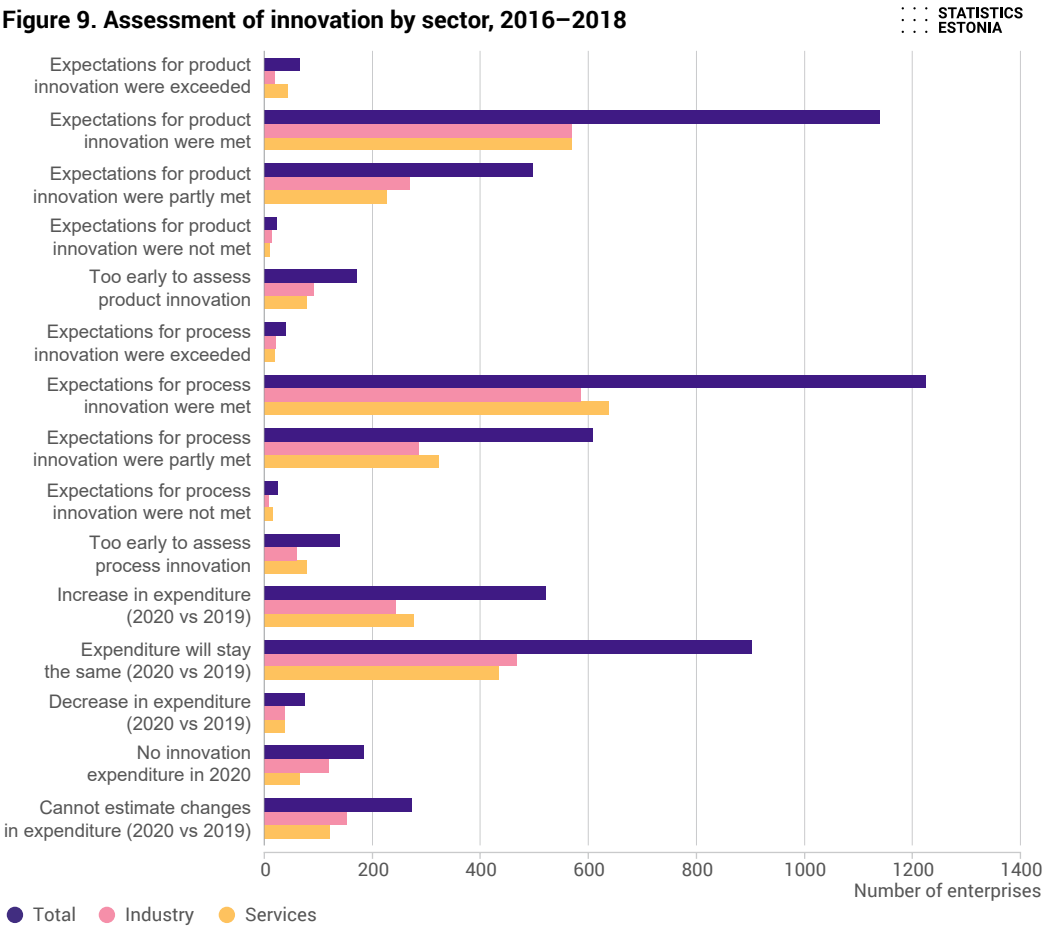
5. Assessment of innovation

Most of the innovations met expectations fully or to some extent. There were very few enterprises that said their innovations did not meet their expectations at all, but at the same time, there were also few innovations that exceeded expectations. Mostly it was assessed that in 2020, innovation expenditures would stay the same or grow compared to 2019. Decrease in innovation expenditures was not widely expected.

There were no big differences in expectations regarding changes in innovation expenditure between economic activity groups. The biggest difference is in the planning of innovation costs – more than twice as many enterprises in the industry sector compared to the services sector did not plan innovation expenditure in 2020.

By size group, assessments were almost the same, but enterprises with over 250 employees said more than others that innovation had met their expectations. Therefore, it can be concluded that in large enterprises innovation is not incidental, but it is more about succeeding and meeting the enterprise's expectations.

Figure 9. Assessment of innovation by sector, 2016–2018

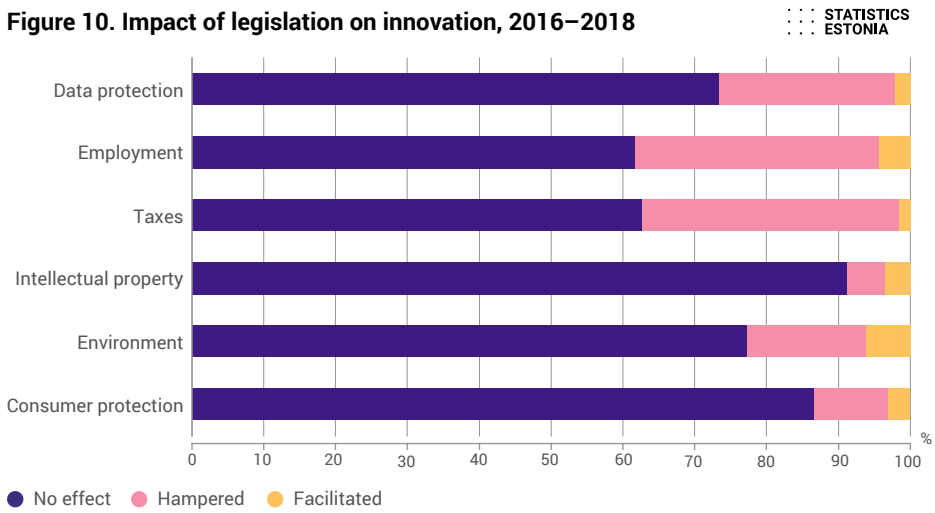


More information:
TDI1613: ENTERPRISES THAT HAVE ASSESSED EXPECTATIONS FOR INNOVATION BY GROUP OF ECONOMIC ACTIVITIES AND NUMBER OF PERSONS EMPLOYED, 2016–2018

6. Impact of legislation

From legislative impacts, the most hampering for innovation was tax and employment related legislation. Not only Estonian legislation but also the legislation of other countries and of the European Union might affect the innovation activities of enterprises. 3.5% of enterprises found that legislation facilitated their innovation activities. However, most enterprises (76%) found that legislation did not have any impact on their innovation activities.

Figure 10. Impact of legislation on innovation, 2016–2018



More information:
TDI1615: ENTERPRISES THAT HAVE ASSESSED THE IMPACT OF LEGISLATION ON INNOVATION BY INNOVATIVENESS, GROUP OF ECONOMIC ACTIVITIES AND NUMBER OF PERSONS EMPLOYED, 2016–2018

7. Strategic activities

The most important in terms of strategic activities in enterprises were focusing on the established customer groups and high quality. The most significant work organisation method was brainstorming to improve the enterprise. This is the same for innovative and non-innovative enterprises, which shows that for most enterprises, it is important to focus on the established customers, high quality and brainstorming. The industry and services sectors rated the strategic activities similarly. Overall, it can be said that innovativeness does not depend on the enterprise's strategy, but is rather influenced by other factors.

Figure 11. Improtance of work organisation methods, 2016–2018

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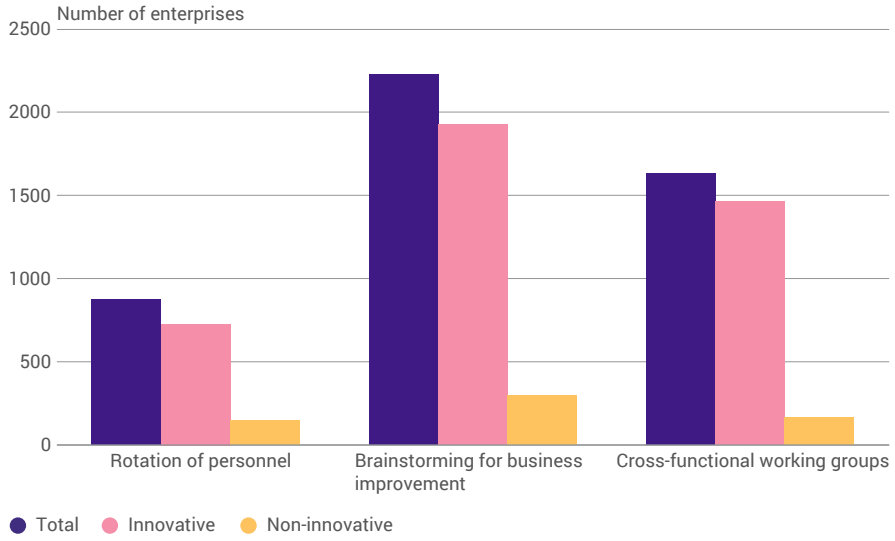

Figure 12. Importance of strategic activities by sector, 2016–2018

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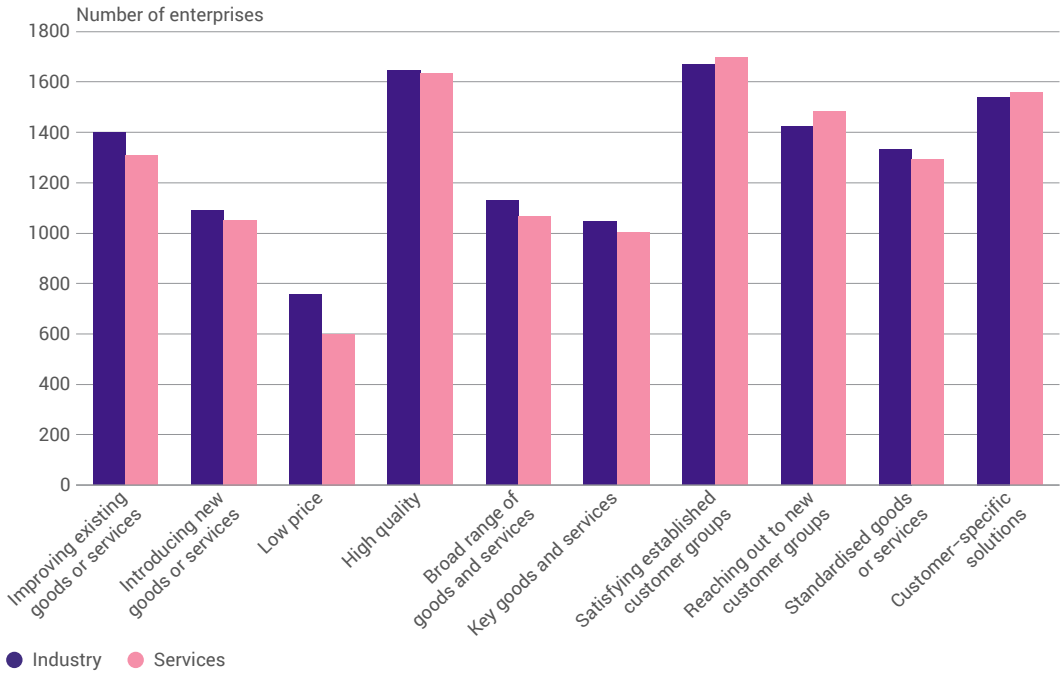
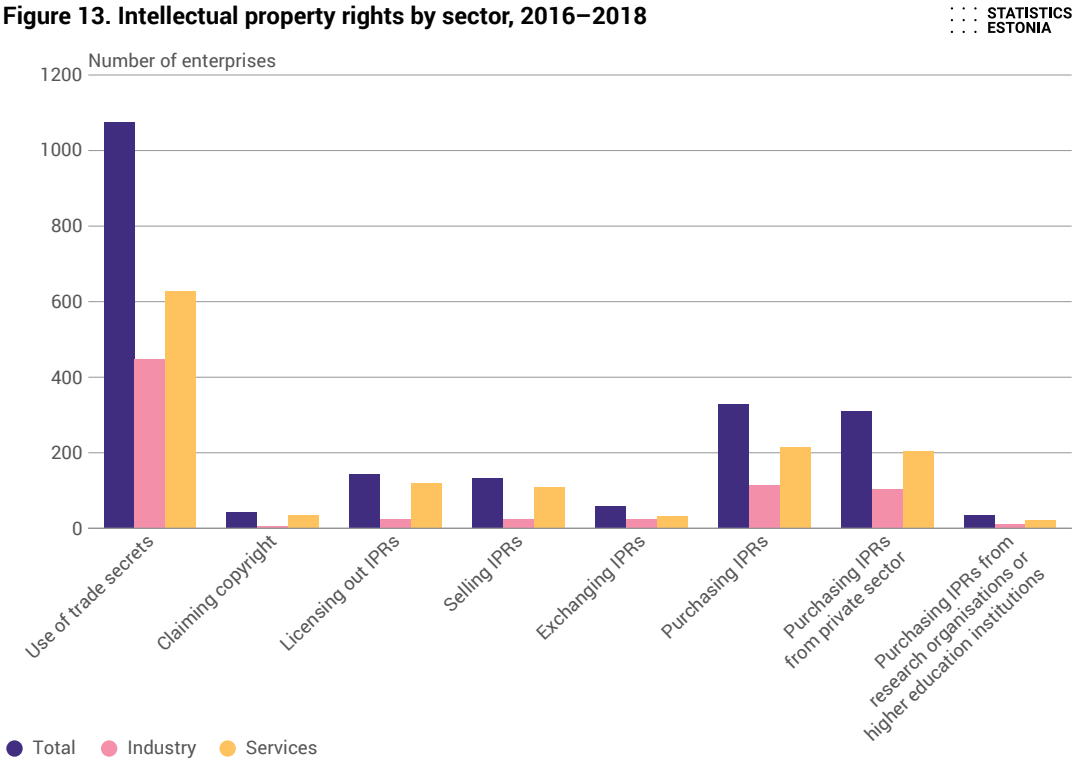


More information:
TDI1617: ENTERPRISES THAT HAVE ASSESSED STRATEGIC ACTIVITIES (INCLUDING METHODS FOR ORGANISING WORK) BY INNOVATIVENESS, GROUP OF ECONOMIC ACTIVITIES AND NUMBER OF PERSONS EMPLOYED, 2016–2018

8. Intellectual property rights

Of intellectual property rights (IPRs), enterprises mostly used trade secrets, which protect the kind of intellectual property that cannot be protected by patents or copyrights. IPRs were mainly purchased from the private sector and relatively little from universities or research institutions. Intellectual property is mainly used and transactions are made rather by innovative enterprises. Intellectual property is more common in the services sector.

Figure 13. Intellectual property rights by sector, 2016–2018



More information:
TDI1619: ENTERPRISES WITH TRANSACTIONS IN INTELLECTUAL PROPERTY RIGHTS (IPR'S) BY INNOVATIVENESS, GROUP OF ECONOMIC ACTIVITIES AND NUMBER OF PERSONS EMPLOYED, 2016–2018

9. Technical services, acquisition of capital goods and knowledge

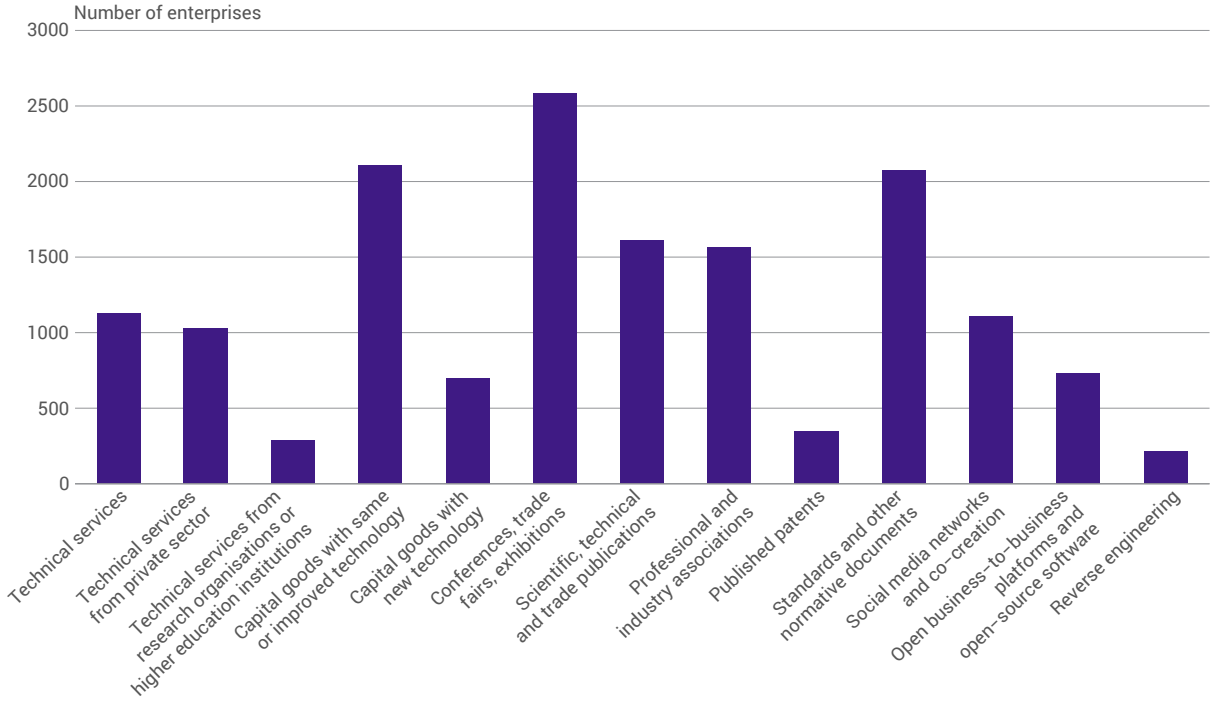
One way to support successful innovation are technical consultations, i.e. purchasing all kinds of technical knowledge and know-how, which can be acquired from the private sector and research institutions. Enterprises mostly preferred to purchase consultations from the private sector and purchases from research institutions or higher education institutions accounted for 72% less.

In purchasing machinery, the same or improved technology was preferred to completely new technology. This shows that the existing technology is good enough for enterprises and they mostly contribute to improvements of the machinery. On the other hand, completely new technology might simply be too expensive to purchase.

To acquire knowledge, most enterprises prefer conferences, trade fairs or exhibitions, standards and other normative documents. Least used were published patents and reverse engineering, which is understandable because both are quite specific and might not be relevant for every economic activity.

Figure 14. Acquisition of technical services, capital goods and knowledge, 2016–2018

STATISTICS ESTONIA



More information:
TDI1621: ENTERPRISES THAT HAVE ACQUIRED MACHINERY, TECHNICAL SERVICES AND KNOWLEDGE BY INNOVATIVENESS, GROUP OF ECONOMIC ACTIVITIES AND NUMBER OF PERSONS EMPLOYED, 2016–2018

10. Co-operation

In the survey period, 43.8% of the enterprises used co-operation, but only 20% used co-operation in innovation and 17% co-operation in R&D. Most of the co-operation took place with the enterprise's partners and enterprises outside the enterprise group. Co-operation with the public sector was quite modest as the private sector was the most preferred partner.

Mostly Estonian universities and higher education institutions were co-operated with mainly by enterprises in the industry sector, even though the overall level of co-operation in the industry and services sectors was almost the same. There was relatively little co-operation with foreign universities.

Figure 15. Co-operation partners, 2016–2018

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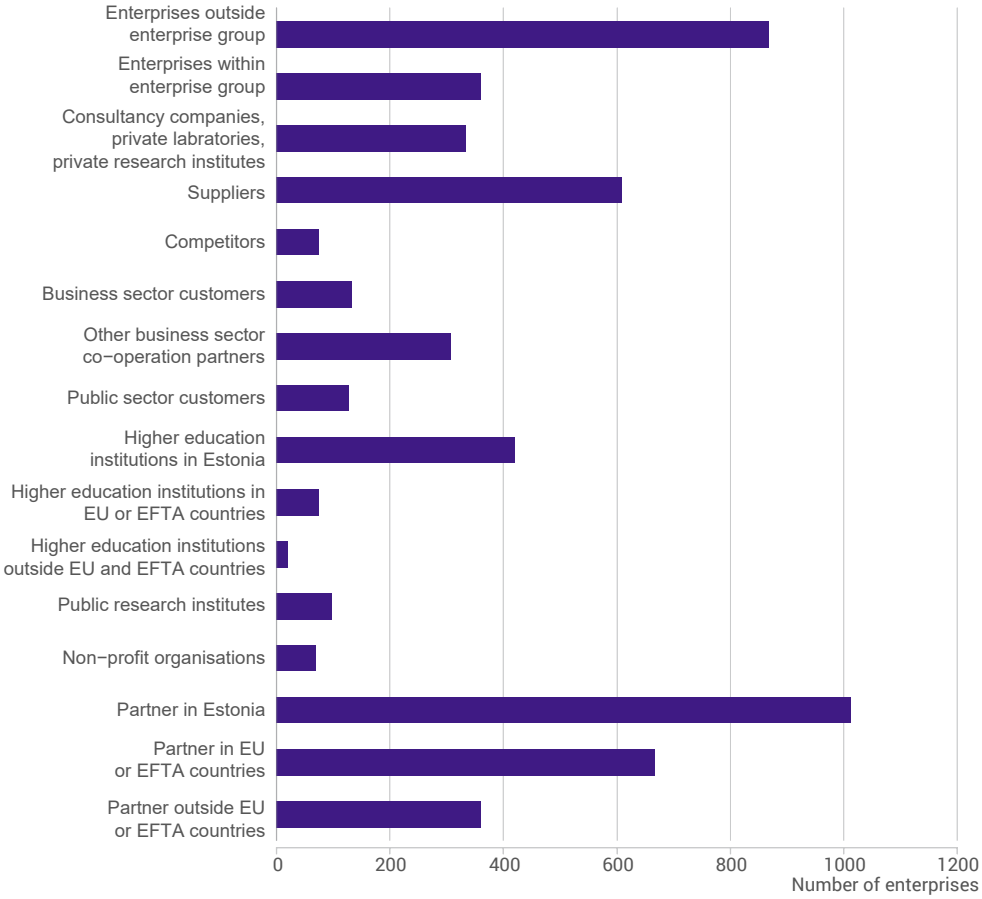

Co-operation has a clear connection with the enterprise's size. The larger the enterprise, the more co-operation there is in innovation, R&D and other business activities. This trend is also seen in the distribution of most co-operation partners, so it can be concluded that co-operation is more important in large enterprises and they also have more co-operation partners than small enterprises.

Figure 16. Co-operation types by number of persons employed, 2016–2018

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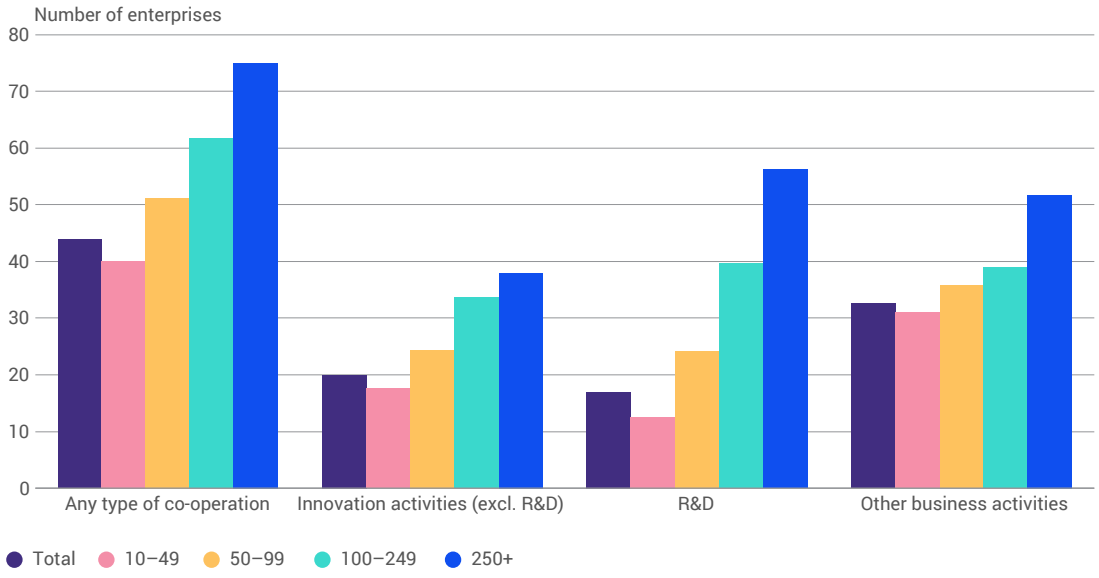


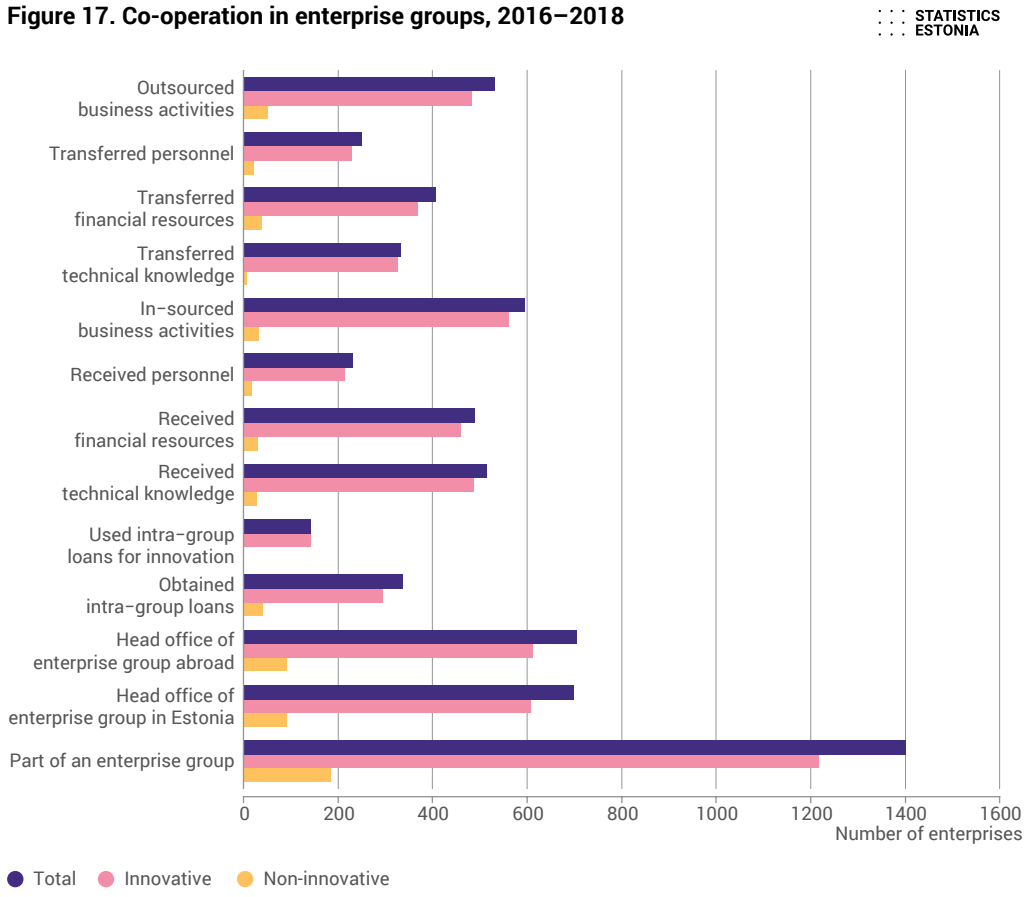
More information:
TDI1623: ENTERPRISES' TYPE OF CO-OPERATION BY INNOVATIVENESS, GROUP OF ECONOMIC ACTIVITIES AND NUMBER OF PERSONS EMPLOYED, 2016–2018

11. Enterprise groups

In the survey period, 37% of the enterprises were part of an enterprise group, and half of them had their head office in Estonia. Inside the enterprise group, most received from other enterprises were technical knowledge and business services. The share of financial resources and loans was also quite high. Of the loans received, less than half were used for innovation. Other enterprises inside the enterprise group were also offered mostly business services and financial resources.

Being part of an enterprise group is more common for the services sector and for large enterprises. In the case of small enterprises, affiliation to an enterprise group was less common, but it grew with the enterprise's size.

Figure 17. Co-operation in enterprise groups, 2016–2018



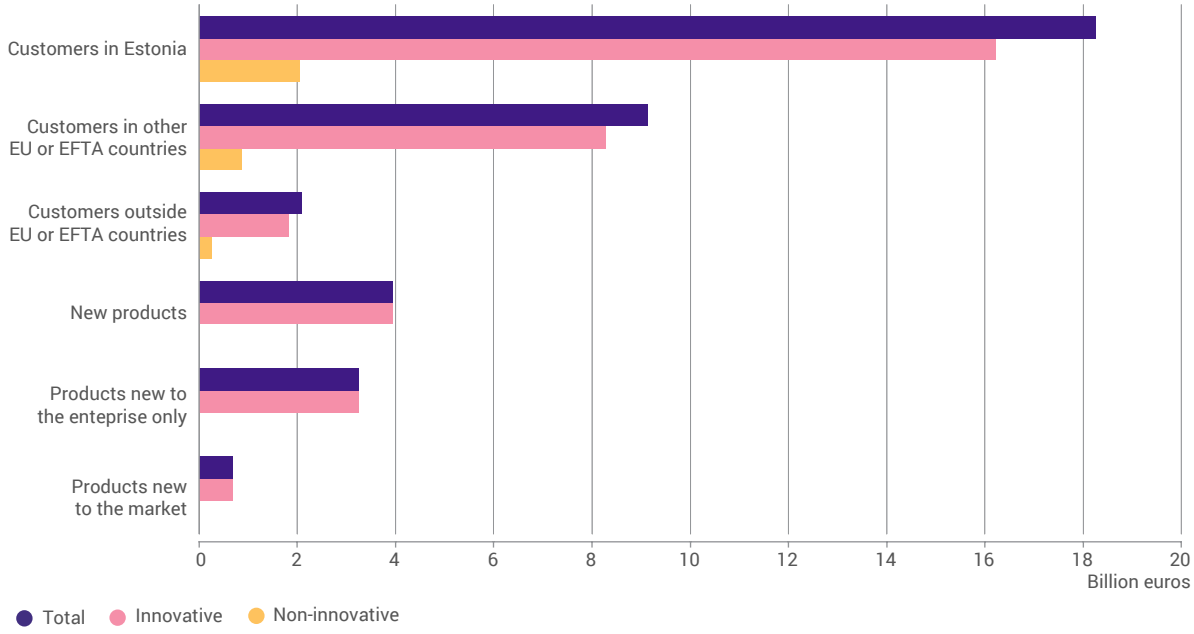
More information:
TDI1625: AFFILIATION AND CO-OPERATION OF ENTERPRISE GROUPS BY INNOVATIVENESS, GROUP OF ECONOMIC ACTIVITIES AND NUMBER OF PERSONS EMPLOYED, 2016–2018

12. Distribution of turnover

Turnover from new products accounted for 15% of innovative enterprises' turnover (new products were sold for 3,934 million euros). Compared to the previous survey, the share of turnover from new products remained the same. Most of the turnover from new products came from products that were new only for the enterprise itself – 3,243 million euros. This is understandable, given that most of the enterprises' new products were new only for the enterprise and already existed on the market. The biggest share of turnover came from sales to Estonian customers – 18,264 million euros. Enterprises selling abroad were mostly industrial enterprises; in the services sector, the main focus was on Estonian customers.

Figure 18. Distribution of turnover, 2016–2018

STATISTICS ESTONIA



More information:
TDI1627: ENTERPRISES' DISTRIBUTION OF TURNOVER BY MARKET, INNOVATIVENESS, GROUP OF ECONOMIC ACTIVITIES AND NUMBER OF PERSONS EMPLOYED, 2016–2018

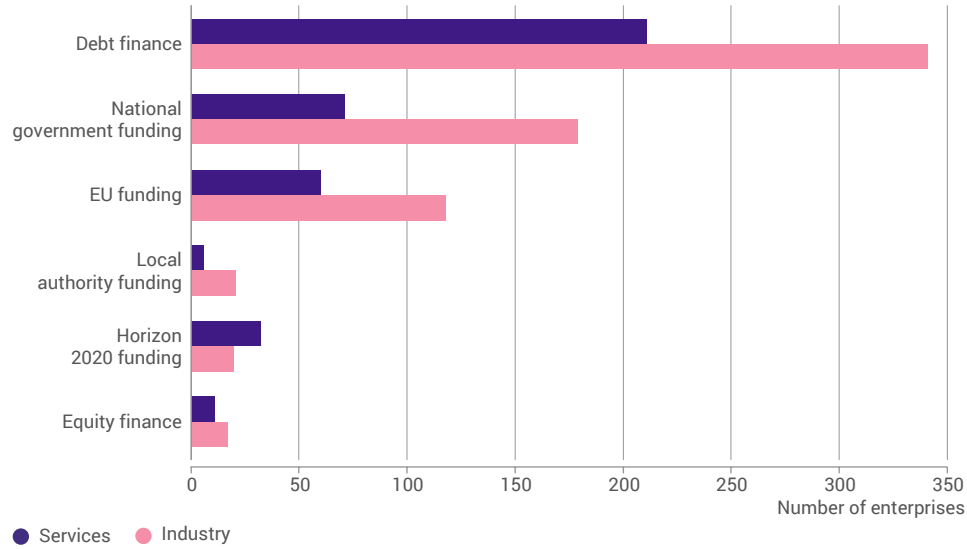
13. Innovation funding

Most of the enterprises used loans to provide additional financing for their activities, but for innovation, loans were used by less than half of the enterprises who acquired them. To finance innovation, there are many subsidies, of which most used by the enterprises were subsidies of the national government and of the European Union. Least used was funding from the European Union's Horizon 2020 programme.

For the most part, enterprises of the industry sector took advantage of additional opportunities to finance innovation. To some extent, also non-innovative enterprises used additional innovation financing, but for some reason this has not been enough for the enterprise to be considered innovative.

Figure 19. Innovation funding, 2016–2018

STATISTICS ESTONIA



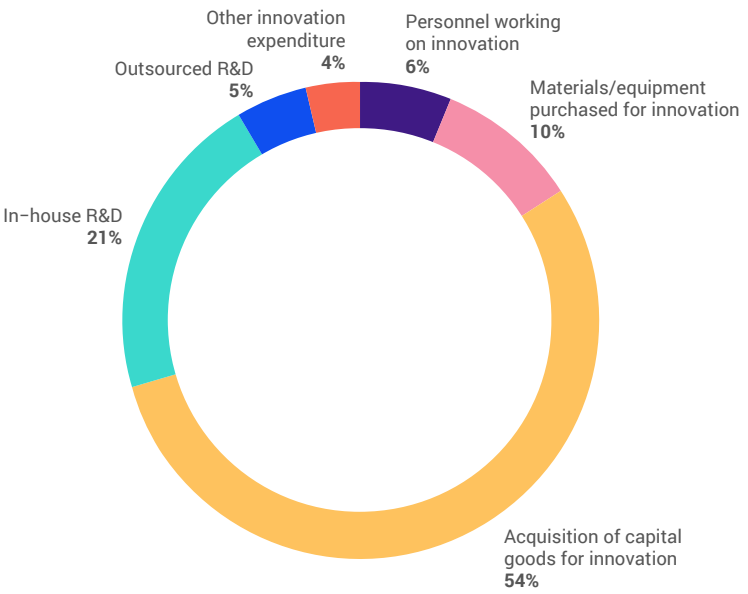
More information:
TDI1629: INNOVATION FUNDING BY INNOVATIVENESS, GROUP OF ECONOMIC ACTIVITIES AND NUMBER OF PERSONS EMPLOYED, 2016–2018

14. Enterprises' expenditure

Enterprises' total innovation expenditure in 2018 was 951,329,700 euros, of which more than half was contributed by the industry sector. Capital goods accounted for more than half of all innovation expenditure. In-house R&D expenditure accounted for 21% of all innovation expenditure, which is significantly higher than the share of expenditure spent on outsourced R&D. This shows that enterprises prefer to carry out R&D activities inside the enterprise and buying the service from others is not so common.

Figure 20. Innovation expenditure, 2018

STATISTICS ESTONIA



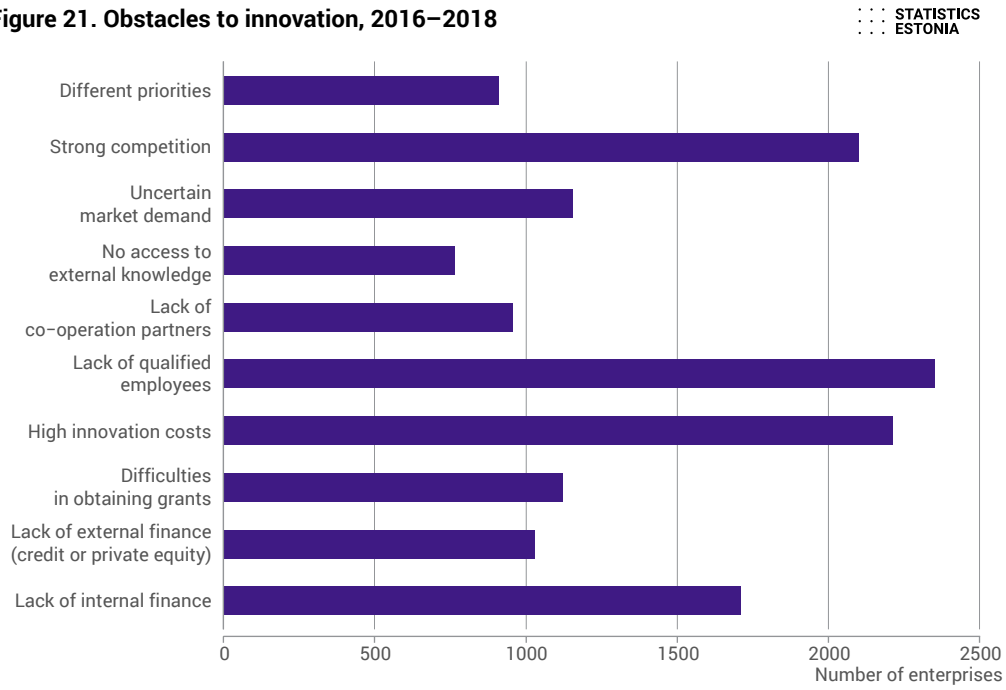
More information:
TDI1631: ENTERPRISES' EXPENDITURES BY TYPE, GROUP OF ECONOMIC ACTIVITIES AND NUMBER OF PERSONS EMPLOYED, 2016–2018

15. Obstacles to innovation

Many obstacles to innovation come from inside the enterprise. The biggest such factors were the lack of qualified employees and high competition on the market. Therefore, on the one hand, innovation is important for enterprises to stay in the competition, but on the other hand, competition can also be one of the biggest obstacles to innovation. The least hampering factors for innovation were different priorities of the enterprise and difficulties in obtaining public grants.

This shows that other priorities within the enterprise do not hamper innovation and do not necessarily exclude it. Neither is getting subsidies a significant issue, which may mean that enterprises have good access to them, or it might also show that enterprises do not need or want subsidies for innovation activities.

Figure 21. Obstacles to innovation, 2016–2018



More information:
TDI1633: ENTERPRISES THAT HAVE ASSESSED FACTORS HAMPERING INNOVATION BY INNOVATIVENESS, GROUP OF ECONOMIC ACTIVITIES AND NUMBER OF PERSONS EMPLOYED, 2016–2018