

Executive summary

The software industry is an example of a young sector that has grown into an important business globally. The overall importance of the sector is nevertheless difficult to assess, because also physical products more and more often contain a significant portion of software. This so-called embedded software and its monetary value are not recorded as such in any of the current statistics. The value of embedded software* is important, and it has been estimated in previous studies to be even greater than the value of the software sold as independent software products.

This report examines the software development of Finnish industrial companies. The main research questions are:

- ▶ In which manufacturing sectors is software development carried out?
- ▶ What is the number of software developers in industrial companies?
- ▶ How much of the value added of industrial products is derived from software?
- ▶ What kind of role will software development play in Finnish industry in the coming years?

Previous surveys do not offer a comprehensive assessment of the importance and value of the software of industrial companies operating in Finland. This shortcoming is attributable to the fact that the data used in the studies are not derived from a statistical sample. The data used in our study, however, are compiled from a statistical sample, which is used as a means for calculating figures for the Finnish economy as a whole. The main findings of this report are summarized below. Of the manufacturing companies operating in Finland and employing at least 10 people, 13 per cent had their own software development at the end of 2010. When the software expertise of subcontractors is

* Embedded software is indivisibly integrated to a physical device to form a product supplied as an entity.

included, some 30 per cent of industrial enterprises benefit from either their own or subcontractors' software expertise. Finnish industrial companies themselves employ about 19,500 software developers globally (in addition to approximately 17,600 man-years via subcontractors, making a total of 37,100 people globally). Of the industrial companies' software developers about 9,400 worked in Finland (in addition to approximately 6,400 subcontracted man-years, making a total of 15,800 persons in Finland). In the companies engaged in developing their own software, an average of about 2/3 of the developers made embedded software while over 20 per cent focused on development of software for internal use. On average about 12 per cent of the enterprises' software developers were geared to stand-alone software products and about 2 per cent of the workforce was subcontracting for other companies. It is noteworthy, however, that there are significant differences in software development in different sectors in terms of volume and types of software.

An average of 49 per cent of the turnover of companies engaged in software development was dependent on software. In terms of euros, some 39 billion euros, i.e. about one-third of all industrial companies'

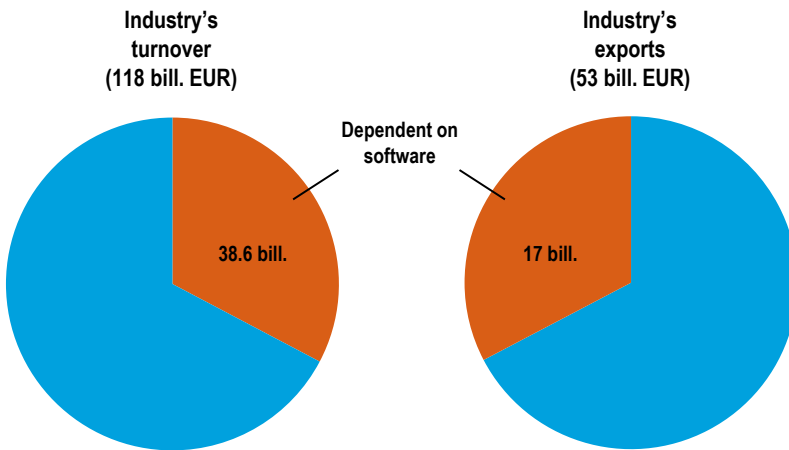


Figure A1
 Dependence of Finnish industrial companies' turnover on software (a) and (b) dependence of industrial companies' exports on software

turnover, came from products dependent on software (Figure A1). As regards exports, the corresponding figure is 17 billion euros, i.e. one third of goods exported. Industrial products nevertheless also include physical parts and components, i.e. the total value of these products does not stem merely from software. For this reason, the value added of software is calculated separately. The results show that the software generates value added amounting to a total of 17 billion euros in industry's turnover. The corresponding figure for exports is about 8 billion euros.

The results showed, however, that a few key players account for the bulk of industry's software development. Of the people engaged in industry's software development in Finland, more than 70 per cent are working for one of the four largest companies in terms of size. A similar concentration also applies to software-dependent turnover and value-added based on software.

Many traditional manufacturing industries anticipate that software development will become increasingly important in the future (Figure A2). It is worth noting, however, that there are considerable differences in the product life cycles between sectors. In some sectors

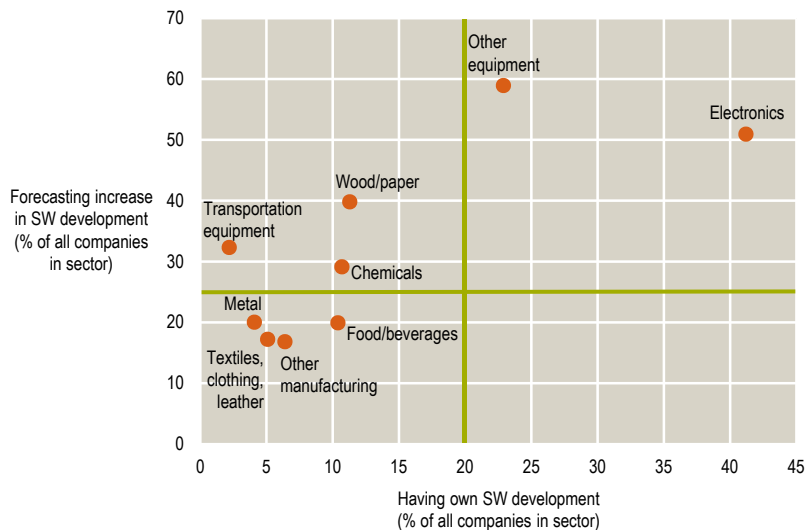


Figure A2
Existing own SW development and forecast increase of SW development

products are renewed faster, while in others the product life cycles are decades long. This will have a major impact also on how the importance of software changes.

Protection of software-related expertise will become essential as the volume of software increases. In sectors benefitting significantly from software, software patents have been important and will become increasingly so. This underscores the importance of managing software-related intellectual property rights in the industries where software plays a growing role.