

# User innovators and their influence on innovation activities of firms in Finland

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**User innovators and their influence on  
innovation activities of firms in Finland**

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# **User innovators and their influence on innovation activities of firms in Finland**

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## **Abstract:**

Statistics Finland added questions to the Finnish Community Innovation Survey (CIS) for 2010 on the importance of user innovation. For firms engaged in innovation activity during the three year period, 2008–2010, 30 per cent reported that user modified products were of high or medium importance to them. For user developed products the figure was 13 per cent. These firms, compared with those that did not rank user innovation as highly, had a higher propensity to produce new to the market product innovations and they were more active in producing product innovations by themselves, by collaborating with others, by adapting and adopting products from other firms, and by using products from other firms. The results for user modified and user developed products were found to be consistent with responses to a standard CIS question on whether the product innovation of the firm was done by adapting products developed by others, but the results were not sufficient to say that responses to this question were a consequence, principally, of user innovation. The wider implications of the findings are discussed along with the need for confirmation of the findings in other countries. Both Portugal and Switzerland have incorporated the Finnish CIS 2010 questions into their CIS 2012 and have added additional questions which may show that existing CIS data provide information on the presence of user innovation.

**Keywords:** user innovation, product innovation, knowledge transfer

**JEL Codes:** D22, O31, O33

## 1. Introduction

This paper introduces new data and analysis of the Finnish Community Innovation Survey (CIS) for 2010, reviews the findings in light of the literature on user innovation and makes recommendations for future work. The focus is on user innovation and any influence it may have on firms that produce new or significantly improved goods or services or means of getting the goods or services to the market. The roles of users in Finland, as sources of information for innovation and as potential collaborators, or co-innovators, have been discussed in Niemi and Kuusisto (2013). This paper draws upon the report of the Finnish CIS 2010 (Statistics Finland 2012), the first report on the new questions added to the survey to probe the role of users (Niemi and Kuusisto 2013) and new analysis of the original data.

The definition of innovation in firms as given in the Oslo Manual (OECD/Eurostat 2005) is well known, and is used in the CIS, which is a partial implementation of the Manual. However, the definition is presented in the next section as a reminder of the constraints it imposes upon measurement and as a way of introducing the definition of user innovation. In that discussion, problems with regarding consumers as user innovators are discussed and that is followed by a short section on why innovation happens to provide context for the discussion.

Once the concepts and definitions are in place, the new questions that were added to the Finnish CIS 2010 are introduced and this is followed by a discussion of the resulting data and the inferences that can be drawn from analysis.

As the study of user innovation in firms is an on-going activity, once conclusions are drawn, suggestions are made for future work.

## 2. Definitions

In Section 2.1, the definition of innovation used in OECD and EU countries for measurement purposes is presented and then, in Section 2.2, a definition of user innovation follows. This raises a question about the kind of user that can innovate for the purpose of official statistics and a solution is proposed to deal with problems that arise in this discussion.

### 2.1 Definition of innovation

For statistical purposes, the definition of innovation is taken from the Oslo Manual (OECD/Eurostat 2005). It is the following.

An **innovation** is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations (OECD/Eurostat 2005, para. 146).

‘Implementation’, used in the definition, links the activity of innovation to the market.

A common feature of an innovation is that it must have been *implemented*. A new or improved product is implemented when it is introduced on the market. New processes, marketing methods or organizational methods are implemented when they are brought into actual use in the firm's operations (OECD/Eurostat 2005, para. 150).

For the Oslo Manual definition, an innovation does not have to be used, or be successful and it does not have to be good, or inclusive, or pro-poor. A product innovation just has to be 'introduced on the market'. For a process change to be an innovation it must provide a better way of getting a product to market. The key issue for innovation is the introduction of the product on the market or facilitating that introduction.

In the rest of this section 'process innovation' will combine the process which transforms inputs to outputs, the process of organizational change and the use of business practices, and the process of market development or the finding of new markets. Once the discussion moves to the CIS 2010 data, 'process' will be restricted to transformation of inputs to outputs only.

The Oslo Manual also provides a classification of novelty associated with innovation (OECD/Eurostat 2005:57). An activity which is 'new to the firm' is the lowest level of novelty to qualify as an innovation. Other levels of novelty are 'new to the market' or 'new to the world' and not all are used in CIS. As an example, a firm is a process innovator if it acquires existing technologies or practices that are new to the firm.

## 2.2 Definition of user innovation

'Users' are firms or individual consumers that expect to benefit from using a good or a service (von Hippel 2005:3). 'User innovation' happens when a user changes a good or service to enhance the benefit provided but that change must, according to the Oslo Manual, have a link to the market for this activity to be innovation.

Strictly interpreted, the Oslo Manual definition of innovation excludes consumers from being innovators and excludes their activities from official statistics. Gault (2012) examines how the definition of innovation could be modified to admit consumers that change goods or services for their own benefit and the recommendation is that the sentence in paragraph 150 of the Oslo Manual be changed from "A new or improved product is implemented when it is *introduced on the market*.", to "A new or improved product is implemented when it is *made available to potential users*." The importance of the introduction of a product to the market (or to potential users), or facilitating the introduction, remains as a fundamental characteristic of innovation. This is the definition of user innovation for consumers that will be used in the rest of the paper.

## 3. Why engage in user innovation?

Bogers et al. (2010: 866), in a review of users as innovators, suggest that there is 'significant scope to develop a theory of why users innovate'. In the case of firms there must be a distinction between product innovation and process innovation (broadly interpreted, see above). The firm, as a process user, will improve processes to get products to market in better ways and this is entirely consistent with firm strategy. That is why firms, as users, innovate. User innovation by firms applies to intermediate consumption by the firm as well as to capital investment in its

production infrastructure. Firms that buy off-the-shelf technologies or practices which are new to them are process innovators, at the lowest level of novelty, new to the firm. They are not user innovators.

Turning to consumers, there are indeed some conceptual challenges. Von Hippel (1988, 2005) makes the point that consumers or end users change goods or services for their own benefit and this activity is referred to as user innovation. According to the Oslo Manual the activity is not innovation as there is no connection to the market. With the Gault (2012) modification the activity could be innovation if the product is made available to potential users. Responding to the challenge of Bogers et al. (2010), Kuusisto et al. (2013) examine consumers as user innovators and there it is reported that while 5 per cent of the population observed changes or creates goods or services for their own benefit, a significant majority do not make the product, or the knowledge related to the product, available to potential users, some make the knowledge available to a peer group or community of practice, fewer make it available to a producer firm and fewer still start their own business. The four populations just identified are open to quite different policy interventions. Some policies, for the start up of new firms and, to some extent, the use of user innovations by producer firms are part of existing industrial or innovation policy. The policy issues are discussed at greater length in Kuusisto et al. (2013) and the point to be made here is that, for the purpose of this paper, both firms and consumers can be regarded as user innovators and are subject to the new questions added to the Finnish CIS 2010.

#### **4. New questions in the Finnish CIS 2010**

Given the interest in user innovation, and especially in Finland, the Finnish statistical office added questions on user innovation to the 2010 CIS which allowed analysis of the influence of user innovation on innovation within firms.

Niemi and Kuusisto (2013) provide a comprehensive discussion of the new questions, including those related to users as a source of information for innovation and users as collaborators. Here, only the questions on user innovators are discussed.

There were two questions about the degree of importance of user innovation under the heading “Utilization and commercialization of products developed or modified by users”. They were:

- Users modified existing products, and your enterprise further developed and commercialized it; and
- Users developed a new product and your enterprise further developed and commercialized it.

The respondent was asked to rate the importance of the activity on a four point Likert scale: high; medium; low; and not used. The results of these questions are discussed in the next section.

As a result of adding the questions to the CIS 2010 in Finland, Portugal and Switzerland decided to add the same questions to their CIS 2012, along with two additional questions, English paraphrases of which follow<sup>1</sup>.

1. During the three years 2010-2012, did your enterprise introduce new or significantly improved products (goods or services) that were partly or entirely developed by customers and users of the product? Y/N
2. If yes, what per cent of the total corresponds to new or significantly improved products (goods or services) put on the market by your enterprise during the three years 2010-2012.

As data resulting from these questions are analysed, a more comprehensive view of the user's role in firm innovation will emerge. This is discussed further Section 6.

## **5. The data from Finland's CIS 2010**

### **5.1 Products modified or developed by users are significant.**

The aggregate data are found in the survey report (Statistics Finland 2012), Appendix 46 and data, for the user innovation results only, follow in Table 1. New data from Statistics Finland for the population of firms that are product innovators are introduced in this Section.

[Table 1 here]

What is clear is that most firms engaged in innovation activities did not use products modified by users as part of their innovation activities and that was even more significant for products developed by users. However, for all industries surveyed the population estimate was that 30 per cent of firms engaged in innovation activities did use products modified by users and found this of high or medium importance (compared with 13 per cent for products developed by users).

The comparable population estimate for firms that were product innovators, and could also be engaged in other innovation activities, was 36 per cent for those that used products modified by users (compared with 16 per cent for products developed by users). The higher results for firms that were product innovators is consistent with the expectation that firms that are product innovators would be more interested in using products modified or developed by users than firms in the general population where only some were product innovators.

The level of importance assigned by firms to products modified or developed by users is an important finding. However, what it does not reveal is the classification of users into firms as users or consumers as users and, given that the CIS is a business survey, there is no way, given the present questions, to retrieve this information without conducting a follow-up survey or a case study. Based on earlier work in Canada, which involved a follow-up survey (Schaan and Uhrbach 2009), for a particular set of manufacturing technologies, about 20 per cent of firms modified technologies that they were adopting and another 20 per cent adopted by developing the technology they needed themselves. The remaining firms bought off-the-shelf technologies which, if they were new to them, made them process innovators but not user innovators. In Schaan and Uhrbach (2009), there were no questions about the source of the technologies adopted; there were questions about the diffusion of the technologies modified or developed. This is also discussed by Gault and von Hippel (2009).



## 5.2 A correlation between the importance of user modification or development of products and a higher level of novelty

Another important finding arising from the new questions on user innovation is that there is evidence of a correlation between firms that rate user innovations as of high or medium importance and firms that introduce new or significantly improved products that are new to the market rather than just new to the firm.

From the data in Table 2 it is clear that firms that rank user modified products as of high or medium importance have a higher propensity to produce product innovations that are new to the market of the firm rather than product innovations that are just new to the firm. As new to the market product innovations provide a higher visibility to the firm, which may enhance its competitiveness, there is a case for exploring the correlation further and considering how policy could promote the incorporation of user innovations by firms. Of course a correlation is not a causal link and further research is needed to understand the results. It may be that firms that are capable of producing new to the market product innovations, as a matter of course, examine and learn from what users do to their products and, to a lesser degree, take note of products developed by users.

[Table 2 here]

## 5.3 Factors influencing the recognition of the modification or development of products by users

Niemi and Kuusisto (2013) show that firms that engage in product and process innovation and do R&D in-house, have a higher propensity to rank products developed by users, higher than firms that do no R&D or engage in no innovation activities. They also show that size is a factor as firms with 10-49 employees give a higher high and medium importance ranking to users that modify their products (31 per cent) than firms in the 50-249 employee range (28 per cent) or the 250+ range (26 per cent). For user developed products, the corresponding figures are (13 per cent), (13 per cent) and (12 per cent) and there is little evidence of size dependence. However, the ranking of high or medium importance of user modified products does decline as the size of the firm increases, suggesting that smaller firms are capitalizing on the work of users.

This suggests that the presence of an R&D unit in a firm and the size of firm are factors for consideration in any follow-up work. In addition, there may be signals in existing CIS questions that could be used to probe the importance of user innovation in existing survey data. That is the subject of the next section.

## **6. Are there other signals of user innovation in CIS results?**

### 6.1 Using CIS questions

Niemi and Kuusisto (2013), in their conclusions, suggest that the results of the Finnish CIS 2010 could be used to probe a relationship between firms giving a high rating to products modified or developed by users and the responses to the 'Who did it' question that follows both the questions in the survey on product and on process innovation. The question, for product innovators, is the following.

Who developed these product innovations?

1. Your enterprise by itself
2. Your enterprise together with other enterprises or institutions\*
3. Your enterprise by adapting or modifying goods or services originally developed by other enterprises or institutions\*
4. Other enterprises or institutions\*

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

The examination of data resulting from such a question has been discussed by Gault (2010: 64, 2012: 122) and also by de Jong and von Hippel (2013: 125), for process innovation, with a view to seeing evidence of user innovation. de Jong and von Hippel suggest that a follow-up survey is required to see such evidence and the probed in this paper is the extent to which knowing that the firm regards user innovation, the modification or development of products, as important, is reflected in the responses to the CIS question.

Before looking at the data, the CIS question is considered. Response 1) indicates that the firm has produced the product innovation itself. Here there could be a bias in response as a respondent could take the view that while user innovation was important, what was transferred to the firm, or seen by the firm, was far from being a product that could go to market. The firm brought the product to market itself. Response 2) deals with co-innovation and it may or may not be triggered by a user innovation as a starting point for co-innovation. Response 3) is an entry point for user innovation if the product is close enough to a final version that it requires some work before it goes to market. This question is also closest to the new questions on user modified or developed products added to CIS 2010 in Finland. Response 4) could describe user innovation, however, it could also describe the imposition of a product on a subsidiary by the parent firm or the agreement in a consortium of firms to launch a new product acquired elsewhere. As such a product would be new to the firm that was introducing it to the market and would qualify as a product innovation at the lowest level of novelty. Reflecting the view of de Jong and von Hippel (2013), there is empirical work that needs to be done before the 'Who did it' question reveals user innovation in CIS data. There is also a semantic problem.

The question asks about other 'enterprises or institutions' but says nothing about consumers who may have modified or developed a product. For consumers to be seen by this question, an additional consumer category needs to be added to the question probing, 'Who developed these product innovations?'. While statistical institutions measure innovation in firms and how it happens, in the broader context the key issue is whether public and private sector organizations have sufficient interest in knowing more about the impact of consumers that change products or develop them.

## 6.2 Analysing data from the Finnish CIS 2010: A case study *Product innovation*

The initial findings from the data from the Finnish CIS 2010 have already been discussed (Niemi and Kuusisto 2013). Here the data on the importance of users that modify or develop products are used to examine the significance of such user innovation (high or medium) to firms that are producing innovative products. These firms could also be doing process innovation or have ongoing or abandoned innovation activities. This is a case study of firm responses rather than an analysis of population estimates for firms in Finland as, in some cases, the number of responses is small and would not support meaningful population estimates.

The conjecture being probed is whether firms that engage in product innovation (along with other activities or not), and the product is developed by others (See section 6.1), might assign a high or medium importance to products modified or developed by users.

First the distribution of responses to the question on ‘Who developed these products innovations’ is given in Table 3

[Table 3 here]

The respondent was told to tick all that apply and there were 1513 responses from 814 firms, or an average of 1.9 responses for each respondent. The distribution makes clear that 78 per cent of respondents introduced product innovations developed in-house while 17 per cent introduced the product innovation made by others. However, the 33 per cent that responded to the third option that the product innovations were developed by “Your enterprise by adapting or modifying goods or services originally developed by other enterprises or institutions” is consistent with “Users modified (developed) existing products, and your enterprise further developed and commercialized it” being of high or medium importance for 36 per cent of the population of product innovator firms responding to user modification and 16 per cent responding to user development.

Table 4 gives the same distribution of the four options but for the 278 firms that ranked user modified products as of high or medium importance.

[Table 4 here]

The distribution exhibits the same rank order, but the activity in each category is greater than that in Table 3 and in particular, the response to the third option has gone up to 38 per cent from 33 per cent. This result may indicate that firms that rank user modifications as of high or medium importance engage more in all of the categories of product innovation, as well as having a higher propensity to produce innovative products that were new to the market of the firm. These are two important observations.

Table 5 deals with the impact of the importance of user developed products. Again the rank order is the same as in the two previous tables, but, as in Table 4, there is more activity in every category of innovation and the response to the third option has now increased to 44 per cent.

[Table 5 here]

There remains a question of whether the behaviour of firms that were product innovators was influenced by the fact that some were also process innovators. This is addressed in Table 6 which gives the distribution of responses to the ‘Who developed these product innovations’ for firms that engaged only in product innovation.

[Table 6 here]

Table 6 has the same rank order as the previous tables, and, as in Table 3, it presents data for all firms in the category, in this case product innovators only, with no restriction to those that ranked user innovation as of high or medium importance. Note that the response to option 3 has dropped to 20 per cent.

Responses for firms that did give a high or medium rating to the importance products modified or developed by users, and which produced product innovations only, are too small in number to publish, but for those responses, firms in this category that produced their product innovations on their own gave higher rankings, 92 per cent for modifiers and 93 per cent for developers, compared with all responses of product innovators, some of which were also process innovators, where the comparable figures were 80 per cent (Table 4) and 85 per cent (Table 5). The reported rate for option three rose in both cases to 33 per cent for modifiers and 47 per cent for developers.

The inference from the data is that firms that responded to option 3 of the CIS ‘Who did it?’ question and also rate as of high or medium importance products modified or developed by users are consistent. However, that consistency does not confirm that firms that respond to option 3 are dealing only with user innovators. More analysis is required.

A counter example is a head office transferring a product that has sold well in one region to the CIS respondent in another, with the requirement that the product be modified in order to appeal to clients in the region of the respondent. This is not a case of user innovation, but it would be reported under option 3. Another example is a product put on the market by a competitor. The CIS respondent changes the product to avoid intellectual property law problems and puts its own version on the market. So long as this product is new to the firm, it is a product innovation.

Once the CIS 2012 questions added by Portugal and Switzerland are posed, firms will respond to the question: ‘During the three years 2010-2012, did your enterprise introduce new of significantly improved products (goods or services) that were partly or entirely developed by customers and users of the product?’ There will then be evidence for firms using products developed by users in addition to data on the importance of the statement: ‘Users modified existing products, and your enterprise further developed and commercialized it.’ It should then be possible to see what percentage of responses to option 3 of the ‘Who did it?’ question for product innovation were due to firms that had actually incorporated user modified or developed products. Once that percentage is known, it will be possible to decide whether the response to option 3 in any CIS survey is a proxy for user innovation or not. It will not, without further work, include consumers as user innovators.

### *Process innovation*

Firms can be product innovators and at the same time be engaged in process innovation. Similarly they can be process innovators, and also engaged in product innovation. In what follows the analysis applied to product innovators is repeated for process innovators. Table 7 gives the distribution of responses to the ‘Who did it?’ question for process innovation.

[Table 7 here]

What is clear from Table 7 is that half of responding firms do their process innovations themselves or with other enterprises. This is consistent with process innovation being internal to the firm and the firm being the user of the processes. However suppliers are well established as a source of information for innovation and as a source of collaborators and that could apply here.

Next the observations are reduced to those process innovators that ranked highly user modified products (Table 8) and user developed products (Table 9). The distributions are similar to those in Table 7, but with an increase in the percentage of firms that did their process innovations themselves or with others.

[Table 8 and Table 9 here]

These figures include those for firms that do both process and product innovation and which may have on-going or abandoned innovation activities. When the responses are reduced to show only process innovators, the percentage of firms doing the process innovation on their own or with another enterprise drops from about 55 per cent in Table 7 to about 40 per cent in Table 10.

[Table 10 here]

Further analysis of those firms that were process innovators only and ranked highly user modified or developed products cannot be presented as there are not enough observations. The conclusion, as suggested by de Jong and von Hippel (2013), is a follow-up survey and a review of the results expected from Portugal and Switzerland

## **7. Policy questions**

The data for firms that are product innovators and which value highly user modified or user developed products raise some analytical questions, already discussed, and also some policy questions.

Innovation policies promote innovation in support, frequently, of job creation and economic growth. In the case of user innovation, there are many firms, and consumers (Kuusisto et al. 2013), engaged in the activities of modifying or developing products and the question that arises is how does the knowledge, developed as a consequence, contribute to innovation elsewhere. If the work of user modifiers and, to a lesser extent, developers, is so important to firms that produce innovations, as demonstrated in Section 6, how can the transfer of knowledge from users to producers be facilitated?

The response will differ from industry to industry, as industries with high capital intensity may need different encouragement to share knowledge with capital equipment suppliers, for example, than more labour intensive industries. Highly regulated industries may have to involve the regulator as part of the innovation process. However, the policy interventions need not only involve the public sector. Industry associations could promote the sharing of knowledge resulting from user innovation, providing recognition of the user innovators and possible compensation. There are many options for improving the flow of knowledge from the user to the producer and in Finland, this is a current policy issue (Ministry of Employment and the Economy 2010).

While the Finnish policy implies that all sources of innovation matter, it appears unlikely that there will be many new actions aimed at promoting user innovation intensity and diffusion. Nevertheless, there is an opportunity for the public sector and industry organizations to move forward in this relatively novel area. As for the public sector, the Ministry of Employment and the Economy and Tekes (The Finnish Funding Agency for Technology and Innovation) have specified several focus areas where the promotion of user innovation could be incorporated.

[Table 11 here]

This paper has focused on user innovators seen by CIS, a business survey, and respondents to all of the questions analysed where businesses. Kuusisto et al. (2013) review policies for improving knowledge transfer from consumers as user innovators, keeping in mind that for firms to be product innovators, they need only make their new or significantly improved product available to the market (or to potential users). Once this is done, there still has to be sufficient absorptive capacity to support knowledge transfer, allowing the product to be used.

## **8. Conclusions and future work**

The analysis of Niemi and Kuusisto (2013) of data resulting from the addition of new questions to the Finnish CIS 2010 reveals two important conclusions. The first is that firms that are engaged in innovation activities, 30 per cent rate as of high or medium importance users that modify products and less so (13 per cent) users that develop products. The second is that firms engaged in innovation activities that rank highly user modified or developed products have a higher likelihood of producing a new to the market innovation. The second finding is a correlation and not a causal link and understanding the link is a subject for future work. However, both points are new and both have policy implications.

This paper provides population estimates for firms that are product innovators and that could also engage in other innovation activities. The results are that for product innovating firms, 36 per cent rate as of high or medium importance users that modify products. The rate is 16 per cent for users that develop products. These higher levels of importance are consistent with product innovators being more interested in sources of new or significantly improved products than firms engaged in other innovation activities.

For unweighted data, it is demonstrated is that product innovating firms that rank user modified or developed products as of high or medium importance, are more active in all four categories of the CIS 'Who did it?' question. While this is not a population estimate for all product innovation

firms in scope for the Finnish CIS, it is an important result, based on the responses that were analysed.

When the question is probed as to whether the standard CIS question on ‘Who developed these product innovations’ could be used to detect the occurrence of user innovation in existing CIS data, the possibility is not ruled out by the evidence. Analysis of questions added to the CIS 2012 by Portugal and Switzerland should shed more light on this conjecture.

In summary, innovative firms in Finland see user modified (30 per cent) or user developed (13 per cent) products as important to them, and these levels are higher for firms that are product innovators (36 per cent and 16 per cent respectively). Innovative firms that regard user modified or developed products as important have a higher propensity than other firms to produce new to the market product innovations. These firms also more active in all ways of engaging in product innovation covered in the CIS. The conjecture that firms that respond positively to the CIS question about whether the product innovation of the firm was done by “You enterprise by adapting or modifying goods or services originally developed by other enterprises or institutions” are providing evidence of user innovation is not ruled out by the analysis but its confirmation or rejection awaits analysis of questions added by Portugal and Switzerland to their CIS 2012.

Adding the new questions to the Finnish CIS 2010 was a major step in understanding the influence of user innovation on the innovation activities of firms. This has produced new results but has also raised questions that need further work to resolve. A problem still outstanding is how to gain insight into the role of consumers, as opposed to firms, as user innovators in the CIS framework.

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## **Notes**

1 The questions are an English paraphrase of the questions used in the CIS 2012 of Portugal and Switzerland. The authors are indebted to Joana Mendonça and Martin Wörter for making these questions available.

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## Tables

**Table 1: The importance to firms of products modified by users and developed by users, share of firms with innovation activity**

<b>Importance to firm:</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>	<b>Not used</b>
	Per cent			
<b>All NACE*</b>				
Modified by users	8.0	21.7	17.2	53.1
Developed by users	3.8	9.1	16.6	70.5
<b>Goods producing**</b>				
Modified by users	8.9	25.0	15.0	51.1
Developed by users	4.9	10.3	17.7	67.1
<b>Services</b>				
Modified by users	7.1	18.3	19.5	55.1
Developed by users	2.7	7.8	15.6	73.9

\* Statistical classification of economic activities in the European Community

\*\*Goods producing includes manufacturing, mining and quarrying, electricity, gas and air conditioning supply, water supply and waste management

Source: Statistics Finland (2012: Appendix Table 46)

**Table 2: Novelty of product innovations and the importance to firms of products modified by users and developed by users**

<b>Importance to firm of user modified products</b>	<b>High</b>	<b>Medium</b>	<b>Low</b>	<b>Total (Some importance)</b>
Product innovations only new to firm	7.1	22.8	18.3	48.2
Product innovations new to the market of the firm	13.7	27.4	19.1	60.2
No product innovations	4.0	16.4	15.0	35.4
<b>Importance to firm of user developed products</b>				
Product innovations only new to firm	2.3	10.3	18.7	31.3
Product innovations new to the market of the firm	7.0	11.5	21.1	39.6
No product innovations	2.2	6.4	11.8	20.4

Source: Statistics Finland and Niemi and Kuusisto (2013)

**Table 3: Responses from 814 product innovator (could also be process innovator) firms to the CIS ‘Who did it’ question for product innovation**

Who developed these product innovations*	Responses from 814 firms**	Percentage of total responses	Percentage of 814 firms
Self	636	42.0	78.1
With	469	31.0	57.6
Modified	268	17.7	32.9
Other	140	9.3	17.2
	1513	100.0	

\* The four categories are given in full in Section 6.1

\*\*Firms may make more than one response

Source: Statistics Finland

**Table 4: Responses from 278 product innovator (could also be process innovator) firms to the CIS ‘Who did it’ question that rated user modified products of high or medium importance**

Who developed these product innovations*	Firms responding out of 278**	Percentage of total responses	Percentage of 278 firms
Self	221	40.2	79.5
With	169	30.7	60.8
Modified	105	19.1	37.8
Other	55	10.0	19.8
	550	100.0	

\* The four categories are given in full in Section 6.1

\*\*Firms may make more than one response

Source: Statistics Finland

**Table 5: Responses from 126 product innovator (could also be process innovator) firms to the CIS ‘Who did it’ question that rated user *developed* products of high or medium importance**

Who developed these product innovations*	Firms responding out of 126**	Percentage of total responses	Percentage of 126 firms
Self	107	38.6	84.9
With	80	28.9	63.5
Modified	56	20.2	44.4
Other	34	12.3	27.0
	277	100.0	

\* The four categories are given in full in Section 6.1

\*\*Firms may make more than one response

Source: Statistics Finland

**Table 6: Responses from 172 product innovator (only) firms to the CIS ‘Who did it’ question**

Who developed these product innovations*	Firms responding out of 172**	Percentage of total responses	Percentage of 172 firms
Self	132	50.1	76.7
With	69	26.2	40.1
Modified	35	13.3	20.3
Other	27	10.3	15.7
	263	100.0	

\* The four categories are given in full in Section 6.1

\*\*Firms may make more than one response

Source: Statistics Finland

**Table 7: Responses from 743 process innovator (could also be product innovators) firms to the CIS ‘Who did it’ question for process innovation**

Who developed these product innovations*	Firms responding out of 743**	Percentage of total responses	Percentage of 743 firms
Self	403	35.9	54.2
With	409	36.4	55.0
Modified	181	16.1	24.3
Other	131	11.7	17.6
	1124	100.0	

\* The four categories are given in full in Section 6.1

\*\*Firms may make more than one response

Source: Statistics Finland

**Table 8: Responses from 249 process innovators (could also be product innovator) firms to the CIS ‘Who did it’ that rated user *modified* products of high or medium importance**

Who developed these product innovations*	Firms responding out of 249**	Percentage of total responses	Percentage of 249 firms
Self	146	37.8	58.6
With	141	36.5	56.6
Modified	55	14.2	22.1
Other	44	11.4	17.7
	386	100.0	

\* The four categories are given in full in Section 6.1

\*\*Firms may make more than one response

Source: Statistics Finland

**Table 9: Responses from 124 process innovator (could also be product innovator) firms to the CIS ‘Who did it’ question that rated user *developed* products of high or medium importance**

Who developed these product innovations*	Firms responding out of 124**	Percentage of total responses	Percentage of 124 firms
Self	75	38.3	60.5
With	73	37.2	58.9
Modified	25	12.8	20.1
Other	23	11.7	18.5
	196	100.0	

\* The four categories are given in full in Section 6.1

\*\*Firms may make more than one response

Source: Statistics Finland

**Table 10: Responses from 131 process innovator (only) firms to the CIS ‘Who did it’ question**

Who developed these product innovations*	Firms responding out of 131**	Percentage of total responses	Percentage of 131 firms
Self	52	31.3	39.7
With	53	31.9	40.5
Modified	26	15.7	19.8
Other	35	21.1	26.7
	166	100.0	

\* The four categories are given in full in Section 6.1

\*\*Firms may make more than one response

Source: Statistics Finland

**Table 11: Innovation policy areas in Finland which could incorporate user innovation promotion**

<b>Ministry of Employment and the Economy</b>	<b>Tekes</b>
Demand and user-driven innovation	Growth of young companies
Service innovation	Innovative activities in growing business
Growth of entrepreneurship	Programme specific objectives related to the wellbeing of people and the environment
Innovative environments	Competence utilization and the transfer of competences
	Agile user-driven innovation processes
	Atmosphere that encourages entrepreneurship, co-operation, experiments and continuous renewal
	Customer orientation
	User-oriented products and processes
	Health promotion
	New forms on innovation activities

Sources:

[http://www.tem.fi/en/innovations/innovation\\_policy](http://www.tem.fi/en/innovations/innovation_policy)

<http://www.tekes.fi/en/tekes/strategy/>

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