

MEASURING THE INNOVATIVENESS OF DESIGN - MISSION IMPOSSIBLE?

Aku Alanen, Statistics Finland, Finland

1. Starting point of measurement

The biggest problem in measuring innovativeness of design is that there is no obvious theoretical basis for it. For example, technological innovation research may lean on or at least gain assistance from innovation theories and measurements based on both neo-classical and evolutionary economic research traditions. However, Grupp (1998, 84) opines that not one of the technological innovation theories offers a direct solution to the problem of measuring a technological innovation. The problem is made no easier by the fact that design, unlike many technological fields, does not even have a corresponding research tradition.

Even if our theory of the economics of design was as good as possible, without measuring and definition of what a design innovation is it will be of no theoretical use to us. Measuring without any background theory is, of course, quite poor as well. Because we do not have a suitable theory for measuring, its starting point is strongly experimental. The evolutionary way of thinking is experimental in nature and it is loosely in the background when planning the measuring.

My paper primarily tries to consider how measuring should be done and what alternatives Finland would have in use for it. The starting point is, however, that even empirical measurement attempts require some kinds of concepts and knowledge of previous innovation theories. They, however, cannot be found anywhere else than in the field of technology.

2. Conceptual classifications of Schumpeterian innovation research

Until now, economic innovation research has focused only on technological innovations. Similarly, the basic concepts still in use in the research of the field have arisen from the world of technological innovations.

The most important classical theoretician in the field, Schumpeter, already separated inventions, innovations and imitations. An invention is a mere idea, draft or model. An innovation is an invention that an entrepreneur has commercialised in the market. And imitations are those innovations that other entrepreneurs copy. As far as I can see, this trisection works quite well for design innovations as well.

Another Schumpeterian basic classification related to product versus process innovations. This bisection is still the basic classification in all technological-economic innovation studies, only with slight changes in wordings. The breakdown into product and process innovations is fairly problematic for design innovations. The concept of process innovation is different in design from that used in technology and I thus exclude it from here. It has to do with such issues as inclusion of the user in design and the role of design in the general strategy of the whole enterprise. Division into radical and incremental innovations can be mentioned as the third basic classification.

3. Creation of design innovation databases

It may be more important to make first empirical measurement attempts in the area of design than to ponder upon the theory of design. One may perhaps move on to the theory only after sufficient empirical experiments.

From this viewpoint measuring of innovations in design would necessitate creation of different databases, for example. Partly product-specific and partly enterprise-specific data gathered to these databases call for answers to at least some of the following questions. 1. What is innovation in design? 2. What kinds of classifications can be used to measure design innovations? 3. How can information be collected about design innovations? 4. What kinds of databases would it be practical to produce on innovativeness of design?

The paper does not thus try to 1. Create a theory of design innovations, 2. Define the data to be collected, or 3. Make yet any calculations on the activity of enterprises having made design innovations or those using design intensively compared with those that have not made or used.

4. Novelty thinking

When creating the database we can start from this: to claim some product or process is a design innovation, it has to be new in some way. Each innovation study or theory must right from the start decide its relation to the novelty concept. Because we know that both new and novelty are very general words, they have to be specified on various dimensions. The answer is different depending on which dimension is used. There are two conventional, well-established methodologies in technological and economic research for innovation surveys, the subject and object approaches. (New in the object approach means a market novelty and new in the subject approach a novelty on the enterprise level).

When talking about object-based product innovations it is very essential to ask to which market the design is new. Is it a question of local or domestic market? Or maybe of a global novelty? For the subject approach the matter is insignificant in the present inquiries; the same design products may already be in the market, that is, it is a question of any market for the enterprise. However, on the object side the matter is more important. If it is a question of global level then it is a really significant innovation.

The classical basic definition of Schumpeter's product innovation was: 'The introduction of a new good or a new quality of the good with which consumers in the market are not familiar.' (Schumpeter cited in Palmberg et al 1999) Interestingly, the basic definition does not say anything about the degree of the success of the innovation, it is enough that it has been introduced in the market.

The subject approach means that it is a question of a novelty from the viewpoint of the enterprise. The product in question may be in the market already before. In the most significant CIS Surveys using the subject approach respondents have been enterprises (Innovation 2004) and they have to (according to the Oslo Manual) assess whether the product is new for their own production, even if some other similar product was already in the market. (OECD 1997)

Is it possible to create some kind of scale model for different degrees of novelty? For example, in subject-based inquiries one could come up with the trisection: slightly, significantly new and completely new. In theory we can see that novelty in the case of a matter like design is always

continuous and no scaling can be made. In practice, if we are doing empirical design research, it could be advisable to produce some scaling. For example, in surveys respondents must be offered some scaling model. The trisection used above could be good for this. However, the methodologically most important manual for technological innovation research, the Oslo Manual, does not have such scaling but there the term significantly new is used unambiguously. The object-based approach could also have some scaling. This question is closely related to the division radical versus incremental innovation, which will not be discussed in this paper.

We can also ask whether to take in design innovation inquiries based on the subject approach even other parties involved in design besides the production enterprise of the final product. Other approaches could be represented by other parts of the value chain, such as the product's designer, manufacturer, distributor, retail trader or final consumer.

5. Basis of classifications for measuring design innovations

Design-based product innovations can be divided into four groups by their ratio of technological and design novelty.

A. First of all, the most important innovations for the total chain of national economy are originally technological. If this technologically new product does not include any functional or appearance innovation, it is then merely a technological innovation. A pure technological innovation is fairly rare and mostly they also require both functional and appearance innovation.

B. Therefore the second group is formed of such new products that are simultaneously both technological and design innovations. In this group it does not matter as such whether the original incentive to the novelty came from design or technology. Some aesthetic design changes may require technical or other functional adaptation to make the design possible, such as use of new materials or components. For example, making a product smaller may require new technology or new components or new switchings. If these new functional changes are significant, then it is a question of a combination of design and technological innovation. In contrast, enlarging a product is probably mostly technologically easy, a mere design innovation if even that.

C. In some fields, such as furniture and clothes, design changes do not bring along technological or functional changes and they are therefore pure design innovations. The group is not restricted to only these fields, however.

D. Finally, we have such new products that do not include technological and thus neither functional nor design innovations. New forms or contents can be so slight that it may not possible to talk about innovations in their connection. The problem is naturally that if such small new things start to accumulate at some point they too become innovations. Drawing the line is difficult and requires case-specific definitions.

6. Object-based design innovation research and creation of a database

Product-based design innovations can be found in sections B and C of the fourfold table above. Process innovations are a different matter in design. A database has to be built for them on quite a different basis from that for product innovations and they are excluded from this examination.

Technological innovation-based design innovations

In Finland there has been only one object-based technological innovation survey and database but it is quite extensive, Sfinno by VTT (Palmberg et al 1999). The sources of Sfinno were: 1. expert panel, 2. scientific and other expert journals, and 3. companies' annual reports.

The Business Register was used to search the producer enterprise or its present successor and various product-specific information for each individual innovation. Methodologically it is conceivable that a similar but applied method could be used for finding design innovations.

In principle, most of the innovations included in Sfinno and the related enterprises can be considered to contain some functional element, i.e. belong to the scope of the design innovation concept as well. It would be necessary to go through separately what types of technological innovations do not perhaps contain any functional element. It can be thought that some innovations in the chemical industry are such. These cases should be examined by means of an expert panel separately for each industry.

It can be thought that Finland has important functional innovations not based on appearance excluded from Sfinno, for example in the field of ergonomics.

Appearance-based design innovations

If we try to find meaningful sources for appearance-based design innovations we can use at least the following sources:

1. Registrations of designs
2. Winners of design competitions and recipients of commendations
3. Presentations of design magazines
4. Interviews of design experts

In Section 8 I will present some features of one source for design innovation, registration of designs.

7. Subject-based design innovation databases

So far, there have been not even one attempt in Finland to build a subject-based design innovation database. In principle, the database could be based on a similar mechanism as the one for technological innovations made in CIS Surveys. In Finland CIS Surveys have been carried out three times.

8. Registration of designs

Industrial design can be broken down in many different ways with respect to analytical needs. Theoretically thinking, one of the most common ways is to divide it on the product level into appearance and functional dimension. For an analysis of design registration the appearance side has to be separated into two; mere external appearance and aesthetics. In practice this division is extremely difficult.

A right to a design is an industrial property right that protects the appearance of a product or part of a product. The object of protection can only be the appearance of the product; technical ideas that can be put into industrial use can, instead, obtain patent or utility model protection. The appearance of a design is the overall impression of its lines, contours, colours, shape, texture or

materials. There are no requirements whatsoever as to the artistic effect of a design. (briefly of the community design law)

According to the law on design registration protection of design covers explicitly only the mere out-ward appearance. In order to make an application for design registration, attention has had to be paid in product development to all the elements of design in addition to appearance, i.e. aesthetics, functionality, raw material, ergonomics and all business objectives later related to the product. Thus design registration does cover all the aspects of design implicitly.

Relationship between design registration, appearance and functionality from the viewpoint of the designer.

To what extent do original designers, both external and the company's own, take into consideration the design aspect already in the planning stage? There must be differences between industries and products. For example, in branches that produce as such simple utensils like Fiskars, designers may have to take account of the requirements of design registration more than average in their work even beforehand. The design of Fiskars pruning shears is intentionally made into such that their manufacturing is very demanding and requires an expensive machine, thus preventing copying possibly even without design protection. How important design registration is considered as part of the company's design strategy also influences whether designers consciously perceive it so as well.

Innovation approach of design registration

Design registration is an important source for measuring commercial creativity and design innovativeness. Each application for registration of a design represents a new appearance both from the viewpoint of the enterprise and the market (if the application is accepted), that is, it is a genuine innovation.

Design registration as a mode of protection is in part closer to patents and in part to trademarks. Similarly as patents it is used for goods but its application and maintenance costs are fairly modest compared with patents, that is, on level with trademarks. As an innovation indicator registration of a design is partly similar to a trademark because it demonstrates in its appearance directly the commercial novelty of the product, and partly similar to a patent in expressing indirectly some of the product's functional novelty as well.

Goodness and badness of design registration as an innovation indicator

The use of design registration is not dependent on the company's size, level of technology use and property. It does not entail high maintenance costs. Nevertheless, on the international level only the large ones of Finnish enterprises use it.

For statistical measuring the worst thing about using design registration is the incompatibility of the classification, which is even worse than that of trademarks, with the conventional Standard Industrial Classification. The restriction in calculating design registration as an innovation indicator is that it can-not contain the functional side of design directly but indirectly it can.

For innovation types design protection is a poor innovation indicator. Design registration cannot be used for protecting service innovations. Nor can it be used as an indicator of process innovation.

Design registration is sometimes felt to have a weaker protection level than a patent and therefore many companies are reluctant to use it and apply only for a patent. Often both a patent and design registration are applied for the same product.

One issue is also important in the use of all industrial property right indicators as an innovation indicator. If the use of the protection prevents or precludes innovativeness of other developers it can be a poor indicator from the viewpoint of entire society, even if it is advantageous to the company in question. Does design protection prevent design innovations of other companies? In my opinion it does not, it is always possible to buy a licence if one wants to use exactly the same format in some product. Design registration is in this respect the least prohibitive form of rights protection. In addition, a known design protection may even increase innovation by forcing others to develop a new design.

Ranking of old EU countries (incl. Norway) / registered designs in three areas per million inhabitants

| | JAPAN | OHIM | USA | GLOBAL |
|----------------|-------|------|-----|--------|
| Luxembourg | 2 | 2 | 1 | 1.7 |
| Denmark | 5 | 1 | 3 | 3.0 |
| Sweden | 1 | 7 | 2 | 3.3 |
| Netherlands | 4 | 6 | 5 | 5.0 |
| Finland | 3 | 10 | 3 | 5.3 |
| Germany | 8 | 3 | 8 | 6.3 |
| Austria | 7 | 4 | 11 | 7.3 |
| Italy | 11 | 5 | 10 | 8.7 |
| Belgium | 12 | 8 | 6 | 8.7 |
| United Kingdom | 10 | 11 | 7 | 9.3 |
| France | 9 | 13 | 9 | 10.3 |
| Norway | 6 | 14 | 12 | 10.7 |
| Spain | 14 | 9 | 14 | 12.3 |
| Ireland | 13 | 12 | 13 | 12.7 |
| Greece | 15 | 16 | 15 | 15.3 |
| Portugal | 16 | 15 | 16 | 15.7 |

With design registration protection can be applied both nationally and more broadly. In recent years the EU's Office for Harmonization in the Internal Market OHIM has gained more and more importance in registration of European designs. Community design has a so-called uniform character, meaning that the trademark can be registered only in the entire EU area and the legal effects of the registration are the same in that area.

In numbers the Nordic Countries do not hold quite the top positions but the situation is different when the numbers are taken as a proportion to the population. By population the Nordic Countries, with the exception of Norway, are very high on the list in the comparison of old EU countries (Alanen 2005).

To some degree the country-specific number of applications for design registrations may be influenced by how enterprises have experienced the efficacy of registered designs against those copying the design. Denmark is considered a country where the interpretation of practical law may be tightest in all Nordic Countries and it may also be reflected in that Danish companies are more prepared to apply for registration of a design from elsewhere as well. In Finland, where the interpretation may be more lenient, at least some companies are more accustomed to apply for a patent only. In relation to the size of the economy (volume of GDP in purchasing price parity USD billion) the Nordic Countries hold the same position in the European comparison as in the population comparison.

In the U.S. design registration is referred to as a design patent. In the U.S. Finland has a clearly higher position than in Europe, primarily thanks to Nokia. In Japan Finnish design and use of design registration is considerably more active compared with the situation in Europe and also in the U.S. Or maybe Nordic angst and minimalism has worked better in Japan. Or perhaps Finnish companies have rather found it worth their while to be more active in matters of design protection there than somewhere else.

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