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INDUSTRIAL DESIGN POLICIES: A REVIEW OF SELECTED COUNTRIES

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FOREWORD

The role of design is now being recognised as economically important, from both the country- and firm-level perspective. Over the last few years, the OECD has been investigating the role of Knowledge Based Capital (KBC) regarding design as a key asset. However, relatively little is known about design activities and their main drivers, how design activities help companies to compete in global markets, how companies protect their product designs, and whether suitable policies may contribute to enhance firm-specific design activities and capabilities.

Industrial design needs to be carefully considered as an essential factor for growth, and this paper is intended to provide insights for policy makers by examining the existing design policies and activities of a sample of OECD countries. This includes comparisons of design Intellectual Property (IP) rights of countries, and the major trends in design application and registration. Also, a proposed OECD Design Survey questionnaire is presented for better understanding of firms' activities, and the results of a pilot test are discussed.

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1. Introduction

Design is mainly associated with the appearance of products. Once regarded as a subsidiary aspect of manufacturing, and considered less important than technological research and development (R&D) activities, design is now being recognised as important for firms, industries and countries. Design does not relate to aesthetics solely anymore, but also to aspects as the functionality of products and their broader appeal to consumers. It is regarded as an important factor affecting economic growth and business performance, and considered to be an element of innovation and an outcome of creative activities.

Investment in industrial design can have implications for enterprise performance, including value added, competitiveness, business growth and job creation. Moreover, according to Swann (2010) investment in design may mitigate(induce) negative(positive) externalities and overcome other market failures such as information asymmetries. This explains why countries are putting in place a number of policy measures to support industrial design and encourage design investment, ranging from financial support, to taxation and human resource development.

Relatively little is known about design activities and their main drivers. In addition, there is little evidence on how design activities help companies to compete in global markets, how companies protect their product designs, and whether suitable policies may contribute to enhance firm-specific design activities and capabilities. The existing industrial design research consists primarily of case-based studies about firms which excel in design, and there is a lack of in-depth research to help better understand the economic consequences of investment in industrial design and how policymakers may promote such investment. Analysis of how design affects companies' performance with larger samples amenable to statistical analysis is also very limited.

It is, therefore necessary to improve our understanding of how policy can encourage designs to be effectively commercialised, especially by small firms. Industrial design needs to be carefully considered as a contributing factor for growth, and this research might provide policy insights for policy makers by examining the existing design policies of a sample of OECD countries. The motivation of this paper is to review design policies in a selection of OECD countries, as a first step toward providing the necessary evidence base.

The rest of this paper is structured as follows. Based on a review of the literature, Section 2 provides various perspectives on design, and discusses how it may affect firm's performance and innovation. Section 3 presents a review of design policies in several OECD countries. Section 4 presents an overview of the evidence on industrial design applications and registrations. Lastly, in the final section policy implications are discussed, bearing in mind the paucity of evidence-based policy analysis in this area. As a way forward, a proposed OECD design survey questionnaire is presented in Annex A.[2]

2. Perspectives on industrial design

The scope of design is broad, and different definitions have been proposed As such, developing a clear and unambiguous definition of design is one of the challenging issues for policy makers if they are to put in place a conducive environment for the design activities of firms, and to increase awareness of the

potential economic importance of design. The rest of this sub-section reviews some of the definitions which have been proposed, before proceeding to a discussion of some of the economic implications associated with investment in design.

2.1 Defining Design

Design is a feature of new product development, alongside R&D, manufacturing, commercialization and marketing. It can contribute as a sector in and of itself, as well as a complementary strategic discipline in other sectors in the manufacturing and service industry (Whicher et al, 2011). In a broad sense, "design is what links creativity and innovation, which shapes ideas to become practical and attractive proposition for users or customers" (Cox, 2005). Simon (1996) saw design as "the transformation of existing conditions into preferred ones".

There is an overlap between concepts of design and Research and Development (R&D), and this lies at the heart of the difficulties with developing a consistent and unambiguous definition. According to the Frascati Manual,[3] design activities include plans and drawings aimed at defining procedures, technical specifications and operational features necessary for the conception, development and manufacturing of new products and processes included in R&D. R&D includes the creative work undertaken on a systematic basis to increase the stock of knowledge and the use of this stock of knowledge to devise new applications (OECD, 2002).

However, relative to R&D there are other difficulties associated with the quantification of design activities. To this end, the OECD Working party on National Experts on Science and Technology Indicators has been working on revising the Frascati Manual to provide clear guideline for measuring design activities.

The Oslo Manual[4] defines design from the perspective of product innovation. Design can be recognised as an integral part of the development and implementation of new product or process innovations as well as changes in product characteristics which affect the appearance, but not the functional performance of products (OECD/Eurostat, 2005). Despite this progress it remains a challenge to identify design as product or process innovation, and as such the review and modification of the Manual is in a discussion among related bodies.

The European Union regards design as a central element of innovation and the value of design was emphasised in the EU's growth strategy Innovation Union 2020. According to the EU Design Regulation, design is defined as *an appearance of the whole or a part of a product resulting from the features of, in particular, the lines, contours, colours, shape, texture and/or materials of the product itself and/or its ornamentation*. In this definition, design is recognised as the "look" of products.

Design is also described as a three-faceted concept: the role of vision in the innovation process and innovation strategy;[5] a technique to harness or channel creativity for commercial advantages; and, a result which can be added as the extra dimension to any product (Swann and Birke, 2005). Design covers a wide range of aspects for function, aesthetic appeal, manufacturing, sustainability or even for reliability or quality (DTI, 2005). Design also refers to both processes and outcomes. The creative thinking process can involve things or can be abstract and the outcome can also be tangible or intangible (Tether, 2005).

Creativity, design and R&D are closely linked to one another. Design and R&D are both ways of channelling creativity for commercialization and creativity and design plays a role as an input to innovation and R&D. Industrial design can be a part of R&D, as well as adding value beyond technological

innovation. Many innovative firms consider design to be a part of R&D process, calling it RD&D[6] (DTI, 2005).

Based on the role of design and its connection with industry, design is specified as industrial design. Industrial designs are defined as the visual features of shape, configuration, pattern or ornament, or any combination of these features, applied to a finished article. It involves the creative concepts, ideas, or products to create something which did not exist in the past.

2.2 Design, economic growth and innovation[7]

There has been a growing belief that investing in industrial design is beneficial to a firm's performance as well as economic growth. The contribution of industrial design can be reflected in higher turnover and employment for those firms which invest in design compared to competing products or firms which do not have targeted investment in industrial design investment, and this can be linked to innovation and economic growth.

There is some case study evidence to support the role of industrial design in enhancing the performance of firms. Firms with high design effectiveness have higher returns on sales and assets, and higher stock market returns than firms with low design effectiveness. However, most of the studies reviewed do not apply formal statistical methods but simply compare performance, measured by different criteria, of those firms which report that they invest in design relative to those who do not do so. A number of other confounding factors may well explain the difference in performance. While there may be methodological concerns about these studies, they give an indication of the potential economic importance of design.

Recent research (Candi and Saemundsson, 2011) in Northern Europe finds that aesthetic design can contribute positively to competitive advantage, resistance to imitation and profitability. Three rounds of longitudinal firm data were collected in order to investigate the relationship between aesthetic design and economic outcomes one or two years later. The firm data was based on a survey of 70 technology-based firms, through face-to-face and telephone interviews with CEOs of firms in Nordic countries.

A study of American firms undertaken by Hertenstein et al (2005) indicates that good industrial design is related to higher returns on sales, returns on assets, and growth rates of sales, net income and cash flow than firms with low design effectiveness. The relationship between industrial design and financial performance was examined by a panel of industrial design experts to rank the industrial design effectiveness of 68 firms within selected manufacturing industries. Based on the rankings, firms were divided into two groups – firms indicating high design effectiveness[8] and those with low effectiveness. The audited financial data[9] of those firms were used to evaluate their financial performance.

In addition, a study of 47 Dutch firms in home furniture and precision instruments by Gemser and Leenders (2001) found that industrial design intensity[10] affects firm performance. A positive effect of industrial design intensity on a variety of measures of firm performance was found. This is particularly true in cases where the strategy of industrial design investment is new for the industry. In addition, the results reveal the importance of the manner and point at which industrial design is integrated into the product development process in terms of the enhancement of the firm's performance.

Investing in design is positively related to design management, and well-established design management enhances firm performance. According to a study of Italian and Spanish firms, companies managing design effectively and efficiently attain better business performance than those that do not. This also implies that good design does not strictly emerge from investment in design, but from the result of a managed design process (Chiva and Alegre, 2009). Research undertaken by DTI (2005) shows that firms

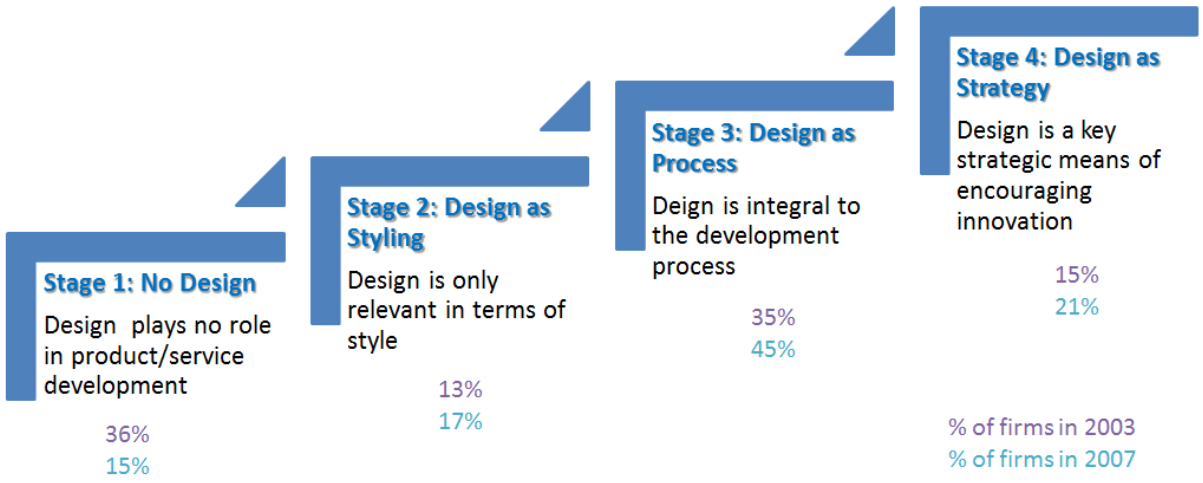
with higher design intensity have greater probability to carry out product innovation, and design expenditure has a positive correlation with the productivity growth of firms.

According to one UK study, for every EUR 100 spent on design, turnover increases by EUR 225 (OHIM, 2014). This is based on the survey by the Design Council National Survey of Firms undertaken in the UK in 2005. They interviewed (by telephone) business managers at 1 500 firms with ten or more employees across the UK. Amongst the respondents they identified 250 firms where the use of design had made a direct impact on a number of measures of firm performance. The average spends on design of these firms for 12 months were GBP 267,000 and the average increase in turnover was GBP 602 000 (Design Council, 2007).

Another study at the firm level by Design Council provides indications that rapidly growing firms pay greater attention to design than companies experiencing average growth. 63 design intensive firms out-performed the FTSE 100 by 200 % over 1994-2004 (Design Council, 2005a). At the macroeconomic level, the Wales government defined the creative and cultural industries including design and found that the Welsh creative industries contributed GBP 465 million gross value added annually to the UK economy of which 36% comes from design (Whicher et al, 2011).[11]

A Danish study[12] sought to measure the level of design activities in Danish businesses applying the Danish Design Ladder methodology (see below). The study found that Danish companies invested approximately DKK 7 billion in design annually. The study shows that the firms which invested in industrial design have additional growth in gross revenue of 250% over the period 2003-2007 compared to the firms which did not. Based on this, the firms were categorized into four stages of design activities, with the higher ranked firms attaching greater strategic importance to design. The result also shows that between 2003 and 2007, the number of companies in stage 3 and 4 rose from 35% to 45% and 15% to 21% each. (Figure 1) (Whicher et al, 2011; SEE, 2010).

Figure 1. Design Policy Ladder



Source: Design Wales (2011), Case Studies in Design Policy & Programmes.

An in-depth case study on the design economy was conducted in 2010 by the French Agency for the Promotion of Industrial Design (APCI),[13] at the request of French Ministry for the Economy, Industry and Employment. It includes analysis on the design supply, the demand for design by business, the economic weight of design and developments in the profession and the impact of the crisis (Box 1).

Design activities can also affect employment levels. A positive correlation between investment in design and employment creation was found in the Danish national research on design.[14] They defined designers as professionals who have graduated from the main design and architecture academies and to the disciplines they represent. The job creation was higher in companies that employ design, compared to firms without design activity, and companies which have increased use of design achieved higher growth in employment. While this research result reveals only a tendency, it is substantiated by other trends in indicators (NAEH, 2003).

The UK government also found that the contribution of the creative industry (including design) to employment in a broad sense. There were about 3 million people employed directly in the creative industries[15] in the UK in 2012 (5.6% of UK total employment). Among them, 116 000 people (5.9% of creative industries total) were employed in the design sector.[16] Employment growth in the design sector between 2011 and 2011 was 16.2% per year, which is higher than the 0.7% growth for the economy overall (DCMS, 2014).

Box 1. A study on the design economy in France

Based on the survey[17] conducted on design, the characteristics of design profession – regional concentration, flexibility in the face of the crisis, and the major fields of design – were described. According to the survey, the majority of design firms were focused on the product design and the importance of consultancy and research on design such as forward studies and concept research, strategic consultancy, and audit design has been increased. More designers have trained in design compared to the year of 2002, but the remuneration is still fairly low.

Using a representative sample of the industry in France[18], the design demand was also analyzed. The level of design integration can be classified with four levels – no design (60%), design as style (17%), design as a skill (8%), and design as a strategy (35%). Design brings positive impacts to the firms – not just growth in turnover but also customer satisfaction, differentiation, competitiveness, creativity and so on, and is seen as a key skill to the firm as a contributor to innovation.

The economic value of design for both supply and demand side in France was evaluated, showing the statistical number of designers, people concerned by the design activity, and overall design turnover. As a result of qualitative questionnaires, two conflicting trends in design were found. It was obvious that there are more awareness of design among businesses, and the persistence of a confused image of design and its professions. The lack of a design culture in the business and the design-related costs are still regarded as an obstacle.

The conclusions and recommendations were drawn to promote the design supply and demand. Government can have an indirect influence on businesses by standing as a model to use design and to pay a fair price. In order to stimulate the demand side, it is necessary to build business awareness of innovation, its tools, and design. The evaluation of the return on the design investment was also emphasized. The report provides indicators on the use of design by businesses and on the designers for better understanding of supply and demand side of design.

Source: DGCIS (2010), Summary of the study on the design economy, the French Ministry for the Economy, Industry and Employment, Directorate General for Competitiveness, Industry, and Services (DGCIS), May 2010.

The European Patent Office (EPO)[19] and Office for Harmonization in the Internal Market (OHIM)[20] have analysed the IPR-intensive industries[21] of European Union countries and found that they contributed 25.9% of employment and 38.6% of GDP in the EU during the period of 2008-2010. 56.5 million Europeans were employed by IPR-intensive industries among the total employment 218 million. Design-intensive industries[22] generated 12% of all jobs in the EU. The contribution of IPR-intensive industries to employment and economic output, as measured by GDP is described in Table 1 (EPO and OHIM, 2013).

Table 1. Contribution of IPR-intensive industries to employment and GDP, European Union

IPR-intensive industries	Employment	Share of total employment	Value added (GDP) (EUR million)	Share of total EU GDP
Patent-intensive	22,446,133	10.3%	1,704,485	33.9%
Design-intensive	26,657,617	12.2%	1,569,565	12.8%
Trade mark-intensive	45,508,046	20.8%	4,163,527	13.9%
Copyright-intensive	7,049,405	3,2%	509,859	4.2%
GI-intensive	374,345	0.2%	16,134	0.1%
IPR-intensive total	56,493,661	25.9%	4,735,262	38.6%
Total EU	218,400,733		12,278,744	

Source: EPO and OHIM (2013), Intellectual property rights intensive industries: contribution to economic performance and employment in the European Union, A joint project between the European Patent Office and the Office for Harmonization in the Internal Market, September 2013.Marsili and Salter (2006) suggested that the design process has indirect influence on firms' performance by being associated with innovative performances such as investment in R&D and other inputs of the innovation process. Design is an important complementary asset for innovation, especially for high-level innovation. In addition, design activities cross boundaries of R&D at all stages and throughout the innovation processes (Tether, 2006).

The evidence on the effects of design on other forms of innovation is generally qualitative in nature. Hobday et al (2012) found that there are few systematic links among different aspects of innovation. Design is regarded as a core of innovation including product, process and service innovation, which has more immediate and direct impact on innovation and economic growth than R&D. However, there has been less focus on design policies than innovation policies. It was pointed out that re-balancing innovation policy to include a greater appreciation and focus on design.

There are some examples that design in public organisations is well connected with social innovation. Public bodies have promoted design through various organizations to deal with various social issues and design has worked well for public services (Box 2).

Box 2. Public bodies to boost design and innovation

SITRA and Helsinki Design Lab (Finland)*: SITRA is a public fund in Finland aimed at sustainable development. The fund is commissioned with the task of promoting stable and balanced development of Finland, economic growth and international competitiveness and cooperation through a specific project base. SITRA runs the Helsinki Design Lab (HDL) which supports strategic design from 2008 to 2013. HDL accelerated the integration of design beyond the aesthetic perspective, focusing on improving the skill and mindset of the designers to help solve social challenges. It supports the ideas that successful design is not only about creative thinking but also about the implementation of design thinking to overall change processes to find out solutions.*

DESIS (Italy)*: DESIS is a network of design labs in design schools which is involved in supporting sustainable change. There are various programs to collaborate with other organizations for social innovation and sustainability - Social Innovation Exchange (SIX), Sustainable Everyday Project (SEP), Learning Network on Sustainability (LeNS), Partnership for Education and Research about Responsible Living (PERL) and International Association of Universities and Colleges of Design, Art and Media (CUMULUS). DESIS also works with firms, non-profit organizations, and government agencies to deal with promoting design activities.*

Mindlab (Denmark)*: MindLab is a cross-governmental innovation unit involving citizens and businesses in creating new solutions for society. It brings together the Ministry of Business and Growth, the Ministry of Education, the Ministry of Employment and Odense Municipality, and also collaborates with the Ministry for Economic Affairs and the Interior. Covering policy areas such as design, entrepreneurship, digital self-service, education and employment, MindLab helps key decision-makers see the problem-solving from a citizen's perspective.*

Source: Website of SITRA (www.sitra.fi), Helsinki Design Lab (www.helsinkidesignlab.org), DESIS (http://www.desis-network.org), and Mindlab (www.mind-lab.dk/).

In addition, design is one of the prominent sources for open innovation. Opening up the innovation process has been regarded as an important strategy for firms, and the role of design in encouraging this process has been emphasised. Acha (2008) pointed out that design capacity - such as organisational design in the specification of tasks and technical design in the task interfaces - is a core capability for open innovation practices.

However, the contribution of design to innovation is still overshadowed by R&D (Tether, 2009). This is certainly partly a consequence of the fact that much investment in design is not recognised as design activities and are usually hidden in R&D expenditures, so it is not easy to conduct accurate measurement of the contribution of design to innovation more generally.

The research available shows that most advanced economies have invested as much or more in Knowledge Based Capital (KBC) [23] as tangible assets. Countries like the United States, the United Kingdom, and Finland show that investment in KBC is more than that in tangible capitals (Figure 2). In the United States for example investment in KBC has continuously risen for last 40 years, and in the United Kingdom it is also estimated to have more than doubled between 1970 and 2004 (OECD, 2013a).

Figure 2. Investment in physical and knowledge-based capital, 2010

As a percentage of value added of the business sector

Source: OECD (2013b), Investment in physical and knowledge-based capital, 2010: As a percentage of value added of the business sector, in OECD Science, Technology and Industry Scoreboard 2013, OECD Publishing. doi: 10.1787/sti_scoreboard-2013-graph28-en.

In summary, there is a lack of in-depth research of the relationship between performance and industrial design, its capabilities, outcomes and management. It is necessary to collect data and undertake studies on the contribution of individual firms to industrial design, and the impact on the firms and the industry as a whole. Measurement of these impacts can allow for the evaluation of industrial design policy, but the absence of a common methodology remains an issue.

3. Review of Design Policy

Countries have different design capabilities. According to the Design Competitiveness ranking 2010, which assessed design competitiveness based on seven design-related indexes,[24] high-ranked countries are Switzerland (1st), Japan (2nd) and Germany (3rd). The UK ranked 14th, Korea ranked 15th, and Canada 23rd among the 50 countries included (DESIGNIUM, 2010). This Section describes the various design related policies of selected countries-the national design policy frameworks of Korea, UK, Canada, Finland, Denmark, Sweden, the Netherlands, and Italy, public investment on design, development of design-related human resources, design capability and design right are reviewed.

3.1 Policy framework

Design policies seek to develop national design resources and encourage their effective use in the economy. It includes the creation of an environment for design and creativity to flourish, and for companies to be encouraged to develop their products focusing on design. Design programmes play a role in introducing design to individual companies or encouraging industry and the government itself to make better use of design resources (Whicher et al, 2011).

The type of design policies implemented differs from country to country, reflecting in part differences in degree of commitment. Some policies only provide a guideline for the national design organization, while others include topic-related specific policies and programmes. There is limited evidence about which strategies are more effective, but there is a tendency for design policies to be increasingly integrated into other government policies (Raulik-Murphy et al, 2010) such as R&D policies.

A survey of barriers to improved understanding of design in Europe shows that "lack of understanding of design among policy-makers" and "lack of knowledge and tools to evaluate the rate of return on design investment" are the main problems (EC, 2009). The practice of design policy is developing, but the general understanding of what is involved has not kept pace with these developments.

In the rest of this section a selective review of design policies, programs or projects to promote design activities of firm and increase national design capabilities is presented, with special focus on industry, technology and innovation.

3.1.1 Canada

In Canada design policy has been implemented at the regional level rather than national level. There is no single body responsible for design at a national level, but there are provincial bodies which provide design support and promotion in the main provinces. In each province, there are regional policy initiatives.

The Quebec government provides a design tax credit aiming to encourage small firms to invest in design. The tax credit is available to any manufacturing firms with at least CAD 150 000 gross revenue for the taxation year as well as employing designers[25] in-house. Also, any type of company or partnership that has a contract with an industrial designer consultant who holds a Recognition of Qualification is eligible. This measure is aimed at improving design competitiveness of small firms whose design products generate economic spin-offs for the province (GOC, 2014).

In 2009, the Design Exchange [26] developed an initiative for the key areas for Canadian competitiveness, cultural identity and environmental leadership. The goal of this initiative is 'to raise awareness among governmental agencies, business and the public as to the power of design for addressing the crucial issues of our times – namely prosperity, accessibility, health, social fabric, the environment and

economic competitiveness', through research, survey results and national fora. The Canadian government has sought the key role of design in innovation and sustainability (SEE Platform, 2014).

3.1.2 Denmark

Denmark also has a well-defined design policy framework. The objective of the Commission for Danish Design Promotion is the strengthening of design as a factor for economic growth. Denmark has focused on design promotion in the private sector, the use of public procurement to encourage design, and the strengthening of design competencies. This has led to design being integrated in the policy on "Economy of Culture and Experience" in 2003.

The government introduced a new policy (*DesignDenmark*) in 2007. The objective was to solve key challenges by creating better market conditions for design, making design education more commercially-orientated, and promoting international use of design (Danish Government, 2007). It was at this point that the aforementioned 'Design Policy Ladder' was developed by Danish Design Centre to better understand how firms use design.

The Design 2020 Committee issued a report (*Design2020*), which reveals the long-term challenges in the design field, focusing on the design products and services, design research and education and branding of design from the national and regional perspectives. Denmark has a strong national identity of design, the Danish design DNA, which embedded in the fundamental values, culture, and aesthetics as well as in Danish products, services and solutions (Design2020 Committee, 2011).

The national innovation policy announced in 2012 includes design as one of the user-driven innovation tools (Danish Government, 2012). For more targeted policy, the government announced an "action plan for the creative industries and design" in 2013 as the national innovation policy. As one of the important creative industries,[27] design plays role in the growth strategy. The 27 initiatives were implemented under four focused areas - improving business skills and access to finance in the creative industries; more creative products and design solutions to be connected to the market; strengthening education and research for the creative industries; and, and promoting Denmark as an international business growth hub in architecture, fashion and design (Danish Government, 2013).

3.1.3 Finland

Finland has encouraged design competence, research and education in a number of ways. Design is regarded as a prominent intellectual property for the competitiveness of enterprises and well-being more broadly. Large Finnish corporations know how to use design in their business operations, but most SMEs do not know how to do so effectively. The Finnish design research sector is very closely related to the Finnish creative designers and to industry, and this makes it possible for design to be directly applied to the production processes.

Finland has developed clear national and regional strategies to include design within innovation policies. The inaugural national policy programme for design (*Design 2005!*) was introduced in 1999. The main goal of the programme was to encourage firms to incorporate design into the product development and business strategies of firms. The Finnish Funding Agency for Technology and Innovation (Tekes) implemented a technology programme on industrial design, which is called Muoto 2005 and promoted design in the research and development activities of the industry. This program has contributed for private actors and the public sector to commit in the development of design (MEC, 2014). In 2008, design was selected as one of the components of the National Innovation System (NIS) focusing on a systemic approach for business and policy sectors and their relevant activities. The demand- and user-driven

innovation policies were emphasized in developing products and services and the participation of end-users in the innovation process (SEE Platform, 2014).

Helsinki was designated as the World Design Capital 2012 and the Designium Innovation Centre at Aalto University in Helsinki started to play a role in strengthening the connection of design, innovation and competitiveness. The World Design Capital Helsinki 2012 (WDCH) programme also promoted the use of design in Finland to improve understanding on the opportunities of design. The Open Helsinki program ("Embedding Design in Life") promoted investment in design. As a result, the WDCH lead to the initiation of 580 projects. The first national design programme and the WDCH project continued in the preparation of the Design Finland programme (MEC, 2014).

The current national design programme, Design Finland (2013-2020) also contains various measures for the promotion of design to strengthen design skills and to improve design research and education (Box 3). It was developed by the Ministry of Employment and the Economy together with the Ministry of Education and Culture. The vision of the Design Programme is to bring the growth of well-being by putting the design as part of the core competence of enterprises and the public sector. It supports cultural entrepreneurship, generation of jobs in the creative sector, and marketing competence in the creative sector. In addition, the tax legislation to improve the status of persons employed in the creative sector was determined. The service design, user-driven approach and sustainable development are also promoted through this programme (MEC, 2014).

3.1.4 Korea

Korea's design policy is closely connected with industrial and technological development because of the industry-intensity of the Korean economy. The design policy of Korea started in the mid-1960s. It was felt that investment design lagged, and the government started to promote design capabilities. The direction of design policy has since undergone a number of important changes.

The Ministry of Trade, Industry, and Energy (MOTIE) is in charge of industrial design policy, with support from the Korea Institute of Design Promotion (KIDP), the national design organisation, responsible for the delivery of design policies and programmes. The Industrial Design Promotion Act is the main law to promote R&D of industrial design and implement related supporting programs (MOTIE, 2014a).

Korea has improved the policies consequently and those policies have had an impact on economic development in Korea. The industrial design policies have been implemented in earnest in five-year cycles since 1993.

- 1st Industrial Design Development 5-year-plan (1993-97);
- 2nd Industrial Design Promotion Plan (1998-2002) - strengthening design workforce, design firms and increasing awareness about design;
- 3rd Design Industry Development Plan (2003-2007) - enhancing design infrastructure and international cooperation toward "Design Korea";
- 4th Design Promotion Plan (2008-2012) - building up the creative design competitiveness; and,
- Design & Industry Convergence Strategy (2013-2017): promotion of design-led R&D.

From 2008 to 2012, Korea implemented its fourth five-year plan for design promotion. The globalisation of Korean design was an important issue in the national plan for creative design, which also includes developing innovation design in companies as well as fostering multidisciplinary courses at

Korean universities. In order to foster creative design talent in the country, KIDP promoted the *Next* Generation Design Leaders Programme since 2004. Also, companies were supported through the Design Innovation Programme and various design supporting programme commissioned by the Small Business Administration. Korea has a number of regional design centres and other design organisations, such as the Seoul Design Foundation, Gwangju Design Centre, Design Centre Busan and Daegu Gyeongbuk Design Centre.

MOTIE established the Design & Industry Convergence Strategy (2013-17) to foster a creative and innovative country. This strategy was based on the broader vision of Korea to encourage 'the design and convergence-led era.' This plan is focused on encouraging the convergence of industries, and improving the competitiveness of the design industry. There are three design strategies: a) a design-led R&D policy will be implemented; b) a design-friendly business environment will be established through various supporting programmes; and, c) regional design capacity will be strengthened through fostering design-related human resources and design clusters (MOTIE, 2013).

a) Design-led R&D policy

- In order to establish a design-led R&D system, design professionals' participation in R&D project planning, project awardee selection and evaluation process of regional R&D projects will be mandatory.
- As of 2010, the percentage of companies which invested in design in Korea was approximately 11.3% for small companies and 12.8% for all companies. The government established a goal to increase the rate to 20% by 2020. In order to accomplish this goal, the specific action plan for the convergence of design and industry was reflected in a five year plan. MOTIE has the objective to implement the design convergence technology development project in seven strategic fields, such as electronics, robots, overland traffic devices, maritime and shipbuilding, household items, medical and service industries, by investing KRW 20 billion next year for SMEs in these industries.
- In order to foster design specialisation in each industrial field, MOTIE will start designating "design graduate schools" for each field next year. The design graduate schools will offer specialised design courses in the areas of IT, automobile, robot and service.

b) Design-friendly business environment

- MOTIE will establish a 'Design Business Support Center' within KIDP and assign personnel for each industry in order to strengthen the supporting function of the centre. Design-specialized incubating and mentoring services will be provided.
- Design support for firms will be improved, focussing on the growth stage of firms and the incentives for so-called "Excellent Design Firms" will be enhanced.
- To protect designers' rights, the real-name design system which allows for the designer's name to be placed on the design product will be introduced. A training program to deal with design right infringement will be implemented.

c) Design cluster and design infrastructure

- The connection between manufacturing and design firms will be strengthened through the establishment of a design cluster.
- MOTIE will also promote the establishment of an 'Industrial Design Promotion Committee' for inter-governmental design policy cooperation. By amending the related laws, MOTIE will establish an organization to discuss design cooperation projects and policies to be promoted by the related government offices.

The government budget for industrial design R&D is KRW 39.4 billion (approximately $US 40 million) in 2014, mainly for design technology development, firms' design capabilities, and design manpower development. Table 2 shows a 31.5% increase in the total industrial design budget compared to 2013 (MOTIE, 2014b).

Table 2. Design R&D Budget

(KRW million)

	Design Professional Technology Development	*Design Manpower Development*	*Design Infrastructure*	*Design Firm Capability Strengthening program*	*Social Problem Solving R&D*	*Total*
2013	*11,174*	*7,100*	*4,329*	*7,400*	*-*	*29,976*
2014	*15,982*	*8,608*	*4,329*	*8,895*	*1,600*	*39,414*
Growth rate (%)	*43.4*	*21.2*	*-*	*20.2*	*New*	*31.5*

Source: MOTIE (2014a), Design R&D Convergence, Ministry of Trade, Industry and Energy, 21 March, 2014.

3.1.5 United Kingdom

The UK is one of the few countries which have well-defined design policies and these are based on the government's strong interests and the active role of the private sector. There are several public institutes promoting and developing design, with the Design Council playing a leading role.

Since the Design Council was established in 1944 (as the Council of Industrial Design), it played a role to promote the improvement of design in the products of British industry. From the 1960s, its work also started to involve an increasing emphasis on technology and engineering design and to focus on both public campaigning and business and education. The Council contributed to form partnerships between business, education and government through various communication channels and initiatives. Its efforts brought increased awareness of design, but promoting the best use of design remained a challenge. The

Design Council has initiated various projects to connect designers with business, schools and public organizations to integrate design thinking into the firms 'business strategies or systems.

In the context of declining numbers of manufacturing enterprises and employees, the Design Council has started to focus on supporting and strengthening the UK economy and society through design-led solutions to social and economic problems. The Design Council has invested in its own R&D to address wider design initiatives, such as social changes and sustainability, and to encourage the use of design in the community and outside specific business support programs.

The UK has set out six essential characteristics of design: i) the multi-faceted character of design; ii) design as a link from creativity to innovation; iii) design as a source of competitive distinction; iv) design as an approach to planning and problem-solving; v) design creating an order out of chaos; and vi) design as an approach to system thinking (BIS, 2010a).

Design Wales (DW) is the main design promotion organisation in Wales. It has been delivering design support programmes for the Welsh Assembly Government (WAG) since 1994, and DW has delivered a Service Design programme for the Welsh manufacturing sector, as well as coordinating the Design Wales Forum, a network of Welsh designers and creative professionals. WAG provides a design support programme focussed on R&D under the innovation strategy 'Flexible Support for Business' structure. The Ecodesign Centre for Wales was established to support building capabilities in eco design for applied research organisations. The Cardiff Design Festival is an annual celebration of design in October and highlights include the 'Best of Welsh Design'. In 2010, the Welsh government announced the 'Economic Renewal: A New Direction' strategy and it included an element of design with focuses on R&D, advanced manufacturing and materials.

Box 3. Design Finland strategy and measures

Design Finland consists of four strategic objectives and specific measures to promote the growth of well-being of nation.

1. Design Competence, research and education

- *Increasing design literacy through early childhood education: Citizens' understanding of design is promoted by education. Design is accumulated with early childhood education and individuals are encouraged through "learning by doing". (e.g. Designer's Treasure Chest project)*
- *Design education is promoted in basic education and upper secondary education: Design education is also incorporated into other subjects such as the use of technology, environmental education, and communication skills.*
- *Intensified international co-operation with leading international education institutions and research institutes in the design fields.*
- *Special education programs for the public sector aiming at the methods or design in the user-driven renewal of public services is promoted.*
- *Teaching of design in other degree curricula and further education are supported.*
- *New user-driven methods such as co-design, crowd sourcing, mass on-line open courses and the utilization of different test environments in innovation activities are used through open innovation.*
- *Design research and the application of research results are strengthened such as the application of new materials and manufacturing techniques. (e.g. 3D printing).*
- *Establishment of Knowledge and Innovation Communities (KICs) for innovation partnerships for co-operation between higher education institutions, research organizations, businesses and other parties.*

2. Design ecosystem to balance the demand and supply of design competence

- *The role of Finish Design Center will be strengthened: supporting SMEs to have more design competence, providing advice on how to utilize design competence, and enhancing the use of design in the public sector*
- *Advisory and development service for SMEs will be provided.*
- *Innovation funding through various projects and programme activities are provided to encourage companies to find experimental and user-driven solutions (e.g. Tekes program).*
- *Companies utilizing design for product and service export are encourages to make use of funding instrument*
- *Tax incentive is provided for the firm's wage costs of staff employed for R&D and design, and a tax relief for companies on licensing income for IPR is provided from spring 2013.*
- *Multi-professional clusters of design is strengthened through investments in education and training and the channeling of public funding (e.g. Innovation Cities (INKA) programme)*
- *New Structural Fund programme will be implemented between 2014 and 2020 and the utilization of design will be more supported.*

3. Effective utilization of design in growth sector

- *Design is integrated in the clean tech programme and development projects for new business opportunities in the green economy.*
- *Design is integrated in the national strategy for bioeconomy, the national programme for wood construction, the Arctic region cluster and the development of user interfaces (e.g. big data, data visualization).*

4. Design used in the development of society and for well-being in the public sector

- *The use of strategic design is encouraged to be sued to find solution for major societal challenges.*
- *Design will be promoted through the innovation operating programs or relevant units (e.g. MindLab, Sitra's Design Exchange Programme)*
- *Design is used as a driver of public service development based on the cooperation of municipalities and the ministries (e.g. public procurement).*
- *More communications between design agencies and cities/municipalities to enhance successful public procurement*

Source: MEE (2014), Design Finland Programme - proposal for strategy and action, Ministry of Employment and the Economy.

3.1.6 Other EU countries

Sweden has a well-established design ecosystem based on high levels of trade, exchange of design-related activities, personnel and resources. The Swedish national design policy comprises several design-related initiatives under different ministerial agencies. The national approach to design is targeted at innovation and improvement in the quality of life. Design policy is administered by the Ministries of Culture, Industry and Education. Several public bodies such as the Council for Architecture Form and Design, the Swedish Society for Crafts and Design and the Swedish Industrial Design Foundation (SVID), have responsibilities for the promotion of design. Innovative Sweden which is a strategy for growth includes the importance of design for innovation (MEEC, 2012).

Sweden recently implemented the *Design Som Utvecklingskraft* (Design as Development Power) programme. This initiative seeks to increase the number of design companies in Sweden, with a focus on SMEs. In total 498 companies developed design concepts and 406 students gained experience of professional design practice. About 10% of the companies involved in the programme experienced increases in turnover and increased recruitment (DeEB, 2014b.

The Netherlands have embedded design policy within industrial policy rather than implementing it as an independent policy. However, there has been increased recognition of the importance of the cultural design climate, and this is reflected in the economic and social agenda in the Netherlands.[28]

Italy launched Industria 2015 in 2006, which includes strategic guidelines for the future development and competitiveness of the Italian economy. This strategy is based on the elaboration of future scenarios facing the country in the medium to long term. The incentives provide a total of EUR 200 million, implementing 30 projects. One of the projects is New Technologies for Industrial Innovation Project (an element of the 'Made in Italy' programme), which outlines the strategy for public intervention in support of business for Italian competitiveness, including specific themes such as the concept of "beauty, design and quality of 'Made in Italy'" (SEE, 2011).

The Italian programme "*un designer per le imprese*" has the objective of raising awareness of the relevance of design in the business of SMEs and the use of innovative materials and innovation processes in medium-sized firms. It is a project implemented to encourage communication between the business community and young designers. Various players such as the Milan Chamber of Commerce (CCIAA), Province of Milan, the Como Chamber of Commerce, the Monza e Brianza Chamber of Commerce, Material ConneXion (MC), six Design Schools located in Milan and Como are involved in this program. Also, Design and Craft for Trentino (DEA) in Italy has sought to develop a design culture within companies and connect design and small businesses at a local level in order to create innovative networks between universities, institutions, micro and small local businesses. Participating companies have received training, support in the selection of project ideas, and design support throughout the development of firm specific projects. Some of results were presented during the Milan Design Week (DEEP, 2014b).

The European Design Leadership Board announced recommendations on the opportunities of design as a source of well-being and growth at national, regional and local levels. This focus on design in the innovation systems of Europe, businesses, public sector, and research and education system (EC, 2012). Furthermore, Europe 2020 is a strategy for growth and jobs of Europe. Design is one of the important disciplines and activities to bring creative ideas to market. In order to accelerate the design in innovation policy, thee strategic areas and action plans are chosen (Table 3).

Table 3. An action plan for design-driven innovation of EU

1. Promoting understanding of design's impact on innovation	
	1-1 Advocating design's role in innovation to policy makers across Europe for information dissemination (SEE Platform)[29]
	1-2 Measuring the economic impact of design and its role alongside other intangible assets in value creation (€Design-project)
	1-3 Applying design methods in multidisciplinary research and innovation programmes that address complex challenges
	1-4 Developing competencies and applying methods for design-driven innovation in education and training
	1-5 Facilitating continuous dialogue among the key stakeholders of design-driven innovation policy (European Design Innovation Platform)
2. Promoting design-driven innovation in industries to strengthen Europe's competitiveness	
	2-1 Creating capacity to deliver support for design –driven innovation for businesses through Europe such as mentoring programmes for SMEs or design-driven innovation incubators (Enterprise Europe Network, European Innovation Management Academy)
	2-2 Strengthening European SME's ability to use design as a strategic tool in creating products and services with a higher value for their customers (WORTH pilot project)[30]
	2-3 Enhancing cooperation among companies that invest in design as a competitive asset (European Technology Platforms)[31]
	2-4 Promoting new collaborative innovation strategies and practices that enable new business-models
	2-5 Integrating design into research and development to better support commercial and societal applications benefiting from a strong user orientation
	2-6 Integrating the needs to update the protection of the intellectual property right for design
3. Promoting the adoption of design to drive renewal in the public sector	
	3-1 Building the capacity of public sector administrators to use design methods and to procure design effectively (European House of Design Management)
	3-2 Enhancing research and development of design-driven innovation for efficient and user-friendly public services
	3-3 Promoting peer learning and cooperation among public-sector actors looking for design-driven solutions

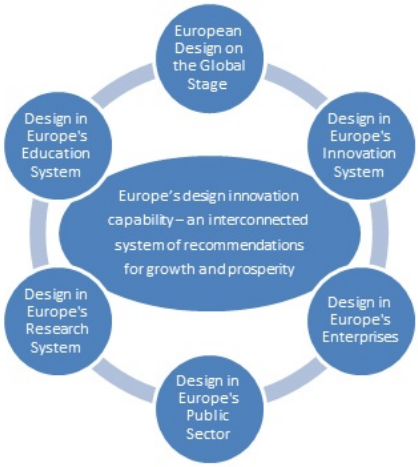
Source: EC (2013), Implementing an Action Plan for Design-Driven Innovation, European Commission, Brussels, Sept. 2013.

EDII (European Design Innovation Initiative) was launched by the European Commission in 2011 to promote and exploit the potential of design for innovation. There are six projects under EDII, linking 46 organisations and 19 EU member states.

- €Design: aims to develop a methodology for measuring the economic impact of design - Coordinator: Barcelona Design Centre (ES).
- SEE Platform (Share Experience Europe): aims to share design policies and programs in Europe through practical workshops to engage public authorities – Coordinator: Design Wales (UK).
- IdeALL (Integrating Design for All in Living Labs): aims to connect designers and innovative ecosystems - Coordinator: EPCC Cite du Design (FR).
- DeEP (Design in European Policies): aims to develop design innovation policies - Coordinator: Politecnico di Milano (IT).
- EHDM - European House of Design Management - Coordinator: EDC, European Design Centre (NL).
- REDI - When Regions support Entrepreneurs and Designers to innovate - Coordinator: APCI, Agence pour la Promotion de la Création Industrielle (FR).

In addition, the EC has established a Leadership Board in order to support the EC and the Member States in integrating design and innovation policies. The main result of this collaboration is a series of recommendations (Figure 3).

Figure 3. Recommendation of EC Leadership Board



Source: Design European Commission, Design for Growth & Prosperity- Report and Recommendations of the European Design Leadership Board, 2012.

3.2 Public investment in design and R&D

In addition to general support measures, a number of governments are investing directly in design. Whicher et al (2013) compared government investment in R&D and design in the UK, Denmark and Finland. The UK spent more public money on design than Denmark or Finland does, EUR 9.75 million per year. This is more than Denmark or Finland, but the percentage of public expenditure on design of GDP. Nevertheless, the number of industrial design registrations is comparatively higher in the UK. The UK government's various design promotion efforts might have an influence on the industrial design registrations (Table 4).

Table 4. Public expenditure on R&D and design at national level and registrations

	PERD (EUR million)	PERD/GDP (%)	PED (EUR million)	PED/GDP (%)	Number of industrial design registrations
UK	2830	0.17%	9.75	0.00057%	236983
Denmark	151	0.06%	3.35	0.00142%	59059
Finland	645	0.36%	5.00	0.00279%	37317

Source: Whicher et al (2013), Design Policy Monitor 2012, SEE Platform; WIPO (2014), WIPO statistics database, June 2014.

Design and R&D are complementary and overlapping concepts. Walsh (1996) explained the similarities and differences of design and R&D. Design is more widespread than R&D because it is a more general endeavour. R&D is more technology-based and concentrated in research-intensive industries, while design is important for both research-intensive and other sectors more generally. However, it is true that national strategies or policies for design have been less analysed than that of R&D. An improved understanding of the different characteristics and consequences of design and R&D might be helpful for effective policy planning.

In Korea, the convergence of design and R&D is regarded as one of the important mechanisms to connect technology and market. The main idea of this strategy is to consider design from the beginning of the R&D planning stage. The program directors (PDs) of KEIT (Korea Evaluation Institute of Industry), which is responsible for R&D project planning and evaluation, review the possible projects for which design can enhance outcomes, and assess its expected impacts. Moreover, during the R&D project evaluation process, the evaluation team examines the design R&D activities of project applicants through their project plan. This is also true of mid-term and final evaluations. Various incentives for public organizations which actively adopt design as an element of their R&D management will be introduced, and the design convergence strategy will be applied for 250 projects, amount of KRW 22 billion.

Design agencies play important roles in linking government, firms, design sectors, academia and other actors. In general, they provide various design supporting programs including mentoring or coaching, and also provide subsidies for firms to invest in design. The activities of design agencies are expending and the importance of it is as well. The budget of design agencies in several countries is shown in table 5.

Table 5. Budget of design agencies

Country (Year)	Design agency	Annual budget (EUR million)	Number of full time staff
Korea(2013)	Korea Institute of Design Promotion	26.7	102
UK (2012)	Design Council	12.5	65
Denmark(2012)	Danish Design Center	3.35	20
Finland (2012)	Design Forum Finland	2.0	17

Source: Whicher et al (2013), Design Policy Monitor 2012, SEE Platform; All Public Information in One (2014), Korea Institute of Design Promotion management information website, www.alio.go.kr/alio/public/p_ma_14_00_list.jsp?org_code=C0184 (accessed 20 May 2014).

3.3 Design rights[32]

A well-functioning and balanced intellectual property (IP) system is key to promoting innovation and creativity and it strengthens a nation's ability to generate economically valuable IP assets (WIPO, 2014a). While firms which invest in design may choose a number of alternative means by which they capture the rents from their investment in design, registration through IP systems are likely to be an important part of their overall strategy. When an industrial design is protected, the owner of design is assured of an exclusive right against unauthorised copying or imitation of the design by third parties. This might be essential to ensure a fair return on investment. IPR strategies have significant effects on the designer's creative ideas, especially in micro firms and SMEs, and this can contribute to improved national competitiveness (Nurani, 2011). Well-designed IP systems also benefit consumers and the public by promoting fair competition and honest trade practice, encouraging creativity, and promoting more aesthetically attractive products (WIPO, 2014c).

Industrial design is an element of intellectual property alongside patents, trademarks and so on. It is distinct from copyright, which includes literary, artistic works, and architectural design (WIPO, 2013). The definitions of Intellectual Property Rights (IPRs) are described in Box 4.

Box 4. Definition of Intellectual Property Rights

- *Patents and Utility Models: A patent is an exclusive right granted for a technology-based invention, such as a product or a process that provides a new way of doing something, or offers a new technical solution to a problem. To obtain a patent, one must disclose the technical knowledge behind the invention, and patents eventually expire (they generally expire 20 years after the filing date).*
- *Industrial Design: An industrial design protects new and/or original ornamental or aesthetic aspects of articles rather than their technical features. A design may consist of three-dimensional features, such as the shape or surface of an article, or of two-dimensional features, such as patterns, lines or color. In many jurisdictions, registered industrial designs are renewable up to a maximum of 25 years.*
- *Trademark: A trademark is words, symbols and brand names that help customers identify and purchase products or services that meet their needs and expectations. The protection period of trademark varies, and can be generally renewed indefinitely.*
- *Copyrights: Copyrights protect and reward literary, artistic and scientific works, including those in the form of computer programs and, in some jurisdictions, databases. Copyright laws also provide for certain exceptions and limitations. Their term of protections typically lasts 50-70 years after the death of the creator.*
- *Geographical Indication (GI): A geographical indication is a sign used on goods which have a specific geographical origin and possess qualities, a reputation that are due to that are essentially attributable to the place of origin.*
- *Trade Secrets: Trade secrets encompass confidential business and technical information and know-how that a firm makes reasonable efforts to keep secret and that has economic value as a result. Trade secrets do not have a fixed duration and can potentially last indefinitely.*

Source: WIPO (2014b), World Intellectual Property Office webpage, www.wipo.int/portal/en/ (accessed 15 April, 2014); OECD (2014), Chapter 2 of KBC2/IP Synthesis Report, Box2 (forthcoming).

Industrial design rights apply to intellectual property with respect to product appearance, without concerning function or operation of the product. The design right protects the way a product looks, whereas patents focus on how it works, and copyright concentrates on non-physical products. In most countries, an industrial design must be registered in order to be protected by industrial design law. National laws and regulations for filing design right applications, issuing design rights and promoting industrial design, differ across jurisdictions.

Industrial designs are often protected because they make a product attractive and appealing, adding to the commercial value of a product and increasing its marketability. Production of new design is a creative activity requiring significant investment of time and effort, skills and labour. Without exclusive rights, any party could replicate the designs and compete with the original creator. Ideas are “expensive to make, but cheap to copy” (HM Treasury, 2006). Without protection there would be under-investment in design.

The lawsuit of two global firms indicates how important industrial designs are for the competitiveness of firms. In April 2011, Apple filed a lawsuit against Samsung in the US, alleging that it had copied the look and design of a product. The jury awarded USD 1.05 billion in damages. The legal protection of industrial design can provide individuals and organisations with incentives to undertake creative and innovative activity by providing them exclusive legal rights as a result of their inventive and creative work. In most countries, industrial design should be registered to be protected under industrial design law. In general, the design must be new, which means that no identical or similar design is known to have existed before.

The World Intellectual Property Office (WIPO)[33] is a United Nations specialised agency with a mandate to promote innovation and creativity for the economic, social and cultural development of all countries through an effective international IP system. The mandate, governing bodies and procedures, are set out in the WIPO Convention, establishing WIPO in 1967. It is also responsible for negotiating and managing the various international IP treaties, and under the "Hague System" allows the owner of an industrial design to obtain protection in several countries by filing one application in a single language (WIPO, 2014b).

The WIPO administers the Hague Agreement, which provides a system for registering a design in several countries through a single application. This simplifies the registration process for the protection of a design in multiple jurisdictions, as well as a subsequent management such as recording changes or renewal the registration. This international registration of industrial design consists of three international treaties: the London Act (1934), the Hague Act (1960), and the Geneva Act (1999).

In order to be protected under the Hague system, the industrial design must be protected in a country which is a party to the Hague Agreement or a member State of an intergovernmental organization which is party to the Hague Agreement. The international application must be filed in English, French or Spanish through an electronic filing interface. The application fees vary depending on the number of States covered. One of main advantage of this system is that designs can be protected with a minimum of formalities and expense. Also, the design owners can avoid complications arising from different procedures and languages of States they apply as well as the subsequent management through a single international registration (WIPO, 2012).

While the Hague Agreement reduces transaction costs for protection of design in multiple jurisdictions, at the national and regional level there can be significant variation in the systems of protection for design-related IP. In the remainder of this section of the report a review of national IP regimes is presented.

Korea

Korea's IP system has evolved according to the economic growth and technological development of Korea. Since the modern IP system was introduced in the 1960s, there have been changes in the degree of IPR protection, coverage, relation with industries, and governance. Industrial design legislation in Korea consists of Acts for design protection and its promotion and the industrial designs are covered by Design Protection. The history of industrial design regulation has not been as long as that of the UK, but it has rapidly developed (KIPO, 2013b).

Korea joined WIPO in 1979 and in March 2014 signed the Geneva Act of the Hague Agreement concerning the international registration of industrial designs which allows the protection of designs in multiple countries through a single filing in March 2014.

The Presidential Council on Intellectual Property[34] - which consists of ministries in charge of IP creation, utilisation, and protection as well as experts from civil society - is the focal point of IPR policy. The Council is responsible for national IPR strategy. The Office of IP Strategy and Planning in MSIP supports the Council. IPRs are handled by the Ministry of Trade, Industry and Energy (Korean Intellectual Property Office, Korea Trade Commission), Ministry of Strategy and Finance (Korea Customs Service) and copyright is handled by the Ministry of Culture, Sports and Tourism.

The Korean Intellectual Property Office (KIPO) is in charge of protection and promotion of IPRs. It is responsible for IP policies. KIPO has established 'the creative economy ecosystem through IP' which is a strategy to connect R&D and the commercialisation the results of R&D in the market (KIPO, 2013a).

Through the "Technology Transfer and Commercialization Promotion Act" MOTIE is responsible for industry related IP, and it has implemented various policies to connect design and industry though linking design and R&D process and supporting programs. Moreover, public institutions related to IPR such as KIPI,[35] KIIP,[36] KIAT,[37] KIPA[38] support IPR policies to create a coordinated IP ecosystem.

In order to obtain a design right, first the owner needs to apply for the design registration to KIPO. If the examiner decides to grant the design registration, and after the applicant pays the stipulated registration fees, the design right is effective. Design rights are valid for 20 years from the date of registration. The design right covers not only the same basic design as that which has been registered, but also similar designs (with the same duration as basic design rights). When a basic design right expires, the design rights for similar designs expire as well (KIPO, 2014).

To register a design, the design should meet the substantial requirements including novelty, creativity, industrial applicability, and non-violation of the enlarged concept of novelty which allows only the first application to be registered when two or more applications filed at the same time.[39] The design application consists of two systems, the Substantive Examination System (SES) and the Non-Substantive Examination System (NSES). The applications under the SES are examined based on the substantial requirements and the applications under the NSES are examined through basic examination,[40] but the effects of rights under the NSES are identical with those under the SES. The NSES applies to articles[41] which are sensitive to trends and have a short lifecycle and the applicant may file an application for twenty designs or less. In order to ensure the safety of non-substantive examination design rights, the law was revised to refuse rights for a design easily created by widely known domestic designs (KIPO, 2014).

Recently, there have been changes in the existing design protection system and the Design Act is being revised. Since Korea joined the "Hague Agreement Concerning the International Registration of Industrial Design", the revised Design Act has provisions corresponding to those in the Hague Agreement with regard to the procedures and exceptional clauses for national implementation. The foreign owners of design will be able to apply for design registration in Korea by filing an application though WIPO. In addition, the duration of a registered design is prolonged from 15 to 20 years from the filing date of the design application (Jeong and Hong, 2013).

Korea's IP laws are comprehensive and the authorities and processes are becoming more efficient, offering a high standard of protection for domestic and foreign rights owners. However, it has been recognised that there are still some difficulties for foreign IP rights owners operating in Korea such as the linguistic challenge (IPO, 2013).

Canada

Canada defines industrial design as "visual features of shape, configuration, pattern or ornament, or any combination of these features, applied to a finished article". Canadian law offers the creator of an original industrial design protection from unlawful imitation of the design. The Industrial Design Act protects design owners while promoting the exchange of knowledge.

In order to obtain this protection, the design must be registered through the Industrial Design Offices (IDO) in Canadian Intellectual Property Office (CIPO). The rights granted by a Canadian industrial design registration are valid throughout Canada, but not to other countries. Once the design is registered, the owner has the exclusive right to registered design for up to ten years from the date of registration. Without the design registration, the owner cannot make a legal claim of ownership, and no legal protection is given to prevent others from making, importing, renting, or selling any article to which your design is applied.

There is no time limit for registering an industrial design as long as the design has never been published. In case the design has been published, it must be filed for registration within 12 months of publication. Registration of industrial design is valid for 10 years, beginning on the date of registration. After the 10-year term is over, anyone is free to make, import, rent or sell the design in Canada.

United Kingdom

Industrial design IPR in the UK was a precursor to the systems adopted in many other countries (IPO, 2011a). The protection of design in the UK has a long history and has undergone changes for over 400 years in terms of the duration, exclusions, scope and definition and the minimum requirements for protection of design responding to changes in industry and economic pressures. The current IPR policy of UK for industrial design is based on both UK-specific processes and EU/international processes. Some aspects are purely within national competence, some within EU competence and some are a mixture of the two.

Industrial design legislation in the UK consists of Acts, Rules and Directives which provide the legal rights, duties and procedures related to the protection of designs in the UK. The main legislation is the Registered Designs Act 1949, which is based on the EU Designs Directive providing guidelines to all Member States of the EU. The Registered Designs Act 1949 is the current law which provides for the registration of designs and the protection of registered designs in the UK. The Designs Registry administers the Act according to detailed rules, The Registered Designs Rules 2006.

The UK IPO is an Executive Agency of the Department of Trade and Industry, which is responsible for all the main IP instruments. The principal functions of the IPO with respect to design include award (registering UK trademarks and designs), raising awareness of IP-related issues among businesses and consumers, advising ministers on IP policy, resolving disputes and leading the development of the UK IP crime strategy (HM Treasury, 2006).

There are two different legal protections, unregistered Design Rights and Registered Designs. On the one hand, for Registered Designs, the exclusive rights are provided only in the UK for up to 25 years. It prevents people from making, offering, marketing, importing, exporting, using or stocking for those purposes, a product to which the design is applied. Two-dimensional designs, surface patterns, shape and configuration can be protected with a Registered Design. The application for Registered Design protection can be done by filling out the appropriate application form and paying the relevant fee (GBP 60) and submitting to the UK IPO.

On the other hand, an unregistered Design Right gives automatic protection for the internal or external shape or configuration of an original design, including its three-dimensional shape. Design Rights can only prevent someone from copying the shape or configuration of the article, without protection for any of the two-dimensional aspects. This protection is also limited to the UK, and lasts either 10 years after the first marketing of articles that use the design, or 15 or 10 years after creation of the design. For the last 5 years of the protection period, the design is subject to a Licence of Right, which means that anyone is entitled to a licence to make and sell products copying the design.

If others manufacture articles based on the design without the owner’s permission, this constitutes infringement of the design right. However, it is more difficult to prove infringement of an unregistered Design Right because the owner must be able to prove it was copied, or that the potential for copying existed. Infringement proceedings must be brought before the Courts, but some disputes concerning the subsistence of design right can be referred to the UK Intellectual Property Office (IPO).

European Union

Under the EU process for industrial design registration, there are two choices: either protect the design with OHIM before commercialisation and obtain an EU-level registered Community design (RCD) or, alternatively, commercialise the design directly without registration by relying on what is known as the unregistered Community design (UCD) right. The RCD is initially valid for five years from the date of filing and can be renewed in blocks of five years up to a maximum of 25 years. It is protected against similar designs even when the infringement of design has been developed in good faith due to ignorance of the existence of the earlier design.

In contrast, UCD is given protection for a period of three years from the date on which the design was first made available to the public within the territory of the European Union. After three years, the protection cannot be extended. UCD grants the right to prevent commercial use of a design only if that design is an intentional copy of the protected one, made in bad faith while being aware of the existence of the earlier design. The legal protection for registered designs is stronger and more transparent. In the case of UCD, it can also be difficult to prove that your design has been intentionally copied and used. However, a registered design provides you with a certificate, which makes it easy to prove the ownership.

The fee for registering and publishing one design is EUR 350 for five years' protection and it can be applied either at OHIM or through WIPO. For both cases, the applications are examined by OHIM. The application form should include information about ownership, a clear representation for RCD, and the design and its product(s).[42]

Synthesis of design rights in different jurisdictions

The industrial design rights of UK, EU, Korea and Canada are summarised in Table 6. The term of design rights vary from 10-25 years, and there are different procedures and systems for each country (IPO, 2011a). Those systems need to protect creative designs with minimal administrative burdens. For designers to be able to generate value form their work, they need an IP system which is flexible, reliable and easy to use (IPO, 2012).

Table 6. Design rights available to design entities

Cover	Name of Right	Right Provider	Term	Range of Cover	Fee
UK	Registered Design	UK IP Office	25 years	The overall appearance of a novel design which has individual character	1 design: GBP 60
	Design Right (Unregistered)	UK law and other private registries	15 years	An original design, protection only extends to copying	Free as copyright (private registries may charge)
EU	Registered Community Design	OHIM	25 years	The overall appearance of a novel design which has individual character	1 design: EUR 350
	Unregistered Community Design[43]	EU regulation	3 years		Free as copy, private registries may charge
Up to 58 signatories including EU	The Hague Industrial Design	WIPO	Between 15-25 years depending on jurisdiction	Varies depending on the national law in the respective members of the Hague system	• 1 design, all states covered: CHF 3753 • 1 design just in EU: CHF 503
Korea	Design Right	KIPO	20 years	The same design as a registered design as well as designs similar to it	• Request for a substantive examination Design application fee (Electronic): 60,000KRW • Registration annual Fee: 25,000-210,000 KRW (varies based on the years)
Canada	Design Right	CIPO (IDO)	10 years	Protection against imitation and unauthorized use of the design	• Examination of an application to register a design - Basic Fee: $400 (CAD) - plus, for each page of drawings in excess of 10 pages: $10(CAD) - Maintenance of a registration of a design: $350(CAD)

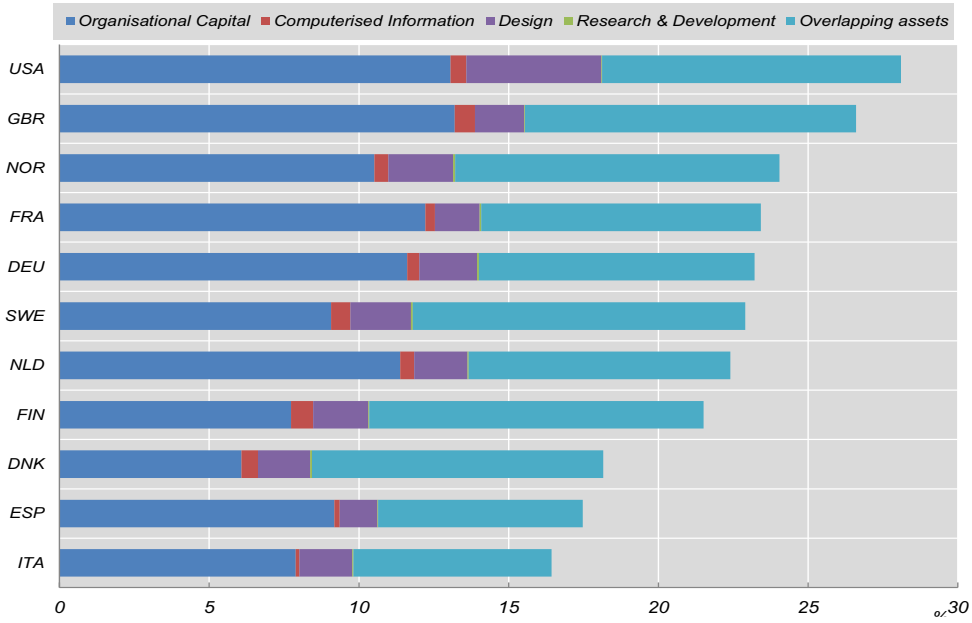
Source: Author's own elaboration based on IPO (2011b), KIPO (2014), and CIPO (2014).

3.4 Design-related human resources

The Government plays an important role in supporting firms' ability to use design through education and skill training programmes. This affects the quality of the workforce in terms of skills and management and the ability of a firm to tap into a competitive labour force. Korea, UK, and Finland have invested in design education, and several universities around the world have been trying to connect design to business through specialised school curricula.

The OECD has identified occupations that contribute to the formation of knowledge-based capital (KBC) such as organisational capital, computerised information, design and R&D. Design-related workers are the second largest group contributing to KBC, after organisational capital workers, and excluding the workers for overlapped assets. KBC related workers accounted for between 13% and 28% of total employment in OECD economies and design workers are just under 4.5% of this total, while R&D related workers are below 1%. The countries with the most design workers are US (4.5%), Norway (2.2%) and Sweden (2.0%) (OECD, 2013b).

Figure 4. Knowledge-based capital related workers, 2012



Source: OECD (2013b), Knowledge-based capital related workers, 2012: As a percentage of total employed persons, in OECD Science, Technology and Industry Scoreboard 2013, OECD Publishing. doi: 10.1787/sti_scoreboard-2013-graph70-en.

Design workers develop aspects of a product, integrating all aspects of form, fit and function, and optimisation for the best possible user experience. They make visually appealing designs and ensure that the product is suited to fit the user. Their capacity to do so has consequences for market success of their design products.

Korea has included education and training as an important element of design policy. The total number of design graduates in Korea has been gradually increasing, but there has been a lack of top-level managers with higher education who are able to participate in the whole process of design, and not just with respect to product appearance. In addition, MOTIE also implemented the "design manpower development strategy". A training programme for engineering design will be provided for R&D project applicants to help them conduct the design R&D convergence more effectively, and also the Engineering Design Graduate School will be newly established to strengthen the industrial specific design capabilities (MOTIE, 2014c).

The UK has an internationally competitive design education base. It was the first country to include design and technology in the national school curriculum (DTI, 2005). Based on creativity and imagination, pupils have chances to design and make products to solve relevant problems within a variety of contexts, considering their own and others' needs and values. They acquire a broad range of subject knowledge within disciplines such as mathematics, science, engineering, computing and art. They learn how to take risks and become resourceful, innovative, enterprising and capable citizens (UKGDE, 2013).

For Finland, design education is at the heart of design competence. Design education is integrated from early childhood education, and continues at all levels of schools, as well as lifelong learning. Supporting design education at a very early point in schooling is regarded as one of the main factors behind the success of Finland (Bom, 2008).

Besides including design as a feature of the national curriculum, there are quite a few design schools integrated with business school. Since businesses have been seeking innovation through design, business school in the world tried regarded as an important factor (Box 5).

Box 5. Design connected with business education

Institute of Design at Stanford: The first "design school" was established within Stanford University in 2003. As a hub for innovators at Stanford, students and faculty in engineering, medicine, business, law, the humanities, sciences, and education are able to participate in this education (http://dschool.stanford.edu/).

Hasso Plattner Institute of Design: The first academic advanced training in Design Thinking was established to promote a special innovation culture, within Germany in 2007. The concept of the Design Thinking approach is to group students in small multi-disciplinary teams and find unexpected innovations by combining their different points of views (www.hpi.uni-potsdam.de/d_school/home.html?L=1).

Design is now integrated into teaching at Harvard, MIT, Illinois Institute of Technology, Carnegie Mellon and other MBA schools in the US. The Rotman School of Management in Canada has placed design at the centre of their education philosophy. Design in business teaching has spread from the US to Europe.

UK universities have initiated multidisciplinary programmes strengthening the links between business schools and design schools. Imperial College and the Royal College of Art as well as Northumbria University are examples.

Source: Design Council (2011), "Design for Innovation", UK; Various websites.

3.5 Design capability

Industrial Design is commonly used among large firms. According to the Design Council, industrial design is integral to 32% of large businesses in the UK, but only 15% of SMEs (Design Council, 2005b). SMEs are experiencing a lack of information on how to access and utilise design and this can limit their potential for innovation and growth.

Based on a Survey of SMEs, Hargreaves (2011) evaluated SME access to Intellectual Property (IP) services including industrial design.[44] He concluded that it is necessary for the current service provision of IP to SMEs be improved to help them understand, protect and exploit their IP. Three main issues faced by SMEs were identified. First, there is a great deal of information on IP, and this information overload acts as a barrier to SMEs, particularly for start-ups. SMEs also want integrated technical and commercial advice with legal expertise, which can help commercialize and protect their IP. The high cost of IP management is another difficulty which SMEs face. This hampers SME's activity on obtaining or maintaining industrial design protection.

"Designing Demand" is a regional business mentoring programme in the UK designed to make SMEs more competitive through the strategic use of design. The objective of the programme is to support SMEs in their efforts to improve competitiveness by using design to bring new products to market, improve products and services, streamline strategic management, and strengthen branding and promotional activities. Support has been provided to over 2 000 firms since 2007 and a lot of them went on to generate new products and services, secure investment, or increase profits. Based on an internal evaluation, the forecast impact was GBP 9.9 gross value added for every GBP 1 spent on supporting firms (BIS, 2010b). This programme was extended to a national coaching program delivered by the Design Council from 2012 (Box 6). The programme aims to foster a greater understanding of the strategic role design can play in

business and embed design tools, techniques and management within business to build skills and capability (Design Council, 2012b).

Box 6. Design Leadership Programme

The Design Leadership Programme in United Kingdom is a programme offering up to 10 days of design and innovation-focused mentoring over a period of 6 to 18 months. This programme aims to help firms in the UK, particularly SMEs, have more awareness of the strategic value of design and design management for effective long term growth and put design at the centre of the business strategy. In addition to the tangible business performance, the programme has been changing the way businesses work, to extent which has improved organisational culture and performance. It provides firms new skills and capabilities, boost competitiveness and speed up growth by:

- *identifying medium to long-term strategic business challenges*
- *working out how to overcome these challenges*
- *making sure projects and programmes move forward*
- *making changes to business*
- *finding specialist help and advice*

The type of programme and the costs are different for each business between GBP 2 000 and GBP 10 000, and a subsidy can be provided up to 50% of the cost.
According to the programme results, 72% of firms surveyed said it had changed the culture of their organisation into a more design-focused firm. 63% of those surveyed were not confident about working with design before participating in the programme. As a result of the coaching, this figure increased to 100%. Before the programme, 55% of firms regarded design as integral to business, compared with 98% after the programme.

During the programme, less than GBP 4.7 million was invested by the respondents in outsourcing external design companies or consultants to undertake the projects identified. After programme participation, they reported investment of an additional GBP 7.8 million in design projects between 2011 and 2014. The Design Council estimated that as a result of a Design Leadership project, the returns for every GBP 1 invested in design include more than GBP 20 in increased revenues, GBP 4 increase in net operating profit, and GBP 5 in increased exports. The evaluation has found that this expenditure can be attributed directly to the influence of the Design Leadership Programme.

Source: Design Council (2012b), "A summary of evidence from the Design Council's Design Leadership Programme", UK. Government of UK (2014), Business Finance and Support, www.gov.uk/designing-demand.

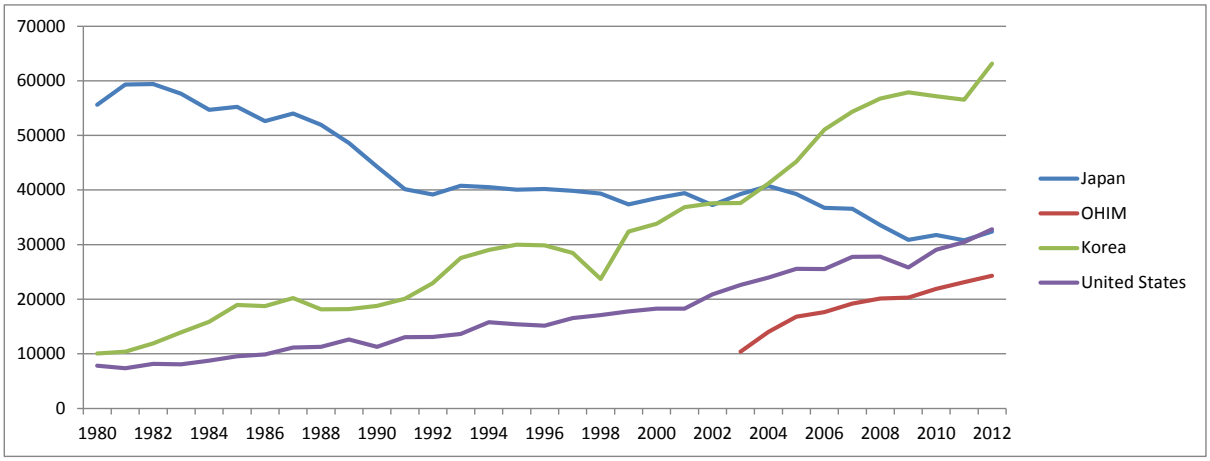
4. Industrial design registrations[45]

While imperfect, registered designs are the best available measure of design output. A registered design is a legal right which can protect the overall appearance of a product or a part of a product in the country or countries where registration was made. Design registrations are the result of firms' involvement in design activities, investment and their needs to prevent their design right. Also, it can be a consequence of government's efforts to boost the design activities of firms through various initiatives, training programmes, or expenditures on design.

According to WIPO, the total number of industrial design applications globally grew by 17% in 2012, which is the highest growth rate since industrial design records became available in 2004. The growth rate was highest in the IP office of the Russian Federation (29.5%) in 2012, followed by the State Intellectual Property Office of China (SIPO, 26.1%), Turkey (12.4%), the Office for Harmonization in the Internal Market (OHIM, 12%) and the Korean Intellectual Property Office (KIPO, 11.8%). The design counts contained in design applications increased from about 582 000 in 2004 to 1 277 000 in 2012 worldwide. This growth is mostly due to an increase in the number of applications filed in China. The estimated number of designs registered worldwide in 2012 was 955 500 showing 15.7% growth rate compared to the previous year (WIPO, 2013).

Data on total design applications of top IP offices (except China) indicate that the number of applicants has been gradually increasing in Korea, the United States and OHIM (Figure 5). While the Japan Patent Office (JPO) received the largest number of applications, it has followed a downward trend since the 1980s, and now falls behind Korea and is approximately equal with the United States. The design applications in Korea through KIPO have gradually increased and maintained its ranking in the second position next to SIPO of China. USPTO has shown the upward trend and it surpassed JPO in 2012. OHIM started to issue its Registered Community Design in 2003 and it has become the fifth largest office in terms of applications filed.

Figure 5. Trend of design applications



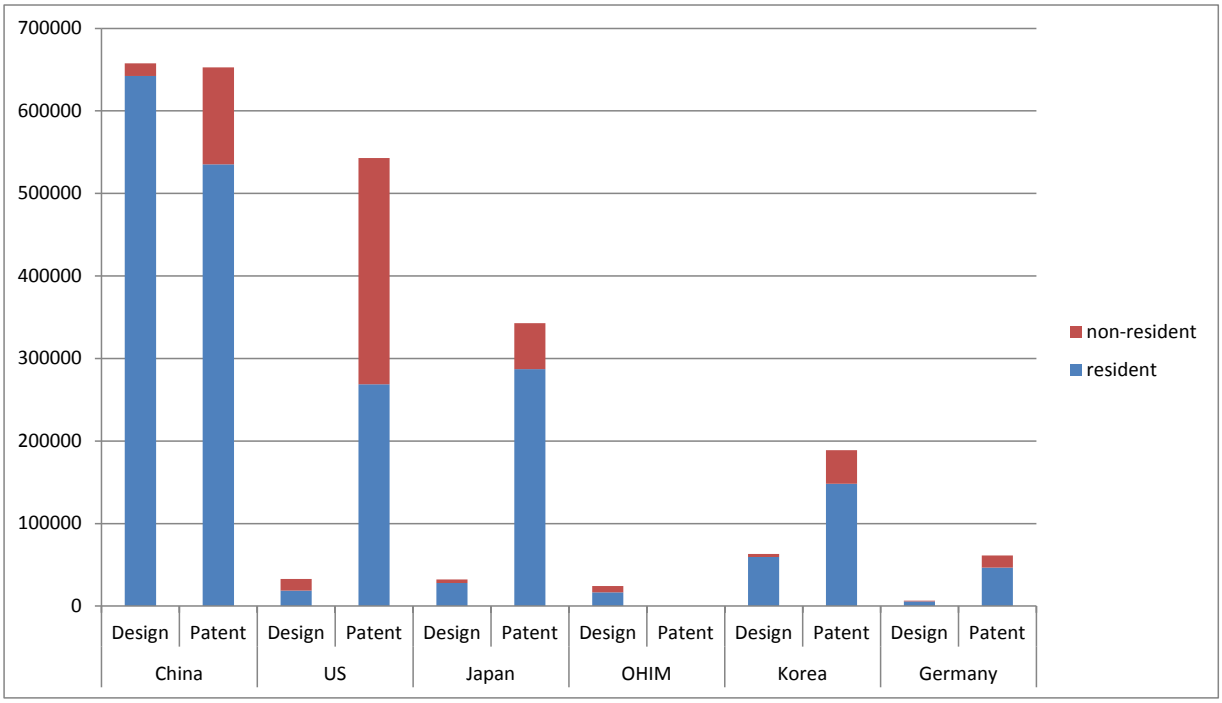
Source: WIPO statistics database. Last updated: January 2014.

Figures 6 and 7 show the number of total applications and registrations of industrial design and patent at selected offices in China, US, Japan, OHIM, Korea and Germany in 2012. Except China, there is a big difference in the number of patent and industrial design applications, and there are more patent applications than industrial design applications.

SIPO in China issued the highest number of industrial design registrations (466 858), followed by OHIM (23 462), Germany (5 810) and Korea (46 146). The number of industrial design registrations and patents are usually lower than that of applications, and for Korea, China and US, there are significant differences in the number of applications and registrations.

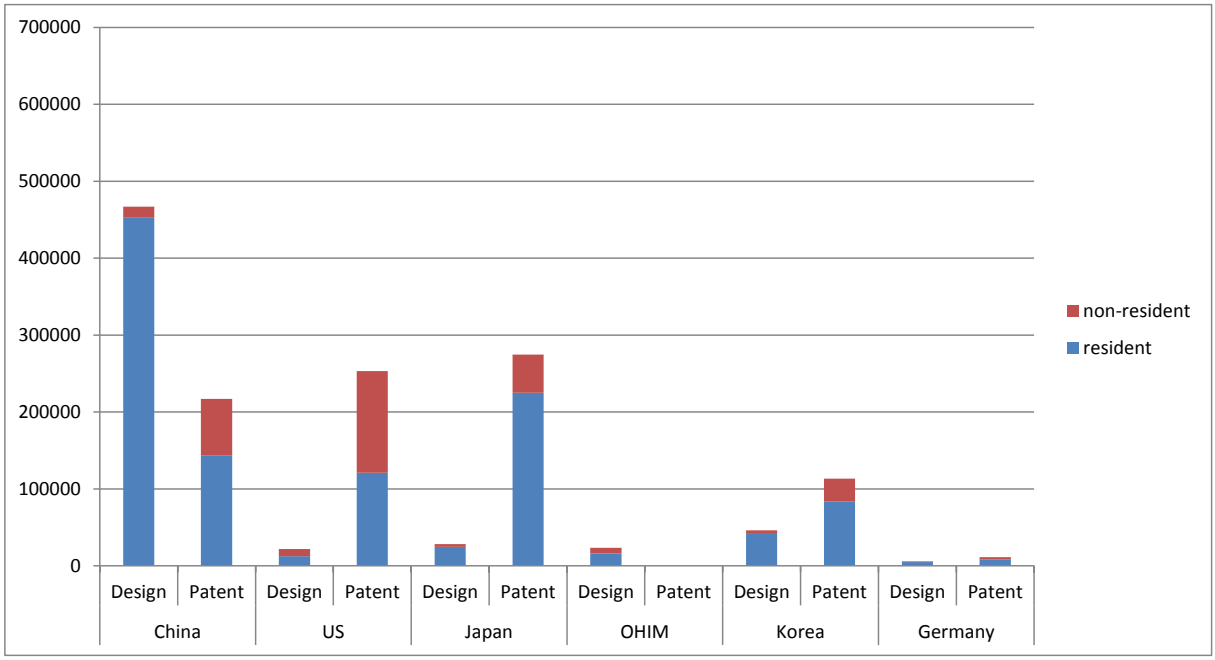
In most countries, counts of design applications and registrations are dominated by applicants whose residence is from the office country, rather than non-residents. Non-resident applications in 2012 account for only 3% of total design counts in registration at SIPO and 7.6% at Korea. USPTO shows the higher rate of non-resident designs registration (43.3%).

Figure 6. Total industrial design counts and patents in application, 2012



Source: WIPO statistics database. Last updated:June 2014.

Figure 7. Total industrial design counts and patents in registration, 2012

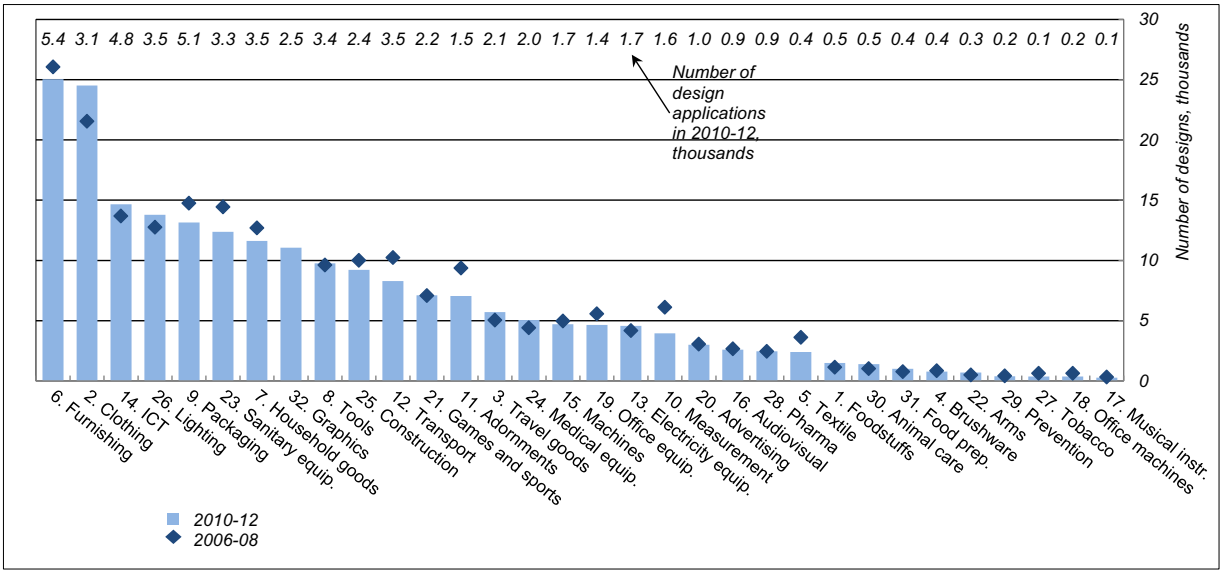


Source: WIPO statistics database. Last updated: June 2014.

OECD analysed the Registered Community[46] designs to identify which types of design are registered. A single design application can include several designs, as a whole range of similar products or different parts of the same product. One application contains 3.5 individual designs on average. Over 2010-2012, furnishing, clothing and ICT equipment accounted for 30% of all design contained in design applications (Figure 8). The United States, Japan, Germany and Korea are amongst the most active in the design of ICT. Korea is strong in communication devices and the United States in data processing equipment (Figure 9) (OECD, 2013).

Figure 8. Number of designs by Locarno class, 2006-08 and 2010-12

Registered Community designs, thousands

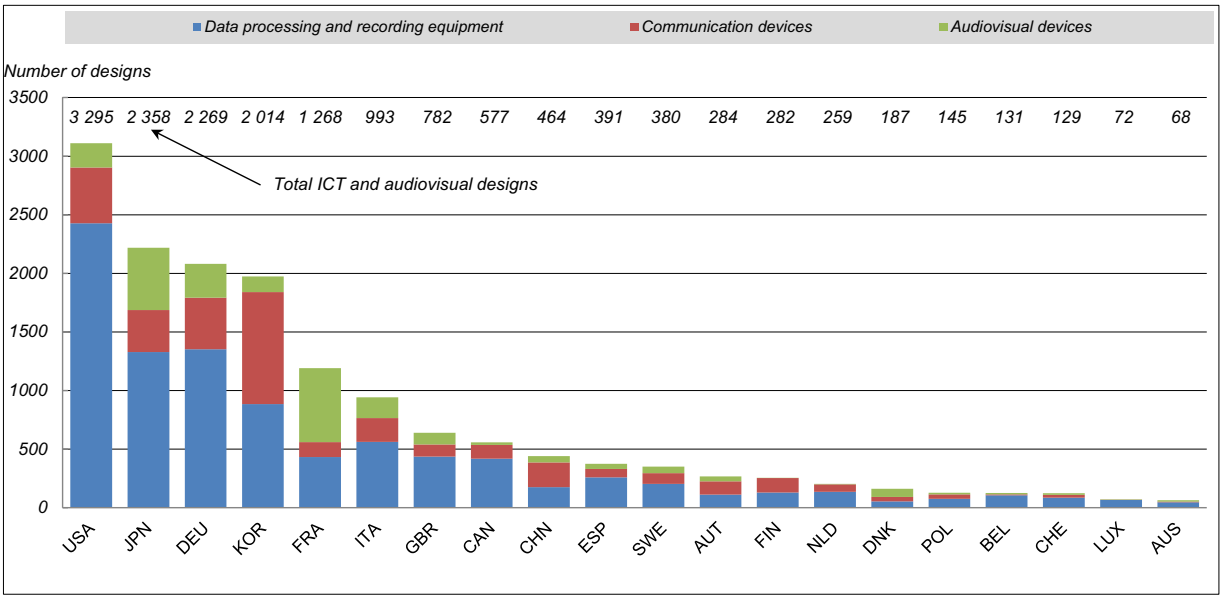


Note: Locarno Classification established in 1969 contains 32 classes and 2019 subclasses of goods.

Source: OECD (2013), Number of designs by Locarno class, 2006-08 and 2010-12: Registered Community designs, thousands, in OECD Science, Technology and Industry Scoreboard 2013, OECD Publishing. doi: 10.1787/sti_scoreboard-2013-graph183-en.

Figure 9. ICT and audio-visual-related designs, 2010-12

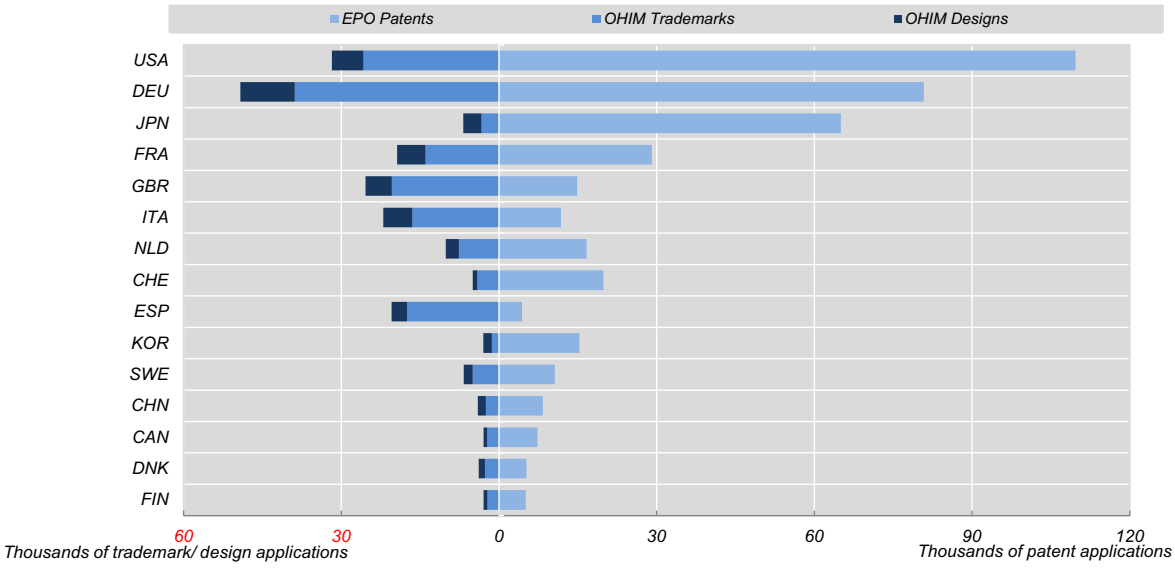
Registered Community designs, top 20 applicants



Source: OECD (2013), ICT and audiovisual-related designs, 2010-12: Registered Community designs, top 20 applicants, in OECD Science, Technology and Industry Scoreboard 2013, OECD Publishing. doi: 10.1787/sti_scoreboard-2013-graph185-en.

Industrial designs are used alongside other types of IPR such as patents, trademarks. This joint use of IPRs is called the IP "bundle". The size and composition of the IP "bundle" are linked to the industrial structure of the country and the main characteristics of its firms, and also framework conditions such as trade openness and IP regimes. As such, it varies across countries in terms of the proportion of patents filed at the European Patent Office (EPO), of Community trade marks (CTM) and of registered Community designs (RCD). The United States, Germany and Japan are the countries which use these knowledge-based assets the most (OECD, 2013b) (Figure 10).

Figure 10. IP bundle of top 20 applicants, 2010-2012



Source: OECD (2013), OECD Science, Technology and Industry Scoreboard 2013, OECD Publishing. doi: 10.1787/sti_scoreboard-2013-graph70-en.

5. Conclusion

Industrial design can be a key element for innovation and competitiveness. In order to help better understand the effects of industrial design and how to promote it, the existing design policies of Korea, United Kingdom, Canada, Finland and some other countries, have been reviewed. Industrial design needs to be carefully considered as a factor for growth, and some observations based on the review emerge.

Businesses and decision-makers appear to have a lack of relevant information on the economic benefits of investment in design. There is a need for an improved understanding of design beyond products and technology to include the full potential of design's value for the broader economy and society. More research on the economic impacts of investment in design is necessary. Also, policymakers need to better understand how features of the IP framework related to design can incentivise firms.

Governments play important roles in establishing the policy environment for investment in design, but businesses have to lead the way in making the best use of their investment. Industrial design clusters and connecting SMEs with specialised design firms might induce firms to be more active in design. Design capabilities and access to design inputs might be strengthened for potential high growth SMEs. In addition, design leadership and skills related programmes might be helpful for SMEs.

Based on the limited evidence available, investment in design would seem to be very low. In addition, it was shown that while business investment in overall KBC has increased, it is not clear if investment in design is also increasing. It is necessary to analyse not just overall KBC but the specific pattern of investment in design based on the firm-level analysis.

According to data on investment in design and R&D, there is a significant gap between the two. Considering the evidence of the positive effects of design on firm performance, investment in design may be less than optimal. However, this cannot be known with any degree of certainty in the absence of more rigorous studies. In particular, given the strong complementarity between the two types of investment it can be difficult to isolate the specific impact of investment in design.

The output from design activity is often – but not exclusively - protected through registration. Governments could do more to encourage firms to register their designs rather than leaving them unregistered. Effective ways to increase industrial design registration rates should be considered (e.g. training programmes, research on best practices, etc.).

Governments could also consider how they can make information on products which can be protected by registered designs more salient. SMEs, in particular, have difficulty in understanding design rights or the advantages they can achieve through design registration, and often face challenges concerning procedures to register their design. Therefore, easily accessible information on design rights would be essential. Highlighting the benefits to businesses might enhance awareness of industrial design rights. For the IPR system, being consistent in terms of quality and standards of IPR across borders is necessary to minimise administration burdens.

Education and training is an integral part of design policy, developing the expertise of design professionals. Korea and the UK are examples where design education has been successfully addressed as an integral part of design policy. The UK in particular has a variety of training programs in terms of design capabilities of firms.

In order to ensure that such policy initiatives are adding value, evaluation of design policy is needed. Various industrial design-related policies have been implemented in each country, but there is a question of their quality and effectiveness. Developing a methodology for the evaluation of policies and the measurement of industrial design effectiveness for a firm's performance is a complicated task.

The Danish Design Ladder and DeEP's evaluation tool are examples of an effective and consistent tool to measure the impact of design. The Ladder was the first step in developing a method to assess the economic benefits of design in Denmark, and it has been used worldwide as a tool to measure the level of design activity in companies. More collaborative efforts between governments, international organizations, patent offices, and so on are needed.

As a building-block for evaluation, it is necessary to establish a measurement system to identify the effects of industrial design. In general, other forms of innovation are well measured in various ways, but design is not similarly captured in many countries. Several governments have conducted an assessment of the contribution of design to the economy in relation to other sectors and firm-level case studies were found, but measure of outputs and inputs for design sectors needs to be established and more strengthened.

A variety of studies demonstrate the effectiveness of design for firm performance. However, there are still many firms which are unaware of the potential benefits of design, or do not have the means to invest in design. Some countries, such as Canada, have tax incentives to encourage firms to invest in design. In order to assess the benefits of such measures it is important to improve our understanding of the reasons for any under-investment which may be occurring.

As such, examining firms' design-activities and their needs might be necessary. Full-scale implementation of the OECD Design Survey questionnaire might be helpful to investigate firms' design capabilities. This pilot survey has been trialled and could be used as a basis for a national survey. Alternatively, specific questions might be recommended for adoption in other surveys (Annex A and B).

And finally, it is important to connect industrial strategies with respect to creativity with design policies. Positioning design in an industrial policy context is necessary in order to ensure coherence.

ANNEX A. OVERVIEW OF OECD DESIGN SURVEY

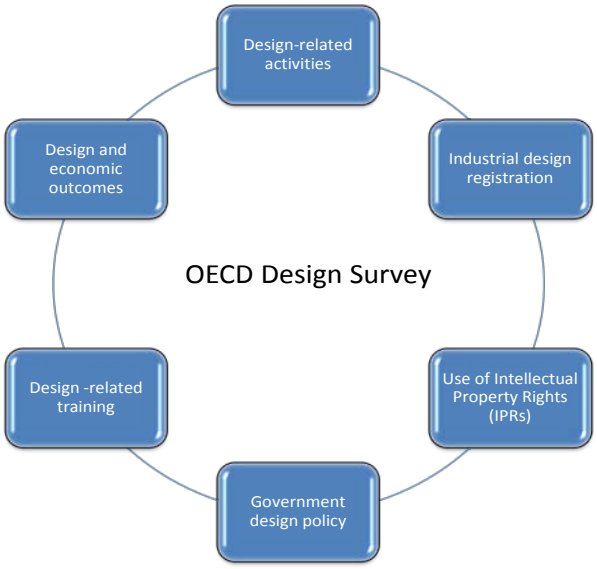
1. Introduction of the survey

Understanding firms' design-related activities and the current status of design in their market strategy are essential for creating better policies to help firms increase design competitiveness. In this context the OECD has developed a survey questionnaire on design to elicit information on the design activities of firms, their main drivers, and the extent to which companies protect their designed products (Annex B). It also aims at understanding whether design helps companies to compete in local and global markets, and whether suitable policies may contribute to enhance firm- specific design activities and capabilities.

The design survey consists of six sections (Figure 11). In the first section, the questions relate to firms' design-related activities: the manner in which they carry out design activities (e.g. in-house or outsourcing); perceptions of the importance of design; expenditures on design; the role of designers; and the number of products featuring design-enhanced characteristics. Design-related expenditures are defined to include labour costs, consultancy services, and purchases of material and equipment for design activities, but they exclude the cost of acquiring assets. In order to gain an understanding of the participation of firms in industrial design registration, the questionnaire includes the number of industrial design products registered, registration trends, and the expected benefit from the registration. Besides industrial design registrations, information is elicited on other types of intellectual property rights and how they are managed.

The questionnaire also elicits information on government design policies which are relevant for the firm. Questions which address firm awareness of design policies, specific programmes and their effectiveness are asked. This also includes questions on design-related training. Since improved understanding the type of training provided and its perceived effectiveness is useful information for design program developers. The last section is about economic outcomes from design. Questions are included on the perceived success of designed products, and how they affect the firms' economic outcomes. The performance can be described by increased turnover, employment and productivity of the responding firms.

Figure 11. Structure of the design survey



2. Pilot test and the result

A pilot test has been conducted via e-mail and a phone interview. The firms for the pilot test were chosen from 350 firms including the winners of major design awards[47] and the applicants of the Office for Harmonization in the Internal Market (OHIM) and United States Patent and Trademark Office (USPTO) industrial design. The selected firms were asked to participate in the OECD Design Survey and also the overall opinions about the survey were collected to improve the questionnaire. As a result, the answers about design-related behaviour of eight firms were collected and they were analysed based on their responses.

In Section 1 of the OECD Design Survey, the design-related activities were investigated. According to the responses collected, firms primarily carry out their design related activities in-house and outsource less than 10% of design activities to external companies or consultants. They see design as an integrated, though not determinant, element in their development work and innovation activities and as a central and determinant element in the development work and innovation activities. Design has been used for solving problems related to the development of new concepts or products, and designers are often involved from the beginning of the development process. The percentage of products which are featuring design-enhanced characteristics varied, and five companies said that they will increase expenditure in design activities more than 10%. The average score about the importance of industrial design for their firms were 7.8 out of 10.

Most of companies answered have a plan to increase expenditures in design activities over the next year. They intend to increase it more than 10% of the previous expenditures and there are various reasons for that. One of the firms answered said that design is one of the important factors which affect the competitiveness of the firms and they have been recognizing the importance of design and investing to it.

Section 2 consists of questions related to the industrial design registration of firms. For the firms which have registered industrial designs, in most cases they tend to register their design before launching a product or at the same time of a product launch at the national office of the country where their firm is located. They do so “to protect against imitation” and “to increase market share abroad”, and they said they actively check for the infringement of their design rights. One of firms having experiences of infringement for several times spent EUR 100 000 to 500 000 to resolve the legal matter and it took 6 months to 1 year on average for one case to be completely resolved.

Section 3 describes the use of IPR of firms. Other types of IPRs such as patents and trademarks were used in addition to the industrial design in most cases. IPR is regarded as an important issue for the performance of firms, but most firms do not have staff specifically devoted to managing IPRs except one company even though they have an overall IPR policy or strategy.

The relationship between government design policies and the design activities of firms were examined in the Section 4. All of these firms knew of the existence of design-related policy in their countries, but only one company had experiences to receive grants or subsidies from the government for tis design activities. The government policies have an influence on firms’ getting access to design-related training and they also affect firms’ capacity to increase collaboration and networking and to get access to relevant markets. Design-related programmes or project grants are recognized as a policy measure which can increase firms’ design capabilities the most. Also, the support for getting access to relevant markets and increasing the network as well as design-related tax credits are selected as policy measures affecting design capabilities. As the most challenging concerns about the design and design activities, the respondents picked “developing technology and getting access to finance” and “proving the design as a profitable element in their company”,

Based on the responses to Section 5 it is found that that some firms have provided their staff with design-related training through other companies, business association or special consultancies with their companies' own funding. These trainings were examined if they met the needs of participants.

Section 6 consists of questions related to the economic outcomes from design. All of the companies that responded felt that the design of the product does help to differentiate against competitors, saying that the commercial success of design products also affected the success of other company products as well as improving their brand image. Respondents said that they are willing to sell design products at a higher price than comparable goods of its key competitors, but the approximate mark-up for such products varied. The launch of new design features positively affects the sales of products for all respondents, and four companies said that they employed more staff with design skills and competencies compared to the previous year. With the exception of one company, the companies are planning to hire more design staff the following year. Overall, all companies reported that their turnover, employment, and productivity of their company have increased thanks to design.

Although this analysis is based on only eight firms which responded to the pilot test, it is interesting to see their design activities and the related performance. All companies think that design has a positive influence on their turnover, employment and productivity. They even believe that the commercially successful design products also affect the success of other products, and they intend to sell the design products at a higher price compared to other competitor's products. The fact that designers have been actively involved in product development implies the environment of product development has been changed. They have IPR strategies in their companies, using patents or trademarks and checking infringement of design rights regularly. The important role of design has been widely recognised, while it is necessary to investigate why some of firms do not protect their designs.

Box 7. Introduction of survey participants

Company #1: A venture established in 2009, based in the United Kingdom. The folding plug, created by a design graduate student, is the main product of this company. The creator won the numerous design awards including Brit Insurance Designs of the Year Award in 2010. This folding plug shows the design education combining with creative engineering can leads to the product development with commercial potential.

Company #2: A company established in 1993, based in Chinese Taipei, specialized in the production of professional measuring tools. The R&D department develops several new designs and inventions for patent application (an applicant of USPTO industrial design). In-house engineers have been invented new technology and equipment to upgrade our products.

Company #3: A machinery company as a process performance provider in Finland, with customers in the mining, construction, and oil & gas industries (OHIM applicants). This company focus on the continuous development of solutions that improve sustainability and profitability.

Company #4: A company producing ICT products located in Chinese Taipei. Their design teams mange pre-manufacturing areas including product conceptualization, industrial and mechanical design, and environmental testing (an applicant of USPTO industrial design).

Company #5: A cosmetic company established in early 1930 in Korea is one of the major cosmetic companies launching successful brands. They pursue creative and value-oriented design and design has been a long-standing corporate philosophy (an applicant of USPTO industrial design).

Company #6: A manufacturing firm established in 2001 in Korea has been developed innovative products specialized in production of tube, cans and bottles. Innovation is a core of the company strategy (an applicant of USPTO industrial design).

Company #7: An electric equipment producer established in 2010 in the United Kingdom. Their low energy light bulbs, which were transformed from a familiar and existing bulb design, awarded the Brit Insurance Design of the Year by the Design Museum in London and the Black Pencil at the D&AD awards in 2011.

Company #8: A chemical company established in 1998 in Korea has succeeded in domestically producing chemical filters and gas scrubbers for the semiconductor industry. Their vision is to develop as an innovator in the Life Science market, and they won the Reddot Design Award in 2013 with the emergency flashlight and mask.

Source: Company websites.

In order to develop a well-organised survey on which to build an analysis of the firm's design activities and improve the quality of responses, an investigation of satisfaction about the design questionnaire was conducted. The respondents were also asked about the opinion about the OECD Design Survey itself:

- What do you think about the overall structure of the survey (number of questions, orders, flow)?
- Were the questionnaires easy to understand? If not, which part was difficult to understand?
- Are there any parts which might be improved?
- Are there any questionnaires which might be omitted or added? What are they and why do you think it is?
- What do you think about this on-line based survey tool? Do you think it was user-friendly?
- Did you have any difficulty while using this survey tool? Which parts do you think it is necessary to be improved? Would you participate in the survey if you are asked in the future? Why would you do that?

- What is your overall opinion about the survey?

Most of companies who responded reported general satisfaction with the survey, but identified some difficulties they experienced answering the questionnaire. Based on the collected opinions from the respondents and internal review on the survey, few possible improvements about the contents and the survey tool can be pointed out.

First, the questionnaire fell into several categories considering the characteristics of company management. One of the respondents said that it was not easy to answer all questions at once by one department. This might cause a delay of answering the questionnaire because it takes much time to find the appropriate department to answer after they receive the inquiry. In some cases, the questionnaire was passed on to other departments several times, and this might lead to the low rate of return. In order to make it easier for respondents to cooperate with department for answering questions, breaking down the questionnaire to several sub parts with a consideration of the different departments of firms might be one option. Moreover, inserting a statement identifying likely respondent characteristics might help distinguish the questions which specific departments can reply to and draw more accurate answers.

The questionnaire can be more specialized based on the industry field. The OECD Design Survey is designed for all industry and did not specify any specific industry field. However, differentiating the survey questionnaire might be helpful to know the different design activities by industry field. There is a question in the survey asking about the industrial sector the respondent involved, but this is just for the additional information to know better about the company. One of the respondents in the chemical industry said that it would be nicer to have the industry specific questions.

The survey tool can be more user-friendly. This OECD Design Survey pilot test was conducted through the online-based survey tool which is easy to implement and collect answers. Once the questionnaire is developed on-line, a link to access to the survey is created, and then the survey recipient can easily participate in the survey and save their answers through the link which were given. However, some technical limitation of survey exists. For example, it was not possible to choose multiple answers or to insert images to help answer on a scale. Also, the respondents have to decide whether they need to answer the following sub questions, and this cause omitting answering questions. Some automatic functions might be added to the OECD Design Survey to help respondents to answer and easily participate in. For instance, a function to directly connect the relevant question followed by the previous answer and to omit the irrelevant questions might increase the user convenience. Moreover, the visual images showing the likert scales might be effective too.

One of the big issues for the design survey is how to attract the potential respondents to take the time to participate in the survey. This links directly to the rate of returns, so it is an important issue. During the pilot test, it was clearly stated that the report and results of this design-related survey will be shared with the respondents upon completion of the project as an incentive. Another effective way to incentivise would be to clearly let the respondents understand the purpose of the survey and explain how these may affect their business environment in the future. Furthermore, explaining why the particular firms were chosen for the survey might be effective to motivate the survey respondents.

Due to the limited number of respondents of the survey, it was not possible to conduct the in-depth analysis. However, if the sufficient sample size is available, more analysis can be done and meaningful results might be drawn. This OECD Design Survey can be adjusted for countries which want to investigate firm’s design related activities and the results might be useful for policy makers to build up design related policies and supporting programmes.

Based on the findings from the pilot test of OECD Design Survey as well as additional inputs to improve the survey, OECD will work on completing the survey structure. With the use of more user-friendly survey tool, it can be developed as an on-line based platform which gives companies easy access to the survey. The responses collected might be used as basic resources for design related policy planning and understanding the impact of design to the economy.

ANNEX B. DRAFT OECD DESIGN SURVEY QUESTIONNAIRE

This OECD questionnaire aims to gather information about design activities, their main drivers, and the extent to which companies protect their designed products. It also aims at understanding whether design helps companies to compete in local and global markets, and whether suitable policies may contribute to enhance firm- specific design activities and capabilities.

- General Information -

Company Name

Number of employees in 2013

□ 1-9 □ 10-49 □ 50-250 □ 251-500 □ More than 500

When was your company established?

□ 2013 □ 2012 □ 2011 □ 2010 □ 2009 □ 2008 □ 2007 □ 2006 □ 2005 □ 2004
□ Before 2004

Turnover in 2013 (in thousand EUR)

Industrial sector*

*ISIC Rev 4 - see unstats.un.org for details

□ 01-09 Agriculture & mining
□ 10-12 Food, beverages & tobacco
□ 13-15 Textiles, wearing & leather products
□ 16-18 Wood & paper products & printing
□ 19-20 Chemical products, coke & petroleum products
□ 21 Pharmaceuticals
□ 22-25 Rubber, plastics, metal & non-metallic products
□ 26 Computer, electronic & optical products
□ 27 Electrical equipment
□ 28 Machinery & equipment n.e.c.
□ 29-30 Transport equipment
□ 31-33 Furniture, other manuf., repair & installation
□ 35-39 Electricity, gas, water & waste
□ 41-43 Construction
□ 45-47 Wholesale, retail trade & repair
□ 49-53 Transportation & storage
□ 55-56 Accommodation & food service
□ 58-60 Publishing, audiovisual & broadcasting
□ 61 Telecommunications
□ 62-63 IT & other information services
□ 64-68 Finance & real estate
□ 69-71 Architecture, engineering, legal, accounting & management
□ 72 Scientific R&D
□ 73-82 Advertising, professional, scientific & support activities
□ 84-85 Public admin. & education
□ 86-88 Health activities & residential care
□ 90-93 Arts, entertainment & recreation
□ 94-96 Other services

Exporting company?

□ Yes □ No

Respondent name (Optional)

Title / Responsibility (Optional)

E-mail address (Optional)

|| Section 1. Design-related activities ||

1.1. Are the design-related activities* of your company carried out in-house?

* Work carried out in relation to design, styling and finish of products, e.g. industrial-, graphical-, digital-, web-, interior-, fashion and textile design. Design activities aim to improve or change the shape or appearance of new or significantly improved goods or services, and encompass the initial preparations for the planning of new products or processes, as well as work on their design and implementation, adjustments and further changes.

□ a) Yes, only-in house □ b) Yes, in part □ c) No

1.1.1. If your answer is "Yes, in part", what is the percentage of design activities that your company outsources to external companies or consultants?

□ Less than 10% □ 10-25% □ 25-50% □ 50-75% □ 75-100%

1.2. Which description fits the design work of your company best?

□ 1) We do not work systematically with design
□ 2) Design is used only as the last finish
□ 3) Design is an integrated, through no determining, element in development work/ innovation activities
□ 4) Design is a central and determining element in the development work/innovation activities
□ 5) Don't know/not relevant

1.3. Broadly speaking, how important is design for your firm?

Scale 0-10, 10 being the highest score.

1.4. Is design used for solving problems related to the development of new concepts or products?

□ Yes □ No

1.5. Have designers been involved in the development of new concepts or products to differentiate your company's products?

□ Yes □ No

1.5.1. If yes, have designers been involved from the beginning of the development process?

□ Yes □ No

1.6. What is the percentage of your products featuring design-enhanced characteristics?
Please, give approximate average annual figure, over the last 3 years

□ Less than 10% □ 10-25% □ 25-50% □ 50-75% □ 75-100%

1.7. How much has your company spent in design-related activities (please, include labour costs, consultancy services, purchases of material and equipment for design activities, but exclude the cost of acquiring assets as e.g. buildings)?

in 2013
Please give approximate figure (in thousand EUR).

in 2012
Please give approximate figure (in thousand EUR).

in 2011
Please give approximate figure (in thousand EUR).

1.8. Is your company planning to maintain, decrease or increase expenditures in design activities over the next year?
If "No change", go to question 2.1

□ No change □ Increase □ Decrease

1.8.1. How much is your company planning to decrease/increase (%)?

□ Less than 10% □ 10-25% □ 25-50% □ 50-75% □ 75-100% □ 100%

1.8.2. Please explain why your company intends to decrease/increase expenditure on design activities.

*** 20% of survey completed ***

|| Section 2. Industrial design registration ||

2.1. Has your company ever registered an industrial (product) design*?
* An industrial design is the ornamental or aesthetic aspect of a useful article, depending on its shape, pattern or colour. The design must have visual appeal and perform its intended function efficiently and must be able to be reproduced by industrial means.

If no, go to 2.1.4.
□ Yes □ No

2.1.1. If yes, what is the % of products for which designs are registered, on average, every year?

□ Less than 10% □ 10-25% □ 25-50% □ 50-75% □ 75-100% □ 100%

2.1.2. If yes, when are industrial designs typically registered?

□ 1) Before launching a product
□ 2) At the same time of a product launch
□ 3) After having launched the product

2.1.3. If yes, at which Intellectual Property Right (IPR) offices does your company typically register designs? (Please select top 2)

Choice #1

□ 1) National office of the country where your firm is located
□ 2) Office of another country(s)
□ 3) OHIM (The Office for Harmonization in the Internal Market)
□ 4) Hague System (WIPO, World IP Organization, -administered)

Choice #2

□ 1) National office of the country where your firm is located
□ 2) Office of another country(s)
□ 3) OHIM (The Office for Harmonization in the Internal Market)
□ 4) Hague System (WIPO, World IP Organization, -administered)

2.1.3.1. What is the % of designs registered at the offices you referred to 2.1.3?

Office of Choice #1

Office of Choice #2

Others
Please specify.

2.1.4. What are the benefits accruing to your firm from the registration of designs? (Answers on a scale 1-5, where 1=least important and 5=most important).

a) Protect against imitation

b) Attract investors

c) Increase market share at home

d) Increase market share abroad

e) Protect brand value

f) Others (Please specify)

2.2. If you answered "No" in 2.1, why did your company not register designs?

- 1) No need/not relevant for my firm
- 2) Cost of application
- 3) Lack of awareness of design right
- 4) Cost of enforcement
- 5) Concerns regarding disclosure
- 6) Lack of qualified personnel to deal with the design right

2.3. Does your company actively check for the infringement of its design rights?

Yes No

2.4. Has your company ever undertaken legal action for the infringement of its design rights?
If no, go to 2.5.

Yes, only once Yes, several times No, never

2.4.1. If yes, how much did it cost in total to resolve the matter(s)? Please include legal fees in your estimates. Please provide average figure in case you answered "Yes, several times"

- Less than EUR 50,000
- EUR 50,000-100,000
- EUR 100,000-500,000
- EUR 500,000-1 million
- More than EUR 1 million

2.4.2. If yes, how much time did it take in total to resolve the matter(s)?
Please provide average figure in case you answered "Yes, several times"

- Less than 6 months
- 6 months – 1 year
- 1-2 years
- More than 2 years
- Never resolved
- Still under discussion

2.4.2.1. Please add details, especially if you chose "Never resolved" or "Still under discussion" in 2.4.2.

2.5. Has your company ever licensed designs from another company?
If no, go to 2.6.

Yes No

2.5.1. If yes, how often?

□ Once □ 2 to 5 times □ 5-10 times □ More than 10 times

2.6. Has your company ever licensed designs to other companies?
If no, go to 3.1.

□ Yes □ No

2.6.1. If yes, how often?

□ Once □ 2 to 5 times □ 5-10 times □ More than 10 times

*** 50% of survey completed ***

|| Section 3. Use of Intellectual Property Rights (IPRs) ||

3.1. Does your company use patents and other types of IPRs?
If no, go to 3.2.

□ Yes □ No

3.1.1. If yes, what are they? Please select all that are relevant.

Choice #1
□ Patent □ Trademark □ Copyright □ Utility models □ Geographical indicators
Choice #2
□ Patent □ Trademark □ Copyright □ Utility models □ Geographical indicators
Choice #3
□ Patent □ Trademark □ Copyright □ Utility models □ Geographical indicators
Choice #4
□ Patent □ Trademark □ Copyright □ Utility models □ Geographical indicators
Others (Please specify)

3.2. How important are IPRs for the performance of your company?
Scale 0-10, ten being the highest score.

3.3. Does your company have staff specifically devoted to managing IPRs?
If no, go to 3.4.

□ Yes □ No

3.3.1. If yes, how many are they?
Please provide approximate full time equivalent (FTE) figure. Full-time equivalent employees equal the number of employees on full-time schedules plus the number of employees on part-time schedules converted to a full-time basis.

3.4. Does your company have an overall IPR policy/strategy?

□ Yes □ No

*** 60% of survey completed ***

|| Section 4. Government design policy ||

4.1. Are you aware of the existence of any specific design-related policy in your country?

□ Yes □ No

4.2. Has your company ever received grants / subsidies for its design activities from the government?
If no, go to 4.3.

□ Yes, from the central government
□ Yes, from the local government
□ Yes, from both local and central government
□ No

4.2.1. If yes, how many times (over the last five years)?

□ Only once □ Several times

4.2.2. If yes, please provide more information.

a) Name of programme(s)

b) Approximate overall amount

c) Period (Years)

d) Other relevant information

4.3. Have government design policies affected your business?
If "Yes, negatively", please go to 4.3.2

□ Yes, positively □ Yes, negatively □ No

4.3.1. If "Yes, positively", how would you rate their impact on:

a) Financing design activities
Answers on a scale 1-5, where 1=very little and 5=very much

b) Improving awareness about design-related IPR rules and registrations
Answers on a scale 1-5, where 1=very little and 5=very much

c) Getting access to design experts
Answers on a scale 1-5, where 1=very little and 5=very much

d) Getting access to design-related training
Answers on a scale 1-5, where 1=very little and 5=very much

e) Increase collaboration and networking with (specialised) suppliers and/or customers
Answers on a scale 1-5, where 1=very little and 5=very much

f) Getting access to relevant markets
Answers on a scale 1-5, where 1=very little and 5=very much

g) Others (please specify and rate impact)
Answers on a scale 1-5, where 1=very little and 5=very much

4.3.2 If "Yes, negatively", please explain.

4.4. What policy measure would increase your company's design capabilities the most?

- a) design-related programme or project grants
- b) design-related tax credit
- c) raising awareness of design-related IPR rules and regulations
- d) design-related training
- e) support for increasing collaboration and networking with (specialised) suppliers and/or customers
- f) support for getting access to relevant markets
- g) other

4.4.1. If you chose "Other", please specify.

4.5. What do you find most challenging about design and design activities?

*** 70% of survey completed ***

|| Section 5. Design-related training ||

5.1 Does your company provide its staff with design-related training?

□ Yes □ No

5.1.1. If yes, the training is provided through: (Please select top 2 in terms of importance)

Choice #1

□ Internally □ Government sponsored training/courses □ Other companies
□ Specialised consultancies □ (Local) school/university □ Business Association
□ Chamber of Commerce

Choice #2

□ Internally □ Government sponsored training/courses □ Other companies
□ Specialised consultancies □ (Local) school/university □ Business Association
□ Chamber of Commerce

Others (Please specify)

5.1.2. If yes, what is the main funding source for the training provided?

Choice #1

□ Your own company
□ Government or other public entity
□ Business association or other private entity
□ Others

Please specify the proportion of funding provided by Choice #1 (in %).

Choice #2

□ Your own company
□ Government or other public entity
□ Business association or other private entity
□ Others

Please specify the proportion of funding provided by Choice #2 (in %).

Others (Please specify the source and the proportion of funding provided by others)

5.1.3. If your company provides its staff with design-related training, does this training fully meet the company's needs?

If yes, go to 6.1.

□ Yes □ No

5.1.3.1. If not, why not? Please explain.

*** 80% of survey completed ***

|| Section 6. Economic outcomes ||

6.1. Have your company's designed product been commercially successful?
Answers on a scale 1-5, where 1=very little and 5=very much. Alternatively, please select "No".

6.1.1. If no, why do you think it is?
If "No", please go to 6.6.

6.2. Has the commercial success of design products also affected the success of other products of your company?

□ Yes □ No

6.3. How much do you think the brand image of your company has improved thanks to design products?

Answer on a scale, 1-5, where 1=very little and 5=very much. Alternatively, please select "No (No effect at all)".

6.4. Is your company able to sell design products at a higher price than comparable goods of its key competitors?

□ Yes □ No

6.4.1. If yes, what would you estimate the approximate mark-up for such products to be?

□ Less than 5% □ 5-10% □ 10-20% □ 20-30% □ More than 30%

6.5. Did the sales of your company's products increase as a result of the launch of new design features?

□ Yes □ No

6.6. Does your company currently employ more staff with design skills and competencies than last year?

□ Yes □ No

6.6.1. If yes, please choose a figure compared to the previous year.

□ Less than 5% □ 5-10% □ 10-20% □ 20-30% □ More than 30%

6.7. Does your company intend to employ more staff with design skills over the next year (compared to the current situation)?

□ Yes □ No

6.8. Overall, do you think that, thanks to design, your company has (please, choose all relevant):

Increased its turnover
□ Yes □ No

Increased its employment
□ Yes □ No

Increased its productivity
□ Yes □ No

*** 100% of survey completed ***

Please click "Submit" to finalize the survey.

THANK YOU VERY MUCH FOR YOUR TIME!

We would welcome any comment or suggestion you might have.

NOTES

[1] This document and any map included herein are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

[2] The OECD Design Survey questionnaire has been developed and a pilot test conducted for firms which are tied with design activities, on the basis of a survey questionnaire (see Annex B). The possible targeted firms for the survey include the winners of major design awards, the applicants of the Office for Harmonization in the Internal Market (OHIM) and United States Patent and Trademark Office (USPTO) industrial design. The objective of the design survey is to investigate the design activities of firms, their main drivers, and the extent to which companies protect their designed products. It aims at understanding whether design helps companies to compete in local and global markets, and whether suitable policies may contribute to enhance firm- specific design activities and capabilities. In addition, the effectiveness of OECD Design Survey itself was examined through the pilot test to develop the concrete survey platform.

[3] The Frascati Manual is the standard of conduct for R&D surveys and data collection in many countries.

[4] The Oslo Manual provides a conceptual and practical framework for the collection and statistical data and the analysis of innovation in firms.

[5] Dumas (1994) regarded the idea of design as a symbolic representation of a concept and the thing itself.

[6] Research, development and demonstration

[7] DSTI/IND(2014)10 provides a review of more formal empirical studies on the impact of design on economic outcomes.

[8] The effectiveness of industrial design were considered based on the quantity of the firm's design program (e.g. design awards), excellence of design evidenced in the firm's products, marketing materials, and design strategies of the firm(e.g. investment in design)

[9] The audited financial data reported to the Securities and Exchange Commission (SEC)

[10] The industrial design intensity includes the percentage of new product development(NPD) projects, the number of design awards, the number of temporarily employed design apprentices and students, and the average expenditure on product appearance during NPD process

[11] Based on the Creative and Cultural Industries Economic & Demographic Footprint research by Creative & Cultural Skills in 2008.

[12] The survey examined the design investment of 1 000 companies chosen from four groups of businesses (10 to 19; 20 to 49; 50 to 99; and 100-plus employees). As a result, the companies were categorised into four stages of design maturity depending on their approach to design investment.

[13] The Cité du Design and the French Fashion Institute (IFM).

[14] About 1 000 telephone interviews were conducted for firms with more than 10 employees in the field of production, commerce and service companies.

[15] The Creative Industries defined as "the industries which have origin in individual creativity, skill and talent and which have a potential for wealth and job creation through the generation and exploitation of intellectual property" (DCMS, 2001).

[16] Product, graphic and fashion design

[17] 462 respondents representing 1000 designers in France .

[18] The quota sample of 304 people interviewed by telephone and an online sample.

[19] The European Patent Office offers inventors a uniform application procedure which enables them to seek patent protection in up to 40 European countries. As the Patent Office for Europe, it supports innovation, competitiveness and economic growth across Europe based on the European Patent Convention.

[20] OHIM is the European Union agency responsible for managing two important IP rights for the protection of creativity and innovation – the Community trade mark and the registered Community design throughout the European Union (EU) with just a single application.

[21] IPO-intensive industries are defined as industries having an above-average use of IPR per employee.

[22] e.g. manufacture of watches and clocks, cutlery, ceramic household and ornamental articles, watches and jewellery, electric lighting equipment, power-driven hand tools, leather clothes, sports goods, electric domestic appliances, games and toys, etc.

[23] One widely accepted classification of KBC: computerised information (software and databases); innovative property (patents, copyrights, designs, trademarks); and economic competencies (including brand equity, firm-specific human capital, networks of people and institutions, and organisational know-how that increases enterprise efficiency) (OECD, 2013a)

[24] Company spending on research and development, nature of competitive advantage, value chain presence, capacity for innovation, production process sophistication, extent of marketing, and degree of customer orientation.

[25] The in-house designer must hold a Recognition of Qualification from the *Ministère du Développement économique, de l'Innovation et de l'Exportation* (MDEIE).

[26] A non-profit design museum not just for hosting exhibitions but for providing educational programming dedicated exclusively to the pursuit of design excellence and preservation of design heritage.

[27] Creative industries (11 sectors): architecture, books & papers, design, film&video, digital content production & computers, arts & crafts, music, fashion & clothing, furniture & interior design, radio & TV and advertising.

[28] Designworld Premsela Policy Plan 2009-2012.

[29] A network of European partners engaging with governments to integrate design into innovation policies and innovation programmes. More information: www.seeplatform.eu/.

[30] WORTH projects support partnerships between SMEs and professional designers to develop new products, processes or services with high design contents.

[31] European Technology Platform (ETP) is an industry-led stakeholder forum charged with defining research priorities in a broad range of technological areas. More information: http://cordis.europa.eu/technology-platforms/

[32] This sub-section provides a qualitative review of the historical development and institutional characteristics of design rights in different countries. See DSTI/IND(2014)10 for a systematic discussion of differences in the characteristics of IP regimes related to design in selected countries.

[33] WIPO works on the intellectual property services, policy, information and cooperation, with 187 member states. Their mission is to lead the development of a balanced and effective international intellectual property (IP) system that enables innovation and creativity for the benefit of all.

[34] It was established in July 2011 (Chair: Prime Minister & Civilian Chairman, Secretariat: Minister of the Ministry of Science, ICT and Future Planning, MSIP).

[35] Korea Institute of Patent Information (an affiliated public institute of the KIPO providing information on industrial property rights

[36] Korea Institute of Intellectual Property (research on IP)

[37] Korea Institute for Advancement of Technology (commercialization, IP consulting programs)

[38] Korea Invention Promotion Association (assistance inventions to commercialization)

[39] When two or more applications relating to the same or similar designs are coincidentally created and filed on different dates, the design registration is granted to the first applicant.

[40] To examine if it is not industrially applicable, if the design can be easily created by means of a shape, pattern, colour, or any combination of widely known in Korea (e.g. national flag).

[41] Food products, clothing, accessories of dresses, other accessories, bags and wallets, footwear, parts of clothes or accessories, bed linen, carpets, household sanitary items, items for congratulations and condolence, household furnishings (small), teaching and painting materials, stationery and writing supplies, paper and printed materials, packing containers, computers, fabrics, and screen display designs

[42] OHIM website, https://oami.europa.eu/ohimportal/en/designs-in-the-european-union.

[43] An unregistered Community design (UCD) is defined by the Community Design Regulation in the same way as the registered Community design (RCD), with protection for a period of three years from the date on which the design was first made available to the public within the EU. An UCD confers on its holder a right to prevent copying, but it does not need to be filed to be protected. The holder of a UCD may encounter serious problems proving the date of disclosure and therefore that protection exists (OHIM, 2014).

[44] Telephone interviews with a random sample of small firms which had applied for and/or been granted IPR by the IPO in recent year.

[45] Additional analysis based on more recent data is available in DSTI/IND(2014)10.

[46] Registered Community designs, valid in the European Union, have an initial life of five years from filing.

[47] A Design Award & Competition (Italy), CES Innovation Award (US), Design of the Year (UK), Fennia Prize (Finland), Good Design Award (Japan), Good Design Award (US), iF Product Design Award (Germany), , IIDEX (Canada), Ilmari Tapiovaara Award (Alto University, Finland), Red Dot Award (Germany), Redgees (Canada)

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