

Theoretical Aspects of Innovative Design and Implementation Possibilities for Business Development in Latvia

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Abstract. The research aim is to investigate the theoretical aspects of innovative design promoting factors and foreign experience, and to define the implementation possibilities for business development in Latvia. The tasks of the research are to investigate and characterise the theoretical aspects of innovation and design in the economic literature; to characterise the factors influencing innovative design; to investigate the European experience for implementation of innovative design; and to define the implementation possibilities of design innovation for business promotion in Latvia.

Design and innovation are often key elements to the success of business enterprises, especially during the time of economic recession. The research focuses on the characteristics of innovation, design, and development, and is based on the studies of theoretical literature. The studies of literature have led to the specification of the role and significance of design innovation. The notion of design-driven innovation has been introduced, which is a systematic and "user-driven" approach to the ideas stage in the development of new products, services, business processes, or organisational forms based on the study of users' lives, practices or needs, including unacknowledged or latent needs, which one may expect will be demanded. The influencing factors of design innovation are characterised and specified in the study.

The research results show that business enterprises, which are using different kinds of resources for designing and developing cutting-edge products and processes, are more innovative and have better possibilities to maintain their competitiveness. The focus is laid towards innovation by design provided technology development, sustainability, and social changes of different countries. It requires an environment that is conducive to the creative and innovative activities, supported by both the public and the private sectors.

Key words: innovation, design, market, business, development.

Introduction

The world is changing, globalisation is increasing competition, and businesses are facing major challenges. Market economy is affected by consequences of the global financial crisis.

Perhaps it would be more advisable to bear in mind the wisdom in an old Chinese proverb "when the wind of change begins to blow, some people build windbreaks, while others build windmills" (*Stavik, 2009, p. 6*).

Evolutionary growth theory is based on J. Schumpeter, an Austrian economist fundamental recognition, who called this process "creative destruction". It involves destruction because many structures, traditions and businesses are destroyed. It is also creative because something new emerges as part of the same process. Hubner (2008) specified that creative ideas and innovative solutions were providing crucial help to Europe in order to emerge from the economic crisis which erupted at the end of 2008. Brudstad (2009) explains that an economic downturn does not mean that people or companies stop buying, but just means that they think twice before they spend money on something. Brudstad (2009) continues that the companies which would emerge unscathed from the financial crisis are the companies that manage to create products and solutions that are unique and that have particular a convincing stamp of quality, which provides with the enthusiasm of customers. Blackburn, Smallbone, Dixon (2009) point that knowledge in the

21st century is a notion driven by science, technology, culture, creativity, behavioural economics and, more importantly, an open-source approach to innovation. Innovative companies and business environments are required in order to overcome these major challenges and achieve success in a global competitive environment.

Design is definitely one of several tools that companies can use in their efforts to be innovative by capitalising available opportunities available on the market. By using professional design as an economic driver the economic development benefits on the microeconomic and macroeconomic level. *Brustad (2009)* explains that design driven innovation is a systematic approach to product development which should be applied to an even greater extent. It involves working in a methodical manner through the whole process, from concept development to market launch. Design can contribute to problem-solving, with designers focusing on the user during the development process, and being involved in developing goods and services which are unique on the market, and generating new competitive advantages. S. Brustad admitted that professional design competence had take on a more leading role for achieving results in innovation.

Frequently design concept is analysed mostly from the aspect of object rather than system promoting innovation and business development. The research addresses an innovative theme, which requires a lot of investigation in Latvia. The research exploits the

notion "design" in a broader sense. It encompasses design process, definition of user requirements, innovation and business growth, which are very essential for the economic development.

The research **hypothesis** was set based on the previous recognitions – the design driven innovations substantially influence the business development.

The research **aim** is to investigate the theoretical aspects of innovative design promoting factors and foreign experience, and to define the implementation possibilities for business development in Latvia.

The following **tasks** are stated to achieve the defined aim:

- 1) to investigate and characterise the theoretical aspects of innovation and design in the economic literature;
- 2) to characterise the influencing factors of innovative design;
- 3) to investigate European experience for the implementation of innovative design;
- 4) to define the implementation possibilities of design innovation for business promotion in Latvia.

The special economic literature and other materials were used in order to deal with defined tasks of the research. The monographic descriptive methods and the method of analysis and synthesis were used for the purpose of the study.

Innovation and design theoretical statements for business performance

Innovation and design definitions and role are described by many authors during the centuries. Angel R. (2005) mentioned that the classic

definition of innovation was "immense, incomplete and inimitable", while the design on earlier literature was understood and described more from designers' position. Nowadays strong link with innovation and design is highlighted. Kotler P. and Rath G.A. (1984) admitted that design was a potent strategic tool, which companies could use to gain a sustainable competitive advantage. Locke J. (1985) states that design is "the conscious decision-making process by which information (an idea) is transformed into an outcome, be it tangible (product) or intangible (service)". Swann P. and Birke D. (2005) admit that one of the most useful definitions is provided by Michael Wolff (here quoted in abbreviated form): "Design is a vision Design is a process Design is a result". Swann P. and Birke D. (2005) point that there are many different linkages between creativity, R&D, design, innovation, productivity, creative culture or creative climate, and performance, with some of these linkages operating in two directions. Design is also a visual style of an organisation with the purpose be visible in the market. The quality of working environment can be improved through design efforts and design directly linked with productivity. Several authors have discovered linkages of design with other categories. Nussbaum B. (2007) states that design thinking is part of the design driven innovations. "... design thinking (or whatever we wind up calling this new field) is being created at the borders of design, business, engineering, and even marketing." The design thinking cannot be separated from creativity. Cunningham P. (2008) points creativity factor as an inherent factor in the processes of research, development, and innovation.

Table 1

Factors of design task by Goel A.K. and Crown S. (2006)

No	Factors	Description
1.	Breath	Design pertains to all kinds of artefacts of architecture, engineering, computer software, and human-machine interfaces; designs of products and systems to designs of processes and services.
2.	Stages	Design involves a multitude of stages. Design process starts with some design requirements, and ends in an implementation of a product that satisfies the requirements. Requirements analysis, preliminary design, detailed design, geometric modelling, simulation, optimisation, embodiment, prototype testing, manufacturing and assembly are some of the common stages of product design.
3.	Specification	Design is very open-ended. The specification of the design problem may evolve during the design process, and the problem and the solution specifications may co-evolve.
4.	Complexity	Design is extremely complex and generally involves a large number of interacting components.
5.	Collaboration	Designers work individually and in a team spatially and temporally, in a particular social and cultural context.
6.	Representation	Design typically involves consideration of both forms (two-dimensional (2-d) drawing and function or a three-dimensional solid mode) and functions (schemes and graphs), and performance is typically represented using numerical measures.
7.	Integration	Computer-aided design (CAD etc.) tools and environments.
8.	Creativity	The design task in general poses the challenge of addressing the issues of innovation and creativity.

According to Ambler and Styles (1997), technology, competition, and consumer trends or needs are the traditional drivers for product innovation and changes in one or several of these dimensions cause the company to react by means of product innovation. Based on this statement Roscam E. and Gessel C. (2008) note that differentiation through innovation can only take place when the innovation is based on unique insights in a changing world. Ylä-Anttila P. (2005) highlights that design and innovation in the economic analysis are intangible capital: design, R&D, IT, brand, equity, and human competencies have become as important growth source in advanced economies as traditional tangible capital.

Goel A.K. and Crown S. (2006) investigate that design is based on modifications and adaptations of existing designs. The summarisation of eight factors for design task is presented in Table 1.

There were put forward eight factors for description of design, innovation and case-based reasoning: breath, stages, specification, complexity, collaboration, representation, integration, and creativity.

The quality of working environment can be improved through design efforts and design directly linked with productivity. Stevens J., Moultrie, and Crilly N. (2008) propose integrated or holistic approach in which "design might be termed strategically: an integrated design approach helps maintain a strategic position, and design thinking informs strategy formulation". By Kotler P. and Rath G.A (1984) some companies still neglect design as a strategic tool. However during the period of global recession, there are possible attitude changes towards the evaluation of design strategy as innovation force. This statement needs further investigation and discussion.

The European Commission has evaluated the role of design in the business development. The European Commission Staff Working Paper (2009) has recognised design as a driver and enabler of innovation complements as more traditional innovation activities such as research. The document states that in the current economic climate, where resources for innovation are scarce, design and other non-technological innovation drivers, such as organisational development, employee-involvement and branding, become particularly relevant. The development of tools and support mechanisms for design-driven, user-centred innovation, networking and research, and collaboration in education and training are the areas of action that could help remove some of the barriers to better use of design in Europe.

User-driven innovation and design driven innovation

Design innovation alone does not guarantee market success, Crabb H (2004) states that above all else, successful products are aimed at customer needs and expectations. Design is increasingly considered a strategic tool for user-centred

innovation. Hippel E. (2001) has introduced the notion of user-driven innovation to describe the ability of user to initiate and develop exceedingly complex products. Hippel E. (2004) has described the role of user-centred innovation processes, which offer great advantages over the manufacturer-centric innovation development systems that have been the mainstay of commerce for hundreds of years. Cunningham P. (2008) describes user driven innovation as a holistic and multidisciplinary problem-solving approach that takes user needs, aspirations and abilities as its starting point and focus. Cunningham P. (2008) also proposes that the term "users" shall be taken in the broadest sense of the word and may include consumers, customers, employees, organisations, partners, suppliers, or other members of the society. The process could be characterised by an interdisciplinary coupling of design expertise from the very start of the project and an ability to transform any information gained into new business opportunities via concrete sketches, prototypes, and descriptions of solutions.

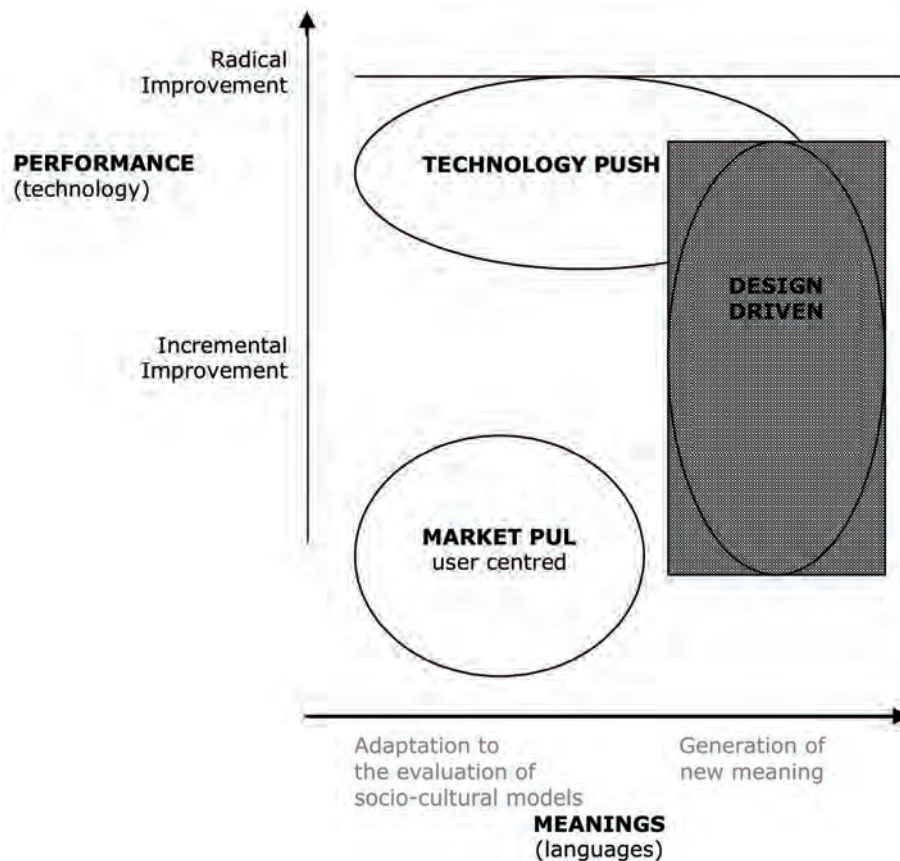
The question from the research has come up: why the user driven innovation is successful? The explanation by Hopkins C.R. (2008) is that customers always have problems to solve.

Abbing E.R. and Gessel C. (2008) point that in the world organisational authenticity and end user relevance are increasingly seen as the key success factors in innovation and design.

The Nordic Innovation Centre has launched "User-Driven Innovation" as a new theme within its Nordic Innovation Policies' focus area. User-driven innovation has been catalysed by increasing global competition – and the challenge of developing exclusive knowledge and skills to remain internationally competitive. There is a need to change the way of thinking and the approach to innovation in order to develop solutions which are tailored to specific consumer values. Levering skills in the creative (e.g. design, etc.) and human sciences (e.g. sociology, anthropology, psychology, ethnology, etc.), and further developing the area of marketing science can help change the thinking.

User-driven innovation can be characterised by:

- 1) **more direct involvement of the user/consumer in the innovation process** – either through observation processes, toolkits, user panels, or letting them do it themselves;
- 2) **a strategic focus on consumer pull** – producing goods that can be sold, rather than selling what is produced;
- 3) **revenue-enhancing activities (vs. cost-cutting activities) by developing solutions that better meet consumer needs** – investing more skills, energy and resources on understanding consumer needs and developing solutions that are more specifically targeted to meeting these needs (often resulting in increased product introductions);
- 4) **use of multiple skills and perspectives in the innovation process** – adding ethnologists, anthropologists and designers to the scientists, engineers and business specialists.



Source: Verganti R., 2009

Figure 1. Innovation Strategy

However innovation expert Verganti R. (2009) has introduced a new notion of design driven innovation, which is not related to the conventional thinking of design innovation coming from markets called as incremental innovation or technology innovation called as radical innovations. Verganti R. (2009) has recognised that design driven innovation creates new markets. As example he has explained Apple's iPod that customers did not ask for such technology, but when they experienced it, it "was loved by first sight". Steve Jobs – a marketing manager at Apple in the Mac World Conference 2008 informed that "We do not think most users will miss the optical drive. We do not think they will need an optical drive. It is really hard to design products by focus groups. A lot of times, people do not know what they want until you show it to them."

Verganti R. (2009) has described innovation strategy with the following graph (Figure 1):

Verganti R. (2009) stresses that in order to understand the user needs it is necessary to introduce a new category called as "interpreters" – such as scientists, customers, suppliers, intermediaries, designers, or artists - who deeply understand and shape the markets they work in. The process of design-driven innovation therefore entails getting close to interpreters, which help understand

people needs and requirements of everyday life. Verganti R. (2009) has admitted that it leverages their ability to *understand* and *influence* how people could give meaning to things: "Firms that implement design-driven innovations are capable of detecting, attracting, and interacting with key interpreters better than their competitors".

Design innovation influencing factors

Theoretical material investigation by different sources has proved that the author for description innovation driven forces admits the below shown picture, which was designed by the Centre of Design innovation (UK). Brown T. (2005) said: "Where you innovate, how you innovate, and what you innovate are design problems". Multidisciplinary approach shows that innovation is driven by three forces: **business, technology, and people**:

- business investigates the viability of new products or services;
- technology explores the feasibility of new products or services;
- people judge the desirability and usability of new products or services.

Figure 2 shows that new innovation occurs at the intersections, for example, process innovation

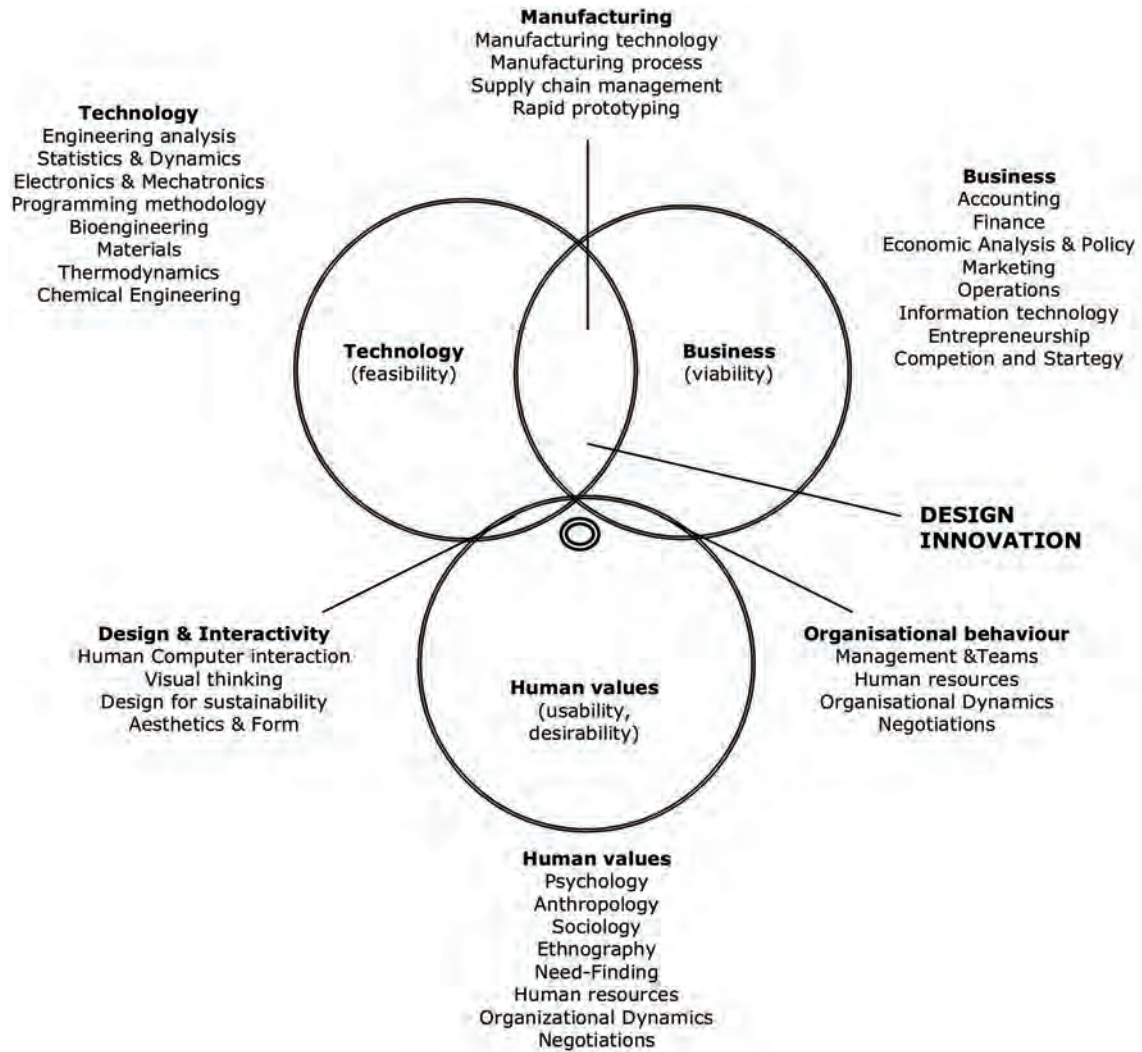


Figure 2. Venn diagram on Multidisciplinary approaches to design innovation from the Institute of Design at Stanford

might occur at the intersection of business and technological innovation. Functional innovation between technology and people creates the interfaces we use to interact with technology. Marketing innovation occurs between businesses and people, enabling branding and emotional connections. Also design innovation factors can be described with the following approach done by Amalnik M.S. (2005). They are level of change, speed of change, and scope of change. Liu G. and Gao X. (2009) identified that distributed innovation was influenced by location, technology, market, profit, resource, and environment factors.

Design driven innovation conditions and indicators

By evaluating the design driven innovation process in the context of business and economic development it is essential to reflect 3 main enabling conditions of design driven innovation. The research authors have completed Moultrie J., Livesey F.,

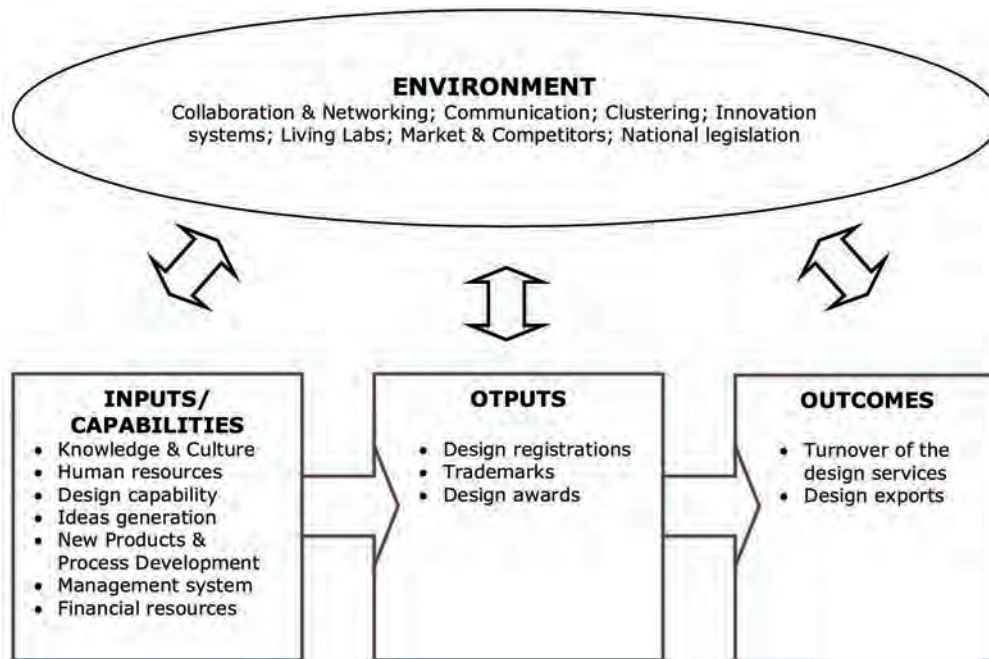
Malvido C., Riedel J., Beltagui A., Pawar K., Nixon B., Macbryde J., Martinez V., Demian P., Evans S. (2008) presented Enabling conditions figure with their own approach to the design driven innovation conditions and indicators (Figure 3):

The research has identified the place and sub-conditions of these enabling conditions (Figure 3):

Inputs: factors relating to long term strengths, such as Knowledge and Human resources; Employee availability; Design capability & Education; Existence of R&D; Research effort; Information for ideas; New ideas generation; Firm knowledge; Employment creativity; New product development processes; Technology compatibility; and Financial investments - company and outsource.

Outputs: the direct results of the input, investments from financial and human capital. Both provide indication on future economic activity; intellectual property and evidence of outputs.

Outcomes: the results of those outputs – quantitative measures, including exports and the growth of technology sector.



Source: made by the authors

Figure 3. Enabling conditions of design driven innovation

Environment: Corporate culture; Collaboration type; Available external services; Networking; Clustering and Living labs; Market – demand conditions, Customers experience, sales of products; Competitors; and National legislation and Innovation system.

Design driven business strategy

Design strategy (by Wikipedia) is a discipline which helps firms determine what to make and do, why do it and how to innovate contextually, both immediately and over the long term. This process involves the interplay between design and business strategy forming a systematic approach integrating holistic-thinking, research methods used to inform

business strategy, and strategic planning which provides a context for design.

The increasing rate of design-driven innovation also denotes a change in the corporate insights and the structure of new product development organisations in the industry (Olson et al., 1995). Hockerts K. and Morsing M. (2008) have analysed that in the process of finding the correct design, in several cases companies employ individuals with specialised skills and training to help build a bridge between theoretical ideas and the generation of the idea. Some companies have their own in-house expertise to develop the right design for the innovation, and they will not have the need for additional contributions. In other cases the

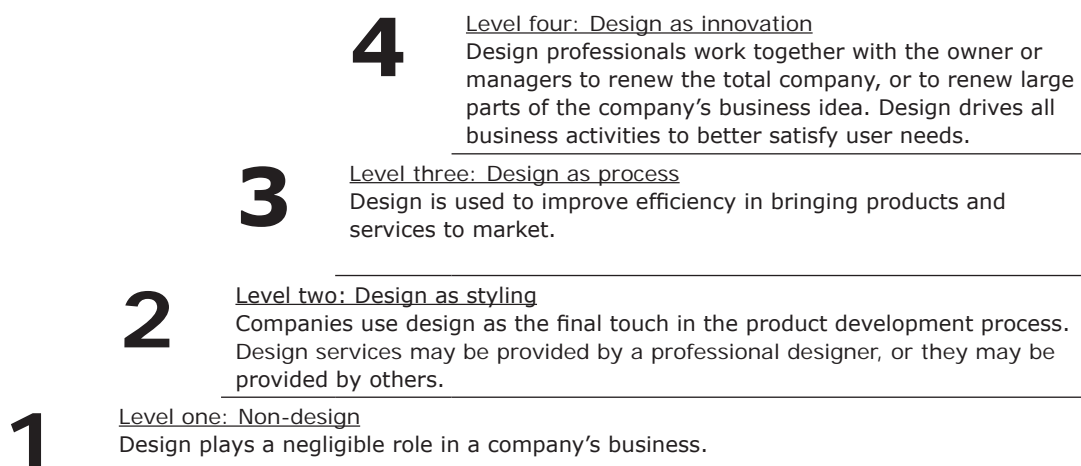


Figure 4. Climbing the design ladder

in-house expertise is missing, which makes it essential to consider which sources can provide the right expertise or in fact take over the modelling and design task. The considerations concerning the design process focus on where to locate the necessary capabilities for design, and how to make use of the resources available in the surrounding. The companies should aim to integrate design consistently and completely across the value chain, across all customer touch-points, and for all their stake-holders.

Several Danish, Irish, Swedish, and Latvian surveys on the economic effects of design use the design maturity scale or design ladder to establish the design maturity of companies. The design maturity scale developed by the Danish Design Centre has four levels (Figure 4).

Design maturity scale is a useful tool for measuring and comparing the use of professional design services for individual companies. It can also be used to measure the use of design in a sector or a region.

There is some empirical evidence that design intensity/input affects positively competitiveness and economic performance on different levels: country level – competitiveness, company level – expected sales growth, and market valuation.

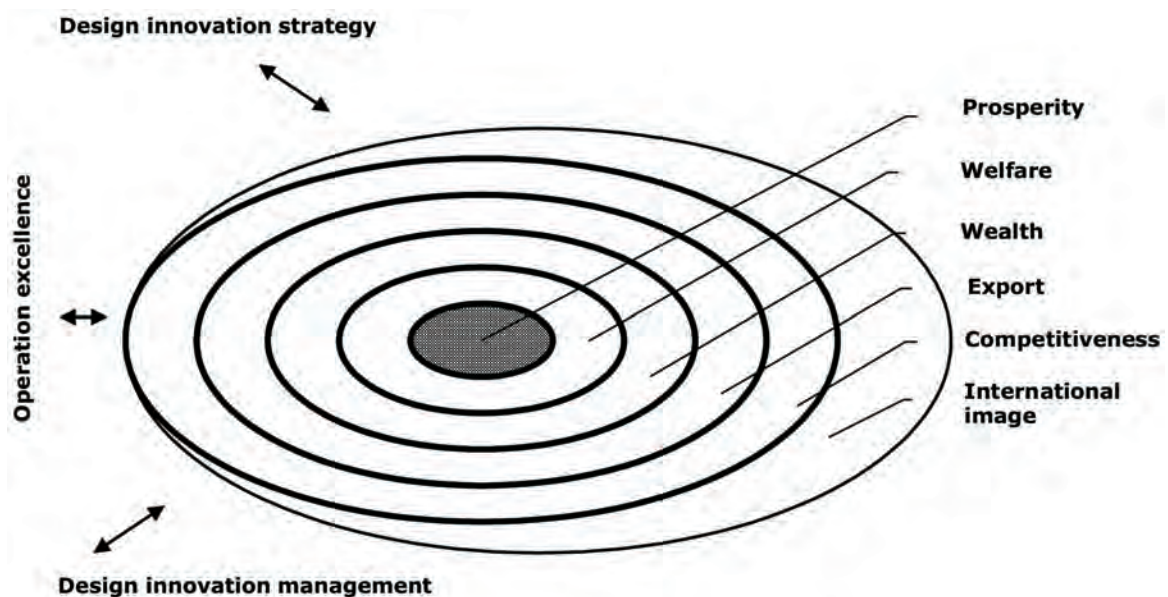
Design innovation implementation possibilities for business promotion in Latvia

Effective design is a part of the integrated product development and innovation process in which design can play an important role. Design innovation creates new products and services, and adds value to the existing ones in micro-economic terms. Design enhances the competitive capacity of

nations in macro-economic terms. The use of design innovation can improve competitiveness of Latvian business and industry by promoting Latvian products and services. Design innovation can also provide sustainable development of the national economy. The strategic vision of design innovations should lead to the highest objective – prosperity. The objective includes the hierarchy steps from lowest to highest – starting with international image, competitiveness, export, wealth, welfare, and the last – prosperity.

The creation of any step of strategic vision for business companies also in Latvia requires advancing design innovation strategy, management of design innovation, and operation excellence. Frey C. and Callahan R. H. (2008) during the global recession period admit the following action tasks: Start scenario planning now; Redouble your focus on customer needs; Strengthen the positioning of your products and services using marketing innovation; Prune your innovation portfolio; Look for opportunities to inexpensively test new ideas; Embrace open-source innovation; Look for creative ways to extend your current products; Take a fresh look at your supplier relationships; Conduct a disruptive threat (competitors) assessment; and Don't just think about innovation in terms of products, services, and business models. The theoretical research of different authors' case studies has proved that adequate design innovation strategy is part of business strategy. As Latvian businesses introduce relatively small number of design innovation products and services goods, there is a necessity to promote the motivation and interests to create added by design innovation.

However the design innovation implementation possibilities require holistic approach to motivation, knowledge and skills, and innovation policy. Based on



Source: made by the authors

Figure 5. Strategic vision of design innovations

user driven design innovation approach the authors have developed a structure of main key elements, which ensure implementation possibilities of design innovation.

Design innovation implementation possibilities in Latvia are based on 1) **Knowledge and capacity building measure** – Education and training (focus on multidisciplinary education and creative thinking); Research (focus on demand, users and design driven approach); Intellectual property management; Design toolkits (advanced IT technology use); Society awareness building (focus on sustainable development); 2) **Infrastructure improvements** (Technology use; Manufacturing processes; Availability of financial recourses; Prototyping); 3) **Promotion Networking** (Supply chain management; Clustering; Public-private partnerships; Living Labs approach); 4) **Sustainable Environment** (Political, Economic, Social situation, Market (competitors); Regulatory base; Open innovation). These influencing factors of design innovation in Latvia are the key elements for promotion of innovations through design. However the characterisation of concrete actions and activities of these key elements requires further investigations and research.

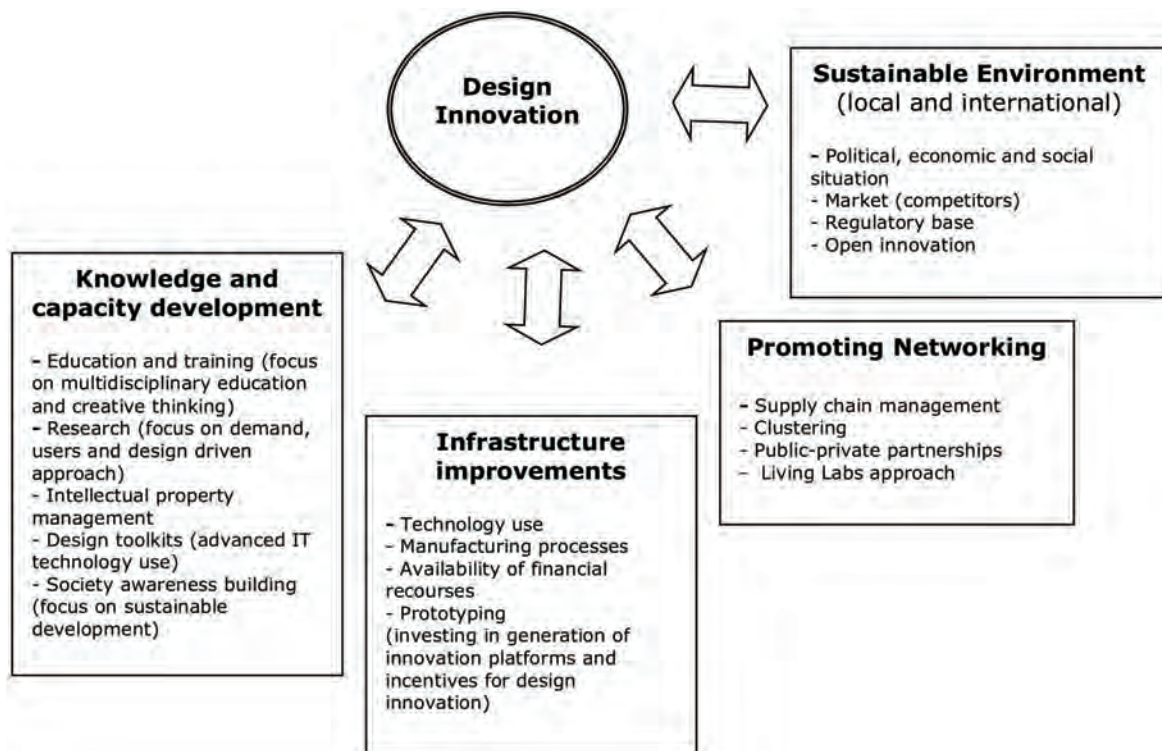
The research authors in order to promote design driven innovation in Latvia also suggest Living Labs approach. The notion "Living Labs", which is an open innovation environment in real-life settings in which user-driven innovation is the co-creation process for new services, products, and societal infrastructures.

The Living Labs model includes end-user participation from an early stage of the creative process of technology development. Living labs are a valuable new tool for boosting innovation in the regional context by involving many actors in the innovation process and enhancing the quality and efficiency of innovation processes in an early stage of innovation. Living Labs engage different types of actors into the same process and their management requires new skills and competences (e.g. user-driven innovation processes, usability, human technology, interaction, facilitation instead of controlling, and facing new type of people).

The basic requirements for successful design innovation suppose will be ensured by using Living Labs approach.

Conclusions

1. Special economic literature introduces different authors' definitions and role of design innovations. Design as a tool for innovation has developed rapidly in recent years, resulting notably in concepts such as strategic design, design management, and design thinking. The significance of design innovations was proved by investigating design innovation case studies in different countries.
2. For characterising the influencing factors of innovative design the authors have used multidisciplinary approach, that innovation is driven by three forces: **business, technology and people**:



Source: made by the authors

Figure 6. Key elements of design driven innovations

- business investigates the viability of new products or services;
 - technology explores the feasibility of new products or services;
 - people judge the desirability and usability of new products or services.
3. Based on user driven design innovation approach the structure of main key elements, which ensure implementation possibilities of design innovation, includes Knowledge and capacity building measure; Infrastructure improvements; Promotion Networking; and Sustainable Environment.
 4. The sustainable and compatible development of the national economy of Latvia requires multidisciplinary approach to design innovation by first creating national design innovation policy and supporting mechanisms, development of design innovation indicator system, and promoting research on investigations.
 5. The characterisation of concrete actions and activities, which should be implemented in Latvia for the development of innovations through design, requires further detailed research and investigations by the authors.

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