Introducing design-driven innovation into Brazilian MSMEs: Barriers and next challenges of design support

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What are the barriers to introducing design-driven innovation into micro, small and medium sized enterprises (MSMEs) in mature industries through design support? What are the next challenges? This paper aims at answering these issues, proposing recommendations to overcome the barriers and exploring what is next. The research strategy was based on the analysis of two exploratory cases of design support in Brazil, taking the key stakeholders' perspectives into account. The approach is qualitative and inductive; we analyse empirical evidence using a literature review on barriers to design-driven innovation. New constraints in the inquired contexts and the ones which were found in other studies are identified and framed at three levels: individual (actors), organisational (micro), and ecosystem. Challenges are pointed out applying the HMW framework to the most promising scenario (which considered critical variables) to design-driven innovation in Brazilian MSMEs. In addition, recommendations on more immediate constraints are suggested.

Design-driven innovation; MSMEs; barriers; design support challenges

1   Introduction

This paper focuses on the Brazilian context, but the problematic which is addressed can be considered of global concern, being a relevant issue in emerging and mature economies (see for instance Arquilla, Maffei, Mortati, Villari, 2015; Raulik-Murphy, 2010; Schneider, Gibet, Colomb, Orazem, Loesch, Kasparyan, Salminen, 2015). MSMEs are important sources of employment and contribute to decreasing the impact of an economic crisis (Airaksinen, Luomaranta, Alajääskö & Roodhuijzen, 2015; Bell, 2015; Cawood, 1997; Madeuf & Estimé, 2000; Organisation for Economic Co-operation and Development [OECD], 2016, Raulik-Murphy & Cawood, 2009). The need for innovation ranging from businesses to regions and nations has been fully recognised (OECD, 2014, ECLAC, 2015, European Comission, 2015, Galinari, Teixeira Junior, & Morgado, 2013; Raulik-Murphy, 2010; Schnaider et al., 2014; Silveira da Rosa, Correa, Lemos, & Barroso, 2007). Design as a way that

leads innovation and humanizes technologies, keeping people at the core throughout its process, constitutes one path to promote change at diverse levels: from micro (organizations, businesses) to macro (policies, territories, industries, nations, ecosystems). The designer "… is concerned with how things *ought* to be in order to *attain goals*, and to *function*" (Simon, 1996, p. 4), this definition is still appropriate nowadays with the expansion of the design field.

1.1 Methodology

This research uses an inductive reasoning, starting from empirical cases to identify the integration of design's problematic in the context of design support[1] when beneficiaries generally are MSMEs and have little or no design experience.

Two research strategies were combined: case study (Eisenhardt, 1989; Stake, 2000; Yin, 1994) and grounded theory (Glaser and Strauss, 1967). The case study is indicated when a contemporary phenomenon is inquired in a real context where the boundaries between the context and the phenomenon are not clearly defined (Yin, 1994). It allows diverse research phases interaction throughout the research process, which enables a better update of the research design according to the discoveries about the phenomenon and the needs found out throughout the research process (Eisenhardt, 1989). The grounded theory approach enables to evidence the meanings from empirical data (Glaser and Strauss, 1967).

Methods' triangulation was used, including semi-structured interviews (addressed to key stakeholders' representatives who take part in the design policy-making processes and implementation such as policy makers, advocates, designers and other consultants, and beneficiaries), in-depth interviews (to get insights on specific topics emerged from the semi-structured interviews), desk research (data collection and analysis from brochures, projects' documents, websites of projects, institutions and companies).

The design support cases inquired were selected in collaboration with a non-profit private entity which aims at promoting the sustainable and competitive development of the Brazilian small businesses. Polar types (Eisenhardt, 1989; Glaser and Strauss, 1967) were considered in order to favour theory extension and to contribute to fill in theoretical gaps. One project in a design-intensive industry[2] and another in a non-design intensive industry were selected. Table 1 shows the projects' characteristics.

Table 1 Projects' characteristics.

Project and context	Description	Activities	Purposes and Funding
P1 *Canastra region* 800 cheese producers 40 certified (Marzano, 2015) *Cheese from Canastra* 200 y. tradition Made of raw milk	Industry: food and agriculture Location: Serra da Canastra (Minas Gerais Federation, Brazil) MSMEs (beneficiaries): This design support initiative counted on 30 to 45 beneficiaries from 2013 to	Cultural heritage identification and registration (verbal language, community behaviour, territory features, institutional videos) Brand, tags and package design (for a consortium of 6 businesses that shared	To develop the territorial brand as well as individual producers brands. To support making products suitable for quality and compulsory certifications regulations, promoting a better communication of

[1] "Design support programmes are a policy instrument for improving the use of design and can comprise of one-to-one mentoring ranging from light-touch to more specialised interventions as well as subsidies, tax credits and export schemes." (Whicher, Swiatek, Cawood, p. 14, 2015) In the Brazilian case, design support is defined, developed and managed mainly by non-profit private entities. These entities are funded through a Brazilian Government's tax paid by formal companies (private firms).

[2] Industries in which design plays an essential role to develop outstanding products and services, considering the definition used by Verganti (2003, p. 35) who includes furniture, lighting, kitchenware, small appliance as examples of this typology of industry.

Project and context	Description	Activities	Purposes and Funding
2008 - Productive practices were considered as part of the Brazilian cultural and immaterial heritage by the Instituto do Patrimônio Histórico e Artístico Nacional (IPHAN) 2015 - *2nd ranking Mondial du Fromage et des Produits Laitières* (Tours, France)	2016. This inquiry focused on 19 beneficiaries of design interventions that included a major range of activities proposed. Projects studied were carried out from 2013 to 2016	the same brand, and for other individual businesses). Research of best practices in loco.	product origin and values. The non-profit entity funds from 60% to 80% of the design interventions, and the beneficiaries pay (refund the institution) from 40% to 20% of the total economic value.
P2 3rd Brazilian Lingerie Cluster 160 manufacturers Focus on wholesale B2B (Guedes, 2014)	Industry: fashion Location: Juruaia (Minas Gerais Federation, Brazil) MSMEs (beneficiaries): This project started with 25 beneficiaries but 15 left the project before its conclusion because of the own (from the entrepreneurs) investment required to open their store. Projects studied were carried out from 2010 to 2014	Technical drawing lingerie modeling workshop. Research of best practices in loco. Mentoring, coaching. Development of brand identities, tags, packages design, and other communication materials. Store design for the consortium of firms (same store and brand shared by a group of entrepreneurs). Lingerie collection design	To enlarge the beneficiaries market share introducing the products into the B2C market through a new retail store, to improve the quality and update the industry trends. The non-profit entity funds from 70% to 80% of the design interventions, and the beneficiaries pay (refund the institution) from 30% to 20% of the total economic value.

All interviews were done in the first language of the interviewee. They were recorded and transcribed. Fragments of the interviewees' speech referring to barriers, clearly connected to the research issues, were translated. Statements that appeared to have personal nature were excluded. A report including the subjects of interest for this research was elaborated and sent to the interviewees in order to validate the information.

Seven representatives of key stakeholders were interviewed (policy makers and project managers, designers and other consultants, and beneficiaries). The interviews were carried out between October 2016 and May 2017. The duration ranged from forty minutes to one hour and thirty minutes.

The analysis of the interviews proceeded in convergence with grounded theory reasoning principle of elicitation, first attributing codes to the texts fragments selected from interviews, summarizing them in short phrases or themes. Second, these themes were clustered according to the similarity between them through cross-reference. Finally, they were confronted with the existing literature enabling to distinguish between the new barriers and the ones that were already identified in prior research (Tables 3, 4, 5).

Three levels of analysis of drivers and barriers were settled as follows:

- The actors level: policy makers, designers and consultants, and beneficiaries as individuals;
- The organisational level: the micro level regarding organisational structure, culture and design process in the firm;
- The ecosystem level: the industry, economic, political and educational environment.

The introduction or integration of design-driven innovation into MSMEs is also studied in the literature with other terminologies such as: to absorb design management capabilities, to learn to use design, to adopt design, to innovate by design, to bring design into business strategy. The main fields that deal with the issue identified in this research were: Design management, Strategic design, Product innovation, Design capabilities, Knowledge management, Design thinking, Creativity, Innovation and Organisational studies. The barriers to design-driven innovation found in the literature came from these fields at the actors and at the organisational level. In the ecosystem level, they were additionally recognised in the Industrial policy, Innovation policy, Design policy, Economics, and Finance field.

Future challenges were elaborated through the identification of critical variables in each level analysed, envisioning a preferred scenario to design-driven innovation, and by applying the 'How Might We' (HMW) question framework from design thinking approach (Ideo.org, n.d.).

1.2 Design and MSMEs: a potential relationship towards change, innovation, productivity and economic growth

Micro, small and medium-sized enterprises (MSMEs) are considered important sources of economic growth, job creation and social cohesion in advanced and emerging economies (Cawood, 1997; Bell, 2015; Madeuf & Estimé, 2000; OECD, 2016, Raulik-Murphy & Cawood, 2009).

There is not a universal definition of MSMEs. MSMEs are, generally, non-subsidiary firms and the criteria used to define MSMEs are based on the number of employees, turnover and financial assets (OECD, 2006, 2016). These numbers vary across countries (OECD, 2006, 2016) as well as the definition and rules applied to employees in each country (European Commission, 2015b). In Brazil, the Brazilian National Confederation of Industry (Confederação Nacional das Indústrias [CNI]) considers as MSMEs firms in industry sectors that have fewer than 250 employees (CNI, n.d.c). the Brazilian Micro and Small Business Support Service (Serviço Brasileiro de Apoio às Micro e Pequenas Empresas [SEBRAE]) sets the limit at 99 employees for firms in the trade and services sectors (SEBRAE, 2014). Table 2 shows the values considered according to these institutions in Brazil (CNI, n.d.c; SEBRAE, 2014, n.d.a) and according to the European Commission in Europe (European Commission, 2015b).

Table 2. MSMEs criteria adopted by diverse institutions.

According to	Enterprize category	Headcount Annual Work Unit (AWU)	Annual turnover		Annual balance sheet
European Comission (2015b)	Medium-sized	<250	≤ €50 million	or	≤ €43 million
	Small	<50	≤ €10 million	or	≤ €10 million
	Micro	<10	≤ €2 million	or	≤ €2 million
CNI (Brazil) Industry	Medium-sized	<250	–		–
	Small	<50	≤ 3.6 million BRL		–
	Micro	<10	≤ 360 thousand BRL		–
SEBRAE (Brazil) Trade and services	Medium-sized	<100	–		–
	Small	<50	≤ 3.6 million BRL		–

According to	Enterprize category	Headcount Annual Work Unit (AWU)	Annual turnover		Annual balance sheet
	Micro	<10	≤ 360 thousand BRL		–

MSMEs generate four out of five new positions of formal jobs in emerging economies (Bell, 2015). They contribute to 45 percent of formal employments and 33 percent of national income (Gross Domestic Product [GDP]) (Bell, 2015). The World Bank estimates that there are between 365-445 million micro, small and medium enterprises (MSMEs) in emerging economies: 25-30 million are formal MSMEs; 55-70 million are formal micro-enterprises; and 285-345 million are informal enterprises (Bell, 2015). 600 million jobs will be needed before 2030 to absorb the global growing workforce (Bell, 2015), which reinforces the need for innovation in MSMEs towards a more sustainable scenario for these businesses, considering their potential contribution to creating jobs.

In the European Union (EU), 99 percent of companies are MSMEs. They contributed with 57 percent of value added in 2012 (Airaksinen, Luomaranta, Alajääskö, & Roodhuijzen, 2015). Gross value added (GVA) and employment are the two main measures that have been used to describe the MSMEs contribution to economies. The first makes economies wealthier, and the latter keeps the unemployment rate low (Airaksinen, et al, 2015).

In Brazil, 99 percent of businesses are MSEs, generating 52 percent of formal jobs (excluding the agriculture sector) in 2013 (Serviço Brasileiro de Apoio às Micro e Pequenas Empresas [SEBRAE] & Departamento Intersindical de Estatística e Estudos Socioeconômicos [DIEESE], 2015) and contributed to 27 percent of the Brazilian GVA in 2011 (SEBRAE, 2014).

The need to reduce inequalities related to MSMEs' productivity between mature and emerging economies through innovation, education and skills deployment is pointed out in order to consolidate the economic growth in developing countries (OECD, 2014; Economic Commission for Latin America and the Caribbean [ECLAC], 2015; European Commission, 2015a).

Despite the absence of a commonly agreed design definition (see for instance Arquilla, Maffei, Mortati, & Villari, 2015; Fonseca Braga, 2016; Swann, 2010), design as:

- a way to transform a current situation into a preferred one (Simon, 1996);
- a tool that drives innovation, competitiveness and national economic growth (European Commission, 2016; Thomson & Koskinen, 2012);
- a way to shape creativity towards innovation (Cox, 2005);
- a lever of non-technological innovations (D'Ippolito, 2014; Thomson & Koskinen, 2012; Verganti, 2008);
- a way to humanise technologies (Heskett, 2009);

is a potential instrument to drive change, innovation, productivity and economic growth at the micro and macro levels (from organisations to nations) as evidenced in several reports (Danish Design Centre [DDC], 2003; Design Council, 2007; Design Council, 2015; European Commission, 2016; Rae, 2013, 2014; Thomson & Koskinen, 2012).

1.3   A brief history and context of design in Brazil

… we could begin to trace the history of design in Brazil before the arrival of the Portuguese. In this case, we would mention the capacity of indigenous Brazilians to objects - networks, screens, baskets and banks - in perfect harmony with nature and with an inherent artistic expression. (Borges, 2009, p. 57)

The influence of architects, such as Oscar Niemeyer, Lucio Costa, and Sergio Rodrigues, as well as Joaquim Tenreiro's and Zanine Caldas's furniture design, marked the basis of modern design and architecture in Brazil since the 1940's (Borges, 2009). In 1964, the Industrial Design College (Escola Superior de Desenho Industrial [ESDI]) was founded in Rio de Janeiro, and held the first higher education design course in South America; the educational programme followed the Ulm School in Germany, having some professors from there (Borges, 2009; Moraes, 2006; Moraes Junior, 2002). The professors' backgrounds were in architecture and engineering (Borges, 2009).

The economic model adopted as well as the late and forced industrialization process since 1964, when the military junta took power, led to the Brazilian identity crisis (Borges, 2009, 2011; Moraes Junior, 2002). Multinational enterprises, mainly from the United States, Europe and Japan, arrived in Brazil, influencing habits, culture and society. This process is known as modern colonization (Moraes Junior, 2002). These educational, political and industrial contexts contributed to the Brazilian rupture with its cultural roots (Borges, 2009, 2011).

After the end of the dictatorship period, in the 1990's the market openness to international competitors brought consequences to the Brazilian businesses:

> Foreign products proved fatal for many companies accustomed to merely copying, since there was always a time-lapse between the original and the copy. At first a number of these companies went under, but in time the survivors grew stronger by absorbing design as a component in their manufacturing strategy. (Borges, 2009, p. 58)

In 1994, the Brazilian Design Programme was the first noteworthy government initiative in the field of design policies promoted by the Ministry of Industry and Commerce (Ministério da Indústria, Comércio Exterior e Serviços [MDIC]), recognising the need for a 'Brazil Brand' and for investing in distinctive design characteristics for Brazilian products. From this time, it is noticed the emergence of Brazilian designers in the international scenario, working for renowned brands such as Motorola, Nike, Bentley, Volkswagen, GM, Disney; doing signed design for foreign companies (e.g. Sergio Rodrigues, Campana Brothers); and having excellent performance in international design awards (e.g. iF- Design Awards and Red Dot Design Award) (Borges, 2009; CBD, Apex-Brasil, MDIC, 2014; Kraichete, 2015; primary data collection). In addition, Brazilian brands start emphasising original features and multinationals with branches in Brazil settled design departments in Brazil, having Brazilian designers also in charge of products development to North America, Europe, China and India (Borges, 2009).

Despite the aspects aforementioned and the diversified industrial sector, Brazilian sectors such as furniture and automotive are still inward focused, being concerned with local content and domestic-market, and the industry is heavily protected from foreign competition (Araújo, 2016; Arnold, 2016; Bradesco, 2017; Galinari, Teixeira Junior, & Morgado, 2013; Moraes Junior, 2002; Organisation for Economic Co-operation and Development [OECD], 2014). Moreover, productivity growth in Brazil is associated with low value added sectors such as agriculture and mining, whereas manufacturing and services correspond to 20% of the Brazilian productivity growth, concentrating over 80% of value added and employment (OECD, 2013). The potential of manufacturing and services to contribute to the productivity growth is underexplored despite the value added and employment rates related to these sectors.

Economic reviews (Araújo, 2016; Arnold, 2016) have suggested the need to open the market to international competitors in order to strengthen the national industries. However, this initiative isolated could lead many firms to go under, especially MSMEs, because of the lack of resources and skills to lead innovation, increasing the unemployment rates. Then, combined initiatives that strengthen education, innovation, design and management skills, or, a learning process to integrate the Brazilian trade into the global one and into exports, providing appropriate support and competences to face this 'openness' process, are required for current and future generations.

1.4   The Brazilian Design Innovation Ecosystem

The Figure 1 uses a framework adapted from Whicher and Walters (2014)[3] to bring a picture of the Brazilian design innovation ecosystem based on

- The Diagnostic Review of Design in Brazil (Centro Brasil Design [CBD], Agência Brasileira de Promoção de Exportações e Investimentos [Apex-Brasil], Ministério da Indústria, Comércio Exterior e Serviços [MDIC], 2014) – this study is an initial effort to measure the Brazilian design capability using as the main reference the Design Staircase Model (Kootstra, 2009) and the International Design Scoreboard (Moultrie and Livesey, 2009).The difficulties related to the lack of available data are clearly evidenced, not enabling to compare Brazil to other European contexts;
- Caloête and Westin (2014) – this publication from SEBRAE lists the Brazilian institutions, programmes, courses, university laboratories, events and fairs;
- Borges (2009) and Kraichete (2015) – this research has been carried out in partnership with the Dutch Culture Centre for International Cooperation and started to map the Brazilian design scenario, its actors and initiatives related to cultural, promotion and funding assets;
- The National Institute for Educational Studies and Research "Anísio Teixeira" (Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira ([INEP], 2017);
- And, information sourced at institutional websites of actors that play a relevant role in design and innovation programmes across Brazil, such as: the Brazilian Micro and Small Business Support Service (Serviço Brasileiro de Apoio às Micro e Pequenas Empresas [SEBRAE]) (SEBRAE, n.d.b), the Brazilian National Confederation of Industry (Confederação Nacional das Indústrias [CNI]) and the National Service of Industrial Training (Serviço Nacional de Aprendizagem Industrial [SENAI]) (CNI, n.d.a, n.d.b).

This scheme does not include all initiatives and entities that compose the Brazilian Design Innovation Ecosystem, but provides examples which have national relevance and sources where to find additional available data.

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[3] This framework is the same adopted in the European context in the Design Policy Monitor (Whicher, Swiatek & Cawood, 2015).

3 per million pop.
Design firms (CBD, Apex-Brasil, MDIC, 2014): 686

78.183
Higher education design students enrolled (INEP, 2017)

15.081
Design graduates in 2016 (INEP, 2017)

301
Higher education institutions (INEP, 2017)

21 per million pop.
Employment in design sector (CBD, Apex-Brasil, MDIC, 2014): 4200

76
Scholarships programmes (Caloête and Westin, 2014)

619
Higher education courses (INEP, 2017)

93
Postgraduate courses - Lato Senso (Caloête and Westin, 2014)

15
Master and PhD degrees - Postgraduate Stricto Senso (Caloête and Westin, 2014)

Assessment based on the DME Staircase model (Kootstra, 2009) from the CBD, Apex-Brasil, MDIC (2014) survey

14,5% DM 4
as a part of organisation's culture

26% DM 3
at a functional level

31% DM 2
at a project level

28,5% DM 1
no design management

Programa Brasileiro de Design (PBD)
Programa Brasileiro de Incremento à Exportação - Promóvel (Brazilian Furniture)
Programa Design de Calçados (Brazilian Footwear)
Programa Design Excellence Brazil
Programa Senai de Design
Programa Inova Talentos (2013-2015)
Programa Design Export
Programas de Incentivo IBGM
Sebraetec - SEBRAE's technology and innovation funding programme
Prodesign – a call for projects which offers credit for software, research and other support for product development in a variety of industries
Edital de Inovação – CNI

19 programmes
Subsidy support (Caloête and Westin)

BRAZILIAN DESIGN INNOVATION ECOSYSTEM

DESIGNERS
USERS
SUPPLY
SUPPORT
EDUCATION
DEMAND
RESEARCH
PROMOTION
FUNDING
ACTORS
SUPPLY AND DEMAND
POLICY & GOVERNMENT

Museums and Cultural Venues
(Borges, 2009; Kraichete (2015):
Museu da Casa Brasileira (São Paulo),
MAM RIO (Museu de Arte Moderna do Rio de Janeiro),
Instituto Tomie Ohtake (São Paulo),
Museu Brasileiro da Escultura (São Paulo),
Instituto Sergio Rodrigues (Rio de Janeiro)

27
Academic events (Caloête and Westin, 2014)

43
Awards (Caloête and Westin, 2014)

Design weeks
(Borges, 2009; Kraichete (2015):
Semana Design Rio,
São Paulo Design Weekend,
Semana D,
What Design Can Do

52
Exhibitions and fairs (Caloête and Westin, 2014)

Design Excellence Brazil

Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq)
Financiadora de Estudos e Projetos (FINEP)
Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Capes)
Confederação Nacional da Indústria (CNI)
Instituto Nacional de Tecnologia (INT)
Instituto Federal de Brasília
Instituto de Pesquisas Tecnológicas (IPT)
Centros de Inovação e Tecnologia SENAI
Instituto Brasileiro de Gemas e Metais Preciosos (IBGM)
Instituto Brasileiro do Couro e Calçados (IBTEC)
Centro de Tecnologia em Embalagem (CETEA)
Several university labs

23
Institutions which promote design research
(Caloête & Westin, 2014)

31
Design centres (Caloête and Westin, 2014)

CBD
Centro Brasil Design

P7 Criativo
independent non-profit association (Belo Horizonte)

Biennals
(Borges, 2009; Kraichete, 2015):
Bienal Brasileira de Design,
ADG Bienal de Design Gráfico

Sebraetec
SEBRAE's technology and innovation funding

Cartão BNDES
a credit line for small businesses) - a design service can be funded by the Brazilian Development Bank (BNDES)

Design Excellence Brazil
this programme offers financial, technical and logistic support to parties to complete for the iF Design Award

Edital de Inovação (CNI)
annual innovation call

Prodesign
a call for projects which offers credit for software, research and other support for product development in a variety of industries

MDIC
Ministry of Industry, Foreign Trade and Services

Apex-Brasil
Brazilian Trade and Investment Promotion Agency

BNDES
The Brazilian Development Bank

MCTIC
Ministry of Science, Technology, Innovation and Communication

CNPq
FINEP

19
Professional Associations (Caloête and Westin, 2014; 2014; CBD, Apex-Brasil, MDIC, 2014)

208
SENAI laboratories technical and technological services

Laboratorio Aberto SENAI
(Belo Horizonte)

700
SEBRAE service centers

CNI SENAIs SEBRAEs SENACs Federations of Industries (e.g. FIRJAN, FIEMG, etc.)
Non-profit private entities supported mainly by public funding (taxes payed by firms in diverse industries) across Brazil
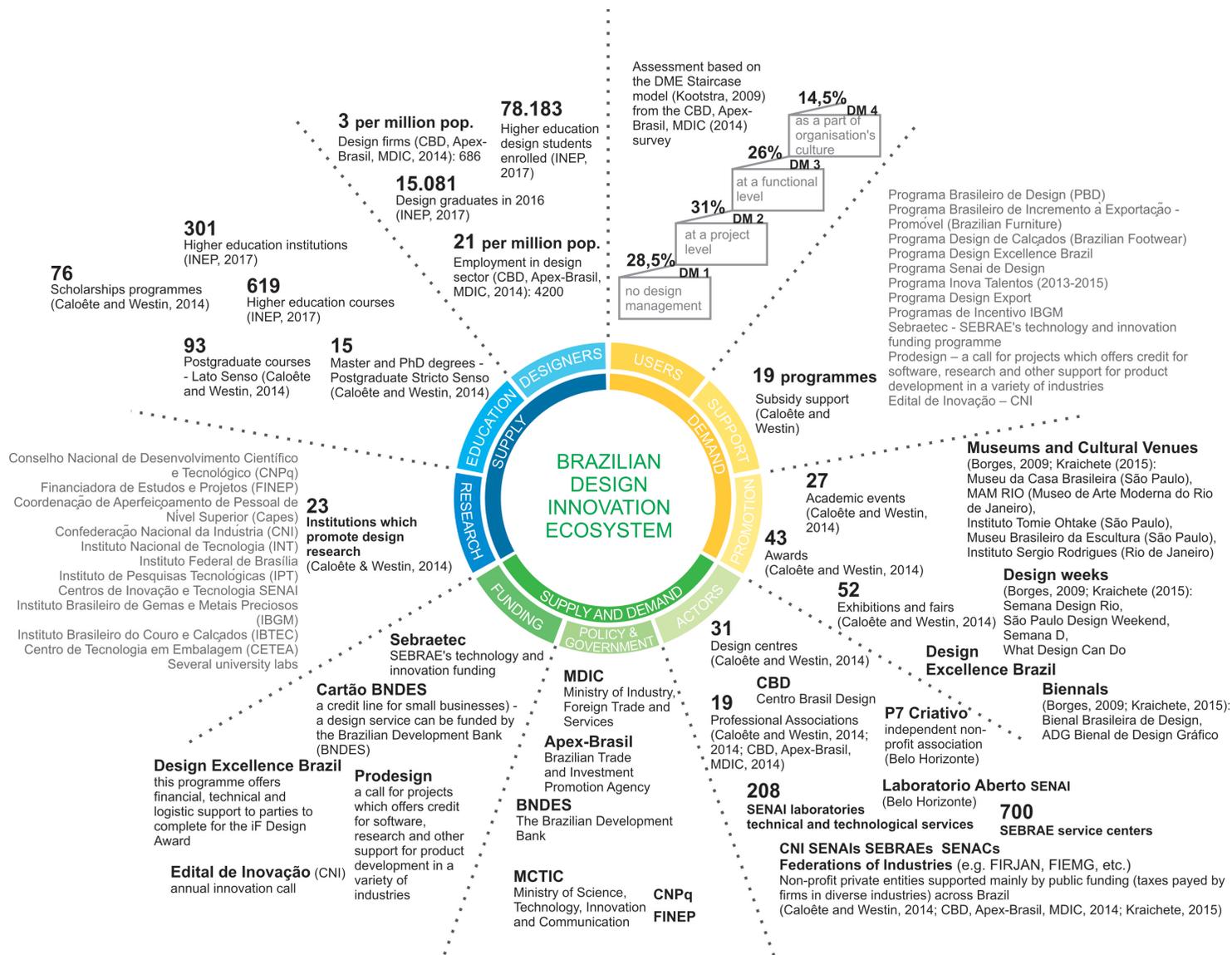(Caloête and Westin, 2014; CBD, Apex-Brasil, MDIC, 2014; Kraichete, 2015)

Figure 1 The Brazilian Design Innovation Ecosystem.

The Brazilian design policies are fragmented and short-term focused (Raulik-Murphy, Cawood, Larsen, & Lewis, 2009). Design and innovation policies publications regarding the Brazilian context have emphasised the need (a) for long run innovation strategies (Mazzucato & Penna, 2015; Raulik-Murphy, Cawood, Larsen, & Lewis, 2009), (b) to combine diversified design policy initiatives (Raulik-Murphy, 2010) and (c) to connect innovation systems that are quite fragmented across the country (Mazzucato & Penna, 2015; Raulik-Murphy, Cawood, Larsen, & Lewis, 2009) that is heterogeneous in terms of culture, education, innovation and design. The geography of design referred to design events (Kraichete, 2015), design jobs and firms (CBD, Apex-Brasil, MDIC, 2014) evidence these contrasting contexts across the country.

The concentration of design firms and jobs is mainly identified in the southeast and southern regions in Brazil (CBD, Apex-Brasil, MDIC, 2014). São Paulo, Rio de Janeiro, and Bento Gonçalves stand out regarding promotion initiatives. São Paulo and Rio held most design events, Bento Gonçalves held the largest furniture fair in Latin America with the Salão Design (Design Hall) Award. The first Brazilian Design Centre (Centro Brasil Design [CBD]) was founded in 1999 in Curitiba city where design concern has been evidenced also through design management studies focused on Paraná Federation companies (Murphy & Raulik Murphy, 2015).

The design and innovation policy-making processes follow essentially a top-down approach where political influence plays a definitive role in strategies, goals and investment decisions. In contrast, experts have emphasised the importance of participatory, collaborative and bottom-up process for policy-making (Maffei, Mortati & Villari, 2014; Whicher & Walters, 2014).

The Diagnostic Review of Design in Brazil (CBD, Apex-Brasil, MDIC, 2014) is an initial attempt, considering that the sizes of companies that answered the survey do not represent the Brazilian reality (where 99 percent of businesses are micro and small) as well as its industry sectors. Moreover, other limitations were pointed out as follows:

> … the absolute design capability indicators in Brazil are often higher in comparison with other countries. However, this can be misleading because when the numbers are placed within the national context according to the size of the population, Brazil's design resources are classified at the lowest end of the table for all indicators. It should also be considered that there is a lack of data on the indicators for public investment in design and the contribution of the design sector towards GDP. (CBD, Apex-Brasil, MDIC, 2014, p. 49)

The lack of design management studies and data on design across Latin America complicates a comparison with foreign regions (CBD, Apex-Brasil, MDIC, 2014) as well as an analysis of the state of the art of design in the country.

2   Barriers to introducing design-driven innovation into MSMEs

Tables 3, 4 and 5 show the barriers to design-driven innovation found in the literature review, and others spontaneously[4] cited by the respondents during the interviews. These barriers were framed at three levels: actors (Table 3), organisational (Table 4), and ecosystem (Table 5). Most barriers quoted were identified in prior research, others that were highlighted were not quoted before related to design innovation in MSMEs.

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[4] The interviewees did not have access to the barriers found in literature nor before neither during the interview.

Table 3   Barriers to design-driven innovation at the actors level

Level		R	Barrier	Prior research
ACTORS	Beneficiaries		Reluctance to delegate authority or decision-making to others	Dyer and Handler (1994) cited in Massa and Testa (2008)
		● (blue)	Over-involvement in operational-level decisions and activities	Bruce, Cooper and Vazquez (1999) Nunes (2014) Raulik-Murphy and Cawood (2009)
		● (blue)	Not knowing where to turn for specialised help	Arquilla, Maffei, Mortati and Villari (2015) Cox (2005)
		● (blue)	Risk aversion	Cox (2005) Sternberg (2006, 2012)
		● (yellow)	Passive attitude towards design with lack of cooperation / engagement with designers throughout projects	Fonseca Braga (2017)
			Lack of long-term strategy vision	Cawood (1997)
		● (blue)	Conventional thinking	Sternberg (2006, 2012)
		● (yellow) ● (blue)	Lack of experience	Arquilla et al. (2015) Bruce et al. (1999) Cox (2005) Schneider, Gibet, Colomb, Orazem, Loesch, Kasparyan and Salminen (2015)
		● (purple) ● (yellow)	Lack of design awareness	Cox (2005) Filson and Lewis (2000) Millward and Lewis (2005)
		● (purple) ● (blue)	Difficulty in trusting motivated by regional culture, tradition*	None
		● (yellow)	Delay in delivering needed activities (e.g. putting off prototype tests) - not related to availability of economic resources	None
		● (purple) ● (blue) ● (yellow)	To 'follow the crowd' attitude (join actions because others are joining)	Sternberg (2006, 2012)
		● (yellow) ● (yellow) ● (blue)	Little understanding of product development/design	Arquilla et al. (2015) Filson and Lewis (2000) Millward and Lewis (2005)
			Not knowing product development and manufacturing costs	Filson and Lewis (2000)
	Designers Consultants	● (purple)	Lack of experience, practice-based know-how	D'Ippolito (2014)
		● (purple)	Lack of ability to communicate design knowledge to company members	Brown (2009)
	Policy makers	● (yellow)	Lack of background in design management	Cox (2005) Maffei, Bianchini and Mortati (2014)

R Respondents
● Beneficiaries
● Designers and consultants
● Policy makers

*Although there are studies emphasising the role of trust in some innovation ecosystems, research pointing out the lack of trust (motivated by regional culture) as an obstacle to design innovation was not found.

The difficulty in trusting and the delay in delivering required activities that would be carried out by the company in order to accomplish a design process phase were pointed out by respondents and identified as new barriers. The difficulty in trusting means that projects beneficiaries show reluctance to engage with consultants or to contribute to them mainly at first attempts of the project when they do not meet each other before. The delay in deliveries impacts design implementation and results (e.g. when tests cannot be carried out, problems are identified later, impacting time to market, and adding design activities to correct them).

Most barriers at the actors level were recognised by interviewees that collaborate with each other, having face-to-face contact throughout projects.

Table 4   Barriers to design-driven innovation at the organisational level

Level		R	Barrier	Prior research
ORGANISATIONAL	Structure	● ● ●	Limited resources	Acklin (2013) Larsen and Lewis (2007)
		● ● ●	Limited in-house capabilities for conducting innovation processes	Acklin (2013) Bruce, Cooper and Vazquez (1999) Cox (2005) Filson and Lewis (2000)
		● ● ●	Underdeveloped education and training	Larsen and Lewis (2007)
			Lack of management skills	Larsen and Lewis (2007) Altenburg and Meyer-Stamer (1999)
			Lack of manufacturing skills	Larsen and Lewis (2007)
	Culture		Use design support to address immediate needs during a crisis	Cawood (1997)
			Cost-driven approach	Millward and Lewis (2005)
		●	Lack of top management support	Cawood (1997) Filson and Lewis (2000) Larsen and Lewis (2007) Schneider et al. (2015)
			Lack of long-term strategy vision	Cawood (1997) Filson and Lewis (2000)
			Weak external contacts	Srinivasan, Lilian, and Rangaswamy (2002) cited in Massa and Testa (2008)
			Influence of a dominant owner/manager	Bruce et al. (1999) Millward and Lewis (2005)
		●	Lack of trust to build up partnerships	Larsen and Lewis (2007)
	Design process		No clear new product development / design strategy	Filson and Lewis (2000)
			Lack of competitors and suppliers knowledge	Larsen and Lewis (2007)
			Domestic market orientation	
			Lack of market launch plan and resource with stage gates	
			Lack of early superior/differentiated product definition	
			Lack of customers / users orientation	

R Respondents
● Beneficiaries
● Designers and consultants
● Policy makers

Few organisational barriers were cited by participants during the interview. Policy makers identify the lack of economic resources and the lack of trust among entrepreneurs, this second one hinders collaboration among them. Designers and beneficiary recognise the need to have in-house capabilities, education and training. The lack of top management (generally the owner in MSMEs) support to collaborate towards design support projects is pointed out by a designer.

The barriers quoted by respondents can be understood as the ones that they perceive as having a clear impact on design introduction through design support initiatives.

Even though the other barriers have an important influence on the introduction of design into MSMEs, they were not spontaneously remembered. A possible reason for this can be the usual focus of projects that do not include a prior design audit or a strategic assessment before defining design support strategies and projects goals. Hence, generally, designers and consultants have the role of developing and implementing specific new products and communication elements that were previously established in the design support programme or project by policy makers.

Table 5 Barriers to design-driven innovation at the ecosystem level

Level		R	Barrier	Prior research
ECOSYSTEM	Industry	● (purple)	Lack of cooperation between businesses**	None
		● (blue)	Illegality in the market (non certified products/firms)	None
			Difficulty in finding appropriate support with respect to design	Arquilla et al. (2015) Cox (2005)
			Imitation strategy context	Altenburg and Meyer-Stamer (1999)
			Inward focused (dedicated to domestic market and local content)	Araújo (2016) Arnold (2016)
			Few design firms considering the size of the national population	CBD, Apex-Brasil, MDIC (2014)
	Policy	●● (purple)	Bureaucracy limitations to select/contract consultants	None
			Bureaucracies related to intellectual property procedures	Larsen and Lewis (2007) Massa and Testa (2008)
		●●● (yellow, blue, purple)	Bureaucracies related to local authorities / regulatory issues	Acklin (2013) Cox (2005)
		● (yellow)	No clear strategy to attend to a businesses / design cluster demand / need - HOW	Maffei, Bianchini and Mortati (2014)
			Fragmented design innovation ecosystem	Maffei, Bianchini and Mortati (2014) Raulik-Murphy and Cawood (2009)
		● (yellow)	One shot projects without follow-ups or long run strategies	Mazzucato and Penna, (2015) Raulik-Murphy, Cawood, Larsen and Lewis (2009)
	Economy		Lack of credit availability	Bell (2015) Larsen and Lewis (2007)
			Low exposure to foreign competition	Araújo (2016) Arnold (2016)
			Industry heavily protected from international competition	Araújo (2016) Arnold (2016)
			Unemployment	Altenburg and Meyer-Stamer (1999)
			Few jobs in the design sector	CBD, Apex-Brasil, MDIC (2014)
	Education		Lack of skills, education to move towards innovation	Altenburg and Meyer-Stamer (1999) OECD (2014)
			Few design graduates considering the national population size	CBD, Apex-Brasil, MDIC (2014)
		● (blue)	Lack of end-users education to recognise design value	Swann (2010)

R Respondents
● Beneficiaries
● Designers and consultants
● Policy makers

**Although the cooperation between businesses is a recognised driver (Cantù, 2013; Rullani, 2011; Symbola & Unioncamere, 2016; Wenger, 2011), research pointing out the lack of cooperation as an obstacle to design innovation in the context of design support was not found.

The lack of cooperation between businesses and the illegality in the market were the new barriers recognised in the industry.

The lack of cooperation is when beneficiaries see the other beneficiaries as competitors that can 'steal their ideas or know-how' more than allies to achieve a goal. In the case of the studied design support projects, the cooperation is not characterized by interdependence and mutual influence[5] among firms in the same industry, since access to external resources such as a design consultancy is assured when the businesses formally join the project, which means that one company will access the competences proposed in the project regardless of other companies' attitudes, conditions and commitment. This cannot be seen as a network because the motivation to join other businesses is mainly based on sharing the investment costs and on the voucher scheme to exploit a resource, not requiring trust (among businesses), commitment or skills from beneficiaries.

Thus, the kind of collaboration identified means 'to help one another' or to learn in a collective process without prior relationships fostered by a bottom-up approach to business needs and to strategies formulation (to exploit resources). In this sense, the way the design support projects are

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[5] i.e. Cantù (2013) explains that these two factors are present in different types of network, including interpersonal ones.

generally designed (top-down process) as well as how businesses join projects do not favour cooperation.

The illegality in the market (shadow economy products) represents the fact that some producers sell their products without quality requirements and compulsory certifications in the market as if they were made in a region where they were not, communicating this misleading information to customers through package and brand. These products are generally cheaper than original and quality-certified products, thereby affecting the competition in the retail market as the customer is not able to distinguish them.

The top-down approach to policy-making leads to the identification of another new barrier: the extensive regulations to contract consultants makes the process slower compared to hiring the designer or consultant in the market situation. Furthermore, the consultant has to fit in several requirements that are not related to their design background, reputation or competence to attain the projects' goals. Another issue is that some of these regulations' requirements counteract the idea of the design policy role (including design support) to balance or stimulate design supply and demand, making the conditions of private studios not suitable to hire them regardless of their competences and reputation.

Most ecosystem barriers were not cited by respondents. Some possible reasons can be that people get used to the national conditions just adapting to them, seeing things within the national boundaries context, another can be the top-down policy approach that discourages taking actions and trying to change a system that lacks meritocracy. The lack of education and skills towards innovation can also lead to hide the weaknesses at the ecosystem level (how can one recognise something in which one has no background or experience?). An additional evidence is the time required to formally recognise by law the designer profession in Brazil, an attempt that comes from 1980 (CBD, Apex-Brasil, MDIC, 2014) and is still being carried out with limited content being discussed regarding the global expansion and importance of design at organisational and national level.

3 Implications and recommendations on design support

All in all, design is not a priority throughout the policy programmes and projects. It is used in practice to achieve other priorities related to, for example, regulations, adequacies to technology and market requirements characterized by short-term strategies, immediate perspectives towards which benefits can be achieved, being more 'pushed' interventions than 'pulled' ones.

Hence, design as a connector, a functional integrator; an enabler of product-service systems (PSS) that fosters innovation to users; as a strategic driver; a way to boost economic growth; to envision futures, collaborating and co-creating them together with citizens, users or beneficiaries of policies, is not observed in project practices, policy priorities and approaches.

In addition, looking at the design support and policy frameworks, and at most research and supportive institutions that relate to design, leads to the interpretation that design is seen as an addition, being usually included in other policy priority such as technology or quality requirements to attain compulsory regulations. There are exceptions regarding this design understanding considering the aforementioned diversity, heterogeneity of design in Brazil. However, analysing the picture of the Brazilian Design Innovation Ecosystem and how it works we may state that generally the potential of design has a very limited understanding. This is evidenced by organisational, institutional and political practices as well as by current Brazilian design management research (e.g. CBD, Apex-Brasil, MDIC, 2014; Murphy, & Raulik Murphy, 2015) that also evidences the lack of data at national level, including public investment in design (CBD, Apex-Brasil, MDIC, 2014).

The difficulty in identifying public investment can be due to the inclusion of design as additional asset in other branches of policies programmes or to the lack of specific policies, institutions and agencies concerned with design. Furthermore, the fragmentation of the design innovation

ecosystem and the way annual accountability reports were done do not facilitate (a) the communication to a general public (citizens) and (b) to distinguish which part was specifically destined to design as well as measurable evidence of benefits directly related to the design interventions.

The suggested recommendations in order to start improving design support in Brazil are mainly related to the policy maker role, considering the current top-down approach to design support programmes. They are:

- To increase designers, consultants and beneficiaries participation in the policy-making process, so they can take part in the definitions of projects' goals and strategies. This kind of earlier beneficiaries' involvement tends to make them strongly committed to the project once they participate in its decisions. Designers and other experts can support prior assessments to design appropriate policy projects according to beneficiaries needs and conditions. The collaboration with experts in earlier phases can avoid misleading decisions regarding the lack of background in design;
- To set clear goals and strategy during the earlier collaborative phase. For instance, what is to be achieved, the competences required, how the programme/project will be carried out, who will be in charge of what and how, communicating this information to all key stakeholders;
- To revise best practices in their field across the world, several aspects related to MSMEs conditions to absorb design-driven innovation through design support programmes are not particular of a context but found in other situations too;
- To look for tools that can support design programmes and projects as well as experts' collaboration in order to strengthen their design capabilities towards future projects;
- To be updated and informed about the regional, national and global content and data related to design support programmes/projects as well as design in the world and in Brazil (collecting also current and comparable data in time), building on reasoning that evidences the impact on the Brazilian society and economy in order to negotiate required changes (e.g. to decrease bureaucracy and better consider meritocracy) to better accomplish their role in the supply and demand of design in Brazil as well as to define budget destinations;
- To move the focus of the work from inside the institution (e.g. fulfilling demanding forms and reports) to outside, including visits to beneficiaries with specific purpose of understanding their needs and conditions, listening to their expectations and what they need from the institution;
- To be immersed in the design world. To cultivate an environment that includes the design industry professionals as well as beneficiaries, promoting when possible events and meetings where people can have the opportunity to meet each other, share knowledge, propose solutions to common problems or discuss businesses' topics that interest both. To be present in design sector events and fairs (not just related to the institution).

4   Challenges of introducing design-driven innovation: What is next?

The next challenges come from the preferred scenario where critical variables were identified in each level:

1. the design support programmes/projects have an important social and economic impact;
2. the processes of policy-making are participatory;
3. the programmes/projects are evaluated[6] and monitored regarding short and long term benefits/impacts;

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[6] Evaluation framework has been discussed in Europe (Maffei, Arquilla, Mortati, Villari, Evans, Chisholm, & Londoni, 2014) and the assessment of design has been matter of discussion at micro (Fonseca Braga, 2016)

4. the organisations are international market focused, human-centred and future-oriented;
5. the actors are design aware and build on appropriate education and skills to lead design-innovation.

In order to propose strategies to achieve this scenario, the How Might We (HMW) questions (Ideo.org, n.d.) are proposed to be answered in collaboration with key stakeholders' representatives through a co-creation workshop using design thinking methods. The HMW questions elaborated are:

1. the design support programmes/projects have an important social and economic impact;

- How might design support programmes/projects propose goals that have an important social and economic impact?
- How might we communicate design support impacts to the general public and to potential partners?

2. the processes of policy-making are participatory;

- How might policy makers elaborate new ways of crafting design support programmes/projects in collaboration with experts and beneficiaries?

3. the programmes/projects are evaluated and monitored regarding short and long term benefits/impacts;

- How might we evaluate short and long-run benefits/impacts of design support programmes/projects?
- How might we monitor short and long-run benefits/impacts of design support programmes/projects?

4. the organisations are international market focused, human-centred and future-oriented

- How might design support programmes/projects prepare companies/beneficiaries to become internationally competitive?
- How might design support programmes/projects make the firms be dedicated to their users' needs?
- How might design support programmes/projects make the firms be future-oriented?

5. the actors are design aware and build on appropriate education and skills to lead design-innovation;

- How might we make policy makers and beneficiaries aware of design?
- How might we improve policy makers and beneficiaries conditions of education and skills towards design-driven innovation?

5   Limitations and future research

Research in the design policy field is acknowledged as a new phenomenon despite the long tradition of design policy practice, remaining the lack of conceptual and theoretical foundations (Hobday, Boddington and Grantham, 2012; Raulik-Murphy, 2010). Moreover, the diversity of design policy programmes, the lack of common terminology, definitions, comparable data and indicators across countries, policies and projects also evidence this aspect (Raulik-Murphy, 2010). In addition, there is the lack of studies and data related to design in the Brazilian context (CBD, Apex-Brasil, MDIC, 2014). The literature used to support the cases analysis is fragmented coming from several fields as a consequence of the holistic view required to inquiry the issues proposed.

Design support programmes and projects *per se* do not assure the design acknowledgement and potential design use within companies and countries. The need for diverse interventions that can be

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and macro Schneider et al., 2015) levels. We need to consider local conditions and actors' perspectives, understanding current frameworks in order to analyse and generate alternatives for the Brazilian case.

combined with design support is recognised (Cox, 2005; Raulik-Murphy, 2010; Swann, 2010). Hence, this is one of this research limitations. This study looks at design support and its recommendations focus on that.

The next steps of this research aim at (1) pointing out the drivers to introducing design-driven innovation that have also been analysed but were not discussed in this paper, and (2) generating answers to the challenges in collaboration with key stakeholders through a co-creation workshop using design thinking methods. It can be seen as an experimentation for a bottom-up approach to start crafting future design support interventions, and their possible strategies.

A further step towards the implementation of collaborative strategies that can be adopted by policy makers is to apply a survey in order to validate and improve strategies considering a representative population.

6   References

Acklin, C. (2013). Design Management Absorption Model – A framework to describe and measure the absorption process of design knowledge by SMEs with little or no prior design experience. *Creativity and Innovation management*, 22(2), 147-160.

Airaksinen, A., Luomaranta, H., Alajääskö, P., & Roodhuijzen, A. (2015). *Statistics on small and medium-sized enterprises. Dependent and independent SMEs and large enterprises*. Retrieved November 21, 2016, from http://ec.europa.eu/eurostat/statistics-explained/index.php/Statistics_on_small_and_medium-sized_enterprises.

Altenburg, T., Meyer-Stamer, J. (1999). How to Promote Clusters: Policy Experiences from Latin America. *World Development*. doi: 10.1016/S0305-750X(99)00081-9.

Araújo, S. (2016). *Untying the knots strangling Brazil's competitiveness*. OECD ECOSCOPE. Retrieved from: https://oecdecoscope.wordpress.com/2016/05/20/untying-the-knots-strangling-brazils-competitiveness/

Arquilla, V., Maffei, S., Mortati, M., Villari, B. (2015). Assessing European Design Policy: Towards an Evaluation Culture. In L. Collina, L. Galluzzo, A. Meroni (Eds.), *Proceedings of the Culumus Conference: The Virtuous Circle* (pp. 915-926). Milan: McGraw-Hill Education Italy. Retrieved May 30, 2016, from http://cumulusmilan2015.org/proceedings/articles/abs-068-Assessing/

Arnold, J. (2016). *Brazil: A tale of two industries or how openness to trade matters*. OECD ECOSCOPE. Retrieved from: https://oecdecoscope.wordpress.com/2016/03/22/brazil-a-tale-of-two-industries-or-how-openness-to-trade-matters/

Bell, S. (2015). *Small and Medium Enterprises (SMEs) Finance*. Retrieved November 21, 2016, from: http://www.worldbank.org/en/topic/financialsector/brief/smes-finance

Borges, A. (2011). *Design + artesanato: o caminho brasileiro* [Design + crafts: the Brazilian way]. São Paulo, Brazil: Terceiro Nome.

Borges, A. (2009). Design. In: *Cultural Mapping Brazil 2009*, pp. 52-85. Dutch Culture Centre for International Cooperation. Retrieved from: https://brazil.dutchculture.nl/sites/default/files/Cultural_Mapping_Brazil_2009_by_DutchCulture.pdf

Bradesco. (2017). *Indústria de Móveis* [Furniture Industry]. Departamento de Pesquisas e Estudos Econômicos. Economia em dia, Osasco. Retrieved June, 2017, from: https://goo.gl/pvm9Dr.

Brown, T. (2009). *Change by design: how design thinking transforms organizations and inspires innovation*. New York, NY: HarperCollins Publishers.

Bruce, M.; Cooper, R.; Vazquez, D. (1999). Effective design management for small businesses. *Design Studies* 20, 297–315.

Caloête, E. Q. M., Westin, D. G. (Coord.). (2014). Serviço Brasileiro de Apoio às Micro e Pequenas Empresas (SEBRAE) - *Design no Brasil: relatório 2014 do setor de design* [The Brazilian Micro and Small Businesses Support Service - Design in Brazil: report 2014]. Brasília, Brazil: Sebrae. Retrieved from:

https://www.sebrae.com.br/sites/PortalSebrae/artigos/o-design-no-brasil-relatorio-2014,6d818242d5e67410VgnVCM1000003b74010aRCRD

Cantù, C. (2013). *Innovazione e prossimità relazionale. Il contesto dei parchi tecnologici* [Innovation and relational proximity. The context of technology parks]. Milan, Italy: Franco Angeli.

Cawood, G. (1997). Design Innovation and Culture in SMEs. *Design Management Journal*, 8(4), 66-70.

CBD, Apex-Brasil, MDIC. (2014). *Diagnostic Review of Design in Brazil*. Retrieved from: http://www.cbd.org.br/downloads/

CNI.(n.d.a). *SENAI* [the National Service of Industrial Training (SENAI)]. Retrieved November 3, 2017, from: http://www.portaldaindustria.com.br/senai/en/about/senai/

CNI. (n.d.b). *Structure*. Retrieved November 3, 2017, from: http://www.portaldaindustria.com.br/senai/en/about/structure/

CNI. (n.d.c). *Variáveis e fontes* [Variables and sources]. Retrieved November 3, 2017, from: http://perfilestados.portaldaindustria.com.br/variaveis

Cox, G. (2005). *Cox Review of Creativity in Business: building on the UK's strengths*. Retrieved June 3, 2016, from http://webarchive.nationalarchives.gov.uk/

Danish Design Centre. (2003) *The Economic Effects of Design*. Copenhagen: National Agency for Enterprise and Housing. Retrieved from: http://www.seeplatform.eu/images/the_economic_effects_of_designn.pdf

Design Council. (2015). *The Design Economy: The value of design to the UK economy*. Retrieved July 14, 2017, from: http://www.designcouncil.org.uk/resources/report/design-economy-report

Design Council. (2007). *The Value of Design: Factfinder report*. Retrieved from: https://www.designcouncil.org.uk/sites/default/files/asset/document/TheValueOfDesignFactfinder_Design_Council.pdf.

D'Ippolito, B. (2014). The importance of design for firms' competitiveness: A review of the literature. *Technovation*, 34, 716-730. doi: 10.1016/j.technovation.2014.01.007

ECLAC (2015). *The European Union and Latin American and the Caribbean in the new economic and social context*. Retrieved June 16, 2015, from http://repositorio.cepal.org/bitstream/handle/11362/38230/S1500330_en.pdf?sequence=1.

Eisenhardt, Kathleen M. (1989). Building Theories from Case Study Research. Academy of Management. *The Academy of Management Review*, 14 (4): 532-550.

European Commission (2015a). AL-INVEST 5.0: Inclusive Growth for Social Cohesion in Latin America – Guidelines for grant applicants. Retrieved June 7, 2015, from https://webgate.ec.europa.eu/europeaid/online-services/index.cfm?ADSSChck=1435233844256&do=publi.detPUB&searchtype=AS&orderbyad=Desc&Pgm=7573839&nbPubliList=15&zgeo=35380&page=1&debpub=&aoref=150066&orderby=upd&userlanguage=en.

European Commission. (2016). *Design for innovation*. Retrieved November 14, 2016, from http://ec.europa.eu/growth/industry/innovation/policy/design/index_en.htm

European Commission. (2015b). *User guide to the SME definition*. Luxembourg: Publications Office of the European Union. Retrieved February 12, 2016, from http://ec.europa.eu/growth/tools-databases/newsroom/cf/itemdetail.cfm?item_id=8274&lang=en

Filson, A., Lewis, A. (2000). Barriers between Design and Business Strategy. *Design Management Journal*, 11 (4), 48-52.

Fonseca Braga, M. (2017). The choice of design. From businesses' conditions to businesses' attitudes. *The Design Journal*, 20:sup 1, S635-S646. doi: 10.1080/14606925.2017.1353011

Fonseca Braga, M. (2016). The value of design: an issue of vision, creativity and interpretation. In P. Lloyd & E. Bohemia (Eds.), *DRS 2016 Conference Proceedings* (pp. 1865-1881). London, UK: Design Research Society.

Galinari, R., Teixeira Junior, J. R., & Morgado, R. R. (2013). A competitividade da indústria de móveis do Brasil: situação atual e perspectivas [The competitiveness of the Brazilian furniture industry: current situation and perspectives]. *BNDES Setorial*, 37, 227-272. Retrieved August 4, 2015, from http://www.bndes.gov.br/SiteBNDES/export/sites/default/bndes_pt/Galerias/Arquivos/conhecimento/bnset/set3706.pdf

Glaser, B. G., Strauss, L. A. (1967) *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine Publishing Co.

Guedes, S. (2014). *Confecções apostam no mercado varejista para aumentar a competitividade* [Lingerie manufacturers bet on the retail market to increase competitiveness]. Retrieved from: http://www.agenciasebrae.com.br/sites/asn/uf/NA/confeccoes-apostam-no-mercado-varejista-para-aumentar-a-competitividade,37c397f2be388410VgnVCM2000003c74010aRCRD

Heskett, J. (2009). Creating Economic Value by Design. *International Journal of Design*, 3(1), 71-84.

Hobday, M.; Boddington, A. ; Grantham, A. (2012). Policies for design and policies for innovation: Contrasting perspectives and remaining challenges. *Technovation*, 32, 272-281. doi:10.1016/j.technovation.2011.12.002

Ideo.org. (n.d.). How Might We. *Design kit*. Retrieved from: http://www.designkit.org/methods/3

INEP. (2017). *Sinopse Estatística da Educação Superior 2016* [Synopsis of Higher Education 2016]. Retrieved from: http://inep.gov.br/web/guest/sinopses-estatisticas-da-educacao-superior

Kootstra, G. L. (2009) *Design Management Europe Survey 2009. The incorporation of design management in today's business practices: An analysis of design management practices in Europe*. Rotterdam, The Netherlands: Centre for Brand, Reputation and Design Management, INHOLLAND University of Applied Sciences. Retrieved from: http://www.bcd.es/site/unitFiles/2585/DME_Survey09-darrera%20versi%C3%B3.pdf

Kraichete, D. (2015). *Mapping Brazil – Design*. DutchCulture centre for international cooperation. Retrieved from: https://brazil.dutchculture.nl/en/mapping/mapping-brazil-design-0

Larsen, P., Lewis, A. (2007). How Award-Winning SMEs Manage the Barriers to Innovation. *Creativity and Innovation Management*, 16(2), 142-151. doi:10.1111/j.1467-8691.2007.00428.x

Madeuf, B., & Estimé, MF. (2000). *Compendium on International and Regional Bodies: Activities and Initiatives Related to Small and Medium-Sized Enterprises (SMEs)*. Retrieved September 20, 2016, from https://www.oecd.org/cfe/smes/2090691.pdf

Maffei, S., Arquilla, V., Mortati, M., Villari, B, Evans, M., Chisholm, J., & Londoni, P. (2014). *Design in European Policy (DeEP) final publication*. Retrieved March 3, 2016, from: http://www.deepinitiative.eu/wp-content/uploads/2012/12/DEEP_FINAL-PUBLICATION.pdf

Maffei, S.; Bianchini, M.; Mortati, M. (2014) *Design 2020. Le sfide della trasformazione del sistema design Lombardo* [Design 2020. The challenges of transforming the Lombard design system]. Regione Lombardia, Direzione Generale Commercio, Turismo e Terziario, Milano, Italia: Libraccio Editore. Retrieved May 31, 2016, from http://www.designpolicy.eu/wp-content/uploads/2016/04/RegioneLombardia_DESIGN2020_Documento-Finale.pdf

Maffei, S., Mortati, M., Villari, B. (2014). Making/Design Policies Together. In: M. Mortati, L. Cruickshank, S. Maffei, & M. Evans (Eds.), *10th European Academy of Design Conference - Crafting the Future* (pp. 1-14). Gothenburg, Sweden: European Academy of Design. Retrieved from: http://www.trippus.se/eventus/userfiles/67172.pdf

Marzano, Francelle. (June 13, 2015). *Queijo de Minas é premiado em competição internacional realizada na França* [Cheese from Minas is awarded in international competition held in France]. Retrieved from: http://www.em.com.br/app/noticia/economia/2015/06/13/internas_economia,657775/queijo-de-minas-e-premiado-na-franca.shtml

Massa, S.; Testa, S. (2008). Innovation and SMEs: Misaligned perspectives and goals among entrepreneurs, academics, and policy makers. *Technovation*, 28, 393–407. doi: 10.1016/j.technovation.2008.01.002

Mazzucato, M., Penna, C. (2015). *The Brazilian Innovation System: A Mission-Oriented Policy Proposal*. Avaliação de Programas em CT&I. Apoio ao Programa Nacional de Ciência (Plataformas de conhecimento). Brasília, DF: Centro de Gestão e Estudos Estratégicos.

Micheli, P. (2014). *Leading Business by Design. Why and how business leaders invest in design*. Design Council and Warwick Business School. Retrieved June 3, 2016, from http://www.designcouncil.org.uk/sites/default/files/asset/document/dc_lbbd_report_08.11.13_FA_LORES.pdf

Millward, H., Lewis, A. (2005). Barriers to successful new product development within small manufacturing companies. *Journal of Small Business and Enterprise Development*, 12 (3), 379-394. doi: 10.1108/14626000510612295

Moraes, D. (2006). *Análise do design brasileiro: entre mimese e mestiçagem* [Analysis of the Brazilian design between mimesis and miscegenation]. São Paulo, Brazil: Blucher.

Moraes Junior, D. (2002). *Il rapporto locale-globale, nuova sfida ed opportunità progettuale: il Brasile come caso locale* [The local-global relationship, the new design challenge and opportunity: Brazil as the local case]. PhD thesis. Milan, Italy: Politecnico di Milano.

Mortati, M.; Cruickshank, L. (2011). Design and SMEs: the trigger of creative ecosystems. In: *Proceedings of the Conference DPPI11*, Milan, Italy. DOI: 10.1145/2347504.2347550

Moultrie, J. & Livesey, T.F. (2009). *International Design Scoreboard - Initial indicators of international design capabilities*. Great Britain: IfM and University of Cambridge. Retrieved May 30, 2016, from https://www.designcouncil.org.uk/sites/default/files/asset/document/InternationalDesignScoreboard.pdf

Murphy, D., & Raulik Murphy, G. (2015). *The Design Innovation Performance of Paraná Businesses*. Centro Brasil Design (CBD) and Duco – Driving Design Strategies. Retrieved from: http://www.cbd.org.br/downloads/

Nunes, V. G.A. (2014). What Does Design & Innovation Mean for MSEs? A case study of eight Brazilian furniture firms. in: E. Bohemia, A. Rieple, J. Liedtka, R. Cooper, eds., *Proceedings of the 19th DMI Academic Design Management Conference: Design Management in an Era of Disruption*. Chapter 1, pp 95-108.

OECD. (2013). *Economic Surveys: Brazil 2013*. Paris: OECD, 2013. Retrieved June 16, 2015, from: https://goo.gl/iY4r5y

OECD (2016). *Financing SMEs and Entrepreneurs 2016: An Scoreboard*. OECD Publishing, Paris, France. doi: 10.1787/fin_sme_ent-2016-en. Retrieved November 7, 2016, from http://www.keepeek.com/Digital-Asset-Management/oecd/industry-and-services/financing-smes-and-entrepreneurs-2016_fin_sme_ent-2016-en#.WC64m3fMw0o#page3

OECD. (2014). *Latin American Economic Outlook 2015: Education, Skills and Innovation for Development*. OECD Publishing. doi:10.1787/leo-2015-en.

OECD (2006). *The Financing Gap* (Vol. 1): Theory and Evidence. Paris, France: OECD Publishing.

Rae, J. (2013). *Design-Conscious Companies: What Is the Real Value of Design?* Design Management Institute, 30-37. Retrieved October 26, 2015, from https://www.dmi.org/resource/resmgr/pdf_files/TheRealValueOfDesign.pdf

Rae, J. (2014). *What Is the Real Value of Design?* Design Management Institute and Motiv Strategies, 1-9. Retrieved October 26, 2015, from http://motivstrategies.com/work/what-is-the-real-value-of-design/

Raulik-Murphy, G. (2010). *A Comparative Analysis of Strategies for Design Promotion in Different National Contexts*. PhD thesis. Cardiff, UK: University of Wales.

Raulik-Murphy, G., Cawood, G., Larsen, P., & Lewis, A. (2009). A comparative analysis of strategies for design in Finland and Brazil. In: *Undisciplined! Design Research Society Conference 2008* (pp. 201/1-201/16). Sheffield, UK: Design Research Society.

Raulik-Murphy, G., Cawood, G. (2009). *'National Design Systems' – a tool for policy making*. Research Seminar: Creative industries and regional policies: making place and giving space. Birmingham: University of Birmingham. Retrieved May 27, 2016, from http://www.seeplatform.eu/images/National%20Design%20Systems%20-%20a%20tool%20for%20policy-making.pdf

Rullani, E. (2011). L'economia della conoscenza nel capitalismo delle reti [The knowledge economy in the capitalism of networks]. *Sinergie Italian Journal of Management*, [S.I.], 67-90. Retrieved from: http://sinergiejournal.eu/index.php/sinergie/article/view/s76.2008.07

Schneider, J., Gibet, S., Colomb, A., Orazem, V., Loesch, SL., Kasparyan, C., Salminen, J. (2015). *Supporting design driven innovation: a review of selected programmes*. Regions supporting Entrepreneurs and Designers to Innovate (REDI). Retrieved May 24, 2016, from http://www.apci.asso.fr/magazine/categorie/activites/rapport-redi-soutenir-l-innovation-par-le-design-analyse-de-quelques-programmes

SEBRAE, DIEESE. (2015). *Anuário do trabalho na micro e pequena empresa: 2014* [Annual review of jobs in micro and small enterprises: 2014]. Retrieved from: https://m.sebrae.com.br/Sebrae/Portal%20Sebrae/Anexos/Anuario-do%20trabalho-na%20micro-e-pequena%20empresa-2014.pdf

SEBRAE. (2014). *Participação das Micro e Pequenas Empresas na Economia Brasileira* [Participation of Micro and Small Businesses in the Brazilian Economy]. Retrieved from: https://m.sebrae.com.br/Sebrae/Portal%20Sebrae/Estudos%20e%20Pesquisas/Participacao%20das%20micro%20e%20pequenas%20empresas.pdf

SEBRAE. (n.d.a). *Quem são os pequenos negócios?* [Who are the small businesses?] Retrieved Nov. 3, 2017, from: http://www.sebrae.com.br/sites/PortalSebrae/estudos_pesquisas/quem-sao-os-pequenos-negociosdestaque5,7f4613074c0a3410VgnVCM1000003b74010aRCRD

SEBRAE. (n.d.b). *700 Service Centers throughout Brazil*. Retrieved Nov. 3, 2017, from: http://www.sebrae.com.br/sites/PortalSebrae/canais_adicionais/sebrae_english

Silveira da Rosa, S. E., Correa, A. R., Lemos, M. L. F., & Barroso, D. V. (2007). O setor de móveis na atualidade: uma análise preliminar [The furniture industry today: a preliminary analysis]. *BNDES Setorial*, 25, 65-106. Retrieved September 15, 2015, from http://www.bndes.gov.br/SiteBNDES/export/sites/default/bndes_pt/Galerias/Arquivos/conhecimento/bnset/set2503.pdf

Simon, H. A. (1996). *The Sciences of the Artificial*, 3rd edition. Cambridge, Massachusetts: MIT Press.

Stake, R. E. (2000) Case Studies. In.: DENZIN, N. K., & LINCOLN, Y. S. (eds.). *Handbook of Qualitative Research*. 2nd ed. Thousand Oaks, California: Sage Publications. p. 435-454.

Sternberg, R. J. (2012). The Assessment of Creativity: An Investment-Based Approach. *Creativity Research Journal*, 24(1), 3–12. DOI: 10.1080/10400419.2012.652925

Sternberg, R. J. (2006). The Nature of Creativity. *Creativity Research Journal*, 18(1), 87-98. DOI: 10.1207/s15326934crj1801_10

Swann, P. G. M. (2010). *The economic rationale for a national design policy*. Retrieved April 18, 2016, from https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32096/10-1112-bis-occasional-paper-02.pdf

Symbola, Unioncamere (2016). *Coesione è Competizione: Nuove geografie della produzione del valore in Italia*. [Cohesion is Competition: New Geographies of Value Production in Italy] Retrieved January 9, 2017, from http://www.symbola.net/html/article/coesioneecompetizione

Thomson, M., Koskinen, T. (Eds.) (2012). *Design for growth and prosperity*. Report and Recommendations of the European Design Leadership Board. Retrieved May 3, 2016, from www.icsid.org Verganti, R. (2003). Design as brokering of languages: Innovation strategies in Italian firms. *Design Management Journal*, 34-42.

Verganti, R. (2003). Design as brokering of languages: Innovation strategies in Italian firms. *Design Management Journal*, 34-42.

Verganti, R. (2008). Design, meanings and radical innovation: A meta-model and a research agenda. *The Journal of Product Innovation Management*, 25, 436-456.

Wenger, E. (2011). *Communities of practice: A brief introduction*. Retrieved May 10, 2017, from https://scholarsbank.uoregon.edu/xmlui/handle/1794/11736?show=full

Whicher, A.; Swiatek, P.; & Cawood, G. (2015). *Design Policy Monitor 2015: Reviewing Innovation and Design Policies across Europe*. Retrieved April 18, 2016, from http://www.seeplatform.eu/docs/SEE%20DPM%202015%20Jan.pdf

Whicher, A., & Walters, A. (2014). *Mapping Design for Innovation in Wales & Scotland*. Research report, Arts and Humanities Research Council (AHRC). Retrieved from: https://repository.cardiffmet.ac.uk/handle/10369/6561

Yin, R. K. (1994). *Case Study Research: Design and Methods*, 2. ed. London, UK: Sage Publications.

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The choice of design. From businesses' conditions to businesses' attitudes

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The choice of design. From businesses' conditions to businesses' attitudes.

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Abstract: This paper addresses a psychological approach to creativity use as a decision in order to understand design management capabilities absorption within small businesses throughout three design policy programs focused on the integration of design into MSMEs in the Brazilian furniture industry. The issue is: What are the different companies' attitudes and prior knowledge (or conditions) that contribute to or block the absorption of design management capabilities throughout these projects? Literature review and participant observation were employed in a qualitative perspective. The integration of design into business has been more related to the organisational culture than to an economic reasoning. The main contribution is to start better understanding different businesses' attitudes and prior knowledge that support the absorption or improvement of design management capabilities within MSMEs. The findings are summed up in a map that shows the perceived businesses' conditions and attitudes and their impact on design management capabilities absorption.

Keywords: business's attitude, prior design knowledge**,** design management absorptive capacity, use of creativity resources, MSMEs

1. Introduction

Creativity is the main basis of the design process. Studies have not considered a psychological approach to creativity in order to analyse the role of firms' conditions and attitude during the integration of design into their (not design-oriented) small businesses. Many design policies focused on the integration of design into micro, small and medium-sized enterprises (MSMEs) and studies on design management ignore differences related to the decision to deploy creativity held by diverse stakeholders and its implications as, for example, the lack of value to move on to the next level of the design ladder, and the mindset and experience regarding design knowledge and practice.

This paper sheds light on the use of creativity resources as a decision at the micro level (enterprises' level) using insights from the Sternberg and Lubart's theory of investment (Sternberg, 2006, 2012) in the psychology field, in order to better understand empirical evidence of success and failure in

absorbing design management capabilities through design policy projects of integration of design into MSMEs.

The choice of exploring the design potential has been considered as more related to organisational culture aspects than to an economic reasoning. Good financial performance is not a precondition for design investment in firms (Gemser & Leenders, 2001; see also Braga, 2016). The main motives for integrating design into businesses reported in the design management literature have been: trust (Micheli, 2014), vision (Borja de Mozota, 2006), ethos (Walsh 1996), behaviour (Danish Design Centre, 2003), cultural imperatives (Heskett, 2009), and adopted strategy (Gemser & Leenders, 2001; Roy & Riedel, 1997). The gap lies on the businesses' attitudes and prior knowledge that support or not the absorption or improvement of design management capabilities.

The assumptions about the fundamentals of creativity related to design management considered in this manuscript are:

1. Design "is creativity deployed to a specific end" (Cox, 2005, p.2);
2. Creativity is not an inborn trait but people can decide to use or not to use creativity resources (Sternberg, 2006, 2012);
3. Deploying creative ideas is harder than 'following the crowd' (Sternberg, 2006, 2012);
4. The value of being creative varies depending on individual perspectives, intra-organisational (see for instance Amabile, Conti, Coon, Lazenby, & Herron, 1996; Braga, 2016; Heskett, 2009) and external environment (e.g. macroeconomic factors, design innovation ecosystem, societal and cultural context);
5. The willingness to explore design and design management in MSMEs does not assure the investment in design or the absorption of design management capabilities (see for instance Acklin, 2013). Organisational aspects such as the lack of top management support (Acklin, 2013; Amabile, et al, 1996; Cowood, 1997; Schneider, Gibet, Colomb, Orazem, Loesch, Kasparyan, & Salminen, 2015), other pressures on the business and risk aversion (Cox, 2015), underdeveloped education and training (Massa & Testa, 2008) as well as external barriers such as the difficulty in finding appropriate support with respect to design professionals (Arquilla, Maffei, Mortati, & Villari, 2015; Cox, 2005), finance (e.g. credit availability) (see Bell, 2015) and bureaucracies related to local authorities and to intellectual property procedures (see for instance Acklin, 2013; Massa & Testa, 2008) are examples of the obstacles that firms face to implement innovative ideas besides their 'willingness' to make them happen.

This discussion brings implications to the way of dealing with innovation in the design management and in the design policy fields (especially for policies focused on the integration of design into MSMEs).

Schneider et al. (2015, p.7-8), Thomson and Koskinen (2012) notice that few companies and industries use design potential to leverage successful business across Europe. This is not considered a specific European difficulty; diverse publications (Organisation for Economic Co-operation and Development [OECD], 2014; Economic Commission for Latin America and the Caribbean [ECLAC], 2015; European Commission, 2015) report the need to lead also countries of the South to more innovative paths reducing the productivity gap between MSMEs in Southern and Northern countries.

2. The use of creativity resources: from conditions to attitudes

This topic is based on Sternberg's (2006, 2012) explanations about Lubart and Sternberg's theory of investment. Their theory sheds light on the use of creativity as a decision. Most analysis provided by Sternberg are based on learning (teacher-students) environments and were useful to understand mainly the individual differences that lead to the use of creativity. Some analogies to the 'absorption' of design management capabilities into MSMEs are possible considering their prior knowledge or condition and decision to deploy creativity (or to promote some change into businesses) by applying design resources throughout a learning 'to use design' process.

Studies have not considered stakeholders' differences referred to attitude and prior knowledge, and empirical evidence from cases studied has shown that the stakeholders' attitude and prior design-related knowledge impact on the absorption of design management capabilities throughout the projects of integration of design into MSMEs in different ways.

According to the theory of investment, creativity is not a result of any particular inborn trait and is seen as a *habitual novel response*, an *attitude towards life*, instead of responding automatically and mindlessly to it (cited in Sternberg, 2012).

Schooling often does not encourage creativity, and evaluating students through tests based on wrong-answer-right-answer format limits assessment, focusing on content related to knowledge. Solving problems that do not fit into the wrong-answer-right-answer standard requires creative thinking or divergent thinking. Then, *knowledge is necessary but it is not a sufficient condition for creativity* (Sternberg, 2012).

Design issues depend on context and there is no 'right' or 'wrong' answer; there is the most appropriate answer that is built up by exploring new ways of thinking, doing and making through the use of the knowledge available at a certain time and a certain context.

Creative ideas defy the crowd, and when first presented they encounter resistance. Society does not realise the value of creative ideas, perceiving them as an opposition to the status quo. Creativity, thus, cannot be understood separated from its societal context (cited in Sternberg, 2006, 2012). However, the issue is whether the creative individual will persist and go against the crowd (cited in Sternberg, 2012).

As stated by Sternberg (2006, 2012), *one decides* to deploy creativity according to six different and interrelated resources, which are briefly described in Table 1.

Table 1. Creativity resources (Sternberg, 2006, 2012).

Creativity resource	Description
Intellectual abilities	Three main abilities compose this resource: (1) the synthetic one, which allows seeing problems in new ways; (2) the analytic one, which refers to the ability to recognise which ideas are worth pursuing and which ones are not; (3) the practical-contextual one, that means knowing how to persuade others of, or to sell others on, the value of one's idea. All of them are important to deploy creative ideas.
Knowledge	Enough knowledge is required to move a field forward. However, knowledge can block creativity when it promotes a closed perspective. Then, the balance between enough knowledge and freeing oneself of it is advised.

Creativity resource	Description
Thinking styles	There are preferred ways of using one's skills. Thinking in new ways (legislative style) and distinguishing the whole from the parts are considered important for creativity.
Personality	Personality attributes such as willingness to overcome barriers, willingness to take sensible risks, willingness to tolerate ambiguity, and self-efficacy.
Motivation	It is not inherent in a person. It is up to the individual to feel motivated by their own reasoning. However, task-focused motivation is important for creative work, and people rarely do truly creative work unless they love what they do and focus on the work more than the rewards (cited in Sternberg, 2006, 2012).
Environment	Supportive and rewarding environment is required to deploy creative ideas. The cultural differences related to the support of creativity as well as about its concept should be taken into account when evaluating creativity (cited in Sternberg, 2012).

These components should be considered together as more than a sum of an individual's level of each component (Sternberg, 2012). Some elements are essential (e.g. knowledge), and creativity is not possible without them; also, when isolated, they are not enough to deploy creativity. Compensation can happen between different components (e.g. strength in motivation can counteract weakness in environment), as well as interactions between resources enhancing creativity (cited in Sternberg, 2012).

3. Key elements to understand the integration of design into MSMEs

Activities of integration of design into businesses through a design policy include (Schneider, et al, 2015, p.10):

1. capacity building: this activity refers to the development of good practices for integrating design through activities such as seminars, approaching topics related to design management such as "writing a brief" and "user-centred innovation",

2. dedicated advising: it is the evaluation by a dedicated advisor in order to assess the needs and capacities of the company, supporting activities such as brief development, design consultant selection, and project development monitoring,

3. bespoke support: it is focused on the integration of design into a business strategy by mentoring or coaching senior managers.

Capacity is the ability to perform an activity in an acceptable manner, whereas capability is the ability to repeatedly deploy the capacity in a well-structured way (cited in Acklin, 2013; cited in Mortati, Villari, & Maffei, 2014). In this sense, design management capabilities absorption can be recognised when a firm is able to develop or improve its design management skills throughout time during a design policy intervention.

Although under-researched, design capabilities are identified as design management skills, tasks, and capabilities in the design management field ranging from basic skills to strategic skills (Acklin, 2013; Mortati, et al, 2014). Several studies provide examples of design management skills (e.g. Acklin, 2013; Borja de Mozota, 2006; Bruce, Cooper, & Vazquez, 1999; Chiva & Alegre, 2009; Mortati, et al, 2014).

Acklin (2011, 2013) proposes the Design Management Absorption Model (DMAM). This model started from a prescriptive approach based on literature review insights, and was first used by the research team to drive the analysis of companies results from a design knowledge absorption perspective during an action research project in 2011 (Acklin, 2013). They studied design projects implementation and their outcomes related to design management skills in five SMEs with little or no prior experience. After a more in-depth study of literature, Acklin (2013) revised DMAM and proposed a second version based on Zahra and George (Figure 1):
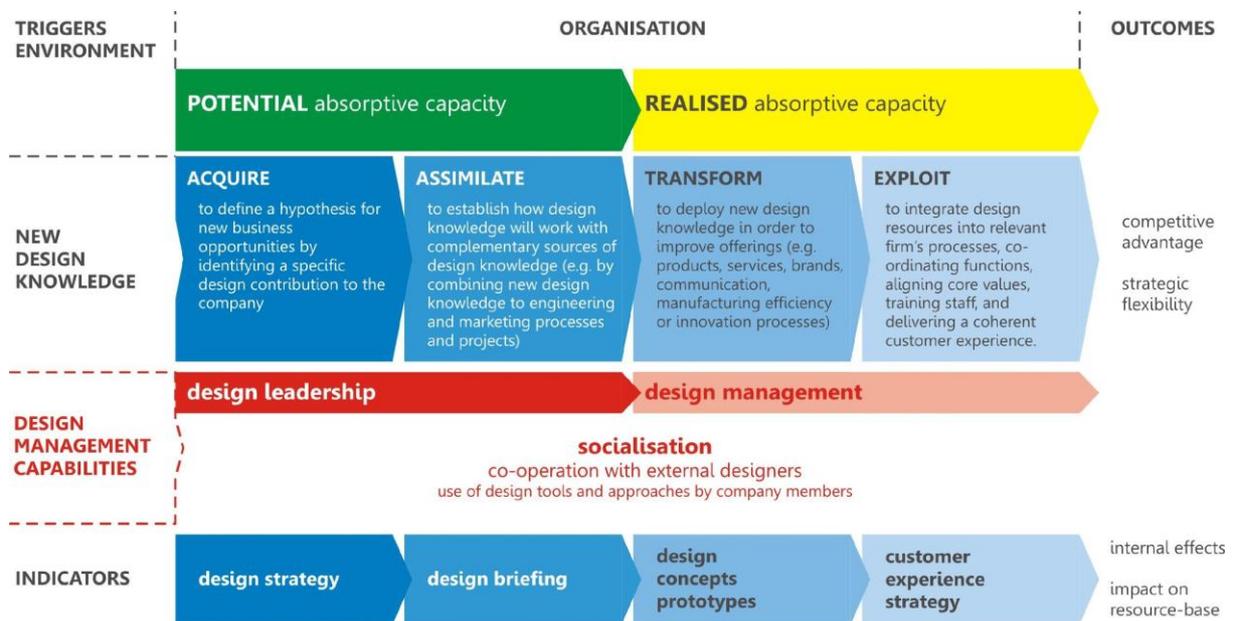
Figure 1. Revised Design Management Absorption Model (Acklin, 2013).

The framework of reference taken by Acklin (2013) adopts a design thinking approach to design management capabilities which promotes the use of design tools by companies' members "as a vehicle to introduce how designers work, to socialise design knowledge throughout the company" (Acklin, 2013, p. 157). She highlights the distinction between design management capabilities and design capabilities, emphasising that design management capabilities "are more readily absorbed" because they establish a relation to the prior company knowledge such as the way to use or manage resources (Acklin, 2013, p. 158).

4. Methods

The main methods used in the research were the literature review and the author's participant observation. The literature review includes topics which were selected considering the potential to contribute to the comprehension of empirical cases, and the gaps that surpass the lack of economic resources to promote the absorption of design management capabilities in MSMEs.

Participant observation was based on design policies' initiatives in different times, from 2006 to 2014 in Brazil (see Table 2). The author took part in projects of integration of design into MSMEs, working

with teams of designers and consultants from other fields (according to the type of intervention requested), being in charge of the (re)identification or adaptation of the enterprises' needs or demands, participating in the development of the 'micro' strategy to achieve the (innovative - when possible and needed) solution required in the real context of each company, while trying to preserve or strengthen the innovative content that could be addressed to and realized in each context (sometimes more innovative steps are not the main priority or need to attribute more value to the business at that moment and in the context of the company).

Table 2. Programs and their projects of integration of design into MSMEs considered.

	characteristics		proposal and goals	projects' architecture
Program 1	Number of MSMEs benefited	Cluster 1: 8 Cluster 2: 5 Cluster 3: 5	To develop products and brand identities for firms in three clusters in the Brazilian furniture industry.	The funds came from public funding through a government design office. There was not foreseen financial or economic compensation coming from benefited companies.
	Staff	18 designers 3 designers seniors		
	Time	2007-2008 8 months		
Program 2	Number of MSMEs benefited	Direct: 1 and indirect[1]	To integrate ergonomics into the design practices of a furniture company contributing to the development of an instrument of ergonomic assessment (to be deployed prior to the complete physical prototyping phase aiming at shrinking that), and specific ergonomic methods applied to and replicated in this industry through diverse design centres.	The funds are provided by a non-profit private entity which has specific funding addressed to innovation. The projects and their beneficiaries are selected through annual edict criteria. The beneficiary covers at least 10% of the costs in economic and financial terms.
	Staff	3 product designers 2 graphic designers 1 physiotherapist		
	Time	2010 2012 2 years		
Program 3	Number of MSMEs benefited	3	P1[2]: To fit products according to the compulsory national regulations	On-demand projects supported by non-profit private entities' initiatives and funds.
	Staff	P1: 2 designers P2: 1 designer P3: 3 designers	P2: to introduce practices of projects detailing to production	The company requests support to a specific design need identified within the firm.
	Time	2014 from 3 to 8 months	P3: to design a new product fitted to a market opportunity	The beneficiaries cover at least 20% of the

[1] MSMEs in the regional and national furniture industry, associations, universities, research centres, laboratories.

[2] P1 means project 1. P2 means project 2. P3 means project 3.

characteristics	proposal and goals	projects' architecture
	identified	costs in economic terms.

The MSMEs which were beneficiaries of these design policies programs are firms in the Brazilian furniture industry in Minas Gerais. The economic relevance of the Brazilian furniture industry is recognised through the value of its production and its potential to create jobs (Ministério do Desenvolvimento, Indústria e Comércio Exterior, 2015). The southeast region of Brazil is the first in number of employees and the second in number of firms, and Minas Gerais state is the third in both numbers in Brazil, presenting 45.002 employees and 2.539 companies formally registered (Departamento de Pesquisas e Estudos Econômicos, 2015).

The Brazilian industry has historically devoted more to the domestic market than to exports (OECD, 2014; Moraes Junior, 2002; Galinari, Teixeira Junior, & Morgado, 2013), and is considered low technology based presenting structural problems that affect trade development and design. The strategy of product-design is low priority, there is low design insertion, and competition is based on prices in low value added markets (Silveira da Rosa, Correa, Lemos, & Barroso, 2007, Galinari, et al, 2013). Most enterprises are MSMEs in the furniture sector in Brazil (Silveira da Rosa, et al, 2007; Galinari, et al, 2013).

5. Results

The indicators of design management capabilities absorption (Acklin, 2013) were used to analyse differences between businesses' prior knowledge or conditions and their attitudes or decisions to use (or not) creativity resources (Sternberg, 2006, 2012) observed within firms.

The customer experience strategy was not successfully explored in any program and was not considered in the design policy proposals. The reasons identified were: the potential and the value of design were not and are still not being acknowledged by diverse stakeholders. The idea of having a project almost 'for free' or completely 'for free', as well as the lack of trust in the competence of the non-profit entities, seem to lead some companies to the lack of commitment with projects' activities and goals. However, these factors are not enough to explain the different levels of firms' engagement with projects and the absorption or no absorption of design management capabilities by the firms throughout the projects.

In Program 1, the differences observed were that, on one hand, some firms did not pursue basic operational design capabilities (e.g. to be able to read the project specification, to properly use the available technologies within the firm, to build jigs) to contribute to making prototypes within the company. Other firms sent employees who did not seem to have enough power or leverage in the strategic decision-making within the company, as well as not enough knowledge of their businesses, to meetings, to take part in the process of defining the design strategy, brief and selecting concepts to be prototyped. This fact led to design strategy, brief, concept and prototype that did not correspond to the company's needs at that moment. Other issues were: to make resources such as time of skilled workers and appropriate machines (or processes) available to collaborate with prototyping activities within the firm, and the commitment of the firm to its tasks deadlines. Most firms made a 'last-minute' prototype close to the deadline; in this way they do not properly use the design experts' support to solve any doubt or to explore detailed solutions specific to their businesses. On the other hand, the few firms which engaged with the project development from the

beginning, showed commitment and meaningful cooperation through specific knowledge of their market, needs, processes, prototyping and skills in their industry.

In Program 2, the lack of (1) basic knowledge applied to productive process, (2) design experience, and (3) a prior defined business strategy by the company[3] contributed to not giving continuity to the ideas of the projects after implementation. The consultants had difficulty carrying out the tasks which required firm participation. The company needed more support than usual to do activities that were supposed to be done by its members. Moreover, the last-minute attitude related to the company's tasks was observed. All in all, this project was more valuable for indirect beneficiaries such as other businesses, universities, associations and laboratories which had access to the material produced and their findings related to applied ergonomics.

In Program 3, each individual business does a design demand based on a need recognised within the company. The demands considered in this study did not involve intense creative effort by design, being them related to (P1) technical adequacy to fit into national regulations, (P2) design projects integration into productive process, and (P3) the design of a furniture piece to serve a defined and established market niche taking the opportunity of a national event into account. These demands were pushed by the external environment (e.g. to fit into national compulsory regulations, to satisfy an event demand) or by basic design knowledge needs (e.g. technical detailing and patterns to production) more than by a unique vision, innovative behaviour or risk taking attitude at the business side. However, these demands represent changes for these businesses in that context and their attitude was more positive considering their engagement with and commitment to projects. P2 contributes to building up other design management capabilities, if the top management *decides* to do it. In the case of P3, the lack of basic design knowledge (e.g. reading design project specifications, building jigs to guide prototyping) was a barrier.

The main differences among firms' conditions and attitudes towards the use (or not) of the creativity resources that leverage the design management capabilities absorption observed in these projects can be summed up as follows (see Figure 2):

based on analysis of the indicators proposed by Acklin (2013): design strategy and briefing, concepts and prototypes

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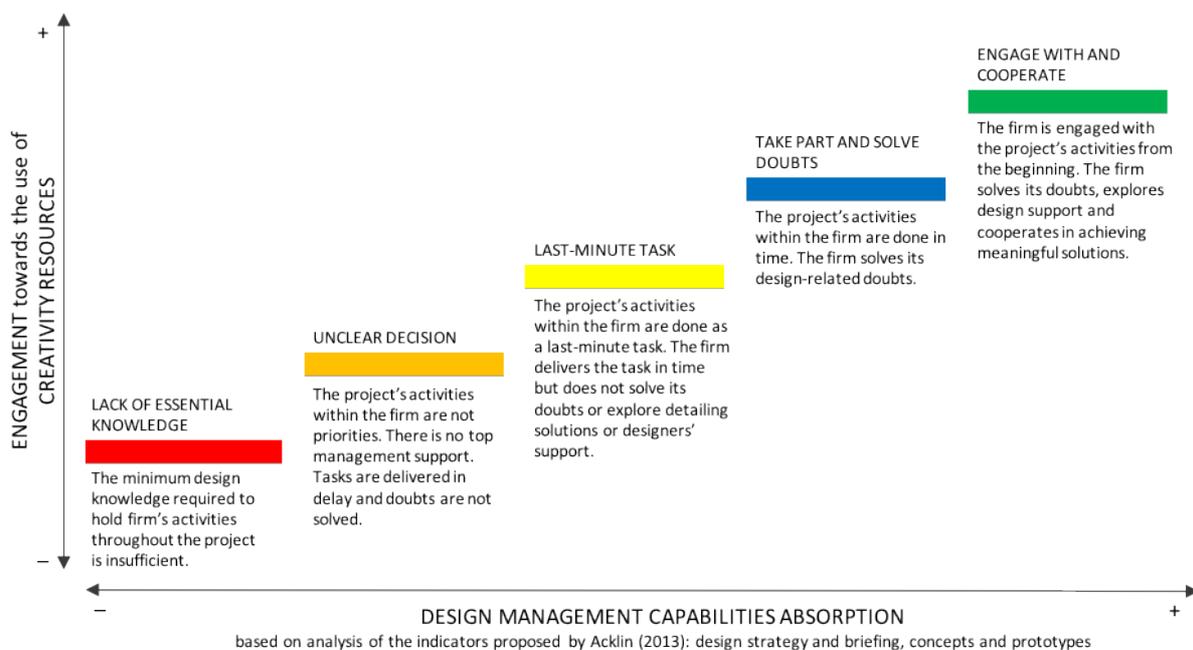
[3] (e.g. the company served a business-to-business market and produced whatever was requested by its customers from building frames to chairs, and pursued a cost-driven approach)

Figure 2. Map of perceived business conditions and attitudes towards the use (or not) of the creativity resources (based on the framework proposed by Sternberg, 2006, 2012) by engagement and their impact on design management capabilities absorption intensity (based on the analysis of Acklin's indicators [2013]) throughout projects of integration of design into MSMEs.

6. Discussion and conclusion

MSMEs' top management can express the willingness to integrate design management capabilities into their businesses. However, sometimes they do not evidence this willingness through attitudes derived from decisions to deploy creativity resources throughout projects' implementation. Some firms seem to join design policy projects 'following the crowd' more than considering purposes related to their organisational culture, business strategy and attitude. Others really lack the basic knowledge or conditions to move on and absorb design management capabilities.

The lack of essential creativity resources, such as the prior knowledge needed, was convergent with Sternberg's point of view when looking at the design management capabilities absorption throughout the projects studied. Some companies lack basic knowledge of their own businesses in diverse dimensions (e.g. productive process, technologies, materials, norms, market, strategy) and of design (e.g. ability to read a project specification, to do a jig, to consider users' needs), which blocks design activities and creative ideas to move on within the firm. In this case, other actions should be considered before in order to 'prepare the field to flourish' creative ideas by design when the firm's top management *decides* to deploy creativity resources.

Hence, from the policy makers side, more than the 'willingness' of companies should be considered to select beneficiaries, especially for design innovation purposes and for the absorption of design management capabilities. For example, the attitude of the business during prior projects and the history of innovative efforts held by firms can indicate their real conditions to integrate design into their business.

Besides the lack of prior knowledge or conditions, the way company's members cooperate and engage with designers makes a difference in the projects' outcomes. The company's members do not have to master the use of design tools, and including the use of these tools in the day-to-day activities is hard in small businesses' environments where one person plays diverse roles in the company. However, they should cooperate in a manner that enhances the potential of the use of design by engagement, what means cooperating and engaging with designers in order to generate meaningful outcomes through the knowledge they already master and designers do not.

Designers are usually included from the implementation phase of the project when the budget and main possible directions have already been decided. Designers' skills, ways of thinking and knowing are useful to shape change, to define problems and opportunities, to envision value creation and innovative steps in a situational, contextual, mode (see Braga, 2016). Therefore, Designers can play an important role in earlier stages of the project. They can contribute to designing the policy.

These projects involve issues inherent to the design activity, such as the diversity of designers and their experiences, know-how, tacit knowledge, creativity and reputation in the design field. On the designers' side, there are also different conditions and attitudes regarding experience, know-how, motivation, commitment and so on.

The selection of designers relies mainly on qualitative aspects such as references from other businesses, individual creativity, talent, and the experience of the designer (D'Ippolito 2014; Gemser & Leenders 2001). The bureaucratic process to contract designers or consultants and the lack of design management skills to properly source professionals and to select beneficiaries are constraints

for non-profit entities in Brazil that carry out design policies. These qualitative criteria are not properly addressed in the bureaucratic contract rules that must be followed according to the Brazilian ministry. The main criterion established is price-oriented.

7. Limitations

This paper looks at the differences related to the use of creativity resources throughout three programs of integration of design into MSMEs. The approach is qualitative and the results and the findings are dependent on these contexts and on the author's participant observation and interpretation. Other limitations observed are:

- The lack of policy makers and beneficiaries' perspectives;
- The designers and policy makers' attitudes towards creativity were not inquired in-depth;
- The external environment (e.g. design innovation ecosystem, societal and cultural context, macroeconomic factors) and its leverage on the firms' attitudes, were not analysed;
- The difficulty in analysing attitudes distinguishing each creativity resource because they compose together the attitude of the individual;
- The evaluation of the real impact regarding design management capabilities absorption or no absorption after the end of projects.

References

Acklin, C. (2013). Design Management Absorption Model – A framework to describe and measure the absorption process of design knowledge by SMEs with little or no prior design experience. *Creativity and Innovation management*, 22(2), 147-160.

Acklin, C. (2011). Design Management Absorption Model – A Framework to Describe the Absorption Process of Design Knowledge by SMEs with Little or No Prior Design Experience. In J. Moultrie, B. Dusch, J. Johnson, K. Keränen, K. Miller (Eds.), *Proceedings of the 1st Cambridge Academic Design Management Conference*, (pp. 1-14). Cambridge: University of Cambridge.

Amabile, T. M., Conti, R., Coon, H., Lazenby, J., Herron, M. (1996). Assessing the Work Environment for Creativity. *The Academy of Management Journal*, 39(5), 1154-1184.

Arquilla, V., Maffei, S., Mortati, M., Villari, B. (2015). Assessing European Design Policy: Towards an Evaluation Culture. In L. Collina, L. Galluzzo, A. Meroni (Eds.), *Proceedings of the Culumus Conference: The Virtuous Circle* (pp. 915-926). Milan: McGraw-Hill Education Italy. Retrieved May 30, 2016, from http://cumulusmilan2015.org/proceedings/articles/abs-068-Assessing/

Bell, S. (2015). *Small and Medium Enterprises (SMEs) Finance*. Retrieved November 21, 2016, from http://www.worldbank.org/en/topic/financialsector/brief/smes-finance

Borja de Mozota, B. (2006). The Four Powers of Design: A Value Model in Design Management. *Design Management Review, 17*, 43-53.

Braga, M. F. (2016). The value of design: an issue of vision, creativity and interpretation. in: P. Lloyd & E. Bohemia, eds., *Proceedings of DRS2016: Design + Research + Society - Future-Focused Thinking*, Volume 5, pp 1865-1881. DOI 10.21606/drs.2016.129

Bruce, M.; Cooper, R.; Vazquez, D. (1999). Effective design management for small businesses. *Design Studies* 20, 297–315.

Cawood, G. (1997). Design Innovation and Culture in SMEs. *Design Management Journal*, 8(4), 66-70.

Chiva, R., Alegre, J. (2009). Investment in Design and Firm Performance: The Mediating Role of Design Management. *The Journal of Product Innovation Management*, 26, 424-440.

Cox, G. (2005). *Cox Review of Creativity in Business: building on the UK's strengths*. Retrieved June 3, 2016, from http://webarchive.nationalarchives.gov.uk/

Danish Design Centre. (2003). *The Economic Effects of Design*. Copenhagen: National Agency for Enterprise and Housing. Retrieved September 17, 2015, from http://www.seeplatform.eu/images/the_economic_effects_of_designn.pdf

Departamento de Pesquisas e Estudos Econômicos (2015). *Indústria de Móveis* [Furniture Industry]. Bradesco. Retrieved September 15, 2015, from http://www.economiaemdia.com.br/EconomiaEmDia/pdf/infset_industria_de_moveis.pdf

D'Ippolito, B. (2014). The importance of design for firms' competitiveness: A review of the literature. *Technovation*, 34, 716-730. doi: 10.1016/j.technovation.2014.01.007

ECLAC (2015). *The European Union and Latin American and the Caribbean in the new economic and social context*. Retrieved June 16, 2015, from http://repositorio.cepal.org/bitstream/handle/11362/38230/S1500330_en.pdf?sequence=1.

European Commission (2015). *AL-INVEST 5.0: Inclusive Growth for Social Cohesion in Latin America – Guidelines for grant applicants*. Retrieved June 7, 2015, from https://webgate.ec.europa.eu/europeaid/online-services/index.cfm?ADSSChck=1435233844256&do=publi.detPUB&searchtype=AS&orderbyad=Desc&Pgm=7573839&nbPubliList=15&zgeo=35380&page=1&debpub=&aoref=150066&orderby=upd&userlanguage=en.

Galinari, R., Teixeira Junior, J. R., & Morgado, R. R. (2013). A competitividade da indústria de móveis do Brasil: situação atual e perspectivas [The competitiveness of the Brazilian furniture industry: current situation and perspectives]. *BNDES Setorial*, 37, 227-272. Retrieved August 4, 2015, from http://www.bndes.gov.br/SiteBNDES/export/sites/default/bndes_pt/Galerias/Arquivos/conhecimento/bnset/set3706.pdf

Gemser, G., Leenders, M. A. A. M. (2001). How integrating industrial design in the product development process: impacts on company performance. *The Journal of Product Innovation Management*, 18, 28-38.

Heskett, J. (2009). Creating Economic Value by Design. *International Journal of Design, 3*(1), 71-84.

Massa, S.; Testa, S. (2008). Innovation and SMEs: Misaligned perspectives and goals among entrepreneurs, academics, and policy makers. *Technovation*, 28, 393–407. doi: 10.1016/j.technovation.2008.01.002

Micheli, P. (2014). *Leading Business by Design. Why and how business leaders invest in design*. Design Council and Warwick Business School. Retrieved June 3, 2016, from http://www.designcouncil.org.uk/sites/default/files/asset/document/dc_lbbd_report_08.11.13_FA_LORES.pdf

Ministério do Desenvolvimento, Indústria e Comércio Exterior (2015). *Cadeia Produtiva de Madeira e Móveis* [Wood and furniture productive chain]. Retrieved September 15, 2015, from http://www.mdic.gov.br/sitio/interna/interna.php?area=2&menu=317

Moraes Junior, D. (2002). *Il rapporto locale-globale: nuova sfida ed opportunità progettuale. Il Brasile come caso locale* [The local-global relationship: the new challenge and design opportunities. Brazil as the local case]. Tesi di dottorato, Politecnico di Milano, Disegno Industriale e Comunicazione Multimediale.

Mortati, M., Villari, B., Maffei, S. (2014). Design capabilities for value creation. In E. Bohemia, A. Rieple, J. Liedtka, & R. Cooper, *Proceedings of the DMI Academic Conference* (pp. 2490-2510). London: Design Management Institute.

OECD. (2014). *Latin American Economic Outlook 2015: Education, Skills and Innovation for Development*. OECD Publishing. doi:10.1787/leo-2015-en.

Roy, R., Riedel, J. (1997). Design and innovation in successful product competition. *Technovation*, 17(10), 537-548. doi: 10.1016/S0166-4972(97)00050-3.

Schneider, J., Gibet, S., Colomb, A., Orazem, V., Loesch, SL., Kasparyan, C., Salminen, J. (2015). *Supporting design driven innovation: a review of selected programmes. Regions supporting Entrepreneurs and Designers to Innovate (REDI)*. Retrieved May 24, 2016, from http://www.apci.asso.fr/magazine/categorie/activites/rapport-redi-soutenir-l-innovation-par-le-design-analyse-de-quelques-programmes

Silveira da Rosa, S. E., Correa, A. R., Lemos, M. L. F., & Barroso, D. V. (2007). O setor de móveis na atualidade: uma análise preliminar [The furniture industry today: a preliminary analysis]. *BNDES Setorial*, 25, 65-106. Retrieved September 15, 2015, from http://www.bndes.gov.br/SiteBNDES/export/sites/default/bndes_pt/Galerias/Arquivos/conhecimento/bnset/set2503.pdf

Sternberg, R. J. (2012). *The Assessment of Creativity: An Investment-Based Approach*. Creativity Research Journal, 24(1), 3–12. DOI: 10.1080/10400419.2012.652925

Sternberg, R. J. (2006). The Nature of Creativity. *Creativity Research Journal*, 18(1), 87-98. DOI: 10.1207/s15326934crj1801_10

Thomson, M.; Koskinen, T. (Eds.) (2012). *Design for growth and prosperity*. Report and Recommendations of the European Design Leadership Board. Retrieved May 3, 2016, from www.icsid.org

Walsh, V. (1996). Design, innovation and the boundaries of the firm. *Research Policy*, 25, 509-529.

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CEASING COPYCAT BEHAVIOUR: DEVELOPING PRODUCT-DESIGN IDENTITY THROUGH INDUSTRY AND HANDCRAFT INTERACTION

ROMPENDO COM O COMPORTAMENTO DA CÓPIA: O DESENVOLVIMENTO DA IDENTIDADE DE PRODUTOS POR MEIO DA INTERAÇÃO ENTRE INDÚSTRIA E ARTESANATO

ARTIGO

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ABSTRACT: The Brazilian industrial history and design education have not contributed to the construction of a design culture and to the preservation of cultural heritage, despite the richness and variety of its culture and renowned production of Brazilian designers. The urgency of transforming this scenario – characterized by a culture of copying – into innovative contexts has been reported in several publications. This study sheds light on the issue of copycat behaviour changes in Brazilian furniture industry through two practice-based cases analysis. These cases show the interaction between industry and craftwork towards design culture conception and cultural heritage preservation. Participant observation was the main method used to collect data in the first case (Pedra de Minas). The second case (Corn armchair) was based on a semi-structured interview addressed to the company's owner, as well as observation and analysis of archival sources such as brochures, materials used in exhibitions, and the company's website. Interdisciplinary literature review supported the understanding of the empirical cases and context regarding copycat behaviour. This research was focused on: drivers and barriers to integrating design innovation into small and medium-sized enterprises (SMEs); copycat behaviour (under-researched issue in the design field); product identity; industrial and handcraft systems and their relationship to design. The purposes of this paper are to contribute to the analysis of practice-based cases in an emerging economy, to inquiry relations between crafts, industry and design, proposing possibilities of bidirectional projects as potential sources to create value in companies and communities, to start understanding copycat behaviour related to product-design in the Brazilian furniture industry and its changes towards design innovation, to better understand the feasibility and importance of prototyping as well as their boundaries for design development in this context. The discussion and conclusion point out drivers and barriers found at the company's level and at the macro level, emphasizing the need to develop effective design policies and appropriate infrastructure in order to support design culture conception and cultural heritage preservation.

KEYWORDS: Copycat Behaviour; Design; Brazilian Furniture Industry; Crafts; SMEs.

RESUMO: A história do desenvolvimento industrial brasileiro e a educação em design não contribuíram para a construção de uma cultura de design e para a preservação da herança cultural, apesar da riqueza e variedade da cultura brasileira, e da reconhecida produção dos designers brasileiros. A urgência em transformar esse cenário caracterizado por uma cultura da cópia em direção a contextos inovadores tem sido relatada em diversas publicações. Este estudo visa contribuir para o entendimento da mudança do comportamento de cópia na indústria moveleira do Brasil partindo da análise de dois casos práticos. Os casos mostram a interação entre indústria e artesanato rumo à construção de uma cultura de design e à preservação do patrimônio cultural regional. O primeiro caso (Pedra de Minas) usa observação participante como principal método, o segundo (poltrona Corn) usa entrevista semiestruturada direcionada ao proprietário da empresa, observação e análise de materiais de divulgação e website da empresa. Revisão de literatura interdisciplinar foi utilizada para auxiliar o entendimento dos casos empíricos e dos contextos de cópia no qual estão imersos, abordaram-se os seguintes tópicos: desencadeadores e barreiras para a integração do design nas Pequenas e Médias Empresas (PME); o comportamento da cópia (tópico pouco conhecido na área de pesquisa em design); identidade do produto; sistemas de produção industrial e artesanal e suas relações com o design. Os objetivos deste artigo são: contribuir para a análise de casos práticos em uma economia emergente, investigar as relações entre

artesanato, indústria e design propondo possibilidades de projetos bidirecionais como potencial fonte de criação de valor na empresa e comunidade locais, começar a compreender o comportamento de cópia relacionado ao design de produto na indústria de móveis brasileira assim como sua mudança rumo a inovação orientada pelo design, entender melhor a importância da viabilidade para a manufatura e da prototipagem assim como suas fronteiras neste contexto. A discussão e a conclusão apontam os impulsionadores e as barreiras encontradas nos níveis micro (da empresa) e macro (do ambiente externo), enfatizando a necessidade de desenvolver políticas de design efetivas e infraestrutura adequada para apoiar a construção de uma cultura de design e a preservação do patrimônio cultural.

INTRODUCTION

This paper was motivated by several questions that have not been fully answered in Brazil. It was inspired by two empirical cases that show the interaction of industrial and handcraft processes as source of identity and value. Despite the economic growth, industrial and cultural potential, Brazilian companies have not demonstrated the capacity to consolidate a design culture as a source of competitive advantage or as a strategic resource in mature industries, such as the furniture one. Even design as a form-giving[1] process has faced obstacles related to the lack of structure (ROSA et al., 2007).

The five main goals of this study are:

1) To contribute to the analysis of empirical design cases in emerging economies.[2] The lack of practice-based cases in the design field is acknowledged and design has been considered a trial and error practice based on experimentation (BROWN, 2009) that does not assure, by itself, product success in the market, even though the field of exploration has broadened.[3]

2) To inquiry the interaction among handcraft, industry and design, exploring possibilities of bidirectional projects strategies that have already emerged in the Brazilian practice. It is not the intention to discuss preferences or aesthetics outputs but to provide strategies to work on product identity connected to local resources (people, their cultural heritage techniques and skills, and available materials in the territory) suggesting potential sources to create local value in a context in which enterprises have faced difficulties in doing so.

3) To start understanding the copycat behaviour in the Brazilian furniture industry and its possible reasons.

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[1] This is the second step in the Design Ladder tool developed by the Danish Design Centre (2001). The Design Ladder proposes four levels of design integration in the firm that are categorized from step 1 (non-design) to step 4 (design as strategy).

[2] Developing x Emerging Brazil is included in two major group definitions: developing country or economy and emerging market. "The term developing used to denote low- and middle-income countries does not imply that all economies in the group are experiencing similar levels of development or that other economies have reached a preferred or final stage of development" (WORLD BANK, 2015). Emerging market, country or economy have been related to countries which have reached a rapid economic growth and integration into world markets (OECD, 2009) but these countries are still considered very risky for several reasons (EMERGING MARKETS, 2003) including inequality (OECD, 2011). We note that the terms are also used overlapped (see INTERNATIONAL MONETARY FUND, 2008, 2012). The emerging countries (markets or economies) are developing ones (e. g. Brazil and China are considered upper-middle income economies). It is possible to identify different groups of emerging economies depending on the source, aim of information or analysed subject (e. g. MORGAN STANLEY INVESTMENT FUNDS, 2015; TSOUNTA, 2014).

[3] Product-service systems, strategic design, service design, design for policies, and social innovation are examples of fields that have widened the design perspective beyond the product-design issues or design as an outcome bounded by the material culture aspects. In this sense, design becomes an instrument of change, not just proposing solutions to problems but envisioning new opportunities, considering people's behaviour, quality of life and the need for change in diverse dimensions (economic, political, social, cultural, environmental).

4) To provide insights about the change of direction from the copycat behaviour to a design culture supported by the empirical case, which shows how a small enterprise settled in a furniture cluster (characterized by this copycat culture) has started developing its design, linking its manufacture to the local handcraft system, while creating an armchair together with the local community. This case aims at clarifying the change in copycat culture towards a design culture.

5) To understand the importance of implementation and feasibility as well as the boundaries to introduce new projects into manufacture. The Pedra de Minas case inquiries this issue.

METHODOLOGY

This research approach is inductive, qualitative and exploratory. Two empirical cases were analysed. They demonstrate that cooperation between different stakeholders in local productive systems can be a source of product identity in a copy culture context. The Pedra de Minas case explores the idea of productive systems integration through design, waste from soapstone crafts was used as a source of regional identity. In addition, the Corn armchair case shows the enterprise's attitude towards design despite its unfavourable surrounding context.

Considering design as a phenomenon that is still not fully grasped within companies (D'IPPOLITO, 2014; TRUEMAN; JOBBER, 1998; WALSH, 1996), case study was the research strategy adopted. According to Yin (1994), this strategy is recommended when we study a contemporary phenomenon in a real context where the boundaries between context and phenomenon are not clearly defined.

Stake (2000) characterizes the case as a complex entity and a bounded system composed of diverse dimensions (e. g. cultural, psychological, physiological, economic). The criterion to select the cases considers Stake's observation (2000, p. 446): "Potential for learning is a different and sometimes superior criterion to representativeness".

These cases were built using multiple-method approach. The Pedra de Minas case was based on participant observation during the Industrial Design graduation project of this paper's author. The main methods used in the Corn armchair case were observation, semi-structured interview addressed to the owner of the company, informal conversations with the entrepreneur and archival sources (projects, exhibitions memories, company's brochures and website).

Literature review was used to support the analysis of these cases, based on topics that emerged from their practices and contexts and were not grasped just through the empirical evidence found. Hence, it was identified the need to introduce the Brazilian context through diverse sources that have described and explained the Brazilian conditions related to design (BORGES, 2011; ECONOMIC COMMISSION FOR LATIN AMERICA AND THE CARIBBEAN, 2015; MORAES, 2006; MORAES JUNIOR, 2002; ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, 2013; ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, 2014; ROSA et al., 2007). Furthermore, the literature review was interdisciplinary considering the under-researched copycat behaviour issue in the design field. The themes approached are: drivers and barriers to integrating design into micro, small and medium-sized enterprises (MSMEs) at the organizational level; copycat behaviour; product identity and features of industrial and craftwork processes. The third part describes empirical cases based on the interaction between handcraft and industry as source of product-identity. Afterwards, discussion and conclusion shed light on the paper's goals, and limitations and future research were pointed out.

Brazilian Context

After a ten-year economic growth, Brazil has been experiencing an economic slowdown since 2010. Productivity growth in Brazil is associated with low value added sectors such as agriculture and mining, whereas manufacturing and services correspond to 20% of the Brazilian productivity growth, concentrating over 80% of value added and employment (ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, 2013). The potential of manufacturing and services to contribute to the productivity growth is underexplored despite the value added and employment rates related to these sectors.

The furniture industry is among the most important manufacturing businesses in Brazil, not only because of the importance of its production value but also for its potential to generate jobs (BRASIL, 2015). Minas Gerais is the third state in number of companies and the fourth in number of employees in Brazil, presenting 3.093 companies and 34.104 employees in 2015 (BRADESCO, 2017). The opportunity to innovate through design is identified in the furniture industry, which is not technology-intensive (GALINARI; TEIXEIRA JUNIOR; MORGADO, 2013; GEMSER; LEENDERS, 2001).

Although Brazilian culture can be considered rich and authentic, with a variety of craftwork, the reproduction of the same designs manufactured by many producers instead of developing a new product design is usual in Brazil. This context leads to cost-oriented markets. This means that products generally compete on price, and cost reduction is the main strategy applied to changes in goods. Hence, the copycat behaviour opposed to a design culture nurture is found. One of the results is the drop in the products quality and the dependence on specific retail customers. Moreover, even negative features are copied, such as ergonomic problems that are not recognized by manufacturers. Enterprises become vulnerable to retail's requirements instead of focusing on users and innovation.

Moraes (2006) identifies a European influence through the rational-functionalist thinking from Bauhaus and Ulm in the Brazilian Design education. The difficulty in finding its self-identity throughout the integration of cultural icons into the national design is also unleashed by the late and forced industrialization introduced in the 1960s during the dictatorship when multinational enterprises, mainly from United States, Europe and Japan, arrived in Brazil (MORAES JUNIOR, 2002). This process is known as modern colonialism and impacted the Brazilian society, culture and habits. The lack of evolution from this context leads the Brazilian design to an inferiority feeling (MORAES JUNIOR, 2002).

Borges (2011) points out the rupture of Brazil with its cultural roots. She explores the relationship between design and handcraft in Brazil as a means to recover missed roots and provide product identity related to the local culture and craftsmen, highlighting the importance of Lina Bo Bardi for Brazilian craftwork preservation and acknowledgement. In this context, design has a role in reinterpreting the cultural heritage skills and techniques supporting the development of products that fits the current users' needs and trends.

The Brazilian industry has historically devoted more to the domestic market than to exports (BRADESCO, 2017; GALINARI; TEIXEIRA JUNIOR; MORGADO, 2013; MORAES JUNIOR, 2002; ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, 2014). Despite some designers have demonstrated capacity to convey the Brazilian culture through meaningful design (MORAES, 2006), the Brazilian furniture industry is considered low technology based presenting structural problems that affect design and trade development. Most companies focus efforts on technological improvements to enhance their industrial park and manufacturing

processes, and the development of product-design strategy is a low priority (ROSA et al., 2007, p. 97). The Brazilian Development Bank (Banco Nacional de Desenvolvimento Econômico e Social – BNDES) sectorial report (ROSA et al., 2007) identifies design as a key factor for competition and recognizes design problems in the furniture industry. The Brazilian furniture business is not design-oriented and competition is based on prices in low value added markets (GALINARI; TEIXEIRA JUNIOR; MORGADO, 2013). Most furniture firms are SMEs (Small and Medium-sized Enterprises) in Brazil (GALINARI; TEIXEIRA JUNIOR; MORGADO, 2013; ROSA et al., 2007).

Drivers and barriers to introducing design innovation into SMEs

> the introduction of design culture within companies normally meets many obstacles – primarily the established culture and the natural resistance to change of organizations in which design culture seems to fight a daily war by being indissolubly bound to innovation (DESERTI; RIZZO, 2014, p. 36).

Design has been considered a strategic resource for companies (BORJA DE MOZOTA, 2006; BRUCE; BESSANT, 2002; DELL'ERA; VERGANTI, 2007), and providing people what they want as well as value 'on time' and 'on budget' are guidelines to increasing the chances of designing well (BESSANT, 2002). Design has been related to the companies' benefits and considered a way to achieve innovation in organizations (BROWN, 2009; DESIGN COUNCIL, 2007; GEMSER; LEENDERS; 2001; MAEDA, 2015). Diverse models have been developed to categorize design evolution within enterprises such as the Design Management Staircase model (KOOTSTRA, 2009) and the Design Ladder (DANISH DESIGN CENTRE, 2001). However, what leads the company to change from non-design towards a design-oriented approach is still under-researched (few studies focus on this, e.g. DOHERTY et al., 2014). Furthermore, some companies are born design-oriented, which can be one of the reasons for this.

The four powers of design found in small and medium European design-oriented firms are defined by Borja de Mozota (2006) as: design as differentiator (as source of competitive advantage); design as integrator (as a resource that enhances new product development and favours modular and platform architecture of product lines); design as transformer (as a resource that creates new business activities and develops the company's ability to cope with change); and design as good business (as a resource that increases financial and economic values, and as a resource for society through inclusive and sustainable design). This model explores the role of design in different firm's levels and activities.

Companies exploit the use of design according to their vision of how design affects the enterprise and other stakeholders. Borja de Mozota (2006) defines design visions as design as styling, design as process and design as strategy. The firm's design vision matched with its management vision leads to the design management idea adopted by the enterprise. Different visions define different perspectives for creating value by design in each area of the enterprise and outside the company (other stakeholders).

Drivers and barriers to integrating design into SMEs at the organizational level (see table 1) have been investigated in the following fields: organizational culture and design, design management, product innovation, and design and innovation policies. In the case of small businesses, design strategy lies mainly on the experience and skills of the owner who tends to be in charge of management and strategies (BRUCE; COOPER; VAZQUEZ, 1999, p. 300).

Table 1: Drivers and barriers to integrating design into SMEs at the organizational level

	Drivers	Barriers
Structure	Scarce bureaucracy (MINTZBERG, 1992; SIVADES; DWYER, 2000 apud MASSA; TESTA, 2008)	Limited resources (ACKLIN, 2013; LARSEN; LEWIS, 2007)
	Great operational expertise (DAHL; MOREAU, 2002 apud MASSA; TESTA, 2008)	Limited in-house capabilities for conducting innovation processes (ACKLIN, 2013; BRUCE; COOPER; VAZQUEZ, 1999; FILSON; LEWIS, 2000; HAUSMAN, 2005 apud MASSA; TESTA, 2008)
	Flexible organizational structures (faster response to changes) (CAWOOD, 1997; MINTZBERG, 1992)	Underdeveloped education and training (LARSEN; LEWIS, 2007; ROMANO, 1990 apud MASSA; TESTA)
		Lack of management skills (ALTENBURG; MEYER-STAMER, 1999; LARSEN; LEWIS, 2007)
		Lack of manufacturing skills (LARSEN; LEWIS, 2007)
Culture	Customer/users oriented (LARSEN; LEWIS, 2007; MASSA; TESTA, 2008)	Use design support to address immediate needs during a crisis (CAWOOD, 1997)
	Motivating environment/external motivation (POIRIER; SCHWARTZ; EDDY; BERMAN; CHACOUR; WYNNE; CAVANAUGH; MARTIN; BYRNE; SANBERG, 2017; STERNBERG, 2006, 2012)	Cost-driven approach (MILLWARD; LEWIS, 2005)
	Commitment of senior management (CAWOOD, 1997; SCHNEIDER; GIBET; COLOMB; ORAZEM; LOESCH; KASPARYAN; SALMINEN, 2015)	Lack of top management support (CAWOOD, 1997; FILSON; LEWIS, 2000; LARSEN; LEWIS, 2007; SCHNEIDER et al., 2015)
	Multi-disciplinary people are close to each other (POIRIER et al., 2017)	Lack of long-term strategic vision (CAWOOD, 1997; FILSON; LEWIS, 2000)
	Collaboration among individuals from different backgrounds (POIRIER et al., 2017; LARSEN; LEWIS, 2007)	Too many pressures on business (COX, 2005; FILSON; LEWIS, 2000; LARSEN; LEWIS, 2007)
	Great ability to use external networks (NOOTEBOOM, 1994; ROTHWELL; DODGSON, 1994 apud MASSA, TESTA, 2008)	Weak external contacts (SRINIVASAN et al., 2002 apud MASSA; TESTA, 2008)
	Great ability to create alliances (VAN DIJK et al., 1997 apud MASSA; TESTA, 2008)	Influence of a dominant owner/manager (BRUCE et al., 1999; MILLWARD; LEWIS, 2005)
	Face-to-face communication (MINTZBERG, 1992)	Lack of trust to build up partnerships (LARSEN; LEWIS, 2007)
	Clannish structures (SIVADES; DWYER, 2000 apud MASSA; TESTA, 2008)	
Product-design process	Clear product development/design strategy (FILSON; LEWIS, 2000)	No clear new product development/design strategy (FILSON; LEWIS, 2000)
	Competitors and suppliers updated knowledge (LARSEN; LEWIS, 2007)	Lack of competitors and suppliers' knowledge (LARSEN; LEWIS, 2007)
	International market-focused orientation with effective internal and external communication (LARSEN; LEWIS, 2007)	Domestic market orientation (LARSEN; LEWIS, 2007)
	Plan and resource market launch using stage gates process (LARSEN; LEWIS, 2007)	Lack of market launch plan and resource with stage gates (LARSEN; LEWIS, 2007)
	Early superior/differentiated product definition (LARSEN; LEWIS, 2007)	Lack of early superior/differentiated product definition (LARSEN; LEWIS, 2007)
		Lack of customers/users' orientation (LARSEN; LEWIS, 2007)

Source: Research data

The lack of reported practice and literature that refer to design in the Brazilian (and emerging economies) enterprises is recognized despite the well-developed theory about design for the market (MARGOLIN; MARGOLIN, 2002).

Globalization has contributed to empowering emerging economies for global competition and collaboration (FRIEDMAN, 2005). On the other hand, design culture relies on "the necessity of rooting design deeply within the

enterprise, which takes both a long time and the ability to adapt it to the specificity of the situation" (DESERTI; RIZZO, 2014, p. 56). The need to take in the local context qualities, in other words, to understand the territory and the way in which products are conceived and manufactured to grasp the relationships created involving production and consumption of products is emphasized by Krucken (2009, p. 17).

Design has its foundations mainly in Europe and the USA where approaches have been developed and used ranging from the process to the strategic level. Although design is considered a universal phenomenon,[4] there are meaningful differences in the conditions for design development at the company level as well as at the macro level (education, policies and economy) in Latin America compared to the USA and Europe. These differences are related to the historical background, technological approach and development, macroeconomic policy, social inequality, lack of education and skills, and so on (ALTENBURG; MEYER-STAMER, 1999; ECONOMIC COMMISSION FOR LATIN AMERICA AND THE CARIBBEAN, 2015; ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, 2014). Enterprises in Latin America are born for diverse reasons too, especially SMEs (ALTENBURG; MEYER-STAMER, 1999).

The process of design at work in the company is not "an easy journey"; there are procedural difficulties and there is no guarantee of success (BESSANT, 2000). Design contributes to building the enterprise's vision and allows people to visualize it (ZURLO, 1999, p. 35). The contribution of design to organizations can range from product engineering aspects to strategic importance, shaping the company's vision.

WHY ARE SOME ENTERPRISES IMITATING (OTHERS)?

> " when imitation is easy, markets don't work well"
> TEECE, 1986, p. 285

Competition amongst firms is first focused on designs which are quite different from each other, and when a dominant design emerges it shifts to price (TEECE, 1986, p. 288). Despite the responsibility of the innovator for fundamental breakthroughs and design, when imitation is easy, imitators compete and can profit from others' innovations (TEECE, 1986, p. 288).

Literature on imitation, copy and plagiarism is scarce (SATOMURA; WEDEL; PIETERS, 2014). The followers' behaviour has been studied in fields such as marketing, economics, business, management, law, sociology and psychology. There is a lack of literature in the product-design field related to the copycat behaviour in companies. This issue leads to asking why enterprises are copying design products from other companies despite the design advantages reported in the last decades (e.g. DANISH DESIGN CENTRE, 2003; DESIGN COUNCIL, 2007, 2015; GEMSER; LEENDERS, 2001; RAE, 2013; 2014; ROY; RIEDEL, 1997). In order to contribute to this discussion, diverse perspectives ranging from the social and psychological (LITTLE et al., 2011; VAN HOREN; PIETERS, 2013; YANG et al., 2014) to the marketing, business (TEECE, 1986), design management (BORJA DE MOZOTA, 2006; DELL'ERA; VERGANTI, 2007; DESERTI; RIZZO, 2014; GEMSER; LEENDERS, 2001; HESKETT, 2009; ROY; RIEDEL, 1997) were considered in this paper. In addition, Altenburg and Meyer-Stamer (1999) contextualized the differences in the copy culture in Latin America. This behaviour cannot be grasped by looking at only one dimension or field.

The idea of copycat behaviour is linked to social learning that is first related to the non-humans behaviour. When a "model" female chooses a "target" male from two males being observed by other females, the latter are more likely to prefer the target male chosen by the model after watching the "model" female's decision (LITTLE et al., 2011). This behaviour has

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[4]   Bonsiepe claims that design should be considered a universal phenomenon (Groll, 2015).

also been observed in humans in a more complex manner in which social learning is a mechanism to spread preferences for certain traits, but human beings "preferentially copy the choices of individuals with high status or better access to critical information" (LITTLE et al., 2011, p. 373).

Although copying is negatively evaluated by people (VAN HOREN; PIETERS, 2012; YANG et al., 2013), even by children from different cultures (YANG et al., 2013), it is noticed that the consumer evaluation of copycats' brands depends on circumstances. People dislike copycat brands when uncertainty about the products' quality is low (they recognize the well-known brands and others available) but this preference changes when uncertainty is high (they do not know the available brands) despite the recognition of imitation (VAN HOREN; PIETERS, 2013). Moreover, different kinds of imitation are identified and have been differently evaluated by consumers (VAN HOREN; PIETERS, 2013).

Despite the recognized importance of design for enterprises (BORJA DE MOZOTA, 2006; BRUCE; BESSANT, 2002; DANISH DESIGN CENTRE, 2003; DELL'ERA; VERGANTI, 2007; DESIGN COUNCIL, 2007; GEMSER; LEENDERS, 2001; TEECE, 1986) and even though investment in design expertise is considered low risk (BESSANT, 2002), the presence of a copy culture can be considered a way to reduce risks and investments, especially in SMEs where the company's foundation is a consequence of the unemployment condition as in the case of Latin America (ALTEMBURG; MEYER-STAMER, 1999). In this context, the owner of the company is worried about survival, fears unemployment and does not think as an entrepreneur. The need for immediate results to survive, and the lack of management skills to lead business, drive the company to the copycat behaviour (ALTEMBURG; MEYER-STAMEER, 1999).

When the enterprise is immersed in a copycat culture or imitation it is possible to imagine the hypothesis that the company will decrease efforts in product development, focusing on designs that have achieved success in the market, but this hypothesis has not been confirmed (DELL'ERA; VERGANTI, 2007; GEMSER; LEENDERS, 2001; ROY; RIEDEL, 1997). Dell'Era and Verganti (2007) analyze 2.000 products launched by 210 Italian firms and conclude that imitators tend to present higher product variety while innovators limit new product languages in the market. The authors deduce that imitators "miss the capability to interpret the complex evolution of products signs and languages in the market" (DELL'ERA; VERGANTI, 2007, p. 597). The Danish Design Centre (2003), Gemser and Leenders (2001) and Roy and Riedel (1997) demonstrate that more innovative design strategy leads to better results (e.g. turnover growth and exports).

Rosa et al. (2007) notice that Brazilian enterprises in the furniture industry have not established a product-design strategy despite the importance of design for competitiveness in this industry that is not technology-intensive. Some reasons considered are related to structural problems. Italian enterprises are considered references for the Brazilian furniture design, and the ease of imitation avoids the competition with Italian companies (ROSA et al., 2007).

Heskett (2009, p. 75) points out that designs are widely imitated by competitors because some companies choose the "fast-followers" strategy, producing successful innovations at low cost. In this sense, design is considered something that can be easily acquired at no cost (HESKETT, 2009, p. 75). On the other hand, Dell'Era and Verganti (2007) evidence that imitators are not doing the "right" copies because they are not able to recognize the dominant design or language in advance.

The lack of skills identified in different contexts (ALTENBURG et al., 1999; DELL'ERA; VERGANTI, 2007) leads the copycat behaviour. Adopting a copycat behaviour seems easier than creating novelty or developing new ways of thinking (see also STERNBERG, 2006, 2012). This social learning process of copying is identified from an instinctual behaviour to a design management style when to do it "right", one follows a "model", avoiding

the effort to interpret changes in people's behaviour and needs, to develop criteria, to create options and to take decisions towards new directions. It can also be related to the lack of vision to associate design with diverse company and stakeholders' benefits or to the mindset of people (POIRIER et al., 2017) in charge of a small company's top management. Design is not adopted as a strategic resource to create value in the Brazilian furniture industry as it has been noticed in practice and sectorial reports despite research (FUNDAÇÃO GETULIO VARGAS, 2015) suggested this intention based on the perspective of the companies' representatives on product-design. This approach is questionable considering the lack of design experience, awareness and understanding usually found in SMEs even in European contexts (e.g. ARQUILLA et al., 2015; BRUCE; COOPER; VAZQUEZ, 1999; COX, 2005; FILSON; LEWIS, 2000; MILLWARD; LEWIS, 2005; SCHNEIDER et al., 2015), where design is considered a source of indigenous innovation. Moreover, design at the strategic level surpasses product-design issues. Another way to better visualize the design landscape in this industry could be looking at design leadership, design investment and design intensity (ROPER et al., 2009), which points out the level of importance of design within the company.

Design and product identity

Design is a way to convey persuasive ideas, attitudes, values and meanings to the users (BRUCE; BESSANT, 2002; DELL'ERA; VERGANTI, 2007).

Everybody has a self-image based on personal and social belonged values (BAXTER, 1998). According to Baxter (1998), it is part of the human nature to surround ourselves with goods which represent our self-image. The identity of products is built in the imaginary or reflexive level of people. It demonstrates how these people would like to be perceived by others through goods that belong to them which expresses their self-image and identity (NORMAN, 2008).

The contemporary individual seeks his identity and roots in a dynamic or "liquid" world in continuous change. Hence, desiring their own defined identity, which expresses their authenticity in the world, makes this individual feel that they belong to (or is identified with) a territory or a lived history (BAUMAN, 2001).

The 'celebration nation' trend suggested that natural and cultural heritage (the original symbols, lifestyles and traditions that were previously denied) in emerging markets such as Brazil, Russia, India and China (BRIC group) have been updated to become a source of pride for national consumers and to interested global ones (TRENDWATCHING, 2011).

Crafts are considered a source of design identity along with shapes, colour combinations, style, materials and their preparation, and when the object has identity it is unmistakable (BONSIEPE, 2011). Local products are cultural expressions related to the territory and its community, representing symbolic and cultural values that are an outcome of relationships built throughout time involving biodiversity, traditional production and habits (KRUCKEN, 2009).

Design, industry, and crafts

Scale manufacturing, characterized by labour division, plays a fundamental role in the birth of industrial design at the end of the XVII and in the beginning of the XVIII century. Social aspirations had to be transferred to a new production system defined by phases, specialized tasks and sectors in the factory, and product-design (or project) and manufacturing were separated (BÜRDEK, 2006; FORTY, 2007).

Two kinds of culture can be identified in the Design school. One is inclusive and considers the multiplicity of design regarding arts and craftwork interactions. The other is the polytechnic culture where design

is a branch of architecture and interacts with engineering and is called industrial design (TROCCHIANESI; GUGLIELMETTI, 2012, p. 39).

The design culture is regarded as a mediator between producers and users (DESERTI; RIZZO, 2014). How to connect these worlds in a successful manner is still uncertain. Design is also related to the way of achieving innovation through interdisciplinary teamwork on problem-solving approach such as design-thinking (BROWN, 2009).

Historically, Brazil broke up with its cultural roots during the transition towards industrial (or scale) production (BORGES, 2011). The process of changing from craftwork to industrial manufacturing was forced in the dictatorship period when the design main skills and decisions were kept in the mature economies meanwhile manufacturing and design adjustments were performed in Brazil (MORAES JUNIOR, 2002).

Brazilian crafts can be categorized into two general groups. One includes indigenous and traditional craftwork, and the other is "industrianato". The first group is characterized by lower production and better market value, and by being close to the popular art in terms of expression, whereas the second one presents higher production capacity, uses less sophisticated techniques and has lower market value (FREITAS, 2006). Figures 1 and 2 show examples of "industrianato".

Figure 1: 'Industrianato' example: keychain made of soapstone
Source: Author's personal archive

Figure 2: 'Industrianato' example: football teams' emblems inserted into pieces of soapstone
Source: Author's personal archive

Technology advancements (e. g. rapid prototyping, Computer Numerical Control (CNC) technologies and so on) (VOLPATO et al., 2007) and the emergence of new forms of manufacturing (e. g. flexible manufacturing) bring different possibilities for products and production. Design tests can be performed faster in industry through prototypes that also communicate ideas and enable companies to get feedback from users, suppliers and interdisciplinary teams (CLARK; WHEELWRIGHT, 1993; BROWN, 2009).

Crafts are not just related to the handmade artefacts but to the opportunity to make complex-shape products that can be perceived as craftwork, and to produce personalized goods through rapid prototyping technologies where the distinction between project and manufacture becomes blurred.

Trocchianesi and Guglielmetti (2012) identify types of interaction between industry and crafts mediated by design. In this context, the role of design is also to provide new uses and signs for crafts, contributing to keep the cultural heritage alive. Bidirectional projects' approach is a way to develop product identity and customized products, considering also technological advancements. In this approach, design has an innovative role, interpreting crafts and transferring them into the entrepreneurial contexts, designing new contexts for use through the fusion of languages and techniques (TROCCHIANESI; GUGLIELMETTI, 2012).

Reaching novelty is related to the human being creativity deployment. Technologies can support scaling up a product production; however, they are not valuable *per se* – they become valuable depending on the way they are interpreted and used to create value to users in a defined context. The productivity concept lies on the demand issue. It is not enough to produce more if there are not people willing to buy the product (SLACK; BRANDON-JONES; JOHNSTON, 2009). The ability to change direction or to identify what dimensions are worthy to be improved or to receive innovation is crucial in the design management field, otherwise "that effort will be wasted if the dimension you improve is not the one that matters most to the customer" (PILDITCH, 1990, p. 20, see also VERGANTI, 2016). Thus, identifying what can be worthy on the demand side is an overlapping matter that concerns design management, design leadership, marketing and production management.

Pedra de Minas' furniture line: cultural heritage through craft's waste

Pedra de Minas line was developed in 2005. It was the final project in the Industrial Design course at the University of the State of Minas Gerais (Universidade do Estado de Minas Gerais [UEMG]). The student who developed the design was a trainee at the furniture company that backed the prototype development.

This project emerged from the need to characterize inns in a historical touristic area, Estrada Real, which is part of Minas Gerais history and development. Regional productive systems, referred to carpentry factories and crafts, were considered. The region is a reference in local crafts.

The price had to be affordable for the local lodgings conditions and the furniture should convey regional cultural values. During fieldwork, in the artisans' communities, it was observed that the process of crafting soapstone generated small pieces of stones which could not be used to make objects. From this evidence, the use of waste from craftwork as source of local identity was considered throughout the project.

The users (tourists) ranged from adventurers and backpackers to elderlies. The habits of these travellers were studied and used as a source for the project inspiration-information and criteria for the selection of ideas.

The furniture had to be easy to manufacture and possible to be produced in the local SMEs. The main materials used by these firms were MDF (Medium Density Fiberboard) and wood. The selected material was MDF, once the use of

wood was not a common feature among most producers, and that which can be made of MDF (as it was found in the supplier) can be made of wood, but the inverse is not possible according to the local productive practices at that time.

The technological requirements led to developing the furniture using productive processes that were available in the average furniture producer in that context. The DFMA (Design for Manufacture and Assembly) approach (BOOTHROYD; DEWHURST; KNIGHT, 2002) contributed to developing intuitive assembly-disassembly features favouring transport, package, maintenance and modularity to build different furniture pieces using the same design and product parts.

The issue that arose was how to incorporate the crafts' waste into the industrial MDF parts of the furniture. Among the solutions exploited, the selected one was to standardize soapstone residue which was inserted into the MDF parts that were torn up by a CNC.

Figure 3: Pedra de Minas
Source: Author's personal archive

Soapstone presents different ranges of colour: from greys and pinks to greens. The effect of the soapstone's waste was the aesthetics' differentiator, enabling contrast, touch sensation and connection with the cultural heritage. Other features were defined based on users' needs such as a mobile support inspired by backpackers' behaviour and a small wardrobe considering elderly's habits when they travel. In addition, a niche for local crafts exhibition was included in the wardrobe in order to foster the trade of regional craftwork.

Pedra de Minas participated in the major Latin America furniture exhibition: Movelsul in 2006, in Bento Gonçalves (Rio Grande do Sul, Brazil). The furniture was exhibited in the Design Hall section.

The Corn Armchair: Furniture Manufacturer and Artisans' Community Joint Development

Nova América was founded in 1994 in Ubá, Minas Gerais, Brazil, and is the company which produces the Corn armchair. Ubá represents one of the most important furniture clusters in Brazil.

The company sells its products in six states, from south-east to north-east, in Brazil. The Corn armchair is manufactured through traditional processes adopted by the couch industry in the furniture cluster, but its arms are made from corn straw which is woven by women artisans who

live in the region what makes this armchair different compared to other similar furniture in the market.

The first contact with the artisans' community happened on the occasion of a local event known as Potato Fair. The craftsmen community worked on dolls made from corn straw, however, the earnings resulting from the dolls were scarce. Besides corn straw, the dolls used a framework of wood, that came from the local furniture industry waste.

The entrepreneur envisioned an opportunity to develop some parts of the Corn armchair in collaboration with the artisans. He started delivering the wooden framework of the armchair when the truck went to deliver pieces of wood for the doll production, and the truck returned with the woven armchair arms. The access to the community was hard because the road was bad.

The artisans chose the kind of texture that would be created by weaving the corn straw. The Corn armchair development helped to increment the community income, it became a second option of earning money and also contributed to the maintenance of traditional skills and techniques of the community cultural heritage in corn straw, once the doll business was not going well. Professional designers did not take part in the design process, the project was developed by an employee with a background in couch manufacture.

According to the entrepreneur, the launch of Corn armchair attracted attention but was not financially successful in the beginning, because the cost was higher than other products. Another constraint reported was related to the commercialization, it was not addressed to the 'right' public that recognizes the value of handmade products. Although sales are not high compared to other products by the company, the perceived value and profit margin are higher than others, according to the owner.

"Nova América has as one of the principles to interact with several actors, among them craftsmen and small carpenters. We believe that we can provide them conditions to present their work, their skills and thereby improve their self-esteem, their working conditions and improve their income"[5] (NOVA AMERICA ENTREPRENEUR, 2015).

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[5]   "a Nova América tem como um dos princípios interagir com diversos atores, entre eles artesões e pequenos marceneiros. Acreditamos que podemos oferecer a estes atores condições de apresentarem os seus trabalhos, suas habilidades e com isso melhorarem a alto-estima, suas condições de trabalho e melhorar a sua renda".

DISCUSSION AND CONCLUSION

The interaction between industrial and craft processes cannot be considered an issue of technological barriers. It can be considered, as design, an issue of vision. Local craftwork can be a source of local identity, as noticed by Trocchianesi and Guglielmetti (2012), Bonsiepe (2011), Borges (2011), and Krucken (2009), not just related to traditional crafts but connected to the local enterprises' design system.

If Brazil has broken up with its roots (BORGES, 2011; MORAES JUNIOR, 2002) and the copycat behaviour is common among the furniture industry firms, it is not only related to organizations' culture, but to a range of disadvantages, such as the lack of skills, quality of education and other reported conditions to move towards more innovative contexts (ALTENBURG; MEYER-STAMER, 1999; ECONOMIC COMMISSION FOR LATIN AMERICA AND THE CARIBBEAN, 2015; EUROPEAN COMISSION, 2015; GALINARI; TEIXEIRA JUNIOR; MORGADO, 2013; ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, 2013; ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, 2014; ROSA et al., 2007). The studied cases are examples of efforts to overcome these barriers and to build product-design identity.

Pedra de Minas case shows that it is possible to appropriate local values considering regional networks including local enterprises, craftsmen, lodgings, and tourists (users) requirements during the design process. The design feasibility was crucial in practice in order to prototype the furniture. However, the lack of experience in introducing new ideas into production reduces the ability of company's members to analyse and envision ways of making a prototype in diverse stages of the prototyping process. They tend to use methods, processes and materials that they are used to. This barrier contributes to the difficulty in achieving unique feasibility solutions to a new product-design in an interdisciplinary way, fully appreciating the diverse company's member skills and fostering the development of new ones.

The distrust among local stakeholders is a recognized constraint in Latin America (ALTENBURG; MEYER-STAMER, 1999). The Corn armchair case is an example that this boundary can be overcome through the development of partnership and the ability to use external networks towards a shared goal. The use of local productive techniques and materials along with the increment of the artisans' income contribute to the cultural heritage preservation. On the other hand, the enterprise has the opportunity to develop the product identity in a unique manner.

The Corn armchair case demonstrates the capacity of generating new visions connected to local communities' potentialities. In this case, the local social event (Potatoes Fair) and the entrepreneur mindset were fundamental to make the joint action a reality and to introduce a new practice in the company culture. As stated by Bruce, Cooper and Vazquez (1999), SMEs are managed in a personalized way, where the experiences and skills of the individual (generally the owner) become crucial. Despite an unfavourable environment to develop and implement new ideas, the entrepreneur's intrinsic motivation and mindset (see POIRIER et al., 2017; STERNBERG, 2006; 2012) were drivers to surpass the constraints, envisioning and deploying new opportunities.

The difficulty of commercialization can be considered a barrier, regarding the lack of a structured and diffused design knowledge throughout the firm's members and processes from ideas to market implementation with the participation of diverse stakeholders. Other constraints are related to the external environment such as the cost-oriented market that is historically focused on domestic market, and the lack of design awareness and knowledge diffusion among stakeholders (e.g. users, suppliers, distributors, salesmen).

The introduction of a design culture requires long run strategies and experience in design, and the lack of an appropriate environment puts at risk the development, continuity or evolvement of this approach towards design innovation. Hence, the need for appropriate infrastructure and effective design policies that support design education and diffusion at diverse levels (from micro to macro) is pointed out.

The two cases analysed in this paper are sources of possible ideas to create value by design considering the local identity, and to engage with diverse stakeholders that play a fundamental role in the local cultural heritage maintenance. The creation of value by design is not just related to economic assets but to the company learning in the process of implementing changes (see for instance BORJA DE MOZOTA, 2006) as well as to social benefits.

LIMITATIONS AND FUTURE RESEARCH

The cases analysed highlight the local potential for product design and identity. However, they demonstrate empirical evidence from specific contexts and time. Pedra de Minas case was experimental and the products were not introduced into the market. The issue of scaling up this furniture should be studied in-depth to better understand the sustainability for crafts cultural heritage because of the soapstone waste use. The furniture production has a different scale and time.

This paper is focused on product-design aspects related to the use of local resources or potentialities. The potential of the territory and its cultural heritage can be valuable sources of languages and identities for companies ranging from product-design to strategic design. The strategic level was not fully explored in this study.

Moreover, the Corn armchair case is closely related to the enterprises' owner vision, intrinsic motivation and action to develop the product together with the craftsmen community. The innovator behaviour that counteracts unfavourable environment to innovate was not inquired in-depth through a literature review which could contribute to discuss this feature thoroughly.

To grasp how a design culture can be introduced, creating value, ceasing copy culture cycle and enabling identity development, is still an issue to be investigated in-depth in a longitudinal study. For instance, some questions are: how can a design culture be built into a small company, breaking up with the established copycat behaviour and inspiring innovation? How can design policies be effective in these contexts?

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REFERENCES

ACKLIN, C. Design Management Absorption Model: A Framework to Describe and Measure the Absorption Process of Design Knowledge by SMEs with Little or No Prior Design Experience. **Creativity and Innovation Management**, Medford, v. 22, n. 2, p. 147-160, 2013.

ALTENBURG, T.; MEYER-STAMER, J. (1999). How to Promote Clusters: Policy Experiences from Latin America. **World Development**, Amsterdam, v. 27, n. 9, p. 1693-1713, 1999.

ARQUILLA, V. et al. Assessing European Design Policy: Towards an Evaluation

Culture. In: MERONI, A.; COLLINA, L; GALLUZZO, L. (Eds.). **Culumus Conference: The Virtuous Circle**. Milan: McGraw-Hill Education, 2015. p. 915-926. Disponível de: <https://goo.gl/PL1mQQ>. Acesso em: 30 maio 2016.

BAUMAN, Z. **Modernidade líquida**. Rio de Janeiro: Zahar, 2001.

BAXTER, M. **Projeto de produto**: guia prático para o design de novos produtos. São Paulo: Blucher, 1998.

BESSANT, J. Why design? In: BRUCE, M.; BESSANT, J. **Design in business**: strategic innovation through design. London: Financial Times Prentice Hall, 2002. p. 3-17.

BONSIEPE, G. **Design, cultura e sociedade**. São Paulo: Blucher, 2011.

BOOTHROYD, G.; DEWHURST, P.; KNIGHT, W. **Product Design for Manufacture and Assembly**. New York: Marcel Dekker, 2002.

BORGES, A. **Design + artesanato**: o caminho brasileiro. São Paulo: Terceiro Nome, 2011.

BORJA DE MOZOTA, B. (2006). The Four Powers of Design: A Value Model in Design Management. **Design Management Review**, Malden, v. 17, n. 2, p. 43-53, 2006.

BRADESCO. **Departamento de Pesquisas e Estudos Econômicos**. Indústria de Móveis. Economia em dia, Osasco, 2017. Disponível em: <https://goo.gl/pvm9Dr>. Acesso em: jun. 2017.

BRASIL. Ministério do Desenvolvimento, Indústria e Comércio Exterior. **Cadeia Produtiva de Madeira e Móveis**. Brasília, DF: MDIC, 2015. Disponível em: <https://goo.gl/QsREMr>. Acesso em: 11 set. 2015.

BROWN, T. **Change by design**: how design thinking transforms organizations and inspires innovation. New York: Harper Collins, 2009.

BRUCE, M.; BESSANT, J. Design definitions and management processes. In: _____. **Design in business**: strategic innovation through design. London: Financial Times Prentice Hall, 2002. p. 1-2.

BRUCE, M.; COOPER, R.; VAZQUEZ, D. Effective design management for small businesses. **Design Studies**, Amsterdam, v. 20, n. 3, p. 297-315, 1999.

BÜRDEK, B. E. **História, teoria e prática do design de produtos**. São Paulo: Blucher, 2006.

CAWOOD, G. Design Innovation and Culture in SMEs. **Design Management Review**, Malden, v. 8, n. 4, p. 66-70, 1997.

CLARK, K. B.; WHEELWRIGHT, S. C. **Managing New Product and Process Development**: text and cases. New York: Free Press, 1993. 896p.

COX, G. **Cox Review of Creativity in Business**: building on the UK's strengths. 2005. Disponível em: <https://goo.gl/ysyo99>. Acesso em: 3 jun. 2016.

DANISH DESIGN CENTRE. **The Economic Effects of Design**. Copenhagen: National Agency for Enterprise and Housing. 2003. Disponível em: <https://goo.gl/hCJCQe>. Acesso em: 3 jun. 2016.

DANISH DESIGN CENTRE. **The Design Ladder**: four steps of design use. Copenhagen: Danish Business Authority, 2001. Disponível em: <https://goo.gl/zq8bcn>. Acesso em: 3 jun. 2016.

DELL'ERA, C.; VERGANTI, R. Strategies of Innovation and Imitation of Product Languages. **The Journal of Product Innovation Management**, Medford, v. 24, n. 6, p. 580-599, 2007.

DESERTI, A.; RIZZO, F. Design and the Cultures of Enterprises. **Design Issues**, Cambridge, MA, v. 30, n. 1, p. 36-56, 2014.

DESIGN COUNCIL. **The Design Economy**: The value of design to the UK economy. Executive summary. London, 2015. Disponível em: <https://goo.gl/6HLsAV>. Acesso em: 3 jun. 2016.

DESIGN COUNCIL. **The Value of Design**: Factfinder report. London, 2007. Disponível em: <https://goo.gl/bdiApB>. Acesso em: 23 abr. 2015.

D'IPPOLITO, B. The importance of design for firms' competitiveness: A review of the literature. **Technovation**, Amsterdam, v. 34, n. 11, p. 716-730, 2014.

DOHERTY, R. et al. Climbing the Design Ladder: Step by step. In: DMI: 19th ACADEMIC DESIGN MANAGEMENT CONFERENCE. London: London College of Fashion, 2014. p. 2576-2597.

ECONOMIC COMMISSION FOR LATIN AMERICA AND THE CARIBBEAN. **The European Union and Latin American and the Caribbean in the new economic and social context**. Bonn: German Cooperation; Brussels: European Union, 2015. Disponível em: <https://goo.gl/VfKMua>. Acesso em: 16 jun. 2015.

EMERGING MARKETS. In: **Financial Dictionary**. [S.l.]: The Free Dictionary, 2003. Disponível em: <https://goo.gl/ExnD9q>. Acesso em 24 jun. 2015.

EUROPEAN COMISSION. **AL-INVEST 5.0**: inclusive Growth for Social Cohesion in Latin America: guidelines for grant applicants. Brussels: European Comission, 2015. Disponível em: <https://goo.gl/XzHo6P>. Acesso em: 16 jun. 2015.

FILSON, A.; LEWIS, A. Barriers between Design and Business Strategy. **Design Management Review**, Malden, v. 11, n. 4, p. 48-52, 2000.

FORTY, A. **Objeto de desejo**: design e sociedade desde 1750. São Paulo: Cosac Naify, 2007.

FREITAS, A. L. C. **Design e Artesanato**: Uma experiência de inserção da metodologia de projeto de produto. 2006. Dissertação (Mestrado em Engenharia de Produção) – Escola de Engenharia, Universidade Federal de Minas Gerais, Belo Horizonte, 2006.

FRIEDMAN, T. L. **The world is flat**: a brief History of the Globalized World in the Twenty-first Century. London: Penguin, 2005.

FUNDAÇÃO GETÚLIO VARGAS. **O Impacto do Design no Desempenho das Empresas**: pesquisa setorial. Porto Alegre: Pequenas Empresas e Grandes Negócios, 2015. Disponível em: <https://goo.gl/czhGaR>. Acesso em 10 abr. 2015.

GALINARI, R.; TEIXEIRA JUNIOR, J. R.; MORGADO, R. R. A competitividade da indústria de móveis do Brasil: situação atual e perspectivas. **BNDES Setorial**, Brasília, DF, n. 37, p. 227-272, 2013. Disponível em: <https://goo.gl/DRvq34>. Acesso em: 4 ago. 2015.

GEMSER, G., LEENDERS, M. A. A. M. How integrating industrial design in the product development process: impacts on company performance. **Journal of Product Innovation Management**, Amsterdam, v. 18, n. 1, p. 28-38, 2001.

GROLL, S. Traces and Hopes of Design Research: An Interview with Gui Bonsiepe, Klaus Krippendorff, Siegfried Maser, and René Spitz. **Design Issues**, Cambridge, MA, v. 31, n. 1, p. 18-31, 2015.

HESKETT, J. Creating economic value by design. **International Journal of Design**, Taipei, v. 3, n. 1, p. 71-84, 2009.

INTERNATIONAL MONETARY FUND. **Emerging and developing economies/ Countries**. Washington, DC, Apr. 2008. Disponível em: <https://goo.gl/wqC9eA>. Acesso em: 24 jun. 2015.

INTERNATIONAL MONETARY FUND. **Emerging, Developing Economies Now More Resilient**. Washington, DC, Sep. 2012.

Disponível em: <https://goo.gl/MRzTwg>. Acesso em 24 jun. 2015.

KOOTSTRA, G. L. **The incorporation of design management in today's business practices**: an analysis of design management practices in Europe. Rotterdam: Centre for Brand, Reputation and Design Management, 2009. Disponível em: <https://goo.gl/XRh2Fd>. Acesso em 24 jun. 2015.

KRUCKEN, L. **Design e território**: valorização de identidades e produtos locais. Barueri: Studio Nobel, 2009.

LARSEN, P.; LEWIS, A. How Award-Winning SMEs Manage the Barriers to Innovation. **Creativity and Innovation Management,** Medford, v. 16, n. 2, p. 142-151, 2007.

LITTLE, A. C. et al. Social learning and human mate preferences: a potential mechanism for generating and maintaining between-population diversity in attraction. **Philosophical Transactions of the Royal Society**, London, v. 366, n. 1563, p. 366-375, 2011.

MAEDA, J. #DesignIn Tech Report. **KPCB**, San Francisco, mar. 2015. Disponível em: <https://goo.gl/PWf1Ar>. Acesso em 23 abr. 2015.

MARGOLIN, V.; MARGOLIN, S. A "Social Model" of Design: Issues of Practice and Research. **Design Issues**, Cambridge, MA, v. 18, n. 4, p. 24-30, 2002.

MASSA, S.; TESTA, S. Innovation and SMEs: Misaligned perspectives and goals among entrepreneurs, academics, and policy makers. **Technovation**, Amsterdam, v. 28, n. 7, p. 393-407, 2008.

MILLWARD, H.; LEWIS, A. Barriers to successful new product development within small manufacturing companies. **Journal of Small Business and Enterprise Development,** Bingley, v. 12, n. 3, p. 379-394, 2005.

MINTZBERG, H. **Structure in fives**: designing effective organizations. New Jersey: Prentice Hall, 1992.

MORAES, D. **Análise do design brasileiro**: entre mimese e mestiçagem. São Paulo: Blucher, 2006.

MORAES JUNIOR, D. **Il rapporto locale-globale**: nuova sfida ed opportunità progettuale: il Brasile come caso locale. 2002. Tese (Doutorado em Design) – Politecnico di Milano, Milão, 2002.

MORGAN STANLEY INVESTMENT FUNDS. Emerging Markets Equity Fund. **Investment Management**, New York, 31 jul. 2016.

Disponível em: <https://goo.gl/GL5Dja>. Acesso em: 24 jun. 2015.

NORMAN, D. A. **Design emocional**: por que adoramos (ou detestamos) os objetos do dia-a-dia. Rio de Janeiro: Rocco, 2008.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT. **Globalisation and Emerging Economies**. Paris: OECD, 2009. Disponível em: <https://goo.gl/CrkxqK>. Acesso em: 24 jun. 2015.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT. **Latin American Economic Outlook 2015**: Education, Skills and Innovation for Development. Paris: OECD, 2014. Disponível em: <https://goo.gl/FNFGth>. Acesso em: 16 jun. 2015.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT. **OECD Economic Surveys**: Brazil 2013. Paris: OECD, 2013. Disponível em: <https://goo.gl/iY4r5y> Acesso em: 16 jun. 2015.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT. **Special Focus**: Inequality in Emerging Economies (EEs). Paris: OECD, 2011. Disponível em: <https://goo.gl/oaPXaQ>. Acesso em: 24 jun. 2015.

PILDITCH, J. Using design effectively. In: GORB, P. (Ed.). **Design management**: papers from the London Business School. London: Architecture Design and Technology Press, 1990. p. 13-23.

POIRIER, V. et al. Thoughts on improving innovation: what are the characteristics of innovation and how do we cultivate them? **Technology and Innovation**, Tampa, v. 18, n. 4, p. 319-330, 2017.

RAE, J. What is the real value of design? **Design Management Institute and Motiv Strategies**, Boston, p. 1-9, 2014. Disponível em: <https://goo.gl/PxxGM5>. Acesso em: 11 fev. 2016.

RAE, J. What is the real value of design? **Design Management Review**, Malden, v. 24, n. 4, p. 30-37, 2013. Disponível em: <https://goo.gl/jSncvF>. Acesso em: 11 fev. 2016.

ROPER, S. et al. **Measuring sectoral innovation capability in nine areas of the UK economy**: report for NESTA innovation index project. London: NESTA, 2009. Disponível em: <https://goo.gl/2zNydy> Acesso em 17 abr. 2017.

ROSA, S. E. S. et al. O setor de móveis na atualidade: uma análise preliminar. **BNDES Setorial**, Brasília, DF, n. 25, p. 65-106, 2007. Disponível em: <https://goo.gl/ghG2P9>. Acesso em: 15 set. 2015.

ROY, R.; RIEDEL, J. Design and innovation in successful product competition. **Technovation**, Amsterdam, v. 17, n. 10, p. 537-548, 1997.

SATOMURA, T.; WEDEL, M.; PIETERS, R. Copy Alert: A Method and Metric to Detect Visual Copycat Brands. **Journal of Marketing Research**, New Orleans, v. 51, n. 1, p. 1-13, 2014.

SCHNEIDER, J. et al. **Supporting design driven innovation**: a review of selected programmes. Paris: Agence por la Promotion de la Creátion Industrielle, 2015. Disponível em: <https://goo.gl/rVCP8F>. Acesso em: 24 maio 2016.

SLACK, N.; BRANDON-JONES, A.; JOHNSTON, R. **Administração da produção**. 3. ed. São Paulo: Atlas, 2009.

STAKE, R. E. Case studies. In.: DENZIN, N. K.; LINCOLN, Y. S. (Eds.). 2000. **Handbook of qualitative research**. 2. ed. Thousand Oaks: Sage. p. 435-454.

STERNBERG, R. J. The Nature of Creativity. **Creativity Research Journal**, Abington, v. 18, n. 1, p. 87-98, 2006.

STERNBERG, R. J. The Assessment of Creativity: An Investment-Based Approach. **Creativity Research Journal**, Abington, v. 24, n. 1, p. 3-12, 2012.

TEECE, D. J. Profiting from technological innovation: implications for integration, licensing and public policy. **Research Policy**, Amsterdam, v. 15, n. 6, p. 285-305, 1986.

TRENDWATCHING. **Celebration Nation**. London, [2011]. Disponível em: <http://trendwatching.com/trends/10trends2013/?celebrationnation>. Acesso em 11 fev. 2014.

TRUEMAN, M.; JOBBER, D. Competing through Design. **Long Range Planning**, Amsterdam, v. 31, n. 4, p. 594-605, 1998.

TROCCHIANESI, R.; GUGLIELMETTI, I. Elementos de reconhecimento do design na multiplicidade e "multiversalidade" das diversas dinâmicas de relação com o artesanato. In: Jaña, A.; Abreu, I.; Albino, C. (Orgs.). **Design, artesanato e indústria**. Amieira: Greca Artes Gráficas, 2012. p. 30-39.

TSOUNTA, E. **Slowdown in Emerging Markets**: Sign of a Bumpy Road Ahead? Washington, DC: International Monetary Fund, 2014. Disponível em: <https://goo.gl/Fiagvg>. Acesso em 24 jun. 2015.

VAN HOREN, F.; PIETERS, R. Preference reversal for copycat brands: Uncertainty makes imitation feel good. **Journal of Economic Psychology**, Amsterdam, v. 37, p. 54-64, 2013.

VERGANTI, R. **Overcrowded**: designing meaningful products in a world awash with ideas. Cambridge, MA: MIT Press, 2016.

VOLPATO, N. et al. **Prototipagem rápida**: tecnologias e aplicações. São Paulo: Blucher, 2007.

WALSH, V. Design, innovation and the boundaries of the firm. **Research Policy**, Amsterdam, v. 25, n. 4, p. 509-529, 1996.

WORLD BANK. Country and Lending Groups. Washington, DC, 2015. Disponível em: <https://goo.gl/2Bqm6h>. Acesso em 24 jun. 2015.

YANG, F. et al. No one likes a copycat: A cross-cultural investigation of children's response to plagiarism. **Journal of Experimental Child Psychology**, Amsterdam, v. 121, p. 111-119, 2014.

YIN, R. K. **Case study research**: design and methods. 2. ed. London: Sage, 1994. 171p.

ZURLO, F. **Un modello di lettura per il Design Strategico**: la relazione tra design e strategia nell'impresa contemporanea. 1999. Dissertação (Doutorado) – Politecnico di Milano, Milão, 1999.

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