Arts and design as translational mechanisms for academic entrepreneurship: The metaLAB at Harvard case study

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ABSTRACT

This paper proposes arts and design as translational mechanisms to connect and align stakeholders, particularly in the context of academic entrepreneurship where multiple stakeholders with different expertise and interests work together in joint endeavors. Insights gathered from an ethnographic investigation carried out at metaLAB - an academic laboratory located at Harvard University (Cambridge, MA, USA) - build the empirical foundation. Findings show that various forms of arts and design (including poetry, photography, art installations, motion graphics videos, data visualization) play an important role in connecting metaLAB to external stakeholders and in activating multiple value drivers. The adoption of arts- and design-based initiatives allows the translation of different needs and wants of stakeholders into shared meanings, but also supports emotional and cognitive engagement and creative and divergent viewpoints. This paper contributes to existing studies focusing on how arts-based initiatives can support organizations in exploiting their potential for organizational value creation.

1. Introduction

The complexity and turbulence of current global, interconnected economies and societies are affecting a wide spectrum of organizations, including universities and higher education systems moving towards more entrepreneurial configurations to pursue innovation development, social and economic engagement (Siegel & Wright, 2015; Urbano & Guerrero, 2013). Universities engage, for example, in entrepreneurial activities such as technology transfer and brokering, intellectual property management, participation in science parks, incubators, university spin-offs and other processes aimed at implementing the third mission of the university (social and economic development) (Rothaermel, Agung, & Jiang, 2007; Shane, 2004; Wright et al., 2009). These activities can be referred to as forms of academic entrepreneurship conceived as "a practice performed with the intention to transfer knowledge between the university and the external environment in order to produce economic and social value both for external actors and for members of the academia, and in which at least a member of academia maintains a primary role" (Cantaragiu, 2012, p. 687). This definition builds upon various viewpoints about academic entrepreneurship. The term academic entrepreneurship was initially conceived to refer to an extension of business entrepreneurship toward academia and a mere differentiation between companies based on

academic knowledge and the others (Cantaragiu, 2012). The prevailing definitions of academic entrepreneurship then moved from the idea of for-profit business creation and focused on the primary role of university spin-offs (Shane, 2004; Wright et al., 2009). Later, other authors proposed a view of academic entrepreneurship as a means of knowledge transfer from the university environment to the market; this wider interpretation of academic entrepreneurship included all contacts that academics have with business entities, which are the basis of monetary value creation (Philpott, Dooley, O'Reilly, & Lupton, 2011). Finally, whilst not necessarily denying the importance of the economic outcomes generated by these forms of entrepreneurship, some authors have regarded academic entrepreneurship as also being oriented toward creating societal value (Botes, 2005; Kingma, 2011). From an entrepreneurial perspective, the multifaceted performance that a university is required to achieve embraces a larger meaning of social value creation through the management of stakeholders' relationships (Post, Preston, & Sachs, 2002). This phenomenon stimulated scholarly research into the entrepreneurial dimension that allows academia to pursue innovation development and social engagement with external stakeholders (Shane, 2004; Wright et al., 2009). The literature includes many attempts to classify stakeholders using various criteria; according to Freeman (1984), two main groups can be identified for a university: internal stakeholders (alumni, faculty, administration and university

staff) and external stakeholders (industry, government and regional/ local community, citizens). In this perspective, the interplay between academia and external stakeholders is of paramount importance for generating value through joint collaborative endeavors, where these different stakeholders bring together their assets, competencies and specificities (for a review, see: Powell & Snellman, 2004; Stam & Garnsey, 2008).

However, in these joint collaborative endeavors, stakeholders generally tend to have different needs and interests, speak different languages and might not be aligned in terms of which kind of value should be created (Simeone, 2016; Simeone, Secundo, & Schiuma, 2017a). Diverse notions of value can be complementary or in conflict, agreed upon or contested by stakeholders. In all these cases, stakeholders engage in processes of negotiation and responses to external factors (McAdam, Miller, McAdam, & Teague, 2012), to ensure that their needs and wants are systematically addressed, orchestrated and balanced (Fogelberg & Sanden, 2008; Garrett-Jones, Turpin, Burns, & Diment, 2005). Along a similar line of thinking, Chiesa and Piccaluga (1998) note that given the different objectives and languages prevalent in academic and industrial contexts, there is also a need for translators, or translation mechanisms, between these two groups of stakeholders. This notion of translation denotes the challenge of defining a common platform of communication and knowledge sharing & transfer among multiple and diverse stakeholders. Despite the relevance of translation as a mechanism to support scientific processes has been studied (Ito, 2016; Moultrie, 2015; Rusk, 2016), there is still a lack of investigations about how to support the alignment and collaboration of different stakeholders, particularly in the context of academic entrepreneurship processes.

In an attempt to cover this gap, the paper proposes a conceptualization of the arts and design as a translational mechanism to connect and align different stakeholders for value creation dynamics in academic entrepreneurship. Art, interpreted as a cornerstone of human life, provides a vehicle that can inspire and improve today's management discipline and practices (Adler, 2006; Taylor & Ladkin, 2009). As argued by Schiuma (2011): "The planned managerial use of art's forms (i.e. Arts-based Initiatives, ABIs) can support and drive the development of organisational value creation capacity and in turn improve performance" (p. 8). Although the boundaries between art and design are blurred, we distinguish design from arts following the definition proposed by Heskett (2002) and further contextualized by Norman and Verganti (2014): design is "the deliberate and reasoned shaping and making of our environment in ways that satisfy our needs and give meaning to our lives" (2014, p. 80). In this sense, the design activity can lead, for example, to the creation of a chair that is ergonomic and aesthetically pleasant, but that is not necessarily considered artwork. The common conceptual background connecting arts and design is that they can be considered as aesthetic technologies, i.e. they represent means through which it is possible to enhance, engage, deploy and employ human senses in order to better make sense of the reality and objects to be understood and managed. The above assumptions define the context of analysis of the two key questions of this paper: Can arts and design be used as translational mechanisms to connect and align different stakeholders, particularly in the context of academic entrepreneurship? What are the value drivers activated by the use of arts- and design-based initiatives that foster value creation mechanisms? The aim is to show how - through an intentional and instrumental use of arts and design - ideas, concepts, needs and interests of the various stakeholders involved in academic entrepreneurship undergo semiotic translations and are materialized into visual, audio and tangible formats. These acts of translation support organizational processes, such as networking, communication, knowledge transfer, inspiration, learning, development and transformation, that allow stakeholders to be connected, to agree upon shared meaning and jointly work on collaborative actions. Therefore, arts and design as aesthetic technologies provide a medium to support, facilitate and develop people's capacity to connect

and to better understand their inner and outer world. The empirical evidence to support this perspective is built upon an ethnographic analysis of metaLAB at Harvard University, a laboratory institutionally affiliated with the Berkman Center for Internet and Society and located in Cambridge, MA (USA). The study was conducted in 2013 and 2015 and shows that the use of arts and design can sustain academic laboratories and research intensive organizations in their efforts to face today's knowledge management challenges and improve their value creation capability.

The paper is organized as follows: Section 2 introduces the literature background and key concepts, such as arts for management, design as translational mechanism and how arts can create organizational value. Section 3 describes the research approach and the research context. Section 4 presents the findings of the study. Section 5 elaborates and discusses the results. Finally, the last section concludes the paper underlying the main research insights.

2. Literature review

2.1. Understanding arts and design in a management context

The relational component is a key element for academic entrepreneurship; the role of academics is to act as "entrepreneurial thinkers […] which seek new ways to engage with the community to create value" (Kingma, 2011, p. ix). Academic entrepreneurship unfolds precisely by intentionally developing a network of social contacts from which resources can be obtained and with whom the university will work to convert these resources into added social value (Fayolle & Redford, 2014). Value emerges directly through joint collaborative endeavors, where both internal stakeholders (e.g., faculty members and students) and external stakeholders (e.g., alumni, research partners, private companies, government institutions) bring together their assets, competencies and specificities (Redford & Fayolle, 2014). The problem is that sometimes these stakeholders have different needs and interests, speak different languages and might not be aligned in terms of what kind of value has to be created. Activists from an NGO (non-governmental organization), venture capitalists and academic researchers involved into a joint research project might have divergent interests: the academic researchers might want to further develop their scholarly investigation; the venture capitalists might see the potential of the project in terms of pure economic revenues and might want to patent some of this technology and market it; the NGO might instead be interested in releasing the results of the project as open source and open access in order to maximize societal benefits. These diverse notions of value can be complementary or in conflict, agreed upon or contested by the stakeholders. In all these cases, stakeholders engage in processes of negotiation and responses to external factors (McAdam et al., 2012) in which arts and design can offer an innovative way to inspire and support management (Adler, 2006, 2010; Austin & Devin, 2003; Nissley, 2010). From the Latin "aris", the concept of art has been used to denote any skills or craft aimed at designing or building something by using creativity, intelligence and mastery (Strati, 2000). So, "art translates a creative process for the arrangements of elements, and indicates creative skill, a creative process or a creative product" (Schiuma, 2011, p. 25). It is acknowledged that art can be used as a metaphor indicating creative activities or creative accomplishments (Austin & Devin, 2003). Adopting the arts to support organizational dynamics means creating the enabling conditions for transforming the organizations in various ways. These transformations can, for example, unfold through a better engagement of employees that feel inspired by some sculptures positioned in their offices or through a stronger brand image of an organization that sponsors an exhibition in a prestigious museum. A good number of scholars and practitioners (e.g., policy makers, managers, artists, and consultants) acknowledge that the arts can produce a wide range of benefits and, especially, can help to stimulate new ways of thinking; to renew routines, processes, values, identity, image, brand

and culture; to challenge established mindsets; to shape workplace innovation and add value to products and services; and to develop new skills, competences and behaviors (Adler, 2006; Darsø, 2004; Harris, 1999; Meisiek & Barry, 2014; Nissley, 2010; Styhre & Eriksson, 2008).

The planned managerial use of arts-based initiatives (ABIs) can sustain organizations in their efforts to face today's competitive challenges and improve their value creation capability (Schiuma, 2011). Through ABIs new strategic organizational value drivers, such as passion, emotions, hope, moral, imagination, aspirations, and creativity (Boyatzis, McKee, & Goleman, 2002; Bruch & Ghoshal, 2003; Cross, Baker, & Parker, 2003; Gratton, 2007; Schiuma, 2011; Steers, Mowday, & Shapiro, 2004), relationships can be fruitfully developed, generally first at the individual level, engaging a person emotionally and intellectually, and then at group and organizational levels. The focus of an ABI is not the work of art in itself, but the experiences triggered by arts. An ABI employs arts to ignite, catalyze, drive, harness and govern emotions and energies within organizations and to foster new viewpoints and ways of thinking. This process can have an impact not only on people, but also on the organizational infrastructure of tangible and intangible assets. The development of organizational value creation capacity of ABIs is connected to the creation and transformation of organizational knowledge assets. The arts sustain the human-based nature of the organizations (Ghoshal & Bartlett, 1999; Hamel, 2000), where elements such as emotions, ethics and energy (Fineman, 1985; Mintzberg, 1985; Strati, 1992; Turner, 1990), are seen as key factors affecting the capacity of the organizations to create value.

2.2. Design as translational mechanism

We specifically refer to design as a symbolic practice where the very act of designing, for example, a logo, a diagram, a prototype, a product or a service is a way of creating meaning (Krippendorff, 1989). Design comprises a set of practices and methods, such as user research and user testing, rapid and frequent prototyping, visualization techniques, task-based scenario building, attention to the brand experience, which also mark a distinctive way of thinking, approaching and solving problems (Buchanan, 2004). The etymology of the word design goes back to the Latin 'de + signare' and refers to "making something, distinguishing it by a sign, giving it significance, designating its relation to other things, owners, users or goods" (Verganti, 2003, p. 157; Krippendorff, 1989). Based on this original meaning, "design is making sense of things" (Krippendorff, 2006, p. XV). Krippendorff anchors his reflection on design as a meaning-making activity to a semantic perspective, and argues that the meanings of an artifact emerge in the socio-cultural arena where the understandings of multiple stakeholders interact, clash and come into play. The multiple meanings of an artifact are socially built by the interactions of these stakeholders and their embodied and enacted understandings. These understandings can "differ not merely in clarity or in the perspective from which different stakeholders are seeing, but foremost in their construction, as may become evident in the use of incommensurable vocabularies, logics, values, and goals. Each [stakeholder] is positioned in his or her own understanding; the designer in the designer's world, the client in the client's world, the ecologist in the ecologist's world, and the user in the user's world" (Krippendorff, 2006, p. 67). More recently and from different angles, other authors have also examined how the interplay of various stakeholders plays out in various design projects, analyzing power dynamics and decision-making in participatory design (Bratteteig & Wagner, 2014), and the ways in which technology design can provoke and engage the political (DiSalvo, 2009; DiSalvo, 2012).

Previous studies showed how design can be used a translational mechanism to align the needs and interests of various stakeholders (Simeone, Secundo, & Schiuma, 2017b). Through the design process, ideas and concepts undergo semiotic translations and are materialized in visual, audio, tangible formats and, consequently, design artifacts can be seen as translational mechanisms, as an attempt at expressing meaning in different languages. For example, an academic lab working with pioneering and complex technologies can use design to produce an early-phase sketch or a motion graphic animation which translates its advances in technologies into a format that could be better understood by some external stakeholders, if compared to a traditional scientific paper. Design can also be used to create a prototype that shows the interplay of various technological components in a more tangible way than, again, a traditional scholarly publication. Design can even be employed to facilitate participatory design sessions where all stakeholders directly contribute to the design-as-translation process, jointly creating visual representations and prototypes that translate the multiple perspectives of the various stakeholders (Simonsen & Robertson, 2013).

Translation is seen here as a semiotic process, in line with what Augusto Ponzio claims, "the problem of translation cannot be reduced to the problem of the relation among texts in different languages. Each time there is a sign process, semiosis, there is translation. Therefore, translation concerns the relation among signs in general" (in the *Preface* of Petrilli, 2003, p. 15). As suggested by Petrilli: "to translate is not to decodify, not to decipher, but to interpret" (*ibid*, p. 17). This view sees translation in light of its semiotic dimension and highlights both the interpretive component of translational processes and their generative, creative potential. Along similar lines, semiotics has been used to look at the translational dimensions of design (Baule & Caratti, 2016; Riccò, 2016; Zingale, 2016). This paper extends these studies by assessing whether the generative and creative potential of the simultaneous use of arts and design can activate translational mechanisms and support the interplay of various stakeholders in academic entrepreneurship. To look into this matter, the potential value drivers activated by a managerial use of arts and design are explored using the framework of the Arts Value Matrix (Schiuma, 2011).

2.3. The value drivers activated by the managerial use of the arts and design

The Arts Value Matrix (Fig. 1) is a framework to map the organizational value drivers that can be activated and affected by and intentional and instrumental use of arts' forms and design methods as means to support organizational processes and value creation mechanisms (Schiuma, 2011).

The basic assumption behind the framework is the recognition that arts-based initiative (ABIs) can have an impact on two fundamental dimensions of an organization: (1) the organization's human resources, and more generally any organizational stakeholder; and (2) the infrastructure, or the overall tangible and intangible structural assets grounding the working mechanisms of a business model and supporting stakeholders in the creation and delivery of value. Depending on what the organization is trying to achieve (i.e., a focus on people/stakeholders or enhancements of infrastructure or both) it is possible to represent these benefits in the Arts Value Matrix (see Fig. 1). The matrix identifies nine categories of organizational value drivers that can be affected by the managerial adoption of arts and design:

- *Entertainment*: is related to the use of arts- and design-based initiatives as a means to shape joyful experiences that allow for the creation of a pleasant and a relaxing experiential context for people.
- *Galvanizing*: it refers to the capacity of arts- and design-based initiatives to catalyze people's emotions and energy by captivating people in experiences allowing them to feel passionate and energized.
- *Inspiration*: this is the result of the use of arts and design as a means to provoke people to question and reflect upon the way they act and take decisions; by deploying and exploiting art forms and design methods it is possible to generate self-awareness and critical thinking.
- *Reputation*: it is the result of strengthening organizational images by using arts and design, i.e. the adoption of arts- and design-based
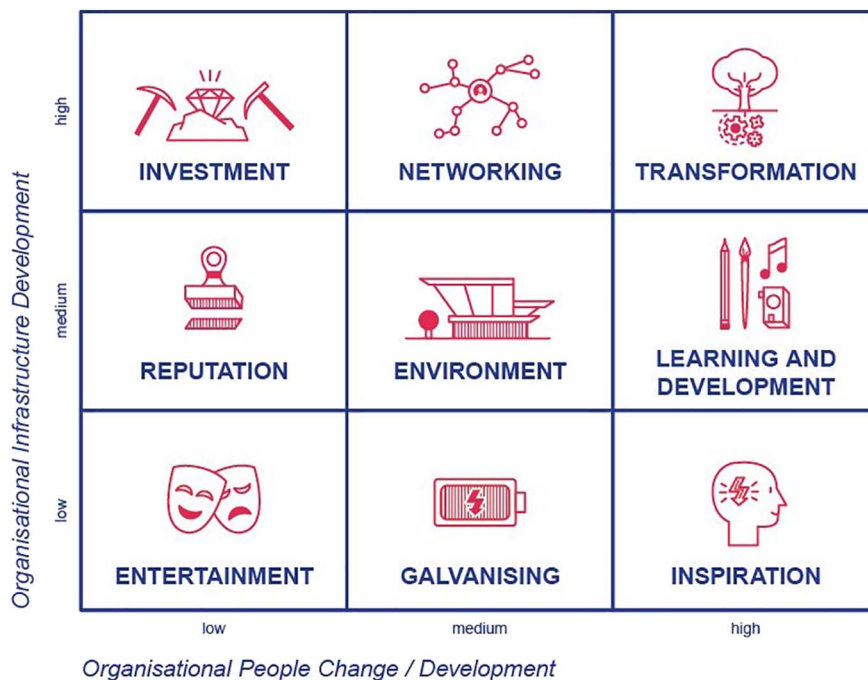
initiatives attracts stakeholder attention and raises the organizational profile and image by showing a link with artistry and creativity.

- **Environment**: the use of arts- and design-based initiatives can shape a workplace as for it to be soaked of a positive and energetic organizational atmosphere, which affects people's attitude and behaviors.
- **Learning and development**: it refers to the use of arts- and design-based initiatives to induce experiential learning experiences and nurture people's soft skills.
- **Investment**: this equals to use arts and design as a value vector, i.e. as a means aimed at creating and incorporating intangible values into products and other organizations' infrastructural components.
- **Networking**: this corresponds to the creation of relational capital by defining a common ground to activate and support relationships and collaboration among people/stakeholders so that this can turn into networking dynamics both within organizations and between organizations and their stakeholders.
- **Transformation**: arts- and design-based initiatives can also be deployed as a means of management to drive organizational change by creating a new consciousness for people that affects the organizational ability to undertake renovation as well as by creating a convergence between people development and organizational infrastructure renewal.

Undoubtedly, the value generated from arts and design experiences is extremely difficult to quantify using only economic values because they tend to meet different needs, which are subjective, idiosyncratic, context- and time-related. Moreover, their effects on individual and organizational change are intangible in nature, elusive and hard to quantify, especially in economic terms. Along a similar vein, other authors study how arts and design can support business and entrepreneurial processes, for example, by fostering new and translational thinking, innovation and creativity and organizational change (Deserti & Rizzo, 2014; Hargadon, 2005; Walton, 2004). As Berthoin Antal (2012) claims: "Contrary to the stereotypes of the past, [the artists working in residential projects within organizations] are not loners […] They have a clear working system and are able to explore new fields of expression – which often intersect with and are linked to the

scientific, technological or social – new materials, new ways of acting and new relational dynamics, new scenarios of action, new communication channels and new languages" (Berthoin Antal, 2012, pp. 61–62). It is this relational and intersectional capacity across multiple domains that make arts and design particularly interesting in the context of academic entrepreneurship. One of the central challenges for universities toward a more entrepreneurial configuration is the difference in terms of interests, needs, languages and agendas of the various stakeholders participating to academic entrepreneurship. In this context, arts and design can be adopted as translational mechanisms to better connect and align stakeholders to facilitate collaboration towards the achievement of one or more value drivers mapped by the Arts Value Matrix.

3. Research methods

Based on the logic of the grounded theory (Glaser & Strauss, 1967), it is possible to adopt a qualitative methodology of case study to identify meaningful insights through a limited number of examples (Pettigrew, 1990). In general, case studies are the preferred strategy when 'how' or 'why' questions are being posed (Yin, 1994). As pointed out by Glaser and Strauss (1967), case studies support a research strategy involving an empirical investigation of a particular contemporary phenomenon within its real-life context by using multiple sources of evidence (Robson, 2002).

Specifically, we have chosen an extreme case study (Eisenhardt, 1989; Yin, 1994), a single example of processes and environments where arts and design are extensively used in relation to the interplay of various stakeholders in the context of academic entrepreneurship. By selecting an extreme case, we can better understand the role and meaning of arts and design as a translation approach for organizational value creation. To generate and analyze data for our case, a combination of methods - mostly ethnographic observations, interviews and archival research - was adopted. An ethnographic investigation was conducted in 2013 and 2015 at metaLAB, Harvard University, in Cambridge, MA. The application of an ethnographic approach with the direct involvement of researchers in the field has proven to be a common element of a good number of recent studies on organizations (Czarniawska, 2012). The main difference between case study research

and ethnographic research is the extent to which the researchers immerse themselves in the life of the social group or context they are investigating. The organizational and social researcher, Bryman (2008), describes ethnography as an approach to data collection "in which the researcher is immersed in a social setting for some time in order to observe and listen with a view to gaining an appreciation of the culture of a social group" (2008, p. 369). Within design research, Blomberg and Karasti (2013) point out how "at its foundation ethnography relies on the ability of people to make sense out of what is going on through participation in social life and is guided by a few basic principles. These principles include studying phenomena in their natural settings, taking a holistic view, providing a descriptive understanding, and taking a members' perspective" (2013, p. 374). Both definitions highlight how the researchers typically spend an extended period in the field to get involved with the people they are studying, often with some degree of active participation in their daily lives as well. Ethnography aims at learning about people's lives from the people's own perspective, while studying these lives in the context of their lived experience.

3.1. The research context

The metaLAB at Harvard University is a laboratory that is institutionally affiliated with the Berkman Center for Internet and Society, located in Cambridge, MA (USA). According to the description on its official website: "metaLAB is a research and teaching unit at Harvard University aimed at exploring and expanding the frontiers of networked culture in the arts and humanities".[1] The projects carried out by metaLAB bridge different disciplinary domains and range from the architecture and design to the implementation of digital platforms, such as *The Japan Disaster Archive* which uses crowdsourcing mechanisms to collect, preserve, and make as much of the digital record of the 2011 earthquake accessible as possible, to data visualization, such as the *Library Observatory*, a set of visual tools to explore the full range of information related to the open collections of the Digital Public Library of America. Similarly to many other research institutions, metaLAB does not entirely cover its costs with the support from its university, but has to find additional economic and financial resources. MetaLAB tries to find these resources in an entrepreneurial way, carrying out various projects in collaboration with external stakeholders such as foundations, NGOs, other universities and private companies. The outcomes of these collaborative entrepreneurial endeavors range from the development of new technologies to the creation of spin-offs originated from metaLAB's research strands.

3.2. Data collection and generation

In operational terms, data were collected and generated through archival research, direct observation, on field experience as a participant in the lab and e-mail exchanges. Field source data mainly consisted of notes, photographs and audio-video recordings. Multiple data collection methods were used to exploit the synergistic effects of combining them via triangulation (Eisenhardt, 2002; Jick, 1979), consisting of an interplay of investigative techniques to reduce the bias of a single observation in comparison of multiple data (Tarrow, 1995). This process is particularly relevant in ethnographic research, where the personal observation of the researcher plays an important role in the processes of data gathering and analysis. It is also for this reason that the authors used secondary sources such as archival records, documentary information, official communication tools (such as websites, social media accounts for metaLAB – e.g., metaLAB's YouTube channel or Twitter account) to confirm some of the data that emerged during the fieldwork. Authors worked independently on the processes of data gathering and generation and subsequently aligned their materials.

In order to enrich the investigation 14 semi-structured interviews with various key informants were conducted (Kumar, Anderson, & Stern, 1993), including representatives of metaLAB (one of the directors and 5 members), external collaborators and representatives from other organizations collaborating with the lab. Interviews were based on semi-structured schemas using a flexible approach that allowed gathering the informant's perspective on specific issues, or as a way of checking whether the informant could confirm insights and information the researchers already held (Myers, 2008). The interviews were mainly oriented towards exploring metaLAB's organizational dynamics tied to the use of arts and design. Finally, processes of data reduction, data display, conclusion drawing and verification (Miles & Huberman, 1994) have been carried out. As argued by Gilmore and Pine (1997), in case studies methodology, this approach guarantees the highest degree of reliability.

3.3. Data analysis

In order to examine the various instances of arts and design in metaLAB, the analysis of data followed an inductive and iterative process (Miles & Huberman, 1994; Strauss & Corbin, 1998), moving from a descriptive code resulting from the consolidated framework of the categorization of the Arts Value Matrix (Schiuma, 2011). The field source materials mainly consist of notes, approximately 100 photographs and 14 audio-video recordings. The authors also collected artifacts, such as invitation flyers, posters, and DVDs produced by the lab. This material was edited and organized in a single profile document in which photographs were positioned in sequence with relative caption (date, caption). Notes from direct observations were placed in a loose, thematic narrative structure, and photographs were organized accordingly to coincide with this narrative. This resulted in the concise textual and visual documentation of all the material which was subsequently elaborated upon to write the draft of the final report. The data were subsequently organised into tables to ease comparisons, and the importance of some concepts representing the key elements of the analysis were highlighted. The data was interpreted by seeking out relationships occurring between the different stakeholders and identifying the way through which the translation process was developed using arts and design. Finally, as described by Eisenhardt (1989), a further series of iterations between the data, both secondary and primary, and the literature has been conducted to better ground the theoretical foundations of our investigation into current scholarly work.

3.4. Validity

Four types of methods proposed by Yin (2009) to improve the validity of a qualitative case research have been adopted: construct validity, internal validity, external validity and reliability.

- Firstly, construct validity can be executed by utilizing a wide variety of sources of evidence to establish reliable chains of evidence. In our case, we used a combination of data collection methods, from ethnographic observations, to documented interviews, up to different types of archival documents, such as websites, articles and printed report and materials. Using these different sources, it was possible to cross-check the findings and, therefore, to create trustworthiness.
- Secondly, internal validity is assured by identifying causal relationships and patterns in the case research. This is executed by relating empirical data to existing research.
- Thirdly, external validity is proved by the generalization of the study results. As the research only contains one case and a narrow number of interviews, the generalization of the findings is limited. Awareness of these limitations accounts the external validity.
- Finally, reliability has been improved in the following way: firstly, by adopting a consistent structure for the interviews; secondly, all the data utilized in the research has been well documented into archival records eventually accessible by other researchers.

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[1] http://metalab.harvard.edu/ accessed 27 January 2016.

4. Findings

4.1. The entrepreneurial dimension of metaLAB

As with any other organization, metaLAB needs economic and financial resources to operate. The academic institution behind the lab – Harvard University – does not entirely cover the cost of the lab and, generally, metaLAB manages to match the funding received from the university by adopting an entrepreneurial perspective that unfolds through various collaborations with external stakeholders. Nowadays - in our complex, global and interconnected economies - ideas, resources and competencies might be distributed across various organizations. Some organizations may have brilliant ideas, but they might lack competencies or resources to fully exploit these ideas. Conversely, some other organizations might have economic or financial resources and lack innovative ideas (for example, for new products or services). Entrepreneurship is a way for various organizations to network, exchange and/or jointly produce ideas, resources and competencies with the goal of creating economic and, potentially, other kinds of value (e.g., social, cultural, environmental, etc.). This is precisely what we term as the entrepreneurial dimension of metaLAB. In its joint projects with external stakeholders (NGOs, cultural organizations, companies, etc.), metaLAB offers its competencies, resources and ideas and, in exchange, can access competencies, resources and ideas from other organizations. For example, metaLAB can offer its visionary ideas on the future of publishing or on the technological advancements of digital archives. Some external companies could offer economic resources and, together with metaLAB, build upon these visionary ideas in order to create some prototypes, technological demonstrators or software platforms. If further developed, these items could even lead to the commercialization of market products or services. Over time, metaLAB has collaborated with a variety of stakeholders. Projects such as NovelTM[2] – a large-scale cross-cultural study of the literary form of the novel according to quantitative methods – show how the experimental work and the research produced by metaLAB and various other academic institutions is carried out together with commercial partners, in this specific case, a company operating in digital publishing. In another case, concepts, ideas, technology and processes originated at metaLAB were also instrumental in creating Zeega,[3] a spin-off focusing on crowdsourcing technological platform supported by a San Francisco-based accelerator. In particular, Zeega was born out of a set of experiments in curatorial practices at metaLAB, which constituted the ground for developing the technological platform behind the start-up. On another occasion, the Italian motorbike manufacturer Piaggio supported the creation of Piaggio Fast Forward, a startup founded and directed by Jeffrey Schnapp (metaLAB's director), investigating the future of mobility.[4] These examples show how important it is for metaLAB to activate entrepreneurial processes in order to access economic, financial and other resources and create value. These entrepreneurial processes typically unfold in situations where different and diverse stakeholders sit at the same table and try to work together across their convergent and divergent interests. How does metaLAB tune into the various divergent interests, languages and needs of various stakeholders?

4.2. Arts and design as translational mechanisms at metaLAB

A distinctive component of metaLAB is the strict interplay between arts and design. A design-based process is used while developing artistic projects that cross and combine art forms, such as poetry, photography,

cinema, art installations, digital art, music. These arts- and design-based initiatives are exemplified by projects such as *Digital Ecologies*, a collaborative enterprise started in the summer of 2012 with Harvard's Arnold Arboretum. In *Digital Ecologies*, typical design processes, such as iterative and user-centered prototyping and participatory design, are used to explore human-environment interactions, especially human-landscape and human-plant interactions. Through the creation of concepts, prototypes and digital tools such as open databases, participatory mapping, virtual collecting, this initiative aims at fostering multiple intersections among different domains (digital cultures, history of botanical gardens, STS, interaction design). Projects within *Digital Ecologies* include an art installation for the sonification (representation of data through sound) of vital processes in trees and the *Decompository*, a curatorial space for the collection, exploration and exhibition of Arboretum decomposition in its varied forms (Fig. 2).[5]

In this and other projects developed at metaLAB, diverse stakeholders coming from academia, cultural institutions, NGOs, industry, public sphere are involved at several levels, sometimes as spectators, at other times as early-stage co-creators or active users for digital crowdsourcing platforms. These stakeholders are located within their own cultural, economic, socio-material contexts where diverse and specific languages, grammars, authorities are in place and at work. Processes of semiotic translation are needed to foster conversation and collaboration among these different languages and to make knowledge produced by specific stakeholders (e.g., academia) relevant for other stakeholders (e.g., an amateur botanist) or applicable in other contexts (e.g., the market sphere).

The following is the description of *A bit in the Abyss* (Fig. 3), another project developed by metaLAB: "a digital storage server in a small shipping container, similar to those used by the Internet Archive for storing the scanned, hard-copy source media they acquire. As data are accessed, their processing is sonified to represent the growth of server hosts spanning from the origins of the internet to the present. Within the container, mirrors reflect the server's blinking indicator lights in all directions. Audience members enter the container in small groups to experience the prismatic effects of light and sound produced therein."[6]

In this project, a design-based process of progressive and exploratory user-centered iterations culminated in an interactive and lighting installation. *A bit in the Abyss* is a way of exposing visitors to an immersive experience where various questions related to the contemporary role of archival data and information storage emerge: "as we digitize recorded knowledge, it falls into a virtual abyss of abstraction" (*ibid.*). These are themes generally explored by metaLAB in its scholarly publications. When codified into a typical academic article or book, metaLAB's reflections only reach a limited target of stakeholders. Creating experiences such as *A bit in the Abyss* is a strategy for metaLAB to exploit artistic and design-based practices to disseminate its research in a powerful, immersive and poetic way. In other terms, the arts- and design-based initiatives introduce in *A bit in the Abyss* some creative languages that allow metaLAB to codify its research into formats that are aesthetically stimulating and that allow stakeholders to more easily communicate and share ideas and knowledge.

Similar processes are also exemplified by *Curarium*, a concept developed at metaLAB for a digital curatorial platform which "leverages the power of the crowd in order to annotate, curate, and augment [artistic] works within and beyond their respective collections".[7] *Curarium* is a web-based interactive platform for exploring, analyzing and making arguments about art collections and the objects they include; users can annotate objects, tell stories about these objects and curate collections in a collaborative way. Stakeholders interested in *Curarium* are, for example, art curators,

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Fig. 2. Sketch for *Bioprosthesis*, a project for the sonification of trees.
(2013, courtesy of http://stsdesignworkshop.tumblr.com/post/60137874191/bioprosthesis).

museums, companies that want to offer cultural services to the market, academia, government bodies. These stakeholders are located within their own cultural, economic, socio-material contexts, where diverse and specific languages are in place and at work. While developing *Curarium*, metaLAB used arts- and design-based materials such as sketches, motion graphics videos, data visualizations and interactive prototypes to interact with these multiple stakeholders: these were all ways in which technological ideas and curatorial concepts behind *Curarium* were translated into visual, audio,

tangible formats and shared with these stakeholders. For example, a concept such as 'orphan work' can be rather familiar to a professional curator, but not so familiar to someone who works at a web development company. In order to explain this and other technological concepts (such as the one of 'interoperability of data models'), metaLAB used cinematic language and created some motion graphics videos to translate these concepts into easy-to-understand visual formats and, as such, helped various stakeholders in better understanding each other and collaborating (Fig. 4).

These examples, along with many other projects described on the official metaLAB website (http://metalab.harvard.edu/), show how the lab consistently uses typical design processes such as user-centered iterative prototyping or participatory design to (1) produce artworks that cross photography, video art, music, performances and installations, and (2) to interact with multiple stakeholders, applying various design and art-based translational practices.

Fig. 3. *A bit in the Abyss*, by metaLAB.
(2015, photo by Aram Boghosian, courtesy of ILLUMINUS).

5. Discussion

The findings highlighted how metaLAB employs various art-based practices and design as a translational mechanism to connect and align various stakeholders in academic entrepreneurship. We will now use some categories of the Arts Value Matrix (Schiuma, 2011) to analyze how these translational mechanisms supported value creation. Examining metaLAB's projects shows that a common trait of the use of arts- and design-based initiatives is that they involve stakeholders first and foremost at a level that is entertaining, i.e. cognitively and emotionally engaging. Stakeholders taking parts in metaLAB's projects are
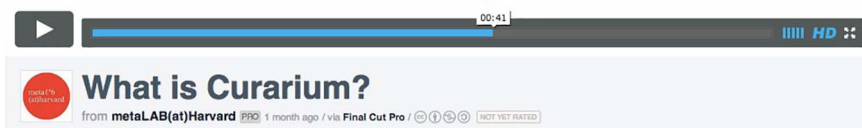
Fig. 4. Frame of a motion graphics video showing key concepts of Curarium.
(2014, courtesy of metaLAB).

challenged and stimulated in looking at things differently (i.e. in imaginative and provoking ways) and this galvanizes these stakeholders tapping into their cognitive and emotional energies. A further impact of the use of arts- and design methods in metaLAB is the inspiration they generate. In projects such as *Digital Ecologies* and *A bit in the Abyss*, these aesthetics and poetic experiences invite spectators, users and participants to reflect upon themes such as the contemporary role of archival data. These themes are not (only) codified into scholarly formats (e.g., the essay or the book that an academic lab would typically work on), but are instead translated into dimensions that can be experienced, understood and enjoyed by a variety of stakeholders, not only academic ones. These powerful aesthetic experiences are sources of inspiration where design is coupled with art forms to delve into and foster complexity and to create rich, emotionally-charged and immersive stories and environments. Arts- and design-based initiatives represent a path to opening possibilities for multiple, creative and divergent interpretations both within single organizations or across multistakeholder collaborative processes. Projects such as *Digital Ecologies* are also a means of providing educational experiences for learning and development. *Digital Ecologies* was precisely structured as a hands-on, participatory design seminar where participants with various backgrounds were invited to jointly create interactive artworks and to actively experiment with technological advances at the intersection of human-environment interactions, human-landscape and human-plant interactions. The prototypes generated in *Bioprosthesis* were a translational materialization of botanical and environmental concepts into a sonification process. The very designerly act of iteratively visualizing ideas and building various prototypes was an exercise that stimulated the participants' creativity, their ability to improvise and work in groups, to listen to each other and to look at technical and scientific matters as translated into formats that were easier to appreciate. These educational experiences increased the capacity of the participants to deal with the fuzziness of an artistic process. These are all components that can be extremely valuable when working in contexts such as academic entrepreneurship, where it is necessary to operate in complex environments where multiple stakeholders interact. Networking is at the core of most of the projects at metaLAB. Specifically, the goal of connecting and inspiring to work collaboratively is a focal point, for example, of the project *Curarium*. In *Curarium*, a variety of design artefacts (diagrams, mockups, sketches, prototypes, motion graphics videos) were oriented towards translating some technical and academic concepts (such as interoperability of data model or orphan work) into design- and art-based forms that could better facilitate interactions between specialists and non-specialists and ignite and sustain a crowdsourced crosspollination of knowledge and viewpoints.

Summarizing, arts and design can be used to translate complexity into something that is easier to appreciate and, consequently, to align stakeholders because they better understand each other. The use of arts and design aims to produce rich and immersive experiences, which also move, inspire, help reframing and represent organizational, social, cultural issues in all their complexity. This sort of emotional and cognitive activation helps stakeholders in realizing that the same project can be seen from multiple viewpoints and, consequently, in being more open to accept divergences and build upon convergences. This is a key issue in academic entrepreneurship where it is frequently the case that stakeholders have different agendas. Consistently with the capacity of arts- and design-based initiatives to support connecting and bonding, design- and arts-based translations arts enable the creation of an atmosphere and affect the characteristics of a workplace so that they are more conducive of creativity, collaboration and innovation. All of this leads to another powerful feature of arts- and design-based translational mechanisms: their transformational effect. This is the case, for example, of the Zeega spin-off originated from metaLAB. Zeega emerged from various experiences carried out by metaLAB in curation of digital archives, a core area of interest for some members of the lab. These experiences were codified as demonstrators and interactive art

installations that translated ideas and concepts into arts- and design-based formats. These arts- and design-based translations have been proved to be so powerful that they (1) have encouraged venture capitalists to provide economic resources and, consequently, (2) literally have transformed metaLAB into an entrepreneurial hub where some members decided to spin-off, leave the lab and create Zeega as a new organizational infrastructure to carry out their activity.

6. Conclusions and implications

By focusing on an academic laboratory located at Harvard University, this paper built upon a wide definition of academic entrepreneurship as a way to connect academia with external stakeholders in order to jointly create various forms of value, from the economic value generated by a new start-up like Zeega, up to the social and cultural value of an artistic installation that praises openness for the current curatorial and archival practices. This entrepreneurial dimension unfolds thanks to the exchange and co-production of ideas, resources and competencies distributed across stakeholders such as academics, external spin-offs, cultural and government institutions. Obviously, these stakeholders have some convergent interests, and this could explain why they all collaborate in these joint projects. At the same time, these convergent interests might co-exist with differences in interests, needs and agendas. Some of these stakeholders might also speak different languages: researchers can be familiar with a diagram or a scientific paper representing the technological architecture of a complex system developed by metaLAB, whilst government representatives, or members of NGOs, might not be able to fully understand such documents. Private companies might need to produce a detailed business plan, which analyzes the market potential of the technologies originated from the lab and forecasts the revenue streams of its commercialization; in this case, probably not all academics would be equipped to thoroughly follow the details of cash flow movements or financing strategies as presented in the business plan. In these contexts, arts and design can be deployed as means to activate processes of translation that align stakeholders and help them to collaborate better. The paper examined how arts and design can be implemented as translation mechanisms in the context of the metaLAB by impacting on multiple value drivers as mapped by the Arts Value Map. The research contribution emerging from our analysis is that the specific interplay of arts and design can play a fundamental role as translational mechanisms that support knowledge-based processes such as communication, ideas and knowledge representation, alignment, collaboration and engagement of various stakeholders. In the specific context of academic entrepreneurship, the translational processes unfold through a somewhat paradoxical articulation. On the one hand, sketches, visual diagrams and prototypes simplify and streamline collaboration, for example, in the case of a diagram that translates technical or academic concepts into a language and a format that can be more easily understood by the various non-academic stakeholders. On the other, the artistic dimension of these artworks - spanning photography, poetry, video art, music and installations - delves into and fosters complexity. These artworks have an emotional and cognitive impact, exposing various stakeholders to complex immersive and aesthetic experiences and to different ways of seeing the world. We contend that it is precisely when various stakeholders are exposed to these paradoxical translational processes - which simultaneously reduce complexity and foster complexity - that they become more open to collaboration, diversity and building upon convergences in spite of possible existing divergences.

This paper contributes to theory building by providing the notion of arts- and design-based initiatives as translational mechanisms to connect, integrate and engage stakeholders, particularly in the context of academic entrepreneurship. In addition, it provides insights about the understanding of the value drivers affected by the use of arts forms and design methods as management means. The empirical evidences related

to the analysis of the projects at the metaLAB provide also practical insights about the intentional and instrumental use of arts and design to facilitate and enhance communication and collaboration processes. The use of a single case study, although useful for developing grounded-based theory, presents limitations for the generalizability of the research implications. Acknowledging this limitation, further investigations should not only validate the role of arts and design as knowledge translational mechanism, but to focus on the exploration of the properties, management principles and processes of the application of arts and design. In this paper and in the activities of metaLAB, arts and design are strictly coupled in a way that makes it relevant to jointly examine them. This might not be the case for other contexts.

Acknowledgement

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