Unpacking the experimental process of business model innovation: the role of the cognitive dimension in the photojournalism industry

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Abstract:

Digitalization of the news market has profoundly affected the news photo sector, leading to economic challenges and a shift towards quantity over quality. Then, the rise of digital journalism, coupled with the COVID-19 pandemic, has further strained the media market. Photo prices have plummeted, driving professional photographers into economic and social hardship. To face this crisis, industry leaders have launched an ambitious innovation project: Pix.T, a blockchain-based solution to trace photos by photojournalists and restore their value. But this project requires a business model innovation to overcome the limits of the traditional photojournalism model, involving a high degree of collaboration and experimentation. Our research explores this particular and little-studied moment of experimentation, focusing on the cognitive aspects largely ignored by the literature. It addresses the question of how to organize the experimentation process in a collaborative and cognitive construction of business model innovation. Primary data, including interviews and a two-year action research, were collected, supplemented by essential secondary data. Three key findings emerged: the experimentation of a business model innovation involves two interlinked stages, individual actors face cognitive barriers during experimentation, and openness facilitates the process through shared spaces or common practices.

Key words: business model, cognitive business model, industry transformation, photojournalism.

INTRODUCTION

The internet has fundamentally transformed the news market, particularly affecting the news photo sector (Maillot, 2019). The removal of entry barriers through digital access has led to economic challenges for news media, as audiences are reluctant to pay for online content (Allan, 2013). Major social platforms dominate traffic, attention, and advertising, while the technological formats carrying photo content lack security and reliability. Web content has an indefinite lifespan, but the absence of technical solutions hampers tracking long-term value (Palomo and Guerrero-García, 2015). The ubiquity of images, facilitated by Web 2.0 and smartphones, creates a perception that anyone can be a journalist or photographer (Allan, 2013). This influx has shifted the market towards quantity over quality, diminishing the role of professional photographers as price makers. Over the past 15 years, photo prices have declined, and photographers struggle to protect image circulation, authorship, and copyrights. The 2018 World Press Photo report highlights that unauthorized use of photographers' work has increased, with few able to derive income from such instances.

The rise of digital journalism has made photojournalism both more crucial and fragile, complicating the task of distinguishing valuable photography amid a continuous flow of images from professional and amateur sources (Palomo and Guerrero-García, 2015). The COVID-19 pandemic has further strained the media market, with communication and advertisement budgets plummeting. However, the crisis has also increased public interest in and willingness to pay for high-quality journalism. For photographers, lockdowns and event cancellations have halted many activities, exacerbating an already precarious economic situation (Miller et al., 2024). In response to this unprecedented crisis, several dominant players in the industry decided to come together to envision a solution: Pix.T. Relying on blockchain technology, Pix.T aims to ensure traceability for photos taken and disseminated by photojournalists. However, this

project necessitates a rethinking of the historical model of the photojournalism industry to a business model innovation.

Business model innovation (BMI) is based on the development of new configurations of value creation, proposition and capture, through original design (new BM) or significant modification of existing BM (Massa and Tucci, 2013). BMI is particularly suited to supporting industry transformation, but requires a collaborative approach between individuals and/or key stakeholders to create a new logic of value (Chesbrough, 2010; Ritter and Lettl, 2018). But the collaborative approach raises cognitive barriers and commitment issues that can derail the innovation process (Kotter, 2007; Massa et al, 2017). This why BMI involves a high degree of experimentation during the design phase (Massa and Tucci, 2013). The aim is to experiment with value hypotheses (Berends et al, 2016), particularly in the prototyping stage (Geissdoerfer et al., 2022), by means of a trial-and-error process (Sosna et al., 2010). But the collective organization of this experimentation process is not studied by current research. In addition, the cognitive prerequisites that can frame this process to lead it to a testable prototype are still unclear (e.g. Gibson and Jetter, 2014).

To fill this gap, the objective of this research is to study the experimentation process of BMI in detail to understand the role of the cognitive dimension in its organization. Specifically, we aim to answer the following research question: ***How to organize the experimentation process of business model innovation collectively and cognitively?*** To answer this question, we collected numerous primary and secondary data from the case study of the Pix.T project. Three main findings emerge from our work. Firstly, it appears that the experimentation of BMI relies on a process consisting of two interlinked stages: a prototyping stage followed by an experimentation stage. A second result demonstrates that experimentation leads individual actors to face barriers that hinder collective cognitive construction. Finally, our last result shows that openness facilitates this process, whether through shared spaces or common practices.

This article is structured as follows. We first present the literature on photojournalism and then on BMI, emphasizing the need for experimentation and the cognitive barriers related to the variety of actors involved in its design. We then delve into the case study and the project, including the partners, before providing detailed insights into our data collection and analysis. Finally, we present our findings before we conclude and discuss our findings.

1. THEORETICAL BACKGROUNG

1.1. ORIGIN OF THE PHOTOJOURNALISM CRISIS AND THE NEED TO INNOVATE

The Internet has structurally changed the news market for several cumulative reasons that strongly impact its news photo market component (Maillot, 2019). Broadly speaking, the news media has suffered economically as the "barriers of entry" have been eliminated by digital access that allows any individual or organization to become a de facto publisher (Allan, 2013). News organizations have been largely unable to convince their audiences to pay for news content online, giving the general public the illusion that as news and photojournalism is free to consume, it is also free to produce. Meanwhile, the major social platforms have succeeded in channeling most of the traffic and holding most of the public attention and advertising market (Fletcher and Nielsen, 2017). The technological formats (.jpeg) which carry photo content are not secured nor reliable as they can be edited, modified, copied, downloaded, shared, stored with no tracking nor monetization solutions (Korus, 2017). At the same time, the lifespan of a webpage is virtually infinite as compared with dailies, magazines and broadcasters' programs. But contracts between offer and demand remain unchanged as there are no technical solutions to track this additional long-term value. The ubiquity of images since Web 2.0 and smartphones have created the illusion that anyone can be "somehow" a journalist and photographer even as media outlets' need for professional level images has exploded online as any article needs its illustrations pushing the market towards quantity instead of quality (Allan, 2013).

As a result, professional photographers are no longer price makers and photo prices have dropped over the last 15 years. Worse, photographers cannot protect the circulation of their images and the authorship and copyrights attached to these. According to the 2018 World Press Photo "The State of News Photography" report: In 2015, 63% of the respondents said their work had been used without their permission. This had risen to 65% by the 2018 survey. Less than a quarter said they had been able to extract income from unauthorized use of their work. Thus, the rise of digital journalism has simultaneously made the role of photojournalism more vital and yet more fragile: as new actors have arised blurring the old borders and as the public is drawn in as consumer, producer and distributor of a constant flow of images, where professional and amateur mix, the job of identifying, distinguishing and verifying the photography of value becomes increasingly difficult (Allan, 2013). Most recently, the COVID-19 pandemic has further deteriorated the media market as communication and advertisement (which accounts for half of the overall media resources with subscriptions and unit sales) budget have dropped sharply since the beginning of the crisis (Miller et al., 2014). The crisis also fostered the interest and willingness to pay for high-quality journalism and news content among citizens. Specifically for photographers, the lockdowns, the closure of borders and the cancelations of most events have put a major stop to much of their activities (Radcliffe, 2021). Even as many continue to document events, and the effects of the pandemic and other topics, for the industry as a whole the crisis has aggravated an already precarious economic situation.

This crisis explains the urgent need for a transformation in order to create dual value for the photojournalism industry: social value, to address the precariousness of photojournalists and restore value to news photography; and economic value, to ensure fairer and more equitable remuneration for the industry's stakeholders (Pollack et al., 2020). It also underscores the urgent need for a transformation in the photojournalism industry to create dual value: social value to

address photojournalists' precariousness and restore value to news photography, and economic value to ensure fair and equitable remuneration for industry stakeholders (Newman et al., 2021). Indeed, the gradual and then massive adoption of digital media in journalism has challenged not only the industry but also the professionals themselves (Bardan, 2015). The photojournalist profession has suffered hard from digitization and the arrival of new freelance models, propelled by social networks and other streams of fast and cheap photography distribution (Maillot, 2019). The news photo has thus become a common data, almost worthless because drowned in a mass of low quality and multiplied by citizen photojournalism (Solaroli, 2016). The role of professional photojournalists, their legitimacy, their values, their remuneration and the protection of their work have profoundly changed under the influence of the digital era (Thomson, 2018). The precariousness of their profession and the vulnerability of their position in the industry is now a major issue that needs to be urgently addressed.

To do so, the literature (e.g. Klein-Avraham and Reich, 2014; Bardan, 2015) points out the necessity of redefining the BM of the whole industry by involving and making work together all the actors of the photojournalism industry, developing new digital, strategic and economic BMé.

1.2. BUSINESS MODEL INNOVATION, COGNITION AND EXPERIMENTATION

BM is a cognitive framework for designing and formalizing a company's strategy, consisting of three key components: value creation (i.e. using internal/external resources and activities with partners in value chains and networks), value proposition (i.e. essential marketing and logistics elements to provide value to specific consumer groups in distinct market segments in order to engage them in the purchasing process), and value capture (i.e. economic factors that capture tangible or intangible value). By focusing on these three different components, companies can align their strategic decisions with their environment. They can

particularly devise their sources of competitive advantage, leverage innovations, technologies, and market opportunities (Teece, 2010), reorganize their resources and activities within their value chain, and optimize innovation, especially through collaboration (Appleyard and Chesbrough, 2017).

When developing new configurations of value creation, proposition and capture, firms encompass the ability to create and/or modify various dimensions of a BM, leading to BMI (Massa and Tucci, 2013). It involves the creation or acquisition of a new BM, the evolution or the diversification of an existing BM, the diversification of a BM or the acquisition of a new BM (Geissdorfer et al., 2018a). To do so, BMI is mainly based on a collaborative approach both internally and externally with stakeholders (Chesbrough, 2006). Indeed, taking into consideration the increasing openness of companies towards their stakeholders, particularly their customers, and the simultaneous need to address both production and customer-oriented issues, it's essential to conceive BMI in a collaborative way (Chesbrough 2007, 2010; Ritter and Lettl, 2018). Objective is to design a collaborative value logic based on the sharing of resources and skills to innovate and/or create value (Spieth et al., 2020). However, integrating stakeholders into the design of a BMI initially raises cognitive barriers that can lead to process failure (Breuer and Lüdeke-Freund, 2017; Geissdoerfer et al, 2018). Indeed, the design of a BMI relies first on a cognitive approach in which stakeholders must engage to structure a collective dynamic centered on innovation (Kotter, 2007).

The cognitive dimension of the BM is defined as a mental representation, influenced by the perceptions, beliefs, and experiences of leaders. It focuses on the cognitive processes behind the creation, implementation, and adaptation of BMs. (Heubeck and Meckl, 2019). This dimension includes strategic cognition, systemic thinking, and the ability to interpret and adapt BMs in response to environmental changes (Heubeck and Meckl, 2019). The literature has widely emphasized the importance of cognition in BM design. For example, Gavetti and Rivkin

(2007) demonstrated that leaders' perceptions strongly influence strategic decisions, affecting how BMs are designed and modified. Cognitive BMs also allow for greater flexibility and adaptation, as they incorporate feedback and enable dynamic reconfiguration in response to market changes (Teece, 2010). The cognitive BM thus provides a better understanding of the cognitive factors that influence BM performance (Tikkanen et al., 2005). It also enhances the strategic flexibility of the organization by enabling firms to quickly adapt to environmental changes (Doz and Kosonen, 2010). Finally, it fosters innovation by integrating feedback and continuously adjusting BMs based on new information and emerging trends (Chesbrough, 2010). However, its implementation is not without difficulties. On the one hand, analyzing leaders' mental models can be complex and subjective, requiring robust methodologies to be effective (Hodgkinson and Healey, 2008). On the other hand, leaders and top managers may resist changing their perceptions and beliefs (Tripsas and Gavetti, 2000), a particular limitation in the context of BMI, where alignment, i.e., the coordination and synchronization of various stakeholders, is not easily achieved (Adner, 2012).

Thus, cognitive construction implies that the BM is not fixed in the minds of the actors and can manifest individually or collectively in the form of representations (Eppler and Platts, 2009; Teece, 2010; Evans et al, 2017; Martins et al, 2015; Massa et al, 2017), making the design complex. To overcome these limitations, the BMI design must rely on experimental actions to test value hypotheses (Berends et al., 2016). These actions should logically integrate into a trial-and-error process to organize successive tests and leverage learning effects (Sosna et al., 2010). The main objective is to anticipate technological and usage problems (Koning et al., 2022) and reduce market uncertainties, including the identification of potential customers and their likelihood of engagement in the value proposition (Baden-Fuller and Mangematin, 2013; Martins et al., 2015). These tests and experiments are particularly crucial in the prototyping phase as they help structure the micro-process of BM prototyping (Geissdoerfer et al., 2022).

Furthermore, the literature indicates that BMI is a transformative process that involves experimentation. This experimentation is based on a cognitive process that, in the case of BMI, is complicated by the alignment required among multiple partners (Adner, 2017). This alignment is even more important as collective innovations, such as BMI, often involve a complex interdependence between different actors. Alignment ensures that all partners are in sync and working towards a common goal, thereby reducing the risks of failure (Adner, 2012). For innovation to succeed, the contributions of each stakeholder must be synchronized. This means that developments must progress at the same pace and be compatible with each other (Adner, 2012). However, it is often because of this cognitive dimension that alignment becomes complex. Each actor may have their own priorities and constraints, which can lead to conflicts (Adner, 2012) that challenge the intended objective. This leads us to examine the experimentation process of BMI in a collaborative and cognitive perspective.

2. METHODS

Our research involves a qualitative approach through a single case study (Yin, 2009), relying on data gathered from a European project: Pix.T (see subsection 2.1.) We conducted an intrinsic case study, emphasizing an exploration of the intricacies within the single case to gain a deeper understanding, aligning with Stake's (1995) perspective. This case study has been supplemented by a survey distributed to a limited sample for reasons of project confidentiality. Stake (1995) emphasizes that the selection of the case is not for the purpose of generalizing to other cases but is driven by the inherent interest in the unique characteristics of the case itself. We consider Pix.T as a distinctive and pertinent case that offers insights to understand how to organize the experimentation of an open BM during its cognitive construction. Notably, unlike other cases discussed in BM literature, our examination of Pix.T allows us to unpack the experimentation process and understand more precisely the relationship between individual

cognition and collective cognitive construction. This aspect makes our case valuable and contributes to both research and practical understanding.

2.1. PRESENTATION OF THE PIX.T PROJECT

To address the photojournalism crisis (see section 1), an open innovation approach is required as there is a need to establish a new value logic through a new standard of protection and traceability for news photos (involving a new economic value assessment system for the photos). This is the ambition of the Pix.T project, bringing together a diverse range of industry stakeholders in an open innovation process (to be explained through the workshops we conducted) to design a platform for storing and tracing news photos. The platform itself will be an open space conducive to innovation as it will incorporate collaborative principles among stakeholders within innovative services (reiterating our BM) to establish a new, more sustainable, and equitable value logic.

Concretely, Pix.T is a blockchain-backed technology to drive a new digital economy for professional photography and visual storytelling. Bringing together leading technologists with photojournalists, visual creatives, international media and art market leaders, Pix.T aims to maximize the value of photographic work, ensure control and ethical practices for creators and find new market opportunities for the industry**.** Pix.T is the innovative photography marketplace built on trust[1]: a secure, easy-to-use technical protocol designed in the interest of photographers. It entails a unique blockchain solution that guarantees transparency and security and reestablishes scarcity, restoring true value in top photography for our digital future. Pix.T also prevents digital image theft through blockchain-backed image streaming players. Finally, it

[1] For more information, see the Manifesto of Pix.T Pix.T - A Manifesto for professional photography in the digital age (pixt.co)

gives photographers exclusive print sales via news partnerships, managing digital licensing, logistics and revenue shares.

The Pix.T solution is developed by 5 partners from the whole photojournalism industry[2] and 5 technical partners (see Table 1). Both researchers involved in the project has been considered as partners (to ensure the confidentiality of authorship, we do not include us into table 1).

Table 1: partners of Pix.T

Partner	Country	Nature	Information
Worldcrunch	France	digital media created in 2011, based in Paris, France	Number of pictures used daily: 2 to 8 Turn over 2020: 692 K€
NOOR Images BV (NOOR)	Netherlands	photo agency created in 2007, based in Amsterdam, Netherlands	Scope: Representing a global collective of accomplished journalists, filmmakers and photographers investigating, documenting and witnessing the world's challenges. Size: 20 Number of photographers: 14 Number of new photos daily: 50 Archives photos: 70.000 Number of clients: 300-400 Number of redistributors: 7 Turn over 2020: € 780.755, 48
Photomakers Srl (Contrasto)	Italy	photo agency created in 2020, Rome, Italy	Italian photo agency syndicating its material – photographers' production and archives - in over a hundred countries worldwide. The agency also syndicates some of the most important agencies worldwide in Italy such as Magnum Photos, The New York Times, Redux, AUGUST, Camera Press, The Guardian/The Observer, and the such. Size: 9 Number of photographers: about 90 Number of new photos daily 100 Archives photos: about 1,250,000 Number of clients: 300-400 Number of redistributors: 7

[2] Customers of media partners are indirectly involved: (1) NOOR (*Le Monde, Der Spiegel, The Washington Post*), (2) CONTRASTO (*Internazionale, La Repubblica, The Guardian*), (3) CTK (*Právo, Deník, ČT24*), (4) PAP (*Gazeta Wyborcza, Fakt, Telewizja Polska S.A*).

Ceska Tiskova Kancelar (CTK)	Czech Republic	Czech News Agency	Scope: national News agency in the Czech Republic with operations in Slovakia and Hungary, Croatia and Romania (through subsidiary) Size: 250 employees Number of photographers: 30 (staff) Number of new photos daily: 200 CTK's pictures in wire Archives photos: 8 mil., 100+ mil. pictures in Profimedia databases Number of clients: several hundreds Number of redistributors: - Turn over 2020: 10,3mil €
Polska Agencja Prasowa SA (PAP)	Poland	Polish news agency	Scope: National news agency, provider of text, photo and video services for polish media and government institutions Size: 390 employees Number of photographers: 53 Number of new photos daily: 1500 Archives photos: 16 500 000 Number of clients: approx 1 000 Number of redistributors: - Turn over 2020: 14,630,685€
Tyger Tyger	France	UX and development agency	Creating the current version of the Pix.T prototype
InBlocks	France	blockchain developer and integrator	Creating the back end of the current Pix.T prototype
42c	France	Developer	Creating the front end of the current Pix.T prototype
Profimedia. CZ	Czech Republic	CTK entity	Designing the relevant connectivity between the Pix.T database and services and test the integration of the Pix.T solutions within CTK and Profimedia workflows

2. Data collection and analysis

We gathered our data from diverse sources. First, we collected primary data with a 2-year research action. This research action included the integration of both researchers in the Pix.T project (participation to the kick off meeting, to the monthly online meetings, collecting data from 10 semi-structured interviews (see Table 2), leading a focus group with the partners during a meeting in Paris (see Box 1), participating to meeting with technical teams, etc.) This data has been supplemented by various secondary sources. This approach aimed to enhance construct

validity and facilitate result triangulation, following Yin's (2009) recommendations. The data collection period spanned from March 2022 to March 2024.

Table 2: interviewees profile

Date	Organization	Role in the organization
25/05/2022	CONTRASTO	Directrice
25/05/2022	CONTRASTO	Responsable de la production et des archives
26/04/2022	NOOR	Productrice culturelle
14/04/2022	CTK	Directeur
14/04/2022	CTK	Responsable production
16/05/2022	PAP	Directeur marketing et ventes
16/05/2022	PAP	Manager commercial
07/06/2022	WORDLCRUNCH	Directeur
07/06/2022	WORLDCRUNCH	Assistant
09/06/2022	TYGER TYGER	Dirigeant

For the semi-structured interviews, an interview guide, derived from the initial theoretical framework, guided the questioning process. Initial questions were broad, addressing *Actor background and business strategy* to better understand the partners, followed by more specific inquiries about *Environment, ecosystem and industry business model* and *The Pix.T project*, to better understand the barriers, needs for a solution to meet the photojournalism crisis. The interviews, lasting between on average 90 minutes, were recorded and fully transcribed to enhance reliability (Eisenhardt, 1989).

Box 1: a focus group with the Pix.T partners

On September 5, 2022, we organized a focus group with all the organizations participating in the Pixt project (excluding the technical provider). The focus group took place at the offices of the leading company on the project, Worldcrunch. Lasting for 3 hours, we proceeded in multiple stages. After an introduction to the workday and an "icebreaking" session, we initially asked organizations to work individually on their perception of the photojournalism ecosystem and to

clearly formulate the issue addressed by Pix.T. This led us to the following problem: the lack of value of the digital image. Pix.t should propose a blockchain solution that provides encrypted, tracked, and trusted photos. We consolidated the visions of all participants, which, not surprisingly, converged. This allowed us to stabilize key players and relationships among them. In a second phase, we asked partners, again individually before sharing collectively, to work on the industry's value chain. Titled "Designing the Value Chain and the Ecosystem of Partners," this session focused on developing the central value proposition of the Pix.T project by identifying key activities and the actors responsible for them, specifying whether each was a new or existing activity and whether it was primary or secondary. Finally, a third step titled "Identifying the Main Risks and Problems" involved partners identifying obstacles, risks, and solutions, and classifying them by importance. Like the other stages, partners were initially asked to work individually before converging collectively. The focus group was recorded, and documents and visuals were produced.

All the qualitative primary data has been analyzed according to the Miles and Huberman (2003) iterative content analysis methods, which involves a 3-step process (data condensation, data presentation and conclusion). Concretely, we read the interview transcriptions and categorized them into units of analysis, namely codes derived from the literature. By engaging in iterative cycles between theory and practice as recommended by the authors, we also identified emerging code categories.

Finally, as part of the project, we conducted a questionnaire with 39 industry stakeholders. This survey was administered, distributed, and analyzed using Sphinx software. Its purpose was to complement the initial insights gathered from the semi-structured interviews conducted with project partners. The questionnaire consists of 4 sections and 18 questions. Due to the confidentiality of the Pix.T project at the time of its distribution (a project still in technical

development), our sample was limited to the most significant clients of our partners, explaining the restricted number of respondents.

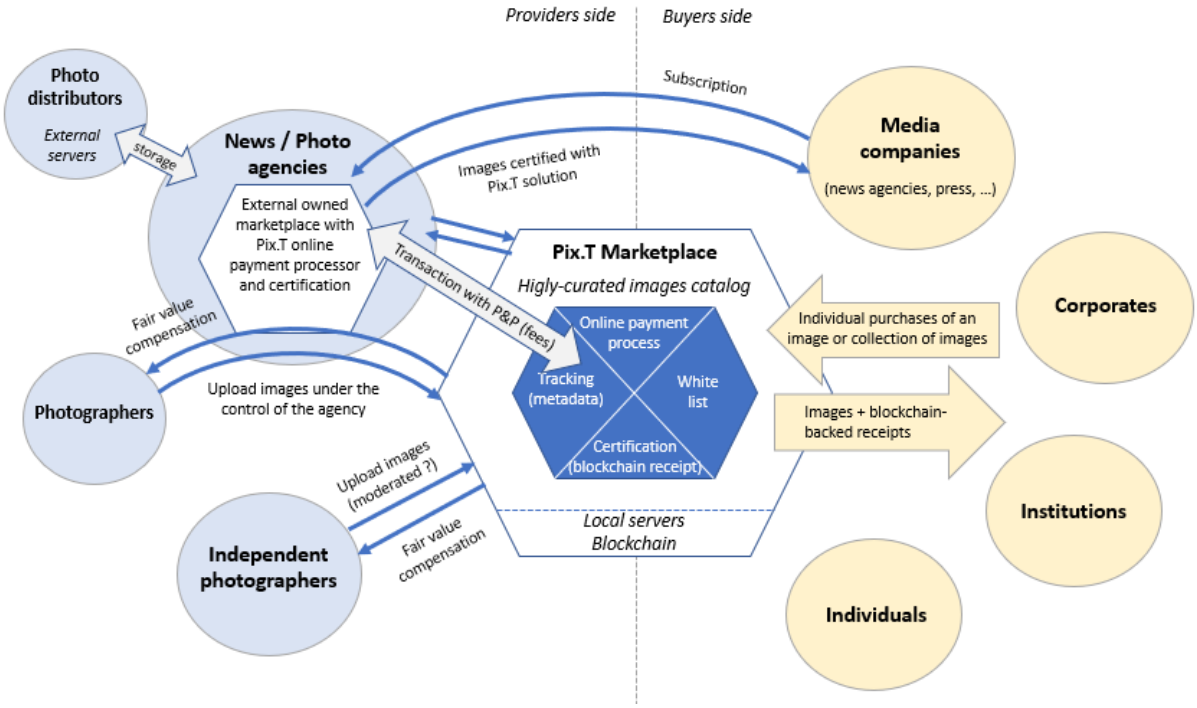
3. KEY RESULTS

Our preliminary results are based on the Pix.T project, studying the construction of a BMI of a group of actors collectively addressing the crisis in photojournalism. Three main findings emerge from our work. Firstly, it appears that the experimentation process of a BMI is intertwined with the prototyping process. A second result demonstrates that experimentation pushes actors to individual barriers awareness that can hinder collective cognitive construction. Finally, our last result shows that openness dynamics is essential to facilitate this process, whether through shared spaces or common practices.

3.1. A BMI EXPERIMENTATION PROCESS EMBEDDED WITHIN THE PROTOTYPING PROCESS

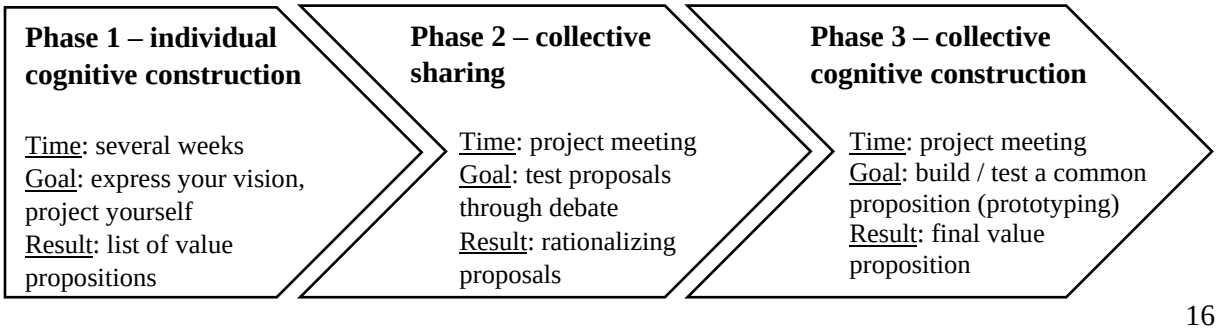
Our first result describes an embedded experimentation process with the BM prototyping process. The Pix.T project demonstrates that experimentation is conducted to test the prototyping hypotheses, making it an agile and feedback-driven process. The BM prototyping (cf. figure 1) went through a set of steps.

Figure 1: Pix.t Business Model



Each actor was invited to reflect individually over several weeks on the BM of the photojournalistic industry and the project in which they were involved. Subsequently, an in-person focus group was conducted to encourage each partner to reveal their own vision of the BM, consolidated by collective collaboration to reach a final value proposition. During this step, various visual representation tools (diagrams, figures, drawings, graphics, etc.) were necessary to formalize the state of the BM at a given moment and experiment with the value hypotheses formulated during the prototyping stage. During the focus group, data analysis thus enables us to describe the experimentation process and its interaction with the prototyping process. More specifically, we identify three key phases (cf. Figure 2):

Figure 2: cognitive process of BMI experimentation



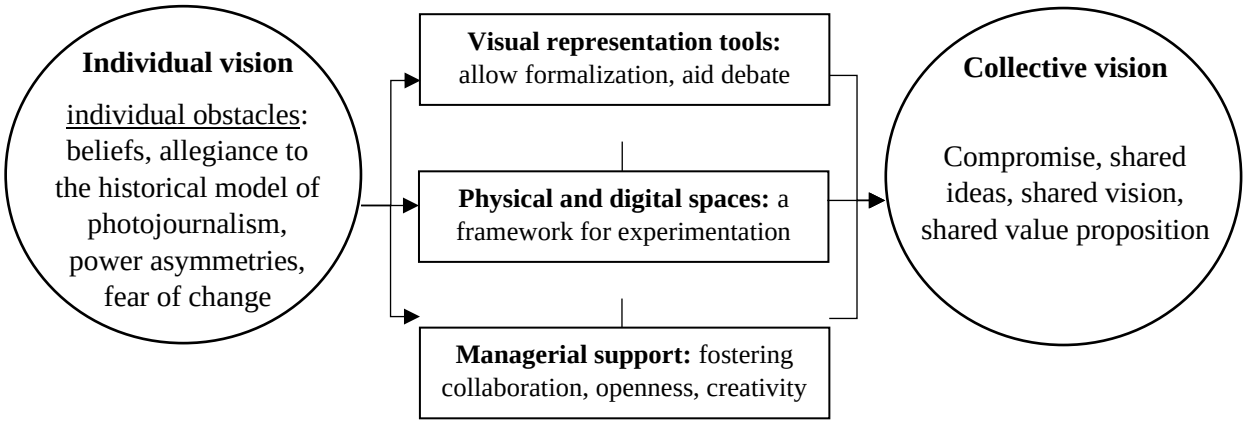
- (1) individual cognitive construction, enabling players to envisage a new value proposition based on their view of the industry and its dysfunctions. This phase is an essential individual prototyping exercise, enabling players to express their vision and project themselves into a new, disruptive open BM.
- (2) collective sharing of individually constructed value propositions and debate. This phase is essentially focused on experimentation, as it aims to collectively debate individual value propositions, allowing each player to express himself, to be listened to and to set out his arguments for or against certain value propositions. The result is a rationalization of propositions, some of which are discarded in favor of others that are conceded.
- (3) the construction of a common value proposition. Based on the previous debates, this phase simultaneously involves collective prototyping and in situ experimentation of this prototyping. Indeed, we note that actors collaborate to use elements of individual value propositions to design a common proposition. Each actor's argument or creative proposal is immediately tested against industry knowledge and data. This is not a concrete experiment, but a cognitive one, calling on the players' knowledge and understanding of the possibilities and impossibilities of the current industry. The aim of this phase is to produce a common value proposition, tested and validated collectively.

3.2. THE IMPORTANCE OF COLLECTIVE COGNITIVE WORK TO OVERCOME INDIVIDUAL-LEVEL OBSTACLES

Within the experimentation of the Pix.T project's BM, we observe that the key point is the transition from individual to collective construction of the value proposition. But this transition is complex because even if the actors are similar, different organizations within the project have their markets, clients, constraints, culture, and geographical contexts. Each has

their own idea of what the current BM of photojournalism is and what the BM of the Pix.T project should be. Our data show that this leads project actors to face individual obstacles, such as beliefs, allegiance to the historical model of photojournalism (with its dependencies and power asymmetries) for some, a fear of change. To identify and overcome these individual cognitive obstacles that negatively impact a collective common vision, we identified three types of factors implemented in the Pix.T project: visual representation tools (previously mentioned), spaces (virtual or physical), and managerial guidance (cf. Figure 3):

Figure 3: factors supporting transition from individual to collective construction



- (1) visual representation tools are essential for formalizing the results of cognitive construction. For example, individual actors were encouraged to write down several value propositions and choose the one with the most potential. Each individual value proposition was then plotted in a collectively shared table so that the propositions could be compared (which facilitated debate and experimentation). The prototyping of the BM including the common value proposition was also the subject of a schematization, in order to get the players to experiment with the articulation of the value creation, proposition and capture components. At each stage of the process, visual tools were used as formalization aids, enabling the cognitive construction to evolve towards a shared vision.

- (2) spaces (physical and digital) are also essential for collective prototyping and experimentation. As part of the Pix.T project, several spaces were set up and used for meetings and work sessions. Firstly, digital spaces were used to stimulate players in the individual construction of their value proposition, but also to obtain feedback in relation to visual representations, shared visions of the BM, and so on. These digital spaces ensure a permanent connection between project players, and centralize file storage and project progress. Next, a physical space was set up to bring the players together and carry out the focus group. Face-to-face meetings were essential to ensure the performance of the collective prototyping and experimentation process. As a result, the players were more involved than in the virtual spaces, and fully invested in the collective construction of the Open BM.
- (3) managerial guidance is crucial to support collaboration between the players and promotes openness conducive to creativity. The initial challenge was to encourage individual expression and the sharing of ideas, to avoid frustration and compartmentalization between players. Highly participative management methods were implemented to achieve these objectives, while taking care to moderate any power plays between players. Other, more directive practices were sometimes used to encourage players to make choices at the end of the experiment: what should be kept for collective construction, and what should be abandoned? Managerial support was therefore essential to engage and motivate players in prototyping and experimentation, but also to create a positive, non-sanctioning collaborative dynamic.

These three factors have facilitated the transition from individual cognition to collective construction by overcoming the individual barriers of each actor.

3.3. THE IMPORTANCE OF THE LEVEL OF OPENNESS IN ORCHESTRATING THE EMBEDDED DYNAMICS OF BM EXPERIMENTATION AND PROTOTYPING

Finally, our results tend to show that for the integration of the two processes of prototyping and experimentation to work, a very strong dynamic of openness must be experienced by the actors within the project. Regarding tools, first and foremost, within the Pix.T project, special care was taken to ensure that they were as collaborative and shared as possible, discussed, and validated by all actors (especially during the focus group). The same tools were made available to all actors for individual work and were then discussed together, projected for everyone to see, in order to work collectively.

Concerning spaces, our results have already highlighted the importance of the collective in-person focus group. Special attention was obviously given to this meeting: the organization of a single collective workspace, materials, and an atmosphere conducive to openness and creativity, etc. However, the importance of virtual spaces should not be underestimated. The Pix.T project lasted for 2 years and is ongoing. Given the geographical distribution of members, virtual collaborative spaces were adopted, especially through Google (shared documents, monthly Google Meet meetings, etc.). Coordinated under the guidance of the project leader, these monthly meetings were conceived as open discussions following agendas aimed at presenting the project's progress. Openness thus stimulated exchanges and transitioned from the individual to the collective throughout the entire process.

4. DISCUSSION

4.1. THEORETICAL CONTRIBUTIONS

Our preliminary findings lead us to discuss three key elements. Firstly, it is pertinent to discuss the processual dimension of experimenting with a BMI. Indeed, our results demonstrate

that the experimentation process cannot be considered independently of prototyping (Geissdoerfer et al., 2022) and the cognitive co-construction dynamics of the BM (Eppler et Platts, 2009). It is an embedded process that shows back-and-forth movements at different levels: (1) individual vs. collective, as project actors are led to test their own convictions and obstacles in the face of the collective construction of the BM, and (2) local vs. global, as actors test the collective vision of the value proposition against industry actors. In the case of Pix.T, experimentation is mainly used to reduce market uncertainty (Baden-Fuller and Mangematin, 2013) regarding the introduction of a new disruptive value proposition, capable of changing the rules of the game in the industry (Jacobides et al., 2006). It's also about anticipating technological and usage issues (Koning et al., 2022) in bringing to market a new protocol for certifying news photos using blockchain technology. Finally, experimentation promotes learning effects in a trial-and-error process management (Sosna et al., 2010), as the testing of value hypotheses provides knowledge about which elements to change and which to keep.

Our preliminary findings also prompt a discussion of boundaries in the context of experimenting with a BMI. Indeed, cognitive dynamics are fundamental to dislodging individuals from their beliefs and allegiance to dominant model(s) in the industry (Kotter, 2007). In this sense, experimentation provides a framework for resolving the individual barriers that can hinder collective work (Breuer and Lüdeke-Freund, 2017). Visual representation tools are particularly effective for carrying out this work, as they formalize cognitive visions and anchor them in reality (Massa et al, 2017). Experimentation also has a positive effect on stakeholders' ability to align around a focal value proposition (Adner, 2017), as it provides a testing framework for prototyping and encourages collective decision-making. Boundary work is thus essential: spatial delocalization, anchoring work (Bojovic et al. 2020). Beyond opening spaces, our work suggests the interest in creating an experimental space (Cartel et al., 2019) in the context of BMI.

Finally, in this line, a last point of discussion relates to the project's openness since our results show that the cognitive dynamic in the experimentation/prototyping process relies on a predisposition to openness. Establishing such a dynamic is therefore essential to sustainably engaging players in BM's innovation activity (Chesbrough, 2006), particularly when the stakes are high and concerns the industry and/or societal scale (Kortmann and Piller, 2016). The dynamics of openness must then facilitate the exchange of ideas and knowledge, as well as the sharing of resources essential to the co-creation of value (Spieth et al., 2020). However, this predisposition to openness implies more than mere exchanges: a collaborative BM (Saebi and Foss, 2015) must be designed, with goals, governance, and mechanisms that may conflict with other forms of BMI. From this perspective, the choice of management style and of physical and virtual spaces are crucial to orchestrating the dynamic of openness (Chesbrough, 2017).

4.2. MANAGERIAL CONTRIBUTIONS

This study provides actionable insights for managers and stakeholders in the photojournalism industry and beyond. By unpacking the experimental process of business model innovation (BMI) within the Pix.T project, the findings highlight several key managerial takeaways:

Integrated Prototyping and Experimentation. Managers are encouraged to view experimentation as an embedded component of the prototyping process. The iterative back-and-forth between individual and collective cognition ensures robust value propositions. This approach can be adopted in other industries facing digital disruption to foster adaptive and resilient business models.

Overcoming Cognitive Barriers. The study emphasizes the importance of addressing individual-level cognitive obstacles, such as adherence to traditional models and fear of change. Managers should employ tools like visual representations and structured spaces (both physical

and digital) to facilitate the transition from individual to collective construction. These mechanisms can drive alignment among diverse stakeholders, a critical factor for innovation success.

Openness as a Catalyst. The results underscore the necessity of openness in tools, processes, and leadership. Managers should cultivate a collaborative culture, ensuring that shared resources, ideas, and goals are central to the innovation process. This openness not only enhances creativity but also improves stakeholder buy-in and commitment.

Role of Managerial Support. Effective managerial guidance plays a pivotal role in mitigating conflicts and ensuring smooth collaboration. Managers must balance participative and directive practices to enable creativity while driving collective decision-making.

For photojournalism specifically, the Pix.T initiative demonstrates how blockchain technology can restore value and fairness in a disrupted market. Managers in similar creative industries can draw on these insights to design digital solutions that balance ethical practices with new revenue opportunities.

4.3. Limitations and Future Research Directions

While this study provides valuable insights into the cognitive and collaborative dynamics of BMI, several limitations must be acknowledged, offering avenues for future research. First, the findings are based on a single case study, the Pix.T project. Although rich in detail, the results may not fully apply to other industries or contexts. Future research could explore similar dynamics in different sectors facing digital transformation to validate and expand the findings. Then, the research spans two years of the Pix.T project, capturing its early phases. Longitudinal studies that examine the sustained impact of the BMI process over time, including the operationalization and scaling of the proposed model, would provide a more comprehensive understanding. Finally, while the study highlights blockchain's potential in photojournalism, it

does not explore the technical challenges or adoption barriers in detail. Future research could investigate these aspects to provide practical guidance on implementation. By addressing these limitations, future research can build on the foundational insights of this study, offering deeper and broader perspectives on BMI in disrupted industries.

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