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RESEARCH

Paradoxes of Innovation in French Digital Comics

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The word 'innovative' and its lexical field of novelty are often used to market digital comics. This obsession with everything new implies a specific link to the past. Anything which breaks with prior methods or forms of graphic creation becomes innovative. However, the formal evolution of French digital comics does not match with this linear pattern of innovation. This paper presents an analysis of the idea of innovation in relation to the long-term history of French digital comics creation. Whilst the technical means of graphic creation have improved since the 1980s, does that necessarily mean that the form and aesthetics of digital comics have evolved simultaneously? What is the role played by traditional printed comics in the aesthetic evolution of digital comics? Starting with the 1990s, it is not the potentiality but the reality of technological innovation that we will try to understand through time.

Keywords: digital comics; innovation; technological progress; webcomics; digital media

In the mid-1990s, digital comics established themselves in English- and French-speaking areas as graphic works sharing three main characteristics: born-digital comics, produced and designed for publication in a digital format, and works that formally 'look like' comics through the use of traits specific to its media identity (sequentiality, speech bubbles, etc.; see Wilde 2015). As digital comics started to reach a much broader audience, the twenty-first century opened up a confrontation with the many recent evolutions of digital technologies, both in terms of creation and distribution, for comics as for other arts. Born '*on* print, and perhaps even *from* print' (Robert 2016: 11; my translation), comics have been driven to question their secular attachment to material print formats, in order to interrogate the possibilities for a transition, perhaps even a transfer, to digital distribution.

The novelty aspect of this transition process from print to digital is seldom challenged, as if 'going digital' necessarily implies formal changes, without also going back to older forms. As can be expected, the narrative that emphasizes the novelty of digital comics is often used in marketing departments as a selling point. The example of the media advertising strategy of the French webtoon publisher Delitooon shows a constant relentless promotion of 'novelty,' 'invention' and 'innovation.' The 'About' page of the Delitooon website launched in 2011 claimed to 'transform comic to match with its own time and with a new reading medium, the screen' ['transfigurer la bande dessinée pour l'adapter à son temps et au nouveau support qu'est l'écran', my translation] (Delitooon 2018). Five years later, in a 2016 interview, Didier Borg, founder of Delitooon, says that '[w]ith Delitooon, we propose a new form of comic' (Bry 2016). This emphasis on formal innovation is also a recurring feature in scholarly discourses. In his well-known essay *Reinventing Comics*, Scott McCloud (2000: 202) specifically describes the encounter between comics and digital technology in terms of change and invention. The majority of learned publications about digital comics stress out the formal changes implied by the technological transition and overlook the idea that these changes are not self-evident when considered from a historical point of view. In fact, they follow a certain conception of digital media as a linear transformation process, as expressed by Bolter and Grusin in their conclusion: 'Each month seems to bring new evidence of the voracity with which new media are refashioning the established media and reinventing themselves in the quest for immediacy' (Bolter and Grusin 1999: 267). It is common to describe the digital transition as a linear process supposedly evolving towards the goal of an 'all-digital' form.

Without denying that digital technology introduces a number of changes into the form of comics, I believe it appears necessary, more than twenty years after the appearance of the first digital comic, to get a better understanding of how these many changes evolve through time, questioning the linearity of this process and their outcome as a 'new' form. In other words, the relationship between comics and the digital needs to be historicized: adopting a historical point of view can help us understand not only how digital technology transforms comics, but also how and at what pace these changes occurs in time.

First of all, the knowledge we have of the early history of French digital comics (Baudry 2012) appears to be in contradiction with the narrative of linear innovation: the very first digital comics created during the 1990s (*John Lecrocheur, Opération Teddy Bear, Supershoes* to name a few...) are in many ways more innovative with form than most of the digital comics of the late 2010s. The context of French digital comics reveals a paradox between the widespread idea of a linear transition towards novelty in digital form and the empirical observation that comics simply do not follow that direction. In the field of digital media studies, the historical context has also been highlighted as the best way to avoid novelty and linearity biases (Gitelman & Pingree 2003, xiv).

Moreover, a historiographic approach to comics gives us the intellectual tools to verify and confirm that first impression. Comics historians have become skeptical when thinking about formal development. Following the recent historiographic reflections of Thierry Smolderen (2014), Harry Morgan (2003) or Éric Maigret (2012), comics history is less seen as a progressive tendency towards a definitive form than as the record of the ceaseless mutations of an ever-changing form. Maigret explains how comics appeared as part of 'widespread artistic experiments within the context of media industrialization,' hence within an environment where 'there cannot be any definitive definition of what comics are, since something innovative can appear at any time and challenge established canons' (Maigret 2012: 68; my translation). Applied to digital comics, this historiographic statement leads us to consider a process that can go in various directions at the same time, rather than a mechanical process of innovation. The general aim of this article is thus to establish benchmarks that can help us to better frame technological change as a historical process, mindful of the specificities French digital comics. In turn, by applying a historiographic approach to digital comics, I hope that the established guidelines will feed back into a wider perspective on digital media history.

Preliminarily, two important distinctions are necessary to situate the disciplinary framework of this article. The first one comes from the history of technology, and particularly the field of science and technology studies (STS), which differentiates two distinct processes at work when we think about technological changes. Historian

of technology Bertrand Gille distinguishes *invention*, as the discovery or development of technology, from *innovation*, which he describes as a 'site of convergence' between the technological system on the one hand, and on the other, the economic, social, political and institutional systems (Gille 1978: 64–65). Innovation, in other words, happens through the 'positive endorsement by the users' of a technological invention (Akrich et al. 1988: 4–29). In the case of digital comics, what ranks as invention is the technological system that feeds into the creation of digital comics (graphics software, tablets, web technologies, etc.), while innovation designates the ways authors and readers appropriate these new technologies.

In the case of webcomics, for instance, the three major technological shifts pointed as decisive by Campbell (2006) are hypertext, image display and global interactivity. When thinking about digital media, it is important to single out *innovation* from *invention* in order to historicize the process. The main emphasis of this article, however, is not on social-economic changes: my focus is on comics as form, not as a cultural industry. My assumption is that the formal development of comics follows its own path: it is linked to the way technology alters social-economic practices, but does not necessarily move forward at the same pace. We can apply the distinction between *innovation* and *invention* to formal changes, and define formal innovation as opposed to the invention of new forms within the field of comics. The identification and classification of such formal inventions in digital comics is an avenue of research in itself, already explored, for instance, by Magali Boudissa (2010, 2016), whose typology will inform the present article. Boudissa's typology focuses on formal transformations from print to digital, offering a helpful context to precisely describe and understand formal innovations in digital comics (as opposed to changes in use). She maps out three types of visual invention: shift to screen, addition of sound and animations, interactivity. Drawing from this typology, my focus will rather try to understand how (and whether) these inventions, after their appearance, circulate and become widespread, in other words how these formal inventions become formal innovations. The development of this article draws on a historiographic perspective that grounds the textual analysis of digital works on a larger temporal scale. To avoid cherry-picking pitch-perfect illustrations (as is often the case in research on digital comics), I will

look both at specific examples and larger corpora. A first step will consist in making specific comparisons through time in order to better understand when and where innovation takes place. Shifting to the statistical analysis of a larger body of works, I will then try to identify a phenomenon of resistance against that formal innovation. Lastly, I will propose a periodical, chronological framework to think about formal innovation in digital French comics in the context of technological evolutions.

Identifying Paradoxes in Innovations

The methodology of comparing various works across time accomplishes the goal of identifying the process of formal evolutions between two moments in time. It can be difficult to make sure that the comparative corpus selected will be representative of general evolutions. To prevent any such bias, instead of relying on just one comparison between two comics drawn at different periods, I have preferred to look for converging changes in different contexts. Therefore, I propose three successive comparisons: a first one between two works selected for their representative quality of a phenomenon that is already known and identified as specifically bound to their respective periods by other researchers; then, the account of the trajectory of a single author through decades; finally, a comparison between two collective projects that implies more than one author, and as such can show a more global development.

The two works that I selected for comparison each belong to and represent a decade in digital comics history:

- On the one hand, Simon Guibert and Julien Malland's *John Lecrocheur*, produced in 1998–1999 by I/O Interactifs and Wanadoo Éditions. This work is similar to many other pieces of the same period, usually described as 'multimedia' (Falgas 2014: 46–57), such as *Opération Teddy Bear*, *L'Oreille coupée*, *Supershoes*.
- On the other hand, Jibé's webcomic titled *Sans emploi* and distributed through his blog from 2004 to 2012 (**Figure 1**). The serial distribution and formal choices of this comic can be related to many other similar works born out of the 'blogs bd' (Caboche 2013) trend manifest since 2004 (*bouletcorp.com*, *Un crayon dans le coeur*), but also with slightly earlier examples (*Lapin*).



Figure 1: Jibé, *Sans emploi*, July 8, 2009 available at: <http://web.archive.org/web/20121014070124/http://sansemploi.chezjibe.com/> © Jibé.



Figure 2: Jibé, *Sans emploi*, top strip from February 18, 2004, bottom strip from 2010, available at: <http://web.archive.org/web/20121014070124/http://sansemploi.chezjibe.com/> © Jibé.

John Lecrocheur (Guibert and Malland 1998–1999) is a spy fiction in a slideshow format that is complex in its make-up, as the reader has to click on the panels to make the following panels appear as well as to trigger animations and sound effects, while this reading experience is further enhanced with a soundtrack. *Sans emploi* (Jibé 2004–2012) appears as a series of four-panel comic strips, integrated into a webpage on which the strips are published on a regular basis (**Figures 1** and **2**). The strip follows the everyday life of Corentin, an unemployed hero reminiscent of André Franquin's character Gaston Lagaffe. The strip is drawn in a minimalist drawing style, slightly amateurish in its first version, and, safe for the third and sixth seasons, will remain consistent throughout its seven-year-long serial publication. It displays none of the complex digital effects seen in *John Lecrocheur*.

The formal comparison of both works already highlights striking differences, which are detailed in the following **Table 1**, following Boudissa's typology of formal innovations:

Table 1: Comparing *John Lecrocheur* and *Sans emploi*: what formal innovations? Table by Julien Baudry, 2018.

Criteria of Formal Innovation	<i>John Lecrocheur</i> (1999–2000)	<i>Sans emploi</i> (2004–2012)
Shift to screen	The page is 'deconstructed': panels are overlaid on each other following the reader's clicking (Figure 3).	The format follows the newspaper gag strip as a sequence of four panels to tell a short gag.
Addition of animation and sounds	Animation effects are used (e.g. landing of a seaplane) together with sound (music and effects).	No animation nor sound effects are used, all images are static.
Interactivity	The reader must find where to click on the page to unfold the narrative; his click can trigger actions within the diegesis (lighting a cigarette, etc.).	The reader is allowed to add comments (external to the story).



Figure 3: Three sequential screenshots showing the diaporama format of *John Lecrocheur*. Guibert S. and Malland J., *John Lecrocheur* (I/O Interactifs and Wanadoo Éditions, 1998–1999). Available at: <https://www.criticalsecret.com/lecrocheur/en/ep1.html> [Last accessed 11 February 2016]. © Julien Malland et Simon Guibert & I/O Interactifs & Wanadoo.

Sans emploi largely follows, without transforming it, the formal model of the printed newspaper strip, whereas *John Lecrocheur* uses by various means the specificities of its digital format. The comparison thus immediately spotlights a paradox: of both works, the most innovative in terms of form is also the older one, *John Lecrocheur*.

This paradox is not an isolated case but also shows up in at least two other comparisons. Cartoonist Fred Boot's career is similarly marked by a trajectory from a high degree to a lower degree of formal innovations. Indeed, the digital adaptations of Frédéric Boilet's comics albums that he realizes between 2002 and 2004 in the context of the nouvelle manga present sound effects and animations (*Chuban*) or call onto the reader's actions to trigger an interactive engagement with the comics (*L'Épinard de Yukiko*). In both cases, they break down the traditional comics page to foster a reading mode adapted to the screen. By contrast, Fred Boot's works published since 2008 on the webcomics platform (such as *Balsamo*, *Shao-Bai-Bai*) include neither sounds, nor animation, nor interactivity; their format remains close to the traditional multi-panel layout of the comics page.

A similar discrepancy can be drawn from the comparison between two collective projects led by professional cartoonists: the @Fluidz webzine published between 1999 and 2005, and the 8comix platform regularly updated between 2011 and 2014. From the forty-something comics uploaded on @Fluidz and still available today, only two followed the traditional strip or page formats. About fifteen others integrate sound and videos. By contrast, across the nine comics published online at 8comix, only two uses the screen in other ways than the classic formats of page or strip, relying on vertical scrolling (Efix's *Anarchie dans la colle*) and diaporama (Stéphane Gess' *Gustave Babel*). None feature sound, animation, or interactivity.

These three analyses lead to the same paradox: recent digital comics appear as less formally innovative, while earlier comics make formal choices that take into account the potentialities of their digital format. I do not mean to highlight this change so as to assert a value judgement: *John Lecrocheur* is not necessarily a 'better' digital comic than *Sans emploi* because it takes avail of the specificities of its format, or because it takes more distance from print comics. While remaining cautious in my

wording, I would like to stress the implications of this analysis for the larger issue of technological progress in the context of comics, which are threefold:

- Technological progress does not appear as ineluctable: the formal development of digital comics does not necessarily go hand in hand with a growing awareness of technological changes.
- Paradigmatic changes for technology are not best read in terms of rupture: innovations do not entail the disappearance of earlier, older forms.
- Potential formal innovations are there from the start: they do not appear gradually, one after the other, they are directly part of the cartoonists' knowledge, who are conscious of their abilities early on.

This last assertion is furthermore backed up by digital comics theories, such as François Schuiten and Benoît Peeters' *L'Aventure des Images* (Schuiten, Peeters 1997) or Scott McCloud's *Reinventing Comics* (2000), which very early laid the foundations for various kinds of formal invention. The description of creative potentialities, however, was not immediately taken up by cartoonists in their works. The diachronic comparison of French digital comics thus suggests that the integration of formal innovations linked to new technologies in the production of comics did not follow a logic of progress.

Paradoxes of Innovation: Causes and Analysis

This paradoxical phenomenon is only an apparent paradox: the history of technology teaches us that it takes time for inventions to reach widespread use. The specific case of digital comics might be grasped through Jacques Perriault's notion of the 'diligence effect,' a major trend in the history of technology: 'It takes a certain time for a technological invention to adapt and become an innovation as Bertrand Gille sees it, that is to become socially accepted. During this acclimatization period, old protocols are applied to new technologies. The first wagons were shaped as diligences' (Perriault 2002: 52–53). The history of technology thus appears as a social history powered by users' knowledge rather than the primacy of invention. Consequently, the appearance of *Sans emploi* after that *John Lecrocheur* (and others) had explored

formal innovations made possible by digital technology cannot be read as a step back in any way, but rather as a transitory moment within a social history of formal innovation. It shows a process of acclimatization during which forms of print comics remain present.

In his analysis of print comics digitized and distributed through the Izneo platform (the main distribution platform for digitized comics in French-speaking countries), Benoît Berthou makes the following observation: 'the added value of the digital does not go without saying. [...] It must be noted that information today, despite the emergence of new technologies, remains organized by following the hegemonic model of the book' (Berthou 2016: 200–201; my translation). In fact, the same goes for original, digital-born comics of the same period, which is subjected to the same 'hegemony.' The odd experimentation aside, the fact remains that the dominant aesthetics in digital comics from 2005 to 2009 is that of the 'scan' which Anthony Rageul derogates as 'creation under the print paradigm' (2014: 12; my translation).

The 'resistance' of print in the face of technological innovation hence appears as a distinguishing feature of that period. Focusing on the persistence of materiality within digital graphic creations brings out the extent to which digital comics artists of the 2000s are potentially influenced by print standards. To draw a general overview of this phenomenon, however, the comparative analysis of key examples falls short and does not prove sufficient to map out the amplitude of the permanence of print standards. I will thus shift my method to the statistical analysis of a much larger corpus, based on a selection of works published on Webcomics.fr in the year of its launch in 2007. The nature of the corpus is also different, as Webcomics.fr is an open self-publishing platform that is mainly used by amateur and semi-professional cartoonists (Zouari 2009). The technological set-up and publication tools specific to this platform are particularly interesting for my argument as they are open and, in principle, do not prevent from uploading formally innovative comics.

Nevertheless, here are the results obtained after sorting the 89 entries published on Webcomics.fr in 2007 into three categories based on their formats (page, strip, and other format bearing no direct reference to print):

- 65% use the 'page' format (**Figure 4**)
- 18% use the strip format
- Only 17% break out from these two formats.



Figure 4: Example of a comic distributed in 'page' format, presented here with its reading environment. Dr Folaweb, *Deo Ignito*, Webcomics.fr, 2007–2015, available at: <http://deoignito.webcomics.fr> [Last accessed 11 March 2016], © Dr Folaweb.

Only two comics, moreover, actually make use of effects that could be considered as specifically linked to the digital, by combining animation, sounds, hyperlinks in images, interactivity, etc. In several cases, many artists try to keep 'paratextual' elements directly drawn from the printed book such as covers, segmentation in chapters or table of contents – all elements that are frequently integrating in digital comics uploaded onto Webcomics.fr. It appears clear that authors do not seek out technological innovations: quite on the contrary, they attempt to get as close as possible to the standards of print books. This observation is not so much specific to Webcomics.fr as it can easily be repeated for other distribution platforms from the late 2000s, such as Grandpapier.org, Lapin, Manolosanctis, and most 'blogs bd.' Print comics remain, in that period, the horizon of expectation for digital comics—even more so given the continued influx, since 2005, of book adaptations based on digital-born works.

The analysis of the historical context of digital comics production brings out several explanations for better understanding the mechanisms that underpin the endurance of print forms within digital comics, and more widely the endurance of old media within a digital ecology. The social-economic factor offers a first set of answers. Pre-2000 digital comics most often benefited from significant financial investments from the nascent industry of telecommunication and the Internet. *John Lecrocheur* was tellingly funded by Wanadaoo, an Internet provider affiliated to France Telecom, and produced by the I/O Interactifs company. Yet, the burst of the speculative bubble in the early 2000s turned this economic sector into a much less stable enterprise (Falgas 2014: 53–54), which downsized the production of technologically ambitious works.

Contrastingly, most works created and distributed online in the 2000s are self-published by their authors and do not benefit from the same technological environment (Baudry 2012). They develop mostly in a non-professionnal or semi-professionnal artists community who doesn't seek technological innovation. The gradual democratization of the Internet throughout the 2000s (in France: 14% subscribers in 2000, 58% in 2008 (World Bank Database 2018) brings in users that are less technophile than the original audience of the web, and whose expectations in terms of technological innovations are not the same. Comics as *John Lecrocheur* also had a 'demonstrative' function, oriented towards demanding users of digital formats. This need to meet technophiles' expectations clearly recedes in the 2000s. While

these two explanations relate the endurance of print forms in digital comics to external factors linked to the social-economic context of the Web, another kind of explanation, opening up an interesting lead, can also be found 'within' comics, as the 2000s witnessed a remarkable and strong dynamism of printed comics, both in terms of forms and materiality (Groensteen 2009: 156–182). The French print comics market of the 2000s, contrary to that of the USA, was relatively stable and successful: it is dynamic, growing, and reached a certain diversity between large mainstream publishing houses and small press (Mouchart 2017: 79–80). Following the generalization of the graphic novel in the 2000s, the book format prevails over periodical publications, with alternative comics artists displaying a keen interest in the book-as-object (Beaty 2007: 50–51). The book format has an indisputable aura for both authors and readers. In a sense, then, the desire for formal innovations in comics is already met by print comics and the experiments of that period, both in print and digital, come together: this period is thus marked by a formal reinvention of comics, open to any kind of formal innovation.

Finally, one must take into account the necessary adaptation of a profession as a whole to the digital world. The works of the multimedia era, such as *John Lecrocheur*, are mainly created by creative teams where the graphic artist is but one maker among others, collaborating with software developers, sound designers, and other workers. However, from a 2016 survey conducted by the *Etats Généraux de la Bande Dessinée* among more than 1500 French comic artists, it appears that 60% of them assert a 'low' or 'non-existent' use of digital tools in their drawing habits (*États Généraux de la Bande Dessinée* 2016). The reason could be the cost of those tools, or the necessary training to use them, but eventually comic art remains an activity deeply attached to non-digital technologies of creation (Baudry 2016: 56).

A Chronology of Innovation in Digital Comics

The endurance of print-like digital comics between 2005 and 2009, even after important formal inventions, must not be seen as a step backward in the digital transformation of comic art. It simply draws our attention to the variety of ways innovation can take place during an acclimatization period where 'old protocols are applied to

new technology,' to repeat Perriault's hypothesis. The historical narrative of a 'resistance' of old forms to novelty is not entirely satisfactory: we cannot simply describe two different, opposite conceptions following a mere conflictual logic, without losing sight of important nuances. Shifting from French history of technology to digital media theory can help to elaborate a more refined account of what happened in digital comics history. The fact that the first step for 'new' media is to be inspired by earlier media is the groundwork of most of digital media theory, following Jay David Bolter and Richard Grusin's theory of remediation: 'a medium refashions its predecessors' (Bolter and Grusin 1999: 18). According to Bolter and Grusin, the main feature of new media is to build their form from old ones.

The refashioning process can be seen in digital comics of the acclimatization period. Even though print forms remain present within digital comics, they are distorted and readjusted. It is not simply a matter of imitating a bookish materiality within a digital context, but rather of *adapting* this materiality. Many contributors to Webcomics.fr, for instance, adopt a format that could be qualified as intermediary, opting for a 'square' or 'half-page' format that consists in downsizing a traditional page, ordinarily used in portrait orientation, to the space of a single screen so as that readers do not have to scroll down the webpage and can grasp the whole comics page on one single screen. In a similar logic, some authors stretch the comics page into an immense reading scroll that the reader unfolds by scrolling down (**Figure 5**). Although there have been some vertical strips, the comic strip in print format is usually horizontal; the shift from horizontal to vertical orientation already reflects an adaptation to the digital context. Many comics blogs hence develop vertical scrolling – transparent to the reader but consciously displaying the formal reality of the work – as a digital-specific way of drawing.

These examples of refashioning print comic form in the digital context confirms that 2005–2009 is a transitional period of acclimatization, as described by Perriault and Gille. But we have to consider them in the light of previous works, much more innovative, like *John Lécrocheur*. In *John Lécrocheur*, the formal structure of print comic art is also remediated, using 'classical' panels and speech bubbles, but they are integrated to a sophisticated digital invention, which allows this structure to appear



Figure 5: Visualization of a single installment of the *Maliki* webcomic. 9 January 2007, available at: <http://maliki.com/en/strips/anthropology/> [Last accessed 11 March 2016] © Maliki.

gradually in reading time or to be deconstructed through superimposition – processes that are impossible in a traditional printed comic album. In the *Maliki* web-comic installment, the formal invention of vertical scrolling seems precisely chosen because it endeavors to preserve most of the old media structure and of the reading habits despite its on-screen display. The necessity for preservation seems very strong, as if the concept of immediacy overcomes that of hypermediacy.

The evolution pattern does not appear as linear as Bolter and Grusin's new media theory implies: remediation can take multiple directions and unfolds variously in time, more or less preserving the old media. The shift from invention to innovation can be pinpointed when old and new forms reach the right equilibrium, considering their social contexts and the specificity of the distinct media. For this reason, the case of French digital comics invites us to reassess the technological determinism found in remediation theory and confirms that the study of 'anachronism' and 'feedback' could be a subtler way to understand how change takes place within the remediation process, as suggested by Lisa Gitelman (2006) or Jan Baetens (2009: 85).

Moreover, post-2009 developments further need to be taken into account as the period that stretches from the very end of the 2000s to the present day witnesses a resurgence of digital experimentations, as more and more comics integrate important formal innovations. In terms of individual artists, Tony's *Prise de tête* (Rageul 2009), Marc-Anthony Mathieu's *3''* (2011), and Marietta Ren's *Phallaina* (2016) stand out as comics that integrate interactivity, a deconstruction of the page, and the addition of sounds and animation. Two more examples will illustrate larger collective efforts for a progressive (re)adaptation of innovative features within contemporary digital comics production. Following Balak's 2009 definition of 'turbomedia' (Balak, 2009) as a new form for digital comics, there has been a widespread use of the slideshow format, sometimes coupled with the addition of animation, by both amateur, semi-professional and professional cartoonists. This growing tendency has led to the development of platforms (*Spunch comics*, *Les auteurs numériques*, *TurboInteractive*) entirely dedicated to this type of digital comics, firmly established as of 2016, and thus opening up an alternative that slows down the phenomenon embodied by Webcomics.fr between 2007 and 2009.

As for collective initiatives emerging from professional authors, the *Professeur Cyclope* webzine (2012–2014) offers a valid counter-example to the previous comparison between @Fluidz and 8comix. From the forty-one comics (series and one-shots) published in *Professeur Cyclope*, nine only are based on the model of the comics page, and eleven are strips. In the remaining twenty-one works, many integrate one or more formal innovations and, in particular, adopt the animated slideshow format. This phenomenon clearly seems to point out that we are now coming into a period where formal innovations linked to digital technologies, as they appeared in the 1990, are becoming adopted by the communities of creators and users.

These observations have allowed me to establish a chronology of formal innovation for French digital comics, following a three-phase periodization:

- Phase 1 (1995–2005): the appearance of a new technology sparks the production of formally innovative works. Although scarce, they help establish and identify potentialities.
- Phase 2 (2005–2009): the growing number of connected actors (authors and readers) leads to a transitory phase, with digital comics that disregard innovations for an enduring reliance on forms taken from the 'print paradigm.' They allow all users to appropriate digital technologies.
- Phase 3 (2009–2018): the phase of appropriation is reaching an end as more and more comics return to formal innovations, giving rise to more digital-specific works that integrate its potentialities.

Despite this clear periodization, I would like to stress out that the end of the transitory phase does not mean that webcomics following the 'print paradigm' are necessarily going to disappear. I prefer to think the present phase as a cohabitation phase where a variety of forms can coexist, drawn or not from print formats, without that a single form takes the lead on the others. The print-driven model of 2000s platforms is still there and active, on grandpapier.org for example, but also in more recent amateur platforms as projets-bd.com. Furthermore, it is not my task to make predictions about the future of digital comics.

Conclusion

While digital comics only reach back two decennia, there is a lot to be gained for comics studies by approaching them from a historical perspective. We need a historiography of French digital comics that helps us identifying and historicizing the medium. The history of technology offers a starting point to think about the relationships between creation and technology, and the development of media in the face of digital technologies. In this article, I have focused on formal innovations, but the necessary return to the social impact of technology shows that other kinds of innovations generated by digital media should be considered more carefully, such as the connection to audiences, readers' interactivity and the spreadability of content (Jenkins 2013: 1–2).

The three-phase periodization that I have outlined above helps to better think about the temporal development of digital comics, as well as the history of comics as a whole. Not only the phases of digital comics are linked to moments in the history of comics, as the importance of formal experimentation both in print and digital creation becomes prominent during the 2000s, but it also carries on the century-old history of the relationship between comics and technological changes, aptly described by Smolderen (2014) for the nineteenth century. It confirms that comics is always in dialogue with technological changes in visual culture.

More generally, the article defines three phases for the meeting of digital technology and artistic practices: a first, highly innovative phase, a second phase of appropriation marked by an endurance of old forms, a third phase of progressive integration of innovations. It also offers new approaches to the concept of remediation, suggesting that French digital comics follow a non-linear pattern where the formal persistence of old media is strong and constitutes the main background against which to understand changes in the long run. It would be useful to measure the differences between this general chronology of French digital comics and that of American or Korean comics, as well as the reasons for such cultural differences.

We could also go further: the comparison between comics and other art forms would also prove useful. Jan Baetens' analysis of digital literature through

a reading of Éric Sadin's works, concludes on lines that could equally fit the context of comics: 'More generally, Sadin's text highlights to what extent print culture can resist to attempts of digital remediation [...] by focusing on its own set of features, anachronistic when compared to the larger set of technological means available to digital culture, but irreplaceable within the larger media universe' (Baetens 2009: 91; my translation). He thus calls for a media genealogy that strays away from the linear progress narrative often associated with new digital media. The comparison with the history of comics in the digital age is all the more relevant that, as I discuss it earlier, some print publishers in the 1990s and 2000s were careful to the material quality of their comic books. It is the same phenomenon described by Baetens about digital poetry: print culture 'focuses on its own set of features' as a response to digital culture. The mutual response of comics and poetry to technological change already suggests that the digital transformation of media is a heterogeneous phenomenon, contrasting with the linearity and one-way conversion to the digital that still undergirds some general theories on digital media.

A historian's perspective precisely eschews a naive attitude towards technology and its influence on creative practices: the present moment is precisely fascinating because it witnesses a kind of balance between two ideals, the old print culture and the promises of digital creation.

Editorial Note

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Competing Interests

The author has no competing interests to declare.

Author Information

The author want to specify that the webcomic Sans Emploi is no longer available online, or only partially on Internet Archive. Thus, he had to use old screenshots for pictures 1 and 2. The author is grateful to the peer-reviewers for their high-quality work in improving this article.

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