ASSESSING DIGITAL STRATEGIES AND TOOLS FOR LEGACY PUBLISHERS: WHAT WORKS? WHAT FAILS? AND WHAT'S NEXT?

by

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Abstract

This paper will first outline the importance of transitioning to the digital era for legacy publishers, defined here as publishers that existed before the rise of the Information Age and the current dominance of digital technologies in the 21st century. Particular focus is paid to academic publishers, catalogues, and journals rather than publishers in education and trade. The parameters of digital transition, the choices a legacy publisher may face, and the problems that challenge legacy publishers are discussed and put into context in regards to a legacy publisher's role in the digital age. Finally, an examination of different tools used in digital native companies is performed and their usefulness for legacy publishers are analyzed.

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I dedicate this paper to my parents, David and Tracey Christie, who tirelessly reminded me of my capabilities and who have always believed in me, even during the times when I did not.

– N.J.C.

TABLE OF CONTENTS

List of Tables

List of Figures

Assessing Digital Strategies and Tools for Legacy Publishers: What Works? What Fails? And What's Next?

Introduction

> Technology is Janus faced. It keeps the wheels of commerce turning but it opens the opportunity for radical change. The technophiliac dream can thus range from simple technological fix of existing problems and greater convenience of our existing way of life to one of transformation of our worlds and our understanding of ourselves such as that proposed from technohippies, hackers and cyberpunks. (Coulthard & Keller, 2012)

The fundamental act of publishing is to produce content, whether it be informational or artistic expression, that is desired by a consumer. Up until recent times, this seemed like a straightforward process: Create, Copy, Disseminate, Profit. However, beginning in the late 20th century, computer-based technologies saturated the two major social domains of life: the home, and the workplace. The resulting disruption to the publishing industries—trade, education, and academic—have had many catalogues, scholarly journals, and publishing houses following a three-step process of tailoring, testing, and brandishing new approaches for the digital era. Though, in respect to the first two steps, perhaps more time could have been spent.

Indeed, despite the variety of attempts publishers have made in the past decades to assert themselves in the digital era, consensus on an ideal digital strategy has yet to be reached. There remain nagging questions over the ideal tools and procedures to produce content for digital media, and so the lack of conclusiveness engenders both pride and sloth in the directions

publishers choose to take. For among the industries, no other may be more emblematic of digital stagnation than that of the publishing business.

This is not to say that the evolution of digital media has negated the reason for publishing to exist. The service undertaken by a publisher, the aforementioned fundamental act of production, is something that will always exist as long as society and culture does. Even if the printed word dies, the human desire to inform and entertain will survive, and thus there will always be some method to disseminate such content.

Nevertheless, digital disruption has left in question as to what this method is and what it entails, among the many methods proposed. And disruption is expected to continue greatly in the publishing world [*see Figure 1*]. The publishing industry started with a massive techno-social disruption in the form of the printing press, so there is a degree of irony present as it now tries to adapt to the digital era. Problems such as copyright management, profitability, and the form of

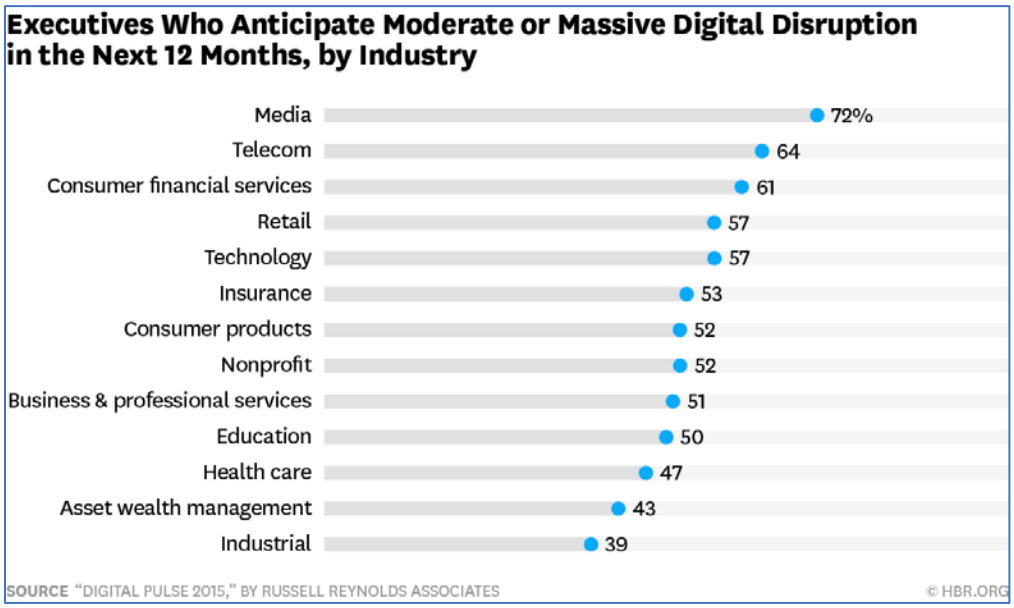

Figure 1 A 2015 survey of 2,000 C-level executives who were asked whether their companies would experience digital disruption over the next year (Grossman, 2016). Publishing is considered to fall under the "Media" category. Source for image: *Harvard Business Review*.

the content itself are some examples of the challenges faced by publishers in the past quarter-century, with the majority of them unresolved.

Indeed, for many publishers, the choice to face the future of their business model was delayed as much as possible. There are few other modern industries that are frequently derided in post-millennium newsfeed as not *modern* (Godine, 2011). Whether a publisher was academic, educational, trade, or journal (often the distinction between the types was not made in the news), they could look forward to being coupled with the keywords “future” and “outdated” (Godine, 2011). Topics such as ebook price matching, copyrights, and subscription costs were among the most contentious stories recalled when people were asked to give their thoughts about publishers (Godine, 2011; Larivière, 2015).

This lack of uniformity is especially conspicuous among academic and scholarly publishers. Trade publishers have become a united front in seeking universal formats for ebooks, and have taken steps to differentiate their print versus digital approaches (Breede, 2008; *Engadget*, 2010; Enis, 2013). Leading education publishers such as Nelson can proclaim that they are innovating with accessible, proprietary digital learning platforms (Carter, 2017; Tyner, 2014). Academic publishers, meanwhile, were reported in 2013 as having issue with the standardization of something seemingly as simple as publication dates (Proctor), and, as of writing, no such standardization has yet to be proposed. The strenuous relationship between academic publishers and academic libraries, often made fragile over the question of profit margins, has not progressed much in a little under a decade (McGuigan & Russel, 2008; Ward & Lavoie, 2016).

On the face, academic publishers operate on business-to-consumer (B2C) models where content is often peer reviewed and then produced for the public benefit. But, whether it is the

lack of access, lack of updating, or lack of affordability, many publishers still rely on toolsets and processes that were more suitable in an environment now since passed. Thus, these publishers face challenges, if not resentment from their readerships, who expect the same level of digital compatibility that they experience with other forms of digital media. Digital consumers expect open access to every piece of content for little to no cost, something that seems inherently contradictory for publishers to overcome. They also expect timely updating; however, the parameters of "timely" have changed. Where it used to be that every issue would qualify as being up-to-date enough—whether that is decided on years, quarters, or months—now the rapid back-and-forths of the digital era means that new information should be discussed and disseminated in a matter of days, hours, or minutes. The image of the ideal digital *and* scholarly publisher is, as of yet, unrealized.

In response, publishers have turned to various digital solutions—the methods. Content management systems (CMS), originally developed by independent programmers that wanted easier methods of uploading and sharing their own content online (such as their photos and stories), are increasingly being used by publishers in the hopes that they will accommodate and solve their digital needs. The makeup of personnel may include someone versed in HTML and CSS, if not having a web development team outright. For typesetters, managing and production editors, proofreaders, copy-editors, graphic artists, and others who have traditionally worked in the publishing realm, lines are being increasingly blurred as to what their capabilities are and where their responsibilities lie. Not to be forgotten are the authors themselves; as expected in academia and scholarly research, they are often experts in their field, and many came into the prime of the careers when digital media was still very much in the background (McCrindle,

2006). They now find themselves unfamiliar with the new directions the publishers are pursuing, and encouraged to use authoring tools and platforms they have never had a need to use before.

This paper will examine what publishers are doing in their transition to the digital era. What tools are they using? What abilities and roles do they value? What are the structures of these publishers, and what were the changes made in these structures in response to the digital era (if there were any)? By examining the toolsets and processes of academic publishers, conducting case studies of their digital developments, and comparing and contrasting their approaches taken with those who fit more naturally into the digital era—including an analysis of which unfamiliar technologies, created by innovators, can be applied in familiar scenarios—this paper intends to serve those in the publishing industry an introduction to effective digital strategies and tools.

Part 1 – Setting the Parameters

WHAT IS A LEGACY PUBLISHER?

Counterintuitively enough, the failings of academic publishers to find a unifying digital strategy is in part due to their long and storied existences. Persisting in business for more than a decade is considering a monumental mark of success for any start-up today, bar alone those poor start-ups who decided to go into publishing (where the line is closer to a year). Many academic publishers, especially the ones directly affiliated with a university, have been around for quite a long time (White, 2015); it is safe to say that many academic publishers were founded well before the first transistor switched on. For publishers such as these, they will be referred to here in this paper as *legacy publishers*.

To pinpoint a more specific definition, legacy publishers are those that have existed for long enough that their standard of living, their business models, their business strategy, et cetera, were based in an era with a different subset of technologies at hand. As this term is not defined by the type of content produced, it can be applied toward those in trade and education as well, though many of the strategies and tools discussed in this paper are analyzed with academic publishers and journals in mind. For all legacy publishers, the digital era presents itself as the next phase in development—a transition from one set of thinking to another.

WHAT IS A DIGITAL NATIVE?

While legacy publishers consider the challenges of transition, the *digital natives* have been sneaking into the frame and taking over the view. Digital native publishers, as the terms suggests, were founded in the Information Age (Palfrey & Gasser, 2013), and differ from legacy publishers in that their "digital" component is inherent to their business model. Thus, their

success is closely tied to how effectively they implement their digital strategy (Bilton, 2016). This contrasts to legacy publishers, where many still treat their digital strategy as an add-on and not a core component of their business (Gill, 2015).

As such, digital native companies do not need to transition into a set of thinking that already comes naturally. But when did the digital natives begin to appear?

WHAT IS THE DIGITAL ERA?

Whichever event that one agrees as the start of the "digital era"—the first personal computer in the mid-70's, the release of the World Wide Web to the public in the early 90s, the social media explosion of the late 2000's, or perhaps something else—one could agree that the transition from analogue to digital media has been a significant, if not the most significant, development of the last quarter-century (Breede, 2008; McCrindle, 2006; Rushkoff, 2010). The breadth of such a statement allows easy application to the outlook that one believes in: whether one is arguing from a social deterministic lens, or a technological one; whether the perspectives taken are through economic, political, or cultural prisms; et cetera.

As a response to this transition, many professions, trades, and industries have embraced the digital wave, and have ridden its crest to new lands of opportunity. Broaching untapped resources, pioneering innovative tools, and developing neo-abilities, these contemporaries (in both senses of the word) have founded distinct, modernistic places for themselves in this new digital world. Despite immigrating, they integrate themselves as well as any digital native would. The best of the contemporaries are the ones most equipped to deal with the new problems, and their adaptability and ingenuity allows for the digital era to progress—this is a challenge that digital natives inherently find easier to overcome versus legacy publishers.

But what about those who have not found progress? Perhaps the navigational equipment—all the astrolabes and sextants—are broken; perhaps no one can understand what the charts mean; perhaps they had not recognized the need for galleons when the transports of choice were still rafts. There may be a place for them in the new digital world, but the tools, abilities, and resources being used are not developed enough for the journey. Thus, the transition to digital is markedly more fraught. Just as Columbus misjudged the size of the Earth, legacy publishers can misjudge the scale of the digital world. Columbus thought that he had found what he was looking for when he landed in the Bahamas, but the promises of spices and gold that he sought were not found—though there were bounties of a different sort. A publisher's voyage may be doomed if no one on the ship, not even the captain, really knows what they are looking for.

WHAT IS…DIGITAL?

> People ask me what my predictions are for publishing and how digital is changing things, and I tell them my only real prediction which is it's all changing. I don't know what publishing's going to look like five years from now. Anyone who says they do is probably lying to you. (Gaiman, 2013)

"Digital" is a nebulous term. Poll a classroom, business, focus group, et al., on its definition, and one would likely get not just differing responses between parties, but between individuals as well. How often has the call-to-action to become "digital" been uttered in corporate boardrooms and written in company-wide memorandums? The benefits of proclaiming a move to the digital era seem obvious: In addition to the positive perception of being modern, the promise of having a part of digital media ensures a seat at the innovation table [*see* THE DIFFUSION PROBLEM, *found elsewhere in this paper*]. The most alluring positives are the new potential opportunities

for profit, which usually favour the publisher more than the consumer (Cross, 2011; Larivière, 2015; Larivière, 2016).

However, interpreting this phrase correctly from the speaker's intent can be a nebulous affair. The term "digital" has been generalized well enough to mean anything that sounds remotely technological—and of course, being technological is *in*. Even where being analogue is a certificate of authenticity (e.g., an Etsy user that markets their handcrafted wares), the "digital" aspect, whether it be the platform (e.g., a website), the means of communication (e.g., Twitter or a different social media account), or other, is the guarantor of success. For today's businesses, it is a realistic perception that competency in this "digital" arena is tied to competency across the whole (Morabito, 2016).

Misuse in Marketing

Thus, one can hear this refrain chanted often enough that, whether one is a business or a customer, there is no indifference to the idea of "digital" (*Progressive Digital Media*, 2016). However, it is a term where understanding is expected among listeners, but never thoroughly detailed or discussed in-depth from the speaker. Hence, "digital" has a potential to be misused as a buzzword in both business-to-business (B2B) and B2C communications, creating confusing marketing messages that hide proof (or lack) of success (Sloane, 2017). For one company, being "digital" may just mean using "devices or tools that produce, store or analyse data" (*Progressive Digital Media*, 2016), a definition too general to convey anything useful. Perhaps another company could be more specific, and detail their social, mobile, analytics, and cloud tools [*see Figure 2*] that have been developed over the past 20 years (Baxter-Reynolds, 2014). Still, the method "to become digital" is not elaborated upon. Companies that speak glowingly of their digital strategy, but, in reality, have little to no idea of what their transformation to being digital

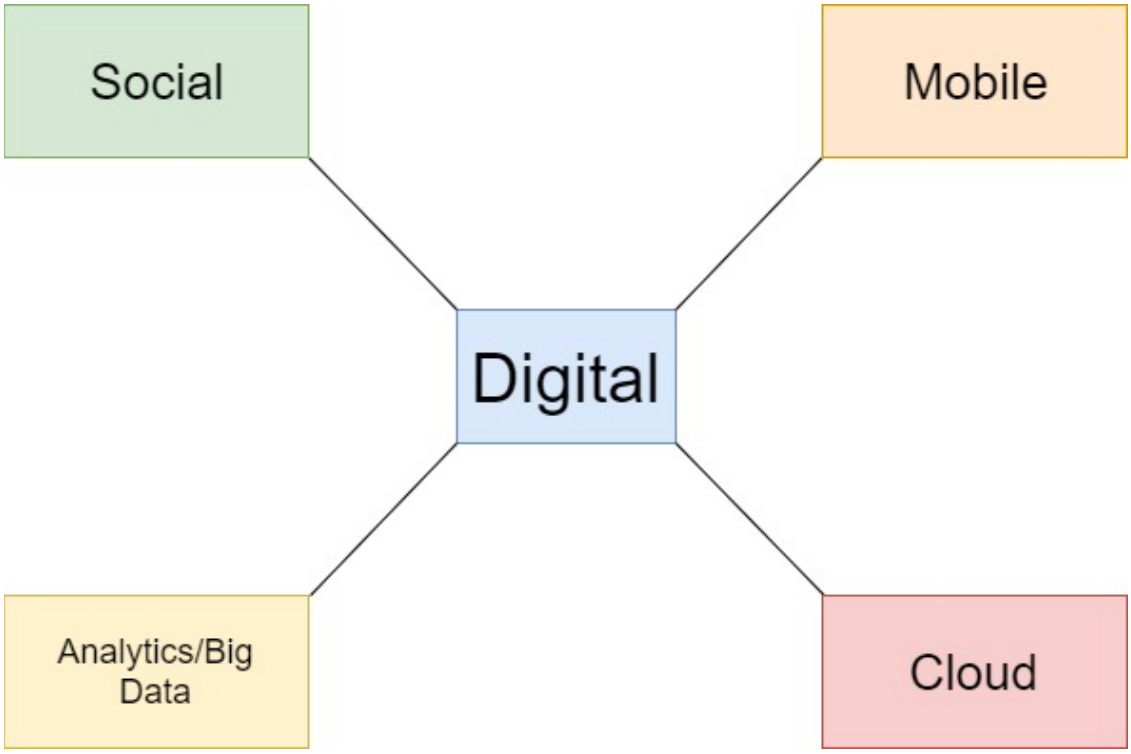

Figure 2 The SMAC Diagram (Social, Mobile, Analytics/Big Data, and Cloud) is frequently used in marketing circles to explain the make-up of the term "digital" (Baxter-Reynolds, 2014).

entails, will likely run into operational crises in a matter of time (Chahal, 2016). Indeed, having no clear digital strategy was identified as the biggest barrier for companies looking for a digital transition (Kane, Palmer, Phillips, Kiron, & Buckley, 2015).

To wit, when conducting interviews at his company, technical architect Reda Hmeid employs the following question: "What does being digital mean?" As he states below, the responses received were indicative of the lack of a commonly agreed definition for the term:

> In fact, more often than not, the reaction is confusion or blind panic. It's the sudden realisation that they have been working in a digital environment, citing digital transformation as their goal with no clear definition in their minds of what being digital is. They will start down the path of digital being the process of moving offline services online……but we've been doing that for 15–20 years already. (2017)

The manner in which a company markets its digital competency is crucial, insofar that if the message does not inspire assurance, then it is unlikely that said company will find it from its employees. A company that is digitally competent will have a firm message, easy for its employees to follow. For a legacy publisher, where the workforce is likely to be a mix of generations as any, it cannot necessarily rely on digital native hires to overhaul the message and rescue the company from digital stagnation overnight.

Misuse at the Executive Level

There is no rescue coming from the leadership ranks, either, where understanding of digital strategy should be most crucial. Having a "digital disconnect" among the executives of a legacy publisher creates a mismatch where one has the authority to issue a directive, but not the expertise to identify in which direction (Sorofman, 2013). In 2014, The *MIT Sloan Management Review* surveyed more than 4,800 business executives, managers, and analysts on the challenges of transitioning into digital business. More than half of respondents responded that "the digital agenda at their companies was led by a single person or group," with "nearly two-thirds of those respondents indicat[ing] that the person or group includes someone at the C-suite or vice president level" (Kane, Palmer, Phillips, Kiron, & Buckley, 2015).

In companies that identified themselves as just getting their digital transition started, only 34% had a single executive or group leading the way, while companies that identified themselves as digitally "mature" were twice as likely to have a single voice (Kane, Palmer, Phillips, Kiron, & Buckley, 2015). Does this indicate a lack of confidence among those companies beginning their transition? Karel Dörner and David Edelman, in their analysis of how these executives may approach the term "digital", propose the following explanation:

> For some executives, it's about technology. For others, digital is a new way of engaging with customers. And for others still, it represents an entirely new way of doing business. None of these definitions is necessarily incorrect. But such diverse perspectives often trip up leadership teams because they reflect a lack of alignment and common vision about where the business needs to go. This often results in piecemeal initiatives or misguided efforts that lead to missed opportunities, sluggish performance, or false starts. (2015)

It is fair to say that executives cannot be expected to understand the nuances of every technical aspect of every job under their umbrella. It is tempting to write it off as just the product of the time that we now live in. In Douglas Rushkoff's text, *Program or Be Programmed: Ten Commands for a Digital Age*, he states that the digital era is unique among human history in that entire industries are based on inventions that their users could not explain: we use laptops and smartphones for work and play, but the percentage of those who could detail their inner workings is an absolute minority (2010).

At the same time, however, the lack of clarity is what allows a plan to be twisted and derailed. Executives interested in leading their companies to the digital era can preventing this by being more specific when using the term, "digital". An associate professor at the EDHEC Business School in France outlines the key point as thus: "Managers need to go beyond saying digital is a good thing and do it" (Kane, Palmer, Phillips, Kiron, & Buckley, 2015).

When the digital agenda is led with clarity from the executive level, it ensures confidence from the base that will crucially support the company as it attempts to transition to the digital era. Digital competency doesn't mean requiring the knowledge to perform every technical task, in contrast to what Rushkoff claims. Instead, digital competency only requires that the executive

can “articulate the value of digital technologies” and relate it to the future of the company (Kane, Palmer, Phillips, Kiron, & Buckley, 2015).

Misuse in the Working Culture

Further, the transition to digital requires that the culture of the company embraces and carries out the agenda. In a separate survey of executives conducted by Forrester Research, Inc., only 21% of respondents believed that their company culture was an appropriate incubator for their digital strategy (Fenwick, 2015). While legacy publishers are wary of taking risks, digital native companies will not hold back if it means being recognized as the “first” or “foremost”. The nature of digital media itself increases the space allowable for risk-taking when compared to the traditional, as the affordances of new technologies allow for faster communication and increased collaboration (Dörner & Edelman, 2015). Further, without a reliable history and brand recognition—two areas where legacy publishers have the advantage—innovation is the only way for digital natives to stand out and become successful. Thus, the working culture of digital natives is easy to rally around, as these companies start out with a singular goal in mind.

Overall, should a legacy publisher have a firm message to rally around, a firm leader to lead the transformation, and a firm working culture that provides a nurturing environment, the transition to digital will become markedly easier. They effectively acquire a digital mindset [*discussed more in* THE HYBRID PUBLISHER, *found elsewhere in this paper*].

Part 2 – Choosing to Become Digital

A SHORT STORY ABOUT LIVING IN THE PAST

(Adapted from an anecdote told by Neil Gaiman at the Digital Minds Conference, 2013.)

A man and his wife lived together in a small apartment in the city. Happy as they were, continued increases in rent, gas, and the price of bread were edging them closer off the precipice into squalor. Meandering paycheque-to-paycheque, the man spent what little extra earnings he had gained on...calendars.

A stupendous amount of calendars, actually. The entirety of the small apartment was filled with stacks—calendars in the closet, calendars under the staircase, calendars in the kitchen sink. Calendars of baby animals, calendars of shirtless firemen, calendars of paddleboats. But the most curious part was that they all had the same year: 1993.

The man's wife called him an idiot. "These are not even new! I don't know what you're planning—no one will buy them!"

The man sneered in self-assurance. "Pfft. Think that if you like. But if 1993 ever comes back, I'm going to clean up!"

THE "FUTURE"—A LEGACY PUBLISHER'S LEAST FAVOURITE WORD

No one would think that they will ever be as obstinate as the man is in the previous story. But when one is confronted with the spectre of change, where their comfortable standard of living may be turned upside down and inside out, it is not uncommon to make illogical choices, or rather, no choice at all.

But when the choices do get made, eventually, the decision can be just as baffling as someone buying a stack of calendars from 1993 (as any undergrad using a DRM-locked textbook, or an academic re-formatting their entire reference list to fit a publication style, could attest). The choices legacy publishers need to make are a series *of whether tos*: of whether be a participant in the future shock; of whether to move their assets, procedures, practices to the online world; of whether to transition from the static solidity of the physical printed form to a more dynamic, transformative form; of whether to become *digital*.

For legacy publishers, the lack of a strong, centralized definition has led to various problems: multiple solutions for problems that don't exist, lack of solutions for problems that do exist, and a general sense of uncertainty, if not disdain, toward the future. Legacy publishers that do not learn from these mistakes will likely not survive for much longer.

For those publishers who are willing to adopt, embrace, and make home with new technologies; who are willing to sacrifice some of the components that had mattered before in the company's development, but not anymore; and who realize that the term "digital" is just in flux as with everything else, an opportunity is made to transform. Even in the shift from publisher to "information provider", new challenges will be brought to the fore (Turner, 2014). Still, recognizing that these challenges are a natural part of the digital genesis will ensure a healthier and more successful approach to future relevancy.

REFUSING TO MAKE THE CHOICE (AND SUCCEEDING)

Nevertheless, many legacy publishers, academic and scholarly publishers in particular, have taken the paradoxical step of using digital capabilities (or the lack of) to reinforce their traditional business models.

Take, for example, the consolidation of academic journals into a concentrated for-profit industry. Julia Proctor, in writing about the aforementioned lack of implementation for standardized publication dates and terminology on academic publishers' ebooks and websites, theorized that due to the lack of commons standards, academic librarians were in for a confusing length of time in collecting material, and were more likely to purchase an article or text more than once in error—not an unwelcome development for an academic publisher (2013). As well, subscription costs for academic journals and databases have increased well above the rate of inflation—from 1986 to 2005, academic journal costs for the member libraries of the Association of Research Libraries (ARL) increased 302%, with the average annual percentage increase in price being 7.6% (McGuigan & Russel, 2008). Meanwhile, the number of items purchased by academic libraries had increased only 1.9% on average per year (McGuigan & Russel, 2008). The last independent estimates for the total revenue size of academic journals in the scientific, technical, and medical (STM) disciplines amounted to approximately $11.5 billion in the North America market alone, and over $19 billion worldwide (Buranyi, 2017; McGuigan & Russel, 2008).

The largest scholarly publisher in STM is Reed-Elsevier, who hold a quarter of the entire market share and have an estimated annual revenue exceeding $6 billion (Buranyi, 2017). Their last reported profits, in 2010, put them at $724 million over $2 billion in revenue, a profit margin of 36%, which has kept them in remarkable consistency with their profits at the turn of the millennium [*see Table 1*] (Buranyi, 2017; McGuigan & Russel, 2008). For comparison, Reed-Elsevier's 2010 profit margins were higher than those that digital media giants Google, Apple, and Amazon made in the same year (Buranyi, 2017). Even the most successful traditional publishers' profit margins are expected to be no more than 12-15% (Buranyi, 2017).

Table 1 – Operating Profit Margins (%) for Elsevier Versus Other Periodical Publishers

Year	Elsevier Science & Medical	Total Elsevier Journals	All Periodical Publishers*
1998	35.9	25.7	4.9
1999	35.4	23.4	4.7
2000	36.4	21	4.3

** Industrial ratios based upon accounting periods from April 1 of year listed to March 31 of following year. Adapted from http://southernlibrarianship.icaap.org/content/v09n03/mcguigan_g01.html.*

Deutsche Bank, in a statement toward investors, commented on the irrationality of the extraordinarily high profit margins made by Reed-Elsevier in the 2000s, indicating that "[Deutsche Bank] believe[s] the publisher adds relatively little value to the publishing process…[Deutsche Bank] are simply observing that if the process really were as complex, costly and value-added as the publishers protest that it is, 40% margins wouldn't be available" (McGuigan & Russel, 2008). In response, Reed-Elsevier "justifie[d] the steady price increases because of an increase in articles per issue; the increase of electronic usage; and the increased costs of maintaining the electronic infrastructure" (McGuigan & Russel, 2008).

How does a legacy publisher, whose publishing model has largely unchanged in the digital era except to use the medium to reach more, not only survive in the digital era, but do so with such consistency and high profits that eclipse even those of digital natives? Scientific journals, Reed-Elsevier's main product, became a highly concentrated industry in the 1970s, and the publisher's role in disseminating academic work afforded them a position where they can be hardly challenged (Buranyi, 2017; McGuigan & Russel, 2008). Thus, despite the advent of the digital era, legacy publishers such as Reed-Elsevier are still able to apply traditional publishing methods to monopolize and profit excessively. These methods do not innovate in technology or

reward the consumer in any way, but instead entrench the publisher in a position that will only make it more difficult for transformation when they invariably backfire, with an unhappy consumer base and inflexible infrastructure, due to a triad of unavoidable problems. Eventually, legacy publishers such as Reed-Elsevier will have to confront these three problems—Digitization, Diffusion, and Perception—which the digital era will force upon them, no matter how large their profit margins may be:

Part 3 – Three Problems Facing Legacy Publishers

THE DIGITIZATION PROBLEM

The path mentioned among Hmeid's applicants—that of moving "offline services online"—had been the basic call-to-action especially in the publishing industry. As such, many legacy publishers, in their belated attempt to catch up to the digital world, made the mistaken assumption that this transition, of moving the offline to online, would be as simple as it sounded. Digitization, where the publisher's content—*their* content, which they held the rights to (re)possess, (re)produce, and (re)distribute—was scanned from print to screen, seemed like an easy, safe answer to a complex, unfamiliar problem. Publishers expected "vanilla implementation", where new software is implemented, but the difficult task of customizing it to fit the company's parameters is not performed. These digitization processes were akin to a smaller scaled and more manageable version of Google's ambitious plan to transfer all the books from the world to the World Web.

But, the Google Books project is currently in limbo, its original plan abandoned, over-complicated with copyright battles (Darnton, 2011; Wu, 2015). This was not the only mass digitization project that did not reach its goals: in 2009, leading software vendors in the United States were asked to digitize the country's medical records within five years. While the usage of digital records in hospitals increased from 9.4% in 2009 to 75.5% in 2014, the vendors failed to deliver a system that could deliver the records from hospital to another—effectively cancelling the operable and transferable advantages of the digital form (Caldwell, 2015). Despite digital practices becoming an integral part of business structure and industry in the 21st century, overall labour productivity in the United States has been in a slowdown since 2004 (Syverson, 2016a).

Information and communication technologies, as theorized by economist Chad Syverson, are not being used to their fullest potential, and are more likely to be misused:

> A lot of people think [information technology] helped inventory practices, and it did. Basically what we did was, we took pencil and paper and we replaced it with a computer, but we're still doing inventory in the same way. It's just we're doing it more efficiently now that we have a computer. So you could imagine once you're tracking goods electronically, it's not just that you do inventory differently, you do all sorts of things differently. And while we've gotten little bits of that, maybe, there's a whole bunch of possibilities we haven't figured out. (2016b)

If even Google and other software companies failed in their physical-to-digital enterprises, what hope was there for the many legacy publishers in theirs? Digitization did not reveal to them the path *to become digital*. Instead, it had created static facsimiles that made neither practical nor innovative use of new technologies (Lee, 2001). As Kathleen Fitzpatrick notes about PDF-based texts that were digitized from physical manuscripts, there is nothing in particular about these products that are remarkably innovative (2011). When legacy publishers discuss their digital transitions, they, more than likely, are referring to this process. Perhaps the apparent simplicity of the digitization process is why it is so prevalent as a proposed solution. However, the end result of digitization does not guarantee a legacy publisher a foothold in the digital era, as there is no real innovation that is to be expected with digital media. Thus, publishers cannot assume innovation will come hand-in-hand with digitization.

Take, for example, the digitization of the scholarly journal and legacy publisher *Canadian Military History (CMH)*. The case study conducted on this publisher's transition to digital media focused on issues like renewing copyright and assuaging authors concerned about

being published on an electronic-only publication (Bakker, 2013). While *CMH* succeeded in their digital transition in the parameters of the aforementioned areas, their approach created a platform that hosted digital copies of already-printed, typeset material (Bakker, 2013). While *CMH* were able to transition to the digital era, they still applied traditional processes to their new platform, which may hold back the potential of their digital capabilities. As such, the success of *CMH* as a digital publisher is handicapped—the more legacy publishers rely on traditional methods, the less chance they will have to innovate.

Innovation cannot be born out of passivity; consumers will reject 50% to 90% of new products, and passive attempts at innovation are more likely to fail (Heidenreich & Spieth, 2013). Publishers that attempted digitization had shown their hand, and the cards they held revealed no proficiency in playing the game. Rushkoff states that "like the participants of media revolutions before our own, we have embraced the new technologies and literacies of our age without actually learning how they work and work on us" (2010). Instead of competency, legacy publishers were frequently perceived as confused and out-of-touch, exemplified by struggling printers and typesetters, bookstores going out of business, increasing costs of textbooks, a plethora of copyright questions, and fewer and fewer subscriptions to academic/scientific journals and databases taken out from libraries and institutions (Robinson, 2012; Schöpfel & Leduc, 2012).

THE DIFFUSION PROBLEM

Further, as Hmeid noted from his interviewees' collective response, the transition to "digital" has already been in effect for more than a decade, with digital native publishers more effective on the same grounds where the legacy publishers stumbled.

To survive, digital native publishers had to understand that the parameters for making the successful transition are becoming tighter and tighter. One trend in the Information Age is that newer technologies are becoming more quickly adopted by the consumer. According to Everett Rogers' diffusion of innovations theory, which examines the rates at which technologies spread and why, there are five categories of adapters: innovators, early adapters, early majority, late majority, and laggards [*see Figure 3*] (Rogers, 1995). Adoption of technology typically occurs in an S-curve, with an explosion of growth coming from the early majority, and tapers off as market share of the technology nears total saturation among users (*Ernst & Young*, 2011). The innovators are the elite, fully able to exploit the new technologies at hand, while the rest, the majority, "learn to be satisfied with gaining the ability offered by the last new medium" (Rushkoff, 2010).

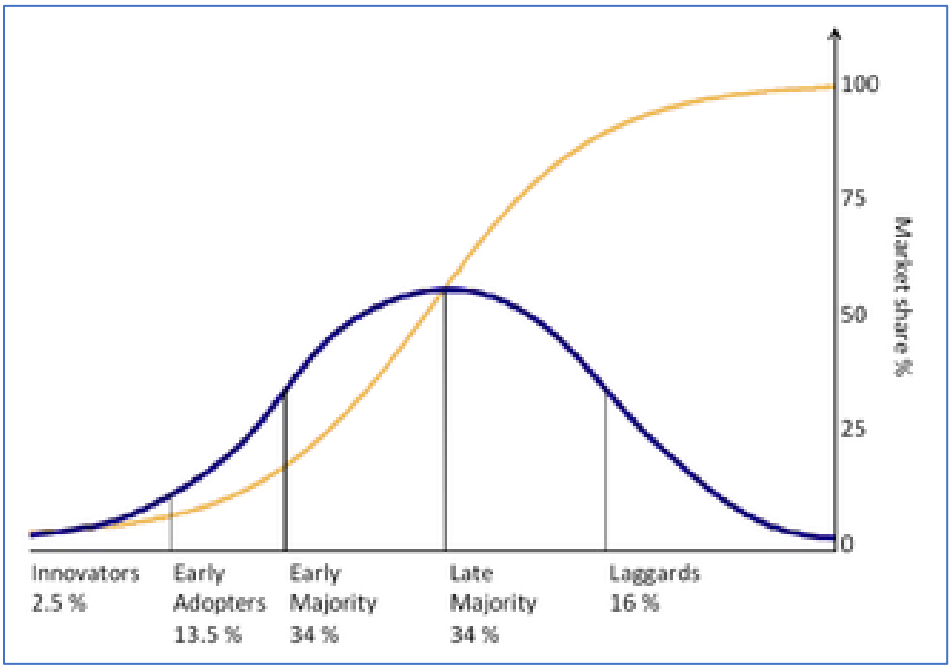

Figure 3 Chart tracking the diffusion of innovations. As more companies adopt new technologies, (shown in blue), the market share (yellow) will eventually reach complete saturation. (Rogers, 1995). Source for chart: *Wikipedia*.

However, the trend for technological growth is exponential. For instance, it took more than 70 years for telephones to be present in more than 50% of homes in the United States, but only 10 years for the internet to reach the same level of saturation (*Ernst & Young*, 2011; Thierer, 2009). It took 852 days for Facebook to reach 10 million active users (*Ernst & Young*, 2011), and in 2009, five years after its inception, the social media platform announced it had reached 350 million active users—roughly 40 million more than the population of the United States at the time (Eldon, 2009). At the end of 2016, Facebook had 1.86 billion active users (Fiegerman, 2017). With the rate of technological diffusion accelerating, the percentage of innovators and early adapters increases, shifting the S-curve farther to the left. With the early majority now occurring even earlier, the pressure increases to adopt new technologies in order to serve the majority's needs. When questioned on the speed of change in today's publishing industry, a senior advisor for Forbes Media stated the following:

> Back, when it was a print world and you had your monthly magazine or bi-weekly magazine, you dealt with change in that time frame. Now, with digital, everything is new everyday. So, dealing and working with your editor has changed because the website is updated every minute, every second. And, dealing with all new content every day. (Patterson, 2016)

Successful publishers in the modern era recognize that timeliness is no longer a choice to be afforded, but a necessity to be addressed. The publication standards of quarterlies, monthlies, weeklies, etc., grow increasingly obsolete as new technologies encourage dailies, hourlies, if not up-to-the-minute releases. Further, the window in which to make those changes is very small. Like any company that doesn't utilize its social media to respond to ongoing events, a publisher

that fails to respond to recent changes in content is likely to be perceived as out-of-touch, or worse, incompetent.

THE PERCEPTION PROBLEM

Perception from the consumer has always been a significant factor to any business' success, digital or not, but the shift in adapters in the diffusion of technology is also a critical indicator of a shift in audience. In an examination of digital readiness, the Pew Research Center found that "different people and institutions have varying levels of preparedness for using next-generation technologies," with those from the younger demographics generally having more adaptability (Horrigan, 2016). In 2015, the Millennial Generation became the majority of the U.S. workforce [*see Figure 4*], where more than one-in-three was a Millennial (Fry, 2015). As each year passes,

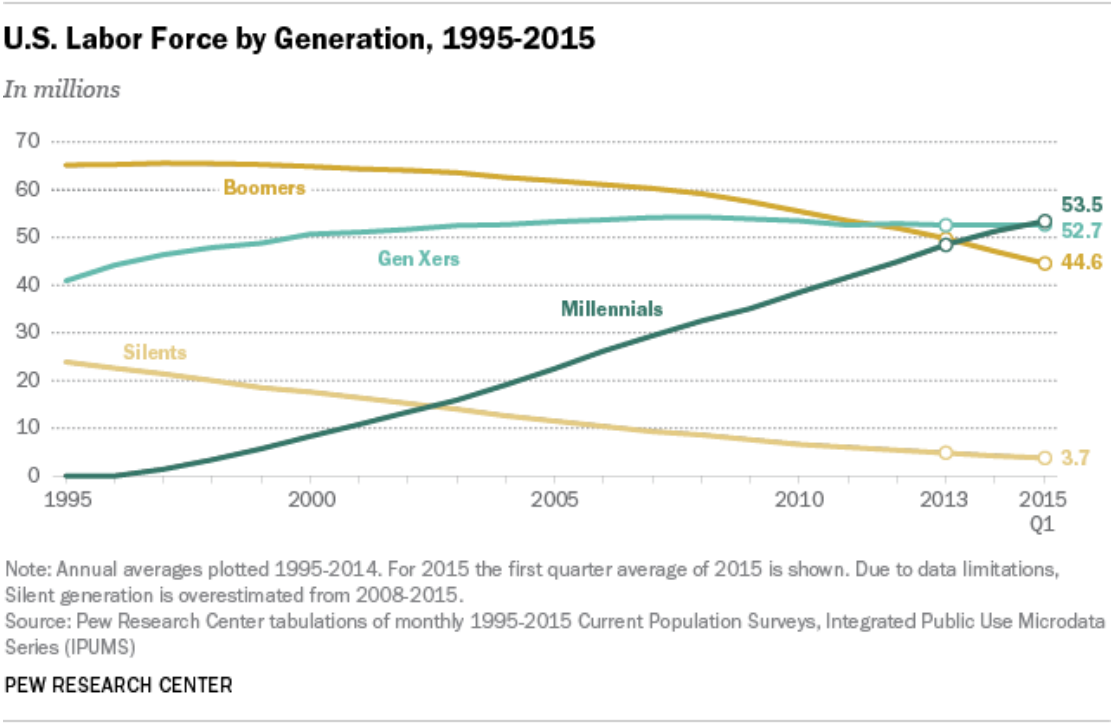

Figure 4 The Millennial Generation (dark green line) has taken over as the most populous workforce in the United States (Fry, 2015). Source: *Pew Research Center*

the Millennials, and their tastes and trends, become more dominant. Along with Generation Z, these generations are generally considered those to be born after 1980, and have been referred to as digital natives due to their familiarity with and reliance on information and communication technology (Prensky, 2001). All their lives, they have been "surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age" (Prensky, 2001). Their competency in being "digital" is natural, with access to networked digital technologies from a young age, and the skills to use them (Palfrey & Gasser, 2013).

In contrast to these digital natives, the generations before (Generation X, Baby Boomers, Greatest Generation), who were born before the digital age went into swing, are referred to as "digital immigrants". (McCrindle, 2006). This term is apt, as many workers in older generations find themselves out of their comfort zone, forced to move to new, "digital" lands to make a living. Rushkoff states their challenge as thus, "In the emerging, highly programmed landscape ahead, you will either create the software or you will be the software…choose the former, and you gain access to the control panel of civilization" (2010). To resist the "digital" is to risk futility; if your choice is to be a part of the software, then "it could be the last real choice you get to make" (Rushkoff, 2010).

Thus, while digital native publishers have garnered the head start on their legacy competitors in adopting their business structure to be inherently "digital", so do they have an advantage in audience, with their digital strategies tailored to engage the new generations, rather than conform to the older methods (McCrindle, 2006). Digital native publishers, who are more likely to be composed of workers from the Millennial and Z generations (Meyer, 2016), essentially speak a new language, affording them more and earlier opportunities to adopt

technologies, and gain a larger market share ahead of legacy competitors. For legacy publishers, the challenge is to find method to extricate themselves from the late adapter and laggard categories, which grows more arduous as the exponential rate of diffusion keeps moving the goalposts toward the digital natives' side of the field, on top of the changing desires of the userbase.

Part 4 – Transitions and Transmutations

THE HYBRID PUBLISHER

However, this is not to say that the legacy publisher is doomed to die. Though digital natives are more willing to share their innovation, their openness may ultimately prove to be their undoing. In addition to history and recognition, legacy publishers will often have advantages over digital native publishers in areas such as resources and networking. In the traditional news media industry, for example, traffic growth for legacy publishers' online portals has accelerated, while growth for digital publishers have stagnated (Bilton, 2016). In this case, the playing field has been levelled, with legacy publishers applying what they have learned from their digital native competitors. Their innovations no longer novel, and their market shares diminished, the advantages of digital natives are cancelled out. As it stands, "the resurgence of legacy publishers on the Web…might complicate the value proposition of digital native publishers, whose natural advantages are less obvious once legacy companies adopt their skills (or acquire them entirely)" (Bilton, 2016).

Additionally, the workforce behind legacy publishers is shifting as well. Whether it be a higher paycheque, or the consistency of a well-worn brand, legacy publishers can be attractive to Millennial and Generation Z job-seekers, especially in a tumultuous job market (Fry, 2015). The increasing role of digital natives in traditional companies offer an opportunity for transformation. Jennifer Parker-Starbuck, in her analysis of digital integration in academic publishing, writes that "those entering academia now are products of a digital age…they grew up in a world in which the digital is pervasive" (2015). We can likewise say that those entering the workforce are bringing that digital pervasiveness along with them as well, and to the benefit of their employers. As newer generations blend into the workforce year by year, distinguishing terms such as

"legacy" and "digital native" become increasingly inapplicable, and the "hybrid" publisher comes to the fore. In this sense, legacy publishers can live on, not as they once were, but integrated into something new and innovative.

With that being understood, how does one become a hybrid publisher? It should be as easy as adopting the new technologies that digital natives use, no?

UNDERSTANDING TECHNOLOGY'S ROLE

> Of all the monsters that fill the nightmares of our folklore, none terrify more than werewolves, because they transform unexpectedly from the familiar into horrors. For these, one seeks bullets of silver that can magically lay them to rest. (Brooks, 1987)

As many legacy publishers have learned, the digital era has its own set of parameters to be dealt with, separate from the traditional methods. One cannot apply the same ruleset to the other—it is not just telling rugby players to play with an American football, it is changing the pitch, the plays, the uniforms, even the crowd watching them play. While it is tempting for a legacy publisher to build a new arena or change the playbook, such drastic changes are more likely to cause confusion. There is a temptation for legacy publishers to view technology as the "silver bullet" that will slay the terrifying werewolves that hound them, but the reality is that the inherent complexity of technology does not promote simple solutions (perhaps it is here is where Rushkoff's assertion on using technology you can inherently understand is most applicable). A new tool cannot be relied on to instantly solve all of a legacy publisher's problems at once; there are too many factors to consider, too many tasks to achieve, and pulling one thread loose may end up tightening another.

Though it being written in 1987 makes it practically a Bronze Age relic in the digital era, Frederick P. Brooks' text *No Silver Bullet: Essence and Accidents of Software Engineering* contains a particular passage that strikes gold in the face of immediate technological upheaval:

> Digital computers are themselves more complex than most things people build: They have very large numbers of states. This makes conceiving, describing, and testing them hard. Software systems have orders-of-magnitude more states than computers do.
>
> Likewise, a scaling-up of a software entity is not merely a repetition of the same elements in larger sizes; it is necessarily an increase in the number of different elements. In most cases, the elements interact with each other in some nonlinear fashion, and the complexity of the whole increases much more than linearly.
>
> The complexity of software is an essential property, not an accidental one. Hence, descriptions of a software entity that abstract away its complexity often abstract away its essence. For three centuries, mathematics and the physical sciences made great strides by constructing simplified models of complex phenomena, deriving properties from the models, and verifying those properties by experiment. This paradigm worked because the complexities ignored in the models were not the essential properties of the phenomena. It does not work when the complexities are the essence.
>
> Many of the classic problems of developing software products derive from this essential complexity and its nonlinear increases with size. From the complexity comes the difficulty of communication among team members, which leads to product flaws, cost overruns, and schedule delays. From the complexity comes the difficulty of enumerating, much less understanding, all the possible states of the program, and from that comes the unreliability. From complexity of function comes the difficulty of invoking function, which makes programs hard to use. From complexity of structure comes the difficulty of extending programs to new functions without creating side effects. From complexity of structure come the unvisualized states that constitute security trapdoors. (1987)

Instead of sweeping changes that overhaul entire procedures and systems that require technological complexity, it may be more useful for legacy publishers to import their technological initiatives in separate parts, and utilize new tools to address one aspect of the transition at a time.

In their role to assist legacy publishers, digital technologies are neither angels nor demons; one should act secular and use them for what they are, tools. And with any tool, one must understand how a tool is used before using it. As Brooks stated in the previous passage, digital technologies are at a degree more complex than any technology developed before in human history, and many problems can arise by just assuming a digital transformation is a "scaling up" of current procedures. This recalls the Digitization problem of Part 3, as well as the inability of leaders and executives within a company to accurately recognize and plan an effective digital transformation.

CASE STUDIES IN DIGITAL TRANSITIONS

For legacy publishers, if there is a positive aspect to being a part of an industry that almost universally consists of laggards, it is the history of good, bad, and ugly digital transitions that have already been performed. The trailblazing efforts achieved by innovators and early adopters, and the methods in which they surmounted obstacles in the transition process, are now valuable lessons for legacy publishers to follow, and are a good basis for what to do and what not. For many companies that developed their information technology (IT) departments as the digital era began, transition meant implementing systems that integrated traditional processes into a digital space. Today, we refer them by a variety of initialisms: the aforementioned CMS, enterprise systems (ES), enterprise content management (ECM) systems, enterprise resource planning (ERP) systems and digital asset management (DAM) systems. Defining each kind of system in

relation to their use in digital publishing is a topic for another paper entirely, though the basic definitions of each are found in the glossary, located at the end of the paper. However, each system shares the same general purpose of supporting a company's digital infrastructure.

The remainder of this section consists of two case studies where digital transitions were performed inadequately, followed by one case study of a legacy publishing finding success. The case studies that look at failure do not reveal the names of the companies involved, perhaps as a requirement that the studies' reference needed to follow to acquire the requisite details. Due to the difference in systems being implemented, the disparate sizes of the companies involved, and the nature of their respective businesses, these case studies should not be taken as one–to–one comparisons, but instead drawn upon for general themes in the usage of digital strategy and tools.

Failure at a Medium-Sized Business

A distribution company based in New Zealand is a medium-sized business in logistics and shipping. In the late 1990s, this company implemented an ERP system, with new distribution and financial modules, in collaboration with resource planning company J.D. Edwards as the vendor (Viehland & Shakir, 2005). The transition costed approximately $3 million in New Zealand dollars: $700,000 in hardware, $500,000 in software, and $1,800,000 in implementation costs (Viehland & Shakir, 2005). The transition started in 1998, and after a variety of delays for a variety of reasons external to the process, such as an organizational restructure and changes in executive leadership, the ERP system went live in July 2002 (Viehland & Shakir, 2005).

But not all delays were external. Constant redesigns, perhaps due to the restructuring, hampered the transition. At one point, the distribution company received a cost estimate from

J.D. Edwards that was double what they expected, which initiated another call back to the drawing board. The difference in estimates were attributed to the distribution company's expectation that the ERP software could be implemented without changing any of their traditional business processes—a vanilla implementation. Instead, much customization of the software was required so that the distribution company could continue to adhere to the processes it was accustomed to (Viehland & Shakir, 2005).

Failure at a Large-Sized Government Agency

Keep in mind that the distribution company was not relatively large, with no more than 300 employees. Another example of a transition, this time involving a much larger workforce, was a national government agency employing approximately 8,500 workers. The purpose of the agency is to provide government-sponsored services in one of New Zealand's largest metropolitan areas (Viehland & Shakir, 2005). The agency already had a solid, if outdated, ES, based on Oracle. However, due to government requirements demanding increased standardization in the services offered, as well as a desire for more accurate control of its finances, at the turn of the millennium the agency decided to upgrade the ES to something that was hopefully more comprehensive and easier to manage. Rather than seeking an entirely new system, the agency decided to stay with Oracle, and upgrade to the latest software version released, Oracle 11i. However, the upgrade was more complex than predicted, and the expansion of the ES to cover the financial aspects resulted in a transition that resembled less of an upgrade and more like an entirely new implementation (Viehland & Shakir, 2005).

The cost of the transition was less than that of the distribution company, at approximately $2.3 million in New Zealand dollars: $1.7 million for hardware, software, consultancy, and internal costs, and $650,000 for operational costs (Viehland & Shakir, 2005). The transition

began in January 2000, with the intention that the upgrade be fast-tracked for release within one year. However, the process was delayed due to a lack of quality testing; bugs in the new software and failure of the hardware to meet performance specifications were discovered in the weeks before the upgrade was to go live (Viehland & Shakir, 2005).

Success at a Small Publishing Offshoot of a Very Large Business

Besides the Kiwi connection, common themes in both of the previous case studies were unrealistic expectations regarding the time needed to conduct the transition, and a lack of planning and preparation. The case study of American Express Publishing (AEP) and their digital transition is one where these themes are reversed for a positive outcome.

Until its acquisition by Time Warner, Inc. in 2013, AEP was a small publishing house that had no more than 50 people to its staff. However, it was also the publishing arm of American Express, a multinational financial services company with approximately 56,000 employees as of 2016 (*American Express,* 2016). As such, when it came for its digital transition in the late 2000s, AEP had significantly more resources and mobility than the average publisher.

Although AEP already had an online presence, the addition of a DAM system to the publisher was undertook with the intention to expand the publisher's online presence and present AEP as more digital than print. While AEP did not expect a vanilla implementation, from the beginning the DAM system was planned for the integration of the publisher's editorial and production processes, rather than outright replacement (Beer & Boerner, 2013). However, by engaging in a soft rollout where the system's basic functionality was tested, the development team quickly found out incompatibilities between the publisher's processes and the new system. The team, which was small, experienced in IT, and familiar with the publisher, frequently kept in

contact with the employees at AEP as well as the end-users—readers of the AEP–branded magazines—as the system developed (Beer & Boerner, 2013).

As a result, the development team presented an alternate process that would work within the parameters of the new system as well as reaching the goals of the traditional process:

> When it became clear the workflow did not work, it became necessary to quickly invent and implement a plan B that would still meet the fundamental goals of the DAM project. Because of the knowledge built from the deep system testing before the soft rollout, and because of the exhaustive rounds of end-user interviews that taught a deep understanding of the creative teams' workflows, it was possible to nimbly shift gears to develop an alternative yet still DAM-enabled workflow that successfully served magazine production. (Beer & Boerner, 2013)

When it was released in 2010, the DAM system was markedly different than the first iteration that was proposed. However, in contrast to the surprise and discouragement found in the previous case studies, this difference was understood and welcomed by AEP as a natural part of the digital transition. Realistic expectations were set early on in development, which was assisted by an informed staff and a work cycle that encouraged continuous testing before deployment. Overall, the new DAM system fulfilled the intentions of the project by enhancing the capabilities of the publisher even further, having "met and surpassed its initial project goals" (Beer & Boerner, 2013). It is pertinent to note that AEP was able to afford a longer development time and a skilled development team due to the deep pockets of its parent company. Perhaps this case study also proves the efficacy of a hybrid publisher, where a legacy company's assets and a digital native's innovation combine for the better.

THE DIGITAL MINDSET

Regarding the requirements of becoming a hybrid publisher, it is good to recall the ending of Part 1. The successful transition experienced by AEP was assisted by clear targeting of the requirements, a knowledgeable leading team, and a positive working culture that encouraged continuous development instead of a solve-and-stop approach. The summary of the case study concluded with three "touchstones":

> (1) A deep knowledge of affected end-user teams and their workflows;
>
> (2) a deep knowledge of the DAM system; and
>
> (3) the core enterprise functions the DAM system was meant to fulfil. (Beer & Boerner, 2013)

AEP were able to achieve all of the above, and by doing so, they were also able to understand their digital tools properly and use them appropriately.

It is tempting to dismiss legacy publishers' efforts to transform as doomed, and that their traditional processes are an inextricable part of the company DNA. But, with the AEP case study, there is potential in the hybrid option. With that strategy in mind, it would be sensible, then, for legacy publishers to examine the technologies that digital natives are innovating. If legacy publishers are to mutate into hybrid publishers using digital native DNA, what are some digital tools that could be realistically applicable for a legacy publisher's genome?

Part 5 – Digital Native Tools for Legacy Publishers

ANNOTATION AND COLLABORATIVE REVISION

One of the most paradoxical features of new technologies, or, rather, the application of new technologies, is how they are often not based on entirely new thinking at all, but instead on the wants and dreams of the past thinkers. As digital technologies have afforded social media, so has social media afforded the proliferation of tools that have existed since well before the digital era. In a sense, new technologies are innovation triggers for past ideas that could not have been implemented before.

Take annotations, for example. Annotations are the defining feature of the lyrics website Genius, which started out in hip-hop and has since expanded to not only all genres of music, but multiple genres of media as well (entire passages in books are now being featured, for instance). The distinguishing feature of Genius allows a user to highlight one or several words one can add sentence-based annotations. Other than on-platform, whole text annotation this can also be done directly on the web page, as long as it is HTML-based text. A space in the right margin pops up, and then one can write an annotation that will unfold every time someone clicks the yellow highlighted sentence.

An annotation can cover a wide range of media, including written text, images and hyperlinks—as it is the user's decision, this can create a variety of relationships, sometimes humorous, sometimes political, sometimes both. For example, as T.A.M. Linssen proposes, one could annotate the statement on Donald Trump's campaign site, in which he describes the wall on the Mexican border, with the fictitious wall on the television series *Games of Thrones* (2016).

However, the social history of annotations does not begin with Genius. In the Middle Ages, monk scribes undertaking their dutiful process of copying manuscripts would frequently add their own "rhetorical structures," comments, and criticisms (Barney, 1991), and they were not nearly as pious as one would expect—hence marginal asides such as "New parchment, bad ink; I say nothing more"; "Oh, my hand"; and "I am very cold" (Popova, 2012). It was Gutenberg's printing press, ironically, that discouraged the practice of annotation, as the mass-reproduction process meant more uniformity and less stability (Barney, 1991). As more people read, and more people kept their own copies, and the act of reading took place in privacy, one would no longer would see annotations, unless they had a public library book (Linssen, 2016). Nevertheless, any opportunity for annotation arose were taken; when the copyright of *Mein Kampf* ran out in 2016, it was soon republished, albeit with 3,700 annotations submitted by historians repudiating the statements made by Hitler in the book (Linssen, 2016). Clive Thompson, in writing about the affordances of digital technology on the act of reading itself, states that "Books have a centuries-old tradition of annotation and commentary, ranging from the Talmud and scholarly criticism to book clubs and marginalia" (2009).

Indeed, digital technologies, specifically the web platform and xml markup, has allowed annotations to come back with more presence than ever before. People are given the opportunity to "collaboratively (re)create, alter and circulate texts" (Linssen, 2016; Thompson, 2009). The platform which Genius is based on is essentially a crowd-sourced annotation module. These annotations, as in the example of Trump and his wall, are often served to show inconsistences. Genius itself presents this feature as "fact-checking", not unlike the online wikis that have completely erased printed encyclopedias, and are used by many, but edited by very few. Linssen

summarizes digital annotations as an opportunity that "creates a new dimension of delivering information, where the data and its context in media is delivered to the user" (2016).

For academic and scholarly journals, much of the production process is spent in the editing and revision process, where the article goes back and forth on the smallest of details. Even more so for the databases that rely on updating the same type of article year after year—to engage in copy-editors, typesetters, and proofreaders for a process that may result in less than 10% of the content being changed. Genius and the various wikis have made the editing of online content easy to achieve, as well as an expected feature—should Wikipedia ever attempt to lock all of its articles to the public, it would only take a competitor to announce the opposite and the users shall flock elsewhere. Having the editing process of an article accessible to all parties involved—author, stylistic editor, copy-editor, and publisher—may reduce the time, and money, spent on its development. And an annotation tool would be the method to accomplish this. After all, many editors and authors are already familiar with one form of this tool in Microsoft Word's Track Changes feature.

Annotations also allow the reader to know the relevancy of information contained within an article. As one can view the last edits made to a wiki article or a song on Genius, one should also be able to view the last time an article in a medical database was updated. Doing so should not be difficult for a publisher to accomplish, given the flexibility of the annotation tool.

MACHINE LEARNING AND SMART CURATION

As anyone can tell you, computers are excellent at compiling and collecting data. Housing massive amounts of datasets and then utilizing them in a digestible form is part of why computers came to be. A computer can give a user data—but can it give a user information?

It is important to delineate the differences between data and information. Data is a subset of information and is limited to numeric information and single keywords. Information is the umbrella that houses data, and all the assets that fall under data, including media, audiovisual properties, texts, and other documents. In other words, pieces of data are bricks, while information is the ability to perceive a collection of those bricks, constructed in a certain way, as a house. Information provides context to understanding data.

Most platforms deal with data (ergo the term is *Big Data* and not *Big Info*), and have the common hurdle of unifying data sources in a simple matter that can be read (Pop, 2017). With the proliferation of metadata and tagging, bot technology has substantially advanced in the past few years, where algorithms scan through data and deliver summaries based on the frequency, order, and the relation of components with one another. For instance, there are now bots that are advanced enough to break down the structure of a news story, suss out the keywords, and deliver a summary of data (i.e., information) that is useful for the reader. Bots such as these have gained popularity on social aggregation and forum-based sites such as Reddit (Long, 2017). Based on this capability, automated bots should be able to read a book and deliver an accurate approximation of said book's *Coles Notes*.

However, teaching a computer how to recognize context is incredibly hard to do—on the five levels of artificial intelligence puts the understanding of context as the final, and most difficult, level to achieve. The fifth level is where human level understanding lies; the ability to inter-contextualize, compare and contrast components, and create new meaning from datasets. Recognizing context is what allows a roomful of chimpanzees to write a jazz symphony when all the computing power in the world could not achieve the same.

Currently, contextualization in machine learning is dependant on the assistance of live beings. Companies developing machine learning artificial intelligence (AI) will bring in consultants and experts for their system to interrogate. The AI, with its datasets, will ask questions and, based on the response received, assign relationships to the statements and definitions contained. This is a lengthy process, but the goal is to have a system that can use context in its organization of data. When the AI can achieve this, the AI can also recognize whether insights found in search queries are pertinent to the user's request or not.

If machine learning can be developed for academic and scholarly databases, it would be an incredible asset for both academic librarians and authors to have. Combined with the annotation tool, which can highlight relevant passages in an article immediately, machine learning can assist in a more accurate and quicker research process.

CLOUD PLATFORMS AND PUBLIC "BETA" TESTING

This is where the advent of social media as one of the preeminent tools in a digital native's toolbox comes into play, as social media platforms allow for increased interaction with the end user, the customer, and thus further opportunities for the digital native to improve their product or service (Fenwick, 2015). Annotation tools, as mentioned before, are instruments of social collaboration, and thus would work best if the platform that employed them were centralized and accessible. Cloud-based platforms, such as Google Docs, are beginning to displace Microsoft Word as the word processor of choice, and that is largely due to the benefits of cloud technology: instant syncing, interoperability, and, most importantly, its potential for collaboration (Crider, 2015). Should that trend to continue, it may be more appropriate to no longer think of them as just "processors".

The public beta testing approach, for example, serves the same purpose as a focus group would, if not better. An analysis of beta testing performed in software development environments showed that public beta testing can benefit a company through increased word-of-mouth and network effects, thereby securing a better market position and product quality (Jiang, Scheibe, Nilakanta, & Qu, 2017). In contrast, the traditional "develop-test-market" approach would act as more of a handicap, as users are increasingly expecting to become more involved with the development process, and do not prefer to be consulted just once and never again (Jiang, Scheibe, Nilakanta, & Qu, 2017). Thus, companies that interact in this manner are more likely to innovate in order to provide their users with what they want; equivalently, users are more likely to stay loyal to the company and see what else may lie in store.

As such, when improvements can be made continuously instead of a one-time, "make-or-break" release, and with the knowledge that the consumers will be more forgiving, it becomes much easier for digital natives to take risks. When success finds a digital native company, it comes as positive reinforcement to a working culture that in turn further encourages more communication and collaboration.

Conclusion

> I thought it was all about technology. I thought if we hired a couple thousand technology people, if we upgraded our software, things like that, that was it. I was wrong. Product managers have to be different; salespeople have to be different; onsite support has to be different. We've had to drill and change a lot about the company. And I just think it's infecting everything we do. It's infecting our own IT. It's infecting our own manufacturing plants. It's infected everything we're doing, I think in a positive way. (Immelt, 2015)

Integration into innovation—does this not sound like the "digital" spirit? After all, the question remains: How does one define "being digital," to the legacy publisher? Taking in consideration of the past failures to digitize, the diffusion of new technologies, the shift in perception, the best understanding of the term "digital" for a legacy publisher is being *transformative*. In a world of new technologies and constant redefinition, being digital is changing your form to adapt and proliferate. As the CEO of General Electric (GE), Jeff Immelt, learned as he pushed his company to digital competency, being digital is not about upgrading to the right technology, but rather adapting the processes and personnel of GE to the right mindsets.

For legacy publishers, digital transitions involve change. Thus, "all facets of change management should be considered including managerial disputes about the nature of advancement, a socio-cultural challenge resulting from the organizational effects on the involved people (which may lead them to react against those changes), and a technical challenge, which is due to the difficulty in understanding and adopting a new technology" (Parviainen, Tihinen, Kääriäinen, & Teppola, 2017). A top-down approach does not necessarily work, as an underinformed leadership team are more likely to overlook, simplify, or outright dismiss

obstacles of technological complexity. A bottom-up approach would achieve similar undesirable results, as there may be confusion over the fundamental directives that a company needs to achieve. Instead, a legacy publisher must be able to change from both sides: having a leadership team that recognizes and plans for obstacles, and a workforce that is motivated and targeted.

The final step for legacy publishers will be to stop thinking about their "legacy", and, perhaps, even stop thinking of themselves as publishers. Perhaps that term "to publish" implies a more closed-door approach to producing content, where a user cannot participate in the production until they receive the product. Instead, publishers need to think of themselves more as providers and facilitators, and move into the digital era not too slowly, not too quickly, but at an assured and steady rate.

In conclusion, for legacy publishers to successfully transition into the digital era, their digital strategy must account for the transformation of the company as a whole, and acknowledge that the traditional methods that got them this far may not get them any further. The leadership team of a legacy publisher must do well in establishing the digital working culture, and the working culture must support the vision laid out by the leadership team. Change needs to be accepted and encouraged. For the legacy publisher to truly become hybrid, they should also keep aware of the latest trends in digital natives and developing technologies, and use their resources to innovate and stay competitive.

"As the harbor is welcome to the sailor, so is the last line to the scribe.”

(Scribble written by an anonymous monk in the margins of a manuscript.)

Glossary

Academic/Scholarly Publishing

The subfield of publishing which distributes academic research and scholarship. Most academic work is published in academic journal article, book or thesis form.

Beta Testing

In software development, a beta test is the second phase of software testing in which a sampling of the intended audience tries the product out. Beta testing is also sometimes referred to as user acceptance testing (UAT) or end user testing. In this phase of software development, applications are subjected to real world testing by the intended audience for the software. The experiences of the early users are forwarded back to the developers who make final changes before releasing the software commercially.

Business-to-business (B2B)

Usually in the context of e-commerce, where commercial transactions are made between businesses online.

Business-to-consumer (B2C)

Essentially, online retail, where businesses sell their services, goods, and/or products to an end user (an individual).

Cloud Platform

A computing-infrastructure and software model for enabling ubiquitous access to shared resources.

Content Management System (CMS)

Software used to create, edit, manage, and publish content in a consistently organized fashion. Frequently used by digital native companies. Popular examples are WordPress and Drupal.

Diffusion of Innovations

A theory that seeks to explain how, why, and at what rate new ideas and technology spread.

Digital Asset Management (DAM)

A system that manages, organizes, and distributes digital assets, like videos, images and creative files, from a central content hub.

Digital Disruption

The change that occurs when new digital technologies and business models affect the value proposition of existing goods and services.

Digital Native

A person born or brought up during the age of digital technology and therefore familiar with computers and the Internet from an early age. Can also be applied to companies.

Digital Transition

The process in which a company moves the majority of its operations and services to an environment reliant on digital technologies.

Digitization

The process of taking a physical medium and making a 1:1 digital copy for online dissemination.

Early Adapters

In the Diffusion of Innovation theory, these individuals have the highest degree of opinion leadership among the adopter categories. Early adopters have a higher social status, financial liquidity, advanced education and are more socially forward than late adopters. They are more discreet in adoption choices than innovators. They use judicious choice of adoption to help them maintain a central communication position.

Early Majority

In the Diffusion of Innovation theory, they adopt an innovation after a varying degree of time that is significantly longer than the innovators and early adopters. Early Majority have above average social status, contact with early adopters and seldom hold positions of opinion leadership in a system.

Educational Publishing

Educational publishing companies are companies that specialize in publishing materials for educational markets: primary schools, colleges and universities, training programs, etc. This may include textbooks, indexes and abstracts, study guides, etc.

Enterprise System (ES)

Enterprise systems are large-scale application software packages that support business processes, information flows, reporting, and data analytics in complex organizations. From a hardware perspective, enterprise systems are the servers, storage and associated software that large businesses use as the foundation for their IT infrastructure

Enterprise Content Management (ECM)

The technologies used to capture, manage, store, preserve, and deliver content and documents related to organizational processes. ECM tools and strategies allow the management of an organization's unstructured information, wherever that information exists.

Innovation Trigger

The application of a solution, usually in a technological context, that spurs further development.

Innovators

In the Diffusion of Innovation theory, innovators are willing to take risks, have the highest social status, have financial liquidity, are social and have closest contact to scientific sources and interaction with other innovators. Their risk tolerance allows them to adopt technologies that may ultimately fail. Financial resources help absorb these failures.

Laggards

In the Diffusion of Innovation theory, they are the last to adopt an innovation. Unlike some of the previous categories, individuals in this category show little to no opinion leadership. These individuals typically have an aversion to change-agents. Laggards typically tend to be focused on "traditions", lowest social status, lowest financial liquidity, oldest among adopters, and in contact with only family and close friends.

Late Majority

In the Diffusion of Innovation theory, they adopt an innovation after the average participant. These individuals approach an innovation with a high degree of skepticism and after the majority of society has adopted the innovation. Late Majority are typically skeptical about an innovation,

have below average social status, little financial liquidity, in contact with others in late majority and early majority and little opinion leadership.

Legacy Publisher

A publisher that was founded before the digital era, and whose processes and workflows are based on technologies that may no longer be relevant today,

Machine Learning

The subfield of computer science that focuses on prediction-making through the use of computers.

Publishing House

A company that publishes books to achieve commercial success. Depending on the size of the publishing company, the book publisher may carry out all aspects of publication, or may delegate part of the work to editors, designers and marketing specialists.

STM

Abbreviation for Scientific, Technical and Medical. The largest and most profitable category in scholarly publishing.

Trade Publishing

The subfield of publishing which distributes books for a general audience. Fiction makes up a large percentage of trade houses.

Vanilla Implementation

The process of introducing software with no customizations or updates tailored for its user.

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