Memory Curators and Memory Archivists in the Digital Memory Age

Memory Curators and Memory Archivists in the Digital Memory Age

By

Andrew McFadzean

Memory Curators and Memory Archivists in the Digital Memory Age

By Andrew McFadzean

TABLE OF CONTENTS

LIST OF SUMMARY TABLES

LIST OF EXPLANATORY DIAGRAMS

INTRODUCTION

THE NEW REINVENTED INFORMATION PROFESSIONALS

Reinventing the fox and the hedgehog: memory makers

This book is about new yet paradoxically reinvented information professionals known as the memory makers (memory curators-memory archivists). The new informational professionals will be reinvented from traditional librarians and archivists into contemporary memory makers. These librarian-archivists apply their tacit personal knowing of expertise, experience, and skills by valuing sources and the expertise of knowing whom to ask about who knows. Three key interdependent concepts drive the evolution of the memory makers: tacit knowing as Snowden's Agile Remembering, Ogburn's theory of multiples and Mulgan's Big Mind collective intelligence. Roberts simply but powerfully describes how

> know-how is acquired and developed through practice, in order to obtain a high level of competency, individuals must specialise. And where specialist know-how is important, know who will be essential —because, for specialisation to be successful, it is necessary to bring individual specialists together with others and related fields" (Roberts 2017, 42). Memory makers learn that "success requires knowing knowledge—that is, knowing who knows what, and not just within the boundaries of the organisation but also in the wider local and global commercial environment. For this reason, knowledge about who knows how to do specialist tasks is vital (Roberts 2017, 42).

Therefore, the true value of the memory makers is recognising that "know-how involves the formation of social relationships and the development of social capital, which provides access to experts and their knowledge. Like know-how, know who develops over time, through experience and engagement in social practice. The growing importance of this type of knowledge is reflected in the rising academic interest in social capital, which the political scientist Robert Putnam, in a landmark study of the rise and fall of

community in the USA, defined as 'connections among individuals—social networks and the norms of reciprocity and trustworthiness that arise from them'" (Roberts 2017, 42).

Pentland explains in a broad, sweeping brush that the "connection between engagement, trust, and people's ability to act cooperatively is perhaps the main point of Robert Putnam's classic book *Bowling Alone*, which highlights the relationship between civic engagement and the health of society … we are traders in ideas, goods, favors, and information … Exchanges within this network of trusted social ties facilitate idea flow, creating an inclusive, vigorous culture, and are responsible for the collective intelligence of our society" (Pentland 2015, 130).

Folksonomies focusing TMS

Following Pentland's idea that "exchanges within this network of trusted social ties facilitate idea flow, what would be the result in developing a super-folksonomy managed by memory makers (memory curators-memory archivists) for complex, adaptive systems such as websites on the internet? The memory makers would become the key, critical facilitators supporting the exchanges. This folksonomy could become a TMS using David Snowden's ASHEN metadata schema to categorise the personal knowing of participants by managing user tagging. David Snowden's ASHEN schema collects and categorises each participant's professional memory, expertise, heuristics (ways of adapting skills and expertise to situations), professional experience and natural aptitude. This folksonomy would create a continuous, chronologically-linked series of sequential digital records mapping exchanges of dialogues among the participants in a collective intelligence swarm. The folksonomy and the ASHEN schema would be part of the TMS Hub.

The TMS Hub has three key functions: (1) a user-accessed and owned clearinghouse and exchange of ideas and insights; (2) a library of personal knowing (including explicit knowledge); and (3) a business archive documenting valuable intellectual records. The folksonomy would then allow memory makers to make sense of the exchanges using a digital inventory of useful, valued information (keywords, images and sounds, technical terms, scientific theories and concepts) held in a folksonomy. These records would be searchable, retrievable and storable. The folksonomy with the TMS Hub becomes the Remembering Continuum.

Practical system requirements for the criteria for creating and sustaining a folksonomy should include processes to document nine key criteria: 1. the purpose and coverage of the folksonomy; 2. what is

membership and participation; 3. how will the folksonomy and tagging be governed; 4. as a record documenting exchanges how will the folksonomy be recorded and who will have access to the Hub and the folksonomy; 5. who participates and how; 6. how will the folksonomy change and evolve; 7. what is contributed; 8. who contributes to tagging; 9. how is this documented and what protection, if required, is provided for personal privacy, scientific research and development, national security or protecting commercial secrets.

Further research into describing the roles of the memory makers would include reviewing David Snowden's Agile Remembering, Daniel Wegner's pioneering studies on transactive memory and Michael Polanyi's research into personal knowing with the ASHEN schema in the context of Clark and Chalmers Extended mind thesis in complex, adaptive environments and cybernetics. Professor Daniel Wegner (28 June 1948 – 5 July 2013) was a professor of psychology at Harvard University where he developed his theory of transactive memory.

Organisational climate change and memory makers

The organisational climate for knowledge management and recordkeeping informatics is changing massively and rapidly from the paper-based, analogue culture of the mass market, logistical-supply chain era of the twentieth century to the digital complexity and agility and document diversity of the Internet supporting the creative economies of the twenty-first century. The memory maker can use the growing volume, variety and velocity of data and information to make sense of and narrate change. As a key facilitator, the memory maker participates in collective intelligence, which is the process of applying the Essential Equation to create shared transactive memories to collaborate and arrive at an assembled reasoning from collective intelligence.

This book argues that assembled reasoning creates a synergy between personal knowing and digitised data collected through artificial intelligence. As discussed in this book, tagging arranged into managed folksonomies documents information could allow memory makers to manage the volume, variety and velocity of information by linking collective intelligence to artificial intelligence systems. The rich diversity of divergent thinking through tagging in collective intelligence is managed by the convergent thinking of artificial intelligence and the metadata schema housed in the folksonomy. The metadata schema links the author to insight to other associated researchers. The folksonomy.

The folksonomy powers collective intelligence and documents assembled reasoning

These two concepts create the synergy that memory makers could use to make sense of situations and explain through narration the nature of change. Memory makers, as knowledge managers, curate personal and collaborative evolving knowing and information and provide vital transactional and translative skills and services for these new peer-production co-innovation online users found in collective intelligence. The value of the book rests with the idea that memory makers play the role of striking a dynamic equilibrium that supports synergy and not a competition between humans and artificial intelligence. This is a work-in-progress.

Curated records: a bigger picture

I am writing about the complex changes in what used to be called knowledge management and what is still called recordkeeping informatics. Part of my analysis is that as computing systems move towards automated digital workflows (and possibly, eventually, some form of the Internet of Things (IOT) records will become systematic and systemic, and a new type of record will be required to make data and other intellectual exchanges both legally and financially, managerially and intellectually accountable and available as real-time system feedback. These new records I have labelled curated records. Part of knowledge management may be evolving and morphing into systems feedback science. Data may be the new oil, but I believe digital data schemas (read profiles) will become the new gold. After discussions over several lunches with my colleague and long-time friend Calin Cobzaru, I have added memory makers (memory makers (memory curators-memory archivists)) to my concept. The business environment should evolve towards symbiotic synergy between digital business-recordkeeping systems and us humans. Walter Isaacson's *The Innovators* helps put progress into a broader technical-cultural context. Catherine Ball describes how systems thinking includes complex adaptive systems "as part of an overall system—an eco-system, if you will—of different nodes doing different jobs, with different levels of interactivity and feedback … means we need to approach interactions as though they are networked—that is, every-thing is connected" (Ball 2022, 42). Professor Genevieve Bell from Australia's ANU helps round-out the bigger picture.

A very important note about the compiling authorship and style of my book

The idea of the summary tables and quotations, both in the summary tables and text around the tables, is drawn heavily from Professor Ann Blair's history of information management in classical times and the early modern era. Professor Blair describes the style of authorship known as compilation. Thompson notes, ironically, that one of the features of contemporary life that "makes me optimistic about our cognitive future is how much it resembles our cognitive past. In the sixteenth century, humanity faced a printed-paper wave of information overload—with the explosion of books that began with the codex and went into overdrive with Gutenberg's movable type" (Thompson 2014, 12). As the historian Ann Blair notes,

> scholars were alarmed: How would they be able to keep on top of the flood of human expression? The famous mathematician Gottfried Wilhelm Leibniz bemoaned 'that horrible mass of books which keeps on growing,' which would doom the quality writers to 'the danger of general oblivion' and produce 'a return to barbarism.' Thankfully, he was wrong. Scholars quickly set about organizing the new mental environment by clipping their favorite passages from books and assembling them into huge tomes—florilegia, bouquets of text—so that readers could sample the best parts. They were basically blogging, going through some of the same arguments modern bloggers go through (Thompson 2014, 12).

The compiler as an author

Against this background, Professor Ann Blair presents the compiler as an author. The author is the broader label covering various tasks and roles: researcher, collector, editor and critically for this book, a curator and recordkeeper. The author uses their authority (including expertise and experience) to craft another (newer) form of document. Essentially, Blair's use of Foucault's study fits well with Kelly's observations about technology, writing and memory in the Digital Age and Thompson's study of personal knowing (experience and expertise) and the digital-creative economy. Blair writes,

> Michel Foucault insightfully observed that the function of the author has a history. Although his own periodisation was rough and ready, Foucault's work has prompted more detailed study of the concept and nature of authorship in different historical

contexts as well as multiple proposals for the proper interpretation of author. In the modern inspired genius model of authorship, a text made of excerpts from other texts is considered inferior to an authored text because it involves little original composition. In contrast, in the post-modern conception of authorship the process of selecting is perceived to carry significant interpretive weight, so that the compiler might be rehabilitated as being on a par with the author. But the firmly entrenched negative connotations of compiling and the utilitarian nature of many compilations have deterred scholarly attention to compilation until recently (Blair 2010, 175).

Blair clearly defends and supports compiling (almost, might I say, curating). In this context, Blair's analysis fits neatly into Bhaskar's contemporary depiction of a curator. In my analysis and narrative, the Blair compiler becomes the memory curator-memory archivist blending the compiling of data and information with the role of information management as a form of proto-recordkeeping, or as Blair notes, information management. Blair declares that compiling

nonetheless offers fertile ground for study, not only because of the individual judgement and creativity involved but also, for my purposes, because compiling was a widespread form of information management in premodern periods. Compilers selected, summarised, sorted, and presented the text to material to facilitate its use by others. Attending to the motivations and self-presentations of compilers and their methods of working offers a useful entry into the history of information management. Early modern compiling was, of course, deeply indebted to a long mediaeval tradition, and those who have attended most closely to the phenomenon are mediaevalists" (Blair 2010, 175).

Therefore, this book is not a narrative but a collection of compilations. My summary tables, consisting of other researchers' quotes on their own or with my annotations, are key documents to my book. These are surrounded by my text, with supporting quotes from researchers, as brief mini-essays that help contextualise the summary tables. I am the author and, more importantly, the compiler of my book. Thank you, Professor Blair, for your book and thoughts, which have helped me greatly through my authoring and compiling.

Structure of the book

Each chapter has a theme which is noted at the start of the chapter. Each chapter is divided into parts. Each part has a sub-theme that relates to the chapter theme. Each part is made up of one or more summary tables. The summary tables are the most important documents in each chapter. Around each summary table, located either before or after the summary table, are mini-essays that provide supporting contextual information about the summary tables. The structure and style are based on the idea that the book is designed more as a compilation-reference source than a longer narrative. As noted above, when discussing Professor Ann Blair's research into compilation, my book is written as a compilation than a pure narrative. I hope you find my book informative, helpful and stimulating.

The introduction will set the context of the study by defining the critical value of the social capital role of the new, reinvented information professionals, the memory makers (memory curators-memory archivists). Then the place of curation and recordkeeping informatics in developing folksonomies in collective intelligence will be briefly described. The introduction will close with a commentary on compilers as curators and the re-emerging value of compilation.

Chapter One describes the seven major historical forces that have telescoped into our era of the early twenty-first century and compressed their separate effects into a contemporary perfect storm of positive and negative effects of change. These forces are: compiling to curating to blogging; expression explosion: the new literacies; rhizomic networking cultures and emerging localism; reinventing new information professionals; digital-creative economies and big data; people power: tacit personal knowing through memory to Agile Remembering; and King Lud in the digital-memory age: deskilling, upskilling, reskilling and appropriability.

Chapter Two provides the background to natural curation and the significance of schemas and categories to make sense of complexity. Significantly, the history of ideas between tacit knowing, explicit knowledge and the key concept of Michael Polanyi's *Personal Knowing* and David Snowden's *Agile Remembering* is the main theme of this chapter.

Chapter Three provides a brief definition and overview of memory curators and concentrates on the skills required by memory curators. This chapter will focus on Bhaskar's research and writing on curation, an explanation of the eSARS strategy, what makes practical curation, David Snowden's archetypical curative strategy of Agile Remembering and the essential power of narratives in making sense.

Chapter Four examines in greater depth the role of memory archivists and how recordkeeping informatics assists memory archivists in managing research data. The new, reinvented information professional, the memory maker (memory curator-memory archivist), is covered, and their evolving team-based roles are explained. The six key skillsets of the memory makers are the compiler, narrator, editor, digital registrar, systems analyst and feedback specialist. This chapter also reviews how international standards in recordkeeping and open-source folksonomies developed by users of systems influence recordkeeping digital data collections.

Chapter Five defines, describes, and explains the collaborative learning of the Essential Equation. The Essential Equation comprises the converging of four key theories: Michael Polanyi's paradox theory of personal knowing; David Snowden's concept of Agile Remembering applying insight memory and the ASHEN metadata schema in complexity; Reg Revan's collaborative learning through facilitated, group learning known as Action Learning; and Daniel Wenger's theory of distributed memory learning known as the TMS expressed through the Hub.

Chapter Six focuses on how corporate memory is evolving into collective intelligence to the next stage of assembled reasoning. The evolution from corporate memory to collective intelligence and assembled reasoning focuses on the critical Remembering Continuum (memories to remembering) and the role of Consilience with the example of Gergis' book *Sunburnt Country. The History and Future of Climate Change in Australia*. The memory makers' education, training, skills, experience and expertise are debated through Archilochus' fable of the fox and hedgehog, and the ways of observing, learning and remembering are reviewed in the compiled summary tables integral to this chapter.

Chapter Seven will be a reference source for readers. This chapter will be an annotated reference list of significant and professionally useful websites (including the Digital Curation Centre supported by the University of Edinburgh), webpages, blogs, journals and books providing information about the key concepts identified in this book.

The conclusion seeks to answer the three broad themes that run through this book: what is the value and role of memory curators in the evolving Digital Memory Age; is there a place for experience and skills of recordkeepers in the new networked collaborative economies; and will there be a synergy between memory curators (as memory archivists) and artificial intelligence (AI)?

Memory-making: The three themes of the Remembering Continuum

Making memories through the curated records of the Remembering Continuum is a response to the forces of organisational climate change. The Remembering Continuum is based on three themes. First, pre and post-written language text literacy is evolving into digital literacy (multimedia, multi-source) that reinvents and massively broadens expression and access to communication through the Internet and social media for a vast population. The irony is that in the period of predominantly written language text, many in that culture were excluded and marginalised by authority and archives, as described by McKemmish, Faulkland, Russell and Reed. Nowadays, through the post-text culture of the WWW and social media, expression and communication are booming with digital literacy.

Second, Brien Brothman's theory about the memory-archives continuum means memory and archives can be seen systemically and interactively as separate parts of a bigger system. Memory archivists study how the past affects social identity and collective memory, while history archivist seeks evidence about linear historical narratives. Collective (community, group, social, cultural or organisational) memory and archives may be physically scattered or administratively separated but historically bound as shared, inter-related narratives and, therefore, contested and contestable. Key contestable issues include: what records describe the archive, how reliably were these collected, the points of tension between collective memories and the historical archive, and who is driving the new memory-history dynamic? Archives are becoming intellectually rhizomically mapped yet exist in traditional stand-alone archives through webs of various collective memories.

Third, curated digital records are becoming wired and morphing into cultural and everyday artefacts based on social and financial lifestyles. Unlike the clunky and isolated hidden histories of paper-based records, digital records are far more inextricably linked to our daily lives in many ways, obvious and hidden in plain sight. Digital records are socially, politically, psychologically and economically extensive and intensive. Digital recordkeeping could be described as contemporary digital songlines culturally and physically embedded and profiles and datasets as message sticks in the new Digital-Memory Age.

Recordkeeping informatics: mapping the Remembering Continuum

To make sense of the three themes, the Remembering Continuum uses recordkeeping informatics, which is about mapping records. There are two themes to mapping: provenance and access. Mapping means knowing the provenance of records that covers the origin, source, creator, authority and overall history behind the information. Access is an umbrella concept covering the registration, protection and ongoing access to the information as it flows through the Remembering Continuum. Recordkeeping informatics is essential to defining digital records, authenticating the Remembering Continuum and using information.

Memory makers (memory curators-memory archivists)

Drawing on Ancient Greek soldier-poet Archilochus' fabled fox memory makers should be thinking reflexively: mapping all the pathways through the ecology; finding ideas from many sources; looking for the unexpected; joining the dots by integrating, synthesising and aggregating insights; and willingly, readily reinventing other ideas to make sense when necessary.

Summary of key points

- Recordkeeping is the systematic application of information culture to support metadata to identify records and allow access to business process information.
- The Remembering Continuum is about creating assembled reasoning through collaborative thinking
- Compiling is curating, and the compiler is another form of authorship.

CHAPTER ONE

ORGANISATIONAL CLIMATE CHANGE IN THE EMERGING DIGITAL-MEMORY AGE

Organisational climate change is here:
History catches up with us

The concept of the memory maker (memory curator-memory archivist) draws heavily on history, primarily the early modern era of the fifteenth century and, ironically, the era of our time with the Internet and the Web from the early 1980s. This beautiful merging of contradiction of the obvious and the underlying themes gives the prototypical memory maker (memory curator-memory archivist) their unique and similar features and strengths as sensemakers.

The new information professional, the memory maker (memory curator-memory archivist), is a composite of several concepts and themes of knowledge and information management. Essentially the memory maker (memory curator-memory archivist) is an archivist with a strong sense of the reasoning, organisation and business of organisations developed from records and how these are collected, labelled, arranged and used. Archivists develop a keen sense of business history and organisational and information cultures through records illustrating change and adaptation.

The memory maker (memory curator-memory archivist) is also a librarian with a strong sense of general and specific personal knowing and fantastic expertise in knowing who knows who and who knows what! As a librarian, the memory maker (memory curator-memory archivist) is an explorer who curates (searches, selects, sorts, classifies, arranges, summarises and displays) information and data, then classifies the information and arranges this into a summary that can then be moulded into a presentation as a story to answer questions. In an environment of knowledge and data explosions with massive information overload Kelly describes editors as the "middle people—or what are called 'curators' today—the professionals between a creator and the audience. These middle folk work at publishers, music labels, galleries, or film studios. While their roles would have to

change drastically, the demand for the middle would not go away. Intermediates of some type are needed to shape the cloud of creativity that boils up from the crowd" (Kelly 2017, 150).

The need for the memory maker (memory curator-memory archivist) comes from merging seven significant themes in information management at the start of the twenty-first century. The seven themes are:

- the growth of personal curating (compiling, blogging and curating stories)
- the expression explosion through new-old literacies (oral and video expression)
- rhizomic networking and the new localism
- the reinventing of new information professionals in a time of information overload
- the emerging digital-creative economies of the complex adaptive systems of the Internet
- thinking and reasoning through people power (tacit remembering replacing explicit memory)
- hybridity and synergy between people and robotics (automation)

Curators in the bigger picture: seven forces of organisational climate change

The seven separate yet interdependent intellectual, social, political, and economic forces converging as organisational climate change create consilience.

1. Personal compiling to curating to blogging

The long revolution in scientific research accelerated in the seventeenth century with the emergence of the coffee house debates, journals as accredited scientific communication channels across Europe and political and emerging social changes from the rise of pamphleteering leading to public debate by private citizens (Standage 2013, 104-123). We now live and work in a networked world of massive data collection, storage, analysis, curating and marketing scientific, financial, economic, political, social media and social data. Scholars became curators and compilers of knowledge of the early modern era to cope with the knowledge explosion and information overload triggered by Gutenberg's printing revolution. Compiling has close conceptual links to blogging. Both emerged under

conditions of knowledge explosions and information overload (Blair 2010, 3-8, 175-176, 228, 268). Podcasting could be seen as a new variant of blogging and traditional media broadcasting, another example of curating information and knowledge.

In times of information overloading, compilers and bloggers become editors (Kelly 2017, 150). These editors select, summarise and curate the increased volume of data and information and, by curating, help readers keep up with the increased velocity, variety, and volume of new information and how this is contextualised into society and the economy. Like the compilers of the sixteenth century, today's bloggers make statements as authors through two key practices. First, the selected, sorted, summarised, and presented content should follow a theme. This theme may be broad or specific, varied, or singular. Second, the analysis or commentary explaining the curated selections provides the essential background to the curated compilation, both in the sixteenth and twenty-first centuries.

Blair's research puts the compiler-curator in a new light. It fits well for the further study of the memory maker (memory curator-memory archivist) by observing, "in the postmodern conception of authorship the process of selecting is perceived to carry significant interpretive weight, so that the compiler might be rehabilitated as being on a par with the author. But the firmly entrenched negative connotations of compiling and the utilitarian nature of many compilations have deterred scholarly attention to compilation until recently" (Blair 2010, 175). Standage writes about back to the future as "social media is not new. It has been around for centuries. Today, blogs are the new pamphlets. Microblogs and online social networks are the new coffee houses. Media-sharing sites are the new commonplace books. They are all shared, social platforms that enable ideas to travel from one person to another, rippling through networks of people connected by social bonds, rather than having to squeeze through the privileged bottleneck of broadcast media" (Standage 2013, 250).

2. Expression explosion: the new literacies

Personal expression has evolved from the oral traditions of the rhetoric of ancient Greece and Rome, cultural bards of European cultures and village gossip to contemporary online social media messaging or texting (Standage 2013, 14-20, 22-38). The rise of digital expression and new forms of authoring, notably blogging and now video blogging, has coincided with the rise of online digital platforms, including Facebook, Amazon, Google, and Twitter. Self-expression has evolved yet turned full circle with multimedia software allowing compilations of text, oral and imagery messages to

express ideas, insights, and emotions to close friends or global audiences on social media platforms across the globe (Standage 2013, 222-234). The ease and simplicity of messaging leads to a trade-off of personal privacy for online access. Thompson notes that computing and digital systems have created new literacies, including video, imagery and datasets (Thompson 2014, 87) in which, notably, a "key area of video literacy is our growing ability to capture ideas that are difficult to represent in text" (Thompson 2014, 102).

With this access, the rise of the ownership and protection of personal data became part of the larger issue of information security, including cyber-crime (hacking, theft and fraud), data theft, identity theft and intellectual espionage. The rise of blogging, particularly video blogging, has also triggered crises in intellectual property rights as blogging involves mixing, recreating and sharing massive volumes of original and previously copied subject matter to the point where blogging has returned us to the earlier issue of defining compilers as authors. This will become an issue for the memory makers (memory curators-memory archivists). The cultures of compiling, curating and blogging have brought creativity, originality and Foucault's question about the author function back into the light. Significantly, Turkle notes that people need time to develop the art and practice of conversation, thinking and reflecting while negotiating new insights and meanings. Turkle reasons that conversing is vital to creativity (Turkle 2015, 76-77, 221, 245-246, 282-283, 332-333). Following Turkle's research into conversation and reflection, historians Pettegree and der Weduwen note in their recent history of the library that

> by empowering the digital revolution, librarians have given up the one unique selling point which they defended so tenaciously for almost as long as we have had libraries: the right to apply their knowledge, taste and discrimination to assisting the choice of their patrons. … Can the Internet, in all its enormous variety, ever replace this reflective process of deliberation, the slow choosing, the eager anticipation, the slow unfolding of plot? The Internet, it is true, is the perfect tool for an impatient age; we love the convenience of same-day delivery, but we complain more and more of the stress of the relentless pace of life. … Libraries and books encourage reflective thought (Pettegree and der Weduwen 2021, 409-410).

From a critical modern functional point of view, Pettegree and der Weduwen conclude that computerised browsing is key to library research. Therefore, while computerised searching creates "recommendations by association in both the search results (if you bought this you may also like

this) and the micro-targeted page advertising. But what if we want something different, rather than more the same? What if we do not know that we want something different, but a chance encounter sparks our interest?" (Pettegree and der Weduwen 2021, 413).

3. Rhizomic networking cultures and emerging localism

Memory makers (memory curators-memory archivists) are new professions in the digital environment. The emergence of networks, such as the nineteenth century's industrial and domestic electricity networks, laid the groundwork for the later digital networking of the Internet from the 1990s (Bell 2017, 3). As the Internet evolved, the social media platforms of Facebook, Amazon, Google and Alibaba coevolved with Tim Berners-Lee's World Wide Web and associated social media and online commerce. The business office culture of the late nineteenth century grew technically and socially with the rise of the electronic and then digital business technologies of the late twentieth-century networks (Bell 2017, 3).

The Internet turned the earlier electronic networks of the telegraph and telephone into the complex digital adaptive system of the digital Internet (Bell 2017, 3). Across the rhizomic network also evolved the built space of cities and the workplace culture of corporate management, digital technologies, and the rise of the email culture as a symbol of modern business processes (Bell 2017, 3). The evolutionary spread of WiFi and cloud computing has made the business cultures of the Internet more challenging for the memory makers (memory curators-memory archivists). Genevieve Bell and Walter Isaacson portray the invention and evolution of the Internet and Berners-Lee's World Wide Web (WWW) as

a messy patchwork of intellectual genealogies, friendships and shared encounters, as well as persistent ideas and relationships. It isn't a simple story about architecture and technological innovation or inventors and scientists … new technologies do not always supersede the old ones; and we spend a lot of time negotiating and navigating between new and old. Which is to say, networks aren't straightforward and getting connected isn't just about a technological infrastructure … What is getting connected? Why? And how? What drives an infrastructure roll out? Efficiencies? A governmental or civic agenda? Cultural aspirations or experiences? Who is doing the connecting, and what is their motive? Will the network evolve and change over time? What are the measures of success and the driving forces? Who are the other voices in the story, and what might be their

> threads? And ultimately, what is the world that all this
> connecting will build? (Bell 2017, 3).

These factors are among the causes identified by Bailey in his ground-breaking book *Managing the Crowd*, which reasons all information is the same as records. Taking Bell and Isaacson's histories further, Rifkin describes the growth and activity of digital networking as almost driving change relentlessly by noting the Internet as a network where a

> generation does not write with words as much as it communicates
> with images, sounds, and video. The distributed nature of the
> medium makes it easy to mix and match and cut and paste within
> and across genres. Because the marginal cost of copying
> anything on the Internet is nearly free, kids grow up with the
> idea that sharing information is little different than sharing
> conversation. The interconnectivity and interactivity of the
> medium cries out for collaboration and gives rise to what Lessig
> calls the 'remix' culture, in which everyone is playing off
> everyone else, using a mix of media and adding their own
> variations to a theme, and passing it down the line in a never-
> ending game (Rifkin 2015, 216-217).

Rifkin noted that the Creative Commons was established in 2001 and started issuing "copyleft licenses, known as Creative Commons licenses, free of charge to anyone involved in creating cultural content. The licenses provide a number of options by which authors can mark their content and determine the freedoms they would like to extend to others. In place of 'all rights reserved,' the critical feature of copyrights, the Creative Commons licenses substitute 'some rights reserved.' Lessig explains: 'The freedoms could be to share the work, or to remix the work, or both'" (Rifkin 2015, 216-217).

4. Reinventing new information professionals

A new wild frontier of data, information and records is now flowing through the rhizomic network of the Internet. This business information was once carolled in traditional paper-based records registries and associated records management processes, systems and technologies. However, the emergence and rise of personal computing, the culture of blogging, access to social media and now mobile digital business systems and technologies, including the ubiquitous mobile or cell phone, in business administration coincided with the erosion of the archival order of the paper-based, bureaucratic registries and led to the wild frontier of contemporary corporate culture,

crises of modern government and the tangled web of social media platforms from the 1990s. The erosion of the professional authority of records professionals and competition from information-communication professionals sparked and fuelled the beginning of the dark data era (the loss of control of records (duplication, distrust in the source of records, fake news, data and information and authority)) as well as data theft and loss.

Bailey's *Managing the Crowd* reasons all information is the same as records (Bailey 2008, 4-13, 125-161). This coincided with the idea of automated digital business workflows and the launching of the concept of IOT. This was intensified by the growing application of AI in the form of machine learning programs and deep-thinking applications. Automation and AI governance in business systems are emerging issues. This includes governance issues about extensive and intensive webs of sensory systems, supercomputing, data analytics, the wholesale marketing of personal dataset profiles, and impacts on public policy. Dystopian information scenarios cover a broad range of challenges, including the governance and regulation of weaponised robotics, the ownership, access and use of personal data, black box algorithms and data analytics on public policy. This is the emergence of the issue of big sense being needed for big data.

The memory makers (memory curators-memory archivists) are the new information professionals who represent reinvented information professionals. The memory makers (memory curators-memory archivists) should have skillsets, expertise and/or experience across five competencies:

- recordkeeping informatics (information cultures, the information continuum, business processes, metadata schemas as document identity, access terms and conditions)
- information cultural systems (organisational, information and recordkeeping cultures focusing on legislative requirements, professional standards, policies and procedures, business rules and practices)
- records as boundary objects of cultural memory (Geoffrey Yeo's theory); (descriptions of exchanges based on speech acts, actions and cultural memory)
- documentation as practical history; (origins, provenance, metadata schemas and supporting contextual information about the record)
- information governance (including personal data profiling, digital forensics, data analytics, black box algorithms and protecting human expertise in AI and automated digital systems)

The references for this complex and complicated subject include (Yeo 2018) (McKemmish, Upward, Bastian, Henttonen, Acker, Evans, Hofman in Gilliland, McKemmish and Lau 2017) (Brown 2018, Reed, Oliver, Upward and Evans 2018; Duranti, Truth and Records; Yeo, Appraisal, 45-63; Bunn, Bearman and Documentation, 65-77; Moss and Thomas,) (Oliver and Foscarini) (Ghosh 2020) (Pasquale 2020).

5. Digital-creative economies and big data

The rise of new businesses in the digital and creative economies of the complex adaptive systems of the Internet and the WWW saw the emergence of service industries based on agility, adaptability, sharing, collaboration, and localism, essentially, reflexivity (Baldwin 2019, 240-248, 268-272). Localism is marketing matching the spread of digital networks to the curiosity and awareness of consumers asking for goods and services closer to specific needs rather than accepting the earlier economic model of one-size-fits-all with mass production and logistical supply chains of the nineteenth and twentieth centuries (Baldwin 2019, 261-264). Now consumers and providers negotiate through social cognition to match necessity to expectation. Goodwill has now become another form of gold in the WWW. The need for memory makers (memory curators-memory archivists) in the complexity of the services-products markets and businesses is significantly greater than the logistical supply-chain mass production system of the mid-twentieth century. Professor Bharat Anand, the Henry R. Byers Professor of Business Administration at Harvard Business School, has reasoned that the two key and new elements to the emerging digital-creative economies are not content but connections and ideas (Anand 2016, loc. 6608). Annand reasons that people in the creative economies

> don't claim to know every answer, but are confident about asking the right questions. … unafraid to go against the grain, to try something different. … able to see the forest and the trees. … understanding how small things are tied to big ones. … requires three things: seeing how what we do is increasingly linked to what others do; looking beyond where we play to bring related but invisible opportunities into focus; and recognizing how what we do is impacted by where we are. It requires recognizing these connections—then respecting, creating, and leveraging them as well (Anand 2016, loc. 129).

The emerging spread of automation and robotic systems in business only highlights the need for information professionals as intermediaries and translators between people and automated systems. This must increase with

the evolution of whatever form the IOT assumes through the early part of the twenty-first century (Rifkin 2015, 14-17, 80-85, 88-95). Kotter's model of the dual-speed business (agile, acquisitive networks morphing into administrative hierarchies) may become the standard form through the various international economies (Kotter 2014, 33-35). The data and business information generated and passed through Kotter's dual systems organisation will morph into networked, curated records (business data and information morphed and shared through systems data (as curated system records) through integrated or singular automated business-recordkeeping systems) (Upward, Reed, Oliver and Evans 2018, a compiled summary of key pages building this idea: 74-76, 155-163, 165-167, 174-175, 185-187, 238-239 and 254). This may be the new localism model of modern business. Evolution through synergy rather than coevolution of AI and people-driven processes and systems.

The new working model recommended for the memory maker (memory curators-memory archivists) is based on a new version of an earlier idea and bridges from agile teams to medieval guilds. Agile teams are small, independent teams of knowledge workers with a range of expertise and experience that provide services to customers through digital networks responding to the dramatic changes in the modern marketplace of creative and digital economies. Agile teams are independently managed, focused and resourced on specific, limited tasks, yet accountable to a larger corporate organisation, a perfect example of a Kotter dual system business (Baldwin 2019, 270-271); (Denning 2013, 3-8, 22-25).

The second, earlier idea is central to the sixth theme below, competency and proficiency. Denning notes that expertise gained through a complex mix of education, training, and professional practice into experience can be found anywhere in an organisation supported by a creative culture. As an organisation becomes more agile and adaptive, "the organization is less like a giant warship, and more like a flotilla of tiny speedboats … an organic living network of high-performance teams. … competence resides throughout the organization and innovation can come from anywhere" (Denning 2016, 6). The practice of an agile team should include four features: 1. tasks in short cycles; 2. teams free from managers during cycles; 3. team reports to the client during the cycle; 4. self-governing: the team describes the purpose after consulting management, decides the schedule, the pace of work; how to apply tasks, evaluates performance internally and assesses and adapts performance to teamwork (Denning 2016, 4).

6. People power: tacit personal knowing through memory to Agile Remembering

The new information professionals, the memory makers (memory curators-memory archivists), challenge the previous, widespread convention of the tacit-explicit dichotomy that had evolved in the 1990s through the Japanese management models of Nonaka and Takeuchi. Essentially, the tacit-explicit knowledge model reasoned that people's internal tacit knowing interacted with a business' external knowledge. Tacit knowing could be codified and captured in corporate memory systems for later use. AI and deep learning research could be an extension of the earlier tacit-explicit dichotomy. Management research, theories and practices since the 1950s have based organisational learning systems and methods on variations of the later Nonaka and Takeuchi theory (Roberts 2015, 44-49). This description and account are based on developments in cognitive psychology, neuroscience and management studies of the early twenty-first century. Research into human sensemaking included memory, learning, language and communications studies. This research includes the emergence of dual process thinking, which includes behavioural economics to explain how people make sense of the working and social environment.

In this newly evolving professional space, the roles of librarian and archivist have been reinvented as memory makers (memory curators-memory archivists) as knowledge workers who apply the uniquely human qualities of associative thinking and social cognition to apply the skills of curating and documenting change with curated records. The emergence of the memory makers (memory curators-memory archivists) coincides with the rise of interest in reflexivity through social capital (through Polanyi and Moravec's paradox). Rather than the regulated, structured concept of the tacit-explicit dichotomy, the memory makers (memory curators-memory archivists) develop expertise and experience through experiential learning, which like medieval artisans, was recognised through professional reputation. Sociologist Richard Sennett reasons that medieval artisans could become guild members that validated apprenticeships, rewarded masters with status and conferred reputation on portable and valued artisans. However, the key point is that your community gives you your reputation and is a complex, valuable, intangible asset (Gratton and Scott 2017, 110-115, 118-122, 140-146).

Essentially, reflexivity is the skill for working with and in complex adaptive systems, such as the Internet. Systems analysis is essential for information security and cybersecurity in complex adaptive systems. Ball notes the complex adaptive systems include technological networks that are