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From Digitization and Digitalization to Digital Transformation: A Case for Grey Literature Management*

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Abstract

Following digitization and digitalization, digital transformation is the next step in the automation of grey literature management. A brief historical overview and analysis of current trends will shed some light on terminological differences in these three terms, but also on more important conceptual differences. At one time, these terms were used almost interchangeably, especially the first two. Although the term 'digital transformation' is newer and currently more frequently used, it still causes semantic confusion. Digital transformation — including the management of grey literature — attempts to rise above this terminological ambiguity by assuming an umbrella role, encompassing digitization and digitalization as its constituting components and regarding them as small, but necessary, steps in the big picture of an organization's digital transformation. Digital transformation has a major impact on all activities carried out by those organizations that adopt it. Because it offers valuable opportunities for the growth of commercial, government, and public organizations, it requires the full attention of business and information managers. It also provides the opportunity to enhance the management of grey literature, increase its value and importance, and improve its usability and accessibility.

Keywords: digital transformation; digitization, digitalization, grey literature

Introduction

The terms digitization, digitalization, and digital transformation often cause confusion and are sometimes used interchangeably, especially the first two terms (Brennen, 2014). Digital transformation is a newer and, currently, a more frequently used term, while still causing semantic confusion. Digital transformation — including information and grey literature management — attempts to rise above this terminological ambiguity by assuming an umbrella role, encompassing digitization and digitalization as its constituting components and regarding them as small, but necessary, steps in the big picture of an organization's digital transformation.

Because digital transformation offers valuable opportunities for commercial, government, and public organizations, it deserves clarity and the full attention of business and information managers. It also offers a chance to enhance the management of grey literature, increase its value and importance, and improve usability and accessibility.

This paper begins by exploring the basic facets of the concept of digital transformation and offering some reasons about why it matters for businesses today. It will then give an overview of terminological, conceptual, and historical differences between digitization, digitalization and digital transformation. Special emphasis will be given to the impact of digital transformation on grey literature management, specifically on its work, workplace, and workforce.

Digital Transformation Concept

The term digital transformation is often used in business presentations, discussions, and numerous papers. However, there is not a single, widely accepted, definition. Researchers and businesses have differing definitions, depending on their area of expertise and interest. Most agree, however, that digital transformation, using modern information technology (IT), represents large-scale change in fundamental business processes and components. These changes generally target business models, products, productivity, employee roles, production, marketing, financial management, and other processes. They also include cultural changes that challenge the status quo, and the way information is managed, structured, and positioned within an organization. All parts of an enterprise can undergo, or feel the impact of, transformation — from infrastructure,

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supply chain, sales, marketing, purchasing, finance, and human resource management, to customer relations.

Some writers regard standard business process re-engineering as digital transformation. Although some elements are the same, business process re-engineering is mainly algorithmic, or rule-based processes, where automation is done simply by deploying newer technologies. Digital transformation has a different goal in mind. It concentrates less on the technology, although highly dependent on it, and more on the starting and end points as business related goals. Information technology is only an enabler in the process of digital transformation for more efficient and, often, different ways of doing business.

Having said that, it does not mean that the type and sophistication of information technology does not play an important role. It does and will continue to do so. Some of the new technologies are of paramount importance in implementing parts of digital transformation. These include artificial intelligence, machine learning, robotics, the Internet of things, big data, cloud and mobile computing, powerful analytics, social networks, 5G networks, 3D printing, augmented and virtual reality. However, it is the business rationale that determines its use, not the other way around.

Digital transformation did not happen suddenly — it is only the last part in a chain of various processes and developments related to automation. Historically speaking, the business world initially went through the process of digitization, followed by digitalization, and finally arriving at the current stage — digital transformation. All three phases are covered in this paper.

The importance of digital transformation

Many trends have been regarded as ‘important’, ‘major’, ‘game changing’, etc. They have come and gone. With that in mind, it is fair to ask if digital transformation really matters — and why it matters. In other words, what is the importance of digital transformation? What makes this latest trend different and special? And will it really have a lasting impact?

Even a brief look at current relevant literature and business reports shows some very important, large-scale predictions for the near and not-so-distant future. The OECD Employment Outlook (OECD, 2019) predicts that 14% of jobs are at high risk of automation, while another 32% of jobs could be radically transformed in the next 15-20 years. This makes 46% of all jobs undergoing some radical change in a relatively short period of time.

According to a report published by Dell Technologies and authored by the Institute for The Future (ITF) and a panel of 20 tech, business and academic experts from around the world, 85% of jobs that will exist in 2030 haven't even been invented yet (DELL Technologies, 2019).

Worldwide spending on the technologies and services that enable the digital transformation (DX) of business practices, products, and organizations is forecast to reach \$2.3 trillion in 2023, according to a new update to the International Data Corporation (IDC, 2019).

The climate change (“green”) movement, also sees an opportunity for improvements and benefits arising from digital transformation. For example, due to intensive automation and digital transformation, Telstra Corporation Australia (2019), predicts a 20% reduction in global carbon emissions by 2030.

From a personal aspect, digital transformation might have some negative impacts. Gartner (2016) predicts that by 2020, the average person will have more conversations with bots than with their spouse. With the rise of Artificial Intelligence (AI) and conversational user interfaces, we are increasingly more likely to interact, unknowingly, with a bot in the future than ever before.

Digitization

According to the Oxford English Dictionary (OED) (2019), the terms ‘digitization’ and ‘digitalization’ in conjunction with computers were first used in the mid-1950s. OED defines digitization as, “the action or process of digitizing; the conversion of analogue data (esp. in later use images, video, and

text) into digital form.” Digitalization, by contrast, is defined as, “the adoption or increase in use of digital or computer technology by an organization, industry, country, etc.”

The easiest way to understand digitization is to regard it as a phase of intensive conversion of various content from analogue to digital format. It includes the conversion of paper, audio, and visual recordings to electronic formats. The rise of commercially available hi-resolution document scanners (e.g. 600 DPI or more) triggered a mass conversion of analogue data — for example paper archives to digital, computer-based formats.

In addition to the introduction of scanners, the invention of the first compact disk (CD-ROM) in 1982 offered a cheap storage and distribution medium, used not only for storing paper documents but also for the conversion of audio and video analogue formats, such as LPs, cassettes, film reels, and VHS tapes. During the digitization phase, several new digital formats were invented to accommodate different requirements. TIFF (1986), PDF (1993), and DjVu (1996) formats were introduced to help convert microfilms and microfiches to electronic media, while MPEG-1 and MPEG-2 file formats were developed in 1991 and 1994 respectively for audio-visual recordings. It should be noted that there were two previous audio-visual formats, H.120 in 1984 and H.261 in 1988, but their resolution was too low to be useful for digitization purposes.

The benefits of this massive conversion of analogue media to digital formats were overwhelming. They included increased usability, speed of access, transferability, and the very important possibility for further processing, which opened the gate for many other applications.

Digitalization

The first use of the term ‘digitalization’ was in a 1971 essay by Robert Wachal (1971) where he discussed the social implications of digitalization, “as a humane man he naturally fears the digitalization of society”. It is worth mentioning that the fear of technology and the fear of automation is an interesting phenomenon, that is still present today in many discussions about digital transformation (e.g. loss of jobs), and especially those on the potential dangers of artificial intelligence.

Still, technological progress is hard to stop, which leads us to the next phase, digitalization, characterized by the automation of business processes. Digitalization most often refers to enabling, improving and/or transforming business operations, functions, and/or models/processes and activities, by leveraging digital technologies and the broader use of digitized data, turned into actionable knowledge, with a specific benefit in mind (i-SCOOP, 2019).

This automation of various business processes and operations, also known as infrastructure convergence (van Dijk, 2006), was based on the development and wide use of powerful IT hardware and software. Enthusiasm for this newly discovered technology was overwhelming. Huge investments were made in purchasing, developing, deploying, and maintaining different applications. Many business processes were reviewed and digitized. However, it was still in its infancy — dealing with single tasks and using unrelated technologies that hardly communicated with each other. Stand-alone applications were mushrooming within the organizations, solving some, while creating other, problems including standardization, networking and communication, and interoperability.

Digitalization went through several phases, which can be categorized as follows:

- **The initial phase**, where single operations or processes were automated.
- **The mid-phase**, where related processes were automated and joined together.
- **The third**, most complex phase, where multiple systems that supported business processes and information flows were partially integrated.

Although information was still, for the most part, kept in silos and applications were distinct, different, and sometimes redundant, digitalization helped lower production costs, optimized business results, and created new revenue options and customer experiences.

Digital transformation

The current phase of overall reorganization and automation is digital transformation. Creating a digital company, for the great majority, means doing things very differently. Starting with the creation of a new business model, it uses modern IT, leverages existing knowledge, and profoundly changes the essence of the organization — its culture, management strategy, technological mix, and operational setup. It also pursues new revenue streams, products and services.

The pivotal point of these newly organized businesses is a customer-centric approach — placing the customer in the center of all decisions and actions.

As with the previous phases, new technologies play a crucial role. They include the use of mobile applications, artificial intelligence, machine learning, augmented and virtual reality, cloud computing, analytics, and chatbots. Still, the goal is not to use technology for technology's sake, but rather to use it in a process of business transformation. In other words, changed business strategies and goals benefiting from technology to bring about and implement foreseen scenarios.

The benefits of digital transformation are numerous, visible and usually very lucrative. They include customer satisfaction, profitability, process streamlining, new business opportunities, and increased revenues.

Impact of automation on grey literature management

There are different ways of looking at the impact of automation on grey literature management. Based on the previously elaborated historical phases, a parallel can be drawn by looking at the specific impacts on grey literature management made throughout the different historical periods. Therefore, the following three historical phases will be reviewed:

- Digitization — Scanning
- Digitalization — Automation
- Digital transformation — Business change

The impact on grey literature work, its workforce, and the workplace will also be examined.

Digitization and grey literature

The digitization of grey literature, just as digitization in general, appeared in the late 1990's and was prompted by the appearance of commercially available scanners, CD-ROMs, and new formats. This created increased interest, funding, and research into the area of grey literature management. From what was once regarded as 'ephemeral documentation' — in other words, routine, trivial, duplicated (also available somewhere else), and of little administrative, financial, legal, cultural, or historical value — grey literature became important, valuable, worth collecting, processing and sharing. From physical preservation and storage — always regarded as labour-intensive and expensive — came easy scanning and cheap storage, and grey literature became interesting, affordable, and easily available. Organizations began not only to scan and store this type of literature for their own use, but also started massively distributing to their customers annual reports, promotional materials, manuals, product catalogues, and other forms of grey documents. As this took place before the introduction and popularity of the Internet, much of the information was exchanged through regular mail, making CD-ROMs a big financial saver.

However, several major issues surfaced. They included the quality of scanning, long-term preservation challenges, appropriate management standards, lack of qualified professionals, and the need for proper training opportunities. Moving from paper and microfiche/microfilm to more sustainable formats, the short life-span of CD-ROMs (5-10 years), and unreliable content quality, were huge obstacles standing in the way of wider acceptance, and especially for archiving. Criticism of this new e-format rapidly grew and soon became a detrimental factor, contributing to its demise.

Digitalization and grey literature

Despite considerable success implementing digitization in the area of grey literature, the digitalization phase that followed was less successful. Procuring powerful IT hardware and software became the main emphasis of organizations and huge investments were made in IT. Investing in stand-alone systems and applications, such as those used in information and grey literature management was not a high priority for organizations.

Grey literature professionals did not help much to alleviate this organizational level focus and consequent priorities. Grey literature managers, in a way, lost their focus and insisted on their omnipresence in all processes, operations and activities. They came up with over 150 types of GL (Farace, 2010). Everything was put in the same basket, from government reports, to business emails, and academic theses. IT became another stumbling block. There were no specific applications developed for grey literature, since it was widely regarded as a larger part of libraries, document management systems, or archives.

A serious issue that became obvious during this phase and still remains unresolved, was the lack of standards and best practices, proper professional training opportunities, and weak professional associations.

Digital transformation and grey literature

Two very strong arguments favouring the increasing importance and impact of grey literature during the digital transformation of today's organizations are a customer-centric approach and organizational culture change. Grey literature has always been connected to and had a special affiliation with non-commercial approaches to dealing with information, such as the open access movement and a culture of sharing and cooperation. These characteristics can improve the status of grey literature within any organization willing to take the path of digital transformation.

It Digital transformation represents a huge opportunity to reposition grey literature within commercial organizations, governments, and academia. Still, grey literature management needs to become part of overall business and information strategies. It needs to establish itself as a key component of Enterprise Content Management (ECM). According to the Gartner Magic Quadrant for Content Services Platforms report (2019), information and documentation management, including grey literature management, should:

- Connect content to digital businesses for efficiency and productivity gains;
- Accelerate performance by integrating with key business applications;
- Improve information governance and minimize non-compliance risk;
- Drive digital transformation to help businesses disrupt their industries.

A strong link with IT departments should also be established by working on various joint projects, including intelligent search and long-term preservation. Within its own ranks, GL management needs to adopt and promote new modern approaches, including agile management, team organization and cooperation, and open access.

Grey literature work

It is predicted that the impact of digital transformation will bring about drastic changes in grey literature work, encompassing its very essence and nature. It will also impact the actual actors, those who are doing the work — the workforce — and how grey literature is managed in the workplace.

What the essence of the grey literature work will be depends on: 1) the variety of existing formats and how they increase; 2) the exorbitant amount of volume; 3) its truthfulness or veracity (a huge current and future issue); 4) the velocity of its creation, already regarded as very high; 5) and the actual value, where the tendency is to regard any information as an asset.

Why something is performed within the organization and the role of leadership should always be considered. Digital transformation requires forward thinking, a visionary approach, high-tech awareness, sharp customer focus, and consideration for the usefulness of grey literature.

Who is managing grey literature. The profile of the grey literature professional workforce will undergo serious changes and modifications. Newly required characteristics will include life-long learning, active engagement, mobility, dealing with the generation gap at work, and importantly, digital ethics.

How the work is organized is undergoing dramatic change in the workplace. This includes the introduction of completely new and different tools; the introduction of digital culture; digital dexterity requirements; agile teams; remote work, and the removal of info silos.

Conclusions

Although historically and conceptually different, digitization, digitalization, and digital transformation are often used interchangeably. Digital transformation assumes an umbrella role, encompassing both digitization and digitalization and regarding them as initial steps in an organization's digital transformation and the reorganization of its information and grey literature management.

Digital transformation has a major impact on all activities carried by organizations that adopt it, and as such it requires the full attention of business and information managers. It offers valuable opportunities for commercial, government, and public organizations to grow. It also offers a chance to enhance the management of grey literature, increase its value and importance, and improve its usability, usefulness, and accessibility.

Grey literature work has already been impacted and undergone changes due to digital transformation. These include the nature of grey literature work and the reasons for managing it. Both the workforce and the workplace have been impacted by digital transformation. To cope with these changes, the workforce needs to adopt new working and learning behaviours, and counter the speed of change by quickly acquiring new grey literature management skills. Constantly improving and obtaining new knowledge is essential for grey literature professionals. Finally, we should consider that the major factor for successful change is not technology itself, but rather the people working with that technology.

References

- Brennen, S., Kreiss, D., 2014. Digitalization and Digitization. <https://bit.ly/330UuBV>
- DELL Technologies, 2019. Realizing 2030: A Divided Vision of the Future. <https://bit.ly/371t2Hq>
- Gartner, 2016. Gartner's Top 10 Strategic Predictions for 2017 and Beyond: Surviving the Storm Winds of Digital Disruption. <https://gtmr.it/2CDdYBG>
- Gartner, 2019. Magic Quadrant for Content Services Platforms. <https://www.opentext.com/info/ecm/gartnermq>
- Farace, D. J. and Schoepfel, J. (Eds.), 2010. Grey Literature in Library and Information Studies. De Gruyter Saur, Germany.
- i-SCOOP, 2019. Digitization, digitalization and digital transformation: the differences. <https://bit.ly/2r7YPpk>
- IDC 2019. Worldwide Spending on Digital Transformation Will Reach \$2.3 Trillion in 2023, More Than Half of All ICT Spending, According to a New IDC Spending Guide. <https://bit.ly/2CEhoUC>
- OECD Employment Outlook 2019. The Future of Work. <https://bit.ly/2CC6MWB>
- Oxford English Dictionary, 2019. <https://bit.ly/2O4kCaN>
- Telstra Corporation, 2019. SMARTer 2030: The Australian Opportunity for ICT Enabled Emission Reductions. <https://bit.ly/2O7Cgt0>