Editor -in-chief's Note

Digital Content Management: An Amalgam of All Disciplines

Mohammad Hassanzadeh∗

Abstract

Although digital content is a widely institutionalized reality at the present age, its management issues and challenges have not been sufficiently explained. One of the most important deterrents to effective digital content management (DCM) is a single-dimensional, disciplinary and sectoral perspective to this multidimensional concept. Digital content management is a multifaceted concept and the best option to deal with this multi-modal phenomenon is an inter-disciplinary and hyper-disciplinary approach. A range of legal, commercial, psychological, sociological, linguistic, computational, and ethical issues are intertwined with digital content management. Each of these issues, in addition to having a solution in one field of study or cognitive area, is also related to various fields of study. This has made digital content management issues a fluid and ever-changing entity. This paper strives to explain the interdisciplinary nature of this concept. In this regard, six main aspects of digital content management were explained including theory, instrument, individual, society, framework and content. Explaining each of these aspects introduces a common ground for an interdisciplinary collaboration. It is concluded that an effective digital content management initiative is possible only through cooperation and synergy on knowledge sharing from various related fields of study.

Keywords: Digital Content Management, Multidimensional, Interdisciplinary Approach.

∗ Professor, Knowledge and Information Science Department, Tarbiat Modares University, Tehran, Iran, Email:hasanzadeh@modares.ac.ir

Introduction

Digitalization covers almost all areas of human life. The process of digitalization and its maturity pathway can be considered as the core of the digital content management lifecycle. Currently, all objects in the universe are rapidly being transformed into digital format. This journey of evolution has led to the emergence of a new lifestyle and communication perspective. The first steps in digitalization were realized through employing information technology to send digital messages and make group discussions. The next generation of digitalization was initiated through converting documents into digital and electronic formats. In this generation, large volumes of books and documents were converted from analog to digital. The creation of digital document repositories in a variety of formats, including HTML, PDF, and other content carriers, gestured the beginning of a massive transformation. During this period, large collections of photos, maps, manuals, and the like were digitized. The third generation of digitalization was fired up by adding objects other than documents to the process. This generation was accompanied by the universal spread of the Internet and the increasing connectivity of formerly discrete objects. For this reason, concepts such as the Internet of things (IoT) found its way into the scientific literature. Before that, the emergence of concepts such as second life, digital avatars, and semantic relationships had created a complex and ever-growing reality of non-analog objects by which the virtual reality is being adopted. Currently we are experiencing the fourth generation of digitalization known as interconnectivity with intelligent agents. Integrating smart technologies and argumentative agents into digital universe tends to establish an interactive semi-autonomous digital object such as self-driving vehicles, smart houses and so on.

The multifaceted nature of digital content

Convergence of satellite communications, Internet-based interactions, and increasing digitalization have led to the rise of the digital world. This modern reality seems to be as fascinating to digital immigrant or even to digital natives as it was to cavemen who were eager to discover and understand the world around them. The golden keyword to this similarity, along with curiosity and amazement, is nothing but the multifaceted nature of the digital content.

Digital content encompasses a wide range of objects that, although supposedly belonging to binary digits, have inherently various and sometimes even contradictory functions and features. For example, as much as a digital book is related to scientific area, a digital store is related to business world. E-learning, telemedicine, telecommuting, autonomous vehicles and the like are instances of the achievements of widespread digitalization.

As digital content proceeds, it not only indicates profound implications for the way humans live and even their environmental insights, but it also raises new issues and challenges. Nowadays, almost everybody is involved with the legal, psychological, sociological, linguistic and logical challenges of the digital world. The emergence of concepts such as digital crime, digital psychosis, digital violence, and even phenomena such as the dark web, all demonstrate the implications of digitalization and its reflections in our real life.

The multifaceted nature of the digital objects, along with all the warnings it delivers, calls us to a comprehensive and inclusive perspective on its management. The fact is that without a comprehensive perspective, it might be impossible to discover the real nature of the digital world around us. The bigger proportion of investigations on digital content management is still in its early development stages. Many practitioners and professionals still look at this *elephant in the dark room* from their own points of view. Hence, each researcher has tried to examine a specific aspect of this multifaceted phenomenon base on their own understanding and expertise.
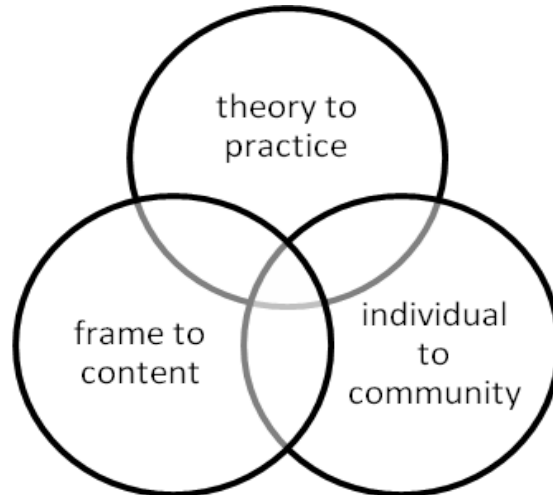
Figure 1. Interconnectivity of comprising elements of digital content management

In the midst of sectoral and disciplinary observation, the comprehensive standpoint that provides a persuasive and value creating approach to digital content management, remains underrecognized. Digital content management refers to an interdisciplinary concept that brings together experts and professionals from various school of thought. Digital content management, on the one hand, encompasses the structures, frameworks, standards, tools and physical objects of digital objects. On the other hand, the social, legal, psychological, political, managerial, economic and governance aspects are examined. For this reason, digital content management is a continuum in which, interconnected circles of theory to action; Individual to the community; and frame to content are discussed.

Theoretical aspects
Theoretical aspects of digital content cover articulation related to philosophical questions in the field of digitalization, the relationship between concepts, and phenomenological and genealogical perspective. From a theoretical stance, there are still many inquiries that need to be explored by scholars from humanities, philosophy, anthropology and the like. For example, what is digital humanity? Can be a digital entity as a real object? Do digital objects have existential independence? Can we authenticate what was created from the

beginning as a digital entity? Some of these questions may seem very simple and rudimentary, but the fact is that from a theoretical point of view they indicate a huge knowledge gap and require a significant line of argumentation.

Let's raise an exemplar legal case. Suppose, for instance, that an autonomous vehicle crashes on a road and is to be settled, if we presume independence to the vehicle, that car should be fined. The question then arises as to how the car should pay the fine. The car has no income; neither is it employed! If we do not consider that car as part of someone's property, two other entities should be responsible for the accident, the manufacturer or the owner of the car. In this case, too, the problem remains. What is the owner's share of the accident? If we put the blame on the manufacturer, how guilty is s/he? Isn't the programmer whose program got the error to blame?

All of these questions indicate that, from a theoretical point of view, digitalization still faces very serious questions, and until finding a convincing answer, we cannot be sure of its integration into social systems. Obviously, no one welcomes accepting a troubled member in their assembly. Therefore, scientists from various fields of study should contribute and participate on theoretical issues related to digital content.

Practical and instrumental aspects

Although digitalization has developed at an incredible pace in the last decade, it still faces very outstanding instrument restraints. For example, many languages are not yet recognizable by Optical Character Recognition (OCR) solutions. This would mean the demise of a valuable human intellectual treasure. In addition, there are serious deficits in terms of interoperability, standards, guidelines and frameworks. Apart from a few basic frameworks provided by institutions such as libraries and information centers or commercial companies to formulate the organization of digital content, comprehensive standards and tools are not available.

Lack of tools to manage content of digital objects would mean ignoring an important part of digital entities. A clear example of an instrument constraint is cryptocurrencies. Digital currencies face instrumental constraints at their highest value. Those who buy these currencies are not easily sure of their official standing in the future.

The responsibilities of robots that will communicate with each other in the future are not well defined.

Individuals are not yet able to convey their feelings while communicating to others in addition to the content and discussions streamed in digital format. Incomplete emojies often lead to misunderstandings. Emotions, on the other hand, are an important part of human communications. Failure to pay attention to this part of the interactions in the near future will lead to the formation of large communication gaps between humans. Those who are digital natives and have not played a role in shaping their world, may gradually become digital immigrants.

Elimination of instrumental constraints requires the coordination, cooperation, intervention and communication of experts from various fields of study such as electricity, electronics, mechanics, mechatronics, psychology, sociology, anthropology, genealogy, etc. The important point is that there is still no agreement and even a sense of serious need from the (potential) parties involved in this cooperation. Most articles and studies conducted by individual experts are published by specific disciplines.

Individual aspects
Individuals are often dependent on their inner world, they like to keep and protect the layers of privacy related to knowledge, feelings, statements, judgments, mistakes, honors and attachments prominently and significantly. This is while digitizing tends extremely towards covertangible items. On the other hand, the volume and production rate of digital objects through variety of carriers are stunning. Many people cannot easily interact with digital content yet because of improper information literacy or other constraints. For this reason, a face-to-face relationship can hardly be replaced with an online relationship.

A face-to-face remark while meeting somebody in person is basically different from a comment on a social network. Individual limitations and human disabilities in digital interactions are not ignorable. Individuals are primarily human beings. They make mistakes, they are forgiven, they are tolerated, and so on. But interactions based on digital content do not seem to have such an opportunity for tolerance. Humans are judged on the basis of incomplete content that does not convey the meaning of the whole.

There are many judgments that are made due to a shortage of meaning transfer by individuals and have devastating consequences.

Overcoming the shortcomings of digital content in the transmission and representation of individual emotions and communication fluidity requires collective cooperation between technical experts and intellectuals. In the absence of cooperation between professionals from various disciplines related to personality, communication, and lifestyle with those involved in digital artifacts, social capital will suffer, and individuals will become increasingly isolated in increasing connectivity. It is in fact one of the historical paradoxes of our time that connected citizens wander alone.

Social aspects
Society is not just a collection of individuals. A community is a structure that plays different roles according to individuals' capabilities and competencies. The biosocial evolution of humans has taken millions of years. After many failures and successes, the primeval has reached the community and has selected the society as the fulcrum of its individuality. Although, at some point in time and place, it recognizes individuality and, ultimately, sets a point of balance between individuality and community. This fluidity means that human beings have shown a range of reactions in accepting the community. There is still a conflict between the originality of the individual and the community from a theoretical point of view as well as in practice.

Introduction of digitalization into the social sphere has added a third dimension to the previous duality. If formerly the discussion were about the individuality and the community, today the concept of digital individuality and community has turned this relationship into a three-dimensional reality. The three-dimensionality of human interaction with the society has created many complexities. Human behavior in virtual communities, though a representative of their behavior in physical communities, but It fundamentally differs. People's real selves are rarely expressed in virtual interactions. In many cases, avatars play a role in human interactions instead of humans. Turning to a necessity, this three-dimensionality urges requirement of digital identification recognition.

For example, what should be the reaction of someone who receives likes or dislikes to a comment from an automated software (robot) on

a social network? How similar are the messages automatically sent by automated systems in response to individual requests to human responses? What effects will the increasing interaction of humans with the beings of artificial intelligence have on their socialization process? To what extent will humans strive to be honest and responsible in their interactions with systems? What will be the effect of irresponsible actions?

The answer to such questions lies not in the ability of a scientist but in the interdisciplinary and hyperdisciplinary collaboration of researchers from different fields of research. Humans, aroused by the indifference of their fellow human beings, are now confronted with the machine of reasoning, however; it is not clear how constructive this interaction will be.

Framework aspects

Frameworks are usually designed to provide stakeholders to control various aspects of entities. Efforts to define guidelines, standards, and frameworks for organizing digital content are accelerating today. Although these efforts are in their early stages, they are not progressing as well as the frameworks for analog objects. The main reason for this exhaustion is the diversity, fluidity and scalability of digital objects and their connection to different worlds.

Although in digital content it is easy to communicate between entities using linked data, a serious point of ambiguity always remains and it is change. Unlike analog objects, which are stable, digital content has a high interpretability. Moreover, , the digital world is constantly expanding. These two principles make the frameworks designed for digital content management inefficient. Dealing with the growing inefficiency of digital content management frameworks reinforces the belief in a comprehensive approach.

Thus, achieving a flexible, accountable, ethical and interactive framework is beyond the reach of a single group. Many of the frameworks provided reflect the estimated literary warranty of the relevant institutions. This is while digital objects and content are as vast as the semantic universe. Defining a framework for the effective management of this vast sphere requires multifaceted cooperation.

Content aspects

Content in the digital age means everything. A piece of music, a photo, a book, a comment, a report and anything collected by humans, cameras, smart agents, machines, and so on could be indicated. Content in fact is so diverse, distinct and complex. Part of it is created by human intelligence; and the other is collected by machine agents. An important part of the content is inferred through the interpretation of the existing information and most part of it is the result of human interaction, a machine with or without a supervisor.

Digital content that has been generated originally has fewer problems than digitalized content. Because original digital content creators have tried to adhere to the communication, semantic, and networking aspects, they seem to be more compatible. As we move towards multimedia generation, the complexities of compatibility increase. The necessary harmony between the components of a multimedia wave has a serious effect on the transmission of meaning and the formation of subsequent behaviors.

Content created by machines is essentially subject to the constraints of thought and action of designers and builders. For example, a film made using a graphic simulator has serious advantages and disadvantages compared to a film produced with human actors. Instrumental limitations, processing and reasoning defects affect the formation of content and meaning transfer. Part of the advantages and disadvantages are related to the human factor and the other part is related to the machines that are used to build and produce locations and reproduce concepts.

Digital content is not necessarily the natural result of human activities. Today, a lot of content is produced solely for the purpose of presenting to the market. Commercially created content has a biased and sometimes seductive structure. Content identification and evaluation requires extensive and interdisciplinary knowledge. Producer evaluation, portability evaluation, production context evaluation, creation process evaluation, evaluation of techniques and methods all require multifaceted cooperation.

Concluding remarks

In this short paper, most of the effort was focused on the fact that digital content management stcomplexities. Meeting the needs of this multifaceted entity requires multiple capabilities and competencies.

Focusing a field of knowledge on digital content management cannot achieve convincing results. Although collective efforts are being made to meet the challenges of digital content management, the majority of research and practical action focuses on individual efforts.

Awareness of the views of different disciplines, reflecting the findings of different disciplines and creating an environment for the synergy of seemingly heterogeneous factors will work in digital content management. As multifaceted and multidimensional approaches are empowered, so will society's ability to overcome the challenges of misunderstanding with a focus on digital content at the individual, social, national, and international levels. Reflecting different perspectives means that there is common ground for cooperation. Identifying collective effort as a role model can pave the way for the introduction of new ideas.

Digital content management is still at a nascent stage despite the tremendous growth of this field. The horizons ahead in this area depend on our seriousness in establishing intellectual, legal, social structures and collective cooperation. Understanding the real nature of this *elephant in the dark* – the digital content, depends on the amount of light that is cast from the horizons into the *room* – the digital world. Each of the various academic disciplines and stakeholders have a role to play in advancing digital content management. Collective wisdom determines how successful we will be in regulating the reality that we leave behind for the posterity .

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