www.irmbrjournal.com
International Review of Management and Business Research
December 2013
Vol. 2 Issue.4

Congruency Between Information Professionals and Users Readiness Attributes, and the Digital Information Environment: A Mixed Approach Investigation

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Abstract

This study investigates the extent to which information professionals and users' readiness attributes are congruent with the digital information environment. The Facebook was used to form a focus group of twenty information professionals from different academic libraries and resource learning centers in Oman. A questionnaire was distributed to 237 students from high schools in Muscat District, Oman. Data collected through the focus group were analyzed using thematic categories. SPSS was applied to analyze the questionnaires. Information professionals were willing to play an active role in the digital information environment if their organizations offered them opportunities to gain more training and rehabilitation to upgrade their readiness attributes. Students had favorable attitudes towards the use of ICT for general purposes and social communication. Information professionals need to be involved in organizational strategies and policies to update their readiness attributes and to match their thinking and actions with the overall organizational goals and strategies. They should be motivated through all available incentives and career opportunities to inspire them to act and achieve. Users should be directed towards better investment of their IT skills. Thus, they would not be addicted to the use of the Internet for only social purposes, but also to correlate their readiness attributes with the continuously changeable digital information environment; more behavioral and systematic orientation is required.

Key Words: *Digital users readiness, digital information environment, information professionals and digitization, information values, professional competencies and skills, professional genes.*

Introduction

When discussing the digital revolution, we should think of Gertrude Himmelfarb's statement in 1999: "for something to be a revolution, it needs to affect all aspects of people's lives all over the world and this is not just a phrase." (Cited in: Gorniak-Kocikowska 2001).Today, digitization has affected all aspects of life: Communication, learning, economic activities, work performance, and services supply and delivery. Traditionally, libraries represented the arteries that held the cells of information–books, periodicals, and audiovisuals. Currently, libraries are different; they have started to hold digital information. Now, the information environment has become different, and is with the following results:

- Users of information are different.
- Users' expectations from information are different.
- Flow channels and arteries that hold information and knowledge are different.

- Accessing information is different.
- Modes of research are different.
- Scholarly and social communication are different.

In fact, the main and only remaining component which has become even more critical is the need for information. The method of expressing needs reflects the life style changes of users. Thus, understanding users' needs requires an understanding of their expectations and readiness attributes to match them with the digital information environment. For survival, information professionals, as information providers, must also change their attitudes, ways of thinking, competencies, and professional attributes. They have to be prepared for the modern digital information environment, before even considering the process of digitization itself.

The typical approach of many information professionals when thinking of digitization is simply to shift from paper shopping to digital participation. They consider such a shift as a rapid and easy approach to building the library collection. To them, having computers, internet facilities, and financial resources is good enough to help them deal with professional and technical problems. However, the attributes of the digital shift is strong enough to affecting all: Users, information professionals, and even decision makers.

The questions that still need practical answers are as follows:

1. Are information professionals aware of the modern digital information environment attributes?
2. Are information professionals as information providers ready to change their professional readiness attributes to match the digital environment attributes?
3. Do users, as information customers, show mutual homogeneity between their digital readiness attributes (as related to their learning competency code, social code, and psychological code) and the digital information environment attributes?
4. Is there mutual homogeneity between the users' requirements with regard to information (users-attributes) and what information professionals can offer them (Providers-attributes)?

Problem Statement

Information professionals have always collected resources to support users' needs and expectations. They have prepared themselves to think and act traditionally. By doing so, they can reach the users, communicate with them and even evaluate their performance satisfaction. As their work is strongly linked to the users' and information environment and heavily restricted by changes surrounding that environment, which is the result of digitization and information technologies, traditional practice becomes less effective. The information community, then, should keep reforming and altering its thinking and actions for better involvement and survival. The entire information environment (information professionals, and information customers) should rebuild their Readiness DNA to achieve mutual homogeneity so that information will flow from one artery to another leading to a better investment of money, time and effort.

Purposes of the Study

Competing to engage in the digital environment has become the endeavor of most organizations, specifically libraries and information centers. Among the most useful advantages of digitization are direct bridging between knowledge sources and users wherever and whenever; facilitating finger-to-finger speed access as alternative to face-to-face slow communication; and providing organized and easy access to knowledge. Merging with and absorption in the digital information environment are complex procedures without the readiness of both, information facilitators (professionals) and customers (users). This study aimed at initiating a discussion among information professionals about exploring their readiness attributes as related to the current digital information environment attributes. This investigation formed the first part of the study.

The second part was devoted to exploring young users' readiness attributes to be digital information customers so that they could achieve a better investment of information and improve their social and learning performance.

Methodological Procedures

Two methodological procedures were applied:

A qualitative approach was used to collect data and analyze the participants' responses to identifying the level of their professional readiness attributes. Hence, Facebook, as a social networking media, was used to create a focus group. Twenty information professionals from different academic libraries and resource learning centers in the Sultanate of Oman agreed to participate in an extensive discussion and define their current thinking about their readiness attributes in order to achieve better involvement in the digital information environment.

To explore the young information users' readiness attributes, a questionnaire was distributed to 237 students from high schools in Oman Muscat District. They were considered as customers of the digital information environment. A quantitative analysis was used to define users' readiness attributes by measuring the extent of the impact of the digital environment (as reflected by the use of the Internet) on their digital readiness attributes-basically on their learning competency code, social code, and psychological code.

Related Studies

Eliard (2005) defines leadership as the "ability to inspire individuals and teams to go where no one else has gone, has become today's most elusive resource." For the same author, the DNA of Leadership focuses on a certain number of principles and practices that arise from the assumption that leadership is the result of learning from our environment and transforming this information into action (Eliard, 2005). Eliard, in his works, applied the concept "DNA" to reflect the intrinsic attributes ingrained in the individual.

This concept has been applied to many areas, including the market DNA and the organization DNA, among many others. In terms of the current study, information is considered a powerful product involving active and expensive market. Thus, entering the new digital information environment requires a specific leadership attributes. As leaders of the profession, information professionals' beliefs and behaviors will determine the success of their decisions on building the digital library of the future as an interactive organization. In order to achieve their future organizational objectives, they have to understand both the information environment attributes and their customers' readiness attributes.

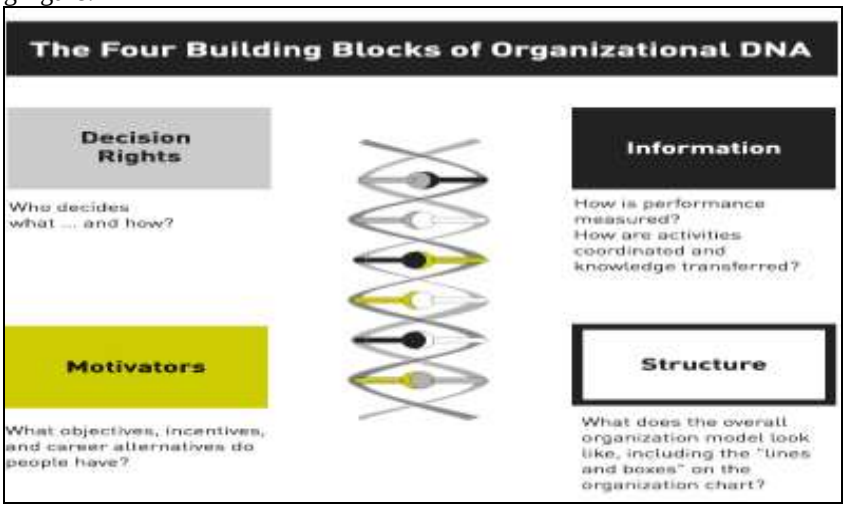
To understand professional leadership attributes, Nicolson and associates (2004) emphasize that "the genius of leadership is inherent in every person who desires to express his talents and achieve significant results." For Jack Welch, former CEO of General Electric, "building leadership into the genetic code of the organization is the ultimate competitive advantage," (cited in: Nicolson and associates, 2004). When it comes to digital environments, building professional information leadership can be realized only by improving the profession itself and by improving the genetic codes of the professionals' thinking, acting, and speaking attributes. Even when it comes to the basic professional job description, many scholars discuss it in different ways. According to Lancaster, information professionals are "people capable of separating the wheat from the chaff" (cited in Gorniak-Kocikowska, 1999, p. 807). Lancaster here focuses mainly on the information professionals' collection building role to satisfy their users' needs. Currently, digitization has transferred a part of this role, if not completely, to venders and publishers. These are clever enough to understand and explore the information marketing attributes and needs and improve their leadership attributes in order to feature as a vital player in the overall digital environment. They are not only entering the digital market by transforming their collection formats into a digital mode, but also by adding a competitive advantage by building batches of collections in databases. By doing so, they are simply facilitating the information professionals' role in collection building. This simply means that information professionals have to switch from the acquisition task (purchasing information sources) to an

access function (licenses for paid remote access to information sources). In addition, they have to switch from a lack of concern about intellectual property to the ethical use of information. Moreover, to build direct relationships with users, publishers and venders must boost their efforts to understand their clients' information search behavior and digital readiness attributes by adding access points to their databases. Subsequently, they will alleviate a part of the information professionals' responsibility for providing searching services. Instead of having users visit the library building, libraries can make digital information available whenever and wherever users need it.

In terms of organization, the Library of Alexandria Job Description of Cataloger specifies that the cataloging function consists of "a variety of complex technical and specialized library functions in relation to the preparation of bibliographic and item records for monographs, journals and other library material" (Bibliotheca Alexandrina 2012). The main objective of this description is to produce an intermediate tool for retrieving sources. This is of great importance in the absence of digital metadata and full- length text. Information market suppliers gain benefits from the Internet metadata as an alternative to cataloging. Although metadata elements may not be enough for specialized users, they can be useful for general users to satisfy their needs. Neilson, Pasternack, and Mendes (2012) pay special attention to the individuals' attributes "DNA" concept when defining the concept of organization. They consider it as "collections of individuals who typically act in their own self-interest," and also that a "consistent corporate execution occurs only when the actions of individuals within it are aligned with one another, and with the overall strategic interests and values of the company." Thus, "individual behaviors determine an organization's success over time." In the above statement, Neilson, Pasternack, and Mendes apply the metaphor of DNA to codify the distinctive characteristics of an organization. They state that "just as the double-stranded DNA molecule is held together by bonds between base pairs of four nucleotides, whose sequence spells out the exact instructions required to create a unique organism", so too organizations should clearly describe their characteristics in terms of genetic codes. Glaser (2007) identifies seven bases (covering mindsets, beliefs, and practices) for developing the genetic leadership codes:

1- **C-gene:** for developing a **co-creating** environment.
2- **H-gene:** for developing **a humanizing** environment.
3- **A-gene:** for developing a **inspirationa**l environment.
4- **N-gene:** for creating a **navigational** environment where everyone benefits.
5- **G-gene:** for developing a **generative** environment.
6- **E-gene:** for developing an **expressive** environment.
7- **S-gene:** for developing **a spirited** environment.

According to Hamilton (2012), four basic building blocks are required to identify the organization's distinctive characteristics, which include a decision rights, information, motivators, and structure, as shown in the following figure:



(Neilson et al. 2004)

For organizations to achieve their objectives and upgrade their leadership DNA, these four characteristics should be practically intertwined. The gaps between them will create numerous deficiencies. For instance, changing structure requires changing decision rights. To make effective decisions, employees need new incentives and different information. In this regard, when libraries and information centers achieve the best organizational structure within the digital environment framework, and when their leaders' genetic characteristics (readiness attributes) match the digital environment genetics, they, consequently, will be characterized as being adapted to the surrounding environment, self-correcting and developing, and equipped to be more professionally healthy to serve over time.

When it comes to digital customers for information products, Web 2:0 and social networking offer them the opportunity to manage their identity through developing and maintaining their profile. They always seek new friends, connect with each other, ask questions, raise discussions, and get answers. Consequently, they constitute a powerful element of the digital environment. 93% of the digital citizens in Lenhart's study (2009) were young users (12–17). In addition to the dramatically increased use of the Internet by youth for information retrieval purposes, learning, and entertainment are found to be the principal drivers for adolescent usage aimed at engaging with interpersonal communication (Maczewski 2002). Gasser and Simun (2010) state that "the integration of digital technologies into daily life is transforming human behavior and social practices." Accordingly, new forms of skills, mindsets, and behaviors are developing because of the "daily immersing in the use of digital technologies" (Gasser and Simun, 2010).

Cooper (2005) emphasizes that modern era children are exposed to digital technology and engaged in digital environment even before they are exposed to books and libraries. Consequently, Cooper recommends that users' practices and behaviors "must be considered when designing digital environments." With regard to the relationship between users and information professionals, Walter and Mediavilla (2005) examined 100 online transactions between users and reference information professionals in California. These professionals were supposed to act and serve as bridges between students and homework help tutors. Using a content analysis approach, they found that there was a "difference in online communication styles between teens and adults." Their study also revealed that the reference and user services guidelines were "severely lacking in the qualities required for effective reference services." These findings reflect a lack of congruence between the information professionals' readiness attributes and the users' attributes. Thus, they selected the statement "Teens are from Neptune, information professionals are from Pluto" as a title for their paper!

In conclusion, previous studies emphasized that in order to survive within the digital environment, there should be a correlation and association between the key players of the environment, specifically in their readiness attributes. In this regard, the data analysis part of the current research intends to identify the type of congruence found between the information professionals' attributes and their users' attributes in the Sultanate of Oman.

Data Analysis and Discussion

Information Professionals' Leadership Attributes

The focus group members were introduced to Glaser elements and asked to express their views on the extent to which these elements would apply to their professional leadership. Responses were summarized as follows:

In terms of the **C-gene**, respondents insisted that they needed to acquire the required skills and understanding of how to develop the digital environment before even starting project for such a change. Their thinking was the result of the increased involvement of users in digital information search behavior and communication. Their readiness, then, was expected to sustain the open minds of users and inspire them to think and act **co-creatively**. Moreover, members were keen to develop **humanizing** environments (**H-gene**) such as their traditional image already reflected.

They were eager to get users together where openness and consideration would abound. Their role was to promote an environment that would enable users to share knowledge, offer help, add honest feedback, and catalyze growth among their classmates, colleagues, friends, and across the wider society.

When asked about their thoughts on creating **inspirational** environments, most participants emphasized that they needed to change themselves to think, act and speak positively and creatively **(A-gene).** They justified their responses by stating that such changes would enable them to discover their required professional talents. They also believed that such talents would help to encourage their users to determine their goals and expectations. As a result, users would be ready to define their information needs and achieve a better investment in their digital collections. This was the general view of digital libraries. This element, however, was related to the next **(N-gene)** where information was considered as power. To invest this power, professionals should think and act on how to create a **navigational** environment where everyone could share and benefit from that power. With the heavy use of technology, respondents emphasized their need to continuously examine its impact on their information environment and society (**G-gene)**. Such an examination would encourage them to learn and acquire basic communication skills for developing **generative** environments.
Finally, regarding **E-gene,** participants expressed the need to think and then seek all the opportunities required for developing **expressive** environments where users can reach the knowledge required to upgrade their understanding and enhance their achievements. This gene emphasized the other **S-gene** that reflected ongoing evolution, which included reinvention and sharing of common purposes needed for developing a **spirited** environment. By doing this, they could demonstrate a greater capacity for mutual growth and evolution with their peers.
To measure their readiness attributes so that it would accommodate would have continuous changes to their information environments, respondents agreed that they have to move beyond their current job descriptions as information professionals. To become knowledge workers, they would have to act in the following capacities:

- As information brokers, change agents, and facilitators ready to provide more e-access to digital content
- As collaborators and policy makers ready to expanding the area of collaboration not just with peers, but also with IT people, sources providers, and the community in a way that helps the development of better information policies
- As educators and website designers and managers, ready to train their users on how to use e-journals, databases, search engines and other tools. This could be enriched by creating an awareness of the library services.

Expectations are only one side of the discussion. The other side concerns the actual practice that affects their readiness attributes. With regard to their organizational structures, respondents were sure that the shift towards digital content would be a decision limited only to the shifting from a paper format to digital arrangements without even thinking about changing organizational structures and their job description. Moreover, as responsible professionals engaged in the transformation process, their actions are always affected by the top management's information literacy. Their concern is money allocation regardless of expected benefits. Such a conflict leads libraries to miss many opportunities and makes information professionals hesitate to take forward action.

Users' Readiness for Digital Environment

A questionnaire was distributed to 237 high school students in Oman's Muscat District. It aimed to explore the readiness attributes that qualified them to be digital information customers. Variables, including learning, social and psychological readiness codes, were considered and measured against their characteristics (gender, study achievement, and level of IT skill). The results of the study were summarized as follows:

1- Among the 237 students, 119 were females and 116 were males. 95% of them possessed an average to high level of Information Technology (IT) skills to help them in accessing and using the Internet.

Table -1-
Student distribution in terms of IT skills

Level of skills	Frequencies	Percentage
High	128	54%
Average	97	41%
Low	12	5%
Total	237	100%

2- Table 2 showed that only 5% of the respondents attained a high level achievement (very good-excellent), while other groups, with good and low-accepted levels achieved equal percentages.

Table -2-
Respondent distribution in terms of study achievement

		Frequency	Percent	Valid percent
Valid	V.Good-excellent	12	5.1	5.1
	Good	112	47.3	47.5
	low-accepted	112	47.3	47.5
	Total	236	99.6	100.0
Missing	System	1	.4	
Total		237	100.0	

3- A Chi-square analysis (Table 3) was applied to examine if there was a relationship between the students' levels of IT skills and their study achievement. The results showed a significance value of 0.007, which is smaller than 0.05 significant levels to reflect a strong relationship between IT skills and study achievement.

Table -3-
Internet skills* and study achievement level cross-tabulation

Internet \ Study		study achievement level			
		V.Good-excellent	Good	low-accepted	Total
Internet skills	low	1	6	5	12
	Middle	8	55	33	96
	High	3	51	74	128
Total		12	112	112	236

4- A T-Test was applied to find out if there was a significant gender impact on students' readiness for the digital environment. The significance values in Table 4 showed that the use of the Internet reflected different effects on the high school students' social code.

The situation was different when it came to learning and psychological codes. Regardless of the social differences, the results revealed that both male and female students considered the Internet environment a suitable place for navigating, sharing, and exchanging information and knowledge with others anywhere and anytime without limitations.

Table -4-
The use of the Internet effects on learning, psychological, and social codes by gender

GENDER		N	Mean	Std. Deviation	t-test for Equality of Means	
					T-test	Sig. (2-tailed)
Learning impact	Male	118	2.8469	.68272	1.828	.069
	Female	119	2.6837	.69165		
Psychological impact	Male	118	2.9815	.72127	.991	.323
	Female	119	2.8902	.69743		
Social impact	Male	118	2.7178	.77782	-2.251	.025
	Female	119	2.9541	.83672		

5- An ANOVA test was applied to determine if the students' levels of study achievement affected their learning, psychological, and social codes as related to their readiness attributes in the area of Internet use. The results in Table 4 showed no significant differences at the level of all three codes. Therefore, one could conclude that the digital environment was suitable for all students, regardless of their achievement levels, as shown in table 5.

Table -5-
Internet use effects on learning, psychological, and social codes based on study achievement levels

		Mean Square	F	Sig.
Learning impact	Between Groups	.589	1.233	.293
	Within Groups	.478		
	Total			
Psychological impact	Between Groups	.383	.759	.469
	Within Groups	.505		
	Total			
Social impact	Between Groups	.635	.953	.387
	Within Groups	.667		
	Total			

6- Another ANOVA test was conducted to determine if the students' levels of IT skills affected their learning, psychological, and social codes of their readiness attributes in the area of Internet use. The results showed no relationship between their psychological and social readiness and the IT skills they possessed. The 95% of students who achieved average to high levels of IT skills frequently used the Internet and Web 2.0 applications based on mobile technology. The result was different in terms of learning readiness. Unsystematically gained IT skills could help them only when using the Internet for simple and limited information needs suitable to their educational level of learning. Table 6.

Table -6-
Internet use effects on learning, psychological, and social codes by IT skills

		Sum of Squares	F	Sig.
Learning	Between Groups	3.678	3.952	.021
	Within Groups	108.883		
	Total	112.561		
Psychological impact	Between Groups	1.631	1.630	.198
	Within Groups	117.125		
	Total	118.757		
Psychological impact	Between Groups	1.811	1.368	.257
	Within Groups	154.893		
	Total	156.704		

Conclusion and Recommendations

Information specialists possess a willingness to be information professionals and play an active role in the digital information environment. They need only to be offered more training and rehabilitation opportunities by their organizations to upgrade their readiness attributes. They realize also that users (male and female) are positively directed towards the use of different technologies, but that their utilization is mainly for general purposes and social communication. Thus, they need more guidance setting and orientation programs to enlarge their readiness attributes and become equipped to express their needs and access the information made available digitally through their libraries.

Moreover, users use Google and browse the Internet because the information they need is already online, but their problem is with the high rate of noise associated with retrieved hits. Another challenge for information professionals is to bring offline content online in order to make it accessible, decrease the noise, and get users involved in sharing and utilizing that content for enhancing achievement and comprehensive development.

According to users' readiness attributes, it seems to motivate them to use new technologies and applications. Their use is focused on general and personal communication. In fact, they find the digital environment a good alternative to their real environment in a way affecting their psychological and learning codes.

Based on the above results, the researchers recommend the following:

- Information professionals need to be involved in the organizational strategies and policies to update their readiness attributes and match their thinking and actions to the overall organizational goals and strategies.
- Information professionals should be motivated to take advantage of all available incentives and career opportunities that will inspire them to act and achieve. Incentives will promote them to align their readiness attributes with the organizational goals and strategies.
- As Hamilton (2012) affirmed, "poor information is the organizational equivalent of junk food" that blocks organizational communication arteries. The effects of poor information and a lack of accurate and influential information will prevent user performance sophistication and learning achievement. Therefore, information professionals need to acquire updated skills and competencies. This can be achieved by offering them training opportunities and the rights to rethink, react, and reassess their readiness attributes.
- Because libraries and information centers intend to shift from paper shelves to digital repositories, they must first think of changing their structures. Restructuring is not a matter of changing lines and boxes, but should reflect the logical flow of information to users. This, incidentally, requires the rethinking of both information professionals and users' readiness attributes.
- On the other hand, users need to be directed towards better investment of their IT skills. In this way, they will not seem addicted to using the Internet only for social purposes, but instead will get their readiness attributes correlated with the digital environment attributes. Needless to say, more behavioral and systematic orientations are required.

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Acknowledgement

The conducting of this study was possible thanks to the generous financial support of the Omani Research Council.