

Study of the Effect of Environmental Scanning on the Relationship between Individual and Organizational Factors and the Use of Information by the Electronic Publishing Managers

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ORIGINAL

Abstract

Objective. To investigate the effect of environmental scanning on the relationship between individual and organizational factors and the use of information by the electronic publishing managers.

Method. The current research is completely practical. The survey-analytical method was applied on 152 managers which were active in the electronic publishing industry. Data was collected through a researcher-made questionnaire.

Results. As the average results indicate, individual factors (information awareness = 16.21 and information disclosure = 7.039), organizational factors (information climate = 7.105 and external attention = 9.96), T value in environmental scanning (50.197) and the use of information (62.92) are above the average level. The analysis and explanation of the findings in this case reveals that after imposing of a mediator, the β value was changes subsequently from ($\beta=0.576$) and ($\beta=0.0383$) to ($\beta=0.267$) and ($\beta=0.341$). This means and reinforces the trivial but crucial effect of the mediator.

Conclusions. The positive attitudes toward the informational based activities, intermittent interaction with experts with high and enriched informational backgrounds and resources, the amount of conditional and organizational access to information and finally the reciprocal action with the environment has a great impact on the amount of environmental scanning and information to which the managers use.

Keyword

Environmental Scanning; Scanning Behavior; Individual Factors; Organizational Factors; Information Resources; Electronic Publishing Managers of Iran

Estudio del efecto de la exploración del entorno en la relación entre los factores individuales y organizativos y el uso de la información por parte de los gestores de la publicaciones electrónicas

Resumen

Objetivo. Investigar el efecto de la exploración del entorno en la relación entre los factores individuales y organizativos y el uso de la información por parte de los gestores de la edición electrónica.

Método. La presente investigación es totalmente práctica. Se aplicó el método de encuesta-análisis a 152 directivos activos en el sector de la edición electrónica. Los datos se recogieron mediante un cuestionario elaborado por el investigador.

Resultados. Como indican los resultados medios, los factores individuales (conciencia de la información = 16,21 y divulgación de la información = 7,039), los factores organizativos (clima informativo = 7,105 y atención externa = 9,96), el valor T en la exploración del entorno (50,197) y el uso de la información (62,92) están por encima del nivel medio. El análisis y la explicación de los resultados en este caso revelan que, tras la imposición de un mediador, el valor β pasó de ($\beta=0,576$) y ($\beta=0,0383$) a ($\beta=0,267$) y ($\beta=0,341$). Esto significa y refuerza el efecto trivial pero crucial del mediador.

Conclusiones. Las actitudes positivas hacia las actividades basadas en la información, la interacción intermitente con expertos con antecedentes y recursos informativos elevados y enriquecidos, la cantidad de acceso condicional y

organizativo a la información y, por último, la acción recíproca con el entorno tienen un gran impacto en la cantidad de exploración del entorno y de información a la que recurren los directivos.

Palabras clave

Escaneado ambiental; Comportamiento de escaneado; Factores individuales; Factores organizativos; Recursos de información; Gestores de publicaciones electrónicas de Irán

Estudo do Efeito da Digitalização Ambiental na Relação entre os Factores Individuais e Organizacionais e a Utilização da Informação pelos Gestores de Publicações Electrónicas

Resumo

Objetivo. Investigar o efeito do scanning ambiental na relação entre os factores individuais e organizacionais e o uso da informação pelos gestores de publicações electrónicas.

Método. A presente investigação é totalmente prática. O método analítico de inquérito foi aplicado a 152 gestores activos na indústria da edição electrónica. Os dados foram recolhidos através de um questionário elaborado pelo investigador.

Resultados. Os resultados médios indicam que os factores individuais (sensibilização para a informação = 16,21 e divulgação da informação = 7,039), os factores organizacionais (clima de informação = 7,105 e atenção externa = 9,96), o valor T da análise ambiental (50,197) e a utilização da informação (62,92) estão acima do nível médio. A análise e a explicação dos resultados neste caso revelam que, após a imposição de um mediador, o valor β foi alterado subsequentemente de ($\beta=0,576$) e ($\beta=0,0383$) para ($\beta=0,267$) e ($\beta=0,341$). Isto significa e reforça o efeito trivial mas crucial do mediador.

Conclusões. As atitudes positivas em relação às actividades baseadas na informação, a interação intermitente com peritos com antecedentes e recursos informativos elevados e enriquecidos, a quantidade de acesso condicional e organizacional à informação e, por último, a ação recíproca com o ambiente têm um grande impacto na quantidade de exploração do ambiente e na informação a que os gestores recorrem.

Palavras chave

Digitalização ambiental; Comportamento de digitalização; Factores individuais; Factores organizacionais; Recursos de informação; Gestores de publicações electrónicas do Irão

1 Introduction

Advances in electronic publishing, largely driven by widespread application of information technology, have significantly transformed mechanisms of generating, storing, organizing, and distributing, as well as accessibility of, information. In the same vein, the internet was a revolutionary invention in digitizing the entertaining industry including music, film and book-related industries. It specifically changed ways of distribution in book industries from traditional cycle of publisher to retailer to a more modern distribution system in the market (Vrethager, 2017). Gilbert and Christensen (In: Gilbert, 2015) in their research on the impact of digitization on the media industry, state their belief that only 9% of companies will survive. One way of surviving in such markets is the application of strategies specifically designed for the digital market. So, they should have a separate business strategy with a separate physical space and separate balance sheets, as well as a new team of people focused on creating content for the digital environment. However, there are still some challenges regarding copyright, free flow of information, and scientific exchange of information. Because, the technology already offers many possibilities, the way it is used is both a technical and a market-related issue. The migration to the digital environment has stimulated major changes in publishing and other media industries.

Publishing sectors such as scientific publications quickly accept the new technological opportunities. Free content and self-publishing models shake the publishing industry and change the publisher's traditional position in the book publishing chain. Advanced software solutions offer authors easy access to virtual 'shelves', allowing publishers a simpler, quicker production and distribution. Changes carry many challenges and threats since the technology is still at an early stage of implementation (Despot & Jakopec, 2013). Zhu (2012) reported that authors do not trust electronic copyright patenting procedures because they believe these procedures are obscure and vague. This is explained, to some extent, by the fact that electronic publishing industry is young and

suffers from immature mechanisms. Mature patterns in an industry are indicators of development (Wen-Qi, Mei, Ling-Yan, 2018). There seems to be little interest in investment in electronic publishing industry mainly because publishers are not aware of mechanisms of marketing digital products and there is no established pattern of profitability (Qin, 2015). On the other hand, rapid growth of electronic publishing as a result of its technical and infrastructural capacities worries traditional publishing system as it provides unlimited access to millions of books in a split of second (Vrethager, 2017). It is, thus, predicted that traditional bookstores will not be able to adapt with digital transformations and lose the battle against electronic stores such as Amazon (Katsarova, 2016). This is evidenced by closure of 150 retail outlets of Barnes and Nobel Bookselling Company in the United States (Wahaba, 2016).

Lee and Liang (2018) argue that educational publishing industries worldwide have undergone major challenges in the last two decades. The underlying factors are unmarketable books, high rate of book returns from retail stores, short cycle of publications as a result of frequent updates, fluctuations in the number of college student due to decreased birthrate, low competitiveness because of presenting similar teaching materials, availability, and demand-based publishing. Therefore, publishers need to care for two key factors: demand prediction and planning. Demand prediction is highly influential but is determined by conscious decision making (Chen & Chien, 2018; Wu & Wu, 2013; Chien, Du & Fu, 2017). Ballhaus (2010) believes that publishing industry is experiencing a transitional stage whereby developers introduce new patterns, publishers apply new tools, companies seek new business patterns, and readers abandon the habit of reading paper books to pick electronic ones. Sealer (2017) holds that the internet and digitization changed schemes of producing and distributing scientific studies. This, along with free access movement, caused significant changes in academic relations. Internet-based services made self-publication an option for authors and provided for big online stores like Amazon to establish direct relations with authors, while linking readers to writers (Hviid, Jacques, Sanchez, 2017).

Also, the review of past research findings show that the availability of content in various formats and viewing modes dependent on consumer preferences (Kleper 2001); and a potential for new forms of digital content, such as original digital texts to be accompanied by contemporary reviews and commentaries (Shatzkin 2008); increased chances of an author having his manuscript published as digital publishing guidelines and without any limitation on length of manuscript or type of characters, etc., authors can better stay in control of the publishing process than print, Higher royalties, the author opportunity to checking out the publisher's contract before submitting his manuscript, reduce in response time from the publishers and speedy publishing, the availability of book over the world from the moment it is published with possible sales going on 24/7 (Duncan, 2014); the opportunity for readers to gather digitally to discuss, create and share content to their respective unique methods using modern machines (Abulude, 2014); faster publishing time for accepted manuscripts, greater flexibility in the relationship between the writer and the publisher, writer's opportunity to update texts often and at no cost, offering longevity for works with slower sales through the unlimited archiving capacity of digital technology, an opportunity to distribute and retrieve time-sensitive and compact contents through mobile phones, PDAs and other wireless devices, distributions of information cost effectively to a wider audience compared to delivery of print books (Ahmed & Babalola, 2015); e-books are delivered by digital content management systems (CMS), no costs associated with storage, pilferage, or the return of unsold stock (Joseph and Jha, 2015); the benefits of digital technology to both customers and publishers, particularly in terms of cost savings compared to traditional book publishing, no physical costs such as paper, printing, or binding, distribution directly to consumers without accompanying delivery costs arising from wholesale and retail costs, improvement of publishing processes such as reformatting and editing, ease of input, redesigning, general layout and printing (Haco-Obasi & Chukwu, 2021); are some of the advantages of digital publishing.

Due to increased global environment volatility and uncertainty, organizations are constantly faced with unexpected events which have brought large disruptions for firms. So, Organizations tries to improve their resilience level for describing how might stay alive and thrive in such a volatile environment. In the highly chaotic and unpredictable environments, organizations constantly face unforeseen occurrences that has caused significant global supply and demand disruptions in many enterprises, resulting in huge financial losses ((Duchek, 2020; Gu, Yang & Huo , 2021). So, despite the fact that conditions vary across business sectors and countries throughout the prolonged uncertainty, the unifying goal for businesses is to respond effectively, design plans to survive the crisis and expedite recovery (Bhattacharyya and Thakre, 2021). In addition, the digitization and the

need to coordinate with the digitization has doubled the importance of paying attention to the events of the external environment and using the environmental scanning mechanism.

In the industries, such as manufacturing, digitalization has developed further than in construction, and has had profound effects (Parida, Sjödin & Reim, 2019). The term Digital Transformation refers to overall changes in products, services, processes, business models and value chains that driven by digitalization, and associated challenges that companies are facing to exploit the opportunities offered by new technologies (Samuelson & Stehn, 2023). In a review of 282 digital transformation related studies, Vial (2019) concluded that it involves profound changes in firms and societies, and that firms need to innovate using digital technologies to adapt to associated changes in their ecosystems. Thus, the concept digital transformation encompasses much broader changes in firms' business than merely the introduction of IT or increases in use of IT. The topic of digital transformation analyzing how isolated technologies help firms to transform leadership and business organization, modify business models, allow development, increase business capabilities and productivity, or allow them to go abroad and internationalize (Feliciano-Cestero, Ameen, Kotabe, Paul & Signoret, 2023). In terms of competition, the business of digital media and publishing in the digital transformation age has always been faced by paradoxes. The barriers to entry are much lower than print or broadcast media, which has led to intense competition. Some refer to this as the attention economy. The idea that content in the broadest sense is no longer scarce with easy access to an endless supply of music, movies, TV, news updates, long-form journalism, video games, newsletters, social media posts as well as digital or print books. The scarce resource is now people's time and attention. The other paradox is that while it was easy to launch a new digital publication, the business models were not clear until the rise of digital subscriptions and developments that followed. Meaning that, while the start-up costs were low, the returns were also lower. For legacy media businesses, print or broadcast still generated the majority of their revenue, and margins for digital businesses were lower. It was difficult to justify a meaningful pivot to digital, meanwhile, audience behaviour continued to shift to digital and accelerated through the rise of social and mobile. This led to a nightmare scenario for legacy media: Advertising started to aggressively shift to digital, but platforms were able to capture the majority of this shift. This hyper-competitive environment and disruptive applications of technology such as ChatGPT have and will force publishers to ask probing questions about the distinctiveness of their offerings and what value they offer to their audiences. So, the challenges of operating in such an environment require that companies seek to use the mechanism of environmental scanning to improve their resilience and adaptability by obtaining useful information.

A review of the literature shows that dynamic technologies, readers' tastes, complexity of environmental factors, and incongruity are reasons that lead to uncertainty in managerial decision-making (Chen & Zhang, 2016). Information is still in demand to identify the pattern of environmental uncertainty in order to have a better understanding of organizational influence from and managerial response to environmental factors. Arieftiara, Utama, and Wardhani (2017) argue that environmental uncertainty is linked with managerial response and widening environmental opportunities for the organization and may determine affect manager's business strategies. This necessitates a thorough analysis of organizational environment before adopting any business strategies (Simon, 2012) to get sufficient information for decision-making and increase the chance of success. Organization benefits from information in making meaningful environmental changes, producing knowledge to be innovative and decide for actions (Choo, 1996). Thus, gaining information from different resources to adopt an optimum decision requires a systematic mechanism such as environmental scanning.

Environmental scanning is defined as information behavior of managers in dealing with environmental challenges such as change rate, complexity, and uncertainty in collecting and applying information. Zhang, Majid and Foo (2010) define it as a systematic method employed by organizations to identify changes and adopting coping strategies to deal with uncertainties. The channel of information collection is a key aspect of scanning behavior (Robinson & Simmons, 2018). In simple words, environmental uncertainties encourage environmental scanning behavior to collect information to respond to changes. The organizations with effective scanning systems tend to align their scanning designs with the requirements of their context. On the other hand, the results show that organizations with ineffective scanning systems typically fail to exhibit the requisite level of alignment between contexts and scanning design (Yasai-Ardekani & Nyström, 1996). Evaluation of information resources is not merely examination of facts and extracts psychosocial relations between the producer and the user of information. Thus, information is a critical ingredient of decision-making processes and solution for human problems (Hjørland & Nicolaisen, 2010). Kari (2010) found that information is an undeniable part of daily life. It is

a multifaceted experience that covers user's communicative behavior with information resources, information searching, information skills, information use, information awareness, information needs, context, responses, and effects. This is asserted by Babalhavaeji & Hosseini, 2012; Babalhavaeji & Farhadpour, 2012; Ziaei & Rasuli, 2016; Choo & Ethel, 1993; NikMuhammad, 2007; Bahmani et al., 2017; Bahmani & Farhadpour, 2017, as a key external factor on scanning behavior of managers. Though environmental scanning behavior mostly collects external information, mechanisms of internal organizational factors are also important when we consider organizational integrity. However, this is mostly neglected in the literature. Internal factors in the form of individual factors (information awareness and information disclosure) as well as external factors (information climate and external attention) impact environmental scanning behavior (Correia & Wilson, 2001). Information disclosure is a strategy for improving industrial environmental performance (Beierle, 2003), means the frequency of opportunities of contact with well-informed people and information-rich contexts and is strongly influenced by the 'outwardness' of the organization: some organizations provide more opportunities of contact with well-informed people or information-rich contexts (Correia & Wilson, 2001).

Achieving awareness is based primarily on informing employees through simple forms of information transmission within organizations (Sedej & Mumel, 2015). Information awareness means the attitude towards information-related activities, denoting the value attributed to information and included the personal sense of responsibility for environmental scanning and the communication pattern developed by the individual. All the interviewees agreed about the vital role of information in business (Correia & Wilson, 2001). Information awareness directly affects the level of one's ability to use information effectively (Wang & Latham, 2013).

As one of the organizational factors organizational climates means the setting of conditions that determine access to and use of information in an organization that was assessed by implementing of information infrastructure to the processes and using in information acquisition and handling (collecting, organizing and making information available, and disseminating it). Also, it was the emergence of evidence relating to the role of organizational culture in shaping the information infrastructure that led to the creation of the construct "information climate" (Correia & Wilson, 2001). Organizational climate is a function of many factors such as communication styles, culture, industry context, organizational structure, group dynamics, leadership style and intervening variables in the business environment (Rožman & Štrukelj, 2021; Banwo, Onokala, & Momoh, 2022). Recent studies highlight the need to adopt a holistic and systematic analysis of human resources, interpersonal relationship dynamics, nature of coordination, environmental nexus, exploration and service framework in understanding organizational climate dimensions (Pomirleanu, Gustafson, & Townsend, 2022; Banwo et al., 2022). The environmental scanning as a facilitator significantly effects on knowledge management capacity for organizations that experienced higher environmental uncertainty (Li et al, 2022). As well as, External attention means the openness of the organizations to the external environment, their permeability to external influences, and capacity to influence the environment (Correia & Wilson, 2001).

Based on the above description, present study is an attempt to examine effects of environmental scanning as a mediator on the relationship between organizational and individual factors, and use of information resources in scanning behavior of electronic publishing managers in Iran. To determine individual and organizational factors, amount of environmental scanning of managers, information resources of managers, and to determine effects of amount of environmental scanning on the relationship between individual and organizational factors and use of information by electronic publishing managers, the following hypotheses and questions were formulated.

1. To what extent do individual factors affect environmental scanning behavior of electronic publishing managers?
2. To what extent do organizational factors affect environmental scanning behavior of electronic publishing managers?
3. To what extent do electronic publishing managers perform environmental scanning?
4. What are the most important information resources used by electronic publishing managers?
5. Amount of environmental scanning affects the relationship between organizational factors and use of information by electronic publishing managers.
6. Amount of environmental scanning affects the relationship between individual factors and use of information by electronic publishing managers.

2 Literature review

Environmental scanning in publishing industry is scarce. Babalhavaeji & Farhadpour, (2012) showed that managers perceive higher uncertainty in readers and customers section and that they used library resources and electronic information services. The authors also reported a positive relationship between environmental uncertainty and use of information resources. Babalhavaeji & Hosseini (2012) reported a higher level of economic uncertainty and a positive relationship between information availability with use of information in environmental scanning. Similarly, Ziaei & Rasuli (2016) found highest level of uncertainty in economic environment and reported that managers used subordinate managers as sources of information. They also found that quality and availability of information affected environmental scanning. Berard & Delerue (2009) showed a positive and significant relationship between scanning activities of institutions and protection of intellectual property, and that national cultural values impact environmental scanning. Okura, Dozir, Sha, and Hofstetter (2009) environmental scanning, particularly in perceived environment, significantly affects decision-making. Lau, Liao, Wong, and Chiu (2012) proposed that smart business model 2.0 can significantly help decision-making in uncertain conditions. Said, Latif, and Ishak (2015) realized that information availability determines managers' environmental scanning activities to collect the required information. They asserted that having access to objective information is key to organizational survival in the business world. Results of the study by Wilburn, Robin, Vanderpool, Jennifer, and Knight (2016) contribute to evaluating the problem, explaining related policies, collecting gray and distributed information resources, collecting primary and secondary, qualitative and quantitative information, sharing results with internal and external stakeholders, decision-making and raising awareness. Bahmani, Farhadpour and Hamidi (2017) also demonstrated that rely more on personal information reported by subordinate staff than other sources of information. In addition, they found that richness, quality, and availability of perceived information have positive and significant effects on use of information in environmental scanning. Finally, Bahmani and Farhadpour (2017) showed that economic sector is more uncertain and managers scan it more than other sectors. Moreover, richness, availability, and quality of perceived information have positive and significant effects on use of information in decision-making.

Pourmohammadi et al. (2020) conducted comprehensive, strategic analysis and environmental scanning in Iranian public hospitals using a mixed method. The result revealed that strategic analysis is influenced by environmental scanning. Also, the results of Nyagaki, Munga & Nzioki (2021) study showed that collectively environmental scanning has positive influence on organization performance. Based on their findings, the environmental scanning continues to be recognized as a feature impacting organizational performance. Also, the dynamic and hostile environments affect commercial based performance. Alrashdi and Nizam's findings (2022) showed that people's use of social networks to receive information needed for job and daily life increases their productivity and performance, and as a result of continuous use of this source of information.

In the other research YahiaMarzouk and Jin (2022) examined how SMEs can foster their resilience through investigating the roles of environmental scanning and process innovation while testing the moderating role of environmental uncertainty. The results revealed that process innovation is a necessary condition for environmental scanning to affect organizational resilience. Furthermore, the results do not support the moderating role of environmental uncertainty the indirect relationship between environmental scanning and organizational resilience. Findings contributed that process innovation is a necessary mechanism to translate environmental scanning information to enhance resilience. Also, Sekere, Kiriri & Njenga (2023) in their study concluded that environmental scanning significantly influences performance of Small and Medium Manufacturing Enterprises. So, the managers and owners of the SMEs should develop an awareness of their industry and competitors, and consequently scan the environment regularly. The literature shows that environmental scanning behavior in most of the cases was connected with use of information in decision-making, and was considered an underlying factor in information flow in organizations, particularly collection and distribution of information.

3 Methodology

This is an applied study that uses analytical-survey method to evaluate effects of individual and organizational factors on use of information by electronic publishing managers with a mediator role of environmental scanning. Population of the study includes all 250 electronic publishing managers in Iran, from among which 152 were randomly sampled using Cochran formula. In addition, all 250 publishers had a publishing license from the

central government and the number of their employees was between 25 and 50 people. The time of data collection was the second half of 2019. Data was collected using a researcher-made questionnaire (23 items) adopted from earlier versions developed by Babalhavaeji & Farhadpour (2012), Choo (1993), and Coorreira & Wilson (2001). The questionnaire was set in a 5-point Likert scale (very little=1, little=2, somewhat=3, much=4 and very much=5). The validity of the questionnaire was confirmed by using experts' opinions in terms of content and formal way. The reliability of the questionnaire was established using Cronbach's alpha coefficients ($\alpha=94$). Then, numbers from 1 to 250 (total research population) were assigned to the publishers and 152 (total research sample) random numbers were generated using the =RandBetween function in Excel 2016, and a questionnaire was distributed to them based on the unique number of each publisher. Moreover, results of Kolmogorov-Smirnov test confirmed normality distribution of the data ($z=0.840$, $Sig.=0.480$). Questions and hypotheses were tested using correlative matrix, t-test, multivariate regression and path analysis.

Demographic analysis of study showed that, in terms of gender, 50% of sample were female and 50% were male. According to the educational status 44.7% have postgraduate education (23.7% female, 21% male), 25.8% have bachelor's education (11.3% female and 14.5% male) and 29.5% have graduate education and more (15% were female and 14.5% were male). According to the age status, 2% in the age group of 25 years (2% female), 45% in the age group of 26 to 35 years (13% of female and 32% of male), 45% in the age group of 36 to 45 years (30% of female and 15% of male) and 12% were in the age group of 46 years and older (5% female and 3% male).

4 Results

Data mean and frequency distribution of the sample was analyzed to test the first two questions on effects of individual and organizational factors (Table 1).

Table 1. Frequency distribution of the sample regarding effects of individual and organizational factors on scanning behavior of electronic publishing managers

Item		Measure	Statistical indicator		Mean	SD	SEM
			Frequency	Percentage			
Individual factors	Information Awareness	very low	14	9.2	16.21	0.141	1.747
		average	125	82.2			
		very high	13	8.6			
		total	152	100			
	Information disclosure	very low	44	28.9	7.039	0.155	1.921
		average	91	59.9			
		very high	17	11.2			
		total	152	100			
Organizational factors	Information climate	very low	24	15.8	7.105	0.138	1.707
		average	111	73			
		very high	17	11.2			
		total	152	100			
	External attention	very low	20	13.2	9.960	0.152	1.880
		average	120	78.9			
		very high	12	7.9			
		total	152	100			

Source: Authors

Table 1 shows that, from among individual factors, awareness (82.6% average, 8.6% very high, and 9.2% very low; mean= 16.21) and information disclosure (59.9% average, 28.9% very low, and 11.2% very high) have highest and lowest effects on scanning behavior of electronic publishing managers. Regarding organizational factors, it can be seen that external attention (78.9% average, 13.2% very low, and 7.9% very high; mean=9.960)

and information climate (73% average, 11.2% very high, and 15.8 very low) have highest and lowest effects on scanning behavior of electronic publishing managers.

Table 2. Frequency distribution of the sample based on amount of environmental scanning by electronic publishing managers

Item	Measure	Statistical indicator		Mean	SD	SEM
		Frequency	Percentage			
Amount of Environmental scanning	very low	24	15.8	50.197	7.527	0.610
	average	97	63.8			
	very high	31	20.4			
	total	152	100			

Source: Authors

Tables 2 summarize results for amount of environmental scanning by electronic publishing managers using frequency distribution, and single t-test. As the result shows, amount of environmental scanning was 63.8% average, 20.4% very high, and 15.8% very low.

Table 3. Amount of environmental scanning based on different environmental sectors

Environmental sectors	Frequency and interval of using environmental information		Awareness of developments in environmental sectors		Scanning
	Mean	SD	Mean	SD	Total
Customers	3.94	1.235	4.29	0.852	8.23
Competitors	3.57	1.220	3.79	1.099	7.36
Technology	3.54	1.200	3.83	0.825	7.37
Supervision	3.03	0.804	3.78	0.639	6.81
Economics	3.30	1.337	3.80	0.882	7.1
Society-culture	3.25	1.528	4.01	0.788	7.26
Ecology	2.98	1.082	3.01	0.880	5.99

Source: Authors

Table 3 reveals that managers perform scanning in regard to customers (mean=8.23), technology (mean=7.37), competitors (mean=7.36), society-culture (mean=7.26), economics (mean=7.1), supervision (mean=6.81), and ecology (mean=5.99), respectively.

Table 4. Results of single t-test for amount of environmental scanning based on different environmental sectors

Item	Theoretical mean= 17.51				Confidence interval (95%)	
	t-statistics	Degree of freedom	Level of significance	Mean difference	Lower limit	Upper limit
Amount of scanning	54.37	151	0.001	33.197	31.991	34.403

Source: Authors

The data in Table 4 shows that estimated t-value for amount of scanning (54.37) with degree of freedom of 151 at significance level >0.05 is greater than theoretical mean score, implying a significance between them. Thus, it is concluded with 95% certainty that external scanning of managers was above the average level. To determine the most important information resource used by electronic publishing managers for environmental scanning, a 16-item measure developed by Bahmani and Farhadpour (2017) in four scales of internal, external, personal, and impersonal resources was used and analyzed. Results are given in tables 5-6.

Table 5. Information resources used by electronic publishing managers for environmental scanning

Information resources	Mean	SD
Customers	4.11	0.686
Competitors	3.96	0.649
Experts in electronic publishing	3.67	0.657
Government agencies	3.96	0.901
Newspaper, magazines, professional journals	3.51	0.876
Organizational reports and publications	3.71	1.077
The media (TV, radio)	3.51	0.640
Professional associations	2.85	0.879
Conferences and specialized exhibitions	3.09	1.005
Counselors and members of committees	2.50	1.085
Subordinate managers and deputies	4.22	0.922
Subordinate staff	3.53	1.316
Internal statements and circular	3.34	0.815
Internal reports and researches	2.89	0.632
Internal libraries	3.19	0.761
Internet resources	3.34	1.111
Social media	3.60	0.963

Source: Authors

As seen in Table 5, managers tend to use information from subordinate managers and deputies (mean=4.22), customers (mean=4.11), competitors and government agencies (mean=3.96) more than other environmental resources and are less interested in information supplied from internal reports and researches (mean=2.89), professional associations (mean=2.85), and counselors and members of committees (mean=2.50).

Table 6. Results of single t-test for use of information resources in environmental scanning behavior

Item	Theoretical mean= 17.51				Confidence interval (95%)	
	t-statistics	Degree of freedom	Level of significance	Mean difference	Lower limit	Upper limit
Information resources	62.92	151	0.001	42.059	40.738	43.379

Source: Authors

The data of table 6 shows that estimated t-value for use of information resources (62.92) with degree of freedom of 151 at sig. >0.05 is greater than theoretical mean score, implying a significance between them. Thus, it is concluded with 95% certainty that managers used information resources above the average level.

Then, the hypotheses were tested using multivariate regression and the results were provided in tables 7-10, and figures 1-2.

Table 7. Results of regression analysis of amount of environmental scanning on the relationship between organizational factors and use of information by electronic publishing managers

Hypothesis	Model	Correlation coefficient	Determination coefficient	Adjustment coefficient	Estimation error
H_1	1	0.383	0.147	0.141	28.2720
	2	0.723	0.523	0.516	21.2211
H_2	1	0.572	0.327	0.322	25.1124
	2	0.750	0.563	0.557	20.3089

Source: Authors

H₁: Amount of environmental scanning has significant effects on the relationship between organizational factors and use of information by electronic publishing managers.

H₂: Amount of environmental scanning has significant effects on the relationship between individual factors and use of information by electronic publishing managers.

It is clear in Table 7 that coefficient of correlation for independent variables (organizational and individual factors) and the mediator variable (amount of scanning) was R=0.383 and R=0.572, respectively. The correlation between dependent variable (use of information by electronic publishing managers) and mediator variable was R=0.723 and R=0.750, respectively. This indicates that individual factors are more influential than organizational ones. Moreover, adjustment coefficient shows how independent variables affect the dependent variables. In this regard, individual and organizational factors respectively explain 32.2% and 14.1% changes in the pattern of scanning behavior. Furthermore, 51.6% and 55.7% of changes in use of information are related to organizational and individual factors, respectively.

Table 8. Results of determination coefficient to predict mediating effects of environmental scanning on the relationship between organizational factors and use of information by electronic publishing managers

Model	Non-standard coefficients		Standard coefficients	t-statistics	Level of significance	
	β-statistics Change prediction	Standard error	β -coefficients			
H₁	Fixed	284.23	12.573	-	22.607	0.001
	Organizational factors	3.680	0.724	0.383	5.081	0.001
	Fixed	179.716	13.500	-	13.312	0.001
	Organizational factors	2300	0.558	0.239	4.119	0.001
	Amount of environmental scanning	2.551	0.236	0.630	10.828	0.001
H₂	Fixed	219.58	15.072	-	14.569	0.001
	Individual factors	5.482	0.642	0.572	8.535	0.001
	Fixed	161.714	13.794	-	11.724	0.001
	Individual factors	3.265	0.575	0.341	5.675	0.001
	Amount of environmental scanning	2.180	0.243	0.538	8.964	0.001

Source: Authors

As the result of table 8 shows, the regression coefficient of independent variables (individual and organizational factors) with dependent variable (use of information by electronic publishing managers) is $\beta = 0.383$ and $\beta = 0.572$, respectively. When the mediator variable of amount of environmental scanning intervenes with independent variable, coefficient of dependent variable decreases to $\beta = 0.239$ and $\beta = 0.341$, respectively. These coefficients are significant at $P > 0.000$. It is concluded that role of amount of environmental scanning as a mediator is insignificant.

Table 9. Direct and indirect effects of amount of environmental scanning on the relationship between individual and organizational factors with use of information by electronic publishing managers

hypotheses	Effect type	Path	Effect size
H_1	Direct	The use of information resources → environmental scanning	0.630
	Direct	The use of information resources → organizational factors	0.383
	Indirect	The use of information resources → environmental scanning → organizational factors	0.622
	Total		1.635
H_2	Direct	use of informational resources → environmental scanning	0.538
	Direct	The use of information resources → individual factors	0.572
	Indirect	The use of information resources → environmental scanning → individual factors	0.111
	Total		2.22

Source: Author

Table 9 shows that total direct and indirect effects of mediator variable of amount of environmental scanning on the relationship between organizational and individual factors are 1.635 and 2.22, respectively..

Table 10. Estimating direct and indirect effects of mediator variable of amount of environmental scanning on the relationship between organizational and individual factors with use of information by electronic publishing managers

Hypothesis	Independent variables	Direct effects	Indirect effects	Total
H_1	Amount of environmental scanning	0.630	-	0.630
	Organizational factors	0.383	0.622	1.005
H_2	Amount of environmental scanning	0.538	-	0.538
	Individual factors	0.527	0.555	1.082

Source: Author

The result of table 10 shows that the amount of environmental scanning as a mediator variable has significant indirect effect on the relationship between organizational and individual factors with use of information by electronic publishing managers.

5 Conclusions

Information is the outcome of organizational transactions and the core of organizational decisions. Information used by managers may be internal, external, personal or impersonal and can be extracted by environmental scanning to be applied in future decision-making. It is found in a wide range of resources and is affected by many underlying factors such as individual factors including awareness (attitude towards information-related activities), information disclosure (frequent access to informed people and rich informational contexts), and organizational

factors including information climate (factors that determine availability and use of information in the organization) and external attention (cooperation with the environment, openness to external stimuli, and the capacity to affect the environment). Our results indicated that levels of organizational, individual, and amount of environmental scanning are higher than the average score. In addition, managers use information provided by subordinate managers and deputies, customers, competitors, and government agencies associated with electronic publishing. Results of testing the hypotheses also showed that amount of environmental scanning as the mediator variable significantly affected the relationship between organizational and individual factor with use of information by managers. Our results are in agreement with the findings of Babalhavaeji & Hosseini, 2012; Babalhavaeji & Farhadpour, 2012; Ziaei & Rasuli, 2016; Coorrea & Wilson, 2001; Okura et al., 2009; Lio et al., 2012; Said et al., 2015; Bahmani, Farhadpour, and Hamidi, 2017; and Bahmani & Farhadpour, 2017.

It is thus claimed that organizational capacity in terms of positive attitudes towards information activities, frequent and consistent relations with informed people, organizational backgrounds with rich availability of information, external cooperation with organizations active in electronic publishing, on the one hand, and use of information, on the other hand, are closely linked with active environmental scanning behavior of managers. Therefore, it is suggested that:

- Managers and the staff develop a positive attitude towards information-related activities.
- Organizations establish an information culture that determines individual information behavior of the staff.
- Organizations are a part of a social context with different agents that interact with each other and should try to strengthen their ties with these external agents.
- Software and hardware infrastructural requirements to have access to applicable information be established in the organization.
- Internal relations to communicate information (information disclosure) between the staff be strengthened to share knowledge and experiences.

6 Limitations

There were limitations in this research. The first limitation was the managers' low confidence in the research data collection process and the fear that their responses would be misused. Therefore, we tried to solve this challenge by negotiating and giving moral commitment and making it optional to mention the names of managers. Another limitation is related to the research community and its time frame, which is recommended to be considered in using the results by other organizations.

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