

The Use of IPTV in E-Business (Case Study: Filmnet)

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ABSTRACT:

IPTV service enables audiences to access services such as access to movie and series archives, music, live broadcasts, online shopping, online gaming, online banking, etc. by purchasing and connecting a set-top box to their television, without paying for internet traffic and without reducing the volume of internet traffic. Therefore, the purpose of the present study is to examine the use of IPTV in e-business. The present study is applied in terms of purpose and is of a quantitative and qualitative type. The statistical population of the present study includes people involved in the Filmnet work system, including employees, participants, and customers of Filmnet. The data collection tool in this study is a researcher-made questionnaire that includes 6 sections and a total of 27 questions. This questionnaire is designed to examine the indicators of IPTV within the framework of the work system, including work processes, customers, information, products / services, technology, and participants in a case study of the Filmnet Iran website. The Delphi method was used to analyze the data. The results demonstrated that in the analysis of the questionnaires of the fourth round, the average response of all components of all six dimensions of work processes, technology, participants, customers, products and services, and information was in the range of agreement (more than 3). On the other hand, all components in the fourth round had a higher mean and lower standard deviation compared to the second round, but there was no significant difference compared to the third round. The mean and standard deviation of all components in the fourth round were 3.70 and 0.42, respectively. By comparing the mean and standard deviation values of this round with the third round (3.65 and 0.44), it can be seen that these values have decreased, but they do not have a significant difference. This indicates that the panelists have a consensus with the selected components and there is no significant difference.

Keywords: *e-business, IPTV application, Filmnet, Delphi method.*

INTRODUCTION:

Over the past decade, the growth of digital satellite and cable services has had an impact on the future of television, but now with the emergence of new broadcast of Internet Protocol Television (IPTV) promises a major transformation in this area, supported by the telecommunications industry and poised to offer greater interactivity and significant competition in the television sales business. IPTV is a product of the convergence of the computer, telecommunications, and multimedia industries and the development of new communication and information technologies. IPTV is the delivery of television content using signals based on the Internet Protocol (Obele et al., 2009). IPTV service enables audiences to access services such as access to movie and series archives, music, live broadcasts, online shopping, online gaming, online banking, etc. by purchasing and connecting a set-top box to their television, without paying for internet traffic and without reducing the volume of internet traffic (Jang and Noh, 2011). Telecommunications operators are entering the digital television market, but it is not yet

clear whether the new IPTV business models will survive in the market. Many analysts believe that the huge potential of the IPTV market will be an opportunity to develop this new market (Bouwman et al., 2008).

IPTV has now revolutionized the television industry. This new technology has provided a creative system for delivering television programs (Erman and Matthews, 2008). The purpose of this new technology is to retain viewers and create new ways of using television. By this technology, television viewers, while watching television programs as before, are able to access the network database via the Internet and manipulate what they see. Each user determines what to watch and how to watch (Kwon and Hong, 2011). We can schedule program broadcasts by this technology, so that the user can change the broadcast time of a program, or reserve his desired program and be informed of the broadcast time of that program through received messages, or automatically save the program for himself/herself (Obele et al., 2009).

Herbert Simon (2006) conducted a study entitled "A Review of Multimedia Subsystems" and concluded

that today, in the field of IPTV, information and telephone communications, the market trend is towards the use of IP for all services related to service delivery, which covers a range from telephone calls to television. The IP multimedia subsystem provides services that can be used on different devices and equipment. In study of Pomalainen et al. (2006), IPTV was compared with traditional television distribution technologies in Finland from a technical and consumer perspective. The study introduced the advantages and limitations of IPTV, examined IPTV from a commercial perspective, and analyzed the current state of IPTV in Finland and abroad. Finally, the potential growth of IPTV in Finland in the next few years was assessed.

Given the increasing importance of IPTV in today's world, much research has been conducted in this field and various aspects of this technology have been considered, including examining the infrastructure of this technology and the requirements necessary to create it and the impact of various factors on this technology. However, few studies have examined the impact of this technology on e-business. In this study, we examine the impact of IPTV on e-business which has gained great importance in the competitive world these days. For this purpose, a model has been designed and various aspects of this impact are examined.

Theoretical foundations of research:

Business process:

Today, the main concerns of organizations are to achieve ways and methods to automate and improve business processes. A significant number of organizations, which are also growing, use business process management to effectively improve organizational processes and operations (Röglinger et al., 2012). Business process management includes methods, techniques and tools that are used to support the design, implementation, management and analysis of business operational processes. The main problem is the large amount of work involved in designing and implementing systems (Schmiedel et al., 2013). Business process management is a set of modern management approaches and technology that are used in a structured, coherent and coordinated way to understand and document, model, analyze and continuously improve business processes (Vom Brocke et al., 2014).

Business process management systems are software for monitoring the execution of business processes, which enable managers to analyze processes and make necessary changes to the initial state. On the other hand, business process management systems are a management model that enables organizations to manage and improve business processes like other capital items of the organization (Schmiedel et al., 2014; Trkman, 2010).

A good business process management system updates the business environment by changing business

processes based on the competitive environment. Business process management is different from business process reengineering; in this way that business process management does not seek to make sudden and revolutionary changes in business processes, but considers their continuous evolution and usually combines management methods with information technology.

Internet Protocol Television (IPTV):

With growing Internet exponentially, it is also increasingly the source of digital television services (Buckingham, 2007). Internet Television is a new technology that bridges the worlds of television and the Internet, and is the product of the convergence of the computer, telecommunications, and multimedia industries. This technology seeks to retain viewers and create new ways of using television. Many researchers believed that Internet Television is a phenomenon of the communication age. The full name of Internet Television is Internet Protocol Television, also known as IPTV (Simpson and Greenfield, 2012). IPTV defines a system that uses the Internet Protocol and broadband connections to broadcast television programs to homes, and its use requires the subscription of an IPTV device. Like VOIP (Voice Over Internet Protocol), which involves the transmission of voice, IPTV involves the transmission of video data over the Internet in the form of data packets. This data can then be stored on a server and sent to the desired computers via ADSL or cable. IPTV can be broadcast both live and as recorded videos, or VOD (Video On Demand) (Anderson, 2006).

In other words, IPTV is a method for broadcasting television images on fixed telephone lines, that is, access to sound and image through a telephone line without disrupting telephone calls. In this technology, using the rules and protocols accepted in the Internet field, audio and video signals are distributed digitally and on frequencies that do not interfere with the telephone call frequency. This is only possible on the condition that the data exchange (whether sound or image or any other data) is carried out digitally. Therefore, in the current situation where production and broadcasting are carried out in analog, its launch can be easily conducted by installing systems that convert from analog to digital and vice versa (Afrasiabi and Khorshidi, 2008).

Conceptual model of the research:

The conceptual model of the research is introduced into the framework of the work system. The work system consists of three stages; a) Imaging the system, b) Identifying problems and opportunities for improvement, 3) Assessing the effects and solutions for improvement. Work systems exist in every organization, such as: information systems, ordering system, producing and delivering products, finding customers, financial reports, hiring, establishing and creating coordination between organizational

departments, etc. The scope of application of these systems ranges from a large supply chain to a small department in the organization. The concept of work system is the general form of systems in which

organizations exist. Its specific form includes information systems, projects, value and supply chains, decision support systems, e-commerce websites, and automated work systems (Alter, 2004)

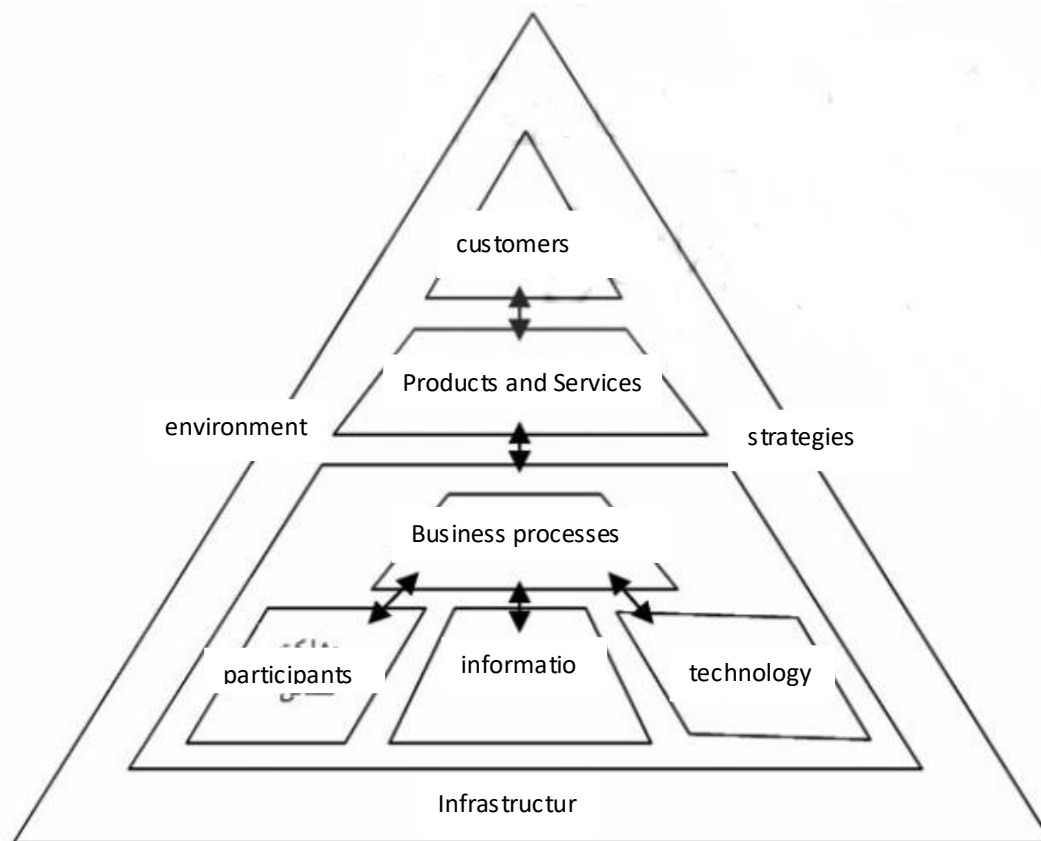


Figure 1: Work System Framework (Alter, 2004)

According to the work system framework, in order to establish a balance between the priorities of different customers, establish a balance between process flexibility and product diversity, control deviations in processes, monitor the quality of input and output of processes, establish a compatibility between work processes and participants, establish a balance between the motivation of participants and the goals of the system, protect and secure information, use

appropriate technologies, support the business strategy, minimize unnecessary risks, maintain and maintain a balance between the elements of the work system, and enhance the ability of the elements to accept growth and change (Alter, 2004), the following conceptual model is presented to examine the features, capabilities and advantages of Filmnet IPTV within the work system framework.

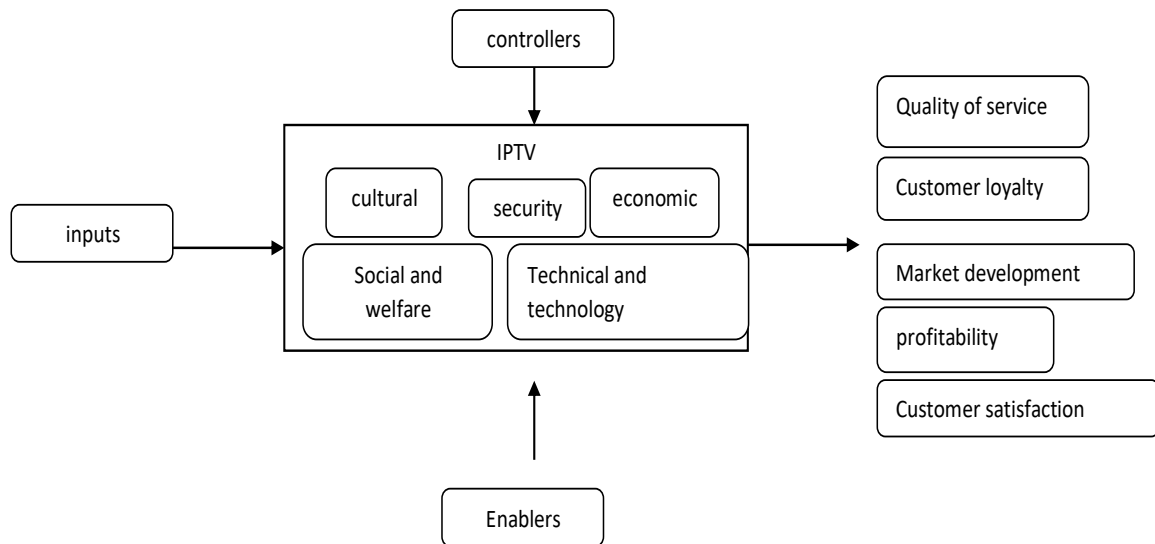


Figure 2: Conceptual Model of Research

Another model used for data analysis is the IDEF0 (Integrated Definition Language) (Figure 3). The process of this model is placed in the central box of the diagram. The left side of this box is related to information related to the inputs of the process inside the box, and the right side of this box is related to information related to the outputs of the process inside the box. Inputs and outputs have the ability to connect the process inside the box to people, documents,

products, services, and other processes. The top and bottom of this box are information related to process controllers and process enablers, respectively. Process controllers can be people, documents, and other processes that manage and control the activities of the process inside the box. Process enablers and supporters support the correct execution of the process inside the box. Furthermore process controllers and enablers are reusable resources.

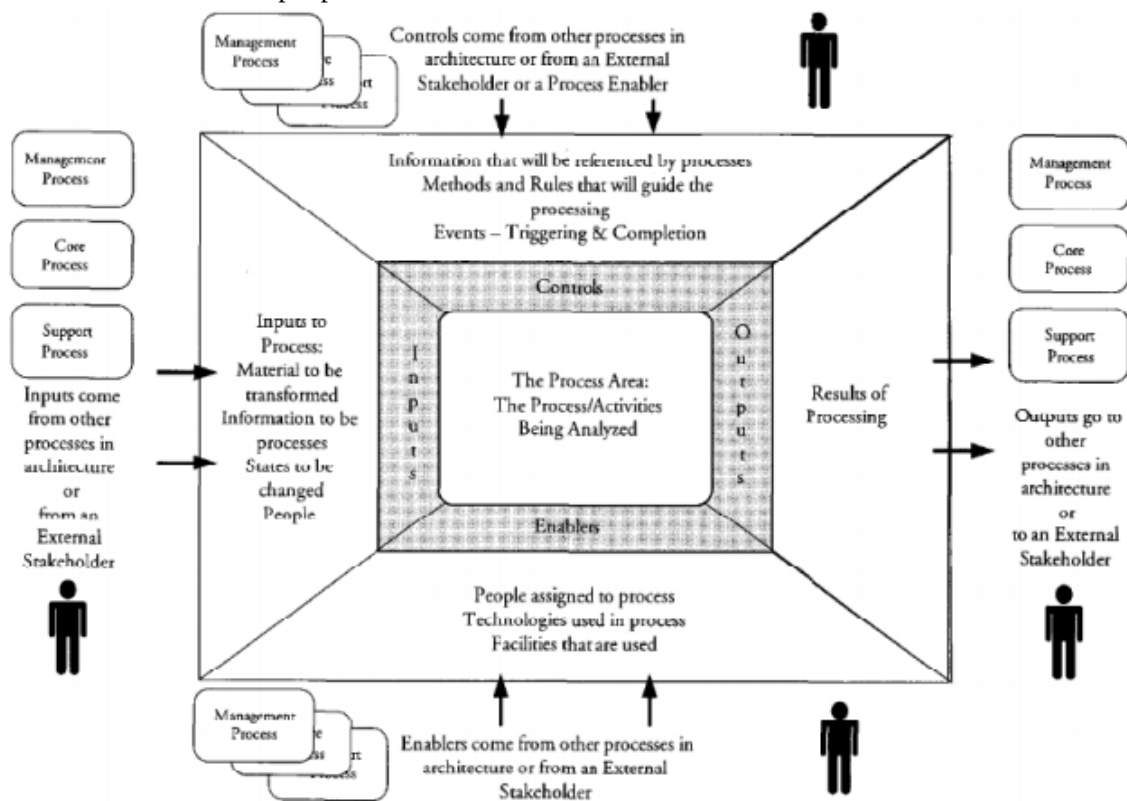


Figure 3: General scheme of the IDEF0 diagram

Filmnet's working system:

The Filmnet's working system is shown in figure 4.

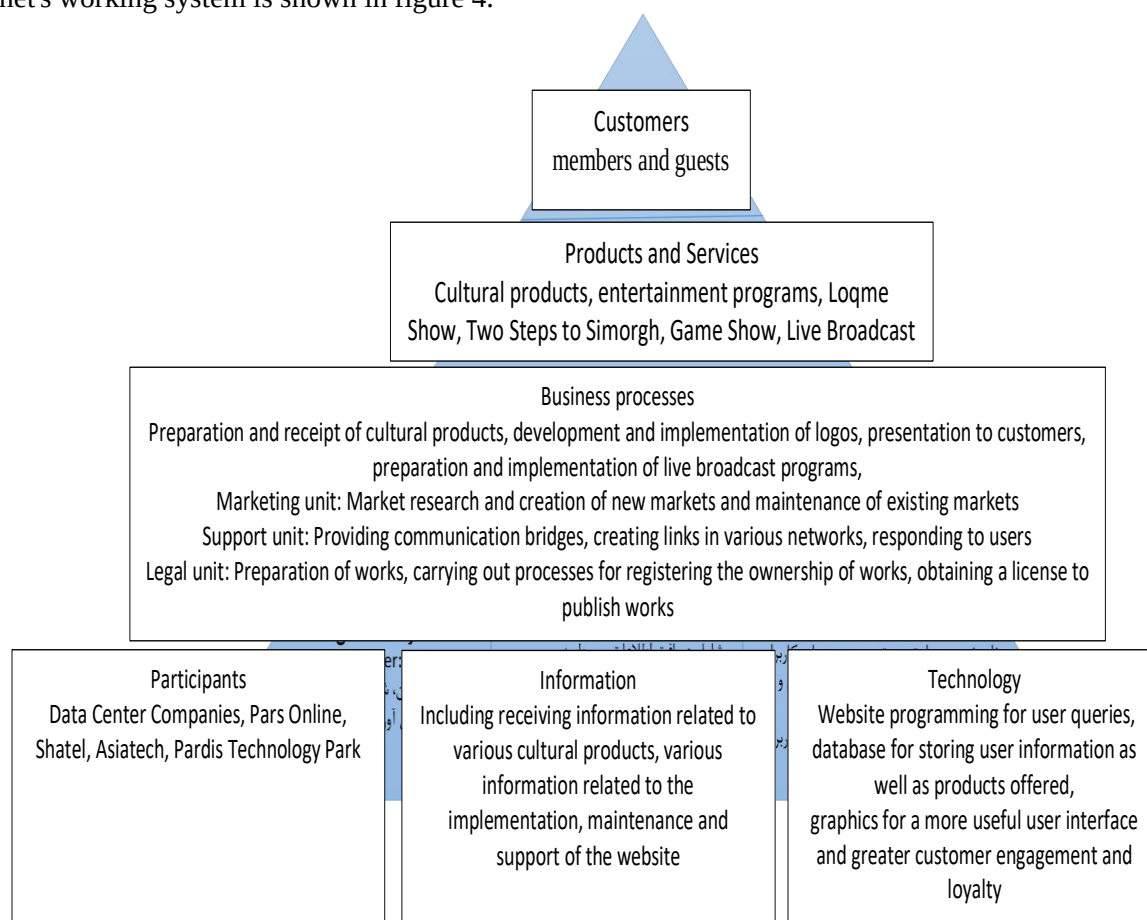


Figure 4: Filmnet's working system

In the systems of Filmnet's working system, customers include all users who deal with this system in some way and are also considered consumers. These customers can be divided into members and guests. In the products and services section of the Filmnet's working system, products include films and series, live programs and competitions are available and offered to customers. The Filmnet's working system includes a series of business processes like all organizations in which the content unit first prepares and receives the products, then the procurement unit and the legal unit of the complex prepare the products and obtain permission for the copyright of the work. The marketing unit places a proprietary logo on the product and finally prepares it for presentation to the customer. The tasks of the technology department include web programming and user queries, databases, and graphics and user interfaces. This unit can help in attracting more customers and building customer loyalty. The information department receives information related to various cultural products and is responsible for the implementation and technical and web support of the system. Companies such as Pars Online, Science and Technology Park, and Pardis are also considered as participants in the working system.

MATERIAL AND METHODS:

The present study is applied in terms of purpose and is of a quantitative-qualitative type. The statistical population of the present study includes people involved in the Filmnet work system, including employees, participants and customers of Filmnet. In addition to library studies (books, articles, etc.), a field method, namely a questionnaire, was used to collect data. The data collection tool in this study is a researcher-made questionnaire consisting of 6 sections and a total of 27 items. This questionnaire was designed to examine the indicators of IPTV within the framework of the work system including work processes - customers - information - products / services - technology - participants in a case study of the Filmnet Iran website. The answer sheet was prepared using a five-point Likert scale

In order to confirm the validity of the questionnaire, the content and questions of the questionnaire were designed considering the opinions of experts. Finally, this questionnaire was approved by the research expert panel. The alpha coefficient was calculated using SPSS software. The questionnaires were distributed in person and the Delphi method was used to analyze the data.

RESULTS:

1. First round of the Delphi process:

The first questionnaire was sent in an unstructured or open-ended form, which served as an idea generation strategy and aimed to uncover all issues related to the topic under study. Each expert was asked to personally brainstorm, freely express any ideas and opinions regarding the use of IPTV in e-business (case study: Filmnet), and to send a brief and anonymous list of topics. At this stage, there was no need to fully develop the ideas and opinions were not evaluated or judged. All relevant responses were collected, because the rest of the steps are based on the first step. At this stage, the issue of the use of IPTV in e-business (case study: Filmnet), its dimensions and aspects were studied, and various questions were asked to the Delphi panel in this regard.

The responses were organized, similar opinions were combined and grouped, and repetitive and marginal topics were removed after collecting the received questionnaires,. A list of IPTV applications in e-business (case study: Filmnet) was compiled and analyzed by considering the experts opinions. This list includes the following:

1. Work processes
2. Technology
3. Participants
4. Customers
5. Products and services
6. Information

In Table (1), these dimensions are presented along with their components.

Table 1: Dimensions and components of IPTV applications in e-business (case study: Filmnet)

No.	Dimension	No.	
1	Work process	1	Drafting laws and regulations regarding issues related to IPTV
		2	Preservation of intellectual property rights related to IPTV
		3	Using Filmnet as an IPTV
		4	Using Filmnet as an IPTV system in the country's media structure
2	Technology	1	Basic facilities for IPTV systems
		2	IPTV system maintenance facilities
		3	IPTV system support facilities
3	Participants	1	Specialized worker to install and launch
		2	Specialized worker to maintain and maintain
		3	Specialized worker to content and program product
		4	Specialized worker to software support and programm
		5	The capabilities of institutions and schools for teaching IPTV
4	Customers	1	Cultural assimilation of users
		2	Acceptance of families

		3	Expanding and accepting users' religious and Islamic beliefs
		4	The right to choose the type of program
		5	Users can choose when to watch the program
5	Products and services	1	Possibility of using links to make programs more attractive
		2	Using hypertext to create artistic appeal
		3	Diversification
		4	Image quality
6	Information	1	Information storage capacity
		2	Information security

The analysis of the open-ended questions in the first round questionnaires demonstrated that the components or factors proposed by the respondents were conceptually identical to the existing factors identified in the literature; therefore, they were merged with the existing factors and no specific factor was added for the second round. Therefore, based on the study of the theoretical framework, articles and scientific sources, as well as using the opinions of the Delphi panel through a questionnaire with open-ended questions, the dimensions and components mentioned in Table (1) were selected as effective factors for the use of IPTV in e-business (case study: Filmnet) in the form of 6 dimensions of work processes (4 components), including the technology dimension (3 components), the participants dimension (5 components), the customers dimension (5 components), the products and services dimension (4 components) and the information dimension (2 components).

The results showed that in the analysis of the second round questionnaires, the average response of all components in all six dimensions was in the range of agreement (more than 3); therefore, none of the factors were eliminated for the third round. In this way, the third round questionnaire was provided to the panel members along with the previous comments and the average of the second round Delphi comments. The average and standard deviation of the total components in the second round were 3.22 and 0.49, respectively.

In the analysis of the third round questionnaires, the average response of all components of all six dimensions of work processes was in the range of agreement (more than 3). On the other hand, all components in the third round had a higher mean and lower standard deviation compared to the second round. This proved that the panelists agree with the selected components. Therefore, none of the factors were eliminated for the fourth round. In this way, the fourth round questionnaire was provided to the panel members along with the previous comments and the average of the second and third Delphi rounds comments. The mean and standard deviation of the total components in the third round were 3.65 and

0.45, respectively. By comparing the mean and standard deviation values of this round with the second round (3.22 and 0.49) It can be seen that these values have decreased, but there must be a significant difference between them. Therefore, the panelists have not reached a complete consensus.

In the fourth round, which is often the last round, the list of remaining items, ratings, minority opinions, and consensus items are distributed among the panelists, providing a final opportunity for participants to revise their opinions and reach an overall consensus. The results of the analysis and statistical summary of the fourth round are presented in Table (2).

Table 2: Results of the analysis and statistical summary of the second, third, and fourth rounds of the Delphi process

No.	Dimension	No.	Components	Second round		Third round		Forth round	
				Mean	SD	Mean	SD	Mean	SD
1	Work process	1	Drafting laws and regulations regarding issues related to IPTV	3.27	0.77	3.53	0.73	3.63	0.63
		2	Preservation of intellectual property rights related to IPTV	2.83	0.27	3.46	0.26	3.46	0.26
		3	Using Filmnet as an IPTV	2.80	0.35	3.41	0.34	3.41	0.34
		4	Using Filmnet as an IPTV system in the country's media structure	3.64	0.24	3.91	0.22	4.01	0.22
2	Technology	1	Basic facilities for IPTV systems	3.21	0.61	3.82	0.61	3.92	0.51
		2	IPTV system maintenance facilities	3.65	0.89	4.22	0.86	4.22	0.86
		3	IPTV system support facilities	3.44	0.31	3.92	0.31	3.92	0.31
3	Participants	1	Specialized worker to install and launch	3.50	0.28	3.57	0.19	3.57	0.09
		2	Specialized worker to maintain and maintain	2.87	0.72	3.26	0.70	3.26	0.70
		3	Specialized worker to content and program product	3.12	0.93	3.64	0.87	3.74	0.87
		4	Specialized worker to software support and programm	3.29	0.51	4.02	0.49	4.02	0.39
		5	The capabilities of institutions and schools for teaching IPTV	2.84	0.75	3.09	0.75	3.19	0.65
4	Customers	1	Cultural assimilation of users	3.45	0.09	3.55	0.04	3.65	0.06
		2	Acceptance of families	2.89	0.22	3.85	0.13	3.95	0.03
		3	Expanding and accepting users' religious and Islamic beliefs	3.51	0.45	4.08	0.36	4.18	0.36
		4	The right to choose the type of program	3.42	0.10	3.98	0.05	4.08	0.05
		5	Users can choose when to watch the program	3.39	0.74	3.40	0.73	3.50	0.63
5	Products and services	1	Possibility of using links to make programs more attractive	3.59	0.66	3.62	0.61	3.62	0.61
		2	Using hypertext to create artistic appeal	2.90	0.38	3.83	0.34	3.93	0.34
		3	Diversification	3.15	0.44	3.59	0.40	3.69	0.40
		4	Image quality	3.13	0.40	3.53	0.36	3.53	0.36
6	Information	1	Information storage capacity	3.60	0.47	3.69	0.41	3.69	0.41
		2	Information security	2.75	0.79	3.05	0.75	3.05	0.65

In the analysis of the questionnaires of the fourth round, the average response of all components of all six dimensions of work processes was in the range of agreement (more than 3). On the other hand, all components in the fourth round had a higher average and lower standard deviation compared to the second round, but there was no significant change compared to the third round. The average and standard deviation of all components in the fourth round were 3.70 and 0.42, respectively. Comparing the average and standard deviation values of this round with the third round (3.65 and 0.44), shows that these values have decreased, but without significant difference. This proved that the panelists have a consensus with the selected components with no significant difference. Interpretation of the value of the Kendall's coefficient of concordance are shown in Table (3). It is worth noting that for panels with more than 10 members, even very small values of the Kendall's coefficient of concordance are considered significant.

Table 3: Interpretation of the value of the Kendall's coefficient of concordance

Kendall's coefficient of concordance	Interpretation	Confidence in the order of factors
0.1	very weak consensus	Does not exist
0.3	weak consensus	Low
0.5	moderate consensus	Medium
0.7	strong consensus	High
0.9	very strong consensus	Very high

The Kendall's coefficient of concordance for the panel members' responses regarding the importance of the factors of work processes was 0.735 for the second round, 0.893 for the third round, and 0.903 for the fourth round. Given that the number of panel members was more than 10 (30 for the second round, 27 for the third round, and 25 for the fourth round), this level of Kendall's coefficient is considered quite significant. Since the value of the Kendall's coefficient of concordance in the fourth round increased by only 0.01 compared to the third round, and considering that the level of consensus and agreement of the members in two consecutive rounds did not show significant growth, we could end the repetition of the Delphi rounds. On the other hand, the values of the Kendall's coefficient of concordance demonstrated strong consensus in the second round, but very strong consensus among the panelists in the third and fourth rounds.

CONCLUSION:

IPTV is a service enables audiences to access services such as access to movie and series archives, music, live broadcasts, online shopping, online gaming,

online banking, etc. by purchasing and connecting a set-top box to their television, without paying for internet traffic and without reducing the volume of internet traffic. Telecom operators are entering the digital television market, but it is not yet clear whether the new IPTV business models will survive in the market.

In the Delphi process, the first questionnaire was sent in an unstructured or open-ended form, which served as an idea generation strategy and aimed to uncover all issues related to the topic under study. Each expert was asked to personally brainstorm, freely express any ideas and opinions regarding the use of IPTV in e-business (case study: Filmnet), and to send a brief and anonymous list of topics. At this stage, there was no need to fully develop the ideas and opinions were not evaluated or judged. All relevant responses were collected as much as possible, because the rest of the steps are based on the first step. At this stage, first, the issue of the use of IPTV in e-business (case study: Filmnet), its dimensions and aspects were studied, and various questions were asked to the Delphi panel in this regard.

The responses were organized, similar opinions were combined and grouped, and repetitive and marginal topics were removed after collecting the received questionnaires,. Considering experts opinions, a list of IPTV applications in e-business (case study: Filmnet) was compiled and analyzed included six general dimensions: business processes, technology, participants, customers, products and services, and information.

In the analysis of the questionnaires of the fourth round, the average response of all components in all six dimensions was in the range of agreement (more than 3). On the other hand, all components in the fourth round had a higher average and lower standard deviation compared to the second round, but there was no significant change compared to the third round. The average and standard deviation of all components in the fourth round were 3.70 and 0.42, respectively. Comparing the average and standard deviation values of this round with the third round (3.65 and 0.44), showed that these values have decreased, but without significant difference. This proved that the panelists have a consensus with the selected components and there is no significant difference.

In order to maintain the validity and reliability of the study, the response rate of experts in each Delphi round should not be less than 70 percent, and if the rate of change in the scores given by experts during two consecutive rounds is less than 15 percent, consensus on the issue under study is accepted. In the fourth round, the opinions of each member in the previous round were available to the others and they were asked again to evaluate each of the elements. After the end of this round and reaching consensus, the Delphi method was finished by completing and finalizing the steps

and producing educational content remotely using social networking platforms.

The Kendall's coefficient of concordance was also used to determine the level of consensus among the panel members. The Kendall's coefficient of concordance for the panel members' responses about the importance of the factors of work processes was 0.735 for the second round, 0.893 for the third round, and 0.903 for the fourth round. Given that the number of panel members was more than 10 (30 for the second round, 27 for the third round, and 25 for the fourth round), this level of Kendall's coefficient is considered quite significant. Since the value of the Kendall's coefficient of concordance in the fourth round increased by only 0.01 compared to the third round, and considering that the level of consensus and agreement of the members in two consecutive rounds did not show significant growth, we could end the repetition of the Delphi rounds. On the other hand, the values of the Kendall's coefficient of concordance demonstrated a strong consensus in the second round, but very strong consensus among the panelists in the third and fourth rounds.

E-business can be promoted in various dimensions through the use of IPTV. For example, in the business process dimension, by drafting laws and regulations related to issues related to IPTV, protecting intellectual property related to IPTV, using Filmnet as an IPTV and an IPTV system in the country's media structure; in the technology dimension, by providing basic facilities for IPTV systems, providing facilities for maintaining the IPTV system, and also providing support facilities for the IPTV system; in the participant dimension, by training specialized human resources to install and launch the IPTV system, training specialized human resources to maintain the IPTV system, training specialized human resources to produce content and programs for IPTV systems, and also, training specialized human resources for software support and programming of IPTV systems; in the customer dimension, by culturally assimilating users, families accepting, expanding and accepting users' religious and Islamic beliefs, creating the right to choose the type of program and also the time to watch the program by users; in the product and service dimension, by creating the possibility of using links for attractiveness in presenting programs, using hypertext to create artistic attractiveness, diversifying and also improving the quality of images; in the information dimension by creating information storage capacity and also providing information security facilities.

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