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THE USE OF WEB 2.0 TOOLS IN LOCAL GOVERNMENT: AN EMPIRICAL STUDY IN TURKISH MUNICIPALITIES

*YEREL YÖNETİMLERDE WEB 2.0 KULLANIMI:
TÜRKİYE'DEKİ BELEDİYELERDE DENEYSSEL BİR ÇALIŞMA*

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Abstract

The increasing popularity of personal computers and internet use by the citizens made it necessary for the governments to use the same platforms. The objective of the study is to determine the usage of web 2.0 tools in local governments. The study presented the Web 2.0 tools in general and after, the explanation for the use of the administrative sense is done. Later on, the findings of web 2.0 tools for the information, interaction and transaction based usage of the municipalities of 81 provinces in Turkey were obtained. The results demonstrated that the usage of web 2.0 technologies by the municipalities in Turkey was at a very low level and concentrated on a few web 2.0 technologies. Municipal governments focus on providing information while using web 2.0 tools and the use of web 2.0 technologies to interaction and transaction remain in the background.

Keywords: e-Government, Municipality, Web 2.0, Information, Interaction, Transaction

Öz

Kişisel bilgisayar ve internet kullanımının vatandaş nezdinde yayılması yönetimlerin de bu platformları kullanmasını zorunlu kılmaya başlamıştır. Bu çalışmanın amacı da Türkiye'deki yerel yönetimlerin web 2.0 ve sosyal ağları kullanma durumlarını ortaya koymaktır. Çalışmada web 2.0 araçları genel olarak tanıtılmış, sonrasında da yönetsel anlamda kullanımına yönelik açıklamalar yapılmıştır. Daha sonra, Türkiye'deki 81 ilin belediyelerinin web 2.0 araçlarını bilgilendirme, etkileşim ve işlem temelli kullanım durumlarına yönelik bulgular elde edilmiştir. Sonuçlar göstermiştir ki, Türkiye'de belediyelerin web 2.0 araçları kullanımı çok düşük düzeydedir ve belli başlı web 2.0 teknolojilerine yoğunlaşmış durumdadır. Belediyeler daha ziyade bilgi verme hizmetlerine yoğunlaşmakta, web 2.0 araçlarının etkileşim ve işlem gibi amaçlarla kullanımının ikinci planda kaldığı görülmüştür.

Anahtar Kelimeler: e-Devlet, Belediye, Web 2.0, Bilgilendirme, Etkileşim, İşlem

1. Introduction

Values such as transparency, accountability and participation occupy a significant place in today's understanding of public administration. Both central and local governments feel the need to refer to these values increasingly. The factors affecting this situation vary considerably. However, this study, instead of researching the reasons for this situation, is more interested in the consequences driven by it. It could be possible to accomplish these values in the governments by utilizing the benefits of information and communication technologies, especially the web 2.0 tools.

Widespread Internet use brought with it a new citizen profile. This new citizen is no longer passive against the government, but rather questions the administration, demands to participate in the processes of the determination of public policies, and expects quality services. Information and communications technologies are a factor in the creation of this new citizen, but they are also a tool in providing for the needs and expectations of this new citizen type. This citizen type is a member of a society that could utilize information and communications technologies efficiently and communicate their expectations to the government using these channels.

First the increasing popularity of personal computers and Internet use, and then the increasing knowledge and use of various social networks and web 2.0 tools by the people made it necessary for the governments to use the same platforms. Thus, the objective of the study is to evaluate the readiness of the public administration and especially the local governments in the face of these developments based on the web 2.0 tools.

In the first section of the study, the concept of web 2.0 would be explained within the framework of the existing literature and in the same section, web 2.0 tools would be introduced / explained including their technical and social aspects. The second section is related to the administrative use of the web 2.0 tools. In this

section, information, interaction and transaction based web 2.0 utilization would be discussed. In the third section, the empirical study conducted to determine the usage of web 2.0 tools in local governments in Turkey would be scrutinized.

2. Research Objectives and Research Questions

The objective of the study is to provide answers to the following questions:

Q1. What is the general profile of the municipal governments that are the subjects of the study based on status, population and whether they had an information-processing center?

Q2. What is the level of use of web 2.0 technologies in municipal governments within the context of information, interaction and transaction?

Q3. What are the web 2.0 success rates for the municipal governments?

Q4. Do the web 2.0 success rates of municipal governments differ based on their status?

Q5. Do the web 2.0 success rates of municipal governments differ based on population?

Q6. Do the web 2.0 success rates of municipal governments differ based on Internet penetration?

Q7. Do the web 2.0 success rates of municipal governments differ based on whether they have an information-processing center?

3. Literature Review

3.1. A Conceptual Framework

Initially Di Nucci (1999) mentioned the concept of web 2.0. However, A number of studies in the literature attribute this concept to the O'Reilly Media conference in 2004 (Graham, 2005; O'Reilly, 2007; Anderson, 2007). Web 2.0 represents user-centered, dynamic creation and development activities on the Internet, beyond the previous statically structured web sites (Cervinski and Butucea, 2010). O'Reilly (2007) demonstrated the differences between web 1.0 and web 2.0 by using the comparison displayed in Table 1.

Table 1. Web 1.0 and Web 2.0 comparison (O'Reilly, 2007)

Web 1.0		Web 2.0
DoubleClick	-->	Google AdSense
Ofoto	-->	Flickr
Akamai	-->	Bit Torrent
mp3.com	-->	Napster
Britannica Online	-->	Wikipedia
personal websites	-->	blogging
Evite	-->	upcoming.org and EVDB
domain name speculation	-->	search engine optimization
page views	-->	cost per click
screen scraping	-->	web services
Publishing	-->	participation
content management systems	-->	wikis
directories (taxonomy)	-->	tagging ("folksonomy")
Stickiness	-->	syndication

According to Tim Barners Lee, web 2.0 should be perceived not as a counterpart to web 1.0, but as more comprehensive utilization of it. Because, the skills to use this technology are based on web 1.0 standard (Anderson, 2007). Web 2.0 is not a new web, a new programming language nor new sites, since some of its most significant resources are blogs and wikis, which existed since 1990's, however certain technologies such as Ajax and Mashup had a key role in development of web 2.0. The new sites provide opportunities for participation, hosting services, web-based communities, and new design methods in stimulation of creativity and information sharing (Bartolomé, 2008). O'Reilly, who came up with the concept of web 2.0, always refrained from defining the concept rigidly (O'Reilly, 2005; O'Reilly, 2006). Similarly, Conole and Alevizou (2010) suffice it to argue that there was no single definition for the concept; however there was a consensus on that web 2.0 fulfills several functions within computer-based communications and digital media networks. According to Oberhelman (2007), web 2.0, instead of being a set of web tools that the information is passively presented by a publisher and that the users just visit to read the content, it is a collabo-

orative collection of web tools where the content is created collectively and the authority on the content creation is shared by the user and the publisher alike.

Based on a similar view, web 2.0 tools are second-generation web tools that provide interactive development, interoperability, safe information exchange and a user-centered design. According to that view, web 2.0 emerges as a concept that could be used for the development of certain applications such as web-based communities, social network and video sharing sites, wikis, blogs and social tagging (Tripathi and Kumar, 2010). There are studies in the literature, while accepting the difficulties of defining web 2.0, certain studies came up with suggestions (in a way, claims) for a definition: "Web 2.0 refers to the second generation of the Web, wherein interoperable, user-centered web applications and services promote social connectedness, media and information sharing, user-created content, and collaboration among individuals and organizations" (Wilson and Lin, 2011). In a literature review conducted by Connolly et al. (2011), 39 different definitions were indicated.

The usage of the term web 2.0 would mean a set of technologies and applications. However, the real significance of the concept of web 2.0 and the reason behind the vast number

of discussions about the concept are the values it represents. Figure 1 displays the technologies, applications and values identified with web 2.0.

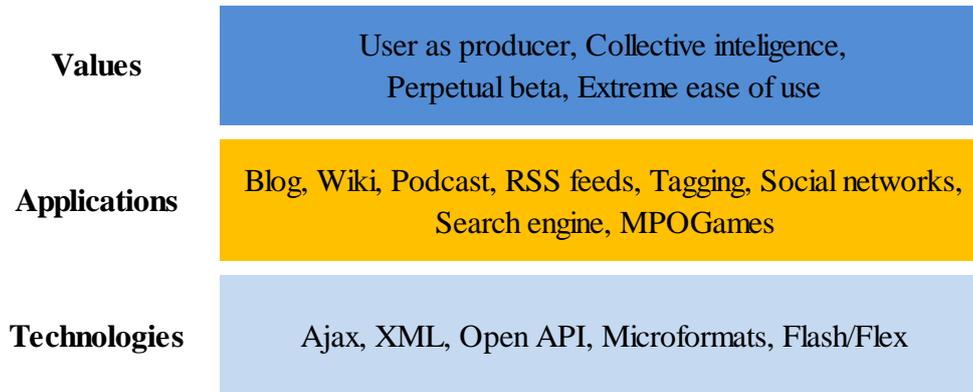


Fig.1. Operational description of web 2.0 (Osimo, 2008)

Thus, it is possible to list the main characteristics that form the infrastructure of web 2.0 technologies as follows: 1) The Web as platform, 2) Harnessing collective intelligence, 3) Data is the next Intel Inside, 4) End of the software release cycle, 5) Lightweight programming models, 6) Software above the level of a single device, and 7) Rich user experiences (O'Reilly, 2007). Below, detailed explanations are presented for each web 2.0 application:

Blog: Blogs or weblogs are dairy-like web-based publications where articles are usually published from the newest to the oldest, mostly the name of the author and the time of publication are located at the end of each article, and the readers could comment on the articles providing an interaction between the author and the readers.

Wiki: Wikis are web applications that allow the users to create new pages, edit the existing pages and connect these to each other.

Content Syndication: Content syndication tools are web site reporters that are usually used by news providers, blogs and podcasts, allowing easy follow-up the recently added content.

Instant Messaging: Instant messaging is the ability to chat real time with people that you add to your list using a computer program that you subscribed to. Based on the program used, it could provide audio or visual communications.

Media Sharing: Media sharing denotes the sharing of rich multimedia content such as pictures, video and audio using multimedia-sharing tools.

Social Networks: Social networks is a general name for networks where individuals could communicate with others using Internet communication methods, they could engage in social communications using symbolic actions representing gestures used in normal social life and thus could define themselves in community life.

Virtual World: Virtual worlds are spaces that are generally created for gaming purposes but also enable the users to walk around in a 3-D modeled world represented by the characters they defined, to engage in real shopping activities, to join classes and receive tutoring in the virtual space.

Mobile Applications: The term mobile applications is used to denote applications developed solely for mobile devices and called as mobile 2.0 as a dimension of web 2.0 tools.

Widget: The word widget was derived from the words "Windows" and "gadget." Widgets are practical applications that could be found both on desktops and on the web displaying information about the weather, stock prices or providing utilities such as notepad.

Mashup: Mashups are methods used to present objects derived from different sources after combination, restructuring, specializing, in

a desired format and if necessary using different tools. It is possible to create unlimited number of mashups since it is possible to create the data derived from different resources in different combinations.

Social Bookmarking: These are applications that make it possible for Internet users to arrange, save and search for bookmarks for Internet resources, to share the content in quality social networks providing more visibility.

3.2. E-Government, Government 2.0, and Local Governments

Technology use in management is not a novelty. Public authorities with functions such as securing citizen rights, guiding the social life and providing services to citizens in the public domain, attempt to fulfill these responsibilities as best as they could by mobilizing appropriate tools in every époque (Engin and Gürses, 2014). The concept of e-government popularized as a result of increasing computer use both by the governments and the society, became a prevalent and significant platform for the interactions between public institutions (G2G), between the public institution and citizens (G2C) and businesses (G2B).

The rhetoric used by the President of the United States Obama during the 2008 elections campaign that he conducted with the motto "transparency and open government;" "the administration should be transparent, participatory and collaborative," was cited in many studies on the use of web 2.0 technologies in the political arena as a successful implementation of the concept (O'Reilly and Battele, 2009; Magro, 2012; Mergel, 2010; Hilgers and Piller, 2011; Citron, 2010; Wilshusen, 2010; Sandoval-Almazan, 2011; Kes-Erkul and Erkul, 2009; Mergel et al., 2011; Carpenter, 2010). Later on, the number of studies show casing the reflections of web 2.0 on the election process and the relationships between the administration and citizens in post-election stage increased. In information systems (IS) literature, the concepts of "E-Government 2.0," "Government 2.0," and "eGov 2.0" are used to express the changes in the traditional mode of administration that occurred due to the adaptation of web 2.0 tools in the administration (Sivarajah and Irani, 2013). Although government 2.0 does not have a universally

accepted definition, it reflects open, transparent and consultative form of technology use by the administration (AGIMO, 2012). Thus, the concept of government 2.0 does not merely relate to increased technology use in administration (AGIMO, 2012), but it should be understood as an attempt to realize transparency, openness, accountability, participation, deliberative democracy, effectiveness, efficiency, and productivity through the technologies utilized in administration.

Although these values mentioned above are significant for the central governments, they are extremely important for local administrations as well. Hence, it is an accepted fact worldwide that local governments are the most appropriate units to provide services for citizens. Similarly, there is another consensus on the importance of local governments in deploying the democracy to the masses. Efficient use of information and communication technologies in local governments would help provide efficient services for the people and establish democratic administration in localities. Thus, local governments that initiate the adventure of technology with the use of web sites (e-information), should extend with stages such as e-services, e-participation and e-voting. At that point in time, active use of the second-generation web technologies in local governments would contribute to the realization of the values mentioned above.

This study scrutinized web 2.0 use in the government, or in other words government 2.0 was scrutinized based on the government and citizen relationship (G2C). The relationship between the government and citizens could be examined based on services and democracy, basically under two different topics. The studies that describe the achievements of public administrations in information and communication technologies use are known as e-government and e-democracy progress/maturity models in the literature. In our opinion, web 2.0 applications could be subjected to the same reasoning and could be differentiated based on the purposed of their use by the administration. In fact, there are studies in the literature, which could provide examples for this categorization (Chang and Kannan, 2008; Schellong and Girrger, 2010).

Although there are various e-

government and e-democracy maturity models, the models are generally classified in the “first phase” of one-way information transfer from the administration to the citizens as catalogue (Layne and Lee, 2001), information (Hiller and Belanger, 2001; OECD, 2001), simple information dissemination (one-way communications) (Moon, 2002), emerging information services (United Nations, 2012), presence on the web or online presence (Almazan and Gil-Garcia, 2006; Baum and Di Maio, 2000), simple Web site (Windley, 2002), billboard (West, 2004), publishing (Howard, 2001), information publishing (Deloitte and Touche, 2000), initial conditions (Lee and Kwak, 2012), information disclosure (Nair, 2007). E-government activities with this content would be considered under the title of “information” in the study. Further on, the models are focused on phases such as the access of the citizens to the administration, communicating their ideas to the government, interacting with the administration in the policy-making process, and even actively contributing to politics: Listening/consultation, online deliberation and online decision-making (Nair, 2007); Quadrant Two, Three and Four (Caldow, 2004); Consultation and Public Participation (OECD, 2001); enhanced information services (two way communication) (United Nations, 2012); interaction between the citizen and the government (Alhomod et al., 2012); two way communications and political participation (Hiller and Belanger, 2001; Moon, 2002); interaction and political participation (Almazan and Gil-Garcia, 2006); interaction (Baum and Di Maio, 2000). All activities that correspond to one or more than one phases in various models, but do not correspond one-way information sharing of the administration and government’s providing public services using various tools online for the citizens and focused on interaction and deliberation would be included under the title of “interaction” in the study. The final phase is where the public institutions provide the services online for the citizens and these activities would be considered under the heading of “transaction” in this study. It was observed that the phases in this category related to the properties of the public services that the government provides for the citizens were considered as “transaction” in various models (Layne and Lee, 2001; Alhomod et al., 2012; Hiller

and Belanger, 2001; Almazan and Gil-Garcia, 2006; Baum and Di Maio, 2000; Moon, 2002; Reddick, 2004), and a further phase corresponding to providing the services using an integrated portal side as “integration” (Alhomod et al., 2012; Hiller and Belanger, 2001; Almazan and Gil-Garcia, 2006). In this study, these two phases are combined under the title of transaction. In brief, web 2.0 applications generally could be divided as information, interaction and transaction on services and democracy focus, based on the intended use by the governments. Figure 2 below demonstrates the evaluation of each web 2.0 applications based on the dimensions that they help to be realized.

Each web 2.0 application by definition could be used to serve certain functions. Figure 2 demonstrates that, while information focused use is a common activity that could be fulfilled using all web 2.0 tools, certain tools could serve interaction focused use in addition to information, and some others could serve transaction focused uses in addition to these two. This study would analyze each web 2.0 application based on the distinction determined above and the values it helps to realize.

3.2.1. Information Focused Uses

As expressed above, the first step of the relationship between the government and the citizen is one-way sharing of the public information by the government with the citizens. The information that the government provides could even be named as a standout service called “the information services.” However, the first phase of democracy is realized via information sharing. Because regular information sharing activities by the public would be beneficial for the awareness of the citizens which have the tendency for political participation, on political issues. Although it could be perceived as occupying a weak place among the activities that could be realized via web 2.0 applications, a healthy information sharing activity that is conducted by the public authority for the citizens would provide the basis for the next phases. All web 2.0 applications are capable of providing information. This form of information that the government provides would form the infrastructure for the values of transparency, accountability and participation.

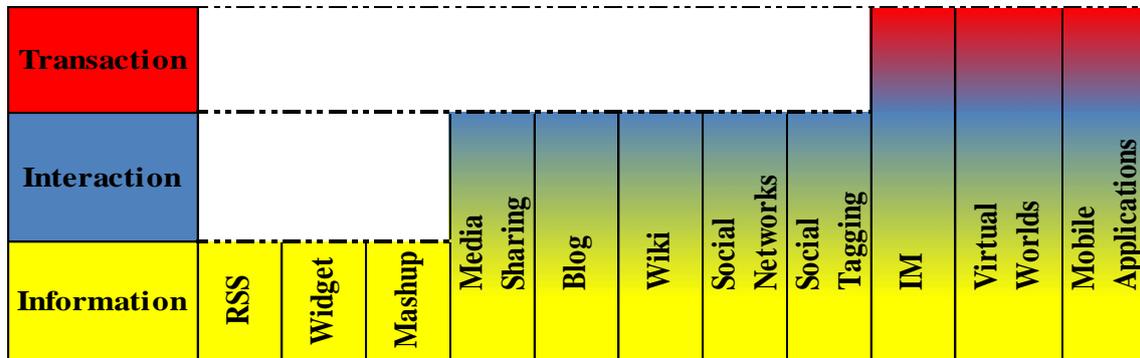


Fig. 2. Web 2.0 technologies based on Information, Interaction and Transaction

3.2.2. Interaction Focused Uses

Interaction focused use of web 2.0 technologies includes all kinds of political interaction such as the accessibility of the citizens to the government, communication of their ideas to the government, interacting with the administration in the policy-making process, and even actively contributing to this process. Web 2.0 technologies scrutinized in the study such as blogs, wikis, media sharing, instant messaging, social networks, virtual worlds, mobile applications and social bookmarking are the kind of activities that provide interaction between the government and citizens. As a result of the use of these web 2.0 tools by the government, values such as accountability, efficiency, effectiveness, productivity, political participation and deliberative democracy could be realized.

3.2.3. Transaction Focused Uses

As a result of the developments in information and communication technologies, changes in the methods that the government uses to provide services to the citizens change as well. Thus, a dimension of the concept of e-government means that the government provides the services using information and communication technologies to the citizens. As mentioned above, certain web 2.0 technologies have the qualifications to be used in a transaction-focused manner while providing services to the citizens. Applications such as instant messaging, virtual worlds and mobile applications that were scrutinized in the study, are web 2.0 tools that could be used to provide easy, practical, functional, efficient and accessible services to citizens. The table below demonstrates the detailed view on the use of web 2.0 technology within the

context of government 2.0.

3.3. Government 2.0 Applications: Potentials for Government

3.3.1. Blog: Blogs could generally be used to transfer one-way information from the government to the citizen and to provide interaction capabilities between the government and the citizen. In the initial sense, blogs are a new information-sharing source for the administrations, a new platform where they could inform the public. Blogs make it possible for the governments to provide information to the citizens based on their areas of interest. Thanks to the subject fields in blog entries, citizens could easily reach the public information on the area of their interests. Thus, blogs could become a good tool for the governments to provide transparency. The second benefit of the blogs is that they provide a space where the government and citizens could interact. Governments have the ability to feel the pulse of the citizens by analyzing the citizen views posted in the blogs on subjects that they have opened for discussion. In addition, blogs could be a good platform to learn the demands and preferences of the citizens. It is possible to determine the content and quality of a planned service by the government based on stakeholder preferences. Blogs are web 2.0 tools that could especially provide great advantages for local governments. Thanks to the blogs, local governments, whose basic reason of existence is to provide efficient services and to extend the democracy to the masses, could move a step closer to actualize these values.

3.3.2. Wiki: Wikis are web 2.0 platforms that make it possible both to inform the citizens and to learn about their ideas, similar to blogs.

Wikis are in the form of an interactive web encyclopedia, different from the classical encyclopedias and the governments could reach certain targets by their utilization. Primarily, the governments could offer wiki items on subjects that they need to define, frame or share. These items could contain information on the institution; they could also contain information on the activities and areas of responsibility of the institution. Despite the details of the content, it could be considered as an acceptable action for transparency in administration for the government to enter information using official accounts to the wikis. In another sense, wikis are also a platform where the citizens could participate in creating content. For instance, wikis could be a good platform for the government to provide information on the public values pertaining the city and the administration, so that the citizens could help determine and define these factors. Citizens could define all types of values on the city via a participating perspective using wikis. Thus, the government would be able to observe directly the form that the citizens would like to see in the city and to design their services according to these demands within the context of citizen satisfaction.

3.3.3. Content Syndication: Content feeding technologies such as RSS and ATOM are web 2.0 tools that provide easy follow up of the content that governments publish on their web sites by the citizens. Those who would like to follow up the government agenda could subscribe to the public institution sites that provide regular information and hence could obtain information on the administration effectively. Content feeding technologies could thus be used to provide a new and functional transparency by the government.

3.3.4. IM: Web 2.0 tools that are called instant messaging could be used in many different forms to serve in government 2.0 context. Instant messaging applications could be text, audio and video-based. Since instant messaging applications require a live correspondent on the side of the government all the time, they could result in direct government-citizen interaction. Instant messaging applications make it possible for the citizens to reach public servants or their representatives in person. Thus, they could communicate their ideas or demands to the administration directly. On the other hand,

instant-messaging applications could be used by the government to provide online face-to-face services to the citizens on a transactional basis. Thus, the citizens who could not travel to a public institution could fulfill their transactions swiftly online with the direct help of the public servant.

3.3.5. Media Sharing: Web 2.0 tools known as media sharing platforms (YouTube, Flickr, etc.) enable the governments to effectively distribute pictures, audio recordings and video documents. Transparent, accountable and participating form of government made it necessary for the government to share the information it owns in many environments possible and in maximum amount possible. Thus, the governments would feel the need to share all their decisions, projects, and all regulations that are legally binding, in short, all their actions with the citizens. Media sharing platforms provide the opportunity to channel the information flow to the citizens using different materials (photographs, audio, video etc.). In addition, the government could also conduct various training activities and could provide systematic information for the citizens and its personnel with the help of media sharing platforms. Media sharing platforms also enable the users to comment on items. With this feature, media sharing platforms could turn into a media where the views and suggestions of the citizens could be consulted as well.

3.3.6. Social Networks: Social networks are sharing platforms such as Facebook, Twitter and LinkedIn, which are widely used around the world. Since numerous users follow these platforms extensively on a daily basis, when used efficiently, could provide several benefits for the governments. Social networks are new and functional channels, which the governments could use to reach citizens. The feature of followers makes it possible for the administration to address a populace that is interested in the information it could provide directly. Governments could open institutional accounts on social networks to disperse information. These institutional could be general accounts, or they could be accounts that are focused on particular subjects. Social network accounts that are focused on certain subjects enable the governments to categorize the citizens based on the subjects that they were interested in and could

reach their target audience on the spot. Thus, the accounts that the government uses could be related to a certain public policy, project or about a campaign that the government had just started. Hence, the governments would have the opportunity to have a stakeholder audience, which is sensitive to public policies and to bring together this audience to attain a public goal. Briefly, social networks are part of the media where several administrative values, especially political participation could be realized today.

3.3.7. Virtual World: A virtual world application is a medium that could be used in the realm of administration as well as gaming, learning, etc. Using virtual world applications governments could simply provide a possibility for the citizens to visit public institutions, various public buildings (museums, art pieces, etc.) virtually and introduce them to the public. Virtual worlds could also be used as discussion media where citizens could ask questions to a real public servant, could ask for counseling, or could organize virtual meetings on various subjects. At the same time, citizens could receive public services using the virtual media using virtual world applications.

3.3.8. Mobile Applications: Mobile applications could be defined as software specifically designed for certain technological devices such as cellular phones, tablet computers, etc. Thanks to these devices that are used in every aspect of the lives of the citizens and that always accompany them in daily life, government and citizen interaction gained a continuous character. Today, almost every web site has a mobile interface. These interfaces developed for mobile devices provide easy and practical web browsing for the users. Governments could also develop mobile applications with different features to share routine information or information that citizens need on-demand, could interact with citizens using special discussion platforms that could be connected by mobile applications, and even could provide transaction based services to citizens. For instance, a local government could send information on the social and cultural activities in the city, new regulations, which directly affect the citizens, legislated recently by the government, traffic and road conditions (blocked and free highways, roads and routes

that are blocked by construction work, etc.), pharmacies on duty and directions to these, the bottlenecks in public institution processing times using the mobile applications to the subscribers. Furthermore, local governments could make it possible to pay dues such as license fees, various fees, taxes, etc. using mobile applications.

3.3.9. Widget: Widgets are small windows on users' desktops that are fed with continuous information from a web source. It is obvious that such a web 2.0 source would serve as an excellent informative platform for governments. By installing the widget extensions provided on government web sites on their own computers, the users, instead of visiting the institution's web site each time they require information, would be presented with this information provided by the government on their desktops each time they turn their computers on. Thus, using widgets, administrations, especially the local governments could provide practical and useful information easily to citizens. For instance, through a widget, which users could download to their mobile phones or computers, they could get information on traffic, on cultural and social activities in the city, or on personalized deadlines for tax, fee or invoice payments.

3.3.10. Mashup: As a result of wide-spread use of information and communication technologies, public administrations create, modify, store and operate all their data on electronic media. Hence, an immense data source was accumulated in electronic media. On the other hand, openness, transparency and accountability are among the indispensable values for the administration mentality of our times. In this context, mashups are used to open the access of public data for all stakeholders. Stakeholders that access public databases could use and transfer this information into all kinds of statistical activities, research, or practical applications, etc.

3.3.11. Social Bookmarking: Social bookmarking is a general name for applications that are used to bookmark content such as pictures, text, videos provided by the government and make these available for sharing among users. Many people could see the shared bookmarks. Bookmarking enables the spreading of

the information shared by the government and facilitates the access to this information by more people.

4. Methodology and the Dataset

There are 81 provinces in Turkey based on the civilian administration division. There are local governments, which are called metropolitan municipalities, in provinces with a population of over 750,000 and provincial municipalities serve towns with a population of 750,000 or lower. Thus, the study group of this study includes metropolitan and provincial municipalities serving each of the 81 provinces in Turkey.

The study initially scrutinized the use of web 2.0 technologies in local governments with respect to the information, interaction and transaction division. In addition, a list of criteria was formed on the use of web 2.0 technologies by the municipal governments. In this criteria list each criterion was coded using the values of "1" and "0" meaning "exists" and "does not exist" respectively. This criteria list was presented to 7 expert academicians in the fields of public administration and IS departments from several universities in Turkey, and the list was edited based on the feedback from these experts and it was finalized (see Appendix A). To test the validity of the criteria list, it was initially applied to 214 municipalities in Turkey. The Cronbach alpha test conducted on these results reflected an internal consistency coefficient of 0.716, demonstrating that the criteria list was reliable for social sciences. The final form of the criteria list was applied to metropolitan and provincial municipal governments in 81 prov-

inces in Turkey. Web 2.0 applications criteria list was filled based on the web 2.0 tools the municipal governments use on web sites and different platforms (i.e. social networks, blogs, etc.). The criteria list was applied to the municipalities between July 5, 2014 and September 15, 2014.

Data obtained to determine the general profile of the municipalities were analyzed using descriptive statistics (percentages and frequencies). To calculate the success rates of municipalities on the web 2.0 applications criteria list, total item points obtained from web 2.0 criteria list were calculated and success rates were obtained by comparing the total item points with the maximum total points available on the criteria list; 30. Furthermore t-test was conducted to see whether the success rates differed based on the status of municipalities (metropolitan/provincial) and whether they had an IT Department or not; and ANOVA test was conducted to observe whether the success rates differed based on the population served within the municipality borders (size of municipality) and the Internet penetration. To determine the source of the difference among groups, Tamhane test for post-hoc analyses within the ANOVA test was utilized. All data in this stage were tested and interpreted at the significance level of 0.05.

5. Findings

5.1. General Profiles of Municipalities: Table 2 displays the frequencies and percentages for the statutes, populations, and Internet penetrations of the municipalities and whether they have an IT Department.

Table 2. Descriptive statistics for the municipalities' demographic characteristics

		Frequency	Percent
Status	Provincial Municipality	51	63,0
	Metropolitan Municipality	30	37,0
Size	100000 or lower	22	27,2
	100001-750000	29	35,8
	750.001-5.000.000	28	34,6
	5.000.001 or higher	2	2,5
Internet Penetration	0-20	9	11,1
	21-30	38	46,9
	31-50	31	38,3
	51 or higher	3	3,7
IT Department	No	25	30,9
	Yes	56	69,1

Findings demonstrated that 37% (n = 30) were metropolitan and 63% (n = 51) were provincial municipalities. 2.5% (n = 2) of the municipalities had a population of over 5 million; 34.6% (n = 28) had a population of between 750,001 and 5 million; 35.8% had a population of between 100,001 and 750,000; and 27.2% had a population of below 100,000. Only 3.7% of the municipalities had an Internet penetration of 51 and over; 38.3% had a penetration of between 31 and 50; 46.9% had between 21 and 30; and 11.1% had a penetration of 20 and lower. 69.1% of the municipalities had an IT Department.

Web 2.0 tools such as social networks, mobile applications, media sharing applications, content syndication, social bookmarking, widg-

ets, blogs, wikis, IM, virtual world and mashup are used for providing information by the local governments. Figure 3 demonstrates that the most frequently used web 2.0 tool for providing information by the municipal governments was social networks (85.19%; n = 69). Social networks were followed by mobile applications with 41.98% (n = 34), media sharing with 39.51% (n = 32), content syndication with 33.33% (n = 27), social bookmarks with 32.10% (n = 26), and widget technology with 1.23% (n = 1). However, it was observed that none of the municipalities used blog, wiki, instant messaging, virtual world and mashup web 2.0 technology applications for informative purposes (n = 0).

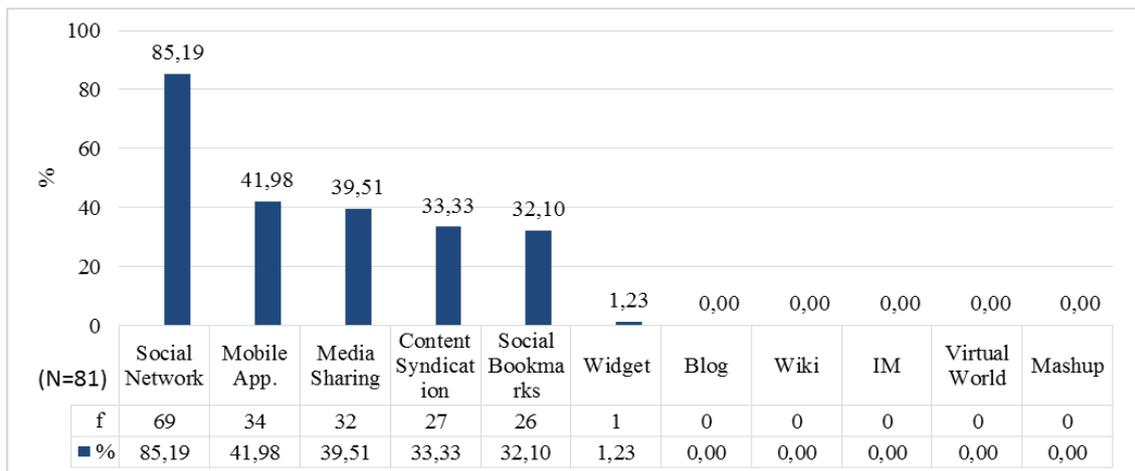


Fig. 3. Turkish municipalities' use of web 2.0 tools based on information

5.2. Web 2.0 usage of the municipalities based on information, interaction and transaction statuses: This section scrutinizes municipalities' use of web 2.0 tools based on information, interaction and transaction aspects. Web 2.0 tools such as media sharing applications, social bookmarking, social networks, mobile applications, blogs, wikis, IM, and virtual world are used by the local governments to interact with the citizens. According to Figure 4, An analysis of the use of web 2.0 tools for interaction by the local governments would demonstrate that media sharing applications were used the most by the local governments with a rate of 34.57% (n = 28) for interactive purposes. It was

followed by social bookmarking (32.10%; n = 26), mobile applications (27.16%; n = 22), and social networks (20.99%; n = 17). Local governments in Turkey did not make use of web 2.0 technologies such as blogs, wikis, IM and virtual world tools for interactive purposes. Web 2.0 tools such as IM, virtual world and mobile applications suitable for use for transactions by the local governments are scrutinized and it was determined that only mobile applications were used by only 7.41% of the local governments (n = 6) as observed in Figure 5. The tools available for transactions such as virtual world and IM were not used by local governments for this purpose.

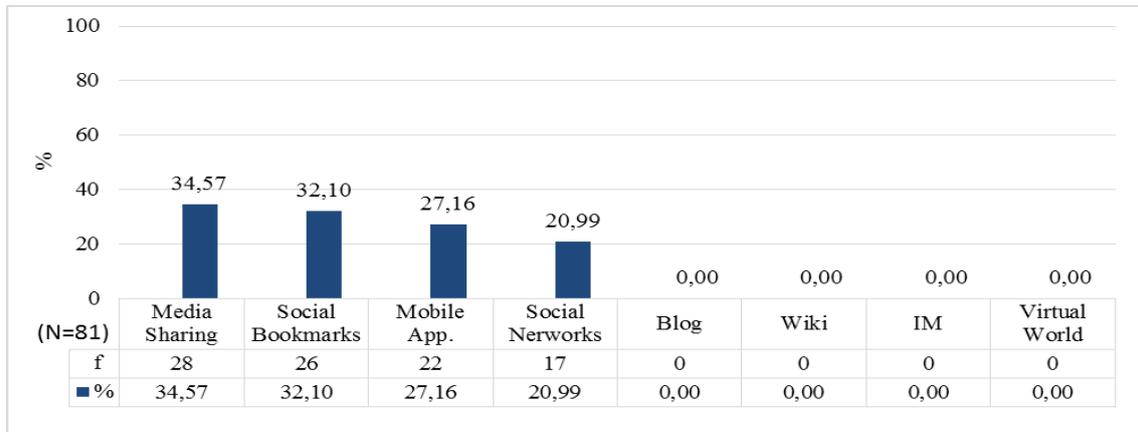


Fig. 4. Turkish municipalities' use of web 2.0 tools based on interaction

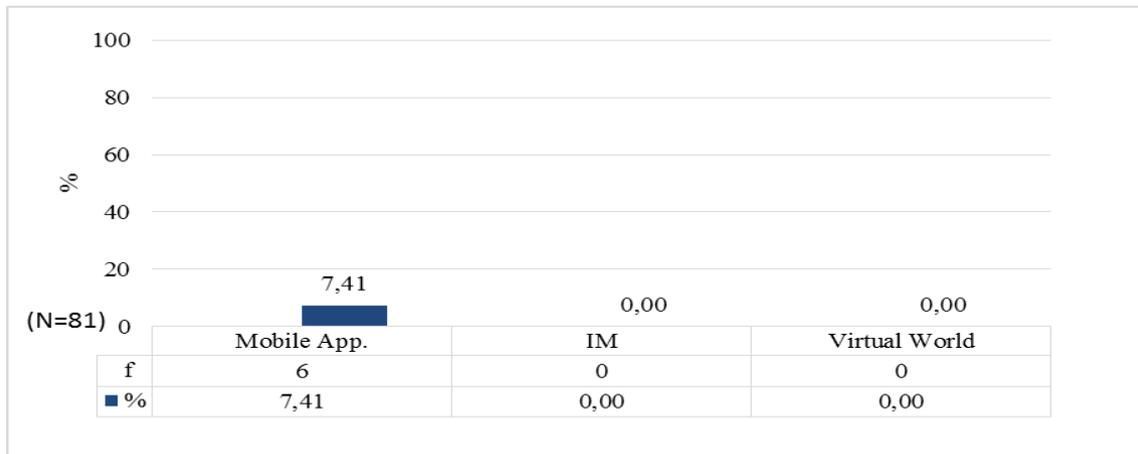


Fig. 5. Turkish municipalities' use of web 2.0 tools based on transaction

5.3. Web 2.0 scores of municipalities:

In calculation of the web 2.0 scores for the municipalities in Turkey, total points scored on the 30 items in the criteria list were considered. Success rates were obtained by expressing the total scores as percentages. Web 2.0 success rates displayed in Table 3 demonstrate that the most successful municipality was Eskişehir Metropolitan Municipality with a success rate of 30%. It was followed by Bolu Municipality (26.67%), Bursa Metropolitan Municipality, Edirne Munic-

ipality, İstanbul Metropolitan Municipality, İzmir Metropolitan Municipality, Kocaeli Metropolitan Municipality and Manisa Metropolitan Municipality. It was observed that Eskişehir was the most successful metropolitan municipality while Bolu and Edirne were the most successful provincial municipalities. A significant finding was the fact that only 2 provincial municipalities and only metropolitan municipalities, a total of only 8 municipalities scored a success rate of over 25%.

Table 3. Web 2.0 scores of municipalities and success rates

Provincial municipality	Web 2.0 scores	Success rates (%)	Provincial municipality	Web 2.0 scores	Success rates (%)
Adana*	6	20,00	Konya*	4	13,33
Adiyaman	1	3,33	Kütahya	3	10,00
Afyon	5	16,67	Malatya*	3	10,00
Ağrı	1	3,33	Manisa*	8	26,67
Amasya	2	6,67	Kahramanmaraş*	4	13,33
Ankara*	7	23,33	Mardin*	0	0,00
Antalya*	6	20,00	Muğla*	2	6,67
Artvin	1	3,33	Muş	1	3,33
Aydın*	2	6,67	Nevşehir	1	3,33
Balıkesir*	4	13,33	Niğde	3	10,00
Bilecik	2	6,67	Ordu*	2	6,67
Bingöl	0	0,00	Rize	1	3,33
Bitlis	4	13,33	Sakarya*	1	3,33
Bolu	8	26,67	Samsun*	5	16,67
Burdur	5	16,67	Siirt	3	10,00
Bursa*	8	26,67	Sinop	5	16,67
Çanakkale	5	16,67	Sivas	5	16,67
Çankırı	4	13,33	Tekirdağ*	7	23,33
Çorum	5	16,67	Tokat	2	6,67
Denizli*	7	23,33	Trabzon*	3	10,00
Diyarbakır*	4	13,33	Tunceli	4	13,33
Edirne	8	26,67	Şanlıurfa*	5	16,67
Elazığ	6	20,00	Uşak	5	16,67
Erzincan	1	3,33	Van*	6	20,00
Erzurum*	4	13,33	Yozgat	2	6,67
Eskişehir*	9	30,00	Zonguldak	2	6,67
Gaziantep*	2	6,67	Aksaray	3	10,00
Giresun	7	23,33	Bayburt	0	0,00
Gümüşhane	1	3,33	Karaman	1	3,33
Hakkari	3	10,00	Kırıkkale	0	0,00
Hatay*	7	23,33	Batman	2	6,67
Isparta	2	6,67	Şırnak	4	13,33
Mersin*	2	6,67	Bartın	2	6,67
İstanbul*	8	26,67	Ardahan	5	16,67
İzmir*	8	26,67	Iğdır	3	10,00
Kars	5	16,67	Yalova	5	16,67
Kastamonu	1	3,33	Karabük	7	23,33
Kayseri*	6	20,00	Kilis	2	6,67
Kırklareli	0	0,00	Osmaniye	7	23,33
Kırşehir	5	16,67	Düzce	2	6,67
Kocaeli*	8	26,67	TURKEY (Mean)	3,83	12,76

Note: '*' denotes the municipality has a metropolitan status.

5.4. Factors affecting the municipalities' web 2.0 usage statuses: In this section,

initially the normality distributions of web 2.0 score, status, size, Internet penetration and IT

Department variables for local governments are examined. Based on the results of Kolmogorov-Smirnov test, it was observed that the data was distributed normally for all groups with 95% confidence ($p > .05$). In addition, a positive correlation was observed between the values based

on the correlation matrix results displayed in Table 4. The findings on the effects of status, size, Internet penetration and IT department variables on web 2.0 success rates are displayed below:

Table 4. Pearson correlations among the continuous independent variables

	1	2	3	4	5
1-Web 2.0 Score	1,000				
2-Status	0,349**	1,000			
3-Size	0,411**	0,864**	1,000		
4-Internet Penetration	0,322**	0,341**	0,358**	1,000	
5-IT Department	0,217	0,346**	0,418**	0,172	1,000

** Correlation is significant at 0.01 level (2-tailed).

5.4.1. Findings on the effects of status:

Results of the Levene test conducted with respect to the statuses of the municipalities demonstrated that the distribution variances were homogenous ($F = 1.12$; $p = 0.29$). Table 5 displays the t-test results for web 2.0 scores based on the statuses of local governments. As per these results, success rates for web 2.0 use of local governments demonstrated a significant

difference based on the status of local governments ($t_{(79)} = 3.314$, $p = 0.001$). Web 2.0 success rates for metropolitan municipalities ($X = 16.44$) were more positive when compared to provincial municipalities ($X = 10.59$). This finding could be interpreted as there was a significant relationship between the web 2.0 success rates and the status of municipal governments.

Table 5. T-test results for web 2.0 scores based on the statuses of local governments

Status	N	X	S	sd	t	P
Provincial Municipality	51	10,59	7,29	79,00	3,314	0,001
Metropolitan Municipality	30	16,44	8,30			

5.4.2. Findings on the effects of size:

To determine whether the population of the municipalities affected the web 2.0 success rates, the municipalities were initially categorized based on their population sizes. Thus, municipalities with a population less than 100,000 were considered as group A, municipalities with a population between 100,000 and 750,000 were considered as group B, municipalities with a

population between 750,000 and 5 million were considered as group C, and municipalities with a population more than 5 millions were considered as group D. Levene test was conducted to determine whether the variances were equal between these groups, and the results are given in Table 6. These findings demonstrated that the variances were not homogenous ($F = 3.179$; $p < .05$).

Table 6. Web 2.0 score Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
3,179	3	77	,029

Analysis results displayed in Table 7 demonstrate that there was a significant difference between web 2.0 scores for the municipali-

ties based on population size ($F_{(3-77)} = 5.612$, $p = .002$). In other words, web 2.0 success rates of the municipalities differ based on the level of popu-

lation (size). Since the variances were not equal among groups, Tamhane test, one of the post-hoc tests conducted to determine the existence of variance between particular groups, was conducted and the results are displayed in Table 8.

Tamhane test results showed that municipalities with a population size of 750,000 – 5M (X = 15.93) and more than 5M (X = 25.00) had better scores than the municipalities with a population size of less than 100,000 (X = 8.64).

Table 7. Web 2.0 score ANOVA results based on Population

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.	Significant Difference
Inter-group	952,050	3	317,350	5,612	0,002	C-A,D-A
Intra-group	4354,397	77	56,551			
Total	5306,447	80				

Table 8. Multiple Comparisons on the Dependent Variable: Score Tamhane

(I) population	(J) population	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
<100K	100K-750K	-3,43260	1,92598	,397	-8,7145	1,8493
	750K-5M	-7,19697*	1,96350	,004	-12,5889	-1,8050
	>5M	-16,36364	2,05046	,062	-34,4323	1,7050
100K-750K	<100K	3,43260	1,92598	,397	-1,8493	8,7145
	750K-5M	-3,76437	2,17061	,426	-9,6886	2,1599
	>5M	-12,93103*	2,24957	,050	-25,8233	-,0387
750K-5M	<100K	7,19697*	1,96350	,004	1,8050	12,5889
	100K-750K	3,76437	2,17061	,426	-2,1599	9,6886
	>5M	-9,16667	2,28177	,123	-21,6327	3,2994
>5M	<100K	16,36364	2,05046	,062	-1,7050	34,4323
	100K-750K	12,93103*	2,24957	,050	,0387	25,8233
	750K-5M	9,16667	2,28177	,123	-3,2994	21,6327

*. The mean difference is significant at 0.05 level.

5.4.3. Findings on the effects of Internet penetration: To determine whether Internet penetration affected web 2.0 success rates of the municipalities, initially the municipalities were grouped based on their Internet penetration values. Municipalities with an Internet penetration of 0-20 were included in group A, municipalities with an Internet penetration of 20-30 were included in group B, municipalities with

an Internet penetration of 30-50 were included in group C, and municipalities with an Internet penetration of over 50 were included in group D. Levene test was conducted to determine whether the variances were equal between these groups, and the results are given in Table 9. These findings demonstrated that the variances were not homogenous (F = 4.532; p < .05).

Table 9. Web 2.0 score Test of Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
4,532	3	77	,006

Analysis results displayed in Table 10 demonstrate that the web 2.0 scores for the municipali-

ties differed based on Internet penetration (F(3-77) = 4.304, p = 0.007).

Table 10. ANOVA results based on number of households using web 2.0 Internet

Source of Variance	Sum of Squares	sd	Mean of Squares	F	p	Significant Difference
Inter-group	762,084	3	254,028	4,304	0,007	D-A,D-B
Intra-group	4544,363	77	59,018			
Total	5306,447	80				

Since the variances were not equal among groups, Tamhane test, one of the post-hoc tests conducted to determine the existence of variance between particular groups, was conducted and the results are displayed in Table 11.

Tamhane test results showed that municipalities with Internet penetration of 50 and more ($X = 25.56$) had better scores than the municipalities with an Internet penetration of 0-20 ($X = 7.78$) and 20-30 ($X = 12.11$).

Table 11. Multiple Comparisons on Dependent Variable: web 2.0 score Tamhane

(I) Internet Household	(J) Internet Household	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
0-20	20-30	-4,32749	2,71092	,590	-12,9518	4,2968
	30-50	-5,98566	2,96565	,315	-14,9171	2,9458
	>50	-17,77778*	2,72166	,000	-26,6764	-8,8791
20-30	0-20	4,32749	2,71092	,590	-4,2968	12,9518
	30-50	-1,65818	1,94898	,953	-6,9803	3,6639
	>50	-13,45029*	1,55268	,000	-18,9973	-7,9033
30-50	0-20	5,98566	2,96565	,315	-2,9458	14,9171
	20-30	1,65818	1,94898	,953	-3,6639	6,9803
	>50	-11,79211*	1,96388	,000	-17,7342	-5,8500
>50	0-20	17,77778*	2,72166	,000	8,8791	26,6764
	20-30	13,45029*	1,55268	,000	7,9033	18,9973
	30-50	11,79211*	1,96388	,000	5,8500	17,7342

*. The mean difference is significant at 0.05 level.

5.4.4. Findings on the effects of whether the municipalities had an IT Department: Levene test results on whether the municipalities had IT Departments showed that the distribution variances were homogenous ($F = 0.658$; $p = 0.420$). Table 12 displays t-test results based on whether the existence of an IT department affected the municipalities' web 2.0 scores. Web 2.0 usage success rates for the municipalities did not demonstrate a significant difference

based on the existence of an IT Department in the municipality ($t_{(79)} = .972$; $p = 0.052$). Web 2.0 success rates for the local governments with IT departments were $X = 13.93$, while web 2.0 success rates for the local governments without IT departments were $X = 10.13$. This finding could be interpreted as there was no significant relationship between web 2.0 usage and whether the municipalities had an IT Department.

Table 12. T-test results based on whether the existence of an IT department affected the municipalities' web 2.0 scores

IT Department	N	X	S	sd	t	P
No IT Department	25	10,13	7,54	79,00	1,972	0,052
IT Department	56	13,93	8,19			

Web 2.0 usage success rates for the municipalities did not demonstrate a significant difference based on the existence of an IT Department in the municipality ($t_{(79)} = .972$; $p = 0.052$). Web 2.0 success rates for the local governments with IT departments were $X = 13.93$, while web 2.0 success rates for the local governments without IT departments were $X = 10.13$. This finding could be interpreted as there was no significant relationship between web 2.0 usage and whether the municipalities had an IT Department.

6. Discussion and Conclusions

This study, focused on web 2.0 based activities of municipal governments in Turkey, generally concentrated on the success rates of municipalities specific to the web 2.0 technologies, the evaluation of the activities that municipalities realized utilizing web 2.0 activities based on providing information, interaction and transactions, and finally on the determination of the factors affecting web 2.0 technology usage of the municipalities.

Web 2.0 success rates of 81 municipal governments in Turkey demonstrated that, principally the municipalities were very inadequate overall in web 2.0 activities with a success rate of 12.76%. The municipalities that utilized web 2.0 technologies the most only appeared in the 25-30% interval. These scores were originated from mainly web 2.0 technologies such as the social networks and mobile applications, media sharing, content syndication and social bookmarking, and other web 2.0 applications were not utilized. On the other hand, an interpretation of the results on the purpose of the use of web 2.0 technologies (i.e. focused on information, interaction or transaction) showed that the municipal governments in Turkey primarily use to provide information for the public. It could be stated the use of web 2.0 technologies focused on interaction and transaction by the municipalities were very low when compared to information-based utilization.

As a result of the analysis of the factors affecting web 2.0 applications success rates, it could be stated that status as an independent variable affected the success rates positively. Thus, it was demonstrated that metropolitan municipalities had higher web 2.0 success rates when compared to provincial municipalities.

Interpretation of the results on the effects of the other independent variable of population size on web 2.0 success rates showed that municipalities with a population higher than 750,000 had higher success rates than the municipalities with a population of lower than 100,000. Internet penetration rate also affected web 2.0 success rate positively. Thus, it was deduced that municipalities with a penetration rate of over 50 were more successful in web 2.0 applications than municipalities with a penetration rate of below 30. It was observed that the final independent variable of having an IT Department within the municipality had no significant effects on the web 2.0 success rates of municipalities.

The findings of this study conducted to analyze the 81 municipal governments in Turkey based on their web 2.0 technology utilization demonstrated that the usage of web 2.0 technologies by the municipalities in Turkey was at a very low level and concentrated on a few web 2.0 technologies. Furthermore, as could be observed in web site ownership, municipal governments focus on providing information (Sobacı & Altınok, 2010; Sobacı & Eryiğit, 2015; Engin & Gürses, 2014) while using web 2.0 tools and the use of web 2.0 technologies to provide efficient services and participation remain in the background. In the light of the increasing tendencies of indigenization in Turkey and around the world, if municipal governments in Turkey would aim to be administrative units that provide effective services and significant democratic institutions, they should invest more in information and communications technologies based on web 2.0 technologies.

Appendix A. Criteria list on web 2.0 tools utilization in municipal governments

- Is there a content syndication application?
- Is there a blog application?
- Is user participation allowed?
- Is there a wiki application?
- Are users allowed to edit wiki content?
- Are users allowed to upload files?
- Is there a text-based instant messaging capability?
- Are there audio-based communication capabilities?
- Are there video-based communication capabilities?

Do any services provided by the local government to the citizens using instant messaging?
 Is a member of any media-sharing network?
 Are any podcast sharing applications used?
 Are any vodcast sharing applications used?
 Does it allow comments by citizens?
 Is a member of any social network?
 Does it allow posts by users?
 Does it allow users to add pictures?
 Does it allow tagging?
 Is virtual world applications used?
 Are mobile applications used?
 Could citizens reach the administration using mobile applications?
 Do mobile applications allow citizens to receive any services from/perform transactions with local government?
 Does it allow social bookmarking?
 Could social bookmarking be used for pictures?
 Could social bookmarking be used for the blog?
 Could social bookmarking be used for the web site?
 Could social bookmarking be used for wiki applications?
 Could social bookmarking be used for podcast and/or vodcast applications?
 Is data sharing available for mashup applications?
 Are there any widget applications

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