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Determining the Factors Affecting the Intention of Using (GNIS) among the Libyan Government Officers

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Abstract

Developments in technology and communication offer new options to realize fast and cost effective field data management. Technology has also recognized to be a decisive tool for advancing the effectiveness and efficiency of government performance. The Geographic Information Systems (GIS) and Geographic Name Information System (GNIS) have been recognized as effective tools to solve the challenges that faced by the government. This study was designed to investigate the factors affecting the intention of using (GNIS) among the Libyan government officers. Emphasis was put on trying to investigate the intention towards the use of the (GNIS) by the Libyan government officers and determining the factors that affect such use of technology. The study employed the use of correlation and descriptive design to establish the nature of such relationship. The validity and reliability of research instruments was established and data was collected from 215 respondents. The findings revealed that (GNIS) trainings, education and perceived ease of use are negatively correlated with the intention of using (GNIS) among the government officers in Libya followed by attitude towards (GNIS). On the basis of the conclusions made, the study has confirmed that (GNIS) is an important tool in upgrading the working prestige among government officers within the country of Libya.

Keywords: *Geographic Name Information System, Intention, Organizational Factors, Technological Factors, Individual Factors, Users' Trust, Users' Beliefs*

1. Introduction

The phenomenon of geographic names' features has received attention among behavioral researchers over the years. Generally, names are important sophisticated labels given to signify a place as unique and distinct from other places (Muehrecke, 1992). Thus, names given to places indicate the essence and existence of a place, as well as the people living there. Similarly, names usually have very strong historical ties to an area, and it is self-inclusive in

terms of the history of place. In other words, a name is itself a form of living history carrying with it a multitude of facts and emotions. Whether places are urban or rural, the unique features of these places can distinguish from neighboring places. It is largely for this reason, that it is difficult to change an already existing name for a place.

Names of many places have experienced various controversies such as authenticity of the name and changing of the name for political reasons. Consequently, people who are more attached to the names of the place religiously or politically have more reasons to the situation which may be termed usurpation. Thus when local people's spatial definition of a place differs from administrative definitions of the area with the same name, the researcher would have to take this into account when researching the locale, be it a district, domain locality, patch, point, region, neighborhood, sector, site, territory tract, or zone among others (Feld et al., 1996; Hirsch, 1995). However, (GNIS) has been defined by Boba (2009) as a "set of computer-based tools that allows the user to modify, visualize, query, and analyze geographic and tabular data" (p. 7). Another definition by Cross-land, Wynne, and Perkins (1995) is that (GIS) is not simply another alternative data display tool. It is a comprehensive set of tools for collecting, storing, retrieving, analyzing and displaying spatially referenced information" (p. 221),

1.1 Geographic Names in the Libyan Context

Generally, Geographic names are an essential element of human relationship with its physical and cultural environments, because naming of places represents both the geographical and cultural use of a space (Al Zoqurti, 1997). However many controversies have trailed this phenomenon universally, and such cases have been reported in Libya as a result of inaccurate information gathering done by the United States Army in 1962. In addition, an attempt to convert a place's information such as the maps into digital forms became noticeable that different scales were used for different areas of the country (National Survey Authority, 1975). For example, 1:25,000 was used for some coastal areas, instead of the general 1:50,000. Such attempts particularly by the Unites States Army are few of the cultural insensitivity and imposition of their sentiment to the geographical and cultural sensitivities of Libya and its peoples. As a result of such imposition and inconsistencies, there is a demand for accurate and uniform geographic data both in their digital and non-digital forms that preserves the cultural history and diversity of Libya.

Traditionally, names of places are approved and transmitted orally from one generation to another, however, in recent times the trend has not only involved the oral route and writing, but this has been extended to cartographic, audio and information technology routes (Hamilton, 1978). The native communities and non-native bodies are now taking steps to ensure that geographical names are collected as a part of locking native languages and cultural traditions (Kraft et al., 1997). Names of places in terms of its spatial dimension is a result of considerations about the area, district, domain locality, patch, point, region, neighborhood, sector, site, spot, territory, tract and zone. A spectrum of considerations regarded valuable by both geography as a science and the culture of the Libyan people are necessary in order to establish accurate representation of the geographical and social landscape of Libya (Dalton, 1978). However, the majorities of geographic place names are presented from local settlement patterns and reflects their needs, patterns of society, and events, in the local community life which is inclusive in their norms and culture (National Survey Authority, NSA, 1975). In view of this, present processes for naming places and features, in most instances, make local communities the decisive factor for the determination of new names or alterations to place names. For this reason the determination of place names has mostly, but not exclusively, been devolved to the NSA in Libya.

The improvement of geographical place names in Libya is ongoing and it plays a key role in the nation's governance ranging from elections, to basic public services, statistical data compilation, economic aid, security, defence and public safety, as well as others responsibilities of the government (National Survey Authority, 2007). Although the populace often forgets these invisible functions until they need it. Standardizing the written form of geographical names and their application is becoming increasingly necessary in order to develop highly accurate maps and charts of large-scale advanced transportation, communications, emergency services and dispatch based on date and geographic mapping data names (Helen, 2003). On the other hand, The United Nation, (2002) has identified geographical names in both written and spoken forms as important rudiments of culture due the fact that they are formidable part of the cultural heritage of countries and are part of the verbal and written communication in daily activities of the people (Eyüce, 2007). It is observed that place names are perhaps the most commonly and broadly used form of geographical information. Clear, definite, unambiguous designations for inhabited places and physical features are important for supply of goods, growth and planning in every country. They provide an important reference system for communication and transportation. Every name appears easy, but with rising demands and improvement in technology, the accuracy of information regarding place names is important and sometimes serious (Helleland, 2002).

2. Problem of the statement

Global competition requires expansion of their borders like never before, which requires efficiency and innovation in all aspects of their business if they want to survive. These challenges have driven the organizations, worldwide, to turn to Geographic Names information Systems (GNIS). This is in accordance to the fact that the significance and importance of geographical names in human lives cannot be disregarded any longer (Rodgers, 1959). Not only are such names significant in Geography to recognize places but are also significant in many other fields of sciences such as history, social sciences and politics among others. Moreover, there remains, to date, limited studies which have adequately analyzed and justified importance of names, its collection, documentation and standardization in Libya. Actually, there exist no complete database of geographical names and no standardized frameworks for the collection, arrangement, change and documentation of geographical names in Libya. No proper technology is being used in Libya to identify and differentiate the geographical names in Libya.

One of the fundamental challenges related to the use and management of geographical names in Libya is the lack of databases. In some cases there are contradictions of place names due many establishments that were set up to deal with these names (NSA, 1973). Therefore, this challenge serves as motivation for this research which primarily focuses on Libya. Other challenges such as lack of application of new technology, such as the (GIS) and the (GNIS), in managing geographical names as well as shortage of studies and frameworks that investigate the intention to use these technologies, are core concern for this study. An initial screening was done by the present researcher to identify the classification of the geographical names in Libya. Data has been collected from the maps and interview with the local people who are familiar about their towns and history. Those people were from old generation who has deep understanding about the history names of the target places whether a nature places or manmade places.

A number of studies have been carried out to identify and analyze the numerous factors that affect the intention to use the (GNIS). In some cases, some employees do have different

orientation about geographic name features and this may be absolutely different from the intention at a specific workplace. Their attitudes and behaviors' play vital roles in their performances, thus, intention to use does not exist in isolation. Identifying these variables will improve the management of geographic name features within the public sector context in most developing countries where there is significant gap in the studies on information systems, particularly the (GNIS). Hence, this research initiated to identify the factors affecting the intention of using the (GNIS) among government officers in Tripoli city, as an attempt to fill such research gap.

3. Empirical studies

3.1 Development of (GIS) as an application

The early development of (GIS) began in the mid-20th century (Foresman, 1998). (GIS) growth at the government level started in Canada, which pioneered (GIS) by developing the Canada Geographic Information Systems (CGIS). This system was used by the Canadian government to perform intensive mapping of Canadian natural resources and land inventory. Using (GIS) at the government level justified its usefulness by presenting more accurate and cheaper results than human work (Goodchild, 2000). Initially, (GIS) applications were designed for mainframe computers, which were very slow and expensive. However, by the late 1970s, rapid developments in computer performance, such as increasing storage capacities and processing speeds, made it possible to transfer (GIS) applications (software) to standard personal computers (affordability). Hence, a number of computer users and companies sought to take advantage of much more refined spatial databases and different types of analysis in their respective fields (Foresman, 1998; Goodchild, 2000).

In the following years, with the expanding number of computers and appearance of global systems like the internet, (GIS) applications grew very rapidly. This rapid improvement trend has helped (GIS) become a worldwide enterprise by branching into different fields across many countries. Another important factor in the expansion of (GIS) is the development of easier software interfaces for users. In contrast to earlier versions of (GIS) applications, the current versions are presented with an intuitive interface for users. The early versions of (GIS), with their overly complex interfaces, were very difficult and presented a significant challenge for the users (Goodchild, 2000).

Furthermore, Murphy (1995) defines (GIS) as special information systems that integrate spatially referenced and descriptive data into the problem-solving process. Hence, (GIS), with its ability to perform spatial analysis, allows the decision maker to make accurate and effective decisions for solving a problem. Smelcer and Carmel (1997) made an effort to illustrate the importance of (GIS). They found that as a technological tool, (GIS) is faster and more effective in solving problems in difficult tasks, thus keeping the problem-solving time from increasing significantly. Moreover, a number of studies focusing on the impact of (GIS) on increasing job performance drew attention to the importance of map visualization for presenting complex and multi-dimensional information to decision makers (Dransch, 2000; Denis & Carte, 1998; J).

Table **(1)**

The Current Applications of Geographical Information Systems (GIS)

-Sector-	-Purpose-
1. Agriculture	To monitoring and management farm activities and networking
2. Archaeology	To description site and evaluate scenario
3. Emergency services	• To optimising the course of fire, police and ambulance Within the metro. • To improve the understanding of crime and its location
4. Environment	• To monitoring, modelling and management land degradation • To evaluate land and rural planning; • To evaluate environmental disaster such as landslides, and desertification. • To monitor water quality and quantity; as well as air quality • To monitor weather and climate modelling and prediction
5.Epidemiology & Health	• To locate disease in relation to environmental factors
6. Forestry	• To manage, plan and optimise the extraction and replanting of forest trees and product
7. Marketing	• To locate site and target groups as well as optimise goods delivery
8. Navigation	• To facilitate navigation of air, sea and land
9. Road and rail	• To plan and manage route and transport
10. Site evaluation & costing	• To compute volumes of materials needed
11. Social studies	• To analysis of demographic movements and developments
12. Tourism	• To locate and manage of facilities and attractions
13. Utilities	• To locate, manage and plan water, drains, gas, electricity, telephone, cable services
14. (GNIS)	• To create the name of the feature layer and used to any place names

3.2 The major factors that affecting the intention of using (GNIS)

Due to the complexity of the geographical locations and the multiple names of the districts and areas which make unaccountable challenges to the decision makers in any corporation, the technology of geographical names information system is imperative need to facilitate the organizations missions and mitigate the geographical challenges. Ironically however, the technology of (GNIS) is not a magic bullet that will change the organizations and achieve their mission successfully. The success of technology information system such as shopping online, (GNIS) and others are dependent on a several factors such as perceived usefulness, perceived enjoyment, infrastructure, capacity and others (Breetzke, 2007; Ramayah & Ignatius, 2005), perceived ease to use (Venkatesh, 2000). Moreover, social pressure or social norms and Technology awareness and acceptance have a positive influence on the system usage (Davis, 1989; Selamat, 2011).

3.2.1 Perceived usefulness

The concept of perceived usefulness refers to the positive belief and perception about the use of the application to increase the performance (Davis, 1989). It is therefore, Perceived usefulness is considered as a strong motivation that has a positive influence on intention in internet media (Horton, Buck, Waterson, & Clegg, 2001). Somehow, many studies from a various disciplines asserted to the positive impact of Perceived usefulness on behavioral intent and among those studies are (Igbaria, 1993; Igbaria, Gumaraes, & Gordon, 1995). In a similar vein, this research aims to evaluate the impact of perceived usefulness of (GNIS) on the intention of using the (GNIS) in the Libyan government system.

3.2.2 Perceived Ease of Use

The characteristics of any information technology system have strong influence on the performance of the technology users (Venkatesh, 2000). For example, ease use of the technology services has strong positive influence of the performance of the company or government that uses this type of technology (Ramayah & Ignatius, 2005). In addition, the convenience is a critical factor that has direct positive impact on the users of technology. For instance, the convenience of technology that has positive impact on the customers' satisfaction when online purchasing (Burke, 1998; Jarvenpaa & Todd, 1997). Similarly, the geographical names information system as a technological tool that facilitate the coding and identifying and search the districts and locations need to be flexible and ease to use. Therefore, this study intends to examine the role of (GNIS) on the Libyan government system with taking in consideration the ease use of (GNIS) technology.

3.2.3 Social Influence

Social influence and norms is an individual and group understanding about the importance of using such system, technology or other that have the capability to gain high level of social statue in the organization (Selamat, 2011). Social norms have been shown its ability to influence the usage of system significantly (Igbaria, 1993). It also perceived as an effective tool for enhancing the diffusion of the innovations (Rogers & Shoemaker, 1997). In line with the importance of social influence in technology promotion, innovation diffusion, this study addresses used to examine the impact of social influence on the Intention to use the (GNIS) among government officers in Libya.

3.2.4 Technology awareness and acceptance

The information technology is not immune from some challenges such as risk of failure, cost and others. Those challenges make barriers in the implementation of information technology in any organization (Venkatesh, 2000). Therefore, technology awareness about the advantages of information technology and acceptance it by the services' users such managers, employers are important factors for adopting a successful information technology system (Venkatesh, 2000; Selamat, 2011). In this research, the researcher believes that the awareness and acceptance the technology of (GNIS) and recognize its advantages in the Libyan government sector is imperative factor towards the Intention to use the (GNIS) among government officers in Libya.

3.2.5 Organizational Factors

In both government and business areas of research, managers play a central role in driving the achievement of (GIS) development. The importance of managers in developing and achieving (GIS) goes back to their characteristics and their management activities which are important determinants in the success of (GIS) implementation in an organization (Croswell, 1989; Koller, 1993; Engelken, 1994 as cited in Ferrari and Onsrud, 1995). However, in order to success the used of (GIS), understanding and sharing vision of how the (GIS) will be used is

imperative (Huxhold and Levinsohn 1995). In addition to the effort of managers, support from government officers, senior management and staff are also considered important in the process (Ferrari and Onsrud 1995). Campbell and Masser (1992) refer to this concerted support from managers, government officers and other members of an organization as the organizational commitment.

3.2.6 Technological context

Individual attitude has been evidenced by the environmental psychology and landscape research as an influential factor in shaping land use transformation (Erickson et al., 2002; Luzar and Diagne, 1999). Attitude is conceptualized in many ways from it being a state of readiness for mental and physical activity, to the feeling for an individual to evaluate objects or aspects in a favorable or unfavorable manner (Dawes, 1972). Moreover, attitude involves affective (feelings), cognitive (behavioral) components and cognitive (knowledge) (Walmsley and Lewis, 1984). Attitude can be affected by others forms of cultural, biophysical and socio-economic interactions. Attitude is an important tool and a powerful predictor of behavior in determining human response to policies and planning decisions (Kaiser et al., 1999; Tuan, 1990). This reseach considers attitude as a perceived ease of use of the (GNIS) as indicated by Gerd and Wänke (2002) that, attitude is learned and summary evaluation that influences thoughts and actions of individual. Therefore, the researcher will look at the influence of the technological context in relation to perceived ease in use of the (GNIS) on the intention to the use of (GNIS) among government officers in Libya.

4. Methodology and Instrument

The study adopts the quantitative approach with survey as the research method. The choice is informed by the fact that quantitative approach provides the researcher the opportunity to measure such phenomenon, from a detached position and with minimal bias. Generalization of the outcome is also possible through careful and systematic selection of a representative sample through sampling procedure. Sampling is considered absolutely central to ensuring that the research project has external validity. By this, the findings of the study can be applied more widely beyond the particular project. This is possible because you have taken every precaution to make sure that the people you have surveyed, or the material you have selected to analyses, are representative of the group of people or the material you are primarily interested in. Given the objective of this study which is to determine the factors affecting the intention of using (GNIS) among the Libyan government officers, the quantitative approach is considered the best approach.

4.1 Statistical Technique

Table **(2)** Profiles of Respondents

Gender	
category	Percent
Male	**64.2 %**
Female	**35.8%**
Age	
category	Percent
18 Yrs-30 Yrs	**26.5%**
31 Yrs-45 Yrs	**54.4%**
>= 45 Yrs	**19.1%**
Education	
category	Percent
Higher School	**17.25**
Diploma	**30.2%**
Bachelor Degree	**47.4%**
Master Degree	**3.7%**
PhD	**1.5%**
Level Management	
category	Percent
Senior Manager	**3.7%**
Engineer	**28.8%**
Supervisor	**35.8%**
Technician	**23.3%**
Others	**8.6%**
Total	**100%**

The descriptive analysis of obtained data as shown in the table (2) indicates that males are the majority of the respondents. They accounted for 138 of the respondents, making 64.2% of the total sample size. Consequently, the female respondents (77) form the rest 35.8% of the sample. The age group, 31 – 45 years, of the respondents, forms about 54.4% of the total sample, while the majority, 73.5 % of the total respondents, falls within the age less than 31 years. In term of education status, about 47.4% (102) of the respondents had bachelor degree. It was found that 30.2% (65) of the respondents hold diploma while slightly less than 5% (11) of the respondents hold higher degree. As regards to the level of management, it was found that 35.8%, 28.8% and 23.3% of the respondents were supervisors, engineers, and technicians, respectively, while 7.9% were surveyors. Almost 93% (199) of the respondents had less than 10 years of experience.

Table **(3)** Reliability Measurement

Variable	Cronbach's Alpha (α)	No of items
Top management support	**0.872**	**5**
(GNIS) training and education	**0.852**	**4**
Perceived usefulness	**0.879**	**7**
Perceived ease of use	**0.909**	**6**
Social influence	**0.850**	**5**
Technology awareness and acceptance	**0.909**	**7**
User trust in the (GNIS) technology	**0.816**	**5**
Attitude towards the (GNIS)	**0.695**	**6**
Intention to use the (GNIS)	**0.737**	**4**

Reliability testing was performed to ensure that all areas of the constructs domain of interest were covered and that the items truly measured what they were supposed to measure before proceeding to undertake exploratory factor analysis (Sekaran, 2003). Therefore, it was highly pertinent to gauge the extent of reliability of the dependent variable (intention to use (GNIS) and independent variables for all of items of the questionnaire, before examining the relationship between them. The Cronbach's Alpha "α" value is greater than 0.7 for all factors except 'Attitude towards the (GNIS) which is close to 0.7, although, it is acceptable. A Cronbach's Alpha value of 0.7 or higher suggests good reliability and that the indicators of model variables validity are good (Hair et al., 2010). Two variables of the reliability measurements, which is 'Perceived ease of use 'as well as' Technology awareness and acceptance, have the highest The Cronbach's Alpha "α" value of 0.909 and this suggest that the two are highly reliable variables.

Table **(4)** Regression Model Analysis between Independent Variables and Dependent Variables

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	VIF
	B	Std. Error	Beta			
(Constant)	-.089	.232		-.384	.701	
Support	.162	.091	.143	1.789	.075	3.929
Training	-.031	.082	-.028	-.377	.706	3.522
Usefulness	.015	.087	.017	.169	.866	6.159
EOU	-.040	.075	-.051	-.537	.592	5.548
Awareness	.113	.061	.100	1.850	.066	1.788
Social	.066	.081	.061	.808	.420	3.483
Trust	.446	.070	.448	6.336	.000	3.092
Attitude	.288	.069	.236	4.153	.000	1.997

There are four principal assumptions which justify the application of regression analysis for the purpose of prediction. They are; (i) linearity of the relationship between dependent and independent variables; (ii) independence of the errors (no serial correlation); (iii) Multicollinearity; and (iv) normality of the error distribution (Field, 2005). Table (4) shows the results of multiple regression analysis between top management support, government staff training, trust, social influence, attitude, PU, POU and intention to use the (GNIS).

5. Discussion of the Findings

Attitude is an imperative instrument and a powerful interpreter of behavior in shaping human reaction to policies and planning decisions (Kaiser et al., 1999; Tuan, 1990). This study considers attitude as a perceived ease of use of the (GNIS) as indicated by Ajzen and Fishbein, (1980), Gerd and Wänke (2002) that, attitude is well-read and précis assessment that impacts thoughts and events of individual. Furthermore, the trustworthiness of the electronic vendor is a main determinant of trust assessment (Felix & Paul, 2004). Bishr and Janowicz, (2010) suggest that informational trust and reputation can be used as proxy measures for information quality. In line with the perspective of this research, trust plays a central role in supporting the intention to use the (GNIS) by Libyan government officer. It does so, through enabling the employers to share the information easily and confidently.

In some way, Technology awareness about the advantages of information technology and acceptance it by the services' users such managers, employers are important factors for adopting a successful information technology system (Venkatesh, 2000; Selamat, 2011). For example the awareness about the advantages of online shopping enhance the aggregate selling of online shopping and influence the customers to accept this technology in Malaysia (Lean, Zailani, Ramayah, and Fernando, 2009; Ramayah and Ignatius, 2005). As illustrated within the result, the finding asserts to a positive relationship between 'User awareness and acceptance 'and 'the intention to use of GNIS as a tool. Likewise, Social norms have ability to influence the usage of information system significantly (Igbaria, 1993). It also perceived as an effective tool for enhancing the diffusion of the innovations (Rogers and Shoemaker, 1997). Social influence and norms refers to an individual and group understanding about the importance of using such system, technology or other that have the capability to gain high level of social statue in the organization (Selamat, 2011). The finding of this research emphasized to the importance of social influence on the implementation of information technology based on (GNIS) in the Libyan government officer. The social network, organizational culture is related to the social influences which have significant impact on intention to use (GNIS).

Similarly, the concept of perceived ease of use refers to the characteristics of the information technology system. Those characteristics include the type of technology, convenience to use, and flexibility which account important determinants that influence the performance of the technology users (Venkatesh, 2000; Ramayah and Ignatius, 2005; Burke, 1998). According to the finding of this research the relationship between perceived ease of use and the intention to use (GNIS) in the Libyan government officer was not supportive. Additionally, the concept of perceived usefulness refers to the positive belief and perception about the use of the application to increase the performance (Davis, 1989). It has been regarded as a vital motivator that influences the intention of using the internet media positively (Horton et al., 2001). According to the result of this research which shown in the analysis, a positive correlation between perceived usefulness and the intention to use of (GNIS) in the Libyan government sector was found.

As a final point, Training gives human resource which facilitates development of their skills in the (GNIS) practices technologically, in creative thinking, problem solving and communication. The results of correlations between 'training' and 'the intention to use of (GNIS) tools show a negative relationship between 'training' and 'the intention use of (GNIS) tools' in National Survey Authority in Libya. while, Top Management Support has a statistically significant effect on the 'intention to use (GNIS) tools. In addition, the results of correlations demonstrated the strongest correlation between 'Top Management Support' and 'the intention to use of (GNIS) tools. However, these results show a positive relationship between 'Top Management Support' and 'the intention use of (GNIS) tools' in National Survey Authority in Libya.

6. Conclusion

The main purpose of the study was to determine the factors affecting the intention of using (GNIS) among the Libyan government officers. The findings revealed the key factors affecting 'the intention to use of (GNIS) in National Survey Authority and showed how the Government officers' intention will be affected by implementing (GNIS). This study creates the concepts of the GNIS in relation to the government work environment characteristics of National Survey Authority in Libya. This study appends further dimension to the literature of (GIS) field. It is hoped that the results of the research study will be able to support all managers and decision makers to facilitate their decision-making process and strategic planning in order to improve and enhance their government offices performances.

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