**Libya before & after the Arab Spring to articulate infrastructure challenges with
recommendations of enhancing the e-government project**.

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ABSTRACT

There are significant extra challenges in providing e-government activity within developing countries that the more technologically developed counties do not face (such as people's access to and awareness of technologies, limited infrastructure, technology education and skills sets, and lack of resources).

However, e-government activity offers much potential to provide much needed services to citizens.

This paper explores some of the issues of providing e-government services for developing countries. It collates together results from several surveys among stakeholders (Students, Experts and Farmers) in Libyan cities before the Arab Spring to articulate challenges and issues in e-government provision, and to identify lessons for e-government activity in developing countries. The paper also looks at e-government initiatives after the Arab Spring in Libya and uses the lessons learnt to discuss ways forward for future successful e-government activity. In addition, the paper has shown how the use of alternative channel(s), such as mobile phones, can be used to address internet infrastructure limitations as well as drawing upon the strong social communities within many developing countries.

Keywords: E-government, Libya, e-government services, e-government challenges, e-government stakeholders, e-government awareness, e-government enhancement.

1 INTRODUCTION

The objective of the study will contribute to help government officials planning to follow an e-government project and make people aware of it and its related infrastructure-details to develop a sound and reliable e-government transformation to reach the optimum adoption and participation from the public side in the developing countries. In addition, it will point out the challenges facing the government official as well as citizen; and offer recommendations for both of them to overcome these challenges. Moreover, it will offer alternative solution(s) represented in using mobile phones since a large proportion of the people in developing countries (including Libya) use these; and advice the government official to turn from e-government services project to m-government services project; when getting infrastructure-accomplishment is going to take time and effort or maybe getting impossible. That will be an interesting and an excellent recommendation and alternative solution not just for Libya as a case study here but for the other developing countries which suffer same challenges and have same opportunities to use the mobile phones to offer government services. Libya provides an interesting example since it has many attributes of a developing country, and has undergone significant upheaval with the Arab Spring. The primary research discussed in this paper was conducted just prior to the Arab Spring in Libya and so provides a snapshot of e-government activity at an interesting time in Global history. The paper also captures the current state of Libyan e-government initiatives after the Arab Spring. Some of the general insights from the study can inform Libya and other developing countries in taking forward e-government initiatives.

The paper discusses various topics. Firstly, it examines the meanings, related issues of e-government and its services. Then, it focuses on the Libyan context and examines the challenges of e-government projects in

technologically developing countries. Then, it describes the methods used to achieve the broad analysis of the extensive tests of the Spearman's Rank Correlation ,the Pearson Chi-Square and T-tests which were applied on the data collected from the three large studies (interview, paper-based survey and online survey) and other case studies such as Alharaba (a Libyan City (LC)) and the blind association. Finally, the findings, lessons learned and the conclusions have been transformed into recommendations to improve citizens' participation in developing countries as a whole and in Libya in particular with alternative solution.

1.1 The meanings and the related issues of e-Government

Two main points are emphasized in defining e-government: changing the way in which government delivers its services, and the use of information and communication technology. E-government means a new way of delivering government services to citizens, businesses and other partners anywhere, anytime utilizing the power of information and communication technology. The "world bank" defines e-government as "the use of information and communication technology to promote more efficient and effective government, facilitate more accessible government services, allow greater public access to information, and make government more accountable to citizens (Basu 2004).

Background and context for Libya:
Libya is a large country in area but has a relatively small population that is approximately 5.6 million people; the demographics is weighted towards the younger age groups, for instance, approximately 1.6 million people are in the education system. The population is dispersed over large areas-for instance 500 KM between cities with little in between (city population 2010). The e-Government projects can bring these localities so close as if they are all living in one city due to internet usage. It also makes it an ideal environment for providing electronic access to the government information and services by usage and availability of appropriate channels. Like many other technologically developing countries, resources in Libya such as skills, manpower, finances and infrastructure are very limited. The Internet cost is fairly high and there is no appropriate network infrastructure such as postal network. Although the wireless Internet is available; but it is at an extreme high cost which makes the average-income citizens unable to meet the cost of the service. The majority of the citizens have from average to low yearly Income; the citizens with high income represent a very small proportion. Moreover, majority of Libyans are not comfortable to use technology (especially Internet and computers), particularly officials and other specialists, although the higher government this year has tried to force officials to adopt the computer and the Internet technology but they are still struggling to make it work. As a final point, the distance and the cost causes the

absence of an e-government project to deliver its services to the whole population, especially to the rural community (Sweisi, Adam, and Eldresi 2007).

2 CHALLENGES OF TECHNOLOGICAL DEVELOPING COUNTRIES

The challenges for e-government projects are more pronounced in technologically developing countries (Al-Sebie and Irani 2002). At a basic level there is likely to be limited access for many citizens to technological resources such as computers and the internet. Maybe, there are limited traditional resources such as roads & transport facilities and limited postal and communication facilities. In addition, there could be lower skills in using the technology, lower literacy and education levels besides having very limited economic resources and thus be less able to develop infrastructure and skills (Drake 2003, Moen 1994).

Public participation is an important element in many stages of the e-government process, from defining a society's vision and priorities for e-Government to determining e-readiness and managing e-Government projects. When it comes to e-government and public participation, we can consider all countries as developing countries. Countries are learning how to encourage, organise and manage public participation (West 2006). Public participation may be an issue in the technologically developed countries in activities such as voting (sometimes it is less than 50% of the population). However, in developing countries, the same challenges are confounded by lack of communication infrastructure and ability to access and provide information.

3 METHODOLOGY: PRE-ARAB SPRING

A mixed method approach was used consisting of an online survey, a paper based survey, selected 'good practice' case examples and interviews.

For the paper survey, the population has been divided into three main groups (Students, Farmers and Engineers) besides other specialities. The studies through student's group (1.6 million in number) can be considered representing the opinion of the whole population. We chose the ten (10) most-populated cities to carry out our studies

Pilot study: The comprehensibility of the survey was tested on 13 students 10 farmers and 15 professionals who had not been included in the study group and their opinions were considered to prepare the final version of the survey.

Data was collected by making a presentation about the surveys to the study groups and the survey was completed after the researchers obtained institutional and Government permits and participants gave verbal consent. Questionnaire was tested for validity & reliability, factor-loadings and internal consistencies of dimension items were high, as it measures (factors that challenges e-government projects to evolve and to reach the optimum

citizens participations) concepts that we were intended to measure.

 The investigating methodology consisted of:-

3.1 The online survey responses:

An online questionnaire was hosted on the Libyan e-government website's main page. The response- rate was very positive and the number of responses reached three hundred and ninety six (396) in three weeks. The participants covered a wide range of groups (part of the survey about the participant's profession), including Students, Engineers, Teachers, Doctors, Computer Professionals, Lawyers, University-Lecturers, Labourers, Vendors/Retailers, Policemen, Farmers, Unemployed, and Others.

Participation was spread across urban and rural areas, and responses were proportional to the population density. The questionnaire contained open and closed questions covering the use and awareness of e-government services and skills related to the usage of computer and Internet.

3.2 The Paper-Based Survey:

The survey covered respondents from 10 cities across Libya, and targeted three main groups in each city with five responses in each group (total 150 responses). The paper-based survey is a complementary investigation to the online survey and covered similar questions and it captured Internet and non-Internet users.

Where usually using Internet					Period since first u		
At work	At home	At school	Coffee net	More than one choice	Non user	< 2 years	2 to 5 years

Frequency of using Internet					Period of average use of		
Once a month	Once a week	3-4 times a week	Daily	none	Less than 2 hours	2 to 5 hours	6 1 ho

Purposes of surfing the Internet			
ivity	Search for information	Education purpose	Checking e-Gov website

e necessity of e-government ces (using traditional way or e-way)			Does the advantage of government service expenses?		
ant	Not significant	Average	I do not know	Suitable advantages.	Non advantages.	Ad

Current e-government introduces full necessity serv		
No	Average of services	I do not know

glish ills	Awareness of e-government services		Visiting e-governm
No	Yes	No	Yes

Does the usage of e-government services appropriate with			
Yes	No	Advantage	I do n

Table 1: Sample from the survey's questions

3.3 Interviewing the respondents and Alharaba case study:

Interviews with focused-groups were conducted which included people from Alharaba-case-study, blind association-Benghazi (LC). We also interviewed the key stakeholders involved in the delivery of e-Government services (6 interviews) and those involved in a "vaccination case study" at the National Centre of Fighting Contagious and Threatened Diseases (NCFCTD using SMS messaging to inform families about vaccinations - 9 interviews).

4 THE ANALYSIS METHODS:

The analyses were conducted on data collected by the surveys and the investigation instruments used have been illustrated next:

4.1 The Spearman's Rank Correlation test:

4.1.1 The Online survey data Analysis of the nonparametric Spearman's correlation test: The sets of data are considered as parametric, a Pearson-correlation would be appropriate here. There may be some who argue that "education" and "computer skills" might be negatively correlated because "computer skills" need "educated" people leaving the uneducated people having less chance to gain "computer skills" and thus are not aware about "e-government services" and "e-government website", then they may select a two-tailed prediction. All these options are easily dealt with in the statistical analysis by simply applying a non-parametric correlation "two-tailed prediction test" and that is what this research paper followed in the entire correlation test's analysis.

The "Education" is not correlated (has no effect/relationship on both sides) with each of the following variables "compatibility of Internet with lifestyle", "cost as a barrier using Internet", "readiness for using e-government website if you have got fitting courses", "e-government services developed enough". However; the $r=.117*$ which denotes that there is a weak positive correlation/relationship between the "education" and the "computer skills" variables. Despite this, the effect of the relationship between the two variables is statistically significant because the Sig.(2 tailed *P-Value*=.020) and

Nonparametric Correlations for the online survey (396 participants)

		Education	Computer Skills	Compatibility of the Internet with lifestyle	Cost as a barrier using internet	Readiness for using e-Government websites if you got fitting courses	E-government services developed enough
Education	Correlation Coefficient (r)		.117*	.034	-.024	.023	-.052
	Sig. (2-tailed) (p)		.020	.498	.635	.648	.302
			(A) (r) : Weak correlation (p): Significant effect	(B) No correlation	(C) No correlation	(D) No correlation	(E) No correlation
Computer Skills	Correlation Coefficient (r)			.337**	.076	.174**	.099*
	Sig. (2-tailed) (p)			.000	.130	.001	.049
				(F) (r): moderate correlation (p): highly significant effect	(G) No correlation	(H) (r): weak correlation (p): highly significant effect	(I) (r): weak correlation (p): significant effect
Compatibility of the Internet with lifestyle	Correlation Coefficient (r)				.003	.250**	.078
	Sig. (2-tailed) (p)				.954	.000	.122
					(J) No correlation	(K) (r): weak correlation (p): highly significant effect	(L) No correlation
Cost as a barrier using internet	Correlation Coefficient (r)					.173**	.199**
	Sig. (2-tailed) (p)					.001	.000
						(M) (r): weak correlation (p): highly significant effect	(N) (r): weak correlation (p): highly significant effect
Readiness for using e-Government websites if you got fitting courses	Correlation Coefficient (r)						.253**
	Sig. (2-tailed) (p)						.000
							(O) (r): weak correlation (p): highly significant effect

Table 2: the non-parametric corr test of the online survey

since our significance level of *r* was set at .05. I.e. the increase in the level of "education" increases the "computer skills". In contrast, the lesser "computer skills" they have the lesser "educated" they are likely to be. The

correlation/relation is weak as the r and *P-Value* are close to zero, which means significant effect in this relationship. Each variable affects the other one highly in a positive direction as predicted (Increase/decrease together which is called a two-tailed prediction)) The "Computer skills" and the "compatibility of the Internet with lifestyle" are positively and moderately correlated. The r=.337** and, the sig.(2 tailed *P-Value*=.000) which means the relationship between the two variables has a highly statistical significant effect proving that as the "computer skills" increase so does the "compatibility of the Internet with lifestyle" and vice versa.

However, the "computer skills" of the participants have no correlation with the "cost as a barrier using the Internet" in cell (G), as r=.076 ≈ zero which means no correlation (*P-Value*=.130 being >0.05 and <0.01 indicates no effect). The results show that participants belonging to lower income groups and rural areas had more knowledge and interest to use internet facilities. These people used net-cafes and computer centres, as they did not have internet-access at home. On the contrary, the participants from the main and high-income cities did not have enough time and interest in having extra skills such as computer and Internet.

The "computer skills" of the participants has a significant correlation with the "readiness for using e-government website if they have got the fitting course". The r value=.174** which denotes that the correlation is weak but as the *P-Value*=.001 indicating that the two variables have highly significant effects on each other. I.E. the more "computer skills" they have the more "ready they are for using e-government website". In contrast, the lesser "readiness of participants for using the e-government website" the more lacking in the "computer skills" they are. The "computer-skills" have a weak correlation with the "e-government services developed enough" since the r=.099*. However, the *P-Value*=.049 indicates that the relationship between the two variables has significant effect in the positive direction. I.E., the more "computer skills" they have the more knowledge about "if the e-government services developed enough" they have; in both direction. Some values indicate that a major chunk of participants is forced to refrain from using the internet due to its access-cost.

4.1.2 The Paper-based survey Analysis of the nonparametric Spearman's correlation test: There were several significant correlations between each of the variables included on the paper-based survey. In fact, most of the variables were: either positively or negatively correlated with each other.

As a final point, we analysed the all numbers data with the same rules as above taking care of the sign of each value. We check the *r*-value and its associated level of significance (* or **). A "*" indicates usual significance and "**" indicates higher significance which are proved to be true during this analysis

Table 3: the Pearson's Chi-Square test of the paper-based survey

4.2 The Pearson Chi-Square test:
4.2.1 Online Survey Analysis of the Pearson's Chi-Square Test: We test all variables in the online survey against the dependency on one another. Generally, in the online surveys, applying the Pearson's Chi-Square test resulted in most of the variables showing insignificant Chi-Square values indicating that they are completely independent of each other. This is a sign of no relation between them, except few significant relationships (five in total) between variables.

4.2.2 Paper-Based Survey data Analysis of the Pearson's Chi-Square Test: There are several significant relationships between each of the variables included on the paper-based survey instrument based on the Pearson Chi-square test. We also applied the Spearman's correlation-test to distinguish how effective the relation/dependency is. Mainly, each one of the variables is significantly related to one another with the exception of one. Here, "Period of first use of the internet" and "Does current e-government introduce full necessity service," are not well related as is evident by the value (insignificant χ^2=.769, *p*=.681 and df=2). This means that no relation exists between them; hence they are independent.

For the remaining Chi-square tests; each variable is significantly related to one another, and the relation is effected through one variable depending on the value of another variable, that means they were not independent. As, the χ^2=183.450, *p*=.000 with df=6, .which indicates that the variables were significantly related and the levels of "Frequency of using the internet" were related to the levels of "Period since first use of the internet". Thus, the

two variables are dependent, and the (Corr. $r= -.970$), $P=.000$ confirms the strong effect of the dependency.

Similarly, the variables: "Period since first use of the internet" and "The necessity of e-government service using tradition or electronic way" were significantly related to one another, as $\chi^2=6.289$, $p=.043$ with df=2. This represents that the two variables are related and thus are dependent ((Corr. $r=.198$), $P=.045$). This shows that the dependency in some way is effective.

4.3 The Independent T-test:

4.3.1 Online survey Analysis of the independent t-test: The Independent Samples T-test contains the statistics that are critical to evaluating the current research questions. That verifying whether people with "English skills" and people with "an awareness of e-government services" are different from each other. Thus, they are dependent which is indicating that there is a statistically significant relation between the two variables. Again it should be prove by correlation test which should (sig.(2-tailed $>= 0.00$ and <0.05). The T-test statistic under the assumption of unequal variances has a value of 11.159, with an associated significance level of .000. The small value in the column labelled Sig.(2-tailed) indicates that the groups do indeed have unequal variances. The significance level tells us that the probability of there is (no relation) between (the two variables) is not true. Thus, there is a significant relation between them.

In contrast, the same thing applied for if people with "English skills" and people who are "visiting the e-Gov website" have an equal variance and they are dependent on each other. The T-test result sig.(2-tailed=.545) >0.05 is insignificant; this is mean variables are Independent and there is no relation between them, also there is no relation in the correlation test.

Independent Samples T-test
for the online survey (396 Participants)

		English Skills	Awareness of e-government services	Visiting e-government website before	Usage of e-government services appropriate with lifestyle
English Skills	T-test Sig. (2-tailed)		11.159 .000 (A 4) Statistically significant	-.606 .545 (B 4) Statistically not significant (No relation)	-20.624 .000 (C 4) Statistically significant
Awareness of e-government services	T-test Sig. (2-tailed)			-11.852 .000 (D 4) Statistically significant	-30.716 .000 (E 4) Statistically significant
Visiting e-government website before	T-test Sig. (2-tailed)				-20.145 .000 (F 4) Statistically significant
Usage of e-government services appropriate with lifestyle	T-test Sig. (2-tailed)				

Table 4: the T-test of the online survey

4.3.2 Paper-based survey Analysis of the independent T-test: The t-test for the paper-based survey signifies that all variables are dependent on one another and they all have statistically significant relation between them.

5 THE FINDINGS AND THE LESSONS LEARNED:PRE-ARAB SPRING

The findings, lessons learned and the recommendations (in the conclusion) provide some guidance for Libyan government to make its first steps toward implementing successful e-government projects. They must consider implementing the alternative solution.

The most important findings in this paper are the following:

- The North East area is "The silicon valley of Libya" with high level of skill and interest in computers, Internet and awareness of e-government services.
- Education is not the main factor that makes people more prone to Internet technology, awareness of e-Gov website and using its services; as good case-studies and examples were found in rural communities (such as Alharaba) proved that. In contrast, the more educated people from urban areas have no idea about e-Gov website and its services. General literacy is prerequisite to do anything.
- A number of respondents acknowledged that studying abroad offered the opportunity to gain and extend their knowledge of computer-and-internet related skills appropriate example are of people studying abroad and then running local training centres back in Libya (Alharaba and Musrata (LC)).
- High levels of awareness were not limited to the cities and high economic areas as initially expected. Good case-studies and examples were found in remote rural communities such as Alhraba and in specific regions such as North-east areas and Misratah.
- Besides, extensive courses on special Internet applications were conducted at the Blind Association which polished their skills and made them go further in their graduate studies, using the Internet and aware of e-government aspects.
- Very few contributions from the females' side were observed as males are dominant (typical developing nation style).
- The high cost of Internet services in general, forms a barrier for the public to interact with e-government website and of its services.
- Lacking the English skills could not cease people from using Internet or visiting e-Gov websites.

In addition, the lessons learned are been noted in the following points:

- Belonging to the high-income area does not mean having high awareness of Internet and computer literacy as has been seen during the case study of the north-east area which is populated by low-income citizens.
- By introducing reforms on how government works, how it manages information and internal functions, and how it delivers services to citizens and businesses might produce all the benefits expected from the time and money invested.

- Simply bringing in technology such as (computers, networks and communication devices, etc.) will not improve the e-government and make officials more service-oriented toward government's customers, nor will computerising the same old procedures and practices since Information and communication technologies are only tools to enable and authorise government reform.
- New and existing technologies should be used as means for achieving the larger goals of the government and the people. Instead of focusing on the technical aspects of e-government, governments should think about creating an intellectual and information people based approach responding to customer needs and changes in the internal and external environments. There are good examples of social networking, which makes use of local (people and expertise) gaining success in implementing new ideas. This, eventually, encourages the community to participate in online e-Gov services as users.
- Improving people awareness; by delivering courses on computers, internet and knowledge on getting and using search-engines on websites and e-Government services. There are examples that we can use as good basis (Alhraba Village, blind association -Benghazi (LC) and disable Association).
- An instance of good practice involving talented and motivated individuals is of these studying abroad and bringing their expertise back to Libya and applying it at the local and the national level. These local champions know the requirements of the local environment and are best suited to apply their education. The practice of sending students to study abroad continues to offer a concrete basis for improving the adoption, sharing and transferring of new technologies skills.
- More generally, supporting the educated people and local champions who are ready to contribute to help and encourage the people for better understanding and usage of new technologies by conducting suitable courses to the people as these local champions are from same culture and are familiar with the people in a particular area.
- Increase the awareness of the people with new technologies by offering computers, access to internet, anytime, anywhere and by conducting training courses cost which is compatible with the common citizen's income. The paper recommends establishment of free government training in every area.
- Government should collect and implement the ideas from other regions or countries, which have successfully implemented similar projects. However, these ideas should be localised based on culture and resources. Just visiting and having discussions with the agencies who have implemented such ideas is not sufficient. The process should be properly reformed comparing factors like availability of computers,

literacy and internet-access. This is relatively a low-cost way of learning.
- Support social networking for its proven power and success (for example, SMS vaccination program).

6 POST-ARAB SPRING

After the Arab Spring Libya, the Government established the e-government office within the prime ministry's office that consists of many experts in the field of information technology and e-government. On the other hand, the City Center of Multimedia set up a committee of an e-government, which composed of experts in information technology, telecommunications, government institutions, civil society organizations which is currently seeking to apply the principle of transparency and decentralization as the e-government is the new applications waged many countries to facilitate services to citizens and solve the problem of the central, and through the implementation of electronic government properly in all public sectors .

Besides, that some of the major powers offered their services to support studies of how to improve the infrastructure and the success of e-government project in Libya that some of them even display free financial support for these studies. To conclude, we discern that the project to establish e-government in Libya has become a hot topic and many government agencies and international seeking to abutment, which makes the image of the tomorrow's Libyan e-government very bright. The study described above conducted just prior to the Arab Spring in Libya provides some timely insights on how to take forward e-government initiatives and projects in both the Libyan context and other countries undergoing similar upheavals.

7 CONCLUSION
The conclusion draws more valuable results and recommendations besides the findings & the lessons learned above to improve e-government-participation of citizens of developing countries as a whole and Libya in particular. The conclusion also proposes the alternative solution. As in this survey, analysis of collected data from the questionnaires, distributed to stakeholders (Students, Experts and Farmers), it was seen that the first thing to be considered is the lack of computer literacy due to the high cost of computer machines. Consequently, the level of computer-related skills among the public is extremely low. Moreover, having English skills and/or being educated does not necessarily mean having computer and Internet skills. Besides, most of them proved to be unaware of e-government services. This unawareness can be improved with appropriate level of utilising the case studies such as Alhraba, north-east of Libya and Benghazi blind association. Advertising this information with all levels of people to let them know what is going to happen, why and how is it related to them. Involve people

from vision to implementation stage, by using efficient of channels. Practical government can provide with this information by distributing loans, encouraging local champions to establish technologies centres, through establishment of internet clubs, centres and providing (free) training courses.

On the other hand, the Internet related Infrastructure in Libya is very limited and in some cases, it does not even exist. Consequentially the common public cannot easily have access to the Internet and thus cannot use e-government sites. Moreover, the high cost of Internet-access limits the access time for people who have access to Internet. Consequently, this Internet is not compatible with their lifestyle. Even when they do surfing the Internet, visiting the e-government website is not their main purpose. Of course, there are some exceptions.

We also notice that the number of services offered do not satisfy the needs of most of the people. Number and quality of the provided services must increase to a level, which encourages the common public to use e-government facilities. Moreover, the idea of e-government needs elaboration. We should advise people about what are the advantages of the e-Gov over the conventional governance.

In contrast, the majority of stakeholders are ready and willing to use e-government services and support it if proper training given to them. It is preferred that the Government takes an initiative to build an appropriate infrastructure to provide these two services (hardware and training). To be exact, if the e-government does not provide or build that infrastructure; there will be a small number of the public only who could interact or make use of e-government services. This will be improved by making landline phones available in every home or/and making wireless internet technology available and reduce its cost. This will result in encouraging the public to have internet access and skills and thus have more access to e-government website. Besides, it should reduce the cost of computer-hardware and associated training courses.

Hence, there is a strong need to look for an alternative to reach most of the people. The other and an excellent recommendation and alternative solution is the use of m-government: To reach to people by using wireless channel - mobile phones (SMS messaging). NCFCTD successfully employed this method when they initiated the vaccination program and announced it through SMS messaging using two mobile companies Almadar and Libyana. The various vaccination programs were successfully completed on-time with 100% attendance all over the country. Additionally, they disseminated the program in the social gatherings, work places, neighbourhoods, etc thus making good use of Social network. Consequentially the messages reach those who missed them in case of full inbox mobile folder (Sweisi, Adam, and Eldresi 2007). The Services by the two mobile companies mentioned above cover most of the populated-Libya.

The Dubai Government effectively used this method to allow its citizens to use various services like payment of Utility Bills, getting Bus and Train Passes etc. Using this alternative (m-government), we can also reach specific target-groups like Blinds by deploying applications on specialized mobile phone. It is a very reliable device to ascertain a person's identity except that when the device is stolen. The mobile service has another good characteristic for it being available during twenty-four hours.

By using this facility, there will be no barriers to reach the target segment of the society in an effective and efficient way with limited cost and on-time. A related study found that a very large chunk of the population (more than 80%) possesses mobile phones and this number is growing every day. Thus, m-government proves to be the best alternative solution to reach the population until the government improves Libyan Internet related infrastructures.

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