Uses and Impact of 'Open Data' Technology for Developing Social Sector in Pakistan

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Abstract

The use of open data has several benefits for the governments, organizations and individuals. The 'Open Data' is a collection of easily accessible data that is to be available for general use without any restrictions. Therefore many developed countries are planning to start getting involved with 'Open Data'. Moreover, the focus is shifting from opening as much data as possible towards realizing the benefits of 'Open Data'. With technological advancements several countries are taking interest in making their government data open to the general public. Moreover several benefits can be reaped through such programs for which the governments are enthusiastic about taking part in the 'Open Data' programs. The benefits associated with 'Open Data' include ensuring better transparency and accountability of the government, participation and self-empowerment to the citizens, economic growth, and stimulation of innovation through re-use of data. The research explained how the fact that when Government of Pakistan had opened their data both internally and externally improved their capacity to innovate. Lastly, this article described how some of the tasks mentioned previously could be outsourced by the government of Pakistan, bringing a new actor in the ecosystem. There are plenty of data sources that might provide a different angle on the economy and large public datasets from cities, countries and government agencies. The collection of data has been done using qualitative and quantitative methods. It is most likely that the using the concept of "access to Open Data may help the government of Pakistan to develop the social sector in Pakistan.

Keywords: 'Open Data', Policy Makers, Strategic Planning, Development, Social Sector, Technology, Transparency, Accountability.

Introduction

The prosperity of any economy is largely based on conducting developmental projects. The developmental projects are important to empower people living and ensuring provision of good social environment that can ensure fairness and safety. Pakistan, having an emerging economy and is striving for ensuring provision of security to the people living in the

country. Various strategies help government to achieve this goal among which use of open data system (ODS) is one, that has been initiated by the government of Pakistan by providing access to the databases. This research highlights the advantages and disadvantages of using ODS influencing the social development of Pakistan. The use of ODS has multifold benefits such as it makes it easier to perform daily life tasks for the general public of Pakistan but also ensures eradications of corruption by fostering greater accountability of national institutions. Open data systems enable people (students) to find the required data pertaining to the research topics. The data is easily accessible to everyone and this provides convenience in use of the available data. The use of open data is encouraged by the various governments of the world for achieving transparency and better management of the affairs.

The companies adopting the open data strategy can have better access to the people and can share its achieved performance targets with the interested people (Attard, 2016). The developed countries have well recognized the importance and benefits of using this system. This drive was successfully initiated by the President Obama in the United States through a campaign for ensuring transparency and accountability. The basic purpose behind using this strategy was to ensure the efficient working of the pubic organizations. Afterwards this was adopted by the government of United Kingdom that promoted the culture of transparency in the UK too (Alcock, 2014). The primary motive for introducing the ODS was to make concrete the responsibility of the civil departments towards their citizens and encourage them to participate in the social development of the country. Besides the social development was supported, but it also brought social empowerment to the people. The governments mainly used it for in time delivery of the rights of the people and to let them inform about the use of their money and the projects in which their money is being used. Keeping in view the same motive this strategy was introduced by the government of UK (Judge, 2005). In the light of the above examples it is argued that adoption of such systems may possibly provide strength to the Pakistan's governments to perform effectively and efficiently with more transparency and can develop good reputation in the minds of people living in Pakistan.

Research Questions
1. How ODS can help the social development in Pakistan?

2. How using ODS can help in formulating the helpful policies for the people?
3. How open data system can play role in achieving transparency?

Research Objectives

In order to know the answer of how researcher will carry this study it is better to probe into following objectives:

- Evaluate definition and need of 'Open Data' terms to find reasons.
- Assess the worth of carrying case study to Social Sector and analyze the impact.
- Work out a strategy which shows the impact of ODS on social0development in the country.
- An 'Open Data' access can prove to be a key that any country can use to assimilate its development purposes.

Research Hypothesis

H1: A positive relationship exists between social and political development in Pakistan by using open data.

H2: The social development of a country (Pakistan) can be improved through use of open data system.

Literature Review

Based on the available literature the concept of open data can be understood in terms of the data that is available for public use with any restriction such as the restrictions like the copyright, patents or other mechanisms of control. The open data refers to the concept that the data should be freely available to everyone to use and republish as per their requirements and as and when they wish, without any restrictions.

Although at the moment there is limited literature available on 'Open Data' policies regarding each country. This gap leads to he development of frameworks that is used to strengthen country`s socio-economic development.

It is an important part to consider that the open data must consider sharing the information pertinent to the organizations that is needed by the customers of the organizations and government departments. Additionally the open data systems must offer information that is frequently utilized like the geographic information, information about the climate, progress statistics, information about the number of visitors per day and information about the functions of the organization. In this regard in March 2011, the

Finnish Government stressed to develop a database for the usage of open information by making it a major part of the Government's Program. Motivated by the government's initiative and keeping in view the goals like transparency and better outreach the government departments started sharing their information through open data in the year 2012. For example, the National Land Survey of Finland started information about advanced topographic information in May 2012. In the same vein a year later the Finnish Meteorological Institute initiated sharing climate information online.

The basic purpose is to provide all significant information collected and stored by the open organization by 2020 and making them accessible and usable through internet and computers, for paying nothing out of pocket as a fee and the information should be shared under clear terms of use. The Europe United Kingdom became the first country to open data for public and has achieved large number of positive outcomes in term of social and economic development.

Methodology

Research approach was deductive in nature. The relationship of 'Open Data' is examined with the socio - political development of the country. The hypotheses were tested for confirmation or rejection with the help of measurement of variables through correlation method.

For this purpose the construct validity and convergent validity was considerable since all the variables should measure the same concept and hence should be strongly correlated. To test this correlation, we have used factor analysis. Measuring validity of instrument here is actually verified by ensuring that the questionnaire contains questions relevant to the concept being taken. In quantitative techniques, validity of instrument is more on theoretic aspect as to what is the purpose. Here, the objectives are clear and construct validity and its testing technique will be used which will substantiate the validity of instrument also.

Both qualitative and quantitative data collection methods were used. Interviews and survey research strategy was employed and data collected from four types of respondents who were in favor of using the open data systems including, businesses, media people, general public and Non-Governmental Organizations.

Further the statistical analysis was conducted using different approaches such as the correlation, regression analysis and factor analysis. The results

showed a positive relationship between use of ODS and positive outcomes in social sectors of Pakistan.

The Pearson's correlation was used to establish a link between the variables having independent and dependent nature. Further the regression analysis was used for examining the effect of independent variable on the dependent variables. The descriptive statistics helped in extracting meaningful results from the study.

Primary User Group	Spend Data %	FOI %
Business	39	23
Media	31	33
Public	23	37
NGO	7	-

(Worthy 2013)

Table 1. Spending Data and Users of FOI

The below mentioned principles are included in the Charter for open data (2015);

- The open status of the data available must be ensured
- The data provided must be reachable and usable i.e. accessible
- The data/information should be exchangeable
- This is used for better governance and engaging the residents
- The data must be innovation supportive
- The information should be timely, appropriate and all-encompassing

Two major indicators are generally considered to measure the Open Data maturity that are its readiness and maturity. These characteristics must be induced in the national Open Data portal. The "readiness" of open data portal ensures the presence of open data policies for the users of such data added with the economic, social and political impact of Open Data. Whereas the "maturity" is using a web-based portal such as its functions the overall again and again using of data, and the spread of data.

Results

The results indicate that only 44% of the journey of adopting complete Open Data systems is accomplished by the Pakistan's Social

Sector. For the adoption of complete ODS would require developing of a clear Open Data Policy that must address the licensing aspects. Additionally it requires the development of national guidelines that help the local governments to learn and adapt from the developed systems. The open data systems adoption completely would require having a better understanding of the expected impact of Open Data. Besides this it requires efficient management of the traffic coming towards open data systems. The portal must contain the features should cover different data categories that is supported with data download feature as well.

Discussion

'Open Data' doesn't start with data. Rather, it starts with a question. Successfully applying data science to the practice of 'Open Data' requires more than providing context and finding clarity in vast amount of unstructured data: it will sometimes require media organizations to think differently about how they work and who they venerate.

Understanding the impact of ODS in the context of Pakistan requires looking at the history of such systems. The initiation of such systems took place in the years back in 2010 that encouraged the country to initiate its formal open data system by developing various databases. Many challenges were experienced in the way to adopt open systems but were adopted keeping in view their unignorably advantages in managing the government affairs. The western countries took lead in introducing such systems for better governmental performance. with the passage of time and based on the utility these systems provide the eastern countries also started adopting these systems. This is because of the reason that the governments almost face similar problems in dealing with general public and customer organizations that require authentic and timely information form the government departments. Their greater importance has compelled countries to prefer using such systems so that the governments can stay clear about their functioning and responsibilities towards their citizens. This helps governments reduce the level of corruption and more clear and transparent information can easily flow towards the general public. Therefore, it is always recommended to use these systems ensure that systems are crucial for country' performance and enhance its social and political setup. Moreover the GDP and economic growth can also be increased through avoiding wastage of resources like the financial and other resources. Sharing the government information is likely results in the development of new governmental systems.

The use of open systems have importance for the residents departments of the government and general organizations that are operating under the control of the government to remain connected and share the information freely. This study remains significant by highlighting the value of open data for the economy of Pakistan. In order to achieve efficiency and effectiveness and to get high targets the country has to ensure its better accountability and transparency in systems that is only possible through adopting and effectively using the open data systems. Pakistan can fight the ills of corruption through integrating open data and participation in both social and cultural development.

Open Data and Improved Transparency

A transparent system can be developed through making information available in-time and all the time. This should be the focal point to improve the government's systems as the Britain government has done by connecting the taxpayers and collectors together. This gives an edge to the government to know about all the taxes collected and there is no point of leakage of the tax money. The tax money is directly deposited into the government's accounts that can be fruitfully used for development projects. This systems ensures more transparency and the society is thus called as the open society where there are no boundaries of the sharing of information. This supports government become accountable and possible threats of corruption can be avoided well as we see in the case of Europe.

Ahonen-Rainio et al. (2014) report revealed various insights of the open data systems but has ignored the monetary effects in Euro terms. Another empirical examination by Koski (2011) shows that in fifteen nations the introduction of geographic information was associated with fundamentally proved to be the faster means of development. In light of responses from 531 Finnish organizations, Koski's (2012) investigation found that in the Finish organizations the era of new information based administration has set in. The outcomes reaped are far more than the costs incurred and administration improvements can be guaranteed in different organizations and areas. According to Kiuru et al. (2012) the small firms can especially get benefit rapidly from recently open information platforms introduced by the administration of various governments.

Open Data Impacting Lives of People

Worthy (2018) reported that open data systems impact the life of people in three major ways that are;

1. Through the use of such systems the government stands more liable than ever before. It makes the government well-organized and the government may become competent by extending effective public services (Stefaan & Andrew, n.a.).

2. These systems empower the residents by affecting the lives of citizens directly.

3. The governments can introduce advanced economic opportunities for the people living in the cities and/or remote areas for opening the new industries and sectors.

Global Impacts of Open Data Sets

The importance of the use of open data system cannot be ignored because these are helpful up to a greater extent for the nations. The governments and residents could assess the progress of the government and the government can evaluate what is going wrong with the policies implemented. So, they can devise the ways to find out the solutions to the challenges faced. The accessibility to such data sets can effectively reap the benefits. It is clearly observed, through various studies conducted in various countries, that open data is an ever green solution to a variety of problems faced by the individuals and governments (Hobley, 2012).

Many governments have already provided and opportunity ot its residents for accessing the data and information openly. Such as India has adopted the open data India has a governmental portal showing all the necessary information for the general public. At the same time the USA Data.gov is an effective open data source benefiting its residents containing various types of relevant data. In Australia the website data.gov.au provides accessible information to its public. Similarly in New Zealand Data.govt.nz provide lists of various datasets extending help to people and in UK the Data.gov.uk is another useful platform.

Looking at the Spain, it has initiated open access, for its general public, to the data in the year 2012 and more than 150 organizations worked solely to develop the database for the delivery of the valuable information to the public. More than almost 4,000 individuals can use the portal at a time, for which the yearly administrative cost of accessing this data was estimated about 330– 500 million Euros. In the United States one

of the Weather Channels and one of the organization responsible for providing GPS advertise named as Garmin, were established that utilized crude open information. Garmin's estimated worth was above USD seven billion in the year 2013 (Capgemini Consulting, 2013; The Open Data Economy).

Climate corporation established in 2006 is a good example of sharing open information. This organization was supposed to gather and discriminate information regarding climate protection purposes. After knowing the importance of the information the organization later expanded its scope of information utilization to support sowing plans for the agriculturists. This company was sold during the harvest time in the year 2013 amounting to USD 930 million.

The history of UK explains us to evaluate the case study of UK contributing towards social development, the path is recommended to be followed by Pakistan too. This is definitely possible because the Pakistan's government is adopting many good things from other countries especially UK. Since its independence, Pakistan is following the UK pattern of governance as a whole.

The United Kingdom has gone through many booms and slums since 1945 but managed to achieve the status of a welfare state and initiated various insurance programs. In the beginning of year 1951 the inflation was very high and the UK government has seen economic recession. Further in the year 1970 the conservatives started politics inducing a major transformation to the regional politics. However, Labors, a political party was again in power in the year 1974. They continued government till the year 1979. Even after experiencing economic crisis in the form of poor industrial growth they managed to continue their governance in the UK. Their efforts put a positive impact on the economic conditions of the UK and they managed to get out of the economic turmoil and seen prosperous age of economic prosperity.

The intense smog impacted the large number of people in the year 1952 that victimized hundreds and thousands of people though infecting them with lung and heart diseases. These diseases were spread as a result of the huge number of industries operating in the United Kingdom. The has seen the economic and atmospheric crises. Besides these challenges it has faced the social problems too in terms of crimes and other related issues. Other problems faced were increased population, having multicultural problems and so forth. The women started joining the workforce that

demanded development of new policies and compensation packages gave raise to several gender based uncontrollable problems. In such conditions it can be well understood that their society was experiencing a massive change right after industrial revolution (Verhulst & Young, n.a.). In these conditions the advanced technology supported them a lot to manage their affairs at the great extent. The residents enjoyed using various technological devices like radio, television and telephone and so forth. With the beginning of 1950's the UK seen a period that is rightly be called as the Enlighted and transformational period for the residents of Great Britain (Cole, 2012).

The Festival of Britain in the year 1950 brought with it another era of change that lasted upto 1960's. When Winston Churchill won elections again initiated the governance period of the conservatives- UK. The 1956 seen a period of embracing huge success for weapons and warfare for Britain and the government established its nuclear power station, adding to its technological capacity. Following the progression path in the year 1957 the Britain introduced the hydrogen bomb as well (Kitchin, 2015).

Now the UK government focused on the achievement and development of the social targets and embraced several social development targets in the year 1960's by abolishing its death sentence penalty for the people by 1965. In 1966 they achieved success in sports. In 1967, the UK achieved another landmark by legalizing homosexuality and abortion. In 1970 after the Conservatives won election the Britain joined the EEC in the year 1973. The EEC is well known as European Economic Community. Following the success after success the in 1976, the Britain approached IMF to fetch loans for more and more developments. In 1978, a test-tube baby introduced by UK and during the year 1979, a female Prime Minister Margaret Thatcher took the power (Duss & Cooley, 2016). The story is not completed here they kept on making technological developments and till date are renounced to have great name in the world.

What Impact and Effectiveness Occurred in Pakistani Society?

Pakistan being a third world country faces many social challenges. For example: Gender inequality, women empowerment, child (especially girls) education, unemployment, inflation, corruption, economic instability, below the belt law and order situation and border insecurities etc. To tackle all these social issues and challenges Pakistan can effectively tackle the circumstances by adopting 'Open Data' system like United Kingdom. The

model of UK 'Open Data' system is highly effective for Pakistan development. As this system allows to fight the ills of society in real-time and provide reasonable solution. As the study shows the societal development of UK due to 'Open Data' the same is possible for Pakistan.

1.Corruption: The utmost and the real power of 'Open Data' is that it helps in controlling corruption. With the power of real-time accountability the system make officials accountable by tracing any misconduct with public data. With the pass of right of information act bill by parliament of Pakistan in 2016, the government is restricting to make all public data open. Today corruption is no doubt is the biggest threat for the economic stability of country. National Accountability0Bureau0(NAB) and Federal-Investigating Agency (FIA) has their own cyber wing.

2. Terrorism: The greatest of all ill along with corruption in Pakistan is a menace of terrorism and to combat it new horizons should be utilize. Open data helps in tracking the terrorist activities and allow authorities to do abrupt act on any symptoms of it. Since 9/11 when Pakistan became an anti NATO ally of War against terrorism, the country being the central of war zone experiences many terrorist attacks which took millions of precious life. The thin tank of country plan many strategies to combat terrorism and using 'Open Data' system is one of them.

3. Election*:* Election is a two side process where one is a candidate and on the other hand there are public who votes. Recently the new census creates many questions regarding the transparency of counting public. In many villages of Punjab and KPK the strength of public is shown less than it actually is. 'Open data' greatly paly an effective role in showing the population of people in any region. For this NADRA can play a vital role. If its data get public it will easily manageable to know how many people live on certain region.

4. Health & Education: Pakistan always lacking behind in numbers and standards when it comes to health and quality education. 'Open data' can assist in telling the number of schools and teachers in real-time and also the presence and quality of doctors in any hospital. The 2017 data on gender differences show that the numbers of boys and girls in education is about 10% from 5th Grade to the 12th Grade (nine years to 17 years old respectively).

It is vital to note here that the drop out proportion of the boys and girls studying in the government public schools is significant, especially at the primary level. One of the major reasons behind this drop out is inadequate

education facilities available at the post-primary schools and secondary school level.

Literacy rate is also low as compared to neighboring countries. Bangladesh which departed from Pakistan in 1971 even holds a better literacy rate. Open Data system can help in combating the illiteracy in Pakistan.

5. Cyber Crime: With the growing power of social media many new challenges are occurring. The recent hybrid war which is also known as fifth generation war between India-Pakistan has strengthened the power and positive use of social media. The cybercrime which include misuse of Internet for instance; to harass or threaten somebody or steal someone's data without their consent can be managed easily with the help of 'Open Data' The impact of UK reflects that this can be achievable in Pakistan as well.

The internet has facilitated the general public up to a great extent by sharing information by using computer, digital devices and networks. This is called as the cyber era. At the same time the cyber-crimes got increased though theft of individual and organizational information across the World. The crimes are not limited to the information rather they have crossed boundaries from information to stealing millions of rupees from online banks and much more. The range of cyber-crime encompasses spreading viruses and hacking data, or posting defamation messages. The cyber-crimes may include the following;

   a) Cyber-crime has now crossed the limits of illegal drug trafficking.
   b) Through such crimes somebody's identity is stolen every three seconds.
   c) The inadequate security systems installed on your computer may result in PC infections within four minutes of connecting to the Internet.

The cyber criminals generally use the social engineering to get to the secret information. The attackers manipulate and motivate users to sgare their confidential information. Data theft is another way of stealing the computer-based information. The privacy of an individual is broken and his confidential information is obtained. It is increasing day by day and the big corporate firms are also faced with same problem.

There is a long list of data theft activities that harm the individuals and organizations. The first ne is the identity theft is a crime where the information is maliciously obtained and is used for the frauds or scams by using the stolen or fake identity. The economic gain is the basic goal

behind such activities. Another one is the cyber-criminal gains by accessing to an individual's e-mail and the information is stolen about individuals to get hold of transactions. Such crimes can be counter for using the 'Open Data' systems like the UK has done it successfully.

Limitations and Future Direction

What Are the 'Open Data' Obstacles in Pakistan? The main obstacle in Pakistan in using of 'Open Data' is the lack of understanding what it is? There is also the non-serious attitude of government when it comes to any positive use of technology. Today all the developed countries are using new digital tools to combat ills in their society. Pakistan still lacks behind as compared to other developing countries in term of using technology. No doubt on individual level there is many sharp minds in Pakistan who are excelling in technology but on government level there is no motivation and support for them. Nevertheless if only investigative journalist learn the skill how to use 'Open Data' many positive changes can be made.

The open data systems influences the higher authorities e.g. the government to ensure availability of information in a transparent manner for social and political developments. Following alternatives can be used by the government;

• The public awareness about the latest technologies.
• Sharing information for better engagement of the general public.
• Upgrading ODS for the government and public sectors.
• A general framework for valuation should be developed so that the suggestions of people should be valued.
• Conduct of scientific research for determining innovation

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