POLICY DISCUSSION PAPER – 1/2014

Better Service Delivery through the use of IT:

Research on Implementation of IT Policy 2010 in City-Based Services

Barsha Paudel

Alliance for Social Dialogue
Policy Research Fellowship Program 2014
November 2014
www.asd.org.np

Alliance for Social Dialogue

ACKNOWLEDGEMENTS

My sincere acknowledgements go to Alliance for Social Dialogue (ASD) and Open Society Foundations (OSF) for providing me with the fellowship to carry out this research work.

I am highly indebted to Ms. Itisha Giri, Mr. Padmendra Shrestha, Mr. Ujjwal Prajapati and Mr. Ujjwal Acharya for providing me with supervision and constructive advice during this period.

I would like to thank Mr. Saroj Lamichhane, Ms. Surabhi Pudasaini and Ms. Ambika Osti for their invaluable time and for being extremely patient with me during the interviews.

I am extremely thankful to Mr. Suman Khakurel for helping me to revise this paper multiple times despite his busy schedule. I would also like to extend my sincere gratitude to Ms. Shehnaz Banu, Mr. Prem Sapkota and Mr. Swagat Raj Pandey from ASD for assisting me in all ways and means to come up with this paper. Without their help, this paper would not have been a reality.

Barsha Paudel

List of Acronyms

B	Business
BPO	Business Process Outsourcing
C	Citizen
CERT	Computer Emergency Response Team
CPE	Continuing Professional Education
CSIO	Cottage & Small Industries Office
DNS	Domain Name System
DoP	Department of Passport
DR	Disaster Recovery
e-GMP	e-Government Master Plan
EGDI	E-Government Development Index
FAQ	Frequently Asked Question
G	Government
G2B	Government to Business
G2C	Government to Citizen
GEA	Government Enterprise Architecture
GIDC	Government Integrated Data Center
GIF	Government Integrated Framework
GoN	Government of Nepal
HLCIT	High Level Commission for Information Technology
IRD	Inland Revenue Department
ISP	Internet Service Providers
IT	Information Technology
ITERC	Information Technology Emergency Rescue Committee
KIPA	Korea Information Technology Industry Promotion Agency
LAN	Local Area Network
MOU	Memorandum of Understanding
MRP	Machine Readable Passport
NITC	National Information Technology Centre
NPS	National Payments System

NRB	Nepal Rastra Bank
NTA	Nepal Telecommunication Authority
OCR	Office of Company Registrar
SC	Supreme Court
UN	United Nations
VDC	Village Development Committee

Contents

Acknowledgements
Acronyms
Abstract

1 Introduction ---------- 8
1.1 Background to E-governance ---------- 8
1.2 History of E-governance in Nepal ---------- 10

2 Problem Formulation ---------- 11
2.1 Research Limitations ---------- 12
2.2 Research Question and Methodology ---------- 13

3 Review of Policies from IT Policy 2010 ---------- 14
3.1 Scope of the Realist Review ---------- 14
3.2 IT Policy 2010 Agendas ---------- 15

4 Reviews of E-services in accordance with Supporting Directives 24
4.1 Review of *Website Development and Management Directive 2011* 24
4.2 Review of *Companies (Electronic Filing) Directive 2012*---------- 25

5 Status of the Two Studied Offices ---------- 26
5.1 DoP's Status ---------- 27
5.2 OCR's Status ---------- 28

6 Conclusions ---------- 28
6.1 Envisioning and Implementation of the IT Policy ---------- 29
6.2 Envisioning and Implementation of Directives ---------- 31

7 Recommendations ---------- 32

8 References ---------- 34

9 Appendix 1 ---------- 36

List of Figures and Tables

Figure 1: Evolutionary stages of e-governance 9

Figure 2: Mixed use of English and Nepali language in DoP's website 17

Figure 3: Mixed use of English and Nepali language in OCR's website 17

Figure 4: OCR's security warning page and site identity button showing vulnerable connection 21

Table 1: Use of Free and Open Source (FOS) and adoption of Open Standard (OS) will be promoted for use in both public and private sectors 15

Table 2: Localization of IT and its subsequent use in local language will be promoted 16

Table 3:Government Enterprise Architecture (GEA) will be constructed and implemented with priority in joint collaboration of government, public and private sectors for development of practice and standardization of IT 18

Table 4: Strengthening the provisions of information security and data protection in the field of IT will be done. Strengthening the judicial and organizational provisions to reduce criminal activities like software piracy and others related to internet will be made 19

Table 5: E-payment gateway and other essential rules, policies and institutional infrastructure required in facilitating e-trade/e-commerce done through network will be developed 22

Table 6: For the effective operation of Government Integrated Data Center (GIDC), cooperation between all government institutions will be expanded. In addition to encouraging these institutions to maximize the benefit from the data centers, proper provisions to migrate servers from all ministries, departments, and government institutions to data centers will be made 23

Table 7: Website-related, in accordance with *Website development and management directive, 2011* 36

Table 8: Website-related, rich user-experience in accordance with prevalent practices 37

Table 9: Online application process for company filing related, in accordance with *Companies (electronic filing) directive, 2012* 37

Table 10: Online application process for company filing related, rich user-experience in accordance with prevalent practices in electronic application filing 38

Table 11: Remaining relevant services, in accordance with popular practice 38

Policy Discussion Paper – 1/2014

Better Service Delivery through the use of IT:

Research on Implementation of IT Policy 2010 in City-Based Services

ABSTRACT

The governments from many developing and developed countries including Nepal have been making an effort to introduce the merits of Information Technology (IT) through policies, directives and regulations in order to transform service-delivery in their countries and fully embrace e-governance. This paper aims to analyze the efforts of the Nepalese government in introducing e-governance in state institutions responsible for delivering core services to the citizens of the country.

Despite the fact that Nepal's first IT policy was formulated in 2000 AD, the plummeting E-Government Development Index (EGDI) and the existing shortcomings in the implementation of e-governance in delivering services reflect the existence of a huge gap between the policies, related guidelines and acts/laws outlined in paper and their implementation on the ground. This research identifies and analyzes these implementation gaps in detail.

In order to discuss the existing policy gaps and highlight the shortcomings, two representative Kathmandu-based government offices, the Department of Passport (DoP) and the Office of Company Registrar (OCR), are selected as case studies as they target two different yet specific types of service seekers; the general public and businesses. Since market and service seeker side constraints are discounted from this research, only those policies and directives that enhance the government of Nepal's (GoN) e-service delivery capacity are picked. The United Nations' (UN) four-stage e-governance model's top tier phase, the *connected phase*, is chosen as the ideal stage of e-governance. Each selected IT policy agenda is then assessed under different sub-headings to identify which stage of the e-governance model it facilitates, what other government moves support that particular policy and what supportive or contradictory practices exist in the two representative offices. The research indicates that the government of Nepal has formulated and executed some policies that support a more mature phase of e-governance without paying heed to establishing the necessary foundations for successfully implementing the changes envisioned. Furthermore, the research shows that the lack of constant revision and policy-monitoring has resulted in a rather inefficient and outdated policy document in the context of the current agenda for e-governance. The lack of realistic timelines and milestones for most of the programs highlight that the strategies have not been assessed rigorously for their feasibility and possible risks making the implementation inefficacious. Also, the blindfolded acceptance of consulting reports produced by external agencies without necessary homework and thorough review has resulted in sub-standard works. Based on these findings and observations, the research concludes that given the lack of pre-requisites in place and the lack of commitment from the government offices, most of the government offices are still at the primitive transactional phase of e-governance which is a long way from attaining the ideal phase.

This paper is a product of the Alliance for Social Dialogue Policy Research Fellowship Program 2014. Policy Research Discussion Papers are also posted on www.asd.org.np. The author may be contacted at barshaaa@gmail.com. *Findings and Conclusions expressed in this paper are those of the author and do not necessarily represent the views of ASD.*

1. Introduction

1.1 Background to E-governance

Information Technology (IT) has become an indispensable part of our lives and we continue to rely on it increasingly as it takes a central space in both our personal and public sphere. The application of modern IT in fields such as science, engineering, commerce, medicine and education has injected efficiency and transparency into existing institutional structures. Many countries, having recognized the capacity of IT in transforming the systems of governance have adopted e-governance as the preferred model for delivering services to their citizenry. Following suit, many governments from developing and developed countries have been making a concerted effort to adopt the model of e-governance whereby IT is at the core of service delivery.[1]

A. D. Maio defines the term e-governance as the transformation of public-sector's internal and external relationships through Internet-enabled operations and IT in order to optimize government service delivery, constituency participation and overall governance. He also highlights that in order for this model of governance to exist, the development, deployment and enforcement of the policies, laws and regulations necessary to support the functioning of a digital society and a digital economy are a pre-requisite.[2]

The merits of e-governance have been highlighted by various agencies. The United Nations (UN) in various reports has emphasized that the use of IT in governance helps connect three main target groups: the government (G), citizens (C) and businesses (B), whilst addressing society's needs and expectations through transparent, prompt and responsible public services. From an integrated e-government portal, citizens and businesses can benefit from easy access to various government services, conduct online transactions, access information and interact with government bodies without having to stand in long queues or handle lots of paperwork, saving them time and money and invariably improving overall efficiency.[3]

As the government of Nepal (GoN) has also shown its commitment towards adopting e-governance by introducing various policies and directives, this paper aims to provide an analysis of how effectively it has managed to implement these policies and directives issued to introduce the model of e-governance in its service delivery. In order to do so, the paper uses the classification and definition of the evolutionary stages of e-governance introduced by the UN. This model is accepted and used internationally to determine which stage of e-governance a particular country has achieved. As illustrated in the diagram below, the evolution of e-governance is categorized into four phases: *emerging, enhanced, transactional,* and *connected,* also referred to as *stage 1, stage 2, stage 3* and *stage 4,* respectively as an indication of the maturity level of e-governance in any country.[4]

[1] Bose and Rashel 2007
[2] Maio 2001
[3] United Nations 2014
[4] United Nations 2014

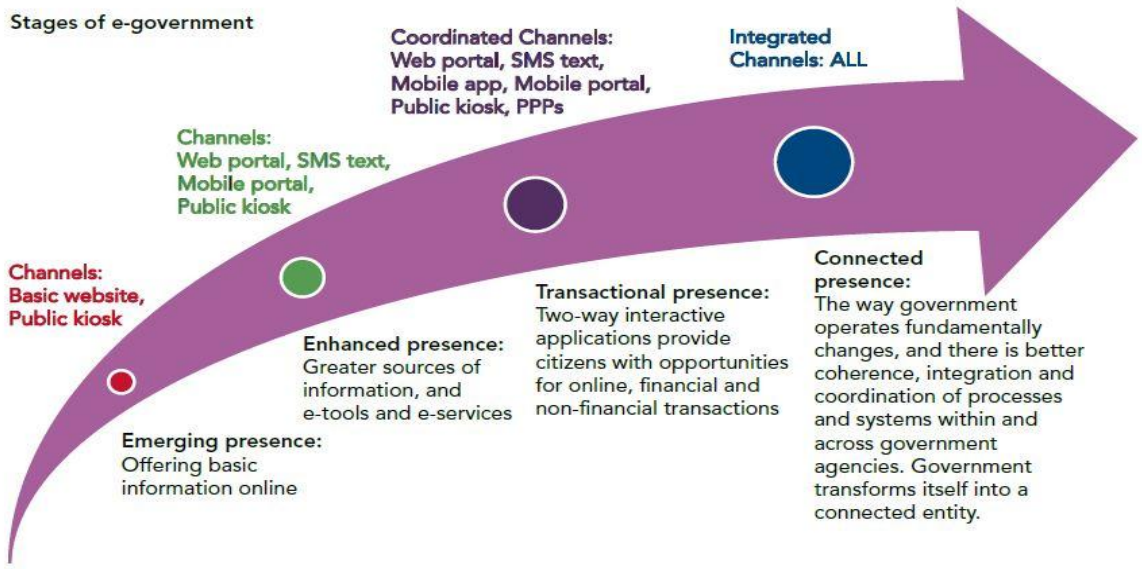

Figure 1: Evolutionary stages of e-governance. Source: UN e-government survey 2014

The first phase of e-governance or the *emerging phase* is attained when relevant information about various services offered are published on a website and are made accessible to the general public - both citizens and business organizations. The second phase is marked by a certain level of interaction between the government institution and the service seeker, facilitated by the website. This includes downloading of relevant forms and documents, inquiries via e-mail and the use of internal search engines for locating relevant information. It also includes the use of internal e-communication between government organizations via Local Area Networks (LANs) and/or intranets. The third phase enables the electronic delivery of the entirety of services and transactions, like filing taxes, renewing licenses, visas and passports, thus obviating the need for a service seeker to visit a government office in person. The *connected phase* is the ultimate phase of e-governance where different organizations work together seamlessly to deliver an integrated information system enabling the service delivery through a single virtual counter.[5]

As different government line agencies are responsible for delivering different services, it is likely that at the onset, different e-services within a country are at different phases of e-governance, thus making it difficult to quantify the extent of the use of IT in the governance of a country overall. To address this, the UN has introduced a common metric known as E-Government Development Index (EGDI) with a range from 0 to 1; the higher the better. EGDI is a composite measure of three important dimensions of e-governance: the provisioning of online services, telecommunication connectivity and human capacity. The global e-government ranking, as derived from EGDI, is not an absolute measure of development of e-governance; rather, it aims to give performance ratings to a national government in relation to others.[6]

[5] United Nations 2014
[6] United Nations 2014

1.2 History of E-governance in Nepal

As mentioned earlier, the government of Nepal (GoN) has acknowledged the benefits of IT and its application in governance. As a result, in 2000 AD, GoN felt the need for the formulation of guidelines to enable, foster, manage, grow and cope with the opportunities and challenges related to the state of IT infrastructure and e-service delivery in the country which led to the drafting of the first IT Policy of Nepal, the same year. The second IT Policy was introduced a decade later in 2010 AD which is in practice till date.

The first IT policy laid some foundations towards using IT to enhance the usability and accessibility of government services. Some of the main objectives of the policy were building websites for all government offices, establishing Government Integrated Data Centers (GIDC), providing internet facilities to each Village Development Committee (VDC) of the country and adopting e-governance in service delivery to a certain extent.[7] In many ways, the first IT policy was geared towards enabling government institutions to attain the *emerging phase* of e-governance. For the implementation, expansion and awareness of IT in service delivery, the National Information Technology Centre (NITC) was established in 2001 and subsequently the High Level Commission for Information Technology (HLCIT) was established in 2002 for the development of affiliated rules and regulations. Following the introduction of the first IT policy and the formation of these committees, the Telecommunication Policy 2004, Electronic & Digital Signature Act 2006, Electronic Transaction Act 2008 and IT Policy 2010 were introduced for the all-round development and effective distribution of IT-enabled services within the country. Moreover, in 2008, HLCIT, GoN and the Korea IT Industry Promotion Agency (KIPA) signed a Memorandum of Understanding (MOU) on offering consultation for the establishment of the e-Government Master Plan (e-GMP) for the development and implementation of e-government systems. The IT Policy 2010 built on this further and made the effective and inclusive implementation of e-governance and GIDC as two of its six objectives.[8]

According to a research paper published by M. P. Pariyar in 2007, it was evident that despite the formulation of the two IT policies, various related acts and formation of several high level committees, the immediate impact on the state of e-governance in Nepal was minimal. The author went on to point out the primitive nature of Nepal's e-governance in the following excerpt from his report:

> "The e-government in Nepal is still in its very infancy; ministries are not connected by intranet via an integrated information system; each ministry's information system and services are separately developed in a piecemeal and vendor driven manner; the concept of centralized data center has not materialized; and the government's presence on the Internet consists mostly of static and out-dated web sites and online e-citizen service is limited. Not many of the tele-centers are successful. Particularly lacking is the participation of private sector, absence of locally relevant content and e-applications, and the inadequate community awareness and capability."[9]

[7] HMG Nepal 2000
[8] Government of Nepal 2010
[9] Pariyar 2007

However, it would be wrong to completely disregard the noticeable changes in Nepal's government institutions brought about by the aforementioned policies and acts. A report in 2008 acknowledged that some institutions were already at the transactional phase of service delivery, for example, online tracking of cases at Supreme Court (SC), online taxation filing at Inland Revenue Department (IRD), online registration, process renewals and on-line counseling at the Cottage & Small Industries Office (CSIO) and the establishment of e-procurement platforms were examples of the progress made in some government agencies.[10] As of 2010, 25 of 26 ministries had websites, 22 had email IDs and around 50% of government departments had a web-presence.[11] But, these efforts and their sustainability came under severe criticism from various parties. The e-procurement platform at CSIO remained largely unused; the IT Park registered its first tenant, but then lost it within 6 months.[12] Also, in an article published in 2013, T. N. Dhakal shared his doubts regarding the effectiveness of 2000 tele-centers established in different parts of the country.[13]

It is clear that the Nepali government showed its commitment towards adopting e-governance as early as 2000 AD by promulgating the first IT policy; however, the progress has been very slow and has mostly been concentrated in the cities. Furthermore, a lot of initiatives have not been given proper continuity required to make e-governance systems robust and mature. The status of e-governance in Nepal can be substantiated from the UN's recent e-government survey in which Nepal is grouped in the category of low-EGDI countries with an EGDI of 0.2344. The ranking of Nepal plummeted from 130th in 2003, when the first survey was conducted, to 165th in 2014.[14]

2. Problem Formulation

The IT Policy 2010 was introduced with the goal of using IT to achieve social and economic development. Six objectives were set out in the document, all of which were targeted towards increasing the use of IT in various sectors in order to establish an economically sound information-based society. To meet these objectives, especially e-service delivery in government services, the IT Policy 2010 included provisions for facilitating e-governance by transitioning the service delivery from a paper-based model to an electronic one. Despite these actions on policy level, the implementation of these provisions and the adherence to the agendas of the policy document is lacking as demonstrated by Nepal's low EGDI rating in UN's e-government survey of 2014. The fact that the policies are not time-bound adds to the trouble of overseeing the extent of progress of the adoption of e-governance. According to UN's report, Nepal's performance in various aspects of e-governance, such as service delivery, infrastructure and citizen participation, among others, is truncated and is mostly stuck in the initial stages. While a good performance would indicate an increased bi-directional e-communication and progression towards complete online e-service delivery, most of the government services in Nepal are still in the early stages of providing *emerging information services*. A significant number of services are still completely paper-based and those transforming to electronic are stuck in the rudimentary phase of e-

[10] Computer Association of Nepal-USA 2008
[11] Dhakal and Jamil 2010
[12] Computer Association of Nepal-USA 2008
[13] Dhakal 2013
[14] United Nations 2014

governance where majority of the information regarding the services are not available on the official government websites.[15]

Despite the fact that the first IT policy was formulated a decade ago, the plummeting EGDI and the existing shortcomings in the implementation of e-governance in information services reflect the existence of a huge gap between policies, related guidelines and acts/laws and their implementation on the ground. The main focus of this research is to assess these gaps in implementation of policies devised to render e-governance.

As mentioned earlier, this research uses the UN's four-stage evolutionary model to define e-governance in order to assess the state of e-service delivery in Nepal. An ideal stage of e-governance would mean the attainment of the *connected phase* across all government offices. This would require a seamless virtual integration of different government offices and their related services to provide e-services from a single portal. Services offered in this highly integrated stage are clearly stated in the widely studied paper on models of e-governance by G. Goldkuhl and A. Persson, where a one-stop government regardless of organizational boundaries provides services at one point of entry even when several agencies are involved. This means that the organizational boundaries in the government structure would be somewhat erased or would be left with little or no visibility to the clients.[16]

2.1 Research Limitations

When talking about the shortcomings in the adoption of e-governance for service delivery in Nepal, the extent of the use of internet by the citizenry cannot be ignored. According to the Nepal Telecommunications Authority's (NTA) annual report for the year 2014, the current internet penetration rate of Nepal is 32.78%, with about 95% of it being contributed by mobile data. The same report also lists a total of 27 Internet Service Providers (ISPs) in Nepal and a total of one hundred thousand subscribers, which is an extremely low number for a country with the population of approximately 30 million. But, since this research is concerned with the service delivery side and the assessment of the implementation of related IT policies, it chooses to ignore the service seeker side constraints like literacy, e-literacy, internet availability, power-shortage and the willingness to migrate to online services. This research is based on the assumption that the service seekers are completely adapted to the *connected* stage of e-governance if the government offers it to them.

It is also beyond the scope of this research to measure the pulse of *connected phase* of e-governance across Nepal. Therefore, it focuses on Kathmandu city and two representative Kathmandu-based offices, viz., Office of Company Registrar (OCR) and Department of Passport (DoP) which have been picked as case studies.

[15] United Nations 2014, Dhakal 2013
[16] Goldkuhl and Persson 2006

2.2 Research Question and Methodology

This research seeks answers on how existing levels of adoption of IT in city-based government services compare to the agendas set out by the IT Policy 2010 and supporting guidelines, acts and laws issued subsequently which directly affect the two offices selected as case studies.

In order to discuss the existing policy gaps and highlight the shortcomings, the two representative Kathmandu-based government offices, DoP and OCR, have been selected as they target two different but specific types of service seekers; the general public and businesses respectively. They are also at different stages of e-governance, for example OCR has already started its online application service putting it at the *transactional phase*, while DoP has not which means it is still at the early *enhanced phase*. This research aims to build evidence related to the level of adoption of relevant clauses from IT Policy 2010 by looking at the level of e-service delivery in these two offices and the implementation of clauses specific to these offices. Furthermore, since these two offices offer specific types of services, the e-service delivery from these offices can also be observed alongside related directives issued after the introduction of the IT Policy in 2010 to facilitate e-service delivery. The two directives which have been identified for this purpose are the *Website development and management directive 2011* and the *Companies (electronic filing) directive 2012*. By following this approach, the paper aims to identify and assess the gaps that exist in the implementation of the IT policy formulated in 2010 along with the status of implementation of the two directives identified.

A review of the relevant policy clauses of IT Policy 2010 is the core focus of this research as it allows us to understand how the policy document supports e-service delivery and how it is being translated into practice in the two offices. To achieve this objective, the selected policy clauses from IT Policy 2010 are individually reviewed under the evaluative framework developed specifically for the purpose of this research. The research uses the framework of Realist Review inspired by a journal article co-authored by R. Pawson.[17] Key informant interviews have been conducted with two different groups, viz., two experts in the field of IT-enabled service delivery and website development and seven service seekers in order to gather information on standard practices, their implementation and problems faced by the service seekers. After the necessary review of the existing scenario, the actual e-services being offered in the two offices are also listed and matched against the instructions listed in the two directives. Within this framework, the efficacy of guidelines and directives are analyzed in detail and the standard of the services in the two offices are assessed.

Since this research identifies particular cases of e-service delivery, only the filtered policies of IT Policy 2010 which are relevant in achieving the *connected phase*, i.e., the ideal stage of e-governance, are reviewed in relation to the two offices. A total of 6 relevant policy clauses have been studied. The evaluation of each selected policy clause is represented in a tabular form where a table is assigned to each policy agenda being reviewed followed by evidence demonstrating the existing status of implementation in the two offices.

[17] Pawson et al. 2005

3. Review of Policies from IT Policy 2010

As mentioned earlier, the framework used in this review is an adapted version of Realist Review. Since market and service seeker side constraints are discounted from this research, only those policies that enhance GoN's e-service delivery capacity are picked. Policies inclined more towards creating a competitive and fair market for private companies and improving the resources of service seekers are not included either. The policy clauses selected for review in this paper are related to three areas that are crucial to maintaining and delivering services in a uniformed manner: infrastructure, legal and technical standards.

- **Infrastructure**: Since telecommunication and internet infrastructures are essential for e-service delivery, policies lying within this framework are selected. Larger infrastructure projects like the IT Park and rural tele-centers are part of the bigger picture of e-service delivery which is why policies on these subjects are eliminated from this review and the focus is on the two specific offices identified as case studies.
- **Legal**: As this is a broad framework, in order to focus on the research agenda, the policies selected explicitly serve the purpose of strengthening the legal and policy framework for e-service delivery for the two case studies used.
- **Technical standards**: This framework is useful in selecting those policies that are essential for maintaining the standard and uniformity of the e-services, like Open Standards (OS), Government Enterprise Architecture (GEA), etc.

3.1 Scope of the Realist Review

Each selected IT policy agenda is assessed under four sub-headings, viz., type of decision making, e-governance phase, supporting government moves and evidence from two cases to see how the intent and policy intervention for e-service delivery is translating into practice in the two representative cases.

1. **Type of decision making**: These are further categorized into three different types: repeated, incremental and new. This section is included to know how the IT policy of 2010 has evolved from the previous policy of 2000. Therefore the policies are grouped under three categories defined below in order to assess the efficacies of the policies and also to understand the work that went behind envisioning the 2010 IT Policy.

    - *Repeated*: The policy under review is almost a replica of one of the policies/objectives/goals of IT Policy 2000; few differences in language in the two policies are discounted.
    - *Incremental*: The policy under review is an upgrade from one of the policies/objectives/goals of IT Policy 2000. Even though the two policies might be similar, there must be some incremental actions, such as reformed action plan, changed targets, etc., for them to be identified as incremental.
    - *New*: This indicates that the policy under review is introduced for the first time after realizing its importance and imperativeness. Normally, these policy clauses serve to realize either the future goals or objectives of the IT Policy 2010.

2. **E-governance phase:** This category shows which of the four phases of e-governance (i.e., *emerging, enhanced, transactional,* or *connected*) the particular policy clause strongly supports or is indispensable for. These phases are respectively represented with numerals, *I, II, III,* and *IV,* in the tables below to emphasize progressive nature of the phases. This helps us understand whether the IT Policy's approach towards adopting e-governance is aligned with the existing and expected level of adoption of e-governance.

3. **Supporting government moves**: Other government acts, laws, guidelines, national plans and budgets that support a particular policy agenda are listed in this entry. The integrated efforts show how government apparatuses are collaborating to uplift the status of e-service delivery.

4. **State of implementation**: This section populates the review with collaborative evidence from two representative offices in Kathmandu related to the respective policy clauses. Collaborative evidence means evidence of practice and contradictory evidence. If there are some practices contrary to what the policy agenda directs, then those practices are also listed under this sub-heading. This part of the review is solely dedicated to finding out how a particular policy agenda specific to the two offices is being put to practice.

3.2 IT Policy 2010 Agendas

The selected policy clauses from the IT Policy 2010 below are arranged according to the e-governance phase they support and are reviewed against the sub-headings explained in Section 3.1. The review and analysis of each clause in relation to the two specific case studies aim to provide an insight into the implementation gaps that exist.

Table 1: Use of Free and Open Source (FOS) and adoption of Open Standard (OS) will be promoted for use in both public and private sectors.

Type of decision making	E-governance phase	Supporting government moves
New FOS and OS are promoted because they increase security of websites, are economically viable and improve accessibility to the websites irrespective of devices or Operating Systems used.	*I, II, III,* and *IV*	• Website development and management directive, 2011[18] The section on website development and presentation in the directive states that the contents on the website should either be in HTML, Word or PDF format.

State of implementation: DoP's website does not use World Wide Web Consortium (W3C) standards defined by Open Web Platform*, whereas OCR's does.[19] W3C standards followed by

[18] Government of Nepal 2011
[19] Validator 2014

OCR are based on Open Web Platform of XHTML (1.0 Transitional) and utf-8** character encoding, which is also a universally accepted open standard.[20] In both of the websites, most of the downloadable PDF documents in the websites that are in Nepali script are not in Open Standard Unicode. In OCR's website, many downloadable information files are kept in MS-Doc format, which is a completely proprietary software format and furthermore, the fonts in these MS-Doc files are not Open Standard Unicode.[21]

**The World Wide Web Consortium (W3C) is an international community that develops internationally accepted open standards to ensure the long-term growth of the Web.*
***XHTML 1.0 is a W3C recommended open source markup language and utf-8 is a W3C recommended open source character encoding.*

Analyses: This policy clause comes under the technical standard framework as defined in Section 3. Its intention is to make the websites available universally to all service seekers irrespective of the devices and software they use, which makes this an extremely relevant and important policy. The review shows a conflicting statement in the directive; MS-Word formats are not OS. Allowing content to be in Word format contradicts with the practice of OS because it is a format developed by proprietary software manufacturer, Microsoft Corp. And the implementation shows a mix of practices, which forces service seekers to use a particular type of Operating System and proprietary software in their devices. This makes services unattainable to service seekers using devices with other Operating Systems, like Linux or Mac-OS. Lack of uniformity and standardization in works can be seen prominently which has caused a lapse in complete adoption of FOS and OS. Since this policy requires minimum resources for implementation, the inconsistencies that exist can be attributed to a lack of strict monitoring.

Table 2: Localization of IT and its subsequent use in local language will be promoted.

Type of decision making	E-governance phase	Supporting government moves
New Localization would increase the ease of use and familiarity of IT and the related services. It would make the websites more accessible to the general public by removing language barriers.	*I, II, III,* and *IV*	• 13th National Plan[22] Working policy: IT will be localized and promoted to be used in local languages. Local portals will be built at local level and later integrated into national portal.

State of implementation: As seen in Figures 2 and 3 below, both of the websites and documents available in these websites use a mix of English and Nepali. On DoP's website, there is no option to choose between languages, whereas, in the case of OCR's this facility exists. But, in the

[20] Validator 2014
[21] Office of Company Registrar 2012
[22] Government of Nepal 2014

English version, the main navigation links do not appear, which force service seekers to switch to the Nepali language version to complete the task. DoP has a single application form in both languages allowing the service seekers to fill the form in the language they are comfortable in. OCR, on the other hand, gives an option to select a language in the online application portal. However, the functionality is compromised if the language selection option is clicked. Furthermore, the basic functions, like the sign-in box and text in the application link's tab, are all in English. Most of the information in the OCR's webpage appears in English. But, the detailed instructions regarding the application are in Nepali. This shows that the two languages are used haphazardly without taking into consideration functionality and user experience.

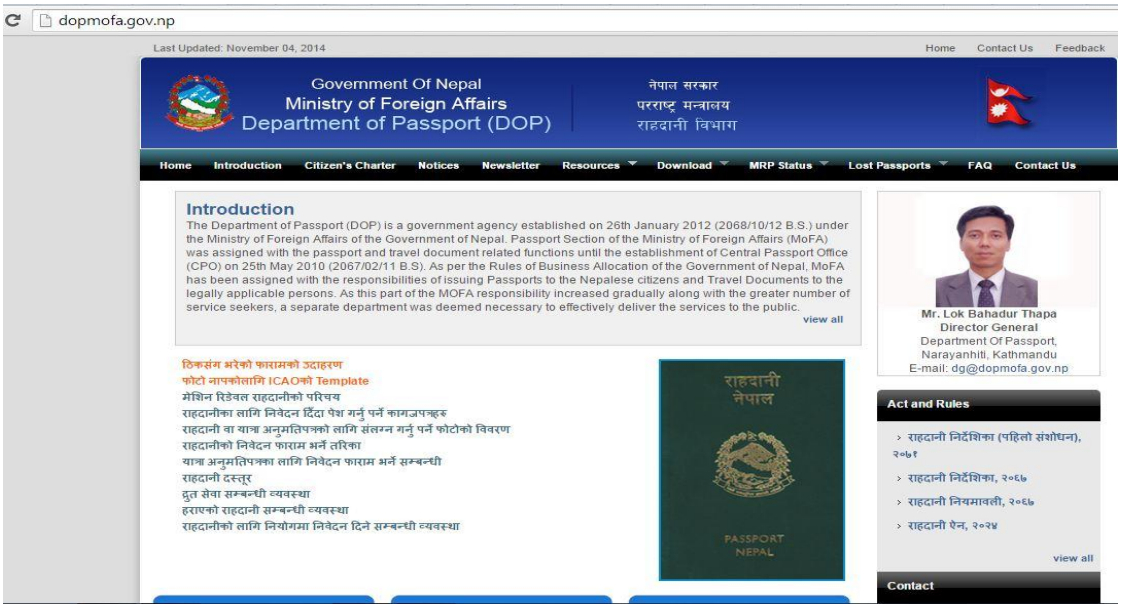

Figure 2: Mixed use of English and Nepali language in DoP's website

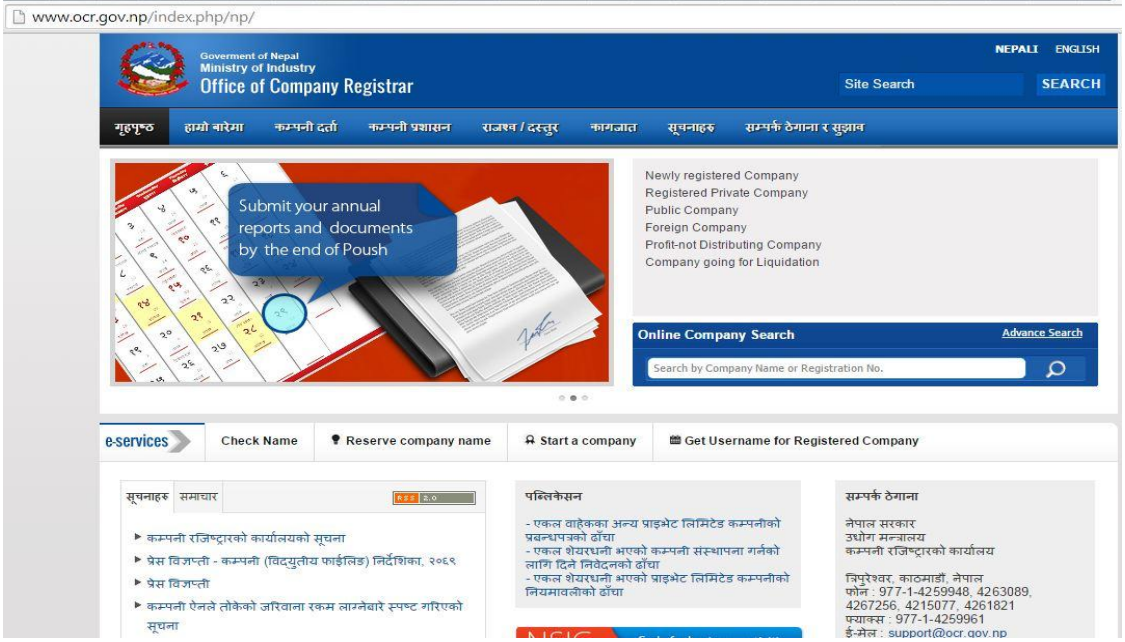

Figure 3: Mixed use of English and Nepali language in OCR's website

Analyses: This policy clause comes under the technical standard framework. The important provision of dual-language functionality is addressed through this policy. But, there is an indiscriminate mix of languages in the websites and web-portals of the two offices which makes it confusing for the service seekers. As seen from the two studied cases, a service seeker must be fully proficient in both English and Nepali to use the e-services on offer by both the offices. Such use of mixed languages in websites might distance the service seekers from using e-service since a majority of them have limited proficiency in English. This shows that if the use of localized software and tools are not made following the standard protocols, it renders the service to be more complicated. According to web-developers, it is the government offices that provide them with the web-content.[23] However, to have the dual language functionality, the web-developers must be provided all of the content in both languages which has not been the case. Clearly, due to lack of commitment from the government's side, efforts of localization have not yet been fruitful.

Table 3: Government Enterprise Architecture (GEA) will be constructed and implemented with priority in joint collaboration of government, public and private sectors for development of practice and standardization of IT.

Type of decision making	E-governance phase	Supporting government moves
Repeated GEA is an effective strategic planning tool for governments to plan and implement frameworks and designs to create linkages among government agencies for increased inter-operability between them. This is designed to benefit internal operational processes as well as public service delivery to citizens. Without implementing GEA, the *connected phase* cannot be achieved. [27]	*I, II, III* and *IV*	• e-GMP consulting report[24] There is a good explanation and illustration of GEA, its potential architecture, its components, and its tasks. • 13th National Plan[25] Working policy: New law on quality of telecommunication service will be implemented. Working policy: Effective implementation of GEA and Government Integrated Framework (GIF) in those public and private sectors that have already adopted e-governance will be made. • Nepal Government Enterprise Architecture – Main Report[26] A comprehensive report prepared in consultation with PwC India. It talks in detail about GEA and proposes suitable architecture for Nepal.

[23] Web-developers, interview by Barsha Paudel, via Skype, October 22, 2014.
[24] HMG Nepal 2006
[25] Government of Nepal 2014
[26] Government of Nepal 2011
[27] National University of Singapore(NUS) Institute of Systems Science 2010

State of implementation: GEA is not followed in either of the studied offices.

Analyses: This policy clause comes under the infrastructural and technical standard framework as defined in Section 3. GEA is an architectural framework for government organizations to manage and align their IT resources, people, operations, and projects for service delivery. GEA builds a platform to share resources among offices to increase the efficiency of e-service delivery and to attain the *connected phase*. GEA has many internal architectural layers, like business architecture, data architecture, information architecture, application architecture and technical architecture, to manage the e-service delivery from government organizations. In Nepal, despite being a pretty old concept, GEA exists only in paper since the first IT policy in 2000. For it to become effective, the offices must follow strict guidelines related to website and portal design, data-bus's characteristics, security protocols, and their connectivity with other offices and data storage protocols. This requires the execution of projects/plans systematically and timely in accordance with GEA along with coordination among government offices. But, in the absence of these, GEA has not been executed yet.

For instance, let us take the current state of implementation of data architecture, one of the architectural layers of GEA. Even though the Government Integrated Data Center (GIDC) located at *Singha Durbar* and LAN connectivity of offices within *Singha Durbar* make the adoption of uniform data architecture across these few offices possible, it has not been put into practice yet. As for offices located at a distance, adopting uniform data architecture is not possible due to lack of data highways connecting those offices with the rest of the offices in Nepal. While it is true that the infrastructure and resources available are still insufficient to fully implement GEA, the negligence of this magnitude in adopting every architectural layer might be prevalent due to complete lack of monitoring mechanism that can make the offices follow the GEA models.

Table 4: Strengthening the provisions of information security and data protection in the field of IT will be done. Strengthening the judicial and organizational provisions to reduce criminal activities like software piracy and others related to internet will be made.

Type of decision making	E-governance phase	Supporting government moves
New This policy clause relates to the security of information/data and provisioning of judicial structure to deal with cases of cyber-crimes.	*II, III,* and *IV*	• National Information Technology Center (NITC) NITC has been entrusted with the task of monitoring the existing IT services and see if they comply with the set standards. • The Electronic Transactions Act 2063 (2008) and Electronic Transactions Rules 2064 (2007)[28] These documents repeatedly mention the necessity of maintaining security of digital signatures and electronic records. The

[28] Government of Nepal 2008, Government of Nepal 2007

		Electronic Transactions Act also gives the controller the right to audit the service provider to see if the defined security standards are being met. • 13th National Plan[29] One of the strategies is to make the use of IT reliable and safe. Working policy: Structures will be constructed to minimize cyber-crimes and help investigate such crimes. Judicial and policy reform will be made to support Information Technology Emergency Rescue Committee (ITERC), which is required for emergency rescuing of IT sector. Working policy: IT security audit will be made mandatory for all governmental and some private IT systems that serve the public. • Secure password practices[30] Briefly states the passwords' standards for application developments and passphrases for remote login. Also indicates that the application should support TACACS+, RADIUS, and/or X.509 with LDAP* security retrieval, wherever possible. * *Different types of security protocols.* • Nepal Government Enterprise Architecture – Main Report[31] Security architecture is identified as one of the technological architectures in GEA. It envisions security architecture for information systems (including applications, computing platforms, data, and networks).

State of implementation: Both OCR and DoP have websites that use http instead of the more secure https in their URLs. Moreover, the site identity button does not indicate a secure and encrypted connection between the browser and website. Even though web-developers have denied using the same template for designing many websites, security expert believe it to be the reason for parallel hacking of government websites every now and then.[32] Besides, GoN has not employed any Computer Emergency Response Teams (CERT) or Information Technology

[29] Government of Nepal 2014
[30] Government of Nepal 2010
[31] Government of Nepal 2011
[32] Shrestha 2010, Web-developers, interview 2014.

Emergency Rescue Committee (ITERC) to handle the security issues. According to a security expert, both the websites are at a very high risk of being hacked.[33]

DoP's website does not use SSL certificate*, whereas OCR's uses a self-assigned SSL certificate, instead of those issued and verified by a trusted Certificate Authority which has been substantiated with the help of Digicert Validator.[34] This is why web servers display a security alert for this site which is shown in Figure 4.

** International web practice requires an organization to install the SSL Certificate onto its web server to initiate secure sessions between organization's web server and visitors' web browser.*

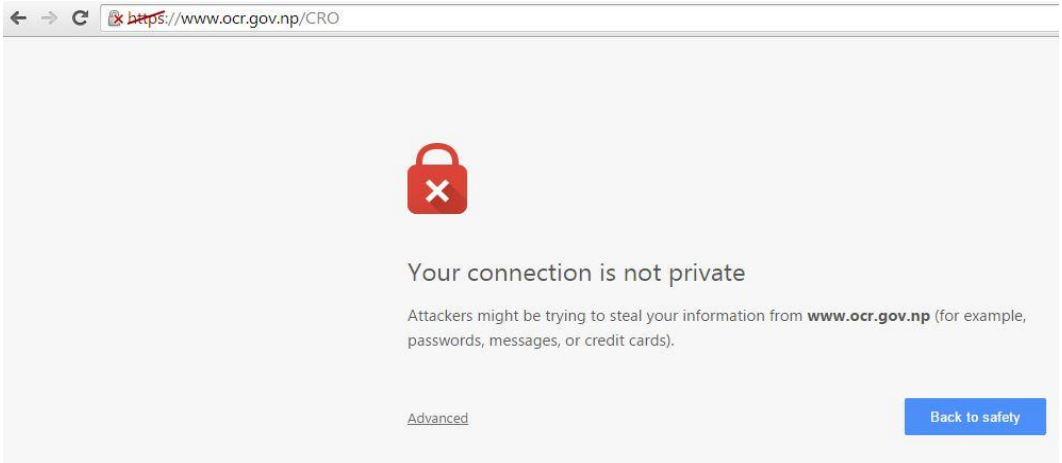

Figure 4: OCR's security warning page and site identity button showing vulnerable connection

Analyses: This policy clause comes under the legal framework as defined in Section 3. The inclusion of security issues in many documents, including IT Policy 2010, shows that the government is well aware of how crucial web-security is for e-governance to be functional. Moreover, since the websites and web portals of studied offices are responsible for dealing with highly sensitive information like personal and/or business details, a robust security provision must be in place to protect information from being hacked, leaked and misused. However, the evidence from the two offices reveals a poor implementation of these policies. The use of same templates for creating the websites and lack of sufficient ground-work for data classification has made the websites vulnerable to cyber-attacks.

Moreover, no provisioning has been made to maintain a redundant backup server; the only data server is located at *Singha Durbar*. Even though work is in progress for the construction of Disaster Recovery (DR) data-site in Hetauda, it will be at least a couple of years before it is operational. In absence of backup servers, data storage of OCR is very vulnerable. To add to this, there is no practice of classifying data into categories, such as simple, classified, and confidential. Data disposal is also not in practice. Security experts believe that the classification

[33] Saroj Lamichhane, interview by Barsha Paudel, Kamal Pokhari, Kathmandu, September 19, 2014.
[34] Digicert 2014, Lamichhane, interview.

and timely disposal of data are the foundations required for data security.[35] Thus, it is evident that the state of security of data in government portals is highly inadequate.

Table 5: E-payment gateway and other essential rules, policies, and institutional infrastructure required in facilitating e-trade/e-commerce done through network will be developed.

Type of decision making	E-governance phase	Supporting government moves
Incremental One of the policies of IT Policy 2000, which has also been included in the 2010 policy, is "to use information technology to promote e-commerce, e-education, e-health, among others, and to transfer technology in rural areas.[38]	*III* and *IV*	• 13th National Plan[36] Working policy: To make e-trade/e-commerce practical, e-payment gateway and other related necessary judicial, policy, and organizational structures will be implemented. Working policy: Existing Electronic Transaction Act will be revised according to international standard and other relevant policies will be introduced. • National Budget 2014/15[37] Legal provisions to receive online payment of income by exporting goods via software and courier from Nepal will be made.

State of implementation: E-payment is not in practice in either of the government offices.

Analyses: This policy clause comes under the legal framework as defined in section 3. For e-service delivery to mature to *transactional phase* and beyond, this provision must be put into practice. Despite being covered in several government documents, e-payment gateway is not yet a reality in government offices. The reason behind this is the lack of supporting legal provisions to authorize e-payment gateway. *Nepal Rastra Bank* (NRB) has not yet launched the National Payments System (NPS) which is supposed to clear the legal hurdles in the way of adopting an e-payment gateway by government offices. A document released by NRB in 2014 (which was an overview of the proposed NPS) states that the system will authorize the inter-operability between bank accounts and allow the transfer and collection of government revenues via e-payment.[39] But, this has not been put into practice yet.

[35] Lamichhane, interview.
[36] Government of Nepal 2014
[37] Government of Nepal 2014
[38] Government of Nepal 2010
[39] Nepal Rastra Bank 2014

Table 6: For the effective operation of Government Integrated Data Center (GIDC), cooperation between all government institutions will be expanded. In addition to encouraging these institutions to maximize the benefit from the data centers, proper provisions to migrate servers from all ministries, departments and government institutions to data centers will be made.

Type of decision making	E-governance phase	Supporting government moves
Incremental Though not mentioned explicitly in the previous IT Policy, the e-Government master plan (e-GMP) consulting report talks in length about the establishment of GIDC as one of the 8 priority projects.[42]	*IV*	• 13th National Plan[40] Working Policy: Cloud infrastructure will be constructed to transfer electronic data between all government offices/institutions to GIDC. Working Policy: Provision to electronically render the government-offered-services from a single portal will be made. • National Budget 2014/15[41] Administrative procedures will be simplified by introducing the merits of information technology. Prevailing practice of submitting the same set of documents in different offices will be ended to deliver a hassle-free service to people. • Government cloud will be set up to archive all information and statistics of GoN. Necessary land will be made available to those foreign investors who are interested to set up data center in Nepal.

State of implementation: GIDC located at *Singha Durbar* contains the web server and Domain Name System (DNS) server* of both the websites. Apart from these two servers, the migration of data from individual offices is either minimal or non-existent.

Analyses: This policy clause comes under the infrastructural framework as defined in Section 3. The government's plan to set up a government cloud is an ambitious one. The amount of resources required for the complete migration of the servers from government offices to GIDC is so huge that it almost seems unattainable at this point of time. Lack of elaborate planning, infrastructure setup, proper guidelines and monitoring provisions are further making the migration process difficult. Hence, to start with, the focus of the concerned authorities should be on the implementation of strict regulations and setting up of essential infrastructure to ensure the smooth and gradual migration of servers to GIDC.

[40] Government of Nepal 2014
[41] Government of Nepal 2014
[42] HMG Nepal 2006

** A website needs many types of servers, like web server, mail server, audio-video server, application server, ftp server, data server, etc. Web server serves static content to a web browser by loading a file from a disk and serving it across the network to a user's web browser. When users use alphanumeric address such as www.ocr.gov.np, the computer needs to understand what numerical IP addresses it needs to contact and this is accomplished through DNS servers. A DNS server is any computer registered to join the Domain Name System.*

4. Reviews of E-services in accordance with Supporting Directives

After the introduction of the IT Policy in 2010, the government issued two subsequent directives: the *Website development and management directive 2011* and the *Companies (electronic filing) directive 2012* to facilitate e-service delivery from the selected two offices. The 2011 directive contains instructions that need to be followed by both DoP and OCR. Similarly, the latter directive was introduced to manage the e-services offered specifically by OCR.

Appendix 1 contains tables where the e-service features of the two offices are written on the far-left column and indication of their inclusion/exclusion in DoP and OCR are shown in the right column. However, the main findings of the tables are summarized in the sub-headings below.

4.1 Review of *Website Development and Management Directive 2011*

The *Website development and management directive 2011* was introduced in order to organize and standardize e-service delivery via websites and is applicable to both OCR and DoP. Even though the issuing of the directive was a move in the right direction, the fact that it is lacking in many ways cannot be ignored. A lot of essential factors and common practices involved in the construction and maintenance of websites have been excluded such as browser-compatibility issues, offline viewing provisions, security issues, and online application tracking as indicated in Table 8 in the Appendix section. This could be because the directive is more focused towards improving the content rather than improving the user-experience, presentation and other technical issues of the website.

In regards to content, both websites are focused on publishing important content such as related laws and provisions, general information, tender notices, press releases, services offered and related charges or fees along with forms that can be downloaded. Both the websites have also included channels of communication for the service seekers in the form of an email address and OCR's website has a comment form as well. DoP's website has also followed instructions of the directive by publishing the names, designations and contact information of its staff though OCR's website does not have information on personnel.

It is evident that OCR has followed the directive better than DoP when it comes to publishing information on procedures to be followed for receiving the service. It has detailed instructions and information published in Nepali language on the website. However, it fails to provide guidance to a service seeker on how to use the website and since OCR's online portal is a relatively new offering, it would have been helpful to service seekers if they received guidance

on using the portal as well. But, in the case of DoP's website, it has not been able to provide any instructions that can guide a service seeker through the process. Detailed information on procedures to be followed for different types of services, like express issuance of MRP, correcting error on printed MRP, renewing MRP, among rest, are mostly missing from website. Such information would be critical to a service seeker. The DoP does however have a Frequently Asked Questions (FAQs) section according to the guidelines of the directive but this is missing in OCR's website.

Furthermore, both websites lag behind in providing a rich user-experience. A search box for internal search within the website is missing from DoP's website (see Figure 2) which makes it hard to search and locate relevant content within the website. However, OCR has incorporated this internal search box in its website. But in the case of OCR's website, it is difficult to determine whether the information is up to date or not as the date when the information was published or any file was uploaded in the website is mostly missing. DoP provides the date for the uploaded files, but does not mention the date for any updated information on the website. Archiving of content is absent from both the websites, contributing to the lack of organization of the content. Most of the content, excluding uploaded files, are not printer-friendly, creating another hurdle for a service seeker. The directive also states the need for information to be available in both Nepali and English, but this feature is not fully incorporated in either of the websites as mentioned earlier.

There are some essential areas that the directive does not focus on altogether. The directive mentions exactly two provisions about security, viz., requirement to undergo security-vulnerability-audit and the need to mention the provision of data security and privacy policy in the website. Even though these are basic security requirements which must be followed by every website, both the websites have failed to follow these provisions. A considerable amount of other security features like data backup, data privacy, strong protections against cyber threat and password protection are completely missing in the directive. Similarly, popular practices in websites offering services similar to that of DoP and OCR are online application tracking facility and browser/machine compatibility features in websites. Online tracking feature is absent from DoP's website and both websites have limited browser/machine compatibility.

Thus, what is clear is that both of the offices have failed to follow the directive rigorously. Many important instructions from the directive have not been implemented yet. To aggravate the situation further, some essential instructions have not been included in the directive to begin with. This shows the need of developing a comprehensive directive that does not miss out on essential components and also calls for a strong monitoring mechanism to ensure that directives are followed well.

4.2 Review of *Companies (Electronic Filing) Directive 2012*

Online application filing is applicable only to OCR. To standardize the online application filing for company registration, a specific directive, *Companies (electronic filing) directive* was issued in 2012. Despite its specific purpose, there are very few instructions listed in this document for the process of online application filing. And hence, instructions on many essential procedures required for electronic filing, such as saving and resuming the application process, periodically

updating the applicant on the status of his/her application, accepting electronic copy of documents, receiving electronic payment, providing electronic copy of certification, among others, are missing from the directive.[43]

The directive has set a time-limit for delivering e-service through OCR. For company-filing, it is 15 days from the date of application filing. However, two of the three interviewed respondents said it took them more than 15 days to receive the service.[44] According to the directive, OCR is required to provide a facility to check the availability of proposed company name from database in the website, which OCR is providing. OCR also keeps a separate online register in its data-server corresponding to each company for the storage of electronic documents as directed by the directive. Even though the directive talks about the electronic attestation of documents, the concept of electronic attestation is not made clear anywhere in the directive. OCR has not mentioned anything about the validation of electronic attestation elsewhere either.

Some other facilities, even though not mentioned in the directive, are provided by OCR. These provisions have given service seekers some level of a rich user-experience. The provision of saving and resuming the electronic application process at a later time makes the process convenient for service seekers. There is also a facility to save, delete or replace the uploaded document before the submission of the application. The application portal provides a check-list of files that are yet to be uploaded to assist the applicants. After the application is submitted, confirmation of submission is emailed to the applicant. Furthermore, updates regarding the application status are available on the online portal. However, the definitions of the various status updates and what they mean are not available on the website, which might make it confusing for the service seekers. In addition, the status of the applications are updated randomly, making it difficult for service seekers to keep track of the process.

OCR is supposed to offer a completely online application process but since electronic payment and electronic verification of the documents aren't yet functional, applicants are required to visit the office several times in order to complete the application process. They are required to make the payment and submit the hard copy of documents in person and are also required to collect the certification of the documents. Application fees amounting more than NRs. 10,000 needs to be paid via a particular branch of *Rastriya Banijya Bank* in Teku, Kathmandu and the original payment slip needs to be submitted at OCR's office. Service seekers interviewed were of the view that if the payment could be made via any branch of *Rastriya Banijya Bank* and scanned copy of the payment slip could be uploaded in the same application portal, then the necessity of standing in the long queues at several places could be easily avoided.

5. Status of the Two Studied Offices

The status of e-services of the two offices is presented in the section below. The analyses of the state of e-service delivery were drawn from findings discussed above along with interviews with service seekers and relevant published articles.

[43] Government of Nepal 2012

[44] Ambika Osti and other OCR service seekers, interview by Barsha Paudel, Gyaneshwor, Kathmandu, September 18, 2014.

5.1 DoP's Status

MRP-issuing-service is one of the most sought after services for Nepalese people in Nepal and abroad. A recent press statement issued by DoP on November 2 2014, states that DoP offers MRP-related services to approximately 4000 people each day. The DoP website contains crucial information on the application process along with essential forms that need to be downloaded which is why it is visited by the general public on a daily basis. The website receives almost twenty thousand visits per month on average.[45]

Despite the number of visits which is a clear indication of the demand on the service seeker side, the website is still at a very preliminary stage of e-service delivery. Given that it has already been fourteen years since the initial efforts to introduce e-governance started at a policy level, the office is far behind from where it should be. Based on the objectives set out by the IT Policy 2010, supporting directives and acts, DoP should have already achieved some clear landmarks in e-service delivery. As the service provided by DoP is supposed to be online, the website should at least meet the criteria stated by the *enhanced phase* of e-governance. Reaching the *enhanced phase* of e-governance for DoP would mean a well-functioning website that is constructed following the prevalent standard practices and GoN's directives for building and maintaining websites. But, Section 4 shows that DoP is lagging in implementation in many aspects. With the amount of resources available, e-service delivery of *enhanced phase* can be easily expected from this office. However, currently missing from e-service are rich user-experience via multi-browser compatibility, support for content search, multi-lingual support, facility to track the application online, opportunity for online communication with the office and intranet connectivity inside the DoP's office or between offices within a certain physical range. With this level of e-service delivery, service seekers could gather all information and forms from the website for MRP application, track the progress of their application online and be easily notified of any changes in the services offered by DoP even though the actual filing of application would still require an in-person visit to the office. But, the level of personal interaction required currently between the service seeker and the service provider indicates otherwise.

The office should have maximized the use of LAN. The use of LAN would have allowed the DoP staff to forward the application files to different departments within the office. Currently, the service seeker is personally required to take the application file to four different sections of the DoP's office to get the application approved. The office should also have been able to offer the facility to track applications online. DoP did start publishing a brief status of MRP applications in a publicly accessible PDF file since August 2014, but given the confidentiality of the information, this service should have instead been offered through an online status-tracking system where the information is visible only to the individual service seeker.[46] Sending important updates and notices via email is also expected of DoP at this stage. Even though the application form captures the email addresses of the applicants, none of the four service seekers interviewed received any email notifications from DoP when their MRP was ready for dispatch. One of them received a call from DoP to collect the MRP, while the rest had to make a telephone

[45] Department of Passport 2014
[46] Status of passport applications to be available online 2014

inquiry themselves.[47] Such limited online interaction is making the service highly inconvenient to service seekers and is against the clear objectives of the need for e-governance.

5.2 OCR's Status

OCR has already launched an online portal and the service was made mandatorily online in October, 2013.[48] GoN has also made other supporting provisions such as acceptance of digital signature possible through acts and guidelines. Because many necessary policy provisions were already in place and targeted agents were involved from business organizations, the adoption of e-governance for OCR was expected to be smooth and efficient. However, owing to a lot of issues, the effectiveness of its implementation is questionable. Even though the service should be granted within 15 days, only one of the service seekers interviewed received the service within that time-frame. These interviewees faced hold-ups due to many issues. For example, when documents were mistakenly submitted in wrong formats, the service seekers were not notified. All three service seekers who were interviewed stated that they had to visit the office in-person for services that should have been made available online. For one of the interviewees, it was because the electronic documents were forwarded to the wrong department for verification and was never followed up by the OCR staff. No email or phone inquiries were entertained in this case and the service seeker was not updated of her application's status. Consequently, she was forced to visit the office in-person.[49] This necessity of personal visits to the office despite the service going online makes the adoption of online system inefficacious.

Since OCR has stopped offering paper-based services, it should theoretically be at the *transactional phase* of e-governance. This means that OCR should have a completely online and standardised portal for service delivery that allows service seekers to file the application, save the application, retrieve the application, securely upload their documents/information/data, make online payment, track application and receive the approved certification, all online, obviating the need to travel to the office multiple times. However, the interviews with the service seekers indicated otherwise.

The study of e-service delivery in these two Kathmandu-based offices tells a very telling tale of the status of e-service delivery in Nepal. Problems such as the websites lacking rich-user-experience, security, storage and data categorization are persistent throughout. And since e-payment gateway is still not open for practice in government services in Nepal, the only phase that can be attained in any government office is the primitive *transactional phase*.

6. Conclusions

IT Policy 2010 came ten years after the previous IT Policy was promulgated. The policy document itself is a mere thirteen-page document with the first five pages dedicated to sections like introduction, background, previous attempts and challenges. Just like the previous policy document, the new policy document tries to cursorily cover a lot of sectors. A policy document

[47] MRP service seekers, interview by Barsha Paudel, Kalanki and Buddha Nagar, Kathmandu, September 22 and September 26, 2014
[48] Pradhan 2014
[49] Osti, interview

with such an ambitious scope requires for the policies and programs to be thoroughly outlined with clear indication of milestones and timelines. As it is only the second policy of its kind in a span of ten years, the document attempts to be a panacea for all existing problems whilst trying to be a guide for ambitious future programs/plans in the IT sector. One cannot deny that the document does have some good aspects. Its clauses cover areas of infrastructure, legal and technical frameworks necessary to create a base for e-service delivery. Moreover, different policy clauses of IT Policy 2010 have provisions to support different stages of e-governance, which is indicative of the fact that GoN plans to evolve e-governance practices and services to reach the final stage of *connected phase*. Construction of GIDC and GEA are indications of commitments towards long-term projects that are essential to reach the *connected phase*. Besides, the government has also shown gradual efforts towards managing the adoption of e-governance through the formulation of the *Website development and management directive 2011* and *Companies (electronic filing) directive 2012.*

The existing scenario of e-service delivery, however, speaks of the shortcomings in the implementation side of the policy. The status of the DoP's e-service is in between the *emerging* and *enhanced phase*, whereas OCR's is in between *enhanced* and *transactional phase,* both still a long way from achieving the *connected phase*.

6.1 Envisioning and Implementation of the IT Policy

The IT Policy 2000 directly supported the e*merging phase* of e-governance by setting out requirements for all government offices to build websites. The rest of the three phases were indirectly and sparsely supported; *enhanced phase* in the form of e-GMP, *transactional phase* in the form of e-commerce promotion and *connected phase* in the form of NITC. Whereas, the IT Policy 2010 was built on the assumption that all government offices had achieved the *emerging phase*; but this has not been the case. The policy espouses some provisions directly relevant to other three phases. Moreover, other requirements of *transactional phase,* like availability of downloadable forms in websites, electronic submission of documents and accessibility to interactive web-portals for servicer seekers were gradually addressed through directives. To add to this, there are other documents in the form of directives and guidelines and sparse inclusions in budget and national plans supporting all four phases. The IT Policy 2010 has made a definite commitment in paper to reach the *connected phase* of e-governance by introducing the concept of GIDC and planning gradual migration of servers from government offices to GIDC. But, the efforts towards achieving the *connected phase* do not match the level of commitment reflected in the policy document. While it is true that most of the ministries and corporations, some offices and few municipalities have a web-presence, many of the offices of the central government and the local government institutions are yet to have a website of their own. Most of the offices with websites have not advanced to *enhanced phase* as evident from the two cases studied in this research. There are a lot of discrepancies between what is laid out on paper and what exists in practice as seen earlier in this paper. Deviations from following the standard design practices in building websites are commonly found when it comes to adopting safety features, providing language options, using localized software and maintaining a two-way communication with service seekers. This also means the data and security architectures outlined in GEA are not followed by the offices. Moreover, some offices have already upgraded themselves to early *transactional phase* without even offering the mandatory provisions of *enhanced phase*. And

with the lack of the e-payment gateway, the non-acceptance of electronic certification, digital photo and signature and limited use of LAN connectivity, service seekers are required to visit the office to get the service which completely defeats the purpose of the upgrade. Lack of NRB's commitment in legalizing e-payment gateway in government offices through NPS has played a significant part in slowing down this phase. Moreover, the concept of e-GMP, despite being championed for fourteen years like the e-payment gateway, is in the infantile stage of implementation. Most notably, major aspects of e-GMP like data categorization, data security, data backup and use of intranet connectivity between offices have slipped under the radar.

The ultimate goal of any e-governance system is to acquire the *connected phase*. Although there have been attempts to create a single portal of e-service delivery, the outcomes are disappointing. The construction of a website called unified government portal is at its rudimentary stage between *emerging* and *enhanced phase*.[50] Furthermore, the construction of GIDC enabled with enhanced security features has been behind schedule and the migration has been minimal. Moreover, in the absence of a full-fledged data-highway across the nation, a lot of government offices can be expected to be still disconnected from GIDC for a considerable number of years. The aforementioned factors are a testimony to the fact that the implementation of e-governance has not been on par with the level of commitments on paper.

As mentioned earlier, the first thing that becomes evident from a look at the policy document is its brevity. A lot of pressing issues have been excluded from the policy document. Overlooking the need to revise the document has also been detrimental towards the efforts of implementing e-governance. The IT Policy 2010 was meant to be revised every three years. But, even after four years since its formulation, it has not been revised yet. Because these documents are not revised in a timely manner, important provisions and changes that become pressing with time go unaccounted for. For the same reason, the pressing issues of data security and data redundancy have been missing from the recent policy document. Many clauses in the recent document are copied from earlier policy document without any analysis of their efficacy. Among six policy clauses reviewed in Section 3.2, one was repeated and two were incremental, meaning the same policies have been around for fourteen years. This lack of constant revision and policy-monitoring has resulted in a rather inefficient and outdated policy document for today's agenda of e-governance. Moreover, two of the three policies mentioned above are covered under infrastructure framework and the related projects are still far from completion, exposing the gap between formulation and implementation of the policy.

Ignored revision of policy document fails to make the document adequate enough to catch up with the dynamic nature of the IT sector. GoN has made some effort every now and then to bridge this inadequacy through other means, such as directives, acts, laws, national plan and the budget, among others. However, sometimes these directives have been anachronistic and at other times, the supplementary provisions for policy document have not filled the inadequacy of the core policy document. Hence, the aforementioned efforts have been unable to compensate the policy-void and have subsequently failed to provide enough support and coordination for the implementation of programs/plans. Examples of such efforts include promotion of the use of FOS, adoption of OS, localization of IT and construction of the government cloud. The Realist Review applied in this research shows that there are very few other supporting government

[50] Government of Nepal 2014

acts/plans to bolster the use of FOS, adoption of OS and localization of IT - making the efforts to address the shortcomings severely inadequate. The government cloud as a part of GIDC has been included in the national budget for two consecutive years. But, the work has not progressed any further. For it to be effectual, there are a lot of essentials factors such as LAN connection among offices, provisioning of secure connection to the data server and classification of data according to their security status that need to be properly addressed first. Hence, the GoN, instead of being overly ambitious, needs to ensure that the necessary fundamentals are in place first.

The other problem seen in adoption and/or envisioning of policies and plans is the blindfolded acceptance of consulting reports produced by external agencies. The GEA documents that are available on the government websites are the exact consulting documents prepared by PwC India for HLCIT. Same is the case for e-GMP report, which was prepared by KIPA for HLCIT. Given the depth of the matter, the duration of programs and the importance of projects these reports deal with, it must be a standard procedure to subject them to rigorous review and revision before they are accepted and endorsed by the government. The lack of realistic timeline and milestones for most of the programs indicates that these programs/plans have not been through thorough discussions regarding their feasibility, risks, possibilities, and the impact of the failures in their execution.

The lack of initial planning and discussions have created a dearth of comprehensive and integrated policies, directives and action plans, which have been the factors resulting in sub-standard works; instances of which are visible in the two studied offices. Besides, what we see is the absence of a clear action plan regarding the use of IT in delivering services. Even though e-service delivery is one of the goals of IT Policy 2010, it does not specifically dedicate any section on marking the milestones for e-service delivery and managing the available infrastructure and technologies. Even if service delivery has been addressed, the addressing is not comprehensive, mostly making the provisions for safety, standardization and monitoring lacking in many ways.

6.2 Envisioning and Implementation of Directives

The two directives issued to support specific clauses of the IT policy 2010 can also be individually assessed to show the lack of planning and the implementation gaps that exist.

The issuing of *Website development and management directive 2011* is anachronistic. Government offices started building websites soon after the introduction of IT Policy 2000. By 2010, twenty five of twenty six ministries already had a web-presence.[51] Hence, introduction of the aforementioned directive after a decade of practice makes it anachronistic. Had the directive been introduced before most of the websites for government offices were built, many of those websites probably would have been built according to the directive ensuring uniformity and a common standard. Moreover, for a directive introduced in the year 2011, the near complete omission of security issues and thorough testing provisions are alarming and raises a big question on the completeness and adequacy of the directive. Furthermore, the lack of provisions of thorough testing after development of websites has compromised the quality of online portal of OCR as shown in Section 4.2.

[51] Dhakal and Jamil 2010

Companies (electronic filing) directive 2012 was introduced at the apt time - just before the opening of online portal of OCR. But, the directive is not thorough and has not addressed all the essential components required for migrating OCR's service to *transactional phase* as seen in Section 4.2. The provision of e-payment or its substitution, if any, to avoid long queues at banks and offices, publishing of data dumping policy and issuing of e-certification are missing from the directive. Even though GoN's weak e-governance apparatus is to be blamed for some of the shortcomings, OCR's lack of commitment is largely responsible for the failure in adoption of a substitute method to help service seekers avoid office visits. Also, the online portal needs to be updated every few years to catch up with the technological advancements, such as interactive websites, advanced online security of portals and data, among rest. However, the directive completely fails to mention the need for periodic update and revision exposing the lack of extensive planning in issuing of the directive.

7. Recommendations

Based on the observations and analyses of policy documents and directives, three major recommendations are proposed which can be incorporated in future policy documents.

- **Necessary homework should be done before policies are introduced**

  Proposed programs/plans must be rigorously analyzed and their feasibility test should be conducted before acceptance. It was seen that most of the consultation works were done by foreigners and the research reports were largely limited to desk-research, with little or no field research whatsoever. Hence, it is likely that important markers that would have been obvious with some field research were missing making the proposed programs less feasible. That is why a feasibility test of the programs must be conducted before accepting them. And, the IT Policy in itself must be developed after thorough planning and comprehensive analysis of each programs/plans included in the policy document to minimize the inclusion of less feasible programs. For instance, the concept of venture capital seed money with the joint participation of public and private sectors for the development of the IT sector was introduced in IT Policy 2000; however, it was dropped in the subsequent IT Policy 2010.

- **Timelines and measurable targets must be incorporated**

  All the projects/plans must have measurable targets, milestones, timelines and deliverables clearly mentioned and programs'/plans' efficacy must be periodically appraised based on these. Currently, with the lack of any type of measurable and timelines, the monitoring aspect is seen to be very poor which has hampered the program's retention and continuity. Moreover, there must be a time-limit set for the completion of proposed projects/plans. Long-term projects should only be limited to infrastructural framework projects, if necessary. It is seen from the analyses that long-term projects were seldom completed and were inconclusively continued for a long periods wasting both time and capital resources. Furthermore, the policy must be revised periodically within the designated time-frame.

- **Policy documents should be comprehensible**

The policy clauses must be self-explanatory and properly arranged under several sub-headings so that there is a clarity in the purpose of each policy clause. Currently, it is hard to identify whether a policy clause is supporting an infrastructure, legal or technical standard base. With the increasing number of IT-related issues that need to be addressed for e-service delivery, there is a growing need for comprehensive policies. For example, if the service offered by DoP were to be upgraded to *transactional phase* then the addressing of the issues related to inter-country LAN connectivity, data security and the acceptance of digital signature, digital photograph and e-payment is a must. Given that different government offices at different places are in different stages of e-governance, it might be challenging to produce a comprehensive policy document applicable to all offices. In this case, the gap can be addressed through other means, like guidelines and directives. Moreover, unlike existing documents, proper care should be given to the comprehensiveness and relevance of the content in supplementary directives and acts.

8. References

1. S. Bose and M. R. Rashel. 2007. "Implementing e-governance using OECD model (modified) and Gartner model (modified) upon agriculture of Bangladesh." Paper presented at the 10th International conference on Computer and Information Technology, Dhaka, Bangladesh.
2. A. D. Maio. 2001. "E-Government Scenario", Gartner Research.
3. United Nations. 2014. *United Nations E-Government Surveys: 2014, E-Government For the Future We Want.* New York: United Nations.
4. His Majesty's Government of Nepal. 2000. *IT Policy, 2057*. Kathmandu: HMG/Nepal.
5. Government of Nepal. 2010. *IT Policy, 2067*. Kathmandu: Government of Nepal.
6. T. N. Dhakal and I. Jamil. 2010. "Prospects and Challenges of E-Governance for Service Delivery in Nepal". Paper presented at Reaching out to People, Achieving Millennium Development Goals through Innovative Public Service Delivery, Trivandrum, India, December 11-13.
7. Computer Association of Nepal-USA. 2008. *Progress and Challenges of ICT Development in Nepal*. California : CAN-USA
8. N. Dhakal. 2013. *Catch Up Strategy: An Instrument to Enhance E-Government in Nepal*. Kathmandu: Nepal Telecom.
9. M. P. Pariyar. 2007. "e-Government Initiatives in Nepal: Challenges and Opportunities." Proceedings of the 1st international conference on theory and practice of electronic governance. Pages 280-282. Macao SAR, China.
10. G. Goldkuhl and A. Persson. 2006. "From e-ladder to e-diamond. Re-conceptualising models for public e-services." Paper presented at 14th European Conference on Information Systems, Göteborg, Sweden.
11. National Information Technology Center. 2011. *Sarkari nikaya ko website nirmaan tatha byawasthapan sambandhi nirdeshika, 2068*. Kathmandu: Government of Nepal.
12. Government of Nepal. 2012. *Company (bidhyutiya filing) nirdeshika, 2069*. Kathmandu: Government of Nepal.
13. R. Pawson, T. Greenhalgh, G. Harvey and K. Walshe. 2005. "Realist review – a new method of systematic review designed for complex policy interventions." *Journal of Health Services Research & Policy* 10, (1): 21–34.
14. Office of Company Registrar, Government of Nepal. 2014. Accessed on August 15, 2014. http://www.ocr.gov.np/index.php/np/2012-08-28-09-11-33/2012-08-28-10-27-45
15. National Planning Commission, Government of Nepal. 2013. *Terhaun Yojana (Aarthik barsha 2070/71-2072/73)*. Kathmandu: Government of Nepal.
16. Korean IT Industry Promotion Agency. 2006. *E-government Master Plan Consulting Report*. Kathmandu: GoN, KIPA.
17. PwC India. 2011. *Nepal Government Enterprise Architecture - Main Report*. India: PwC.
18. National University of Singapore (NUS) Institute of Systems Science. 2010. *Enterprise Architecture as Platform for Connected Government.* Singapore: NUS Institute of Systems Science. http://unpan1.un.org/intradoc/groups/public/documents/unpan/unpan039390.pdf

19. Government of Nepal. 2006. *The Electronic Transactions Act, 2063 2008*. Kathmandu: GoN.
20. Government of Nepal. 2007. *The Electronic Transactions Rules 2064 2007*. Kathmandu: GoN.
21. Ministry of Science and Technology. 2010. *Secure Password Practices, 2067*. Kathmandu: GoN.
22. Nepal Rastra Bank, Banks and Financial Institutions Regulation Department. 2014. *Nepal Payments System Development Strategy*. Kathmandu: NRB.
23. R. Shrestha. 2010. "Hackers targeting Nepali websites". *The Kathmandu Post*, April 19. Accessed November 24, 2014. http://www.ekantipur.com/the-kathmandu-post/2010/04/19/Business/Hackers-targeting-Nepali-websites/207392/
24. Ministry of Finance, Government of Nepal. 2014. *The Budget Speech of Fiscal Year 2014/15*. Kathmandu: GoN.
25. Republica Daily. 2014. "Status of passport applications to be available online." *Republica Daily*, August 20, 2014. Accessed September 10, 2014. http://www.myrepublica.com/portal/index.php?action=news_details&news_id=81318
26. S. Pradhan. 2014. "Ins and outs of the company registration process in Nepal." *The Economic Angle*, 2014. Accessed May 20, 2014. http://econitynepal.com/?p=465

Appendix 1

The tables below contain the services being offered or expected to be offered by DoP and OCR on the left hand side. These services are either taken from one of the two studied directives or prevalent general practices of respective e-services. All of the tables have two columns on the right, one for each office under review, except for Tables 9 and 10, which contain only one column for OCR-offered services since these services are OCR-specific. The column/s on the right side indicates whether the corresponding service in the far left column is available at the two offices under consideration. This column/s may further contain short remarks at the end of this section to clarify the state of the e-services. To summarize, these tables will provide a nutshell view of existing scenario of e-services in the two offices.

Table 7: Website-related, in accordance with Website development and management directive, 2011

	DoP	**OCR**
General features of website of the offices		
Source declaration of contents derived from other sources	Yes	Yes
Data security and privacy policy clearly stated in the website	No	No
Information on the purpose of the office and its services		
Information on goals, missions of the office	Yes	Yes
Classification of services from the office to individual, businesses and government	No	No
Thorough information on procedures to follow to receive the service, including whether or not the service seeker needs to be present at the office in person	Yes	Yes
Content of the website		
Vision, goals and mission of the office	Yes	Yes
Name, introduction and responsibilities of higher officials of the office	Yes	No
Telephone and email address of staffs responsible for carrying out office's works	Yes	No
Related laws and provisions	Yes	Yes
Organizational structure of the office	Yes	No
Information on the service being delivered		
Citizen's charter	Yes	No
List of services the offices offers	Yes	Yes
Detailed information on the service being offered	No[#1]	Yes
Information on how to obtain the service	Yes	Yes
Downloadable forms for all purpose	Yes	Yes
Information on activities of the office		
History of the office	Yes	Yes
Progress and achievements of the office	Yes	Yes
Current plans and programs	No	No
Frequently asked questions (FAQs)	Yes	No
Comment form or email address to send comments	Yes	Yes
Information, tender notice and press release from the office	Yes	Yes

Related web pages' links	Yes	Yes
Yearly report, budget and plans related to the office	No	No
Fees and charges related to the service being offered	Yes	Yes
Site map	Yes	Yes
Website search engine	No	Yes
When the contents are updated, the date when they were updated	No	No
Website development and presentation		
User friendly navigation	Yes	Yes
No more than 3 clicks required to access any content within the website, i.e., a depth link of 3	Yes	Yes
Archiving of contents, when relevant	No	No
Contents on the website should either be in HTML, Word or PDF format	Yes	Yes
Printer friendly	No	No
Website must have undergone security vulnerability audit	No	No
Dual language, Nepali and English, for all contents of the website	No	No
Nepali script should be in Unicode	No	Yes
Use content management system	Yes	Yes
Provision to check government email (.gov.np)	No	Yes

Table 8: Website-related, rich user-experience in accordance with prevalent practices

	DoP	**OCR**
Information on what to do for all possibilities, like human error, technical error, lost documents etc.	Yes[#2]	No
Information on renewal of services, if applicable	No	N/A
Browser compatibility	Limited	Limited
Operating system compatibility	Limited	Limited
Offline saving and viewing of web pages	Yes	Yes
Broken links	No	Yes
Updates on application upon request via email	Yes	Yes*[1]
Tracking of application	No	Yes*[2]

Table 9: Online application process for company filing related, in accordance with Companies (electronic filing) directive, 2012

	OCR
Provision to send documents sent in electronic copy	Yes
Service seekers granted service within 15 days of online application	No*[3]
See the availability of proposed company name from database in the website	Yes
Separate online register for each company to keep the submitted and sent electronic documents safe	Yes
Electronic documents sent should be signed by concerned authority or attested electronically	Yes*[4]

Table 10: Online application process for company filing related, rich user-experience in accordance with prevalent practices in electronic application filing

	OCR
Save and resume the electronic filing at a later time	Yes
Full instructions on how to upload files, maximum file size allowed, formats of files allowed, time out of the upload-portal	No*[5]
Checklist of files uploaded and yet to upload	Yes
Facility to view upload progress during real-time uploading	No*[6]
Facility to save, delete or replace the documents uploaded before the application is submitted	Yes
Facility to save, delete, replace or correct the documents uploaded after the application is submitted	No
Confirmation email of the submission/application	Yes
Periodic updating of the status of the application via website or email	Yes*[7]
Requirement of signed and stamped original documents in hard copy	Yes
Electronic payment	No*[8]
Office visit	Yes
Electronic copy of certification along with paper copy	No*[9]

Table 11: Remaining relevant services, in accordance with popular practice

	DoP	**OCR**
Use of intranet connectivity within office to facilitate service seekers	No	Yes
Intranet connectivity within offices at certain range	No[#3]	No
Windows required to visit at the office to complete the application	4	3

[#1] Information on procedures to follow for some services, like expedited service, renewal of MRP, etc. is missing.
[#2] Even though there is information being added continuously on other possible cases, the information is not yet complete.
[#3] For Citizenship cards obtained from Kathmandu, Lalitpur and Bhaktapur district, the verification is done through the intra-office connectivity.
*[1] Not always available, as was the case for one of the interviewed respondents among OCR's service seekers.
*[2] Sometimes the online portal of applicant is not updated, as was the case for one of the interviewed respondents among OCR's service seekers.
*[3] In case of internal technical errors, like forwarding of the documents to wrong department for review, the service is not granted within fifteen days. Two of the interviewed respondents among OCR's service seekers said it took more than fifteen days to get the service.
*[4] Concept of electronic attestation and its validation is not made clear anywhere.
*[5] Instructions on maximum limit of file size allowed and time-out of portal not given.
*[6] The upload-on-progress bar which shows how much upload is completed are not shown. However, an indication is provided once the file is uploaded completely.
*[7] Updates are not given via email, but provided via online portal of applicant.
*[8] The payments of more than NRs. 10,000 should be paid via a particular branch of *Rastriya Banijya Bank* in Teku, Kathmandu and the original payment slip should be submitted at the OCR.
*[9] Only paper-certification provided.