Evaluation of the Performance, Status, Effectiveness and Impact of Mobile Governance in Karnataka

External Evaluation

ಕರ್ನಾಟಕ ಮೌಲ್ಯಮಾಪನ ಪ್ರಾಧಿಕಾರ
Karnataka Evaluation Authority

Study conducted for
Karnataka Evaluation Authority
and
Department of e-Governance,
Government of Karnataka
by

M/s Hyderabad Karnataka Centre
For Advanced Learning,
H. No. 10-2-152, Bank Colony,
Sangameshwara Nagar
Gulbarga- 585 101

June
2017

FINAL EVALUATION REPORT

"Evaluation of the Performance, Status, Effectiveness and Impact of Mobile Governance in Karnataka State"

HKCAL, Gulbarga

Under auspices of

Karnataka Evaluation Authority (KEA)

PREFACE

Mobile Governance in Karnataka is envisaged as one web solution to address all transactional procedures of the citizens with Government and other organizations. The study 'The performance, Status, Effectiveness and Impact of Mobile Governance in Karnataka' is an attempt to find out the coverage, usage and impact of mobile governance in Karnataka. The Study was initiated by e- Governance Department to be taken p by Karnataka Evaluation Authority (KEA). Kea outsourced the study to the ECO HKCAL Gulbarga. The study evaluates the performance based on desk research as well as a sample of user respondents from different divisions of the State and Bangalore city and from different strata ranging from farmers and students to software professionals. The findings of the study indicate that though the usage of mobile governance is low it has high potential and utility.

The study received constant support and guidance of the Additional Chief Secretary / Principal Secretary and the Secretary Planning, Programme Monitoring and Statistics Department, Government of Karnataka. The officers of the e-Governance Department have also extended their support and cooperation by providing the necessary information. The quality of the report is ensured through a review by members of the Technical Committee of KEA, and an Independent Assessor. Their useful inputs and suggestions have helped to improve the quality of the draft report.

I hope the findings and recommendations of the study will be useful to the department in formulating effective stratified to enhance the coverage and effectiveness of Mobile Governance.

ShivRaj Singh
Chief Evaluation Officer
Karnataka Evaluation Authority

Acknowledgement

The "**Evaluation of the Performance, Status, Effectiveness and Impact of Mobile Governance in Karnataka**" was compiled with efficient analysis of primary and secondary data obtained from the valuable information contributed by beneficiaries of the scheme selected from 30 districts of Karnataka. HKCAL would like to acknowledge the following persons for their valuable contribution in evaluation of this report

Shri. Shivaraj Singh, IFS, Chief Evaluation Officer, Karnataka Evaluation Authority, Govt. of Karnataka.

Shri Ranganna Consultant, Smt. Chaya Devagaonkar Consultant and Smt. Jyothi Jenni, Additional PO, Karnataka Evaluation Authority.

The Project Director of Mobile Governance in the Centre for E - Governance, Bengaluru.

We thank all the concerned officers and Staff of Centre for E-Governance, HKCAL Principal Investigator Dr Dilipkumar S.M. and his team, who contributed their time and information in taking up the Evaluation of the Scheme without whom the evaluation would not have been possible.

Director

HKCAL, Kalaburagi

Glossary

B2C : Business-to-Customer.

CeG : Center for e-Governance.

G2B : Government-to-Business.

G2C : Government-to-Citizens.

GUI : Graphical User Interface.

HID : Human Interface Device.

HKCAL : Hyderabad Karnataka Center for Advanced Learning.

HRMS : Human Resource Management System.

ICT : Information and Communication Technology.

IMPS : Immediate Payment Service.

ITU : International Telecommunication Union.

IVR : Interactive Voice Response.

KEA: Karnataka Evaluation Authority.

KMO: Karnataka Mobile One.

KSWAN : Karnataka State Wide Area Network.

LTD : Live-Till-Date.

MTD: Month-To-Date.

OTP : One Time Password.

PC : Personal Computer.

PDA : Personal Digital Assistant.

POI : Point-of-Interest.

RCB : Registered Certifying Bodies.

SECLAN : Secretariat Local Area Network.

SeMT : State E-Mission Team.

SLA : Service Level Agreement.

SMS: Simple Message Service.

STQC : Standardization, Testing and Quality Certification.

ToR : Terms of Reference.

TRAI : Telecom Regulatory Authority of India.

URL : Uniform Resource Locator.

USSD : Unstructured Supplementary Service Data.

UU : Unique User.

VAS : Value Added Services.

Contents

List of Tables

List of Figures

Chapter 1

Executive Summary

We are living in the world of mobile phones of late. The penetration of mobile phones into our day to day life is such that it has become part and parcel of our life. We can hardly find a family in village or in urban areas which do not possess a mobile phone making one of the basic necessities of individuals and families. Any individual or family even with less income source makes e orts to own a mobile set. In addition, the growing competition in mobile manufacturers has lowered the prices of mobile phones. This is one of the key reasons why we can see mobile phones everywhere be it in rural or urban localities.

In the last decade, the adoption to mobile phones and other wireless technology has changed drastically across the country. This development has been leveraged upon to provide various Government, public and private sector services through Mobile Governance which have a far reaching impact. Mobile Governance is a revolutionary framework which is aimed at leveraging the exponential growth that has happened in the wireless communication technology and the far reaching acceptability it has received in the country.

In terms of mobile users, India ranks second in the world, next to China, as per the data available in TRAI Press Release[1] and World Bank Report[2]. The country with population of 1,295,291,543 has 1,049,740,000 mobile phones at the rate of 82.17% per 100 citizens as of 30th September 2016. Mobile phones facilitate us in various ways in day to day life. They help us in easy and timely communication, access to Internet and social media, save money, ensure safety and the like.

Mobile Governance in Karnataka is envisaged to evolve as a one web solution to address all transactional procedures of the citizens with the government departments, public sector organizations and private organizations. To

[1] TRAI Press release, TRAI, 30 Sep. 2016

[2] World Bank Population Data, World Bank, Retrieved 5th Dec. 2015

realize this ambitious project, it is important for the Government to facilitate creation of reliable technology platforms and technically qualified human re-sources which would accelerate adoption of these services.

The Karnataka Evaluation Authority in congruence with the Center for e-Governance has entrusted Hyderabad Karnataka Center for Advanced Learning (HKCAL), Gulbarga to conduct a technical data analysis and an unbiased survey with the objective of evaluating the performance, status, effectiveness and impact of mobile services in Karnataka state.

This evaluation report targets the citizens from diverse fields ranging from farmers to software professionals, students to government servants, etc. Also, the real-time history data from the Karnataka Mobile One portal dashboard of the Center for e-Governance cell, Government of Karnataka is analyzed.

The research methodology has included both qualitative and quantitative approaches. The quantitative research aims to assess the performance, impact and status of mobile services and qualitative research aims at establishing and measuring the performance indicators that can holistically evaluate the efficiency or efficacy and opinion of users of the Mobile Governance initiative.

The quantitative research has used a formalized and unconcealed questionnaire with close ended questions (Dichotomous, Multiple Responses, and Scale Based). Data were collected through means of survey administered via personal interview and online depending on convenience. First, the desk research was carried out to identify the current shortcomings in Karnataka Mobile One portal and review the potential tools for adopting mobile services in the State. This was done with the officials, technical team and other stake holders of mobile services. The second component i.e., field work was conducted in all parts of the Karnataka State. Four different administrative divisions or regions of the Karnataka State namely Bengaluru, Mysuru, Kalaburgi and Belagavi along with Bengaluru city were considered for evaluation. Roughly, 400 respondents were chosen on random basis from each of the divisions drawing a total of nearly 1600 respondents. Out of 400 respondents from each division, 50% were from district headquarters, 25% each from taluk headquarters and hobli levels. In addition, approximately another 400 respondents were randomly chosen from the Bengaluru city, amounting to 1936 respondents finally.

With regard to current status, only 658 services are integrated into the plat-form, expansion of the set of services by the Departments are limited by the lack of partnering with Government Departments, public and private sector

organizations. It is found that only 0.4% of the mobile phones are registered to access the portal services as against the total number of mobile phones in the State.

It is observed that among the payment based services, the highest number of payments is occurring in the utility services with 95.47%, followed by transportation services with 1.98% and telecom services with 1.26%. The remaining 1.29% is shared by all other category services.

It is observed that many Departments do not provide a complete set of ser-vices that it offers to other users. It is found that only 60.1% of the financial transactions are successful without the fault of user.

Another objective of the study was to determine the impact of the mobile services. The impact has been measured on parameters like awareness, ease and efficiency. Only 33.3% of the respondents are aware of the mobile services out of which only 7% have the highest level of awareness, which leaves considerable scope for creating awareness through online and conventional channels, a medium that is being extensively used today. More than 88% of the users believe that the services have eased the procedures and 64% of them believe that it has brought efficiency.

It was also found that the ICARE facility service is implemented by only three departments. The users are not aware of the ICARE facility.

In spite of several shortcomings, as compared to conventional services delivery mechanisms, the Karnataka Mobile One portal is found to be extremely useful to the users but exploration of the portal offerings is very limited. The research also asked the users for their insights and suggestions for the mobile services. The responses ranged from improving the usability of the processes by bench-marking them with usability provided by private commercial service providers, to improve the security and privacy needs as well as payment gateway, to taking up initiatives to increase the awareness of the high impact potential service and dissemination of timely updates.

Recommendations

Based on all the analysis, and keeping in mind the end objective, the evaluation team recommends the following:

1. During the launch of Karnataka Mobile One (KMO) service in Karnataka there were 4281 services and currently based on the user's feedback, there

are only 658 functioning services. With this, we can conclude that the active services have dropped down to 15.37% since its inception. Hence, there is a need to look in with regard to the services that are currently not included.

2. It is observed that less than 1% of the mobile users in the State have registered to the Karnataka Mobile One. Henceforth, citizen services of Government Departments and private sectors could be partnered and redirected to Karnataka Mobile One service for a single point interface and to facilitate access to mobile services at free or nominal rates.

3. It is recommended to include several other features and improve the GUI of the KMO application/app in addition to few security aspects.

4. During the survey, it is observed that only 33.3% citizens are aware of Karnataka Mobile One service in Karnataka. Therefore, a well defined branding strategy in terms of planning, advertising and popularizing is necessary to make citizens start using mobile services to full extent.

5. It is observed that only 15 services can be availed using more than or equal to 3 channels. Hence, measures can be taken to include various channels to other services.

6. Work on strengthening client relationships by working closely with partnering line departments, and communicating periodic updates and con-ducting regular feedback exercises.

7. A 24 7 365 call centre or ICARE service manned with well trained and highly professional executives is essential to achieve high standards of service and responsiveness that the Mobile Governance team strives for. This will also streamline response effectiveness and closure of various query/ complaint tickets in the prescribed resolution time.

8. In addition to the above recommendations, several specific (technical) recommendations are listed in Sections 9.2.1 and 9.2.3 that may be implemented on priority basis.

Keywords

Mobile Governance, Karnataka, Performance, Status, Impact, Evaluation, mo-bile phone, mobile services.

Chapter 2

Introduction

In this chapter, the definition of mobile governance, mobile services and their advantages are brie y presented. Further, a brief introduction to Center for e-Governance, Government of Karnataka, Karnataka Mobile One (KMO) application/app and background is provided.

2.1 Definition of Mobile Governance

\Mobile governance (m-Governance) is a functional subset of all inclusive e-Government that utilizes the unique features of mobile and/or wireless technologies like cellular/mobile phones, laptops and PDAs (personal digital assistants) connected to wireless networks for provision of location based government services and information to officials and citizens/businesses at anytime (24/7 Operational Model) and any place" (Vikas Kanungo, 2007).

Mobile technology is the rapidly adopted technology in history and the most popular and widespread personal technology. According to ITU, in 2014 the number of mobile-cellular telephone subscribers in the world has reached 7 Billion and the number of mobile-cellular telephone subscriptions per 100 in-habitants in India was 74.48.

Given this unparalleled advancement of mobile communication technologies, governments are turning to Mobile Governance to realize the value of mobile technologies for responsive governance and measurable improvements to social and economic development, public service delivery, operational efficiencies and active citizen engagement. The inter-operability of mobile applications which support quick access to integrated data and location-based services, paves the way for innovative public and private sector governance models.

Given the fact that majority of Indian citizens reside in rural areas, mobile devices are ideally suited as alternative access and delivery channels for public

services in these areas. The success of the proposed initiative on Mobile Governance will greatly depend upon the ability of the government departments and agencies to provide frequently needed public services to the citizens; create infrastructure for anytime and anywhere mobile-based services; adopt appropriate open standard; develop suitable technology platforms; make the cost of services a fordable; and also create awareness, especially in under-served areas. Because of its relatively low cost, ease of use, and accessibility, mobile technology might be the solution for digital connectivity in rural areas.

Compared to classical e-government, mobile governance raises various additional opportunities. First and foremost, Mobile Governance perfectly fits the always-on mentality of modern societies, where information, services, and resources are expected to be available anywhere, any time and anyhow. By relying on mobile technologies, government, public and private sector services can be made accessible 24/7 and independent from the citizen's current context. Second, modern mobile end-user devices feature various technologies that are typically not available on classical end-user devices. This enables completely new use cases and application scenarios. Finally, mobile governance can also be advantageous in regions that suffer from a lack of reliable wire-based communication infrastructures. This applies to several developing countries including India, where mobile communication networks are often more developed than wire-based infrastructures. Therefore, mobile governance services are often the major tools to access the online services and to be efficiently used by the citizens.

2.2 About Center for e-Governance

Centre for e-Governance CeG is a society under the Department of Personnel and Administrative Reforms (e-Governance), Government of Karnataka. CeG was formed with the vision of delivering governance at \Anytime, anywhere and anyhow" for all Government Departments of Karnataka. The following major services are provided to Departments by CeG:

1. Core Infrastructure: KSWAN, SECLAN, etc.
2. Enterprise Applications: e-Procurement, HRMS, etc.
3. Citizen Service Centers: Bangalore One, e-District
4. Consultation and Advisory: SeMT consultation

2.3 About Karnataka Mobile One (KMO)

The honorable president of India launched the Karnataka Mobile One project on 8th December 2014. This project is the first of its kind in the country and world's largest multi-mode mobile governance platform providing anytime, anywhere and anyhow delivery of citizen services at one place to access all Government, public and private sector services. It is designed to service the citizens, Government and businesses alike and provide a unified user interface or one access point (one URL, one App or one short code). In fact, a total of 4302 services including 178 (Departmental), 480 (sakala {G2C) and 3644 (B2C) were included in the Karnataka Mobile One project. The Karnataka Mobile One portal can be accessed via the hyperlink https://www.mobile.karnataka.gov.in/. The user login screen asks for a user's 10-digit mobile number and a password to get registered. On acceptance of the terms of use and privacy policy, the user can log in. The one code numbers include 161# to dial and 161 for SMS help. In addition, a toll-free number 1800-425-425-425 for in-formation enquiry and serves as help desk, and a contact e-mail provided is support.m1@karnataka.gov.in. The available channels include:

1. Mobile Web
2. Mobile App
3. IVR
4. USSD
5. Push SMS and
6. Pull SMS

The benefits of Karnataka Mobile One project include the following:

1. Aggregation of demand, hence economy of scale;
2. Single window for managing SLA;
3. Quick turnaround time for implementation;
4. Bring best practices within and beyond State Government and
5. Hosted in Karnataka State Data Centre, hence secured.

The different category of mobile services with their respective mode of communication are provided in Table 2.1. The payment instruments supported for payment service are credit card, debit card, IMPS (Immediate Payment System), net banking and mobile wallets.

Service category	Channel (mode of communication)
Push Informational Service	SMS and IVR
Pull Informational Service	SMS, IVR, Mobile Web, Smart Client Apps
Payment Service	SMS, IVR, Mobile Web, Smart Client Apps
Data Capture Service	Smart Client Apps, MobileWeb,USSD, IVR
Third party VAS	SMS, IVR, Mobile Web, Smart Client

Table 2.1: Different types of mobile services with its respective mode of communication.

In addition, the Karnataka Mobile One project took on the British e-governance app, one of the biggest in the world, to win gold at the m-governance awards at the fourth World Government Summit held in Dubai on February 11, 2016.

With the vision of implementing Mobile Governance at the large scale and using to its fullest extent, it is felt to conduct an independent third-party survey and evaluation to assess the performance, status, effectiveness and impact of mobile services in Karnataka State. This evaluation also aims at under-standing the difference in perceived and actual benefits, if any.

This evaluation report provides a detailed evaluation of performance, status, effectiveness and impact of mobile services in Karnataka State by analyzing the real-time history data from the dashboard of Karnataka Mobile One and surveying the respondents across the state.

The rest of the report is organized as follows: Chapter 2.4 provides a back-ground of the mobile services in Karnataka. In Chapter 3, the scope and the purpose of the evaluation are explained. Chapter 5 provides the methodology of the evaluation. Measures and Recommendations are presented in Chapter 9 and in Chapter 8 the concluding remarks are presented.

2.4 Background

The total population of Karnataka State at the end of December 2016 was estimated to be 6, 60, and 76,021. As per the 2011 census, population density is 319 per square kilometer, the sex ratio is 973 females to 1000 males and 38.67% of the people in Karnataka live in urban areas as against to 61.33% live in rural areas. The literacy rate is 75.4% including both male and female.

Table 2.2 provides highlights of Telecom Subscription Data provided by Tele-com Regulatory Authority of India (TRAI) [1] as on 30th November 2016 in India. According to data compiled by various reports by the TRAI, as on 30th November 2016, Karnataka has the tele-density of 106.29 standing in the sixth

[1] TRAI Official Website: www.trai.gov.in

SN	Particulars	Wireless	Wireline	Total
1.	Total Telephone Subscribers	1099.51	24.44	1123.46
2.	Urban Telephone Subscribers	638.46	20.57	659.03
3.	Rural Telephone Subscribers	461.05	3.88	464.93
4.	Overall Urban Tele-density[2] Share:	159.27 58.07%	5.13 84.14%	164.40 58.63%
5.	Overall Rural Tele-density Share:	52.45 41.93%	0.44 15.86%	52.89 41.37%
6.	Broadband Subscribers	200.20	18.06	218.26

Table 2.2: Telecom Subscription Data as on 30th November 2016 released by TRAI in Lakhs

place after Delhi (236.38), Himachal Pradesh (135.42), Tamil Nadu (120.60), Punjab (114.28) and Kerala (107.81). As against the country's total wireless subscribers of more than one Billion, the wireless subscriber base in Karnataka as on 30th November 2016 was 6,57,04,434. With the population of 6,60,76,021, the state has 6,57,04,434 mobile phone users at the rate of nearly 99 per 100 citizens.

Understanding clearly the huge penetration of mobile phones in the State both in urban and rural areas, it has become imperative to Government to offer services over mobile devices to realize the value of mobile technologies over traditional services for responsive governance and measurable improvements in the areas like social and economic development, public service delivery, operational efficiencies and active citizen engagement. With this background, Government of Karnataka has launched the Karnataka Mobile One Project. This project has an important objective to provide its citizens \one stop shop" through mobile services, to access all Government, public and private sector services anytime, anywhere and anyhow. Powered by one unified and fully integrated platform, services on multiple departments and various citizen-centric private services are available through One URL, One App and One Short-code.

In fact, a total of 4302 services including 178 (Departmental), 480 (mG2C) and 3644 (mB2C) were included in the Karnataka Mobile One project where citizens can avail through this Mobile Governance initiative. This portal is accessible across all mobile operators and all channels from anywhere in India. The citizens can pay utility bills, property tax, book bus and railway tickets, le income tax returns, m-passport, driving licenses and many other activities with their smart phones. However, due to some practical limitations, the mo-bile services and applications are added to the Karnataka Mobile One portal gradually.

The real-time data is accessed by the technical team via a portal link \http://go

k.imimobile.co/dashboard/". Only authorized users are allowed to access this dashboard. Using this dashboard, the technical team is able to view and down-load various transaction details including:

1. Current day transactions
2. LTD transaction count
3. MTD transaction count
4. Grand total payment
5. Payment and non-payment registrations
6. Channel wise visits trends
7. Payment mode wise summary
8. Department wise transactions
9. Department wise payments
10. And many more.

In addition, many other transaction details can be retrieved from the portal database using specific queries. Using such transaction details (or history data), statistical analysis can be accomplished resulting in possible findings that can be determined and deduced.

After the inception of the Karnataka Mobile One project, this is the first time the CeG in association with the Karnataka Evaluation Authority (KEA) has planned to evaluate the performance, status, effectiveness and impact of mobile services in Karnataka State.

Chapter 3

Scope, Purpose and Objectives of the Evaluation

Mobile Governance is the application of new mobile technologies in most of the developing countries, in contrast to developed countries where it has existed for a relatively long time. Mobile Governance aims to improve the quality of life. However, despite the essence of technology being to make people's lives easier, new mobile technologies are not always accepted, especially in developing countries. This may be due to several reasons including poor education, new trend in the market, the high cost of technology, its complexity of use, or its incompatibility with values and beliefs. Therefore, in order to overcome these barriers, governments in developing countries need to implement mobile services that are seen to be directly in accordance with their citizens' needs. In this chapter, the scope, purpose and the set of objectives of the evaluation study are explained.

3.1 Scope of the Evaluation

The scope of evaluation is the entire State of Karnataka where mobile services are available. In addition, the mobile services in Karnataka State are provided to all people and no distinction is made between nationals and non-nationals in terms of service provision. However, a government policy strategy needs to be adopted. The scope of this study is to investigate the use of primary m-government services like Government-to-Citizen (G2C), Government-to-Business (G2B) and Business-to-Customer (B2C) from the citizens of Karnataka State perspective only.

3.2 Purpose of the Evaluation

The purpose of this evaluation study is to analyze the real-time data to understand the current status, usage pattern of mobile services in Karnataka and

conduct a survey experiment in the most accepted scale in order to evaluate the effectiveness, feasibility, and impact, provide a comprehensive analysis and develop a model in an attempt to improve upon the existing system prior to performance of a full-scale project. However, the literature has not revealed any comprehensive model that is specifically used for mobile services in the State. Therefore, the existence of this gap in the adoption and intention to use mobile services context encouraged this study to derive inferences and conclusions in the implementation of mobile governance in Karnataka State. As a result, there is a need to de ne what factors influence/impact on the intention to use mobile services. This evaluation study is intended to be a useful model for many states of India considering delivery of mobile services in order to explain the factors that influence/impact the intention to use mobile services. The model shall contribute to the existing knowledge because it incorporates many unexplored dimensions that influence/impact the intention to use mobile services. The decision makers who are involved in Mobile Governance services projects need such an evaluation study model that can assist the provision of relevant guidelines for implementation of comprehensive Mobile services. Based on knowledge gained from this study, the decision makers can better under-stand the challenges they will face in the implementation of Mobile services and henceforth, the implementation of these services will be more effective.

3.3 Objectives of the Evaluation Study

The objectives of the evaluation study will be to find and/or evaluate:

1. Whether mobile service is reaching out to all parts of the state where mo-bile services and/or internet are available? To what extent are the services available as of date?
2. Whether the citizens of the state are aware of the services offered?
3. Whether the citizens of the state are using the services of mobile governance?
4. Whether the services are hack free and confidential?
5. Whether the line departments and parastatals are supportive in concept and action of mobile governance?
6. What changes are to be suggested for better implementation and cover-age?

Chapter 4

Evaluation Design

4.1 Research Objectives

The research objectives include both qualitative and quantitative approaches. The quantitative research aims to assess the performance, impact and status of mobile services and qualitative research aims at establishing and measuring the performance indicators that can holistically evaluate the efficiency or efficacy and opinion of users of the Mobile Governance initiative. In order to fulfill the purpose and ensure a fair and unbiased evaluation, this exploratory survey sought to de ne the following objectives:

1. What are the understandings of m-Governance by citizens of Karnataka?
2. Do the citizens of the State are aware of the services offered?
3. To what extent are the services available as of date?
4. Whether m-Governance services are reaching to all parts of the State where mobile services and/or Internet is available?
5. What types of services do citizens receive from service providers or the Karnataka government?
6. Whether the services are hack free and confidential?
7. Do citizens feel they are able to raise issues or complaints to the government or service providers?
8. What do citizens want to talk to the Karnataka Government about with regard to m-Governance?
9. What methods do citizens believe are best to give information to government/service providers?
10. Any changes the citizens wish to suggest for better implementation and coverage?

4.2 Research Design

Data was collected using both qualitative and quantitative approaches through the technical team and a set of questionnaires administered using Kannada or English depending on the preference of the interviewee. The quantitative research used a formalized and unconcealed questionnaire with close ended questions namely, dichotomous, multiple choices, scale based and a brief suggestion. Using the quantitative method, the generation of real-time history data in quantitative form is done subjected to analysis in a formal and rigid fashion.

The evaluation work is based on two folds - desk research and field work. First, the desk research was carried out to identify the current shortcomings in Karnataka Governance and review the potential tools for adopting mobile services in the State. This was done with the officials, technical team and other stake holders of Mobile Governance. The second component i.e., field work was conducted in all parts of the Karnataka State. The four different administrative divisions or regions of the Karnataka State namely Bengaluru, Mysuru, Kalaburgi and Belagavi along with Bengaluru city were considered for evaluation.

Chapter 5

Evaluation Methodology

This chapter describes the methodology used in the evaluation that resulted in the findings, recommendations and conclusions. The evaluation team consisted of Principal Investigator, technical team, and the field staff.

The evaluation study is based on the evaluation questions specified in the Terms of Reference (ToR) for evaluation of the performance, status, effectiveness and impact of Mobile Services in Karnataka. The responses to the evaluation questions are thoroughly written keeping the factors of relevance, inductiveness and clarity. The responses to evaluation questions included all the items normally expected or required. Based on the aim of this evaluation study, the methodology is divided into three major components:

1. Real-time data is retrieved from the back end database or dashboard of the Karnataka Mobile One portal for further analysis and realization.
2. Investigate and exploring the features, functions and performance of the KMO application/app including the security aspects.
3. Field work along with discreet discussions is conducted with the citizens of Karnataka State.

The first and second component of the evaluation methodology has been carried out by the technical team. Whereas, the third component is achieved through the survey as is explained below.

5.1 Survey Instrument

The respective survey instruments for the two components explained above consists of:

1. Focused discussion and interaction with the technical team of the Mobile Governance cell of the Center for e-Governance, Government of Karnataka.

2. Data collected through means of survey administered via the following approaches depending on convenience of the respondent.

   (a) Face-to-face (direct or staff assisted)

   (b) Online survey (using a PC or mobile device with Internet)

5.2 Determining the Sample Size

A sampling frame for data collection through survey for respondents is developed. A stratified sample from four regions along with Bengaluru city as explained above with the total coverage of the State is useful in maintaining the precision of estimates. For surveys, district headquarters, taluk headquarters and hobli headquarters were targeted. The number of respondents were stratified according to the above classification and an adequately large number of the sample size was determined so that it would systematically represent the population. Roughly, 400 respondents were chosen on random basis from each of the divisions drawing a total of nearly 1600 respondents. Out of 400 respondents from each division, 50% were from district headquarters, 25% each from taluk headquarters and hobli levels. In addition, approximately another 400 respondents were randomly chosen from the Bengaluru city, the state capital, with the forecasted population in 2017 of more than 11.5 Million[1], amounting to 2000 respondents totally. The target groups of evaluation are the citizens of Karnataka State (both non-users and users of different mobile services) randomly selected with diverse age, gender, occupation ranging from employees to students, business to farmers, households to differently fabled, etc. It is found that this number of respondents in each region totaling to nearly 2000 will be adequate for assessing the effectiveness and impact of mobile services in Karnataka. The respondents were randomly selected in different places for conducting the manual survey. In addition, an online survey was also con-ducted using Google Forms which allowed to run our surveys. However, at the end, both manual and online survey data were merged. The region-wise details of the survey both manual and online are given in Table 5.1. The Table

SN	Region	Number of Respondents
1.	Bengaluru City	400
2.	Bengaluru	343
3.	Mysuru	499
4.	Kalaburgi	306
5.	Belagavi	388
	Total	1936

Table 5.1: Region-wise Details of the Respondents

[1] http://indiapopulation2017.in/population-of-bengaluru-2017.html

5.2 shows district-wise details of the survey done both manual and online.

SN	District	Number of Respondents
1.	Bengaluru Urban	400
2.	Bengaluru Rural	00
3.	Bidar	18
4.	Ballary	34
5.	Vijayapura	123
6.	Bagalkot	40
7.	Belagavi	09
8.	Chikkamagalur	70
9.	Chitradurga	20
10.	Chikkaballapur	06
11.	Chamarajnagar	90
12.	Dakshina Kannada	15
13.	Davangere	11
14.	Dharwad	11
15.	Gadag	204
16.	Kalaburgi	214
17.	Hassan	04
18.	Haveri	01
19.	Kolar	205
21.	Koppal	10
22.	Kodagu	00
23.	Mandya	66
24.	Mysuru	253
25.	Raichur	10
26.	Ramanagara	01
27.	Shivamogga	93
28.	Tumkuru	07
29.	Udupi	01
30.	Yadgiri	20
	Total	1936

Table 5.2: District-wise Details of the Respondents

5.3 Sampling Framework

With the total estimated population of 6,60,76,021 at the end of December 2016, the State has 6,57,04,434 mobile phone users at the rate of nearly 99 per 100 citizens. The overall sampling structures are adhered to the following pattern:

The sample size was determined based on the population region-wise and district-wise so that the resultant sample size shall systematically represent the population.

The evaluation methodology involved personal interviews of the mobile service users.

A simple random sampling method was followed to obtain the sample and feedback from the respondents.

The sample size was minimized to economize the time and cost.

A list of questions as suggested in the terms of reference (ToR) was shared with the technical team working for the Centre for E-Governance dealing with the implementation of Mobile Governance requesting for real-time history data and responses to other related queries.

The data on the dash board of the platform is analyzed from the inception of Mobile Governance services.

5.4 Conduct of Survey

Nearly 4-5 survey teams of field investigators were constituted and supervised by one supervisor for each team. One of the key items of supervisory check was the legibility of data recording by investigators. A pre-specified proportion of filled instruments was verified by the supervisors.

Chapter 6

Data Collection and Analysis

The questionnaire were designed based on research objectives provided in the ToR of the request for proposal. A formalized survey was created through a manual and an online survey tool with close-ended questions for quantitative analysis and open-ended questions for qualitative analysis. To record the online responses of the survey from respondents, a google form (https://forms.google.com/) was created. Later, this form was embedded in the Blogger (http://www.h kcal2016.blogspot.in) in order to facilitate the one point access and the records were maintained in an online spreadsheet for further analysis. The online survey targeted around 930 respondents. The responses were also collected manually from 1000+ respondents. The online and manual survey data were merged that totaled to 1936 respondents.

6.1 Data Collection Tools and Techniques

For the collection of qualitative as well as quantitative data, the following tools and techniques have been used.

1. Personal interview in the form of questionnaire.
2. Data provided by the technical team of the Mobile Governance.
3. Real-time history data available in the dashboard of Karnataka Mobile One portal.
4. And other observations.

6.2 Data Entry and Establishing Data Validity

Data entry was done in a format that can be directly input into a statistical analysis tool like the MS-Excel. Following steps were taken to ensure data quality:

1. Random check for data entry problems by comparing data from questionnaires with print out of data les.
2. Checking extreme values in data les for each item and unacceptable values for coded items.
3. Cross checking the data recorded for faulty values in the questionnaire.
4. Reject the data that are inadequate.

However, the total number of respondents include in the survey was more than 2100. Some of the survey data were rejected due to inadequate, unacceptable or faulty. After such alteration process, the actual sample size meant for analysis resulted with 1936 records that were finally taken into consideration after data validity checks before embarking on analysis.

6.3 Challenges Faced in Data Collection and Analysis

The few challenges that were faced in data collection and analysis are as follows:

For the assessment of the Mobile Governance system, respondents felt a bit difficult to understand the purpose for this survey, understand the questions, and/or rely on memory.

In case of system of this kind that consists of 162 services in the Karnataka Mobile One portal against the numerous numbers of services and applications available in the market, such a recall and applying their mind may introduce an error in responding precisely.

Since there are no established standards to evaluate Mobile Governance services that would ease the process of data collection and analysis, it would not be easy to frame the questionnaires that exactly fits the objectives.

Chapter 7

Findings and Discussion

This chapter lists the evaluation questions as specified in the ToR and their respective findings. The other findings including demographic information of the respondents, KMO registered users, service quality, impact assessment, etc. after applying the design and analysis tools discussed in Chapters 4 and 5.

7.1 Evaluation Questions and Answers

This section provides a list of compound evaluation questions and respective findings that are documented with actual and statistical proofs. The evaluation questions listed in the ToR are inclusive but not exhaustive. This feature allowed the evaluation process to include several other parameters to evaluate the performance, status, effectiveness and impact of mobile service in Karnataka State.

1. As against the 4281 G2C, B2C and G2B services that are a part of Mobile Governance in Karnataka, how many are fully functional and operational on the date of evaluation? How many of these are free and how many payment based?

   As on date of evaluation, there are a total of 658 services that are fully functional and operational. Table 7.1 provide the number of G2C, B2C and G2B services that are a part of Mobile Governance in Karnataka. Access to all the services of Mobile Governance are free. However, for

SN	Service Category	Number
1.	Government-to-Customer (G2C)	621
2.	Business-to-Customer (B2C)	33
3.	Government-to-Business (G2B)	4
	Total	658

Table 7.1: Number of G2C, B2C and G2B services that are part of Mobile Governance in Karnataka.

any service where payment is required, the request is redirected to the particular service provider through a gateway. The different payment options are as follows:

(a) Net Banking
(b) Credit Card
(c) Debit Card
(d) Immediate Payment Service (IMPS)
(e) Cash Card
(f) Mobile Wallets.

2. How many of these are urban based, how many are rural based and how many are urban as well as rural based?

   Basically, there is no differentiation between urban and rural based ser-vices. All users registered to the Karnataka Mobile One portal can access any of the services from anywhere and anytime.

3. How many of these can be used on SMS channel, how many on Interactive Voice Response (IVR) channel, how many on mobile web, how many on Unstructured Segmented Data (USSD) and how many on smart client applications? How many of these can be availed using more than or equal to three channels?

   A total of 658 services are integrated on six different channels including:

   (a) Simple Message Service
      i. Push Service
      ii. Pull Service
   (b) Interactive Voice Response (IVR)
   (c) Unstructured Segmented Data (USSD)
   (d) Mobile Web
   (e) Mobile App

   Table 7.2 provides the details of number of services available under different channels as per the details shared by the technical team of Mobile Governance. The table also provides the number of Central Government services, State Government services and Value Added Services (VAS) using these channels.

   About fifteen (15) services can be availed using more than or equal to three channels.

   In addition, the Table 7.3 provides details of non-payment registrations channel-wise.

SN	Channel	Central Government	State Government	VAS	Total
a.	SMS				
	i. Push	00	100	00	100
	ii. Pull	06	07	02	15
b.	IVR	06	07	01	14
c.	USSD	01	13	05	19
d.	Mobile Web	28	95	32	155
e.	Mobile App				
	i. Android	28	98	32	158
	ii. iOS	28	98	32	158

Table 7.2: Details of the Number of Services under Different Channels.

SN	Channel	LTD	MTD	31-Jan
1.	Mobile Web/App	7,21,246	25,468	919
2.	USSD	1,92,387	3,516	91
3.	SMS	4,662	15	1
4.	IVR	475	20	0
	Total	918770	29019	1011

Table 7.3: Details of Non-payment Registrations Channel-wise

4. How many of these services are in English only, how many are in Kannada only and how many are in both these languages? All the 658 services hosted on the Karnataka Mobile One are available both in English and Kannada language versions.

5. How many services are in other regional languages and in the national language?

   None of the services hosted on the Karnataka Mobile One portal are in other regional languages and in the National language. All the services are in English and Kannada.

6. Is the Mobile Governance website accessible everywhere where any other website is accessible? Is it accessible on low priced mobile phones too?

   Yes, the Mobile Governance website is accessible in all the places where any other website is accessible from any portable and non-portable de-vices. The Mobile Governance website is accessible from mobile phones that have the mobile web browser installed in it. However, some services are also accessible via push and pull SMS like bank's lead generation, etc. and via IVRS channels from low priced mobile phones that do not have the mobile web browser.

7. How many Mobile phones have been registered for using Mobile Governance through any channel? How does this compare with

the total number of mobile phones existing in the State? What is the rate of registration of Mobile phones for using Mobile Governance?

As on the date of evaluation, a total of 2,53,480 mobile phones have been registered for using mobile services through any channel. Table 7.4 shows the number of mobile phone registrations based on its platform.

SN	Platform	Count (LTD)
1.	iOS	24,595
2.	Android	2,28,885
	Total	2,53,480

Table 7.4: Number of Mobile Phone Registrations based on its Platform.

The population of Karnataka as on December 2016 was estimated to be 6,60,76,021 and the number of mobile phone users is estimated to be 6,57,04,434[1]. It is observed that more than 95% of the population are using mobile phones. Hence, the number of mobile phones that have been registered for using mobile services against the total number of mobile phones in the Karnataka state is in the ratio of 1:250. In other words, for every 250 mobile users, we have only one mobile phone registered for using mobile services. This comparison shows that only less than one percent or more specifically 0.4% of the mobile users in the State have registered to the Karnataka Mobile One portal. However, the unique user (UU) count details from other channels is given in the Table 7.5.

SN	Channel	(UU Count)
1.	IVR	40,43,454
2.	Mobile App/Web	6,85,384
3.	SMS	43,239
	Total	47,72,077

Table 7.5: Unique User Count.

8. Which of the fully functional and operational services of Mobile Governance have been used by people? What is the number of hits for each service recorded per day/month or till date? What is the ranking of services being used?

   As on date, all 658 mobile services that are fully functional and operational are used by the people of Karnataka state. The real-time history data relating to the total number of visitors (LTD, MTD and 31-Jan) as recorded in the dashboard of Karnataka Mobile One as on 31st January 2017 is given in Table 7.6.

   The summary of SMS MO hits is given in Table 7.7.

[1] http://www.indiaonlinepages.com/population/karnataka-population.html

Table 7.6:

SN	Particulars	#Visitors (LTD)	#Visitors (MTD)	#Visitors (31-Jan)
1.	Mobile Web Visitors	5,10,057	10,491	321
2.	Mobile App Visitors	2,00,64,334	8,58,388	26,158
	Total No. of Visitors	2,05,74,391	8,68,879	26,479

Total Number of Visitors (LTD, MTD and 31-Jan) of the Karnataka Mobile One portal as on 31st January 2017.

Table 7.7:

SN	Particulars	#Hits (LTD)	#Hits (MTD)	#Hits (31-Jan)
1.	Total MO Hits	1,87,009	18,729	1,730

Total Number of SMS Hits (LTD, MTD and 31-Jan) of the Karnataka Mobile One portal as on 31st January 2017.

Table 7.8: The USSD hits summary is given in Table 7.8.

SN	Particulars	#Hits (LTD)	#Hits (MTD)	#Hits (31-Jan)
1.	Total Hits	33,29,060	1,12,613	3,463

Total Number of USSD Hits (LTD, MTD and 31-Jan) of the Karnataka Mobile One portal as on 31st January 2017.

Table 7.9: The IVR inbound total calls summary is given in Table 7.9.

SN	Particulars	#Calls (LTD)	#Calls (MTD)	#Calls (31-Jan)
1.	Total Calls	68,075,466	11,854,348	634,277
	Total Pulses	145,111,399	19,631,984	1,590,389

Total Number of IVR inbound total calls and UU (LTD, MTD and 31-Jan) of the Karnataka Mobile One portal as on 31st January 2017.

The ranking of services being used by the citizens of Karnataka is categorized as follows:

(a) The Department-wise payments summary is given in Table 7.10. From this table, it is observed that the BESCOM leads with an amount of INR 20,67,05,419 in payments (share of 66.2% against the total payment) followed by BWSSB with INR 6,06,55,391 (share of 19.5% against the total payment). Further, the prepaid recharge has a total payment of INR 18,24,429 having a sharing of only 0.6% against the total payment even in its 9th position. In a broad sense, it is observed that the highest number of payments is occurring in the utility services, followed by transportation services and telecom services. Figure 7.1 shows the percentage share of payments in each category of services. It is observed that the utility services takes the

SN	Department	LTD	MTD	31-Jan
1.	BESCOM	206,705,419	8,785,791	175,506
2.	BWSSB	60,655,391	5,243,128	183,564
3.	CESCOM	23,342,247	2,096,720	92,035
4.	HESCOM	5,074,300	369,239	5,594
5.	BMRCL	3,996,100	578,850	25,800
6.	RTO	2,191,034	148,626	7,974
7.	MESCOM	2,111,099	666,249	28,859
8.	KSRTC	1,853,796	0	0
9.	PREPAID RECHARGE	1,824,429	57,921	1,591
10.	AIRTEL	941,326	20,197	629
11.	IRCTC	652,427	26,135	1,990
12.	BBMP	564,772	0	0
13.	BENGALORE TRAFFIC POLICE	445,900	31,300	1,100
14.	VODAFONE	394,328	8,547	577
15.	CELLONE	339,239	1,087	0
16.	IDEA	255,982	8,792	817
17.	REDBUS	243,428	4,902	0
18.	TATA	187,724	1,551	0
19.	GESCOM	185,104	185,104	1,278
20.	KSTDC	138,490	0	0
21.	HDMC	52,440	5,537	0
22.	STATE CRIME RECORD BUREAU	39,240	0	0
23.	RML	13,050	1,200	0
24.	VAKIL	4870	0	0
25.	RECHARGE	2146	0	0
26.	BTP	400	0	0
27.	OXIGEN	107	0	0
28.	DPU	12	0	0
	Grand Total	31,22,14,800	1,82,40,876	5,27,304

Table 7.10: Department-wise payments (in INR) summary (LTD, MTD and 31-Jan) of the Karnataka Mobile One portal as on 31st January 2017.

lion share of 95.47%, whereas public transportation and telecom ser-vices share 1.98% and 1.26% respectively. The remaining 1.29% is shared by all other category services.

The summary of payment transactions using different payment modes is presented in Table 7.11.

(b) The Department-wise non-payments for channel-wise registrations summary is given in Table 7.12. From this table, it is observed that RTO with 1,95,718 registrations tops the list in Departments with non-payment registration followed by STAMPS with 1,90,724 registrations and HRMS is the third position with 1,78,081 registrations till the date of evaluation.

(c) The Department-wise payments transaction counts is given in Ta-

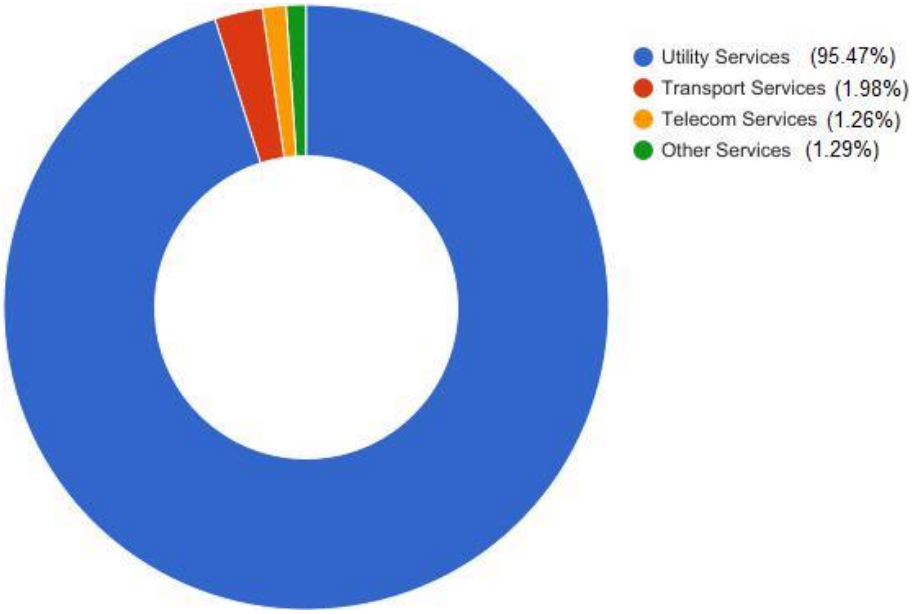

Figure 7.1: Share of Service Category Against the Total Payments

SN	Payment Mode	LTD	MTD	31-Jan
1.	Credit or Debit Card	19,60,90,209	1,22,58,929	3,39,123
2.	IMPS	11,20,918	50,822	0
3.	Mobile Wallets	5,62,347	50,002	885
4.	Net Banking	11,39,75,217	58,28,744	1,87,306
5.	Cash Card	1,658	0	0
	Total	31,17,50,349	1,81,88,497	5,27,314

Table 7.11: Payment Transactions Details (in INR) using Different Payment Modes

table 7.13. It is observed that the total number of payment transaction counts as on the date of evaluation is 5,01,889. Out of this, BESCOM takes the lead with 2,34,977 transactions followed by RTO with 1,21,726 transactions. These are the only two Department ser-vices where the number of transactions has crossed the magnitude in the order of 10^6. It is also observed that the monthly transactions (January 2017) of many Department services is zero.

9. How many citizens have used \ICARE" initiative and registered complaints with service providers as on the date of evaluation? How does this compare with the total number of Mobile phones which have been registered for using Mobile Governance?

   Since the inception of the Karnataka Mobile One project, only three departments are using ICARE facility to receive complaints. These include:

   (a) Bengaluru City Police

   (b) Bengaluru Traffic Police

   (c) Bhruhat Bengluru Mahanagara Palike (BBMP)

SN	Department	LTD	MTD	31-Jan
1.	RTO	195,718	12,961	632
2.	STAMPS	190,724	4,793	95
3.	HRMS	178,081	2,689	66
4.	BESCOM	105,469	3,142	47
5.	SAKALA	59,537	1,482	45
6.	TXTWEB	33,965	0	0
7.	PASSPORT	28,660	611	34
8.	BMTC	26,345	0	0
9.	BWSSB	24,408	1757	53
10.	BCP	10,998	236	8
11.	POSTAL	9,413	197	6
12.	KSRTC	9,302	170	0
13.	INCOMETAX	8,450	0	0
14.	KSDA	4,544	101	3
15.	KSNDMC	4,404	0	0
16.	HESCOM	3,747	226	5
17.	BBMP	3,425	151	2
18.	SBI	3,276	0	0
19.	HDFC	2,950	202	7
20.	AXIS	2,732	0	0
21.	DMA	2,194	0	0
22.	VAKIL	1,475	0	0
23.	HDMC	1,402	43	1
24.	ICARE	1,333	17	0
25.	ACCENTURE	1,276	36	0
26.	EPROC	1,187	21	1
27.	RML	1029	12	1
28.	BACKWARDCLASSES	983	166	5
29.	APNACARE	863	0	0
30.	OLA	394	0	0
31.	RIDINGO	214	6	0
32.	IRCTC	131	0	0
33.	MERU	69	0	0
34.	PRACTO	56	0	0
35.	REDBUS	18	0	0
	Grand Total	9,18,772	29,019	1,011

Table 7.12: Department-wise Non-payments for Channel-wise Registrations summary (LTD, MTD and 31-Jan) of the Karnataka Mobile One portal as on 31st January 2017.

As on the date of evaluation, the number of complaints received against each of these departments is provided in the Table 7.14. Recall Table 7.4 that provides the number of mobile phone registrations till the date of evaluation. About 2,53,480 mobile phones are registered with only a total of 1194 number of complaints has been received.

10. How was the complaint made through \ICARE" initiative dealt

SN	Department	LTD	MTD	31-Jan
1.	BESCOM	234,977	9,370	168
2.	BWSSB	67,982	5,409	135
3.	CESCOM	27,564	2,577	64
4.	HESCOM	6,614	496	9
5.	BMRCL	15,771	2202	102
6.	RTO	121,726	8,257	443
7.	MESCOM	1,943	594	18
8.	KSRTC	2,030	0	0
9.	PREPAID RECHARGE	14,150	466	18
10.	AIRTEL	1021	24	1
11.	IRCTC	1,197	39	3
12.	BBMP	79	0	0
13.	BENGALORE TRAFFIC POLICE	4300	311	11
14.	VODAFONE	567	21	1
15.	CELLONE	429	4	0
16.	IDEA	397	13	1
17.	REDBUS	255	4	0
18.	TATA	366	3	0
19.	GESCOM	187	130	3
20.	KSTDC	47	0	
21.	HDMC	35	4	0
22.	STATE CRIME RECORD BUREAU	178	0	0
23.	RML	28	2	0
24.	VAKIL	9	0	0
25.	RECHARGE	23	0	0
26.	BTP	4	0	0
27.	OXIGEN	8	0	0
28.	DPU	2	0	0
	Grand Total	5,01,889	29,926	977

Table 7.13: Department-wise payments transaction counts summary (LTD, MTD and 31-Jan) of the Karnataka Mobile One portal as on 31st January 2017.

SN	Department	#Complaints
1.	Bhruhat Bengluru Mahanagara Palike	669
2.	Bangalore City Police	429
3.	Bangalore Traffic Police	96
	Total	1,194

Table 7.14: Number of Complaints Received through ICARE

with? How many of them have been disposed? Was the response better than, as good as or worse than the response that is received in conventional mode?

The ICARE facility is one of the services provided by the Mobile Governance of Karnataka. Its primary responsibility is to hear the public grievances and act upon to resolve them based on the issue. Recall Table

7.14 that provides the number of complaints registered through ICARE which indicates that only three Departments have used the ICARE facility with a total number of received complaints of 1,194. As on the date of evaluation, only mobile web and mobile app channels are used to access the ICARE service. Please refer Section 7.2.6 for ICARE satisfaction index.

11. What is the probability of a financial transaction, complaint lodging and actual receiving of a service failing/ aborting/ hanging midway in the first try for no fault or shortcoming of the Mobile Governance user?

    The payment (or financial) transactions count that is recorded on the dashboard of the Karnataka Mobile One portal is shown in the Table 7.15.

SN	Status	LTD	MTD	31-Jan
1.	Success	7,50,229	42,297	1,325
2.	Payment Failure	83,240	4,956	139

Table 7.15: Service Failure, Abortion, and mid-way Hanging Count

Figure 7.2 shows the distribution of number of success and payment failure transactions rate. From the figure, it is observed that the overall

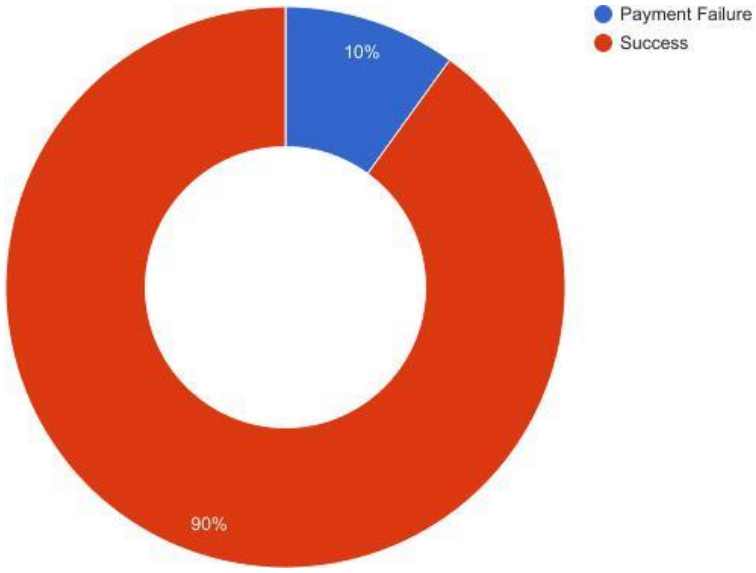

Figure 7.2: Success, Abandoned and Payment Failure Transaction Details

successful transaction rate is 90% and rest 10% transactions are failed during the payment.

12. What is the revenue sharing/business model adopted in Public-Private partnership that goes into Mobile Governance? Is it different from the other sharing/model prevalent?

In order to attract public and private partnerships with Mobile Governance where there is a steady stream of revenues and incentives, an 80:20 revenue sharing/business model is adopted in which 80% in the proportion of public and private partners and 20% to the Mobile Governance of Karnataka. This ensures alignment of business interests of the private partners with the service interest of the Government.

13. How does the Mobile Governance of Karnataka measure on the parameters of Access, Reach, Adoption, Interaction, Cost (to the user as well as the Government) and Efficiency?

    The parameters of access, reach, adoption, interaction, cost and efficiency along with concept, services, quick, easy, potential monetary savings, transparency and reliability were also included as a part of the questionnaire. The users of Karnataka Mobile One services were provided with a set of 10 parameters and were asked to rank them in the order of appreciation. The respondents rated by a scale from 1 to 8 with 1 as most appreciated and 8 as less appreciated. The users responses have been analyzed based on the average ranking assigned to each parameter as tabulated in Table 7.16.

SN	Parameter	Average Ranking by Respondents
1.	Concept or Initiative	7.1
2.	Access	6.4
3.	Transparency	6.2
4.	Reach	6.1
5.	Easy	6.1
6.	Quick	5.8
7.	Reliable	5.6
8.	Potential Monetary Savings	5.5
9.	Services	5.3
10.	Adoption	5.2

Table 7.16: Average Ranking Assigned by Respondents to Each Parameter

14. Whether there is any system or arrangement in place to en-sure that the services being provided are hack free and, where needed, confidential? Are the systems and arrangements sufficient and enough to inspire trust and security?

    Data audit is carried out in every quarter to ensure the services being provided are hack free. The Karnataka Mobile One portal is hosted with STQC (Standardization, Testing and Quality Certification) which impels trust and security. They are one of the Registered Certifying Bodies (RCBs) for various International Standards, such as ISO27001:2013, ISO20000:2011, ISO9001:2015, etc. They are also a Government certifying agency for

several quality and test parameters.

In addition, an application gateway or application-level proxy is an application program that runs on a firewall system between two networks. When a client program establishes a connection to a destination service, it connects to this application gateway, or proxy. In effect, the proxy establishes the connection with the destination behind the firewall and acts on behalf of the client, hiding and protecting individual computers on the network behind the firewall. This is considered a highly secure method of firewall protection.

15. What is the back end readiness and help provided by the line departments and parastatals to the Centre for E-Governance for launching and popularizing Mobile Governance?

    The line departments only provide access to applications. The launching and popularizing the Mobile Governance are under the purview of the Center for E-Governance (CeG).

16. What is the awareness level about Mobile Governance in the minds of citizens of the State?

    The awareness level of the Mobile Governance amongst the citizens is one of the key parameters to assess the performance and efficacy of Mobile Governance. Hence, the awareness information is collected from respondents through survey. As per the outcome of the survey, out of a total of 1936 respondents, only 648 (or 33.5%), nearly one third, said that they are aware of the mobile services and remaining 1288 (i.e. 66.5%), nearly two third, said that they are not aware of mobile services in the state. This is illustrated in the Figure 7.3. The level of awareness is measured through rating levels from 1 to 5 with 1 being the least level and 5 the highest level. The awareness level about the mobile services in the minds of the people of Karnataka is illustrated in Figure 7.4. Out of the 648 respondents who are aware of the mobile services, only 7% (i.e. 45) of the respondents have the highest level of awareness (i.e. 5).

17. What is the perception of Mobile Governance service users about the ease of access, timeliness of service delivery, security of financial transactions done and comparison with conventional service delivery mechanisms?

    When compared to the conventional delivery mechanisms like manual, desktop Internet, etc., the users were asked to respond whether Mobile Governance is better than those, out of a total of 635 users of Mobile Governance, 483 (or 76%) said Mobile Governance is better and only 152

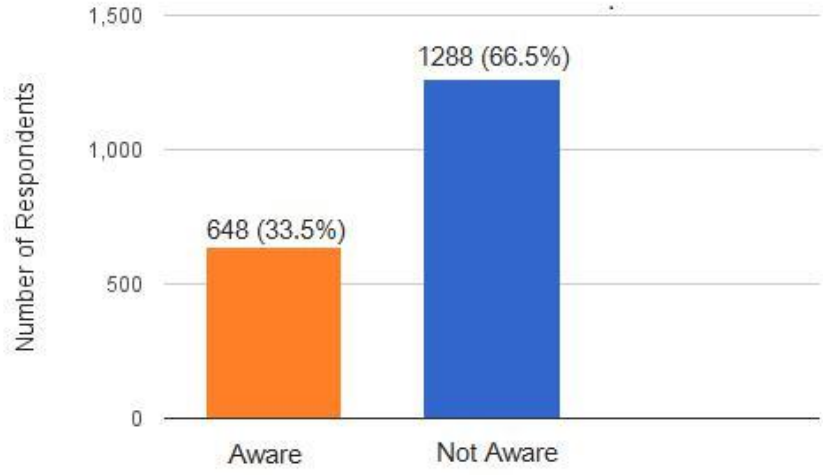

Figure 7.3: Awareness of the Respondents

(24%) said it is not better. Figure 7.5 show the opinion of the respondents in this aspect.

18. What suggestions can be made for making Mobile Governance to meet the objectives it was intended to achieve and standards that it ought to achieve?

    Please refer Chapter 9 for measures and recommendations to make Mo-bile Governance to meet the objectives it was intended to achieve and standards that it ought to achieve.

7.2 Other Findings

7.2.1 Demographic Information of the Respondents

7.2.1.1 Education Background

Out of the total sample of 1936 respondents who are classified based on their educational background (refer Figure 7.6), 44% are undergraduates, 22.6% are 10+2 or diploma holders, 21.6% are post graduates, 9.2% are having doctoral degrees and 2.5% users are below 10 standard.

7.2.1.2 Occupation

The occupation of the respondents is depicted in the Figure 7.7. It shows that 36.6% of the respondents are professionals working as doctors, engineers, lawyers, police personnel, or the ones into other government services, etc., 22.6% are from the student community, 13.4% are business people, 9.1% are

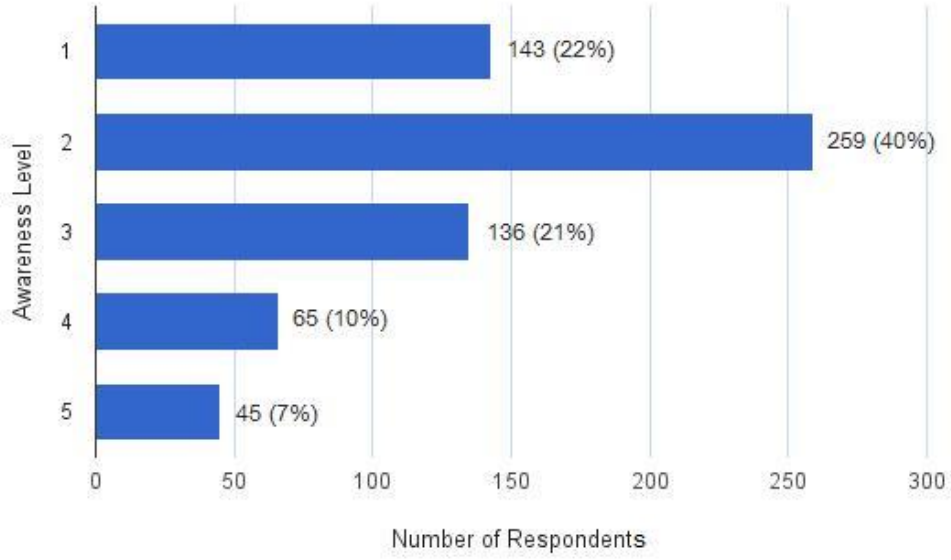

Figure 7.4: Awareness Level of the Respondents

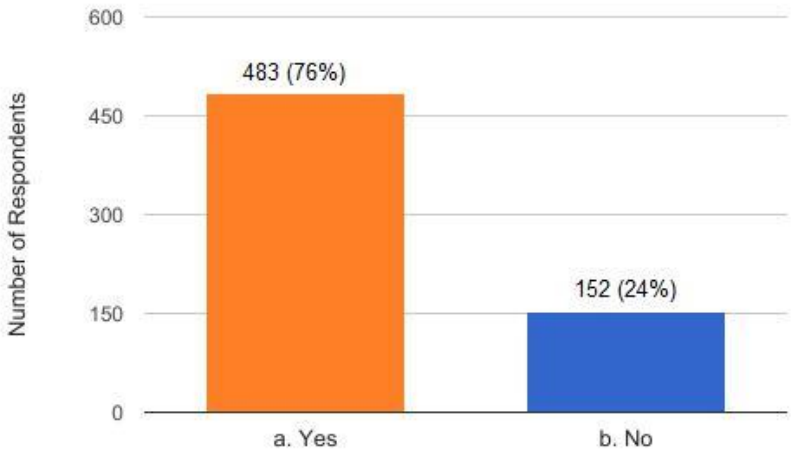

Figure 7.5: Respondents Comparing Mobile Governance Service with Conventional Service Delivery Mechanisms

self-employed, 7% are housewives, 6.9% are farmers, and the remaining 4.4% are not working.

7.2.1.3 Annual Income

The annual income of the respondents is depicted in the Figure 7.8. It shows that 26.4% of them are un-employed, 24.7% have an income between Rs. 1,00,000 and Rs. 10,00,000, 31.5% have between Rs. 10,000 and Rs. 1,00,000, 13.3% have less than Rs. 10,000 and only 4.2% have an income of more than Rs. 10,00,000.

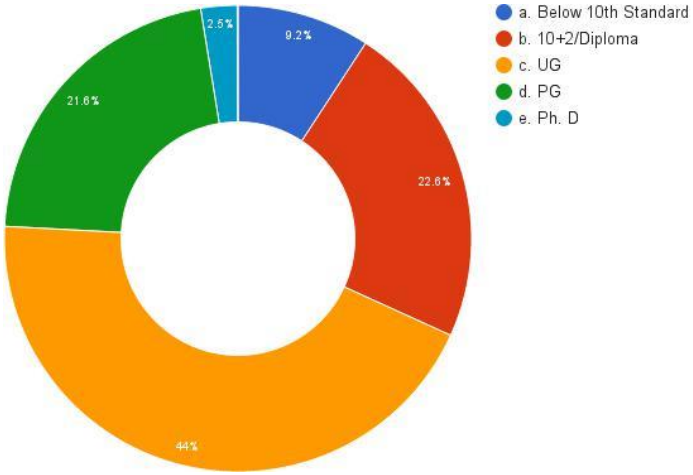

Figure 7.6: Highest Education Level

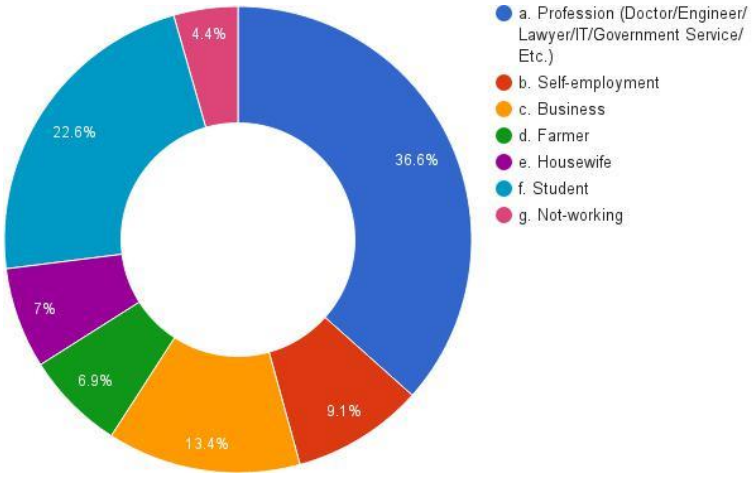

Figure 7.7: Occupation of the Respondents

7.2.1.4 Mobile Phone and Smart Phone Users

Out of total of 1936 respondents surveyed, 1902 (or 98.14%) are mobile phone users and only 36 (or 1.8%) are not using mobile phones. Further, out of a total of 1902 mobile phone users, 1545 (or 81.3%) are smart phone users and only (or 18.8%) users do not posses a smart phone.

7.2.1.5 Internet Connection

It is seen that in Karnataka state 6,57,04,434 people uses mobile phones[2]. Out of a total of 1545 respondents who posses a smart phone taken in the survey, 1155 (or 74.8%) said they have Internet connection and 390 (or 25.2%) said they do not have the Internet connection in their mobile phones (refer Figure 7.9).

[2] http://www.indiaonlinepages.com/population/karnataka-population.html

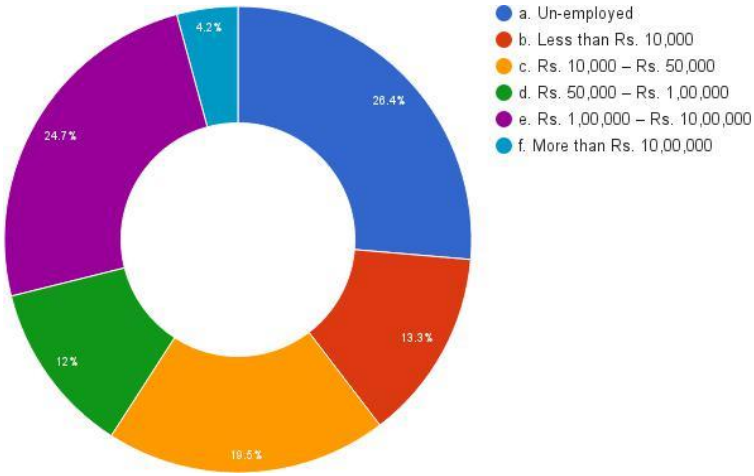

Figure 7.8: Annual Income of the Respondents

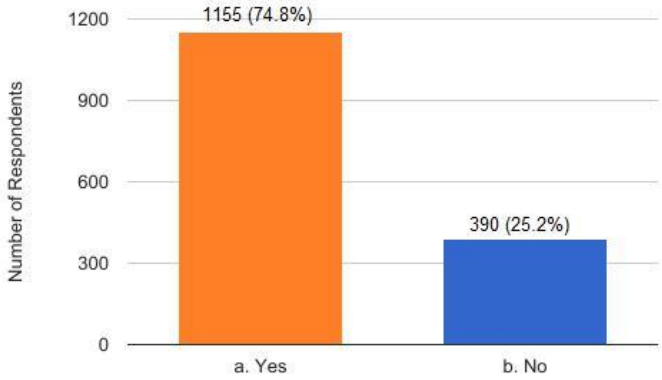

Figure 7.9: Respondents having Internet Connection in their Mobile Phones

7.2.2 Karnataka Mobile One Registered Users

Out of a total of 1902 mobile phone users and 1545 respondents who posses a smart phone, only 635 people are registered to the Karnataka Mobile One portal.

7.2.3 Frequency of Visiting the Karnataka Mobile One Website

Figure 7.10 shows the frequency of visiting the Karnataka Mobile One website in a week by the respondents. Among the 635 registered mobile users, 376 (or 59.2%) do not visit the Karnataka Mobile One website even once in a week. 163 (or 25.6%) respondents say, the frequency of visiting the website is once in a week, 48 (or 7.6%) visits twice in a week, 26 (or 4.1%) visits at least 5 times in a week and only 22 (or 3.5%) visits more than 10 times a week.

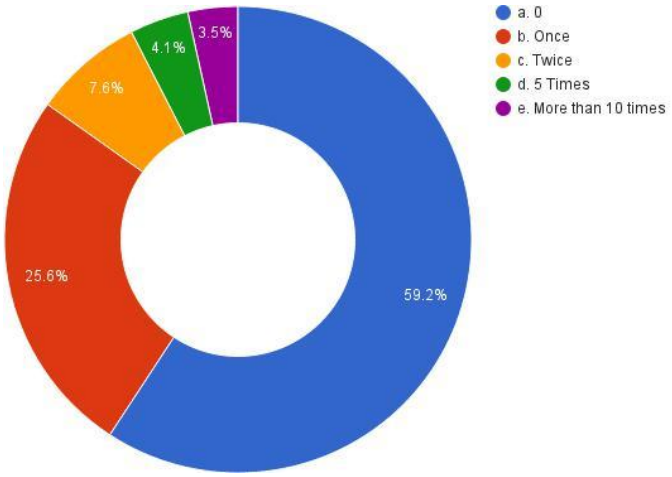

Figure 7.10: Frequency of Visiting the Karnataka Mobile One Website in a Week

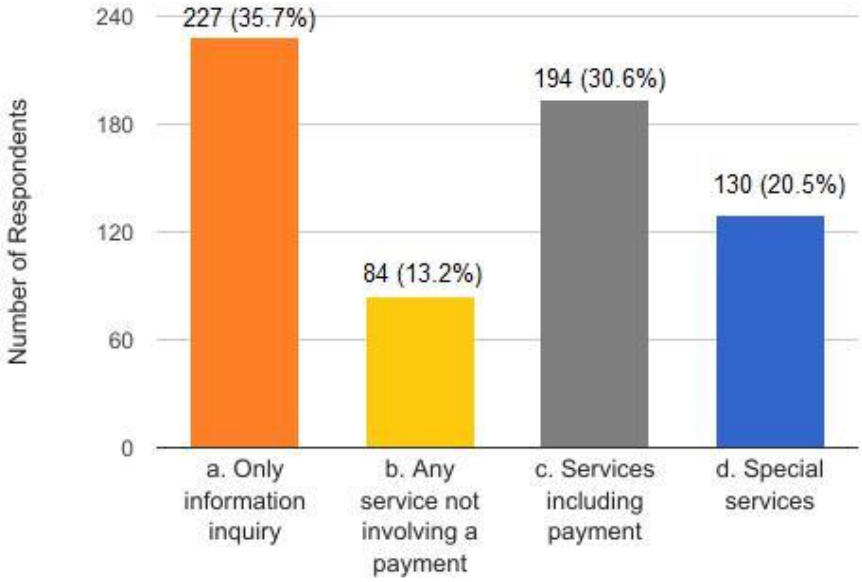

Figure 7.11: Preferred Type of Services

7.2.4 Preferred Type of Services

The survey asked respondents as to what type of services they prefer. Four types of services were listed. Figure 7.11 shows the distribution of respondents preferring the type of mobile service. It is shown that 227 (or 35.7%) respondents uses the Karnataka Mobile One website only for information enquiry, 194 (or 30.6%) uses for services including payment, 130 (or 20.5%) uses for special services and 84 (or 13.2%) uses for services not involving a payment.

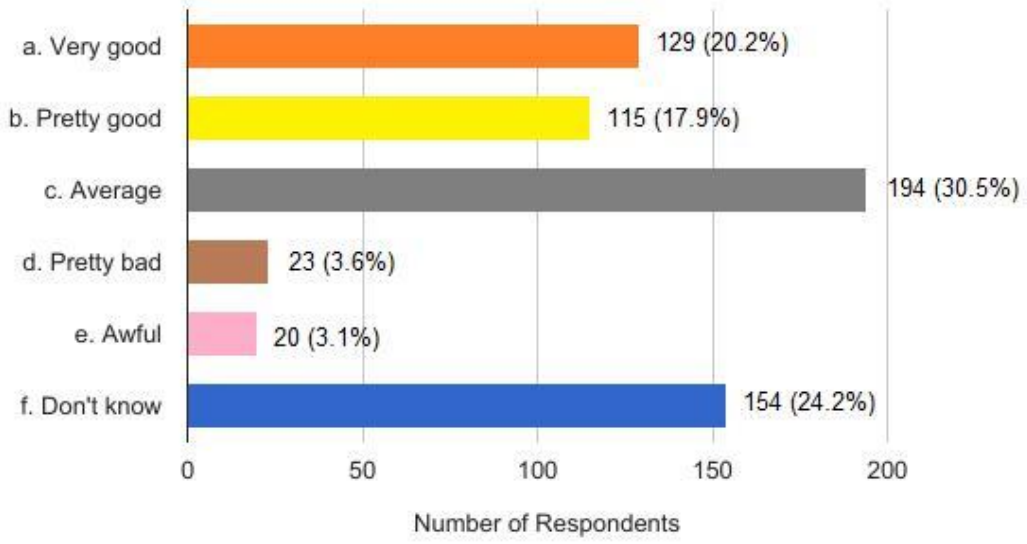

Figure 7.12: Service Quality Opinion

7.2.5 Service Quality

The opinion of the respondents on the service quality is illustrated in Figure 7.12. It is found that 194 (or 30.5%) respondents feel that the service quality provided in the Karnataka Mobile One portal is average, 154 (or 24.2%) say that they do not know anything, 129 (or 20.2%) feel very good, 115 (or 17.9%) feel pretty good, 23 (or 3.6%) fell pretty bad and only 20 (or 3.1%) feel the service quality is awful.

7.2.6 ICARE Satisfaction Index

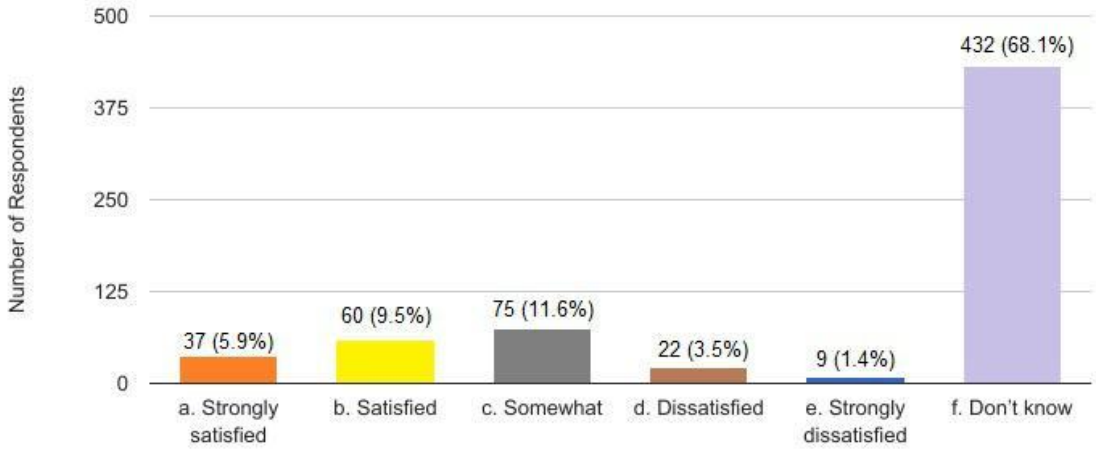

Figure 7.13: Satisfaction on the Action taken through ICARE

From the Figure 7.13, it is found that, among the registered users, 432 (or 68.1%) do not know about ICARE facility. 75 (or 11.6%) expressed that they are somewhat satisfied, 60 (or 9.5%) expressed that they are satisfied, 37 (or 5.9%) are strongly satisfied, 22 (3.5%) are dissatisfied and only 9 (1.4%) are strongly dissatisfied in the actions taken on the matters the users raised through ICARE.

7.2.7 Impact Assessment

7.2.7.1 Awareness

Awareness level of Karnataka Mobile One service among citizens are only 33.3%. Therefore, a dedicated branding team is required to promote the ser-vices and also strive to gather users opinion and accomplish their requirements.

7.2.7.2 Simplified Procedure and Efficiency

More than 85% of the respondents believe that the service has eased procedures and 78% of the respondents believe that it has brought in efficiency.

7.2.8 Suggestions from the Survey Respondents

In the questionnaire, suggestions were invited from the respondents for better implementation and usefulness of mobile services in Karnataka. It is found that some of the suggestions are common, not appropriate and not feasible, but still there are valid suggestions. The following lists 10 key suggestions given by the respondents:

1. Effective advertising campaign on Karnataka mobile one services in Karnataka through print, radio, TV, outdoor and Internet are required to gain awareness among the citizens.
2. Since I am not aware of Mobile Governance Services, I am not able to give feedback. Proper awareness on service availability to be made by giving advertisements. Because of this online survey, I came to know such a portal is available.
3. Subscription based services like news related to agriculture, education, employment and new schemes introduced in various departments could be an added advantage.
4. There is no proper information about the services.
5. Building a dedicated mobile app of this application will be appreciated.
6. The services should be more reliable and updates should be known as and when the services are updated.

7. The service must be marketed well, most of the people are not aware of the services provided by the government through Mobile Governance. Printing advertisements on newspapers and TV commercials showing the Mobile Governance services would help in educating citizens to be aware of these services and make use of it.

8. Provide more services in all Departments.

7.3 Observations and Results

This evaluation study has derived the following findings:

1. During the initial stage, the Karnataka Mobile One service has on-boarded 4281 (G2C, B2C and G2B) services. As per the user's feedback, services are reduced to 658. There is 84.62% decline in on-boarded services since it's inception.

2. Only fifteen services are availed using more than or equal to three channels.

3. None of the services hosted on Karnataka Mobile One portal are in the National language. However, all the services are in English and Kannada languages.

4. Only 2,53,480 mobile phones are registered to the Karnataka Mobile One portal as against the 6,57,04,434 mobile phones in the Karnataka State, or in other words, only 0.4% of the mobile phones are registered.

5. As on the date of evaluation, services like Municipal and KSRTC are not functioning.

6. It is observed that among the payment based services, the highest number of payments is occurring in the utility services with 95.47%, followed by transportation services with 1.98% and telecom services with 1.26%. The remaining 1.29% is shared by all other category services.

7. It is observed that the total number of payment transactions count as on the date of evaluation is 5,01,889. Such a number of transactions is too low even with 658 services on the portal after 25 months of the project initiation.

8. Only three line Departments are using the ICARE service facility and only 1194 complaints have been received as on the date of evaluation.

9. It is found that the success rate of financial transactions in Karnataka Mo-bile Service is 90%, and indeed it is required to work towards in achieving closer to 100%.

10. Only 33.5% respondents are aware of the mobile services out of which only 7% have the highest level of awareness.

11. It is observed that many Departments do not provide a complete set of services needed to use to the fullest extent. For ex., Canara Bank provides only lead generation services.

12. In spite of several shortcomings, as compared to the conventional service delivery mechanisms, 76.3% of the respondents said Mobile Governance is better and useful.

13. It is shown that 35.7% respondents uses the Karnataka Mobile One web-site only for information enquiry, 30.6% uses for services including payment, 20.5% uses for other services and 13.2% uses for services not involving a payment.

14. More than 88% of the users believe that the services have eased the procedures and 64% of them believe that it has brought in efficiency.

This evaluation study resulted in the following deliverables:

1. Insights on the number and types of mobile services and understanding of the transaction pattern and counts.

2. Assessment of impact of Mobile Governance on end-users by understanding their usage pattern, opinions and user experiences.

3. Recommendations based on the analysis of the data available in the dash-board of Karnataka Mobile One to derive the current status.

4. Suggestions from the respondents.

7.4 One-to-One Mapping of Objectives to Findings

In this section, a one-to-one mapping of objectives as specified in the ToR to the findings are given below.

1. Whether Mobile Governance service is reaching out to all parts of the State where mobile services and/or internet is available? To what extent are the services available as of date?

   Finding: Yes, the Mobile Governance service is accessible in all the parts of the state where mobile services and/or internet is available. The mobile governance website is accessible in all the places where any other website is accessible from any portable and non-portable devices. The Mobile Governance application services are accessible from mobile phones that have the Mobile One app installed in it. As on the date of evaluation, there are a total of 658 services that are fully functional and operational. Table

7.1 provide the number of G2C, B2C and G2B services that are a part of Mobile Governance in Karnataka. Access to all the services of Mobile Governance are free. However, for any service where payment is required, the request is redirected to the particular service provider through a gate-way. The 658 services are integrated on six different channels as shown in the Table 7.2.

2. Whether the citizens of the State are aware of the services offered?

   Finding: As per the outcome of the survey, out of 1936 respondents, only 648 (or 33.5%), nearly one third, said that they are aware of the mobile services and remaining 1288 (i.e. 66.5%), nearly two third, said that they are not aware of mobile services in the state. This is illustrated in the Figure 7.3. The level of awareness is measured through rating levels from 1 to 5 with 1 being the least level and 5 the highest level. The awareness level about the mobile services in the minds of the people of Karnataka is illustrated in Figure 7.4. Out of the 648 respondents who are aware of the mobile services, only 7% (i.e. 45) of the respondents have the highest level of awareness (i.e. 5).

3. Whether the citizens are using the services of Mobile Governance?

   Finding: As on the date of evaluation, a total of 2,53,480 mobile phones have been registered for using mobile services through any channel. Table 7.4 shows the number of mobile phone registrations based on its platform. The population of Karnataka as on December 2016 was estimated to be 6,60,76,021 and the number of mobile phone users is estimated to be 6,57,04,434. It is observed that more than 95% of the population are using mobile phones. Hence, the number of mobile phones that have been registered for using mobile services against the total number of mobile phones in the Karnataka state is in the ratio of 1:250. In other words, for every 250 mobile users, we have only one mobile phone registered for using mobile services. This comparison shows that only less than one percent or more specifically 0.4% of the mobile users in the State have registered to the Karnataka Mobile One portal. The real-time history data relating to the total number of visitors (LTD, MTD and 31-Jan) as recorded in

   the dashboard of Karnataka Mobile One as on 31st January 2017 is given in Table 7.6.

4. Whether the services are hack free and confidential?

   Finding: Data audit is carried out in every quarter to ensure the services being provided are hack free. The Karnataka Mobile One portal is hosted with STQC (Standardization, Testing and Quality Certification) which

impels trust and security. They are one of the Registered Certifying Bodies (RCBs) for various International Standards, such as ISO27001:2013, ISO20000:2011, ISO9001:2015, etc. They are also a Government certifying agency for several quality and test parameters. However, two recommendations (item 3 and item 4) are listed in Chapter 9 under the Section 9.2.1in this regard.

5. Whether line departments and parastatals are supportive in concept and action of Mobile Governance?

   Finding: From the Tables 7.10, 7.12 and 7.13, it is observed that, BESCOM tops the list in department-wise payments, fourth in department-wise non-payments and tops in department-wise payment transaction counts. Therefore, the evaluation team visited BESCOM to understand their view on MobileOne app. According to BESCOM, there are comfortable with the functions of the m-governance system and the technical team. However, some points are highlighted in the following:

   (a) Out of a total 15 payment service gateways, two are mobile based i.e. KMO and Pay U. Relatively, the number of transactions that occur in KMO is less than Pay U.

6. What changes are to be suggested for better implementation and coverage?

   Finding: Please refer Chapter 9 for measures and recommendations for better implementation and coverage that the mobile governance was in-tended to achieve and standards that it ought to achieve.

Chapter 8

Conclusion

Many people do not have access to Internet even though the number of mobile phones is quite large. Bridging the digital divide and ensuring that the poorest and most vulnerable people benefit from the progress in the area of ICT and Mobile Governance requires an integrated approach to public policy. This evaluation report details the performance, status, effectiveness and efficiency of mobile services in Karnataka State. Effective planning, advertising and popularizing of mobile services, its usage and benefits is vital. Partnering with various Government, private and public service providers to facilitate access to mobile services is also a key to success. In addition, enhancing the ICT infrastructure and raising the level of human capital, including improvement of the ICT literacy of citizens, to make use of the new technologies so as to realize the full benefits of online and mobile services shall be a road map. Finally, adoption of the recommendations will definitely help the objectives of the project to reach the common man in a comprehensive manner.

Chapter 9

Measures and Recommendations

After a thorough evaluation of performance, status, effectiveness and efficiency of mobile services is Karnataka, several measures and recommendations are made in this chapter.

9.1 Measures

1. Make mobile technology the highest penetrated communication channel to mobile services.
2. Round the clock availability (24 7 365).
3. Centralization of dissemination of real-time, time critical information and timely updates.
4. Make the public service delivery systems more efficient, transparent and bring them closer to the common man.

9.2 Recommendations

Based on the technical data available in the dashboard, feedback gathered from the participating respondents and looking at the problem areas that are highlighted in Chapter 5, the evaluation team has prepared a near exhaustive list of insights classified into short-term and long-term recommendations on improving the Karnataka Mobile One portal/app as follows:

9.2.1 Short Term Recommendations

1. A 24 7 365 call centre or ICARE service manned with well trained and highly professional executives is essential to achieve high standards of service and responsiveness that the Mobile Governance team strives

for. This will also streamline response effectiveness and closure of various query/ complaint tickets in the prescribed resolution time.

2. In all the payment related services, transaction charges using internet banking is INR 5 for transaction amount upto INR 500 and INR 10 for transaction amount above INR 500. There are many other online payment applications available for example, paytm which do not charge extra transaction amount for the online payment. Due to this, the user might not use MobileOne application payment based services which incurs additional transaction charges.

3. When the user requests for forgot password, the application asks to enter his/her registered mobile number followed by a captcha. A 4-digit new password is sent to the registered user. The hacker may brute force the new password with all possible combinations from 0000 to 9999, thus gaining access to the user's account by just knowing the mobile number of the victim/user. However, the solution is to introduce an OTP pass-word option or reset password link or by increasing the password length of at least 8 characters along with alphanumeric. However, a detailed description in regard is presented in Section 9.2.2.

4. The entire MobileOne source code can be decompiled using various tools such as apktool. Decompilation is a type of reverse engineering that does the opposite of what the compiler does. There are a number of different reasons for decompilation. But decompilation is sometimes used unethically to reproduce the source code for reuse or adaptation without per-mission of the copyright holder. The hacker can also add malicious code to the application source code and spread it over the internet through various social engineering techniques. However, the application source code can be designed to be resistant to decompilation through protective means such as obfuscation. However, a detailed description in this regard is presented in Section 9.2.2.

5. Work on strengthening client relationships by working closely with partnering line departments, and communicating periodic updates and con-ducting regular feedback exercises.

6. Adequate training on the mobile service usage especially for rural citizens is also essential.

7. In addition to the above short term recommendations, the following pro-vides a set of specific (technical) recommendations that may be implemented on priority basis:

(a) The GUI of an application is designed with minimalistic look and feel and thus it doesn't burden the user from fast accessing. However, the smart users may not get attracted to this style. Hence, there is a need of better interfaces and interactions for rich user experience.

(b) Once the user requests for new password by entering the registered mobile number, the application should redirect to login page to login with new password rather than staying at the same page.

(c) Since the MobileOne application consists of 658 fully functional and operational services, it would be better to provide a search option inside the application to get the particular service in addition to traversing all the services.

(d) Recent viewed/used services tab can be introduced in the users ac-count. Providing this facility will enable the users to access frequently used services quickly thus enhancing their experience.

(e) Content of the application should t to the screen to avoid scroll down. This can be achieved by reducing the size of the logos (icons) of different services. However providing larger icons can be separate settings as part of accessibility or geriatric option.

(f) Point-of-Interest (POI) of users or most viewed/used services can be displayed on the main screen.

(g) Instead of displaying more icons and back arrow to access services, swipe left-right of the whole application screen to traverse between different screens/services list could be a better option.

(h) Providing the facility for users to customize their account or creating the favorites by letting to de ne their preferred choice of services in pro le details. And only those services will be visible by default and however, other services can be accessed on demand by means of searching or swiping left or right.

(i) Currently, the invoice generated is sent via SMS. However, the invoice may also be sent via the user's registered e-mail.

(j) Provision for registered users to post their feedback and testimonials about the services.

(k) Sending newsletters via e-mails and push SMS about Karnataka Mo-bile One services and their updates.

9.2.2 Detailed Description for item no. 3 and 4 of the Short Term Recommendations

1. KMO user account hijacking via forgot password feature: KMO application has the feature to set a new password, if user forgets his/her

password like any other application. As per the web application security, this feature is considered as a very high ranked potential vulnerability of account hijacking. Hence, this need to be handled properly. In KMO, when the user clicks on forgot password and the application asks to enter his/her registered 10-digit mobile number. After submitting the mobile number, the user receives a 4 digit pin to login to user account. The issue with this approach is the 4 digit pin, since the pin shared to the user consists only 4 digit numbers and thus it can be brute forced. During this, the attacker might follow the following steps to hijack KMO user account through forgot password.

(a) The attacker may have or get the mobile number of the victim by mean of social engineering.

(b) Once the attacker gets the victim's mobile number and through KMO application requests for forgot password. However, a 4 digit pin number is sent to victim's mobile number. The attacker now performs a \brute force" attack on the victim's mobile number with a combination from 0000 to 9999 to login into victim's KMO account.

(c) To perform the brute force attack on the KMO application, the attacker might use Human Interface Device (HID) Arduino Nano to automate this process and thus gain access to the victim's KMO ac-count by just knowing the mobile number.

To resolve the above issue. Following solutions can be considered.

(a) Sending a One Time Password (OTP) pin to registered mobile number rather than a 4 digit pin.

(b) Increasing the password string length.

(c) Can use captcha during login.

2. De-compilation aw in the KMO application: The entire KMO application source code can be de-compiled using various tools such as apktool, jadax, etc. De-compilation is a type of reverse engineering that does the opposite of what the compiler does. There are a number of different reasons for de-compilation. But de-compilation is sometimes used unethically to reproduce the source code for reuse or adaptation without permission of the copyright holder. The hacker can also add malicious code to the application source code and spread it over the internet through various social engineering techniques.
Following steps the attacker might follow to de-compile KMO application.

(a) Download and Install APKTOOL in any operating system.

(b) Open APKTOOL through Command Prompt

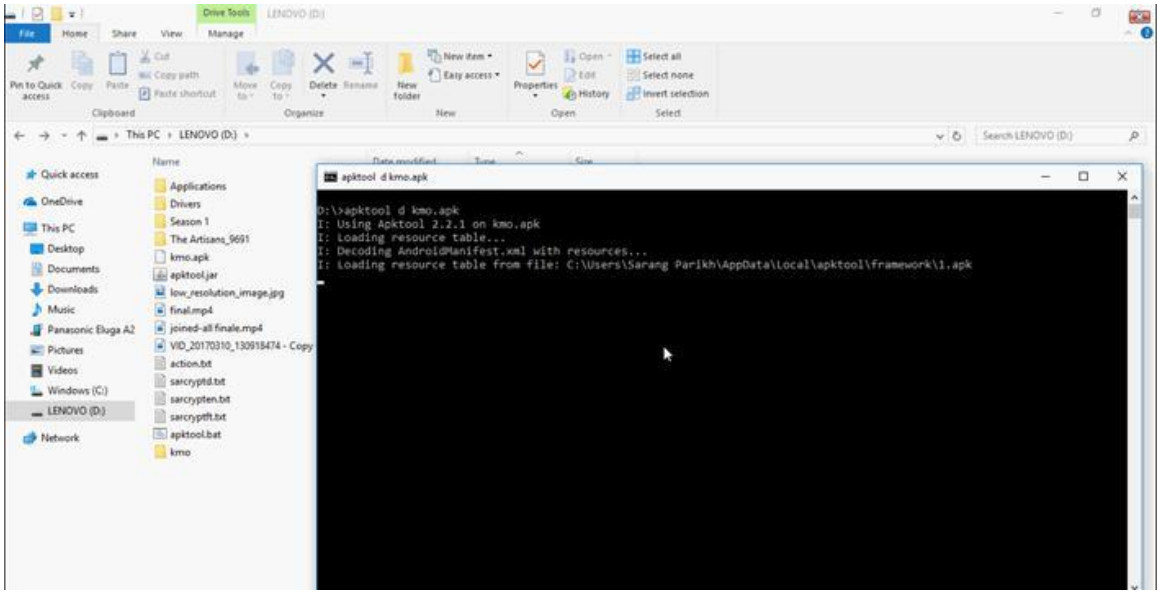

Figure 9.1: KMO app de-compilation process through command prompt.

(c) Download and open apk le of KMO using apk extractor app from play store.

(d) Type the following command: Apktool b <apk name>.apk

(e) Wait the process to complete.

(f) And you can see the entire source code of KMO application.

(g) Now the attacker can modify the source code of KMO and add malicious content and host in app store to download.

(h) The malicious application can now be transferred to the target users via social engineering and SEO techniques.

To resolve the above issue, the following solution can be considered. The application source code can be designed to be resistant to de-compilation through protective means such as obfuscation.

9.2.3 Long term Recommendations

1. During the launch of Karnataka Mobile One service in Karnataka there were 4281 services and currently based on the user's feedback, there are only 658 functioning services. With this, we can conclude that the active services have dropped down to 15.37% since it's inception. Hence, there is a need to look in with regard to the services that are currently not included.

2. It is observed that only 15 services can be availed using more than or equal to 3 channels. Hence, measures can be taken to include various channels to other services.

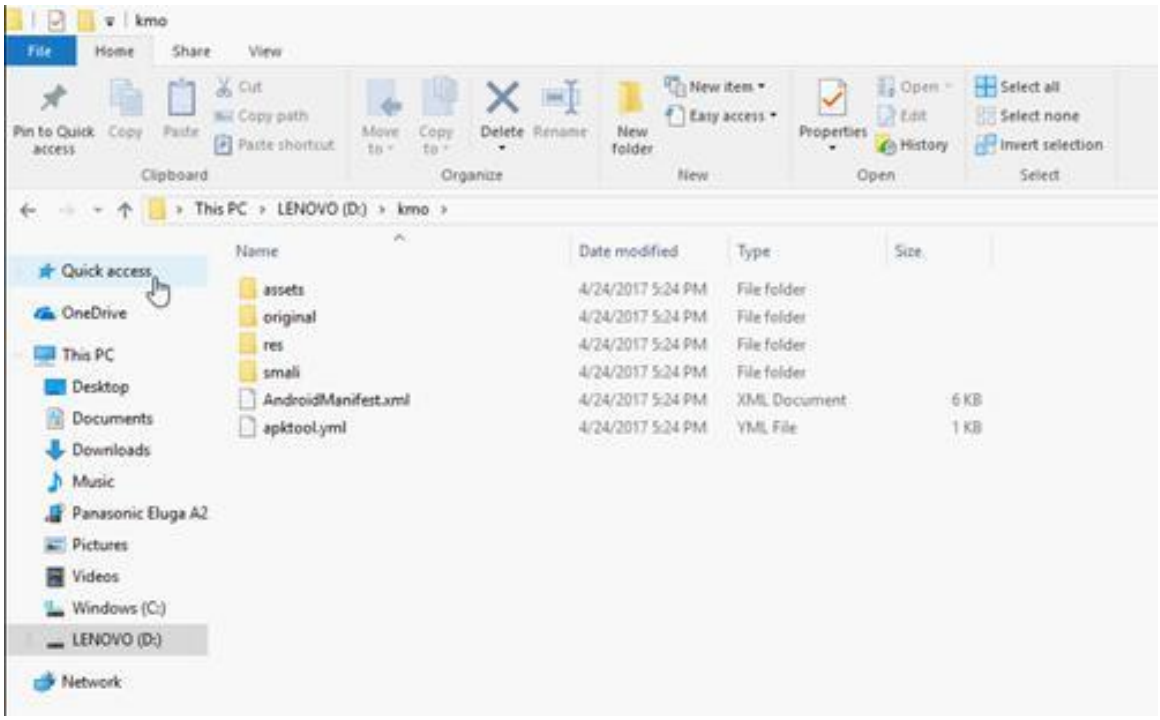

Figure 9.2: Source code directory of KMO app

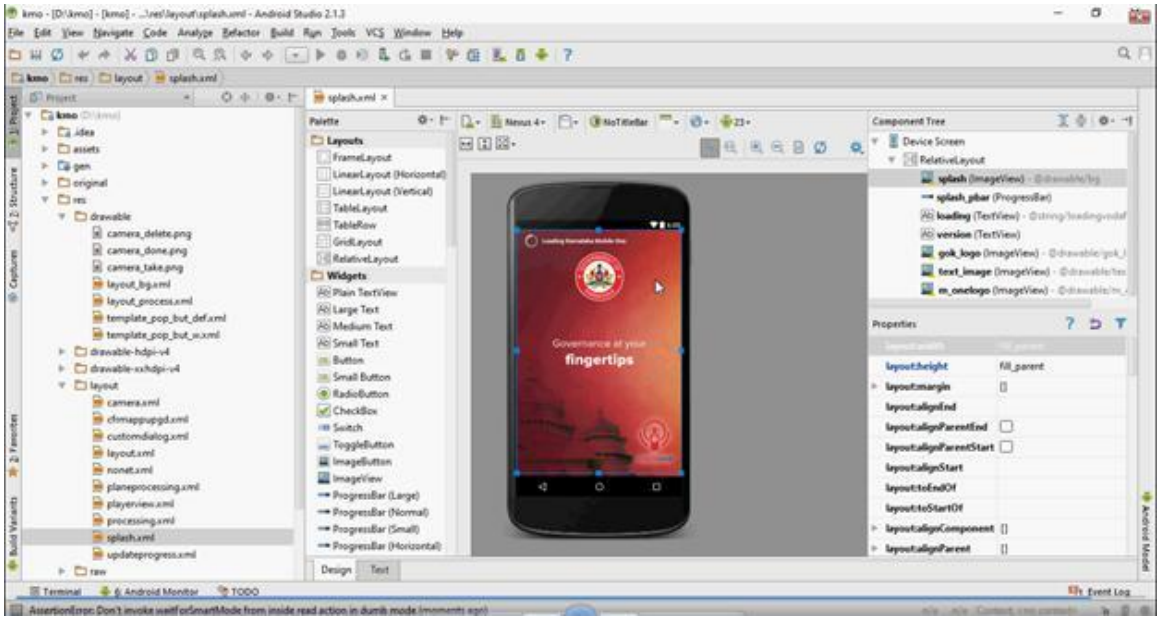

Figure 9.3: Source code of KMO app with the de-compilation process.

3. It is observed that less than 1% of the mobile users in the State have registered to the Karnataka Mobile One. Henceforth, citizen services of Government Departments and private sectors could be partnered and redirected to Karnataka Mobile One service for a single point interface and to facilitate access to mobile services at free or nominal rates.

4. Linking Aadhar card 12 digits Unique Identification Number (UID) issued by UIDAI to Karnataka Mobile One service especially where payment is required. Since it is becoming the Government's base for public welfare and citizen services. This may be done in congruence with the Government policies.

5. During the survey, it is observed that only 33.3% citizens are aware of Karnataka Mobile One service in Karnataka. Therefore, a well defined branding strategy in terms of planning, advertising and popularising is necessary to make citizens start using mobile services to full extent.

Appendix A

Compliance to the Suggestions from the Technical Committee

1. Suggestion 1: Short term and long term recommendations to be synchronized with the evaluation questions and separated by each objective of the programme.

   (a) Objective 1: Whether Mobile Governance service is reaching out to all parts of the State where mobile services and/or internet is available? To what extent are the services available as of date?

      i. Evaluation Question 1. As against the 4281 G2C, B2C and G2B services that are a part of Mobile Governance in Karnataka, how many are fully functional and operational on the date of evaluation? How many of these are free and how many payment based?

         A. Short Term Recommendations: Since the MobileOne application consists of 658 fully functional and operational ser-vices, it would be better to provide a search option inside the application to get the particular service in addition to traversing all the services.

         B. Long Term Recommendations: During the launch of Karnataka Mobile One service in Karnataka there were 4281 ser-vices and currently based on the user's feedback, there are only 658 functioning services. With this, we can conclude that the active services have dropped down to 15.37% since it's inception. Hence, there is a need to look in with regard to the services that are currently not included.

      ii. Evaluation Question 2. How many of these are urban based, how many are rural based and how many are urban as well as rural based?

A. Short Term Recommendations: Adequate training on the mobile service usage especially for rural citizens is also essential.

iii. Evaluation Question 3. How many of these can be used on SMS channel, how many on Interactive Voice Response (IVR) channel, how many on mobile web, how many on Unstructured Segmented Data (USSD) and how many on smart client applications? How many of these can be availed using more than or equal to three channels?

A. Long Term Recommendations: It is observed that only 15 services can be availed using more than or equal to 3 channels. Hence, measures can be taken to include various channels to other services.

(b) Objective 2: Whether the citizens of the State are aware of the services offered?

i. Evaluation Question 16. What is the awareness level about Mobile Governance in the minds of citizens of the State?

A. Long term Recommendation: During the survey, it is observed that only 33.3% citizens are aware of Karnataka Mobile One service in Karnataka. Therefore, a well defined branding strategy in terms of planning, advertising and popularizing is necessary to make citizens start using mobile services to full extent.

(c) Objective 3: Whether the citizens are using the services of Mobile Governance

i. Evaluation Question 7. How many Mobile phones have been registered for using Mobile Governance through any channel? How does this compare with the total number of mobile phones existing in the State? What is the rate of registration of Mobile phones for using Mobile Governance?

A. Long term Recommendation: It is observed that less than 1% of the mobile users in the State have registered to the Karnataka Mobile One. Henceforth, citizen services of Government Departments and private sectors could be partnered and redirected to Karnataka Mobile One service for a single point interface and to facilitate access to mobile services at free or nominal rates.

ii. Evaluation Question 8. Which of the fully functional and operational services of Mobile Governance have been used by people? What is the number of hits for each service recorded per

day/month or till date? What is the ranking of services being used?

A. Short term Recommendation: Since the MobileOne application consists of 658 fully functional and operational services, it would be better to provide a search option inside the application to get the particular service in addition to traversing all the services.

B. Long term Recommendation: During the launch of Karnataka Mobile One service in Karnataka there were 4281 ser-vices and currently based on the user's feedback, there are only 658 functioning services. With this, we can conclude that the active services have dropped down to 15.37% since it's inception. Hence, there is a need to look in with regard to the services that are currently not included.

(d) Objective 4: Whether the services are hack free and confidential?

i. Evaluation Question 14. Whether there is any system or arrangement in place to ensure that the services being provided are hack free and, where needed, confidential? Are the systems and arrangements sufficient and enough to inspire trust and security?

A. Short term Recommendation: The entire MobileOne source code can be decompiled using various tools such as apktool. Decompilation is a type of reverse engineering that does the opposite of what the compiler does. There are a number of different reasons for decompilation. But decompilation is sometimes used unethically to reproduce the source code for reuse or adaptation without permission of the copyright holder. The hacker can also add malicious code to the application source code and spread it over the internet through various social engineering techniques. However, the application source code can be designed to be resistant to decompilation through protective means such as obfuscation.

B. Short term Recommendation: When the user requests for forget password, the application asks to enter his/her registered mobile number followed by a captcha. A 4-digit new password is sent to the registered user. The hacker may brute force the new password with all possible combinations from 0000 to 9999, thus gaining access to the user's account by just knowing the mobile number of the victim/user. However, the solution is to introduce an OTP password option or reset pass-

word link or by increasing the password length of at least 8 characters along with alphanumeric.

(e) Objective 5: Whether line departments and parastatals are supportive in concept and action of Mobile Governance?

i. Evaluation Question 15. What is the back end readiness and help provided by the line departments and parastatals to the Centre for E-Governance for launching and popularizing Mobile Governance?

A. Short term Recommendation: Work on strengthening client relationships by working closely with partnering line departments, and communicating periodic updates and conducting regular feedback exercises.

(f) Objective 6: What changes are to be suggested for better implementation and coverage

i. Evaluation Question 18. What suggestions can be made for making Mobile Governance to meet the objectives it was intended to achieve and standards that it ought to achieve?

A. Short term Recommendation: The GUI of an application is designed with minimalistic look and feel and thus it doesn't burden the user from fast accessing. However, the smart users may not get attracted to this style. Hence, there is a need of better interfaces and interactions for rich user experience.

B. Short term Recommendation: Once the user requests for new password by entering the registered mobile number, the application should redirect to login page to login with new password rather than staying at the same page.

C. Short term Recommendation: Recent viewed/used ser-vices tab can be introduced in the users account. Providing this facility will enable the users to access frequently used ser-vices quickly thus enhancing their experience.

D. Short term Recommendation: Content of the application should t to the screen to avoid scroll down. This can be achieved by reducing the size of the logos (icons) of different services. However providing larger icons can be separate settings as part of accessibility or geriatric option.

E. Short term Recommendation: Point-of-Interest (POI) of users or most viewed/used services can be displayed on the main screen.

F. Short term Recommendation: Instead of displaying more icons and back arrow to access services, swipe left-right of the

whole application screen to traverse between different screens/services list could be a better option.

G. Short term Recommendation: Providing the facility for users to customize their account or creating the favorites by letting to de ne their preferred choice of services in pro le details. And only those services will be visible by default and however, other services can be accessed on demand by means of searching or swiping left or right.

H. Short term Recommendation: Currently, the invoice generated is sent via SMS. However, the invoice may also be sent via the user's registered e-mail.

I. Short term Recommendation: Provision for registered users to post their feedback and testimonials about the ser-vices.

J. Short term Recommendation: Sending newsletters via e-mails and push SMS about Karnataka Mobile One services and their updates.

K. Short term Recommendation: A 24 7 365 call centre or ICARE service manned with well trained and highly professional executives is essential to achieve high standards of service and responsiveness that the Mobile Governance team strives for. This will also streamline response effectiveness and closure of various query/ complaint tickets in the prescribed resolution time.

L. Short term Recommendation: In all the payment related services, transaction charges using internet banking is INR 5 for transaction amount upto INR 500 and INR 10 for trans-action amount above INR 500. There are many other online payment applications available for example, paytm which do not charge extra transaction amount for the online payment. Due to this, the user might not use MobileOne application payment based services which incurs additional transaction charges.

M. Short term Recommendation: Adequate training on the mobile service usage especially for rural citizens is also essential.

N. Long term Recommendation: Linking Aadhar card 12 digits Unique Identification Number (UID) issued by UIDAI to Karnataka Mobile One service especially where payment is required. Since it is becoming the Government's base for public

welfare and citizen services. This may be done in congruence with the Government policies.

2. Suggestion 2: Short term and long term recommendations to be prioritized by their urgency for implementation.
   Priority in short term recommendations

   (a) The entire MobileOne source code can be decompiled using various tools such as apktool. Decompilation is a type of reverse engineering that does the opposite of what the compiler does. There are a number of different reasons for decompilation. But decompilation is sometimes used unethically to reproduce the source code for reuse or adaptation without permission of the copyright holder. The hacker can also add malicious code to the application source code and spread it over the internet through various social engineering techniques. However, the application source code can be designed to be resistant to decompilation through protective means such as obfuscation.

   (b) When the user requests for forget password, the application asks to enter his/her registered mobile number followed by a captcha. A 4-digit new password is sent to the registered user. The hacker may brute force the new password with all possible combinations from 0000 to 9999, thus gaining access to the user's account by just knowing the mobile number of the victim/user. However, the solution is to introduce an OTP password option or reset password link or by increasing the password length of at least 8 characters along with alphanumeric.

   (c) In all the payment related services, transaction charges using internet banking is INR 5 for transaction amount upto INR 500 and INR 10 for transaction amount above INR 500. There are many other online payment applications available for example, paytm which do not charge extra transaction amount for the online payment. Due to this, the user might not use MobileOne application payment based services which incurs additional transaction charges.

   (d) Once the user requests for new password by entering the registered mobile number, the application should redirect to login page to login with new password rather than staying at the same page.

   (e) Since the MobileOne application consists of 658 fully functional and operational services, it would be better to provide a search option inside the application to get the particular service in addition to traversing all the services.

   (f) Content of the application should t to the screen to avoid scroll

down. This can be achieved by reducing the size of the logos (icons) of different services. However providing larger icons can be separate settings as part of accessibility or geriatric option.

(g) Instead of displaying more icons and back arrow to access services, swipe left-right of the whole application screen to traverse between different screens/services list could be a better option.

(h) The GUI of an application is designed with minimalistic look and feel and thus it doesn't burden the user from fast accessing. However, the smart users may not get attracted to this style. Hence, there is a need of better interfaces and interactions for rich user experience.

(i) Currently, the invoice generated is sent via SMS. However, the invoice may also be sent via the user's registered e-mail.

(j) Recent viewed/used services tab can be introduced in the users ac-count. Providing this facility will enable the users to access frequently used services quickly thus enhancing their experience.

(k) Point-of-Interest (POI) of users or most viewed/used services can be displayed on the main screen.

(l) Providing the facility for users to customize their account or creating the favorites by letting to de ne their preferred choice of services in pro le details. And only those services will be visible by default and however, other services can be accessed on demand by means of searching or swiping left or right.

(m) Work on strengthening client relationships by working closely with partnering line departments, and communicating periodic updates and conducting regular feedback exercises.

(n) A 24 7 365 call centre or ICARE service manned with well trained and highly professional executives is essential to achieve high standards of service and responsiveness that the Mobile Governance team strives for. This will also streamline response effectiveness and closure of various query/ complaint tickets in the prescribed resolution time.

(o) Adequate training on the mobile service usage especially for rural citizens is also essential.

(p) Provision for registered users to post their feedback and testimonials about the services.

(q) Sending newsletters via e-mails and push SMS about Karnataka Mo-bile One services and their updates.

The technical recommendations listed under the short term recommendations should be incorporated immediately in the application. Priority in long term recommendations

(a) During the launch of Karnataka Mobile One service in Karnataka there were 4281 services and currently based on the user's feedback, there are only 658 functioning services. With this, we can conclude that the active services have dropped down to 15.37% since it's inception. Hence, there is a need to look in with regard to the services that are currently not included.

(b) During the survey, it is observed that only 33.3% citizens are aware of Karnataka Mobile One service in Karnataka. Therefore, a well defined branding strategy in terms of planning, advertising and popularising is necessary to make citizens start using mobile services to full extent.

(c) It is observed that less than 1% of the mobile users in the State have registered to the Karnataka Mobile One. Henceforth, citizen services of Government Departments and private sectors could be partnered and redirected to Karnataka Mobile One service for a single point interface and to facilitate access to mobile services at free or nominal rates.

(d) It is observed that only 15 services can be availed using more than or equal to 3 channels. Hence, measures can be taken to include various channels to other services.

(e) Linking Aadhar card 12 digits Unique Identification Number (UID) issued by UIDAI to Karnataka Mobile One service especially where payment is required. Since it is becoming the Government's base for public welfare and citizen services. This may be done in congruence with the Government policies.

3. Suggestion 3: A clear road map should be recommended for bringing improvement in the mobile services.

MobileOne has the unique distinction of being certified as India's first and the world's largest multi-mode mobile governance platform with a multitude of services. It is a unified mobile platform for delivery of citizens' services, both from the government and the private sector through an open platform, which can accept any service and is thus future-proof. These anytime, anywhere, anyhow services will be available 24 7 365 days at any location in India on any mobile device. The services include G2C, B2C and G2B and can be availed by anyone. The MobileOne platform is integrated across all the telecom operators and works on the concept

of delivering all its services through the 'OneURL and One App' concept i.e. the citizen can avail all the services under one access point, thus eliminating the need to visit multiple websites.

Making services available at the fingertips of people across Karnataka has saved residents of Karnataka the time and strains of having to stand in queues in all-weather to access government services, be it payment of taxes, utility bills, traffic violation fines, tracking applications pertaining to passports, birth certificates or university results, etc. MobileOne enables citizens to access the above services and more from anywhere and at any time through any device.

(a) Security in mobile app: As part of MobileOne application security point of view, the entire application source code needs to be re-designed in order to be resistant to decompilation through protective means such as obfuscation. The users' account needs to be hack free by increasing the password length with alphanumeric characters to achieve strong password.

(b) Online payments: Various analysts believe positive trend in mobile phone purchases will continue over the years as more and more consumers adapt to online payment services. Hence, mobile application can be designed to facilitate payments using IMPS and mobile wallets.

(c) Innovative mobile user experience design: Effective display of data and content on MobileOne user interface is important for a sound user experience. Leading consumer apps are setting high standards for user interface design, and all organizations must master new skills and work with new partners to meet growing user expectations.

(d) Increase the awareness: To increase the awareness of the MobileOne app, a well defined branding strategy in terms of planning, advertising and popularising is necessary to make citizens start using mobile services to full extent.

Appendix B

Terms of Reference (ToR) of the Evaluation Study

B.1 Title of the study:

The study is titled Evaluation of the Performance, Status, Effectiveness and Impact of Mobile Services in Karnataka.

B.2 Department implementing Mobile Governance:

The Centre for E- Governance implements Mobile Governance.

B.3 Background, Context, Aims and Objectives of Mobile Governance:

1. Mobile Governance (a sub -domain of E Governance) refers to collection of services as the strategic use of government services and applications which are only possible using cellular/mobile telephones, laptop computers, Personal Digital Assistants (PDAs) and wireless internet infrastructure.

   The world's first Mobile Governance work initiated by Professor Ibrahim Kushchu in Japan at them Gov Lab - now grown into Mobile Government^{TM} Consortium- offering services for the transformation to Mobile Governance. Proponents of Mobile Governance services argue it can help make Public information and government services available \anytime, anywhere" and that the ubiquity of these devices mandates their employment in government functions.

   Cost reduction, Efficiency, Transformation/modernization of Public Sector Organizations, added convenience and flexibility, better services to the citizens and ability to reach a larger number of people through mobile de-vices than would be possible using wired internet only are considered to be the main advantages of Mobile Governance.

2. In the country, the Ministry of Communication and Information Technology, Department of Information Technology (DoIT) has announced plans for all its departments and agencies to develop and deploy mobile applications to provide all their services through mobile devices. Following are the main measures laid down by DoIT:

   (a) Web sites of all Government Departments and Agencies shall be made mobile-compliant, using the \One Web" approach.

   (b) Open standards shall be adopted for mobile applications for ensuring the inter-operability of applications across various operating systems and devices as per the Government Policy on Open Standards for e-Governance.

   (c) Uniform/ single pre-designated numbers (long and short codes) shall be used for mobile-based services to ensure convenience.

   (d) All Government Departments and Agencies shall develop and deploy mobile applications for providing all their public services through mobile devices to the extent feasible on the mobile platform. They shall also specify the service levels for such services.

   The current status in the achievement of these objectives is available on the website www.mobileseva.gov.in and their mobile app store for these available on the website www.apps.mgov.gov.in.

3. Mobile Governance in Karnataka was tested in a pilot mode for about an year after 2013.It was on the 08th of December 2014 that the President of India Shri Pranab Mukherjee inaugurated the unified multi-mode Mobile Governance platform of Karnataka called \Karnataka Mobileone". The initiative made Karnataka the first State in India to launch a unified mo-bile platform done on Public-Private Partnership mode for the delivery of citizens' services, both from government and the private sector through an open platform, which can accept any service. These anytime, anywhere, anyhow services will be available 24 7 365 days at any location in the state on any mobile device. The Karnataka Mobile One platform services are claimed to be capable of being availed even on simple low-end phones through Interactive Voice Response (IVR), SMS or Mobile Web, so that the common man can access these services. Through this initiative, citizens of Karnataka, it is claimed, can pay utility bills, property tax, book railway and bus tickets, le income tax, m-passport, driving licenses, lodge Police Complaints and do many more citizen related activities with their smart phones. 4281 services (637 Government and 3644 private) including G2C (Government to Citizen), B2C (Business to Citizen) and G2B (Government to Business) services can be availed by

Karnataka-based citizens through this initiative. Feature phone users can access the Mobile One services through Interactive Voice Response (IVR) or SMS by dialing 161 or through Unstructured Supplementary Service Data (USSD) by dialing 161#. Users can also access these services through the mobile site mobile.karnataka.gov.in. They first need to register their phone numbers to login to the mobile site, following which they can select any service category to proceed. Through an initiative named \ICARE", citizens can even take a simple picture of a non-functioning service such as a pothole or streetlight, and send it automatically to the concerned officials for redressal through smart geo tagging.

B.4 Evaluation Scope and Purpose:

1. The scope of evaluation is the entire State of Karnataka where Mobile Governance services are available.
2. The objective and purpose of the study will be to find/evaluate:
   (a) Whether Mobile Governance service is reaching out to all parts of the State where mobile services and/or internet is available? To what extent are the services available as of date?
   (b) Whether the citizens of the State are aware of the services offered?
   (c) Whether the citizens are using the services of Mobile Governance?
   (d) Whether the services are hack free and confidential?
   (e) Whether line departments and parastatals are supportive in concept and action of Mobile Governance?
   (f) What changes are to be suggested for better implementation and coverage?

B.5 Evaluation Questions (inclusive not exhaustive):

1. As against the 4281 G2C, B2C and G2B services that are a part of Mobile Governance in Karnataka, how many are fully functional and operational on the date of evaluation? How many of these are free and how many payment based?
2. How many of these are urban based, how many rural based and how many urban as well as rural based?
3. How many of these can be used on SMS channel , how many on interactive voice response (IVR) channel, how many on mobile web, how many on Unstructured Segmented Data (USSD) and how many on smart client

applications? How many of these can be availed using more than or equal to three channels?

4. How many of these services are in English only, how many are in Kannada only and how many are in both these languages?
5. How many services are in other regional languages and in the national language?
6. Is the Mobile Governance website accessible everywhere where any other website is accessible? Is it accessible on low priced mobile phones too?
7. How many Mobile phones have been registered for using Mobile Governance through any channel? How does this compare with the total number of mobile phones existing in the State? What is the rate of registration of Mobile phones for using Mobile Governance?
8. Which of the fully functional and operational services of Mobile Governance have been used by people? What is the number of hits for each service recorded per day/month or till date? What is the ranking of services being used?
9. How many citizens have used \ICARE" initiative and registered complaints with service providers as on the date of evaluation? How does this compare with the total number of Mobile phones which have been registered for using Mobile Governance?
10. How was the complaint made through \ICARE" initiative dealt with? How many of them have been disposed? Was the response better than, as good as or worse than the response that is received in conventional mode?
11. What is the probability of a financial transaction, complaint lodging and actual receiving of a service failing/ aborting/ hanging midway in the first try for no fault or shortcoming of the Mobile Governance user?
12. What is the revenue sharing/business model adopted in Public-Private partnership that goes into Mobile Governance? Is it different from the other sharing/model prevalent?
13. How does the Mobile Governance of Karnataka measure on the parameters of Access, Reach, Adoption, Interaction, Cost (to the user as well as the Government) and Efficiency?
14. Whether there is any system or arrangement in place to ensure that the services being provided are hack free and, where needed, confidential? Are the systems and arrangements sufficient and enough to inspire trust and security?

15. What is the back end readiness and help provided by the line departments and parastatals to the Centre for E-Governance for launching and popularizing Mobile Governance?
16. What is the awareness level about Mobile Governance in the minds of citizens of the State?
17. What is the perception of Mobile Governance service users about the ease of access, timeliness of service delivery, security of financial transactions done and comparison with conventional service delivery mechanisms?
18. What suggestions can be made for making Mobile Governance meet the objectives it was intended to achieve and standards that it ought to achieve?

B.6 Sampling and Evaluation Methodology:

Evaluation methodology will involve personal interviews of the Mobile Governance service users and officials of the Centre for E Governance dealing with the implementation of Mobile Governance. Data on the dash board of the plat-form will be analyzed for working out user numbers and the type of services used.

B.7 Qualifications of the consultants and method of selection:

Consultant Evaluation Organizations should have and provide details of evaluation team members having minimum technical qualifications/ capability as below:

1. A Computer Science/ Information Science graduate with at least five years of experience
2. A Development Scientist and
3. Research assistant/Statisticians.

Consultant Evaluation Organizations not having these personnel will not be considered as competent for evaluation.

B.8 Deliverables and time schedule:

The Project Director of Mobile Governance in the Centre for E- Governance will provide all information, data and Government orders related to Mobile Governance, details on processes etc and issue necessary instructions to the

concerned officers to provide the details required to the Consultant Evaluation Organisation and co-operate in completion of the study in the stip-ulated time. It is expected to complete the study in 4 months' time, excluding the time taken for approval. The Consultant Evaluation Organization is expected to adhere to the following timelines and deliverables. The Consultant Evaluation Organization should complete the study in 4 months' time, excluding the time taken for approval. They are expected to adhere to the following timelines and deliverables or be quicker than the follows.

a. Work plan submission : One month after signing the agreement.
b. Field Data Collection : One months from date of Work
   One months from date of Work
c. Draft report Submission : One month after field data collection.
d. Final Report Submission : One month from draft report approval.
e. Total duration : 4 months.

B.9 Qualities Expected from the Evaluation Report:

The following are the points, only inclusive and not exhaustive, which need to be mandatorily followed in the preparation of evaluation report:

1. By the very look of the evaluation report it should be evident that the study is that of the Karnataka Evaluation Authority (KEA) which has been done by the Consultant. It should not intend to convey that the study was the initiative and work of the Consultant, merely financed by the Karnataka Evaluation Authority (KEA).

2. Evaluation is a serious professional task and its presentation should exhibit it accordingly.

3. The Terms of Reference (ToR) of the study should form the first Appendix or Addenda of the report.

4. The results should first correspond to the ToR. In the results chapter, each question of the ToR should be answered. It is only after all questions framed in the ToR are answered, that results over and above these can detailed.

5. In the matter of recommendations, the number of recommendations is no measure of the quality of evaluation. Evaluation has to be done with a purpose to be practicable to implement the recommendations. It is desirable to make recommendations in the report as follows:

   (a) Short Term practicable recommendations: These may not be more than five in number. These should be such that they can

be acted upon without major policy changes and expenditure, and within (say) a year or so.

(b) Long Term practicable recommendations: These may not be more than ten in number. These should be such that they can be implemented in the next four to five financial years, or with sizeable expenditure, or both but does not involve policy changes.

(c) Recommendations requiring change in policy: These are those which will need a lot of time, resources and procedure to implement.

B.10 Cost and schedule of budget releases:

Output based budget release will be as follows:

1. The 1st installment of Consultation fee amounting to 30% of the total fee shall be payable as advance to the Consultant after the approval of the inception report, but only on execution of a bank guarantee of a scheduled nationalized bank, valid for a period of at least 12 months from the date of issuance of advance.

2. The second installment of Consultation fee amounting to 50% of the total fee shall be payable to the Consultant after the approval of the Draft report.

3. The third and final instalment of Consultation fee amounting to 20% of the total fee shall be payable to the Consultant after the receipt of the hard and soft copies of the final report in such format and number as prescribed in the agreement, along with all original documents containing primary and secondary data, processed data outputs, study report and soft copies of all literature used in the final report.

Taxes will be deducted from each payment, as per rates in force. In addition, the evaluating agency/consultant is expected to pay service tax at their end.

B.11 Selection of Consultant Agency for Evaluation:

The selection of evaluation agency should be finalized as per provisions of KTPP Act and rules without on the quality and conflict of compromising interest.

B.12 Contact person for further details:

The Project Director of Mobile Governance in the Centre for E- Governance will be the contact person for giving information and details for this study.

The entire process of evaluation shall be subject to and conform to the letter and spirit of the contents of the Government of Karnataka Order no. PD/8/EVN (2)/2011 dated 11th July 2011 and orders made there under. The Terms of Reference were approved by the Technical Committee of KEA in its 18th Meeting held on 04th May 2015.

Chief Evaluation Officer

Karnataka Evaluation Authority

Appendix C

Inception Report of the Study

C.1 Title of the Study

The title of the proposed study is \Evaluation of the performance, status, effectiveness and impact of mobile governance in Karnataka".

C.2 Background Information

Mobile technology is the rapidly adopted technology in history and the most popular and widespread personal technology. According to ITU, in 2014 the number of mobile-cellular telephone subscribers in the world has reached 7 Billion and the number of mobile-cellular telephone subscriptions per 100 in-habitants in India was 74.48.

Given this unparalleled advancement of mobile communication technologies, governments are turning to m-Governance to realize the value of mobile technologies for responsive governance and measurable improvements to social and economic development, public service delivery, operational efficiencies and active citizen engagement. The inter-operability of mobile applications, which support quick access to integrated data and location-based services, paves the way for innovative public and private sector governance models.

Given the fact that majority of Indian citizens reside in rural areas, mobile devices are ideally suited as alternative access and delivery channels for public services in these areas. The success of the proposed initiative on m-Governance will greatly depend upon the ability of the government departments and agencies to provide frequently needed public services to the citizens create infrastructure for anytime and anywhere mobile-based services, adopt appropriate open standards, develop suitable technology platforms, make the cost of services affordable, and create awareness, especially in under-served areas. Be-cause of its relatively low cost, ease of use, and accessibility, mobile technology might be the solution for digital connectivity in rural areas.

To focus, the honorable president of India launched the Karnataka mobile one

Service category	Channel (mode of communication)
Push Informational Service	SMS and IVR
Pull Informational Service	SMS, IVR, Mobile Web, Smart Client Apps
Payment Service	SMS, IVR, Mobile Web, Smart Client Apps
Data Capture Service	Smart Client Apps, MobileWeb,USSD, IVR
Third party VAS	SMS, IVR, MobileWeb, Smart Client

project on 8th December 2014. This project is the first of its kind in the country and world's largest multi-mode mobile governance platform providing anytime, anywhere and anyhow delivery of citizen services at one place to discover all government, public and private sector services. It provides a united user interface or one access point (one URL, one App or one short code). In fact, a total of 4302 services including 178 (Departmental), 480 (sakala {mG2C) and 3644 (mB2C) were included in the Karnataka mobile one project. The benefits of Karnataka mobile one project include the following:

1. Aggregation of demand, hence economy of scale
2. Single window for managing SLA
3. Quick turnaround time for implementation
4. Bring best practices within and beyond State Government
5. Hosted in Karnataka State Data Centre, hence secured.

The payment instruments supported for payment service are credit card, debit card, IMPS, net banking, and mobile wallets. With the vision of implementing m-Governance at the large scale, it is felt to conduct an independent third-party survey and evaluation to assess the performance, status, effectiveness and impact of m-Governance in Karnataka State. This evaluation also aims to understand the difference in perceived and actual benefits, if any.

C.3 Objectives of the Evaluation

In order to fulfill the purpose and ensure a fair and unbiased evaluation, this exploratory survey sought to de ne the following objectives:

1. What are the understandings of m-Governance by citizens of Karnataka?
2. Do the citizens of the State are aware of the services offered?
3. To what extent are the services available as of date?
4. Whether m-Governance services are reaching to all parts of the State where mobile services and/or Internet is available?
5. What types of services do citizens receive from service providers or the Karnataka government?

6. Whether the services are hack free and confidential?
7. Do citizens feel they are able to raise issues or complaints to the government or service providers?
8. What do citizens want to talk to the Karnataka government about with regard to m-Governance?
9. What methods do citizens believe are best to give information to government/service providers?
10. Any changes the citizens wish to suggest for better implementation and coverage?

C.4 Scope and Purpose of the Scheme

The scope of evaluation is the entire State of Karnataka where m-Governance services are available. In addition, the m-Governance services in Karnataka State are provided to all people and no distinction is made between nationals and non-nationals in terms of service provision. However, a government policy strategy needs to be adopted. The scope of this study is to investigate the use of primary m-government services like Government to Citizen (mG2C), Government to Business (mG2B), Government-to-Government (mG2G) and Government to Employee (mG2E) from the citizens' of Karnataka State perspective only.

M-Governance is the application of new mobile technologies in most of the developing countries, in contrast to developed countries where it has existed for a relatively long time. M-Governance aims to improve the quality of life. However, despite the essence of technology being to make people's lives easier, new mobile technologies are not always accepted, especially in developing countries. This may be due to several reasons including poor education, new trend in the market, the high cost of technology, its complexity of use, or its incompatibility with values and beliefs. Therefore, in order to overcome these barriers, governments in developing countries need to implement mobile services that are seen to be directly in accordance with their citizens' needs.

The purpose of this study is to conduct a survey or pilot experiment in the most accepted scale in order to evaluate feasibility, time, cost, adverse events, and effect size (statistical variability), provide a comprehensive analysis and develop a model in an attempt to improve upon the existing system prior to performance of a full-scale project. However, the literature has not revealed any comprehensive model that is specifically used for m-Governance services. Therefore, the existence of this gap in the adoption and intention to use m-Government services context encouraged this study to derive inferences and

conclusions in the implementation of m-Governance in Karnataka State. As a result, there is a need to de ne what factors influence/impact on the intention to use m-Government services. This study is intended to be a useful model for many states of India considering delivery of m-Government services in order to explain the factors that influence/impact the intention to use m-Government services. The model shall contribute to the existing knowledge because it incorporates many unexplored dimensions that influence/impact the intention to use m-Government services. The decision makers who are involved in m-Government services projects need such study model that can assist the provision of relevant guidelines for implementation of comprehensive m-Government services. Based on knowledge gained from this study, the decision makers can better understand the challenges they will face in the implementation of m-Government services and henceforth, the implementation of these services will be more effective. The study aims to:

1. Examine the factors influencing the intention of citizens to use m-Government services;
2. Examine the perceived characteristics of m-Government services as perceived by users and non-users, including relative advantage, compatibility, complexity, trial ability, and observability;
3. Examine the perceived trustworthiness, perceived security, personal innovativeness and perceived enjoyment of m-Government services as perceived by users and non-users towards their intention to use; and
4. Examine the influence of demographic variables including gender, age and education, of users and non-users in their intention to use m-Government services.

C.5 Staffing and Training Arrangement for the Study

The study team will consist of the following:

SN	Name and Designation	Size
1.	Dr. S M Dilip Kumar, Ph. D (Computer Sc. Engg.) Principal Investigator	01
2.	Dr. Veerashekarappa, M.A, Ph. D (Economics) First Team Member	01
3.	Dr. Madhusudhan Zalki, M. Sc, Ph. D (Statistician) Second Team Member	01
4.	Field Investigator Team	20
5.	DTP Operator	01

Table C.1: Study Team.

Orientation training to be imparted to field investigators for collection of primary and secondary data.

Focused discussions will be carried out by experienced personal/researcher/ statistician for data analysis.

C.6 Methodology

The research methodology shall be a mixture of both qualitative and quantitative methods. The qualitative methods will be used to explain and interpret our findings from the quantitative analysis of data points in a survey. The quantitative research used a formalized and unconcealed questionnaire with close ended questions namely, dichotomous, multiple choices, scale based and a brief suggestion. Using the quantitative method, the generation of data in quantitative form is done subjected to analysis in a formal and rigid fashion. Inferential and experimental techniques are adapted. On the other hand, the qualitative method is subjected to assessment of attributes, opinions and behavior.

The study will be based on the evaluation questions by studying the list of users or citizens of Karnataka State with field verification and discreet discussions. The data shall be collected through means of survey administered via the following approaches depending on convenience of the respondent:

1. Face-to-face (direct or staff assisted)
2. Telephone
3. E-mail
4. On-line survey (using a PC or mobile device with

Internet) The field study is also done on the following:

1. Non-participant direct observation
2. Participant observation
3. Mass observation
4. Personal, focuses and group interviews

The survey is a set of semi-structured questionnaires that will be administered via Kannada or English depending on the preference of the interviewee. This work is based on two folds: desk research and field work to be conducted. First, the desk research will be conducted for a course of thirty (30) days with the aim of identifying the current shortcomings in Karnataka governance and reviewing the potential tools for adopting m-Governance in the State. This is done with the officials of m-Governance, service providers, and other stakeholders. The second component is fieldwork conducted in four different regions of the Karnataka State namely, Bangalore, Mysore, Gulbarga and Belgaum. 200

respondents will be chosen at random from each of the regions drawing a total of 800 respondents. Out of 200 respondents from each region, 100 will be from district headquarters, 50 from taluk headquarters and remaining 50 from hobli level. In addition, 200 respondents will be randomly chosen from the Bangalore capital totaling to 1000 respondents. The target group of evaluation are the stake-holders of different m-Governance services includes central and State government employees, business and labor communities, households, physically disadvantaged, illiterate and literate, farmers, students, patients, etc. The following table shows a rough distribution of target respondents. The on-line

SN	Respondent Type	Sample Size
1.	Central and State Government Employees	100
2.	Business and commercial people	100
3.	Households	100
4.	Physically disadvantaged persons	100
5.	Teachers, doctors, engineers and lawyers	100
6.	Students community	100
7.	Farmers	100
8.	Public services like police, re ghters, military, judges, etc.	100
9.	People from sports, cultural, transport, etc.	100
10.	Rural and or remotely located people	100

Table C.2: Rough Distribution of Target Respondents

survey can be implemented using Google Forms which allows us to run as many polls or surveys. The data on the back end will be stored on Google Drive. Some of the important features of Google Drive include logic threading; get e-mail notifications or responses, mobile friendly, etc.

The m-governance system in Karnataka State being a cluster of services to end users, a number of key performance indicators (KPIs) are devised to:

1. Study the performance and status
2. Measure the effectiveness and
3. Assess the impact of the service

The findings shall report the KPIs including the responsiveness, performance of m-governance system, ease of usage of the services, effectiveness of m-governance portal, transparency, end-user orientation and awareness for evaluation.

The data obtained from the answers of the questionnaire set shall be collected, consolidated, analyzed and stored on a server/cloud which is accessible for further analysis in real time anywhere.

C.7 Deliverables and Time Frame

HKCAL will commence the work immediately on approval of Inception Report (Work Plan). HKCAL in consultation with the e-governance department of

Activity	Time period to complete
Work plan submission	Within 1 month after the release of I installment of the contract sum.
Primary data collection (Field level)	Within 1 month after the work plan is approved by KEA.
Draft evaluation report submission	Within 1 month after completing data collection for approval.
Final report submission	Within 1 month after the draft report is approved.
TOTAL DURATION	4 months

Table C.3: Time Frame of Work

Karnataka State government will approve the evaluation process, methodology and questionnaire.

HKCAL and its team will collect and gather the required data and/or information from diverse stake holders and/or end-users who are expected to adhere to the following time lines and deliverables. Excluding the time taken for approval, the evaluation study shall be completed within four (04) months time. The time schedule of the activities giving milestones is shown below:

C.8 Findings/Outcomes

This is the future phase of action wherein the findings are derived from the data collected. The findings shall correspond to the Terms of Reference (ToR). The findings can be categorized into four categories.

1. Understanding the m-Governance
    (a) Positive, negative and general comments
2. Service delivery
    (a) Service type, number of people received service, positive experiences, negative experience
3. Communication channels with government and service providers
    (a) Social networks, e-mail, telephone, radio call-in, suggestion box, face-to-face meetings, community meetings, etc.
4. Economical implication
    (a) Free services, monetary savings, usage charges, etc.

Appendix D

Responses to the Comments Received on the Draft Version of Report

The Consultant Organization and the Principal Investigators wish to place on record their appreciations over the comments and suggestions made by the independent assessor on the study. The following are the responses and report of action taken based on the comments and suggestions received.

1. The questionnaire or field formats used for canvassing the respondents are not annexed in the report. Due to this the evaluator had no idea on what type of questionnaire has been canvassed. Response: We thank the referee for throwing light into this matter. We have annexed the entire questionnaire in the Annexure F.

2. Terms of Reference may be annexed in the report. Response: We thank the referee for throwing light into this matter. We have annexed the terms of reference in the Annexure B.

3. List of services provided by the a) G2C, b) B2C and c) G2B may be annexed in the report. Response: As on date of evaluation, there are a total of 658 services that are fully functional and operational. Table D.1 provides the number of G2C, B2C and G2B services that are a part of Mobile Governance in Karnataka. Access to all the services of Mobile Governance are free. However, for any service where payment is required, the request is redirected to the particular service provider through a gateway.

4. Mobile Governance initiatives in other states may be incorporated in the report.

SN	Service Category	Number
1.	Government-to-Customer (G2C)	621
2.	Business-to- Customer (B2C)	33
3.	Government-to-Business (G2B)	4
	Total	**658**

Table D.1: Number of G2C, B2C and G2B services that are part of Mobile Governance in Karnataka.

Response: Following are some of the States among many in India which have introduced mobile governance for citizens:

(a) **Jharkhand:** Jharkhand State has also taken step towards realisation of Digital India dreams. The State Government has launched 14 mobile applications and three web portals on the State foundation day to deliver the benefits of information technology to the people of the state in order to bridge the gap between the government and public. The mobile applications were developed by Jharkand Space Application Center (JSAC). These are designed to bring the services from government, civic bodies and police force to the Android smartphones of the beneficiaries. All the applications can be downloaded free of cost from the site http://apps.jharkhand.gov.in/ (also called as Mobile Apps Store). As on date, the number of live applications hosted are 13 and all apps downloaded count is 1847. Due to 2/3rd of the population in Jharkhand are mobile users, Jharkhand has introduced 'The Jharkand Mobile Governance Initative' and it has 15 mobile applications and these applications are accessed based on the department and district wise.

(b) Kerala: The Kerala M-Governance system is integrated to a mobile application which is designed to include all the services and departments under Kerala M-Governance. It was launched on 10th June 2013. It provides services for 15 departments in Kerala. MGovernance in Kerala was started with the aim to utilize the strengths of mobile penetration in the State using the concept of "alwayson" connection for the delivery of government services to common people. And thereby offers various government department services through mobile phones accessible to the citizens in the field, in the street, at home or other convenient locations on a 24×7 basis, rather than the users having to visit government offices or log on to the internet portals to access services. An encapsulated and comprehensive integrated service delivery platform is being created and integrated with e-Governance infrastructure, for enabling m-services of various departments. The m-governance Kerala App for Android is free and is only 434KB

size, and can be downloaded from http://goo.gl/RSPhb.

(c) Madhya Pradesh: Some of the key initiatives of Mobile governance in Madhya Pradesh is IRCTC SMS facility for Madhya Pradesh Tourism, SMS based monitoring system for rural development (MGNREGS), Zila Panchayat Betul and mobile technology for maintaining law and order in Khandwa District.

In addition to the m-governance initiatives from the states, the ministry of electronics and information technology, Government of India has launched "The National Mobile Governance Initiative", also called "Mobile Seva" developed by the CDAC. Four platforms that the app can be downloaded from the App Store and used include Android, Apple, Java-live, and Windows. As on date, the number of application downloads is 4559417, the number of live applications is 1002 and the number of demo applications count is 62. Also, it is found that, there are few citizens developed applications that can be downloaded with free of cost. The list of applications can be found at https://apps.mgov.gov.in/index.jsp.

5. In page 12, the evaluator mentions the aims of the evaluation, where as these are not part of ToR. Response: We thank the referee for commenting in this regard. The aims of the evaluation is included in Chapter 3 and is part of the ToR.

6. In page 16, the population of Bangalore is mentioned 11.5 Million, reference year and source of data may be mentioned. Response: We thank the reviewer for the comment. The population of Bangalore, its reference and source of data is given in the footnote. According to the website http://indiapopulation2017.in/population-of-bengaluru-2017. html, it shows that the population of Bangalore in 2017 is approximated to 11.5 Million.

7. The sample size and methodology may be appropriately mentioned. It is observed there are errors in sample size i.e. total in Table 4.1 and Table 4.2. These errors need to be corrected and later in the corresponding tables and pages in the report. Response: We thank the referee's effort in carefully pointing out the error. Based on the aim of evaluation study, the methodology is divided into three major components:

(a) Real-time data is retrieved from the back end database or dashboard of the Karnataka Mobile One portal for further analysis and realization.

(b) Investigate and exploring the features, functions and performance of the KMO application/app including the security aspects.

(c) Field work along with discreet discussions is conducted with the citizens of Karnataka State.

The first and second component of the evaluation methodology has been carried out by the technical team. Whereas, the third component is achieved through the survey. To determine the sample size, a sampling frame for data collection through survey for respondents is developed. A stratified sample from four regions along with Bengaluru city as explained above with the total coverage of the State is useful in maintaining the precision of estimates. For surveys, district headquarters, taluk headquarters and hobli headquarters were targeted. The number of respondents were stratified according to the above classification and an adequately large number of the sample size was determined so that it would systematically represent the population. Roughly, 400 respondents were chosen on random basis from each of the divisions drawing a total of nearly 1600 respondents. Out of 400 respondents from each division, 50% were from district headquarters, 25% each from taluk headquarters and hobli levels. In addition, approximately another 400 respondents were randomly chosen from the Bengaluru city. It is found that this number of respondents in each region totaling to nearly 2000 will be adequate for assessing the effectiveness and impact of mobile services in Karnataka. The respondents were randomly selected in different places for conducting the manual survey. In addition, an online survey was also conducted using Google Forms which allowed to run our surveys. However, at the end, both manual and online survey data were merged. The region-wise details of the survey both manual and online are given in Table D.2. The Table D.3 shows district-wise details of the survey done both manual and online. The overall sampling structures are adhered to the following pattern:

(a) The sample size was determined based on the population region-wise and district-wise so that the resultant sample size shall systematically represent the population.

(b) The evaluation methodology involved personal interviews of the mobile service users.

(c) A simple random sampling method was followed to obtain the sample and feedback from the respondents.

(d) The sample size was minimized to economize the time and cost.

(e) A list of questions as suggested in the ToR was shared with the technical team working for the Centre for E-Governance dealing with the implementation of Mobile Governance requesting for real-time history data and responses to other related queries.

(f) The data on the dash board of the platform is analyzed from the inception of Mobile Governance services.

The errors in the tables are rectified and are given in Tables D.2 and D.3:

SN	Region	Number of Respondents
1.	Bengaluru City	400
2.	Bengaluru	343
3.	Mysuru	499
4.	Kalaburgi	306
5.	Belagavi	388
	Total	1936

Table D.2: Region-wise Details of the Respondents

8. In page 36, ICARE satisfaction index, it is observed that there are errors in numbers corresponding to the percentage. Response: We thank the referee for the careful insight. However, the correct figure (i.e. Fig. 7.13, Page No. 38) is placed in the appropriate place.

9. Few corrections are marked in pencil in the report - these need to be corrected and incorporated in the report. Response: We are grateful for the referee for finding errors in the report. The views of the referee are well taken, all errors are rectified and the modifications have been done and the same is incorporated in the report.

SN	District	Number of Respondents
1.	Bengaluru Urban	400
2.	Bengaluru Rural	00
3.	Bidar	18
4.	Ballary	34
5.	Vijayapura	123
6.	Bagalkot	40
7.	Belagavi	09
8.	Chikkamagalur	70
9.	Chitradurga	20
10	Chikkaballapur	06
11.	Chamarajnagar	90
12.	Dakshina Kannada	15
13.	Davangere	11
14.	Dharwad	11
15.	Gadag	204
16.	Kalaburgi	214
17.	Hassan	04
18.	Haveri	01
19.	Kolar	205
20.	Uttara Kannada	00
21.	Koppal	10
22.	Kodagu	00
23.	Mandya	66
24.	Mysuru	253
25.	Raichur	10
26.	Ramanagara	01
27.	Shivamogga	93
28.	Tumkuru	07
29.	Udupi	01
30.	Yadgiri	20
	Total	1936

Table D.3: District-wise Details of the Respondents

Appendix E

Short Biography of the Principal Investigator

CONTACT INFORMATION

Dr. S. M Dilip Kumar
Associate Professor, Department of Computer Science and Engg.
University Visvesvaraya College of Engineering (UVCE)
Bangalore University, K. R. Circle, Bangalore 560 001, Karnataka, India. Employee Code No.: 783
Contact Number: +91 78997 60966 (Cell), +91 80 2296 1827 (Office)
E-mail: dilipkumarsm@gmail.com, dilipkumarsm.uvce@bub.ernet.in
Date of Birth: 27th Feb. 1975

EDUCATION

1. Doctoral: Ph. D in Computer Science and Engineering, Kuvempu University, Shimoga, 2010. (Sponsored by the FIP Scheme of UGC, New Delhi).

   Thesis Title: Application of Computational Intelligence Techniques in Mobile Ad hoc Networks.

   Adviser: Dr. B. P. Vijaya Kumar

2. Post Graduation: M. Tech in Computer Science and Engineering with First Class Distinction (Class Topper, 78%), J.N.N College of Engineering, Shimoga (Vishweswaraiah Technological University, Belgaum), 2001. (Sponsored under the QIP Scheme of J.N.N. College of Engineering, Shimoga).

3. Under Graduation: B. E. in Computer Science and Engineering with First Class (67%), J.N.N. College of Engineering, Shimoga, (Kuvempu University), 1996.

TEACHING EXPERIENCE

1. Lecturer from 01-02-1997 to 20-04-2003 in the Department of Computer Science and Engineering, Jawaharlal Nehru National College of Engineering, Shimoga - 577 204, Karnataka.
2. Lecturer from 21-04-2003 to 30-6-2008 in the Department of P.G. Studies and Research in Computer Science, Jnana Sahyadri, Kuvempu University, Shimoga - 577 451, Karnataka.
3. Assistant Professor/Reader from 1-7-2008 to 30-6-2011 in the Department of Computer Science and Engineering, University Visvesvaraya College of Engineering (UVCE), Bangalore University, Bangalore 560 001, Karnataka.
4. Associate Professor from 1-7-2011 to till date in the Department of Computer Science and Engineering, University Visvesvaraya College of Engineering (UVCE), Bangalore University, Bangalore 560 001, Karnataka.

Experience includes teaching U.G., P.G. and Ph. D students, research, guiding projects, handling University examinations, maintenance of computers and other equipments in the Institution/University, organizing seminars, conferences, workshops, etc.

INDUSTRY EXPERIENCE

Project Trainee at Mphasis-BFL Software Ltd., Bangalore from Oct. 2000 to Mar. 2011.

RESEARCH PUBLICATIONS

International Journals: 14

National Journals: 01

International Conferences: 21

National Conferences: 05

Ph. D GUIDANCE

Guided: 01

Guiding: 07

BOOKS/COURSE MATERIALS WRITTEN

1. Vijaya Kumar B. P., S. M. Dilip Kumar and Sriram, \Mobile Computing", Published by Universal Education Trust for Distance Education Council, Kuvempu University, 2005.

2. Abdul Raheman and S. M. Dilip Kumar, \Computer Applications", Published by Universal Education Trust for Distance Education Council, Kuvempu University, 2006.

3. A text book on Probability and Stochastic Processes for Engineers (Under progress).

INVITED TALKS/SPECIAL LECTURES: 35

PROFESSIONAL MEMBERSHIPS

1. Member, Institution of Electrical and Electronics Engineers (IEEE), No. 91272558.

2. Life Member, Indian Society for Technical Education (ISTE), No. LM33560.

ACADEMIC AND TECHNICAL ACTIVITIES

1. Technical expert, setting up and maintenance of wired/wireless campus LAN in Kuvempu University during 2005-08.

2. Coordinator, Instrumentation Maintenance Facility (IMF), UGC sponsored scheme during 2005-08.

3. Chief Custodian, UG(Engg.) Examinations, Bangalore University during 2008-09.

4. Deputy Custodian, PG(Engg.) Examinations, Bangalore University during 2009-10 and 2010-11.

5. Technical expert, e-governance system in Bangalore University from Oct. 2010.

6. Technical expert, setting up campus wide networking in Tumkur University during 2011.

7. Member, technical expert committee for the purchase of computers and other equipments in Tumkur University from Mar. 2011.

8. Chairman, Board of Examiners for PG (ME) in SE/BI, Bangalore University during 2011-12.

9. Member, Board of Studies in Computer Science and Applications (PG), Bangalore University, 2011-14.

10. Deputy Coding Officer, PG Jun./Jul. 2011 Examinations, Bangalore University.
11. Chief Custodian, Valuation and Tabulation (Digital) of UG and PG Engineering Jan./Feb. 2012 Examinations, UVCE and all Colleges, Bangalore University.
12. Advisor, Staff Selection Commission (SSC), KKR Region, Department of Personnel & Training, Govt. of India.
13. Chairman, Board of Examiners PG (CSE and IT), Dept. of Computer Science and Engineering, UVCE, Bangalore University, 2014-15.
14. Technical Expert Member, Evaluation of tender for supply of CCTV Cam-era, Tumkur University, 2014-15.
15. Member, Expert Committee, Implementation of ICT Initiatives in Karnataka State Open University (KSOU), from March 2016.
16. Chairman, Board of Examiners UG (CSE and ISE), Dept. of Computer Science and Engineering, UVCE, Bangalore University, June 2016 and January 2017 Examinations.
17. Member, Technical Advisory Committee, Implementation of Indoor Wi-Fi and Surveillance System at BU, from May 2016.

Appendix F

Evaluation Questions and Answers Matrix

This questionnaire will ask you 30 simple questions about your awareness, experiences, and suggestions on m-governance system in Karnataka State. We request you to fill this survey and we ensure that all reasonable attempts will be taken to protect information. This survey will just take between 10-12 minutes.

1. Full Name of the respondent
2. Highest Education Level (Tick any one)
   (a) Below 10th Standard
   (b) 10+2/Diploma
   (c) UG
   (d) PG
   (e) Ph. D
3. Occupation (Tick any one)
   (a) Profession (Doctor/Engineer/Lawyer/IT/Government Service/Etc.)
   (b) Self employment
   (c) Business
   (d) Farmer
   (e) Housewife
   (f) Student
   (g) Non-working
   (h) Other
4. Annual Income (Tick any one)

(a) Un-employed
(b) Less than Rs. 10,000
(c) Rs. 10,000 { Rs. 50,000
(d) Rs. 50,000 { Rs. 1,00,000
(e) Rs. 1,00,000 { Rs. 10,00,000
(f) More than Rs. 10,00,000

5. Do you have a Mobile phone? (Tick any one)

(a) Yes
(b) No

6. Do you have a Smart phone? (Tick any one)

(a) Yes
(b) No

7. If Yes (to Q. No. 6), do you have an Internet connection? (Tick any one)

(a) Yes
(b) No

8. Do you know how to browse the Internet? (Tick any one)

(a) Yes
(b) No

9. Why don't you browse the Internet? (Can tick more than one)

(a) My phone doesn't have the functionality
(b) I don't know how to browse
(c) Browsing the Internet is too expensive
(d) Browsing consumes lot of phone power
(e) It is too time consuming
(f) I am very busy, no time to browse
(g) Other reason

10. Are you aware of the Mobile governance in Karnataka?

(a) Yes
(b) No

11. If Yes (to Q. No. 10), what is the awareness level? (1 { least level; 5 { highest level) (Tick any one)

(a) 1

(b) 2

(c) 3

(d) 4

(e) 5

12. Preferred type of m-governance service (Tick any one)

(a) Only information inquiry

(b) Any service not involving a payment

(c) Services including payment

(d) Special services

13. Frequency of visiting the Karnataka Mobile one portal (any service) in a week (Tick any one)

(a) 0

(b) 1-5

(c) 6-10

(d) 10-50

(e) More than 50

14. How do you feel the service quality hosted in the Karnataka Mobile one portal? (Tick any one)

(a) Very good

(b) Pretty good

(c) Average

(d) Pretty bad

(e) Awful

15. Have you ever lent the PIN or password of your mobile device to somebody else? (Tick any one)

(a) Yes

(b) No

(c) I don't remember

16. Have you ever lent the PIN or password of your payment instrument to somebody else? (Tick any one)

(a) Yes

(b) No

(c) I don't remember

17. Which access authentication method would you like to have to protect the important information in your mobile device? (Tick any one)

(a) PIN or password

(b) Biometric

(c) Other

18. Problems currently faced in using the m-governance services (Can tick more than one)

(a) Missing out the news/updates

(b) Missing out the required service

(c) Time constraints

(d) Financial constraints

(e) Failure to get response/action done

(f) Victimization

(g) I don't know

19. Have you experienced any service failure or abortion or hanging midway for no fault or shortcomings of the user? (Tick any one)

(a) Yes

(b) No

(c) I don't remember

20. What is the number of chances (out of 10) that your financial transaction, complaint lodging and actual receiving of a service failing/aborting/hanging midway in the first try for no fault or shortcoming as a Mobile governance user? (Tick any one)
1/ 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10

21. Why have you not conducted any Mobile governance service transaction via your mobile device? (Can tick more than one)

(a) Cost reasons

(b) Service availability reason

(c) Security reasons

(d) Issues of mistrust

(e) Other

22. Have you used the ICARE facility available for redressal of issues or registering complaints? (Tick any one)

    (a) Yes

    (b) No

23. Do you think the m-governance system ensure the services being provided is hack free (free from breaking into computer system or software) or confidential? (Tick any one)

    (a) Yes

    (b) No

24. How satisfied were you on the action taken on the matter you raised through ICARE? (Level of satisfaction) (Tick any one)

    (a) Strongly satisfied

    (b) Satisfied

    (c) Somewhat

    (d) Dissatisfied

    (e) Strongly dissatisfied

    (f) I don't know

25. On behalf of whom do you use m-Governance services? (Can tick more than one)

    (a) Yourself

    (b) Spouse

    (c) Children

    (d) Friend

    (e) Parents

    (f) Siblings

    (g) Co-worker

    (h) Unknown person

26. What are the challenges faced? (Can tick more than one)

    (a) Failed to get the connection

    (b) Hiked Internet charges

    (c) Hiked service charges

    (d) Price exploitation by the service providers

    (e) I can't remember

27. What hinders you from accessing information on service updates? (Can tick more than one)

    (a) I don't know where to get updates

    (b) No one gives/sends us the updates

    (c) I have never heard updates in services

    (d) The government is far so no one cares about us

    (e) I have never been concerned about the updates in services

    (f) I have no time to look for updates in the services

28. Rate the following features of m-governance in Karnataka State between 1 to 8 (1 = most appreciated and 8 = less appreciated). (Tick any one number from 1 to 8 for each item below)

    (a) Concept or Initiative (1/2/3/4/5/6/7/8)

    (b) Services (1/2/3/4/5/6/7/8)

    (c) Quick (1/2/3/4/5/6/7/8)

    (d) Easy (1/2/3/4/5/6/7/8)

    (e) Potential Monetary Savings (1/2/3/4/5/6/7/8)

    (f) Access (1/2/3/4/5/6/7/8)

    (g) Transparency (1/2/3/4/5/6/7/8)

    (h) Reliable (1/2/3/4/5/6/7/8)

    (i) Reach (1/2/3/4/5/6/7/8)

    (j) Adoption (1/2/3/4/5/6/7/8)

29. When compared to conventional service delivery mechanisms like manual, desktop internet, etc., whether m-governance is better than those? (Tick any one)

    (a) Yes

    (b) No

30. Any other suggestions the citizens wish to provide for better implementation and coverage in brief?

We thank you very much for taking your time and e ort to complete the survey

TRA- MAY-2015 IRA- SEPT-2016 DRA- APRIL-2017 FNO- KEA 225 EVN 2015

Evaluation of the Performance, Status, Effectiveness and Impact of Mobile Governance in Karnataka