

Study of Increased Usage for Government Services and Customer Interface Using Mobile Apps

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Abstract

The use of mobile applications for services and customer satisfaction has increased manifold in the last 10 years. With the evolution of smart gadgets and new technologies, day-to-day services have become hustle free. Today, world is moving towards digitalization and the internet and smartphone apps act as accelerators for the same. With the help of smartphone apps and internet facility, access to anything and everything is lying within the user's fingertip, which could be used as per their convenience. The study provides the evolution of the mobile applications through years and various factors that lead to the adoption of the same. The study took into consideration some of the online and the app based service provided by the government, which are pre-dominantly used amongst the public and finding its relevance among them and the study also focuses on the various platforms on which they are being offered. The aim here is to categorize these services on the basis of fully online, partially online and fully offline and then finally, establish individual factors that are affecting the adoption of the various services and the overall factors that any service would require for its adoption, which are offered through smartphone app or online.

Keywords: *Apps, Services, Government Services App, fully offline, fully online, Partially online*

1. Introduction

In the last few decades, there have been humungous developments in the technology, mainly in the field of mobile phones. The invention of smartphones is one of the most revolutionary technological developments that disrupted all industries globally, especially the services industry. Since then every service provider is trying to satisfy its customers by providing the service on various online platforms, instead of traditional pen paper based approach. Today, we see that most of the services have become completely online, while some of them are still using traditional methods. Here, we are taking Indian government services that are available online and the factors behind their adoption.

One of the most used services in India is the railways. Initially, railway tickets were booked through booking counters manually, but as the development began, an online portal named IRCTC was launched which enabled the users to book their train tickets online and provided several other services such as cancellations, online payments & refunds, checking seat availability in a particular train, current status of a running train, *etc.* All these features were provided through the website as well as mobile application. This advent in railways made the process so easier and convenient for the users. Everything was now available on the fingertips of the users and they did not have to rush to the booking counters anymore. IRCTC is the most successful example of government services online platform.

Received (June 20, 2017), Review Result (September 26, 2017), Accepted (October 8, 2017)

According to the Indian constitution, each and every citizen of the country is obliged to pay some duties levied by the government as various forms of taxes. Each citizen is bound to pay the Income Tax according to their income slab, but filing the Income Tax Return has always been one of the most tedious tasks. Previously it was done manually through ITR counters, but as the number of filers increased, government of India launched a website and started the online system of filing the ITR called e-filing. Later, it was made mandatory for all the tax payers to file their returns through online portal only. The website made the process easier for the tax filers. It allows the tax payers to enter all their details of income and calculate the appropriate amounts of returns that should be filed. Since it is an online portal, all the data is recorded automatically to the servers and no manual labor is required for it anymore.

Recently, the application of PAN cards in India has also made online by the government. Instead of applying through paper forms and verifying the documents at the ITD, now the citizens can directly apply through the ITD website. The user just needs to put few details and upload some documents to verify his/her identity and the PAN card is delivered directly to his postal address within 15-20 days. After the initiation of Aadhar scheme, the linking of PAN and Aadhaar has become mandatory and that can also be done online through the website. So, by just entering few details online users are capable of generating PAN or linking their PAN to the Aadhar cards, saving a lot of their time and hustle.

Recently Reserve Bank of India [20] has announced that Peer to peer lending will be regulated by it and would be registered as NBFC (Non-Banking Financial Company). The norms for the same has been finalized and would be made publicized in upcoming days. The Users who want loan register himself in P2P App/Portal with some basic document uploaded into the portal/App. After the verification, borrowers are assigned to risk categories, which would then decide the interest rate. Then finally the loan is funded by individual investors who act as a lender. This is a new service which is coming up India, with its advantages like low interest rate, High return and less processing time, it had come under severe criticism like investment solution is riskier one.

2. Literature Review

Rachel Harrison [18] has defined the increased use of mobile devices in various contexts as it can be measured through number of usability models. Except the three important attributes, namely, effectiveness, efficiency & satisfaction, other attributes are overlooked in the usability models despite their impact on success or failure of an application. With the increased usage and processing power of mobile devices, developers are trying to increase the services offered. Issues such as the small screen size, poor connectivity and limited input modalities have an effect on the usability of mobile applications [15,16].

Kenny Phan & Tugrul Daim [17] have presented that the usage of mobile phones is moving towards the data oriented service from the voice oriented services. Increased data services are expected to overcome the decline in the ARPU in telecommunications industry. The factors affecting the adoption of mobile services were determined through literature review and their weights are calculated through questionnaires. Mobile services provider should focus on service quality, speed, simplicity, ease of use & usefulness of the service to attract the users. Also, the pricing should be such that users do not hesitate to buy that.

Ministry of Railways [19] proposed that government is putting its efforts to save time and improve the quality of service, as result the ticket vending machines could be replaced by the e-ticketing for the unreserved. Hopefully Indian government can improve the quality for service by implementing the e-ticketing for all classes of people.

Reserve Bank of India, in its consultation paper suggested that P2P market size has grown exponentially up from 2.2 GBP in 2012 to 4.4 GBP in 2015. Since the P2P is getting accepted year by year, RBI has published a consulting paper on the same describing the regulatory practices in different countries like china, Korea, Australia, France, Italy,

Germany, Israel, Japan. The Advantage of p2p is low interest rate for the borrower and high return to the Investors.

There is no credible data available in P2P Platform in India. The regulatory concerns in such cases would relate to KYC and recovery practices. Since all payments are through bank accounts, the KYC exercise can be deemed to have been carried out by the banks concerned. Though these platforms claim to follow soft recovery practices, the possibility of use of coercive methods cannot be ruled out.

[6] Observed that world is witnessing a speedy migration to second generation of passport which can be referred as biometric passport, more than 120 states have started issuing such e-passports. Trends that should be followed during migration to second generation of passports are:

- 1) plan a total document update
- 2) re-engineer existing processes
- 3) count on the e-passport.
- 4) set new design expectations.

From all the studies presented above, certain factors for the adoption of new technologies around the globe were observed. There are some factors that are common to all the mobile apps or services, while there are some factors that are exclusive to a particular service. The perception of the consumers towards the mobile applications for various services was studied.

The studies related to government services apps in the Indian scenario suggested that from the last few decades there have been a paradigm shift in the services due to the adoption of technology. Most of the services that went online in the last years, have been adopted by the consumers whole-heartedly and the user perception and satisfaction increased manifold.

3. Analysis of Government Apps

In the current scenario, most of the services which were offline are moving to online or to App based. In this paper, we have included fully online (ITR, P2P) and Semi-Online (PAN, IRCTC, Passport) services provided by the government. Further, we have analyzed the journey of the App from the date of its birth till year 2017 and included the major announcement for the same. Analysis of the above apps are as follows.

3.1 Passport

On 26th Nov 2015, ICAO recommended to have biometric data in Passport in machine readable format and today, world is moving towards improved Machine-Readable Travel Document (MRTD), which would reduce the instances of passport forgery, the reduction of error, and the faster Processing times. Today in India there are more than 6.3 Crores passport holders and in upcoming years it is going to increase due to ease in applying and introduction of third Gender to it. The average number of passport issued in the country is about 1.5 Lakh.

3.1.1 Journey of Passport:

Journey of Passport starts from 1920. As the time passed, the importance of the same increased and passport was made a mandate document which is needed by a citizen to travel to other countries [1]. In initial years, passport was hand written and back then government didn't have the storage facility and hence, they don't have the exact count. But in 2001 machine readable passports were introduced and by Nov 25, 2015 it was mandated by the International Civil Aviation Organization and the government ordered to replace all hand-

written passports to machine readable passport. By the end of 2017, government is planning to rollout Electronic chip based passport with biometric security features.

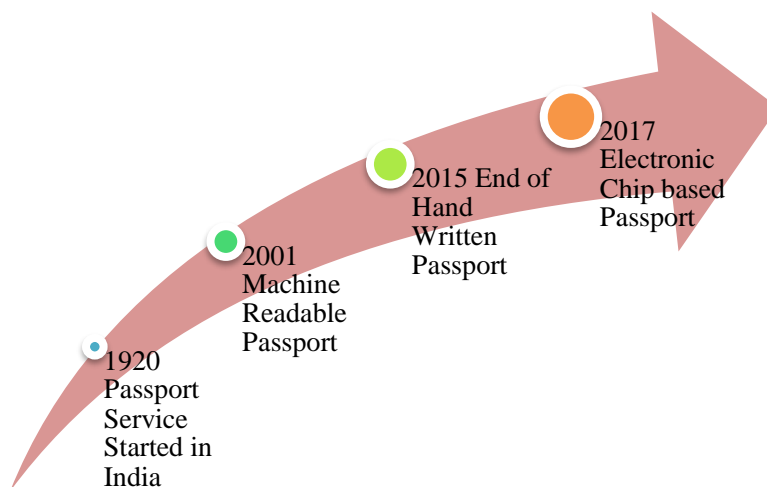


Figure 1. Journey of Passport

3.1.2 Current trends in the Passport:

With the online application and m-passport Seva app number of applications will increase in the near future. Government expects about 30% increase in the passport application due to its app and third gender inclusion. In 2016 Government of India has rendered 1.15 Crore passport and in 2015 the app had 15000 hits. Currently, there are about 6.3 Crore passport holders in India and this number would increase significantly in coming days.

Table 1. Current trends in Passport

Year	Facts
2015	Total 1.2 Crore applied for Passport
	1.2 Lakh application were submitted online
2016	20% increase in application due to online process.
2017	2017 Expectation to increase by 30% due m-passport App and third Gender Inclusion.

3.1.3 Factors Influencing the use of the APPs

- E-Notifications -allows users to 'subscribe' to an e-Notification service. The service alerts via e-mail whenever product upgrades are available for download [9].
- Fast- Ministry of External Affairs has recently decided to accept police verification after the passport has been issued. The directive is for first-time applicants through normal category.
- Ease and Convenience - The users can track status of their passport applications using file number and date of birth.

3.2 IRCTC

Being one of the most preferred modes of transport in India and with government push towards digitalization and e-ticketing railway apps are in high demands. In 2002, number of tickets booked was about 29 per day but, in 2015 it rose to about 13 Lakh tickets per day.

Today IRCTC is equipped with high capacity application servers (present capacity is 50 servers with 216 cores and replacement of 18 servers with 56 additional cores are planned making a total of 50 servers with 272 cores) to meet the run time demands of the users and trends show that it will increase in future.

3.2.1 Journey of IRCTC

IRCTC was launched on 2002, with an average of 29 tickets per day. In 2015 this number was increased to 13 Lakh tickets per day and with this number of internet ticketing in 2014-15 has also rose to 54.25 %. The number of tickets booked per day has taken an exponential jump as shown below [4].

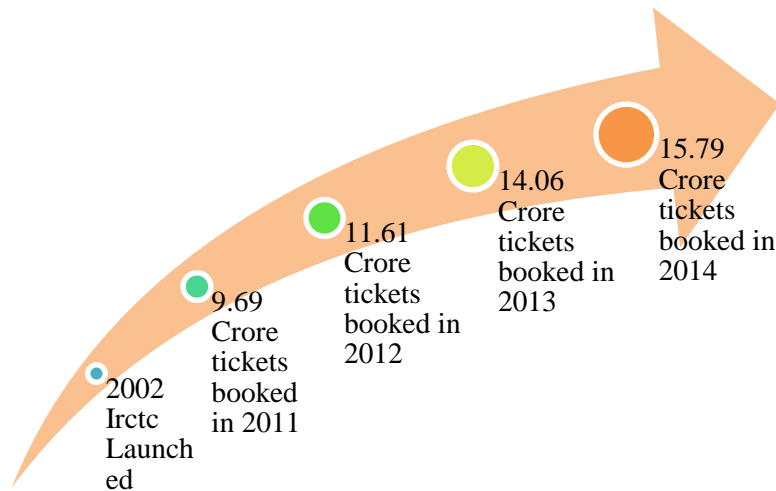


Figure 2. Journey of IRCTC

3.2.2 Current trends in the IRCTC:

With the IRCTC app and online booking the number of ticket booking through as significantly increased as compared to window booking. The number of ticket booked per year has also increased as shown below.

Table 2. Current Trends in IRCTC

Year	Facts
2010-2011	Number of tickets booked were 9,69,11,000
2011-2012	Number of tickets booked were 11,61,77,000
2012-2013	Number of tickets booked were 14,06,88,000
2013-2014	Number of tickets booked were 15,79,81,713
2014-2015	Number of tickets booked were 18,30,00,000

3.2.3 Factors influencing the use of the App

- Superior User Experience - The app will be also integrated with IRCTC e-wallet for faster transactions.
- User Friendly Interface - The app looks clutter-free and is free from images.
- One step PIN based secure login to existing users – A secure and fast way of accessing the service.
- 24/7 service

- Synchronization of mobile app with NGET for ticket booking - The users will get a synchronous behavior across the platform.
- Cancellation and filing of TDR for tickets booked through website.
- Current booking – Could check status of the ticket and track the train which want to travel.
- Boarding point change – Users are given a facility to change the boarding location of their booked tickets as per there convenience prior to departure.

3.3 PEER TO PEER (P2P) LENDING

P2P lending is one of the emerging businesses across the world. Even though it's in the nascent stage it has shown promising start in the country. The ease of use and fast service facility increases its charm among the users.

3.3.1 Journey of P2P

Journey of P2P in India started from 2012 (with 'i-Lend'). In 2016, RBI has published a consultation paper on Peer to Peer lending in July and also, RBI has finalized the norm for the same. P2P will be regulated by RBI and will be registered as NBFC. [20] Today, in India there are 30 Players. P2P take advantage of the digital connectivity to lend money to people who need it for lesser rate, but at the same time it takes severe criticism for high default rate, investment solution etc. [22].

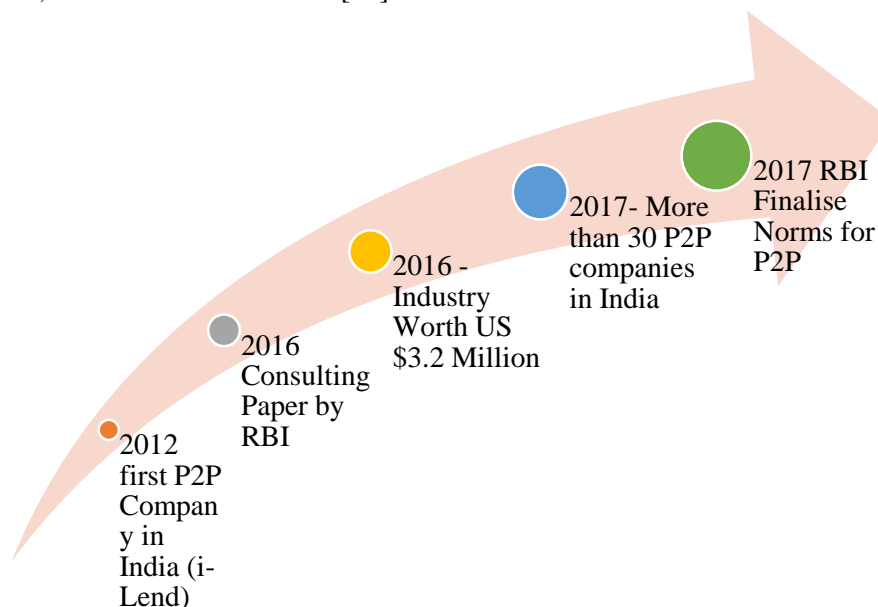


Figure 3. Journey of P2P Lending

3.3.2 Current Trends

P2P in India is in its nascent stage and is expected to do well because of its business model like high return rate for investor and low interest rate for borrower. In 2015, Indian Market size was USD 2 Million and is expected to reach USD 4.5 Billion by the end of 2016, since the sector will be more regulated now.

Table 3. Current Trends in P2P Lending

Year	Facts
2015	Global Market 4.4 Billion Euro
	Indian Market Size USD 2 Million
2016	Expected Indian Market Size USD 4.5 billion

3.3.3 Factors influencing use of the App [20]

- Good Potential Returns
- Low interest rate for Borrower
- Fast completion and receiving of loan process and loan
- Easy and convenient to apply for loan
- Lender remains anonymous to the borrower, so they won't contact you directly.
- Less loan denied
- Simplified user experience

3.4 ITR

Income tax return filling was once considered to be time intense task, but with the introduction e-filing systems burden has been reduced. E-filing has made an efficient and automated systems for tax collection and handling quires. In India, about 71% of e-filers feel that it is easy and efficient to work with it. Perceived ease of use and perceived usefulness, trust of the government, image, compatibility and service quality are found to be significant predictors of citizens' intention to use e-filing [8].

3.4.1 Journey of ITR

Journey of ITR started in 1990 in India. The Income Tax Department (ITD) of India felt the need for an efficient automated system for tax collection and to handle the queries [21]. Until this time, manual counters of ITD were used to file the returns and this system was working fine as the number of tax payers was just around 12 million [3]. In 2006, it was made mandatory for all the corporate firms to file their income tax returns through this e-filing system [10].

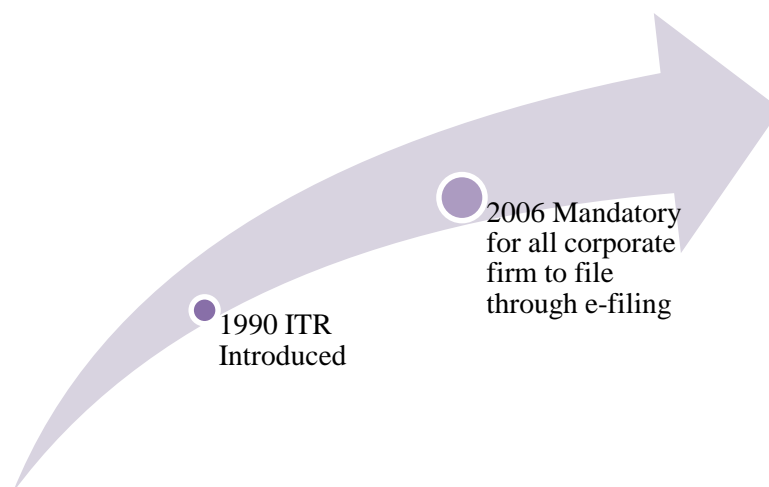


Figure 4. Journey of ITR

3.4.2 Current Trends [7]

Table 4. Current Trends in ITR

Year	Facts
2013	12037324 number of e-filing done
2014	13976318 number of e-filing done
2015	14684389 number of e-filing done

3.5 PAN

Introduced in 1972, after the failure of General Index Register (GIR) System and by 1976 it was mandatory to have an PAN cards for the tax payers [11]. For an online applicant, websites of National Securities Depository Limited (NSDL) or UTI Infrastructure Technology and Services Limited (UTIITSL) portal were launched for enhancing the user experience [2]. Recent announcement by the government to link the PAN with Aadhaar and more than 1.08 crores users have already linked it, accounts to the fact that how easy it has been drafted by the ITD for the people who already have registered mobile number with UIDAI [5,13,14].

3.5.1 Journey of PAN

The concept of PAN was started in India in 1972 but was made mandatory in 1976 for all the taxpayers to have PAN cards. In 1995, after studying the identification number system in US, UK, etc. the system of online application of PAN was started in India.

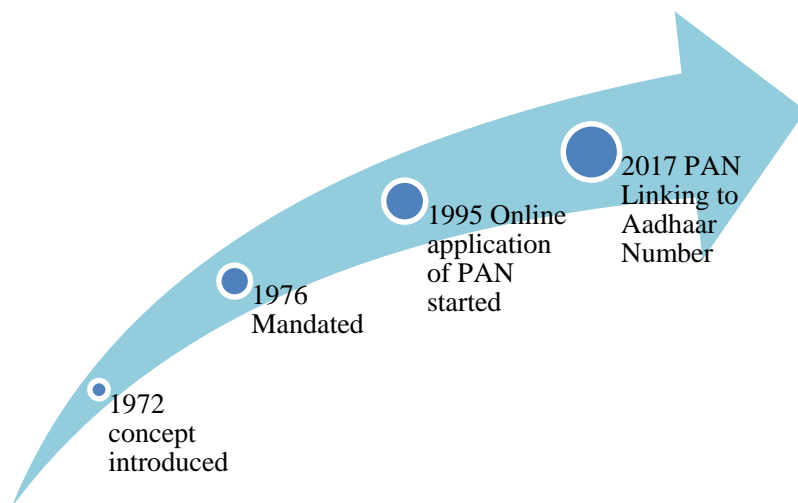


Figure 5. Journey of ITR

3.5.2 Factors influencing the use of Apps

- Perceived usefulness
- Self-efficiency
- Social influence
- Behavioral intention
- Attitude towards technology
- Perceived trust
- Subjective norms

4. Survey and Result

The government services in India have started becoming online since 1920, but only a few of them have been successful in satisfying the customers. The below figure shows the Journey of above mentioned in the survey.

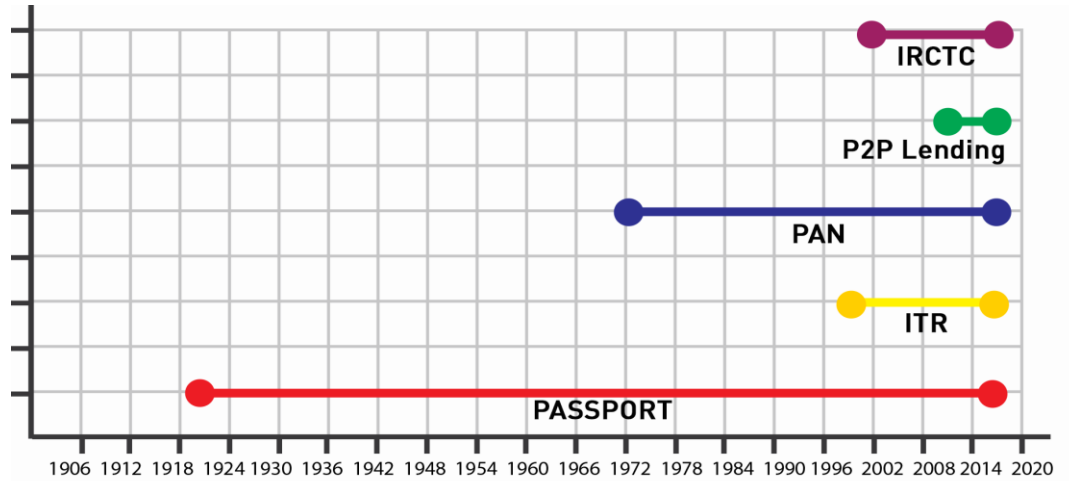


Figure 6. Journey of Apps

The study found out some of the factors that affect the consumer perception towards a particular mobile application. The factors are

Table 5. Factors

Ease of Use	Convenience	Compatibility
Technology Readiness	Trustworthiness	Past Experience of user
Government Norms	E-Notifications	Fast
Superior User interface	24/7 services	Secured

According to the survey done during the study total 111 samples were taken (88 online and 23 offline). In the survey, we found out that around 96% respondents nowadays are using the mobile apps for government services and out of these, IRCTC app is being used the most (61%) followed by ITR (12.5%). Some of the respondents also use the mobile apps for other services such as PAN, BHIM, banking, etc.

Most of the respondents (around 82%) feel comfortable using the full online mode of the services while only 3.4% respondents prefer offline mode as per survey. Around 74% respondents perceive these mobile apps to be fairly secured, 16% of them say that the apps are less secured while only 1% do not trust the security of these apps at all. Asking about the overall satisfaction level of the apps, 59% respondents rated their levels of satisfaction as '4' on the scale of 1 to 5, which shows that most of the users are fairly satisfied with the services provided by these apps.

The prominent factors for the adoption of the apps, after the survey came out to be time saving (85%), convenience (80%), ease of use (76%), fast responses (61%), 24/7 service (59%). Some of the other factors that also played significant role in the adoption of the new apps are security, compatibility, low cost, etc. most of these factors were already established in the study.

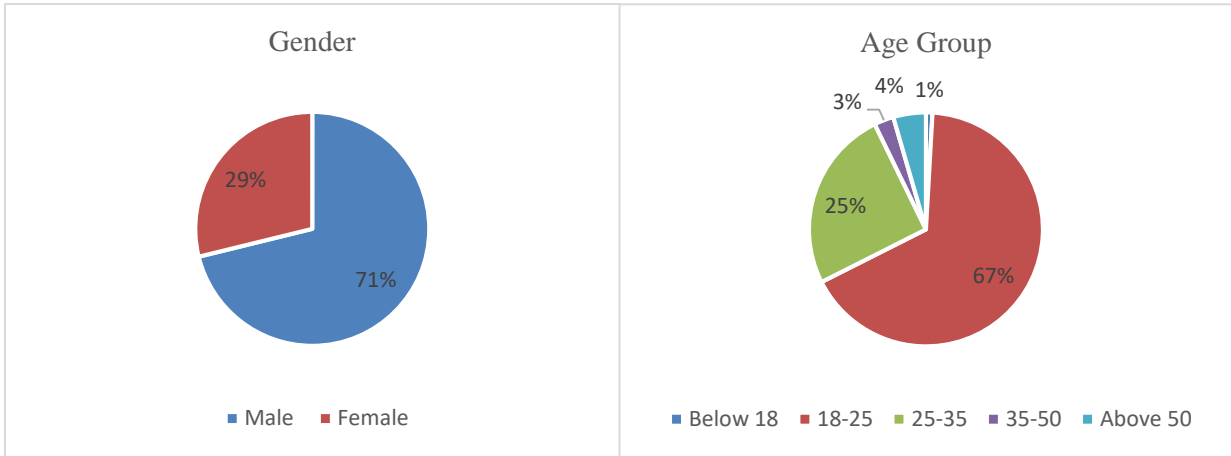


Figure 7. Survey Result

Figure 8. Survey Result

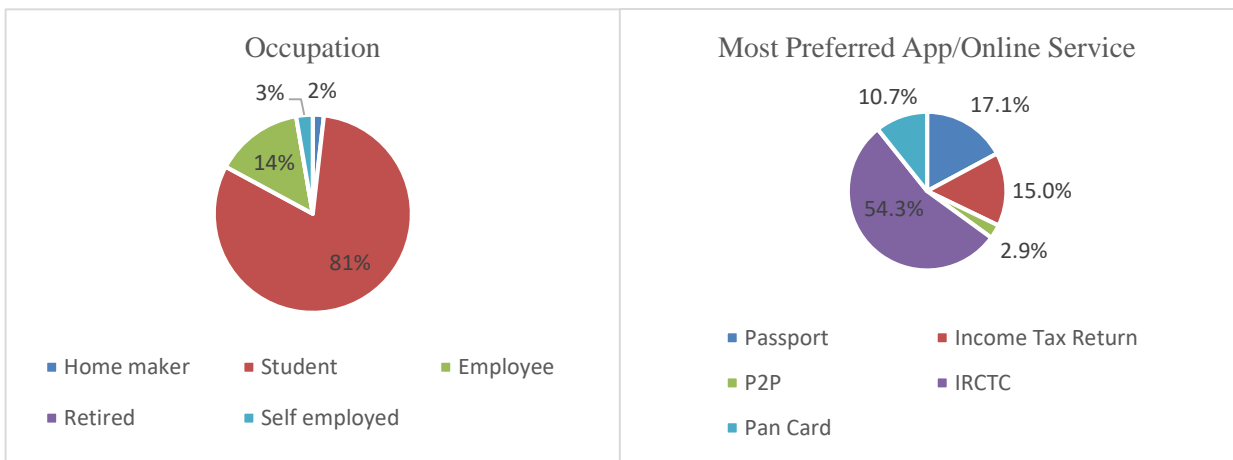


Figure 9. Survey Result

Figure 10. Survey Result

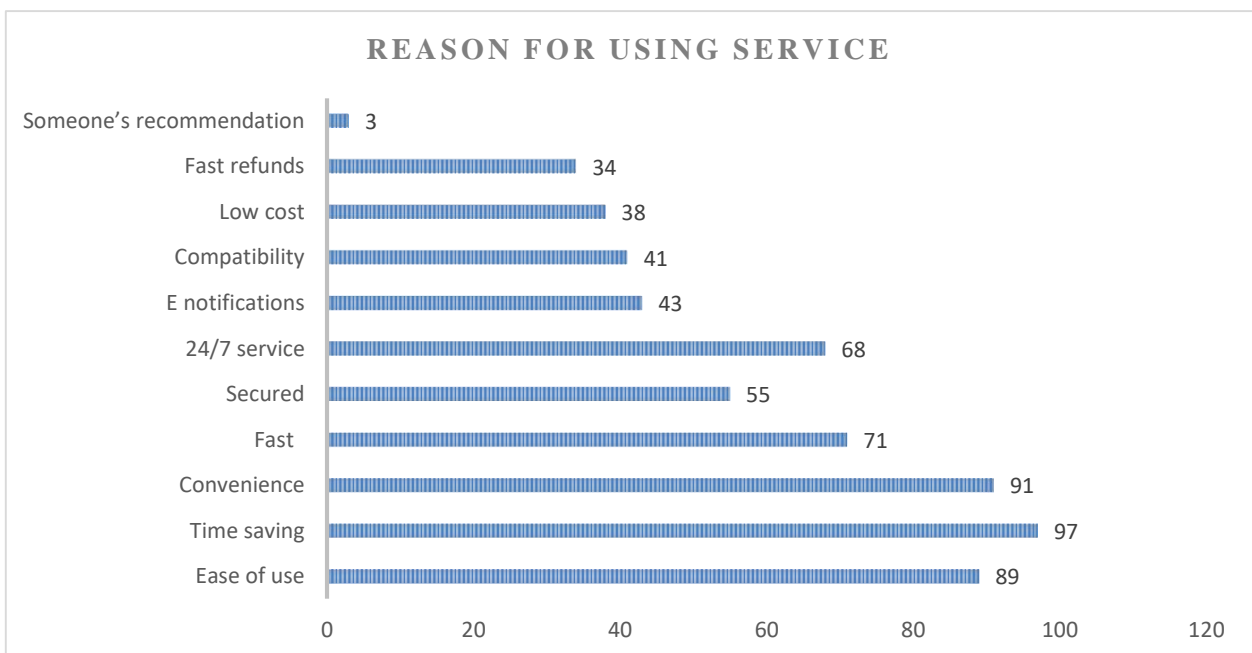


Figure 11. Survey Result

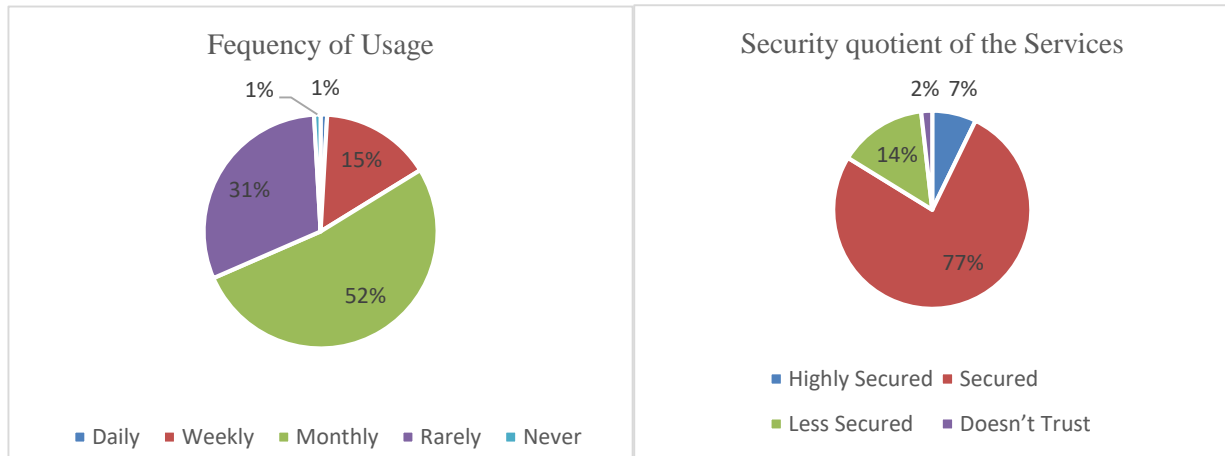


Figure 12. Survey Result

Figure 13. Survey Result

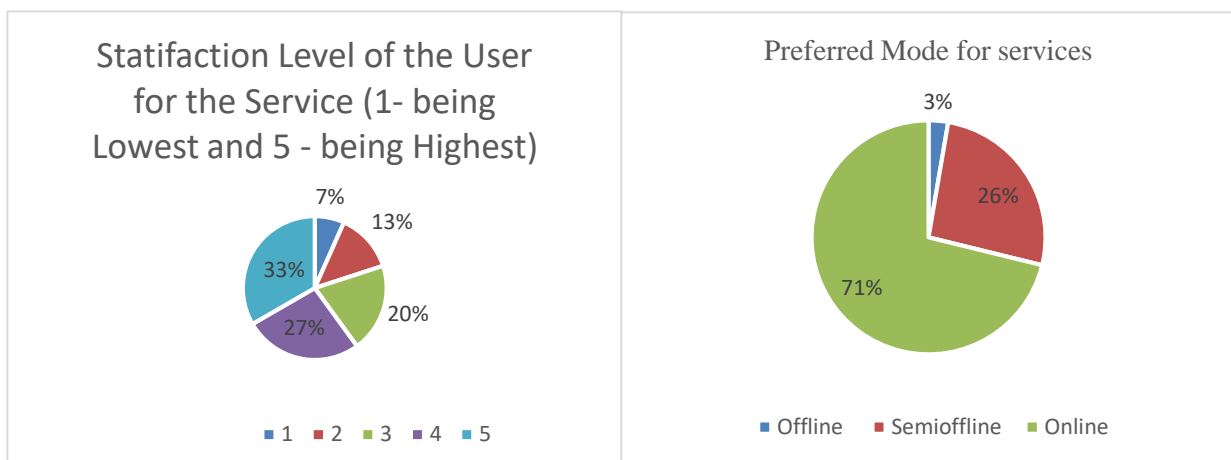


Figure 14. Survey Result

Figure 15. Survey Result

On the Above survey, we conducted a **Chi-Square** analysis in SPSS tool for Apps against User's satisfaction level for different services and Security of App/Website vs User's satisfaction level for different services. The result for the same is shown below.

4.1. Apps against User's satisfaction level for different services

Null Hypothesis: μ_0 : No Relationship between Apps and User's satisfaction level for different service

Alternate Hypothesis: μ_1 : Relationship exist between Apps and User's satisfaction level for different service.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Apps * Statisfaction_Level	130	100.0%	0	0.0%	130	100.0%

Figure 16. SPSS Result

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	24.030 ^a	12	.020
Likelihood Ratio	15.344	12	.223
Linear-by-Linear Association	2.069	1	.150
N of Valid Cases	130		

a. 14 cells (70.0%) have expected count less than 5. The minimum expected count is .15.

Figure 17. SPSS Result

4.2. Security of App/Website vs User’s satisfaction level for different services

Null Hypothesis: μ_0 : No Relationship between Security of App/Website vs User’s satisfaction level for different services.

Alternate Hypothesis: μ_1 : Relationship exist between Security of App/Website and User’s satisfaction level for different service.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Security_quotient* Statifaction_Level	130	100.0%	0	0.0%	130	100.0%

Figure 18. SPSS Result

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.331 ^a	9	.082
Likelihood Ratio	13.176	9	.155
Linear-by-Linear Association	.521	1	.470
N of Valid Cases	130		

a. 12 cells (75.0%) have expected count less than 5. The minimum expected count is .08.

Figure 19. SPSS Result

As per the result, in both the cases null hypothesis can be rejected and alternative hypothesis can be accepted since the singificance level is less than 10%. Hence statistically, there exist a relationship between apps against user’s satisfaction level for different services and security of app/website vs user’s satisfaction level for different services.

5. Conclusion

The evolution of Smartphone Apps and internet facility, access to anything and everything is lying within the user’s fingertip, which could be used as per the convenience. The study provides the evolution of the mobile applications through years and various factors that lead to the adoption of the same. The study took into consideration some of the online and the App based services provided by the government, which are pre-dominantly

used amongst the public and finding its relevance among them and the study also focused on the various platforms on which they are being offered.

This research has concentrated on the increase in the use of mobile apps for the government services since their advent. It took into account five government applications and established the factors for their adoption. Finally, they have been categorized into online, semi-online and offline and the perception of the consumers towards these services on the online platform.

As per the survey and research, it is evident that online is the most preferred mode in the service and government initiatives like Digital India are leading to the same. As per the sample the need of online or App based service is the need of the hour. The need like transport facilities, utility payments, challan payment were the few need that were stressed during the survey. In today's world, were most of them carry mobile with them 24 × 7 accessing Mobile App and Online web service could ease once life to a great extent and could improve the user satisfaction.

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