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Comparative Analysis of Mobile Payment Applications

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Abstract: *Cashless transactions have various benefits attached with them like reduction in black money, increase in span of income tax, reduced crime rates. At the same time, concerns are being raised about the security and service of these applications. There are various countries which have more than 50% of their transactions through cashless means. . Due to demonetization act, already existing mobile payment applications are brought into limelight like Paytm, Mobikwik, Freecharge etc.*

Keywords: *Cashless Economy, Demonetization, Mobile Wallets, ATM Cards, NFC.*

INTRODUCTION

Nowadays, the world is becoming digitalized in every field. One of the examples of this digitalization is that various countries in the world are moving towards becoming a cashless society. A cashless society is the one which doesn't use cash for any of its transactions; all transactions are carried out through other means such as ATM card, credit or debit cards, NFC based systems or mobile wallets etc. Cashless transactions have various benefits attached with them like reduction in black money, an increase in the span of income tax, reduced crime rates. At the same time, concerns are being raised about the security and service of these applications. There are various countries which have more than 50% of their transactions through cashless means. They are using the benefits of this system very well and managed to overcome its negatives also. In India 98% of the total transactions are done through cash. But with the demonetization move of government in Dec'16, our country also has started getting steered towards a cashless society. Due to demonetization act, already existing mobile payment applications are brought into the limelight like Paytm, Mobikwik, Free charge etc. These applications already existed before also but were not that popular. And as the concept of cashless transactions is very new to people so it is not trusted and preferred over transactions made through cash. However, demonetization forced many people to use these applications as these are easier and faster to use compared to wait in long queues before ATM's for the withdrawal of cash. But the popularity of these cashless systems or we say mainly mobile payment applications has not increased too much because with various benefits these mobile payment applications had some disadvantages also like a high risk of identity theft, losing the phone, overspending, and low internet penetration among people. So because of these various shortcomings, these systems cannot manage to gather enough trust which can replace cash from the structure of payment system. In this paper, we mainly discuss one type of the cashless systems that are mobile payment applications. The topic of cashless transactions is not new to us but it is an important topic to be researched on. In this paper, we try to compare the mobile payment applications available in India with those used in countries which have more than 50% of their transactions carried out through cashless means. We can take inspiration from these countries to improve upon the service of the existing applications and can bring more apps with added features. While already existing mobile payment applications gained popularity, the country still lacks in variety of these apps. If we want to have a complete cashless economy in India then citizens must have a variety of services to choose from. This paper aims at identifying the mobile payment applications used all around the world and making a comparison among them based on different criteria. Further, the shortcomings of these applications are predicted by looking at the negative feedbacks and number of downloads for these applications.

METHOD

1. List of all worldwide mobile applications and their features:

- Firstly, a list of all the mobile applications along with their features was made. Mobile applications included in this list are only the ones which had highest downloads or highest popularity on Google play.

- All the mobile applications included in the list are from those countries only, which are at top 10 positions in the ranking of cashless economy.
- Collected information about different features and characteristics of all the mobile apps possible and listed them roughly.
- In this initial stage of work, only information about the mobile wallets is collected. The analysis is done after the required amount of study on a particular mobile wallet is being done.
- After the collection of information in required amount, I processed further which is shown as a second step below.

2. Compared features of different mobile applications

- After getting required amount of information about each mobile wallet comparison is made among different mobile wallets belonging to the same country.
- The comparison was carried out at various basis like:
 - On the basis of security features.
 - Appearance basis.
 - Compatibility with the phones
 - Compatibility with the operating system.
 - Work on how many numbers of systems.

3. Applications are numbered on a five point scale:

- After comparing different features of all the mobile wallets categorization of these features for a wider range is being done.
- Categorisation of the features is done so that to scale them on a five point scale.
- Initially, all the features are categorised into three main categories:
 - **Security features-** it consists of features related to security of the application like the application is secured with a PIN or fingerprints or signature or some OTP.
 - **Availability to people-** it consists of how many populations it covers or to how many people it is available like in how many operating systems it is available and for which of the phones it is compatible.
 - **Easy to use/pay** – this is related to various factors like how much time it takes to transact any money or how easily we can transact money or do the payment.
- Then on the basis of these three categories, all the mobile wallets are numbered in 1-5 according to how many features they consist of in a particular category.
- Like if a wallet has only PIN as a security feature then it is given a number 2 if it contains more than one feature in security category then according to the number of features and effectiveness of the additional features number 3, 4 or 5 is given.
- But this analysis is not much satisfactory for rating the mobile wallets.
- Then the theory called “Content Analysis” for a proper analysis or comparison of different mobile wallets is being used. **Content analysis** is a research technique used to make replicable and valid inferences by interpreting and coding textual material. By systematically evaluating texts (e.g., documents, oral communication, and graphics), qualitative data can be converted into quantitative data.

4. Ratings, the number of downloads and negative comments of all applications are listed for comparison:

- Now a new list is being made which contain :
 - Ratings are given by users
 - Number of downloads till March 2017
 - Estimated revenue
 - % users in different countries.
 - Negative comments of the users.

All this data is collected to analyze the reasons of increase in growth of other cashless societies.

RESULTS

As the first step, a list of worldwide mobile payment applications was made through extensive research on the internet. Following is the country wise list of mobile applications which have the highest popularity on Google play store.

SIXDOTS	BANCONTACT	KBC	ING Smart Banking	EASY Banking	BELFIUS
<ul style="list-style-type: none"> - Accept cards of the associated 9 banks. -Has to be a member of one of the 9 banks. -Not available for windows phone. 	<ul style="list-style-type: none"> - Accepts only Bancontact cards. - Should have a Bancontact card for login. -Available for windows phone also. -Missing SEPA QR code support. 	<ul style="list-style-type: none"> - Can be used only by a KBC customer. - It does not require card reader for first-time login. -If not a customer then can open a current or extra KBC account. -See your current travel insurance plus added cover and get personalised suggestions on the best insurance for your travels. 	<ul style="list-style-type: none"> - Only for ING customers. -It requires ING card reader for first time login. -Want to request funds from, e.g., a friend who owes you money? You can e-mail your friend your account number from the app and add a personal message. 	<ul style="list-style-type: none"> -Only for BNP Paribas customers. -There is a search option in which we can search for desired transactions. 	<ul style="list-style-type: none"> - Only for Belfius customers. -If not a customer can become its customer with this app and receive free gift. -Available for windows phone also.

The list also contains some characteristic feature of each app which was used to further analyze and rate these apps.

BELGIUM:

FRANCE:

KWIXO	LYDIA	S-Money	Orange Cash	WA!
<ul style="list-style-type: none"> - Sign up for Kwixo, whatever your bank. -Kwixo mobile payment service doesn't offer a way to pay merchants in stores. - Kwixo has unveiled its own application marketplace, giving developers access to a software development kit (SDK) with which to build their own mobile and Web tools. -Send money to relatives by indicating their mobile number or e-mail, whether they are already registered or not, regardless of their bank. 	<ul style="list-style-type: none"> -You can send payment notification via e-mail or text message. -You can withdraw wallet money to your bank account in the free-no transaction fee. -All types of transactions done from this app are free like pay a dinner, a movie or rent a friend, request a refund from a friend in one click, pay for your purchases at a professional with your laptop. 	<ul style="list-style-type: none"> -The service is for adults residing in the EEA (European Economic Area) and having a bank account in a bank established in the EEA. -They must also be in possession of a French mobile phone number to subscribe to the S-money service. 	<p>To use this service:</p> <ul style="list-style-type: none"> -Orange customers need to have an NFC smart phone. -This is a prepaid rechargeable account. - This is a mobile contactless payment at merchants accepting Visa settlement without contact. - Online payment via the creation of a dynamic virtual card on the mobile phone. -In addition, as part of the offer Orange Young Cash, a web interface allows parents to manage pocket money from their teen and: *check the balance of young and account monitoring in real-time transactions *recharge the account of the young * block if necessary. 	<ul style="list-style-type: none"> - Provides paperless electronic payment, loyalty and couponing services. -It automatically combines standard loyalty and couponing services with the payment facility, whatever bank or bank card the customer uses.

SWEDEN:

SWISH	SWEDBANK	SEB	SEQR	WyWallet
<ul style="list-style-type: none"> - Swish works via your own salary account. - It's not a service for shops, it's strictly between people. 	<ul style="list-style-type: none"> - You can see your balance by shaking the mobile phone. - Make quick transfers and scan your bills with a phone camera. - You can only make a mobile payment if you and a payment beneficiary have concluded a contract for the Mobile Bank (mobile payment contract at Swedbank). 	<ul style="list-style-type: none"> - Pay bills by scanning OCR number, amount, and recipient with a mobile camera. - Make quick transfers between own accounts by dragging and dropping. - Mobile payments only work in an Estonian mobile network. - No mobile payments can be made abroad. 	<ul style="list-style-type: none"> - SEQR is based on Seamless' technology, a mobile phone payment and transaction service using QR codes & NFC on the front-end and Seamless' proven transaction server on the back-end. - SEQR is the only fully-integrated mobile phone payment solution handling the entire transaction chain, from the customer through to settlement. 	<ul style="list-style-type: none"> - SMS purchases can be done. - Merchants have the ability to accept mobile payments across The Web, (Mobile Web) WAP and Offline, quickly and easily.

US:

Google Wallet	VENMO	Pay With Square	Samsung Pay	Cash By Optus
<ul style="list-style-type: none"> - It requires an NFC chip. - The back of the phone should be tapped against the terminal supplied for payment. - In case the user loses his or her phone, they can use the app's built-in cloud connection to shut down their Google Wallet account. 	<ul style="list-style-type: none"> - Venmo is a pay-by-text service, which enables users to pay one another using its unique system. - This system puts a maximum payment limit of \$2000 per week 	<ul style="list-style-type: none"> - It doesn't require PIN. - Relying instead on your very presence, phone in hand, and your ability to recite your username as its authentication system. - You need to toggle open your "tab" for the business in the app. So, you could even leave your device in your pocket or bag, if you keep your tab open in the app. 	<ul style="list-style-type: none"> - It is able to function as a virtual magnetic swipe, as opposed to the NFC technology that is used by most contactless payments. 	<ul style="list-style-type: none"> - These include the standard sticker, a wearable band and a SIM card that can be used directly in NFC enabled phones.

CANADA:

UGO Wallet	CIBC Mobile App	PayPass	RBC Wallet	My Mobile Wallet
<ul style="list-style-type: none"> - Scan the barcode of your loyalty cards or gift cards, or key in the number manually to add them to your UGO Wallet. -Snap pictures of your receipts to store them in your UGO Wallet. Categorize receipts and add your own notes. When you need them, find receipts quickly by searching by merchant, date, or amount. 	<ul style="list-style-type: none"> -Deposit Canadian dollar cheques with your device. - Just take a picture of both sides of your endorsed cheque, enter the amount, select the account for deposit and submit. - It supports VISA and Mastercard. 	<ul style="list-style-type: none"> - Uses NFC. No PIN required. Faster payment mode. - Only supports Mastercard. - This is a tag which is stick to the back of any phone and functions like your card's tap chip anywhere there is a PayPass terminal. 	<ul style="list-style-type: none"> -For enhancing this app innovator introduced a new app inside the existing one with following benefits: -Increases security as authentication is now tied to the device hardware. -Employs a time out security mechanism that does not require clients to re-enter their PIN to transact within that pre-set timeframe. -Utilizes the same PIN that locks the phone to access RBC Wallet. 	<ul style="list-style-type: none"> -Used to pay for small, everyday purchases like: Coffee, Gas, lunch, and groceries for purchases typically under \$100. - Automatically sync your receipts with your Transaction History. - An eligible <i>Scotia Card Interac</i>-flash enabled debit card, Scotia bank credit card with Visa pay Wave or Scotia bank Prepaid card -A compatible NFC enabled smartphone with Android 4.4 (KitKat) or higher.

UNITED KINGDOM:

PINGIT	World Pay Zinc	PayM
<ul style="list-style-type: none"> -Send payments to anyone with a UK mobile number. - Send money abroad fee-free - make payments to friends and family in Europe (euro), Australia (AUD), India (INR) and across Africa. - Pay for a Lotto, Thunder ball or Euro millions Lucky Dip lottery ticket (UK & IOM only). 	<ul style="list-style-type: none"> - Once you've received your keypad, download the World Pay Zinc app; pair the keypad with your smart phone. - With the World Pay Zinc service, you'll be able to take card payments wherever you are in the UK, using our Chip and PIN keypad and app. 	<ul style="list-style-type: none"> -Payne is a mobile payment system provided by banks and building societies in the United Kingdom. -PayM enables you to send or receive money using just a mobile number. You don't need to share bank details; all you need is a UK mobile phone number. - Exchange payments with other PayM users, no matter who they bank with.

Based on the features listed above, a rating system was developed. The apps were rated around three characteristic features

- Security Features
- Availability to people
- Easy to use/pay

Points have been awarded to each app on a scale of 1-5.

APPLICATIONS	Security Features	Availability to people	Easy to use/pay
-SIXDOTS	3	4	2
-BELFIUS	4	3	
-KBC	3	2	
-BANCONTACT	3	3	
-ING Smart Banking	4	2	3
-KWIXO	4	4	3
-LYDIA		4	4
-Orange Cash		2(need NFC enabled phone)	4
-S-Money	3	3	4
-Swedbank	3	4	4
-WyWallet			5

-SEQR	4	4	3
-SEB	4		4
-Google Wallet	4	3(need NFC enabled phone)	4
-Venmo	4	4	2
-RBC wallet	4	4	5

Finally, the apps are compared as per the data available on the internet.

The data put to use is

- Number of downloads
- Revenue
- Users rating
- Overall app rating
- Negative comments were given by the user

CONCLUSION

1. Less number of the mobile wallet is available for windows phone. And almost all apps are available on android system.
2. All the mobile payment applications are place specific i.e., no single app is there which works in the whole world from which we can transact from anywhere in the world and to anyone.
3. In Belgium (98% of its total transactions are cashless) most of its population uses bank specific mobile wallets. One of the reasons that I concluded is for security purposes. As they can contact to someone directly if something happens.
4. A number of downloads are more for the apps that charge no transaction fee example- Lydia. So this shows that users attract towards cashless systems which have an easy way of payment.
5. Users trust more on the apps which are given by some known name like Google wallet has 70K and Samsung pay has 90K number of downloads.
6. NFC based phones need to be started in India also as this will give one more mode for cashless transactions.
7. There are some unique and good features need to be included in India also:
 - Offer Orange Young Cash, a web interface allows parents to manage pocket money from their teen.
 - Make quick transfers and scan your bills with a phone camera.
 - Pay bills by scanning OCR number, amount, and recipient with a mobile camera.
 - SMS purchases can be done.
 - The unique security feature possessed by Pay with square- It relies on your very presence, phone in hand, and your ability to recite your username as its authentication system.
 - Snap pictures of your receipts to store them in your UGO Wallet
8. These unique features do transactions which are very fast. These features Increases speed, reduces time.
9. As we can see from the data list that a number of downloads are higher for Indian mobile wallets this is because of the population difference between India and other high cashless economy countries.

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Application	Number of downloads	Revenue	% users in different countries	Overall Rating
Sixdots	< 5K	<\$5 K	100 - Belgium	
Bancontact	9K	<\$5 K	97- Belgium, Others-3%	4.5
KBC	10K	<\$5 K	91%- Belgium, 4%- Netherlands	4.5
ING Smart Banking	10K	<\$5 K	79%- Belgium, 5%- France, others	4.5
Belfius	10K	<\$5 K	94%- Belgium, 3%- France	4.5
Easy Banking	20K	<\$5 K	92%- Belgium, 2%- France	3.2
Kwixo	<5k	<\$5 K	100%- France	3.5
Lydia	10K	<\$5 K	100%- France	5
S-Money	<5K	<\$5 K	100%- France	3.4
Google Wallet	70K	<\$5 K	100%- US	
Venmo	500K	<\$5 K	100%- US	4
Samsung Pay	90K	<\$5 K	89%- USA, 9%- South Korea	4.9
My Mobile Wallet	<5K	<\$5 K	Argentina-90%, Colombia -1%, Chile-7%	
RBC wallet	20K	<\$5 K	canada-99%, US-1%	
Orange Cash	8K	<\$5 K	100%- France	3.2
Swish	100K	<\$5 K	98%- Sweden	4.1

Swedbank					30K	<\$5 K	95%- Sweden	4
SEB					9K	<\$5 K		
SEQR					6K	<\$5 K		
Application					Number of users given star rating	<\$5 K	100%- Canada	
	5	4	3	2				
Sixdots	1							1
Bancontact	598	107	24				16	157
KBC	19	2	2				0	0
ING Smart Banking	8	2	0				0	8
Belfius	11	4	0				0	3
Easy Banking	55	13	11				19	51
Kwixo	1	7	8				6	8
Lydia	1229	29	6				7	28
S-Money	37	8	8				5	51
Google Wallet	1630	169	73				78	418
Venmo	9085	923	294				285	1749
Samsung Pay	10	5	0				1	0
My Mobile Wallet								
RBC wallet								
Orange Cash	84	16	11				9	61
Swish	6563	2306	903				414	1249
Swedbank	8055	3090	1162				527	1908
UGO wallet								
Pingit					20K	<\$5 K	100%- Great Britain	
PayTm					200K	<\$5 K	90%- India, 4%-US	
BHIM					200K	<\$5 K	94%- India, 3%- US	
FreeCharge					30K	<\$5 K	90%- India, 4%- US,2%- Great Britain	
SBI pay					200K	<\$5 K	100%- India	
Mobikwik					40K	<\$5 K	91%- India, 4%-US, 1%- Great Britain	