A STUDY ON UPI ADOPTION AMONG MERCHANT OUTLETS IN KALYANA KARNATAKA

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Introduction

In the dynamic landscape of digital finance, the Unified Payment Interface (UPI) has emerged as a pivotal force, revolutionizing the way financial transactions occur in India. Developed and operated by The National Payments Corporation of India (NPCI), UPI stands as a mobile-centric digital payment system that has not only gained widespread acceptance but has also surpassed the growth trajectory of other indigenous financial technology platforms in the country. (Bhat et al., 2023)The adoption of UPI extends far beyond urban centers, reaching even the hinterlands of India, with a profound impact on financial inclusion, consumer behaviour, and banking habits across the population.

What sets UPI apart is its universal accessibility and user-friendly nature, making it a preferred choice for individuals across diverse demographics. The National Payments Corporation of India (NPCI) has played a pivotal role in facilitating this revolutionary shift towards digital transactions, and UPI stands as one of its flagship innovations. Unlike its predecessors, UPI has managed to transcend urban boundaries, permeating into the hinterlands of India. Its impact is not confined to metropolitan areas but extends to remote regions, reshaping financial inclusion and influencing the banking habits of a diverse and widespread population.

Crucially, UPI's significance extends beyond the individual user, finding favour among businesses as a reliable, efficient, and versatile payment tool. The platform's seamless integration with the operational fabric of businesses is a testament to its adaptability and utility. Recognizing the transformative potential of UPI, the present research seeks to delve into the intricate dynamics of its adoption and usage among businesses in the Ballari District of Karnataka. UPI has become an integral part of the transactional landscape for merchant outlets. By understanding the factors influencing UPI adoption in Ballari district, the research contributes to a broader understanding of the digital payment revolution in India and its implications for businesses and policymakers.

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Review of Literature

Venkatesh et al., (2003) proposed a groundbreaking model to study the predictors of people's behavioural intention to use and adopt a novel technology. The Unified Theory of Acceptance & Use of Technology also abbreviated as UTUAT was designed after carefully amalgamating the aspects of eight models such as Theory of Reasoned Action, Technology Acceptance Model, Theory of Planned Behaviour etc. UTAUT originally proposed four constructs or predictors of user adoption and Behavioural intention to use viz.,(a) Performance Expectancy (PE) i.e., the degree to which using a technology will provide benefits to consumers in performing certain activities. (b) Effort Expectancy (EE) i.e., the degree of ease associated with consumers' use of technology.(c) Social Influence (SI) i.e., the extent to which consumers perceive those important others (e.g., family and friends) believe they should use a particular technology(d) Facilitating conditions (FC) refers to consumers' perceptions of the resources and support available to perform behaviour. An extension of UTAUT was also proposed by Venkatesh et al., (2012)which theorised additional constructs and came to be known as UTAUT2.

Singh (2021) formulated a model integrating UTAUT and ECM (Expectation Confirmation Model) and theorised two additional constructs or predictors of Behavioural Intention viz., perceived security and trust. It was empirically shown that the proposed integrated model could more effectively explain or predictthe factors that influence continuance intention to use m-payment systems. Significant factors were satisfaction, trust, performance expectancy, and effort expectancy. The author also argued that UTAUT model could be extended to also study post adoption behaviour of users concerning a technology. Kuriakose et al. (2022) extended the UTAUT2 with theorization of additional constructs viz., 'Relative Advantage', 'Add-on Services' and 'Promotional Benefits' with UTAUT2 constructs. The model was empirically validated to show that a higher predictive power could be derived from this model.

Gupta et al., (2019) studied the adoption of UPI among the youths wherein, they proposed a model incorporating six constructs that influence the adoption of UPI resulting in continued behavioural intention to use. In addition to the three constructs originally part of UTAUT model viz., Performance Expectancy,ease-of-use, social influence. In addition, three more constructs were theorised viz., perceived value, perceived risk, and add-on-benefits.Add-on-benefits was found to be the most significant among all factors. A survey involving 415 smartphone based UPI users was carried out and a multivariate analysis involving Partial Least Squares - Structural Equation Modelling (PLS-SEM) was conducted. It was revealed that Add-on-benefits was found to be the most significant among all factors.Gupta et al., (2021) following a similar approach also used Perceived Risk in addition

to the original four constructs and found them all to be significant predictors of Continuance Intention and User Satisfaction.

Ranpariya et al., (2021) undertook a study the driving factors behind UPI adoption in Rajkot city based on UTAUT model. A sample of 100 respondents was chose using convenience sampling and multiple regression analysis was used. It was found that Performance expectancy, Ease of use or Effort Expectancy and Social influence had significant and positive influence on the Behavioural intention to use UPI. The constructs together accounted for 54% of the variance. Facilitating conditions was found to be insignificant as the authors deem that adequate infrastructure already exists for people to easily adopt and use UPI. Further, demographic variables like gender and age also were not affecting the predictors of user adoption and intention to use.

Mukhopadhyay&Upadhyay (2022) proposed a model to study the impact of institutional interventions and platform competition on the adoption and continuous intention to use mobile payment platforms. The model was based on case study method involving the demonetization exercise of 2016 and a limited number of interviews. The study argues that sustained interventions by the institutions coupled with public eagerness and an increased level of competition among the service providers have resulted in a continuous intention to use mobile payment services.

Bhat et al., (2023) collected 150 recordings from users of UPI in the NCR and tried to conceptualize factors influencing UPI adoption and use, which were further categorized into adoption factors and trust factors. The adoption factors relate the most with UPI's growing consumer demand, rising popularity, and benefits in terms of reduced cash handling costs, whereas the trust factors relate to benefits in terms of convenience, positive consistent transaction experience, safety etc.

Objective:

- To study the factors influencing the adoption of UPI among merchant outlets in Ballari District.

Research Methodology

For the study, a structured close ended questionnaire was designed using the UTAUT model, having 4 constructs (Venkatesh et al., 2003) to analyse the influential factors in UPI adoption. A second section of statements to study the constraints being faced in the adoption and use of UPI was subsequently used. Statements were put on a likert scale of 1-5 to check agreeableness on the statements. A sample of 120 respondents was drawn using judgemental sampling, comprising merchant outlets and businesses in Kampli town

and Ballari City of Ballari District. Respondents included merchant outlets and businesses such as grocery and general stores, clothing & jewellery shops, food joints and bakeries, book stores, pharmacies and other retail outlets having a permanent merchant setup. Only those businesses having UPI payment facilities were chosen. Vegetable hawkers and fruit vendors were not part of the survey. After review, 20 responses were weeded out for either being incomplete or not having further usability. Descriptive statistics were used to check for normality;Cronbach's Alpha for checking the reliability; and KMO and Bartlett's Test for checking sample adequacy and homogeneity of variables. It was followed by Factor Analysis to draw suitable inferences. Extraction of the factors was done using Principal Component Analysis and Rotation was done using Varimax method with Kaiser normalization. Average Variance Extracted (AVE) and Composite Reliability (CR) were calculated. For the analysis, IBM SPSS 23.0 and MS-Excel programmes were used.

Demographic Profile of the Sample:

Table 1: Age * Level of Education Cross-tabulation

Age * Level of Education Cross-tabulation						
	Level of Education					Total
Age	Less than 10th	10th	10+2 or Diploma	Graduation	Post Graduation	
18-30	0	1	7	9	0	17
30-45	1	6	18	17	0	42
45-60	5	8	14	11	1	39
60 & Above	2	0	0	0	0	2
Total	8	15	39	37	1	100

Source: Survey data compiled by Researcher

Table 2: Age * Monthly Income Cross-tabulation

Age * Monthly Income Cross-tabulation						
Age	Monthly Income					Total
	Less than 15000	15000 - 30000	30000 - 50000	50000 - 100000	50000 & above	
18-30	4	4	5	2	2	17
30-45	6	13	18	2	3	42
45-60	9	8	9	5	8	39
60 & Above	2	0	0	0	0	2
Total	21	25	32	9	13	100

Source: Survey data compiled by Researcher

Most respondents were in the age group of 30-45 (42%), followed by 45-60 (39%). 76% respondents had a minimum 10+2 / diploma qualification with 37% being graduates.

One-fourth of the respondents were earning in the range of 15,000 - 30,000 every month, and 32 had a monthly income of 30,000 - 50,000. 21 respondents had an average monthly income of less than 15,000.

Results & Discussions:

Table 3: Descriptive Statistics

Descriptive Statistics

	Mean	Std. Deviation	Skewness	Kurtosis
	Statistic	Statistic	Statistic	Statistic
PE1 – UPI is convenient and easy to use for customers	4.160	1.0320	-1.285	1.216
PE2 – UPI is a fast and hassle-free mode of payment	4.080	1.0218	-1.032	.473
PE3 – UPI is a reliable, time saving and safe Digital payment mode	3.970	.8928	-1.070	1.530
PE4 – UPI helps me to keep a track of transactions and in managing finances	3.860	1.1283	-1.053	.687
PE5 – UPI is useful for a wide variety and volume of transactions.	4.000	.9949	-.942	.477
EE1 – UPI has a user friendly interface	3.710	1.0180	-.443	-.395
EE2 – UPI is easy to understand and use	3.840	.9611	-.647	-.121
EE3 – UPI does not require a lot of technical knowledge	3.660	1.0271	-.414	-.480
EE4 – It is easy to follow up with customer support for grievance resolution.	3.610	1.0239	-.534	-.211
SI1 – Adoption of UPI was influenced by peers / family / friends	3.330	1.2148	-.145	-.917
SI2 – Customer demand made me adopt and use UPI	3.530	1.0294	-.479	-.152
SI3 – Accepting UPI improves social image and validation.	3.500	1.0778	-.370	-.681
SI4 – I feel obliged to use UPI due to the nature of my business.	3.320	1.1624	-.339	-.654
FC1–Digital infrastructure (QR Codes, Scanners, Soundbox, Internet) are accessible to use UPI	3.900	.9796	-1.046	1.011
FC2 – Technical support, learning manuals are provided by service providers	3.740	.9808	-.633	-.001
FC3 – Digital India, consumer protection laws, enhanced security etc are regulated by Govt	3.840	1.0122	-.744	.019
FC4 – Promotional offers and affordable payment terms facilitate use of UPI	3.850	1.0088	-.716	-.248
Valid N (listwise)				

Source: Survey data compiled by Researcher

The data is normally distributed except for four items which show a positively skewed distribution.

Table 4: Reliability Analysis using Cronbach's Alpha

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.926	.928	17

Item-Total Statistics

	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PE1	.734	.837	.919
PE2	.729	.880	.919
PE3	.587	.654	.922
PE4	.678	.742	.920
PE5	.767	.802	.918
EE1	.590	.540	.922
EE2	.682	.683	.920
EE3	.640	.558	.921
EE4	.668	.629	.920
SI1	.557	.550	.924
SI2	.534	.636	.924
SI3	.561	.615	.923
SI4	.224	.566	.923
FC1	.676	.740	.920
FC2	.749	.760	.918
FC3	.713	.704	.919
FC4	.649	.672	.921

Source: Survey data compiled by Researcher

Cronbach's Alpha which indicates the level of statistical reliability and validity of the factors is 0.926 for all the 17 items, which shows that the data is highly reliable and valid for further statistical treatment. An ideal Cronbach's Alpha of over 0.8 is considered to be excellent, which is clearly the case here. Scale item limitation also shows that deletion of none of the items would improve the overall reliability. Therefore, all the items identified for four factors were considered for further analysis.

Table5: KMO and Bartlett's Test for sample adequacy and Homogeneity of variables

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		**.878**
Bartlett's Test of Sphericity	Approx. Chi-Square	1267.042
	df	136
	Sig.	**.000**

Source: Survey data compiled by Researcher

KMO and Bartlett's test is run to ascertain whether there is homogeneity and equivalency of variances, and an ideal KMO value of over 0.7 is desired. KMO measure of 0.878 indicates that the data is fit for factor analysis as the sample is deemed to be adequate. The data also is significant (<0.05).

Table 6:Total Variance Explained - Extraction using PCA

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.192	48.186	48.186	8.192	48.186	48.186	3.740	22.001	22.001
2	2.073	12.194	60.380	2.073	12.194	60.380	3.139	18.463	40.465
3	1.399	8.227	68.607	1.399	8.227	68.607	3.124	18.379	58.844
4	1.051	6.184	74.791	1.051	6.184	**74.791**	2.711	15.947	**74.791**
5	.850	5.002	79.793						
6	.500	2.940	82.733						
7	.499	2.933	85.666						
8	.458	2.694	88.361						
9	.396	2.327	90.688						
10	.334	1.965	92.652						
11	.261	1.535	94.188						
12	.260	1.528	95.716						
13	.195	1.146	96.862						
14	.177	1.042	97.904						
15	.149	.879	98.783						
16	.129	.760	99.542						
17	.078	.458	100.000						
Extraction Method: Principal Component Analysis.									

Source: Survey data compiled by Researcher

Extraction run by Principal Component Analysis yields a four-factor solution, cumulatively accounting for 74.791% of the total variance among all variables as shown in the table above. Four components having Initial Eigen values over 1 were obtained, with Factor 1 accounting for 22.001% of the total variance after rotation, followed by three factors with contributions of 18.46%, 18.38% and 15.95% respectively. The 4 factors extracted account for over 60% of the total variance among the observed variables, which is desirable in Factor analysis. A scree plot for the same is shown below.

Fig 1. Scree plot

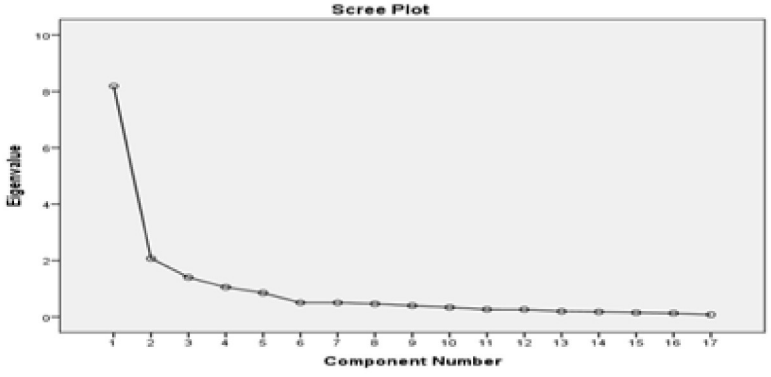

Table 7: Rotated Component Matrix

	Component			
	1	**2**	**3**	**4**
PE1	.780			
PE2	.793			
PE3	.774			
PE4	.800			
PE5	.739			
EE1			.788	
EE2			.717	
EE3			.711	
EE4			.764	
SI1				.650
SI2				.753
SI3				.776
SI4				.854
FC1		.812		
FC2		.744		
FC3		.702		
FC4		.805		
Extraction Method: Principal Component Analysis. **Rotation Method:** Varimax with Kaiser Normalization.				
a. Rotation converged in 6 iterations.				

Source: Survey data compiled by Researcher

For factor loading rotation, Varimax or Orthogonal rotation method is used wherein, the set factors are loaded and rotated horizontally to obtain the factor loadings for each item against the respective construct or variable and to eliminate cross loadings. The table above shows that the data is highly convergent and discriminant validity can also be verified as there are no lopsided / multiple / cross factor loadings. All coefficients below 0.5 were suppressed and a scree plot was obtained. The factor loadings are loaded perfectly against their respective predefined constructs with all items except one having rotated factor loadings over 0.7, which indicates a good data fit for factor analysis.

Table 8: Average Variance Extracted (AVE) and Composite Reliability (CR)

Construct	Items	Loadings Squared	Error Variance	CR	AVE
Performance Expectancy (PE)	PE1	0.609	0.392	**0.884**	**0.604**
	PE2	0.629	0.371		
	PE3	0.598	0.401		
	PE4	0.640	0.36		
	PE5	0.546	0.454		

Effort Expectancy (EE)	EE1	0.621	0.379	**0.833**	**0.556**
	EE2	0.514	0.486		
	EE3	0.505	0.494		
	EE4	0.584	0.416		
Social Influence (SI)	SI1	0.423	0.577	**0.846**	**0.58**
	SI2	0.567	0.433		
	SI3	0.602	0.398		
	SI4	0.730	0.271		
Facilitating Conditions (FC)	FC1	0.659	0.341	**0.851**	**0.589**
	FC2	0.554	0.446		
	FC3	0.492	0.507		
	FC4	0.648	0.352		

Source: Survey data compiled by Researcher

The table shows the values of Average Variance Extracted (AVE) and Composite Reliability (CR) for all items and the four chosen constructs. All the selected four constructs used in the model viz., Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC) have decent AVE values, all over 0.5, which indicates a good and acceptable level of convergent validity of the data and the model. Fornell and Larcker(1981) recommended an AVE greater than 0.5. It shows that the selected constructs are able to explain or account for a large amount of total variance (74.791%) among the indicators. Performance Expectancy (PE) has the highest AVE at 0.604 and is the most influential factor that captures the highest proportion of variance, followed by Facilitating Conditions (FC), Social Influence (SI) and Effort Expectancy (EE) as the next influential factors, with values of 0.589, 0.58 and 0.556 respectively.

A Composite Reliability of 0.70 is ideally recommended(Hair et al., 2009), while Fornell and Larcker (1981) recommended a CR value of 0.60 or more. The CR values for all the constructs are well over 0.8 which indicate a high level of internal consistency for all the selected factors that validate the model. Therefore, the chosen factors are reliable in the measurement model.

Conclusion :

UPI is inarguably one of the most successful innovations in the domain of FinTech in India. What makes the growth story much more appealing is that UPI is a complete indigenous technology, currently much sought after in many countries. UPI adoption brings many benefits to all sections of the society, especially to retailers. The current study incorporated UTAUT model to investigate the influential factors behind adoption and use of UPI in Ballari district of Karnataka. The model was empirically validated as the constructs

together accounted for 74% of the total variance among the observed variables. Performance Expectancy, Facilitating conditions, Social Influence and Effort Expectancy were found to have the highest predictive power in that order, echoing the observations made by Gupta et al., (2021); Gupta et al., (2019); Kuriakose et al., (2022), although additional constructs proposed in UTAUT2 were not theorised in this model, which could be explored in the future research. Facilitating conditions was also a significant predictive factor contradicting observations made by Ranpariya et al., (2021), which could be due to the inadequate infrastructure and low economic development in Kalyana Karnataka region, to which Ballari district belongs. (Hanagodimath, 2014).The present study investigates intricacies of UPI adoption, providing stakeholders with valuable insights into the factors that drive its integration into the operational fabric of businesses.

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