

DIGITAL PAYMENT SYSTEM FOR ECONOMIC SUSTAINABILITY. A CASE STUDY OF GUJARAT NARMADA FERTILIZERS AND CHEMICALS LTD IN INDIA

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Abstract: Digital payment system (DPS) is witnessing growth day by day, especially, in Asian and European countries. E-banking, electronic payment, cashless or less cash economy, digital economy, Digital payment system are all synonymously used to represent new technology in use. Many researchers have discussed about DPS practices leading to economic and sustainable development, its significance and challenges, factors for intention to use and adoption etc. This paper discusses implementation process of a 100% cashless township, created in India. With digitalization, one cannot rule out the ambiguity with issues like cyber security, digital identity and related policies, and hence we see people conveniently using both, cash and card system. But in India, once being tagged as fully digital village is switching back to the old all cash mode. So the much promising digital village initiatives have fallen flat.

Hence this paper presents a case of a government company, which has fostered a responsible action in subordinating governments' 'Digital India program'. In 2016, GNFC has created first 100% Cashless Township in Gujarat, India, consisting of 5000 permanent residents and 10,000 floating population and still continue to transact in digital-only form. This sustainable model has been replicated to more than 100 townships across the country and is adoptable to rural areas to enable successful 'Digital Villages'. We also discuss the sustainable impact generated to the stakeholders in the township.

We use primary data and secondary data to collect required information and use Unified Theory of Acceptance and Use of Technology (UTAUT) model to identify user adoption and acceptance factors in GNFC's digital-only mode of payment system.

Keywords: Digital payment system (DPS), GNFC 100% Cashless Township, UTAUT model, Economic sustainability.

Introduction

There is an immense shift in the mode of transactions, after the serious financial inclusiveness measures by Government of India. Many parts of India willingly or unwillingly have opted for digital payment systems. Digital payments are growing at a rapid pace. It was

2.65% of GDP in FY16 to 7% of GDP in FY18. The cash circulation is reducing day by day. It was INR 18.5 lakh crores in May 2017 and INR 7.8 lakh crores in Dec 2017 (Bhakta, 2018). Post demonetization with severe cash crunch, many villages in India has accepted to be cashless/less-cash zone. But owing to high rentals on POS machines and bank transactions, few villages in the country (Indiatimes, 2017) for instance Ibrahimpur, Ugrawai (Telangana), Dhasal (Maharashtra), Badjhiri (Bhopal), Lanura (Kashmir) chandagalu, Vondaraguppe (Karnataka) and many more are switching back to the old all cash mode. As per RBI, the cash withdrawal from ATM & POS is increasing. (Refer Table 1 and Table 2). The reasons for this change are a bunch of irritants like security and risk issues (Dhani, and Piyush, 2017), inadequate skilled managers and infrastructural deficiencies (Siyanbola, & Tunji, 2013a), cultural problems and technical problems like digital illiteracy – lack of awareness about use of apps, banks charging higher rent, fear of hidden transaction costs involved in digital mode of payment (Rani, 2015).

Despite these incidences, there are instances where people are moving with a strong determination for persuing digital mode. GNFC, township in Bharuch is the first 100% Cashless Township in India which was launched in 2016. The results are interesting as a smallest business from cobbler shops, pan shops, barber shops, flour mills to schools, malls and a temple in the township are using POS machines. Taking GNFC case, the paper finds out the sustainable model for creating cashless or less cash zones and helps to understand implementation strategy and sustainability impact of the same. By using Unified Theory of Acceptance and Use of Technology (UTAUT) model (Venkatesh et al., 2003) we discuss how GNFCs initiative has successfully transformed consumer behavior in supporting Digital India initiative.

India and Digital economy

At first, the term Digital Economy was used in Japan in 1990s. Later, in 1995 the term was used in a book by Don Tapscott – *The Digital Economy: Promise and Peril in the Age of Networked Intelligence* (Tapscott, 1997).

The Payment and Settlement Act, 2007 defines electronic funds transfer as – “any transfer of funds which is initiated by a person by way of instruction, authorization or order to a bank to debit or credit an account maintained with that bank through electronic means and includes point of sale transfers; automated teller machine transactions, direct deposits or withdrawal of funds, transfers initiated by telephone, internet and, card payment”.

India comprises of 15% of the world population, and with a growth rate of 7 to 8%, India is set to become the second largest economy by 2030. To achieve this, the government considers the digital economy as the primary growth enabler (Team Inclusion, 2017). In order to transform India into a digitally empowered society and knowledge economy, Digital India programme was initiated, as a flagship programme of the Government of India in July 2015, Mantra is IT (Indian Talent) + IT (Information Technology) = IT (India Tomorrow) ([digitalindia.gov.in/...](http://digitalindia.gov.in/)).

„The digital economy is the new productivity platform that some experts regard as the third industrial revolution. Digital revolution, also known as ‘The Internet Economy’ or Internet of Everything (IoE), is expected to generate new market growth opportunities, jobs and become the biggest business opportunity of mankind in the next 30 to 40 years” (Gopalratnam, V.C., CIO, Cisco, *CIO Review*, June 2015).

As per the estimation, in India, the digital economy is expected to contribute \$550 bn to \$1 tr in GDP by 2025 and add 2 million jobs by 2018 (Sharma, 2018). Deloitte Report (2010) says the card payments amounts to 60% of the total digital payments and the mobile wallet industry is also rapidly growing. As per Visa & YouGov, being hyper-connected, better informed and digitally empowered, 78% of Indians are keen to accept new modes of digital payment. India’s current digital economy is still in its early days, and this offers new prospects for the country innovation-driven rather than merely consumption-driven growth, and for the creation of new kinds of blue-collar jobs (Padmanaban, 2017). Electronic transactions in India have 4.73% increases than in December 2017. It has reached a record high of 1,11 bn. in January 2018 (Gupta, 2018).

Catching up with rest of the countries like Singapore, Finland, Sweden, Norway, UK etc, India stands 91st position among 139 countries in e-readiness (The Economist Intelligence Unit Report, 2010). Many big Companies in the country like ITC, HP, GNFC, INTEL and ICICI are supporting this initiative by creating cashless zones in unique ways (Refer Table 3).

1. Literature review

We observed history of DPS, its meaning and implementation factors & adoption factors for our literature review section.

History of Digital payment system

For over a decade, banks have been affected by changes associated with globalization and financial liberalization. Reacting to these changes, banks expanded the choice of services offered to the customers and increased their reliance on technology (Al-Smadi and Mohammad, 2012a). Delay in payment of cheque (Siyabola, and Tunji, 2013b) evolution of technology, severe competition led to forced market expansion and increased electronic banking products to reduce operation cost and speed the delivery of services (Ghaziri, 1998). From the customers' point of view, electronic banking allows customers easier access to financial services and time saving in managing their finance (Al-Smadi, and Mohammad, 2012b). There is a connection between cashless banking and the economy and this shows that the introduction of the policy would improve economy as well as the profit level of business men and women (Syanbola, and Tunji, 2013c).

Meaning

Instruments like – banking cards, Unstructured supplementary Service Knowledge (USSD), Aadhaar Enabled payment system (AEPS), unified payments interface (UPI), point of sale (POS) mobile wallets, internet banking, electronic clearing system (ECS) micro ATM real time gross settlement (RTGS) mobile banking except cash is called electronic payment or cashless payment or digital payment (Roy, and Sinha, 2017). For this paper, study of mobile banking is more suitable as in the selected case, mobile banking is more popular. Mobile payments (m-payments) are increasingly being adopted as a new way of doing business in the 21st century (Dennehy, and Sammon, 2015).

Factors for Implementation and Intention to adopt

Factors influencing E-payment system, its benefits and challenges has been discussed by widely many researchers. In order to motivate customers to use e-banking, organisations must make key improvements that address the customers concerns and hence, it is necessary to understand the key factors that influence the adoption of e-banking among the customers (Al-Smadi, and Mohammad, 2012c).

Besides there are several factors that a card holder or the user considers for opting Digital payment system like Technology of payment instruments, information accessed by third parties, (Kazan, and Damsguard, 2014) ease of use, risk, security and trust, consumer awareness, convenience, availability of e-payment tools, Speed Internet Access, the consumer's experience in using, computer and their level of education the technical, protection, security statements, Government and Central Bank regulations, productivity in the transaction, easiness and flexibility in the transaction, the reason that their dear and near recommends were the factors identified and incentivizes the elements which can fillip the usage of e-payment system (Vinitha, and Shanmugam, 2017). Perceived ease of use and perceived usefulness affect the behavior and attitude towards information system (Renny et al., 2013). Cultural factors such as level of education, language and experience of the technology is very important in the adoption of new technologies (Junadi, and Sfenrianto, 2015).

By considering above literature review, we identify that the factors influencing the implementation and adoption of e-payments can be broadly grouped as below:

- Technology & Infrastructure.
- Education, Training & Awareness.
- Behavior & Attitude.
- Cultural factors.
- Online Safety & Security factors.
- Motivational factors.

Digital Payment system Technology and Economic sustainability

E-payment system Enhances value espoused by sustainable development and creates sustainable demand which in turn leads to increased, job creation, production and resultant increase in higher revenue (Oghoghomeh, and Ogbeta, 2014). For efficient use of resources, using the smart solutions for a better quality life is the main goal of sustainability development and our future cities (Batagan, 2011). Economics of payment systems around the world says that lessons drawn from developed countries highlight, how digital payments are cheaper, more efficient and ultimately more sustainable and so it could be more accessible to people, and at the same time boost revenue for financial providers (Bill, and Melinda, 2013).

2. Research Gap

It is a known fact that digitalization enables economic and sustainable development. Very few studies exist discussing about the process of implementing a sustainable model to create cashless/less cash zone. And the contribution of e-payment practices towards a sustainable development is yet to be firmly established (Tennyson, and Mercy, 2014).

3. Problem Statement

Considering the fact of technological innovations for financial inclusiveness measures 'Digital India' Initiative was introduced in India. Substituting the government efforts, many large companies adopted several villages to make 'Digital Villages'. Lot of time and resources is being invested to make Digital India – a dream come true. But several villages which ones made headlines for being totally digital, is falling back by opting for cash transactions again for several reasons.

We identified that GNFC 100% Cashless Township Model is working well in this regard. Hence we present a case study explaining the implementation model, How it is planned and implemented, Who are the stakeholders, What factors are considered/favoured for the adoption of the model (using UTAUT) and what is the impact created which makes the stakeholders to continue to opt for digital payment system in GNFC s township.

4. Concept framework

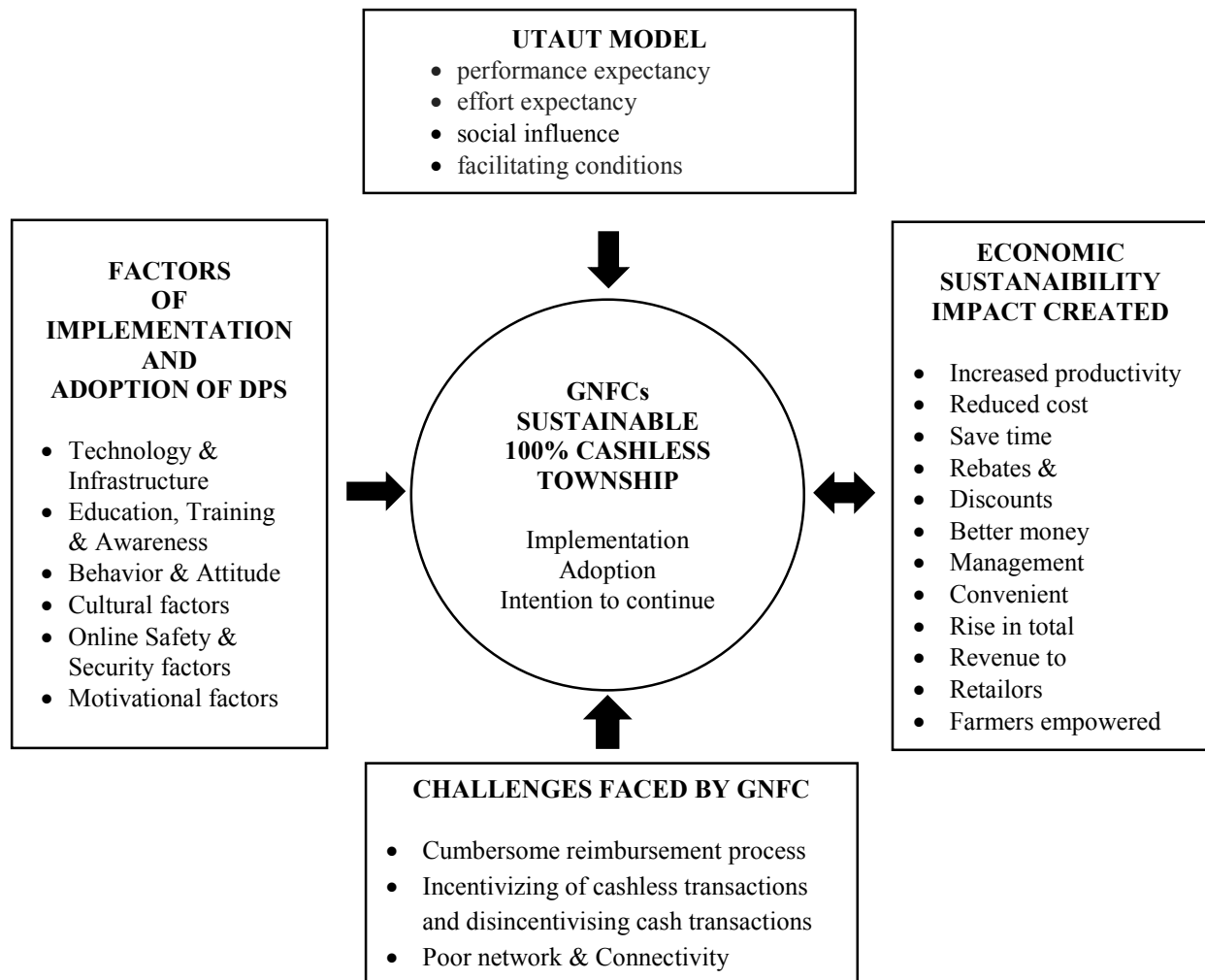


Figure 1. Factors influencing the implementation of 100% cashless township.

5. Research questions

The study was guided by the following research questions:

- Why villages are turning back to all cash mode?
- What are the factors to be considered to implement a successful 100% cashless township model and for the adoption /intention to continue the cashless system of payment?
- What is the process of GNFC Model of 100% cashless System?
- What factors of the GNFC s model led to the easy adoption and use of this technology?
- What were the challenges?
- How can DPS improve economic sustainability?

6. Objectives

1. To identify the factors involved in the implementation of e-payment system.
2. To study the implementation framework of GNFCs 100% cashless township.
3. To examine the factors that led to the easy adoption of digital payment system in GNFC Township. Using UTAUT Model.
4. To identify the challenges in implementation of GNFCs 100% cashless township.
5. To identify the impact of DPS in improving the economic sustainability in the GNFC township.

7. Methodology

Present study is a descriptive case study. Extensive literature review was undertaken in order to find the dimensions or factors for successful implementation and adoption of Digital Payment System. Data is collected through:

1. **Primary data** is collected through telephonic interview with GNFC officials regarding implementation of 100% cashless Township and used personal observation method by attending retailers award function for highest cashless transactions at GNFC. Group discussion with 20 retailers was undertaken with unstructured questions regarding implementation process.
2. **Secondary sources** like Google Scholar, Researchgate, Government Digital India websites RBI & GNFC Company website & Documents, research papers, articles, reports & newspapers.

Unified Theory of Acceptance and Use of Technology (UTAUT) model

In light of importance of consumer acceptance for the adoption of digital payments, UTAUT framework indicators (Venkatesh et al, 2003) are listed below which will be considered further for the case study. The UTAUT aims to explain user intentions to use an information system and subsequent usage behavior. The theory holds that there are four key constructs:

- **Performance expectancy:** performance expectancy is defined as the degree to which using a technology will provide benefits to consumers in performing certain activities.
- **Effort expectancy:** it is the degree of ease associated with consumers' use of technology.

- **Social influence:** it is the extent to which consumers perceive that important others (e.g., family and friends) believe they should use a particular technology.
- **Facilitating conditions:** The perceptions of the resources and support available to perform a behavior.

Genesis of GNFC

Gujarat Narmada Valley Fertilizers & Chemicals (GNFC) is a jointly owned PSU by Government of Gujarat and Gujarat State Fertilizers & Chemicals Ltd. (GSFC) with business of chemicals and fertilizers and IT solutions worth INR 6000 crores. GNFC has extended its profile much beyond fertilizers through a process of horizontal integration. Chemicals, energy sector; electronics and IT form ambitious and challenging additions to its corporate portfolio. GNFC has addressed its success to its swift turnaround strategy which translated the company from loss making (INR 452 crores in 2015) to a profitable (INR 6000cr in 2018), debt-free company. As a result, GNFC is featured No. 1 PSU, in Fortune India Magazine among 50 most profitable PSUs in terms of market cap growth. Being single producer of TDI in India, GNFC has portfolio of 64% of chemicals, 34% of fertilizers and 4% of IT solutions. Besides, GNFC is known for substituting government projects through ‘Neem Initiative’ where lakhs of rural poor women are empowered both financially and socially. Recently GNFC has entered FMCG market with its variety of neem products, supporting ‘Make in India’ goals. GNFC along with Niti Ayog¹ has pioneered to use blockchain technology in fertilizer subsidy disbursal and management. GNFC is also known for creating India’s first 100% cashless Township.

It was a moment of proud for GNFC, when Prime Minister, Narendra Modi appreciated this initiative in his Man Ki Baat radio programme. Niti Ayog certified GNFC cashless township model as ‘doable’ and ‘replicable’ across country. It can be used to prepare training modules to enable DPS. As a benchmark, under Niti Ayog, GNFCs E-Township model, has been replicated in 81 townships across pan India covering 2 lacs population amounting to 2.5 lac transactions per day. For this trailblazing efforts by GNFC, the Cashless Township Initiative received many accolades and recognitions like Prestigious Porter Prize, Golden Peacock Award for innovation, Golden Globe Tigers Award, Malaysia for excellence in cashless payment leadership, Business World Digital India Award, Skoch Order of the Merit Award, Times Networks Digital India Award (www.gnfc.in).

¹ Niti Ayog – National Institute for Transforming India – a think of Government of India.

8. Discussion – GNFCs 100% Cashless Township Model

Inspired by the needs of future digital India, Dr. Rajiv Gupta and his team embarked on this journey after demonetization policy. At first instance, the company stopped usage of cash at the organisation level. Next, the Bharuch Township which has about 5000 permanent residents and 10000 floating population every day, was converted to 100% cashless township. And all this happened with a remarkable duration of 10 days. A township is called less cash if 80% of the transactions is made digitally. It wasn't a cake walk as the township was a mix of households, retail establishments, Hospital, banks, schools & college etc with people of all ages (PWC Report, 2017a).

GNFC deftly constituted expert team within the company, did campaigning & Spreading awareness among the residents, wide training and capacity building, logistics, legal compliance and most importantly developing necessary digital infrastructure with proper cyber security were the initial steps taken by GNFC(PWC Report, 2017b).



Figure 2. 100% Cashless Township Implementation action plan of GNFC. Source: GNFC records.

8.1. Planning phase

The action plan in the planning phase included:

1. To foster efficiency, at first all the stakeholders were identified for the implementation.
2. Meetings with shop holders in the township, residents were held to generate awareness for need of Cashless Transaction and explain modality for implementation.

3. Mass appeals through handbills, word of mouth publicity and door to door help – educating ladies and children in particular for use of mobile applications and credit/debit card, on line banking system was held.
4. Digital literacy campaign was done in 45 interactive sessions.
5. Regular Progress review and reporting was crucial part of planning actions.

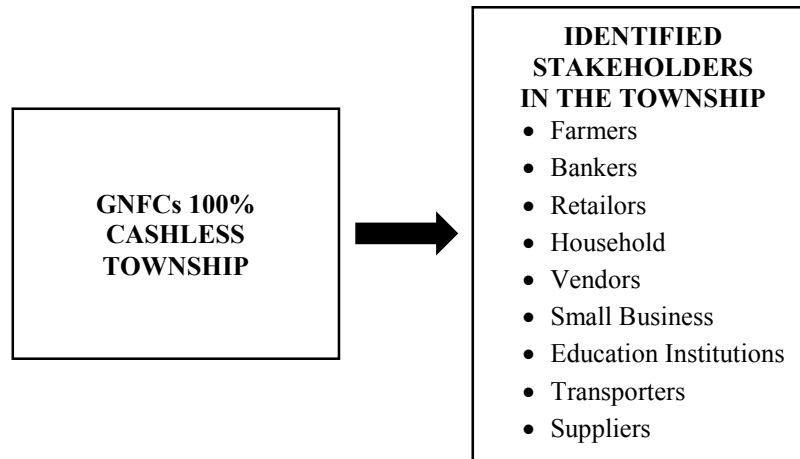


Figure 3. Identified stakeholders in the township.

8.2. Constituting a team of experts

As for a team, GNFC has an apex body constituting MD, Dr. Rajiv Kumar Gupta as the chairman, along with heads of IT, Finance, Administration and a head for the task force. The task force included 6 teams under the apex body i.e. a survey team, a Campaign team, a training team, a handholding & monitoring team, a MIS & Control team, an implementing team consisting of engineers, township supervisors, and trainers in each team.

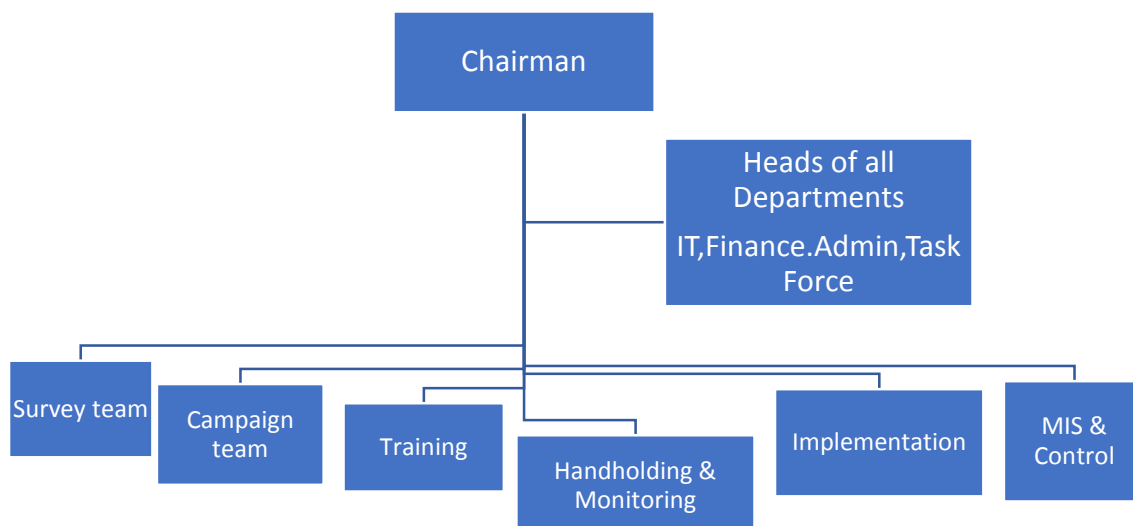


Figure 4. The Organisation structure in GNFC to implement 100% cashless Township model.
Source: own work.

Within few days of demonetization, GNFC took a major decision to be 100% Digital Company. Not just for selling fertilizers but for every facet of the GNFC transactions, be it fertilizer retailers, townships, farmers or payouts to GNFC vendors all done in cashless mode. It was a landmark decision in the history of GNFC and required unprecedented amount of coordinated efforts and teamwork to realize this objective. GNFC had to necessitate revamping of entire supply chain, modifying payment cycles, doing last mile connectivity, managing vendors, procuring and distributing POS machines and other hardware to retailers. Business process re-engineering was undertaken. The process included issuing and understanding the guidelines and directives, identification of impacted business rules, amendment in accounting procedures, validation and cross-verification, renegotiating arrangements with banks, and underwriting risks of buyers and sellers. It then embarked on assessing on-ground challenges and a step by step planning of addressing these challenges. The GNFC team and (n) Code (IT team) collaborated closely to bring their respective strengths of business understanding and strong grasp on IT infrastructures and procedures of e-economy.

8.3. Mass Campaigning and spreading awareness

An initial solid base-line survey was established to know the availability of technological resources for implementing a cashless regime. This was followed by gap analysis of the infrastructure required to roll out the same. Various stakeholders viz. resellers/retailers and consumers of all category such as housewives, children, labourers and casual workers (who do very small value but large number of transactions a day), were presented with options and possibilities.

Large hoardings were put up in public places like factory, office, schools and colleges and at all retail outlets. Awareness was given on the various incentives available through government like 'Lucky Grahak Yojana' and 'Digi dhan vyapar Yojana' where customers and merchants using digital payments are eligible for winning daily and weekly lucky draw prizes.

One of the factors of adoption as identified is safety and security factor. While implementing, GNFC took the stakeholders views on adoption of digital economy through ground survey with a targeted focus on their fears, concerns and on perceived risks. This shows the synchronization of the GNFC cashless township model with adoption factor Safety and security to evade future risks.

8.4. Training and capacity building

Mass contact programmes were held about 100% cashless township and tailored training sessions were conducted separately to housewives, children at schools and colleges. A detailed training was provided to retailers regarding modes of cashless transactions cost of transactions, discount schemes, handling accounts etc. Further, based on interactions and feedbacks necessary tips were provided by concerned team.

After the consultation with stakeholders with detailed analysis and resolution to all potential problems which yielded trust and confidence from the retailers and consumers, GNFC took to a modest beginning. Here we identify the positive change in the factor of behavior and attitude of township people towards the adoption of new technology.

The training and facilities provided by GNFC has been reported as easy to use and clear and understandable so that even the smallest business like pan shops, barber, vegetable shops are using digital modes. This is in par with the effort expectancy of UTAT model.

GNFC trained 22,000 ITI students as 'Digital Trainers', with the mantra 'Each 1 teach 5', and they enabled farmers to be digitally literate. GNFC's women group did on a door-to-door campaign to teach about digital transactions.

8.5. Infrastructure development

The GNFC team conducted a study and found that an employee had an average of 3 transactions per day in canteen. And a single household had 5 transactions per day. A cross functional taskforce was setup to evaluate and work through the myriad of tabled issues that recommended deployment of multiple payment options and the crucial business process re-engineering in the way accounts and audit would accept the receipts of money against sales. Multiple engagements at various forms, with different interest groups were conducted extensively over a 10 day period, while technical team was working alongside in setting up the required infrastructure, renegotiating contracts with banks and other stakeholders on the operations side of the program. Action plan adopted included:

1. First of all, it was ensured that every household member have at least two e-wallet apps.
2. All outlets were made compulsory to accept payments by at least three modes
3. Around 500 Trucks/Tankers/Vehicles have been mandated to use Fast tag/Debit Card for payment of toll tax. Around 1.8 lac trucks trips were cashless transactions last year.
4. Entire shopping arcade was made Wi-Fi enabled.
5. Issuance of M-Swipe, PoS machines to shop owners, shopping center, school, canteens, hospital, sports complex, guest house and other establishments with Finger Print Scanner & Printer for AEPS with proper registration meeting KYC norms.
6. The team helped everyone in the township to have their bank accounts including visitors & service providers to the township and also ensured people had smart mobile phone with data plan.
7. E-Wallet application installed in 3,645 mobile phones. Around 500 students trained for installation of e-wallet app.

GNFC set up an 18-hour operational vernacular voice call center to support and resolve queries and problems faced by stakeholders. With this the facilitating conditions required as per UTAT Model, were met by GNFC.

8.6. MIS & Controlling

Dr. Gupta had daily progress reviews and meetings where major decisions were taken including providing additional comfort to the stakeholders. There were few challenges in banking, telecom and IT infrastructure to sudden spurt in volumes. The main action points were:

1. Putting up help-desk and cashless monitoring cell right at shopping arcade to sort out technical problems.
2. Meetings with various banks and mobile companies to make digital system more users friendly.
3. Adopting multi-pronged approach and formation of dedicated teams to address the issues.
4. There was online real-time problem solving facility made.
5. User-retailer tracking system, ZETA cards were facilitated.
6. Repeated trainings were conducted.

Data were collected from MIS about number of cashless transactions – all payments and receipts within the township, details of volume and types of transactions in the township etc.

Impact on economic sustainability

Setting up the basic necessities was at one hand and at the ground level more than all, influencing the behavior of the target people was the biggest challenge for GNFC as paying digitally has to become a habit intentionally and mindfully. (PWC Report , 2017c)

A third party assessment was made on percentage of cashless transactions. Since the cashless transactions were more than 80% of the transactions, GNFC was declared to be first 100% cashless township in India (Refer Fig. 5). The farmers enjoyed varied discounts on cashless transactions. GNFC provided rebate of 15% and 10% for farmers and retailers. Retailors are awarded for making highest e-payment transactions. Based on this we can say that the farmers were got Hedonic Motivation which made them to pursue DPS. An impact study conducted by PWC (2017d) said, GNFCs Cashless Initiatives led to socio-economic development and sustainability .The high impact results were as follows:

- 96% of farmers to reduce cost of travel to fertilizer shops.
- 90% of the farmers were more empowered, cost savings with better money management.
- 92% of households felt it as more convenient and time saving form of transaction and effective tool for parents to have a better control over their child's expenses.
- 87% of retailers reported a raise in total revenue and the cash handling system improved for the company as a whole.
- Vendors, retailers, suppliers, transporters, etc. also empowered to adopt cashless system.

- Going cashless has forced small businesses to avail of the benefits like increased revenue and profitability, better customer profiling, targeted marketing, increased market share and geographic reach due to e-Commerce and m-Commerce.
- More than one fourth of the cashless transactions were done by people with over 50 years of age while women accounted for 40% of cashless transactions

As per PWC report, the digital payment system adopted in GNFC Township has been conveniently useful to the people in their daily life, increase productivity and economic conditions, reduced cost and help save time leading to sustainability of the is model. This satisfies is the Performance Expectancy mentioned in the UTAT Model.

Cashless transactions brought about more confident and empowered farmer with a sense of pride in his/her cashless lifestyle. Many also reported reduced stress and healthier life as they became better money managers and has accepted it as a culture and lifestyle. This Social Influence or the Social Change on the stakeholders contributed to the intention to continue DPS₂.

Though offering free-bies, cash backs and value deals is industry wide practice to engross new people, it can't be a sustained source of increasing cashless transactions. With Inadequate marketing and promotions, narrowing discounts the number of cashless transactions will reduce. GNFC has opted to be continuously innovating in marketing, incentivizing, and pushing cashless living as a lifestyle mantra to all the stakeholders until people get used to living a cashless life and then it to become difficult for them to turn back to cash transactions (www.gnfc.in/cashless...). Following a digital system in company's every transaction; "GNFC has sold more than 3.5 million bags of fertilizers without using cash" said Dr. Rajiv Kumar Gupta, Former MD, GNFC, Interview 26th July 2018, CEO Magazine.

Challenges Faced

- Fertilizer retailers found reimbursement process to be cumbersome – retailers were happy; however they vouched for an easy and efficient reimbursement process for reclaiming discounts given to farmers.
- Cashless is dis-incentivized as transaction charges needs to be paid. On the other hand cash is incentivized, as there are not extra charges levied on retailers. With this retailers might not be encouraged to do more of cashless transactions.
- Issues with POS transactions – network & connectivity issues and not receiving SMS.

9. Future Research

Future research can be carried out to know how exactly this model works in rural areas. One can also find out how use of an effective technology makes way for economic sustainability. This model can also be tested and tried in upcoming smart cities.

10. Concluding thoughts

The new technology innovations like Radio frequency Identification (RFID), Near Field Communication (NFC), Block chain technology should be encouraged to address transparency and security issues as the country needs to move away from cash-based towards a cashless (electronic) payment system (Das and Agarwal, 2010). This is just a beginning of a new era and the cashless initiatives, if implemented with strategic approach, can lead to far reaching positive changes in society and business at large. To promote digital payments, till now GNFC has provided training and handholding of 140 other townships across India (www.gnfc.in/PM...). GNFCs 100% Cashless Township model imbibes and is in sync with all factors necessary to accept and use the Digi payments technology leading to economic sustainability and social transformation.

Table 1.

Debit card swiped in ATM

Month, 2018	Volume (M) of transactions	Value (INR Lakh CR)
Jan	741.5	2.49
Feb	718.2	2.47
March	774.9	2.66
April	758.9 (15% up) ²	2.64

Note: ET, 20th June, 2018, .p 4.

Table 2.

Debit card swiped on POS

Month, 2018	Volume of transactions (M)	Value (INR CR)
Jan	298.5	40761
Feb	282	37037
March	318.9	41857
April	333.7	45457

Source: ET, 20th June, 2018, p. 4.

Table 3.

Examples of 'Digital India' Initiatives of Indian Companies

Sl.No.	Company Name	Initiative to go cashless	Year	Output	Status of the Project
1	ITC Ltd.	ITC E-Choupal	2008	23 E-Choupal Saagars established. It offers 1% discount on all cashless purchases creating awareness through sms, camps.	Partners with others to promote a digital mind set through ChoupalHaats (rural marketplaces), Launch of E-Choupal 0.4 in, 2018
2	TATA trust and Google India	Internet Saathi	2015, July	Provides digital literacy to 26,000 villages	Have expanded to cover 200 millions

² Niti Ayog – National Institute for Transforming India – a think of Government of India.

cont. table 3.

3	ICICI Bank	ICICI Digital villages	2016, November	100 villages completely digitalized in 100 days	Adding 500 villages to the digital networking by December, 2017
4	SBI State Bank Of India	Housing colony & a village	2016	As a pilot project, a village was converted cashless within 30 days, A housing colony with 1000 residents was converted to cashless	SBI Unnathi card
5	GNFC Gujarat Narmada Fertilizer & Chemicals	Bharuch Cashless Township	2017	Township of 5000 population with 10000 floating population has become cashless in 38 days	Replication of the model in 180 integrated townships across the state with a total population of over 5 lakh.
6	HP Hewlett Packard	Centre for excellence	2017, March	Showcases locally developed solutions that have potential to transform.	Existing
7	Coco-Cola & SBI		2017, January	Skilling and training 2.6 million retailers and 5000 distributors to conduct business transactions digitally	Existing
8	Larsen & Turbo Finance	Digital Sakhi	2017, June	Skilling rural women in 32 villages in Maharashtra	Expansion to 100 000 villagers

Note: Adapted from: “changing phase of financial landscape through cashless rural economy: an insight” by Meghana, K. (2017). ISBN-978-93-83302-25-3. Paper presented in International Conference on Emerging Trends in Finance, Accounting and Banking, Mysore.

Table 4.

Top 10 Townships – summary of Cashless Transactions – April 2017 (GNFCs Model replicated by Niti Ayog & GNFC)

Serial No.	Township Name where Cashless Model was Adopted under the guidance of GNFC	Number of Cashless Transactions
1	Reliance Refineries, Jamnagar	69,50,604
2	BHEL, Trichi	57,36,480
3	Larsen & Toubro, Hazira	35,22,535
4	Atul, Valsad	28,45,645
5	Welspun Anjar, Kutch	2840095
6	Adani Ports & Special Economic Zone Limited (APSEZ), Mundra	23,81,699
7	IPCL, Vadodara	23,12,056
8	BHEL, Haridwar	22,94,697
9	Gujarat Guardian, Bharuch	19,52,465
10	J K Paper Mills, Songadh	17,98,164

Note: GNFC Records.



Figure 5. Volume and type of cashless transactions in GNFC Township. Source: GNFC records

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Bibliography

1. Al-Smadi, and Mohammad (2012). Factors affecting adoption of electronic banking: An analysis of the perspectives of banks' customers. *International Journal of Business and Social Science*, 3, 294-309.
2. Batagan, L. (2011). Smart Cities and Sustainability Models. *Informatica Economică*, 15(3).
3. Bhakta, P. (2018, June 12 th). Demonetization: Indians may have gone back to cash & credit pay . Retrieved from https://economictimes.indiatimes.com/articleshow/64552089.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst, 12.08.2018.
4. Bill & Melinda Gates Foundation (2013). *Digital Payments Can Benefit the Poor, and Be Good for Business*. Press releases and statements, www.gatesfoundation.org/Media-Center/Press-Releases/2013/09/Digital-Payments-Can-Benefit-the-Poor, 04.10.2018.
5. Das, A., and Agarwal, R. (2018). *Cashless Payment System in India –A Roadmap*. Technical Report.
6. Deloitte Report (2010). *Leading the cashless charge – Evolution of the digital wallet industry in India*, <https://www2.deloitte.com/content/dam/Deloitte/in/Documents/strategy/in-strategy-leading-the-cashless-charge-noexp.pdf>, 10.10.2018.
7. Dennehy, D., and Sammon, D. (2015). Trends in mobile payments research: A literature review. *Journal of Innovation Management, JIM*, 3(1), 49-61.

8. Dhani, C., and Piyush, K. (2017). Demonetization and its Impact on Adoption of Digital Payment: Opportunities, Issues and Challenges. *Abhinav National Monthly Refereed Journal of Research in Commerce & Management*, 6, 1-14.
9. Don, T. (1997). *The digital economy: promise and peril in the age of networked intelligence*. New York: McGraw-Hill. Retrieved from Wikipedia, 01.05.2018.
10. Ghaziri, H. (1998). *Information technology in the banking sector opportunities, threats and strategies*. Retrieved from <http://ddc.aub.edu.lb/projects/business/it-banking.html>, 10.10.2018.
11. Gupta, K. (07.02.2018). *Digital transactions rise to 1.11 billion in January*, <https://www.livemint.com/Money/xAFcGXlqfSTjqtTdYva5EO/Digital-transactions-rise-to-111-billion-in-January.html>, 06.10.2018.
12. <http://digitalindia.gov.in/content/about-programme>.
13. <http://www.gnfc.in>.
14. <https://www.gnfc.in/cashless-press-release.html>.
15. <https://www.gnfc.in/PM-launches-81lesscash-townships.html>.
16. Indiatimes (13.10.2017). *Maharashtra And Telangana's 'Cashless' Villages Return To Cash, Villagers Say It Was A Mistake*. Retrieved from www.indiatimes.com/news/india/maharashtra-and-telangana-s-cashless-villages-return-to-cash-villagers-say-it-was-a-mistake-331594.html, 03.05.2018.
17. Junadi, and Sfenrianto (2015). A Model of Factors Influencing Consumer's Intention To Use E-payment System in Indonesia. *Procedia Computer Science*, 59, 214-220, doi.org/10.1016/j.procs.2015.07.557.
18. Kazan, Erol, and Damsgaard (2014). *An Investigation Of Digital Payment Platform Designs: A Comparative Study Of Four European Solutions*. Proceedings – 22nd European Conference on Information Systems. Tel Aviv, Israel. Retrieved from www.researchgate.net/publication/262914388_An_Investigation_Of_Digital_Payment_Platform_Designs_A_Comparative_Study_Of_Four_European_Solutions, 11.10.2018).
19. Padmanabhan, A. (2017, May, 4). *The Right way to nurture India's Digital Economy* Available on <http://carnegieindia.org/2017/05/04/right-way-to-nurture-india-s-digital-economy-pub-69863> (Assessed on 15th may 2018).
20. PWC Report (2017). GNFC, Impact Assessment of Cashless Initiatives.
21. Rani, U. (2015.08.16). *Challenges of Digital India: Some heads-up for Narendra Modi*. Retrieved from www.businessinsider.in/Challenges-of-Digital-India-Some-heads-up-for-Narendra-Modi/articleshow/47959238.cms, 20.08.2018.
22. Renny, Guritno, S. and Siringoringo, H. (2013). Perceived Usefulness, Ease of use, and Attitude Towards Online Shopping Usefulness. Towards Online Airlines Ticket Purchase. *Procedia – Social and Behavioral Sciences*, 81, 212-216, www.sciencedirect.com.

23. Sanghita, R. and Indrajit, S. (2017). Factors affecting Customers' adoption of Electronic Payment: an Empirical Analysis. *IOSR Journal of Business and Management (IOSR-JBM)*, 19(12), 76-90.
24. Sharma, P. (2018.04.25). *Regulating a Digital Economy: An Indian Perspective*, www.brookings.edu/blog/up-front/2018/04/25/regulating-a-digital-economy-an-indian-perspective/, 15.010.2018.
25. Siyanbola, and Tunji, T. (2013). The Effect of cashless banking on Nigerian Economy. *Canadian Journal of Accounting and Finance*, 40, 1(2), 9-19.
26. Team Inclusion (2017). Digital Payments to Digital Economy Road to Success. Retrieved from <http://inclusion.skoch.in/story/887/digital-payments-to-digital-economy-road-to-success-1187.html>, 02.10.2018.
27. Tennyson, O., and Mercy, O. (2014). E-Payment System and its Sustainable Development in the Nigerian Economy. *European Journal of Business and Management*, 6(8), www.iiste.org/Journals/index.php/EJBM/article/view/11534/11877.
28. The Economist Intelligence Unit Report (2010). Digital economy rankings 2010 Beyond e-readiness, www-935.ibm.com/services/us/gbs/bus/pdf/eiu_digital-economy-rankings-2010_final_web.pdf.
29. Venkatesh, V. et. al. (2003). User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3).
30. Venkatesh, V. et. al. (2016). Unified Theory of Acceptance and Use of Technology: A Synthesis and the Road Ahead. *Journal of the Association for Information Systems Research Paper*, 17(5), 328-376.
31. Vinitha, K., and Vasantha, S. (2017). Factors Influencing Consumer's Intention to Adopt Digital Payment-Conceptual Model. *Indian Journal of Public Health Research & Development*, 8, 170, doi: 10.5958/0976-5506.2017.00181.4.
32. Visa and You gov survey (2017). Indian consumers keen to adopt digital payment solutions, www.visa.co.in/about-visa/newsroom/press-releases/indian-consumers-keen-to-adopt-digital-payment-solutions-visa-survey.html.