

Impact Assessment of Common Service Centres (CSC 2.0) Scheme

Carried out for
CSC e-Governance Services India Limited



सत्यमेव जयते

**Ministry of Electronics and Information Technology
Government of India**

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1 Executive Summary

The Government of India has embarked on a scheme to provide enhanced e-governance through the provision of information and public services in an accessible manner in rural and urban areas through franchisee centres known as Common Service Centres (CSCs). The Common Service Centre e-Governance Services India Limited has tied up with public sector and private sector organizations to enhance the availability of financial, educational, health, and other products and services.

The success of this e-governance effort depends on the fulfilling of demand for key e-services in the far-flung areas of the country and ensuring the sustenance of the Village Level Entrepreneurs (VLEs) who deliver these services to citizens in these far-flung areas which in turn depends on their entrepreneurial dimensions, infrastructural and environmental support available for them.

In this report, we analyse the drivers of entrepreneurial performance in the context of a theoretical model built based on extant practices. We then examine the factors that drive the sustainability of Village Level Entrepreneurs (VLE) as a function of the CSCs and shed light on the determinants of entrepreneurial success in social settings. Specifically, we aim to address the internal and external factors that drive the performance of VLEs and the influences of CSC organization and other geographical factors on their performance. We find that intrinsic traits of the VLEs are largely significant in driving their performance but these traits themselves are driven by external factors such as demographics, literacy, prior work experience, and entrepreneurial perception. We also find that the strategies employed by these VLEs in delivering the services are also key influencers of VLE performance. Furthermore, we show that the intrinsic traits also determine these strategies chosen by the VLEs to drive the CSC operations and thereby the impact on the local communities.

In section 2, we provide a brief background of the CSC 2.0 program and the key findings of previous impact assessment studies on e-governance in India. We then elaborate on the theoretical model used in this study and the relevance and need for it based on extant literature. In section 4, we articulate our research methodology and the data collection process. In section 5, we present the key findings from our analyses which is concluded with policy recommendations in section 6.

2 Background

The Government of India launched the Common Service Centres (CSC) scheme as part of the National e-Governance Plan (NeGP) in 2006. The aim of CSC scheme was to introduce e-governance on a massive scale and to provide information and other public services to citizens in urban and rural areas by setting up 1,00,000 such centres across the country. These centres, also known as CSCs, are set up in each village or urban area to enhance governance, deliver essential Government-to-Citizen (G2C) / public utility services, social welfare schemes, financial services, education and skill development programs, health and agriculture services, and digital literacy, amongst a host of other business to consumer (B2C) services. Besides facilitating the delivery e-services, CSCs are positioned as change agents in rural India, promoting rural entrepreneurship and building rural capacities and livelihoods. **Figure 1** below shows an indicative list of services provided by the CSCs.



Figure 1 – List of Services Provided by CSCs (Source: CSC Annual Report 2018)

From an operational standpoint, these centres (CSCs) are run by Village Level Entrepreneurs (VLEs), who hail from rural and local communities and deliver e-services in their respective

villages. The CSCs are also envisioned to create technology-enabled socio-economic change, acting as catalysts for literacy, financial inclusion and gainful economic activity across rural India. It was aimed that CSC 2.0 scheme would consolidate service delivery through a universal technology platform, thereby making e-services, particularly government and business services accessible to citizens anywhere in the country. Key features of CSC 2.0 scheme (Source: <https://csc.gov.in/scheme>) are as follows:

- A self-sustaining network of CSCs in all gram panchayats
- Large bouquet of e-services through a single delivery platform
- Standardization of services and capacity building of stakeholders
- Localized help desk support
- Sustainability of VLEs through maximum commission sharing
- Encouraging more women as VLEs

A rich body of impact assessment studies (conducted by Administrative Staff College of India Centre for Innovations in Public Systems, International Telecommunications Union, and IMRB, amongst others) has provided detailed analyses of the scope and types of services provided by CSCs, as well as their level of engagement with their local community. Several studies assessing the impact of the CSC program have shed light on the positive changes that CSCs have brought to both citizens and the VLEs. These studies have highlighted the scope and diversity of government and business services that are accessible to citizens across states, level of support received from the government and various characteristics that describe corresponding CSCs' operational and infrastructural details (Source: <http://meity.gov.in/content/csc-scheme>).

While these studies are certainly helpful in understanding the characteristic traits of concerned CSCs, the findings cannot be generalized for the scheme at large or useful in understanding how village level entrepreneurship can be made sustainable through the CSC scheme in Indian setting. These studies have not addressed the apparent heterogeneity of both services available, innate differences in the VLEs themselves and factors that promote entrepreneurship in a rural setting. The extent of heterogeneity partly determines the difficulty in drawing conclusions that paint a broad stroke across all 3 lakh plus CSCs and the VLEs.

Within the extant academic literature on entrepreneurship, both normative and empirical studies looked at variety of salient questions broadly centred around two questions – who an entrepreneur is and what entrepreneurship entails. Over time, these questions have become more nuanced and quickly evolved into a large field with continuing uncertainty, boundaries and lack of clear answers. Both the quantum and range of evidences, approaches, definitions, methodologies and theories revolving around the topic of entrepreneurship are also indicative of the multidisciplinary nature of research, high degree of variability, scope for contradictory results, need and relevance for local contexts and complexities involved therein. There is substantial evidence particularly around the relevance of individual-level traits (such as risk propensity, internal locus of control, agreeableness, existence of role models, need for independence, work experience, education, parent’s wealth, etc.) on who chooses to become an entrepreneur. Through a review of over 130 published studies over a 30-year period (1980 – 2009), it has been found that there are over 43 individual traits/determinants are identified to be repeatedly studied and to have relevance in various contexts. Their effects have been found to be either positive or negative depending on specific contexts

However, all this research hasn’t yielded a scientific profile that allows identification of potential entrepreneurs with any certainty. There are also limitations to taking only trait-based approach of understanding entrepreneurial success and it is even argued that “*Who Is an Entrepreneur?*” *Is the Wrong Question* (Gartner 1989). Several scholars have long argued that entrepreneurs cannot be solely viewed as a fixed collection of individual characteristic traits which will ascertain business performance but traits as contributors to both what they do in creating organizations and in how they shape entrepreneurial performance corresponding to their specific contexts. Specifically, the social capital of the entrepreneurs and the environmental dimension (specific to regional contexts) are also found to further determine the range of firm-level strategies deployed and the performance (growth and profit) measures (Covin and Slevin, 1989; Lumpkin and Dess, 1996; Wales et al., 2011a; Stam et al., 2014). Near 100% of this extant literature is related to entrepreneurs and small firm performance in developed country contexts. The understanding of entrepreneurial success within a scheme like CSC 2.0 scheme is further compounded by lack of large-scale studies and empirical data in Indian rural environments that are ridden with geographic and socio-economic inequalities. In the subsequent section, we develop a theoretical model that is based on the learnings from the academic literature and enables us to understand the drivers of VLE success.

2.1 Theoretical Model

Based on extant understanding of the CSC 2.0 scheme and the key insights gained from the academic literature review of entrepreneurship, we construct a theoretical model (**Figures 2 & 3**) that help deepen the understanding of the drivers of successful Village Level Entrepreneurship in Indian context. As evidenced in the previous impact assessment studies and academic literature, the performance of CSC is influenced by an amalgamation of factors not limited to the VLEs as individuals and their characteristic traits, the environmental factors and state-level attributes under which they operate and the strategies they deploy within their firms (CSCs).

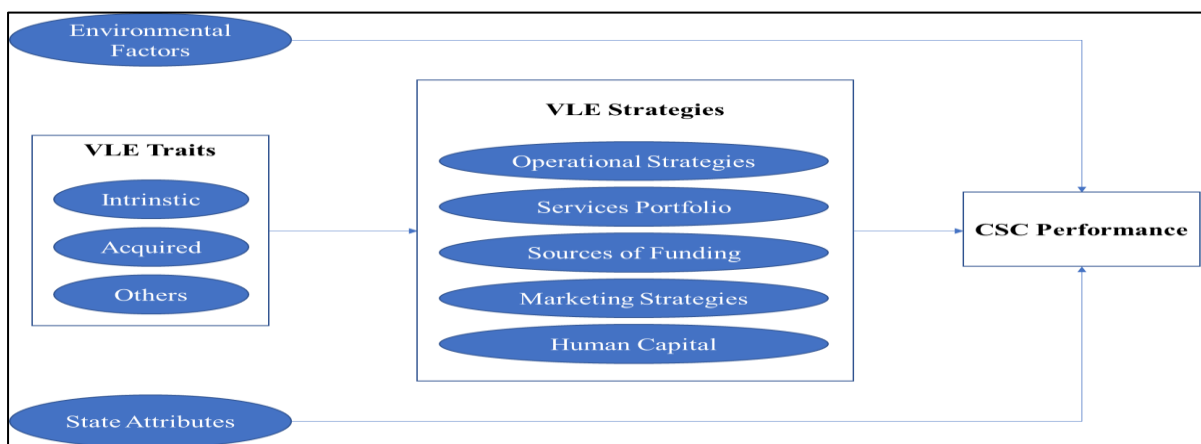


Figure 2 – Theoretical Model for Understanding Drivers of CSC Performance

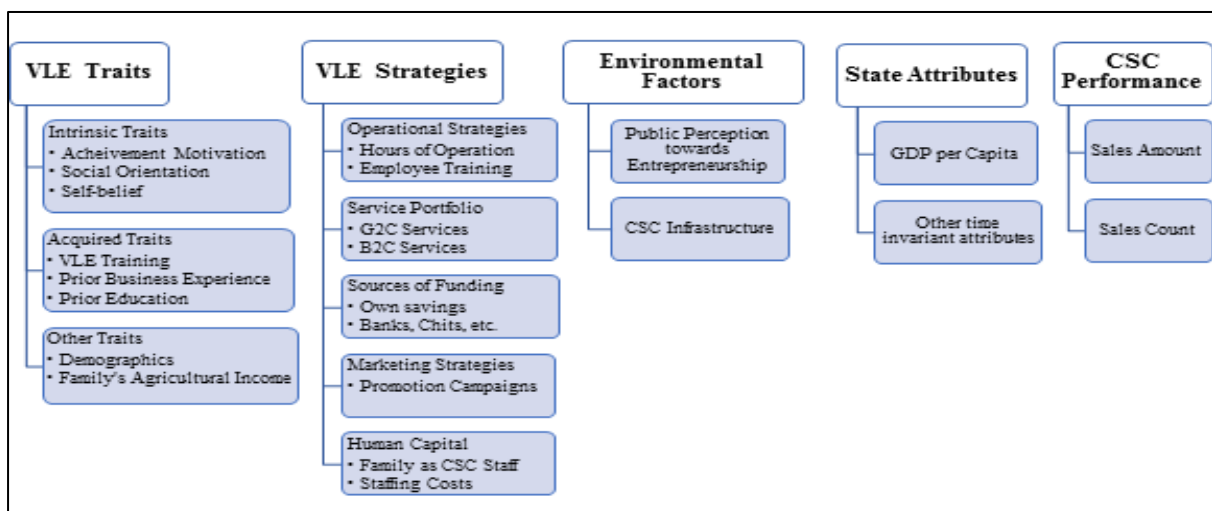


Figure 3 – Factors Influencing CSC Performance

In the following sections, we further elaborate the theoretical underpinnings from academic literature to substantiate the relevance of various drivers of CSC performance.

2.2 VLE Traits

A vast amount of previous academic literature on entrepreneurship points to the importance of how individual characteristic traits of entrepreneurs influence the performance of the firms they lead. Given the levels of heterogeneity observed in individuals as entrepreneurs, these traits help us get a deeper understanding of how these traits matter to how the CSCs perform. Among the significant ones that are relevant to the context like CSCs run by VLEs, we categorize three types of VLE traits:

1. Intrinsic Traits – Achievement Motivation, Social Orientation and Self-Belief

VLEs are individuals who are choosing to operate CSCs vis-à-vis other career and work alternatives and deliver the e-governance and business services to their local communities. Obviously, the long – term sustainability of the CSC scheme and the VLE’s success would be contingent on the readiness and willingness of the individuals to stay committed to the CSC scheme, put sustained efforts to continue to engage with the citizens in delivering the services and overcome the challenges of being an entrepreneur in a rural setting. If not for the innate confidence, motivation and social networks of the VLE, it would be very hard for the CSC operations to have necessary business volumes and thereby be sustainable in the long run.

A consistent relationship between intrinsic traits of entrepreneurs and their success can be found in extant literature. While a group of scholars (McClelland, 1987 and Johnson, 1990) highlight the importance of Achievement Motivation as a key variable of interest to entrepreneurial success, it is also found that this variable was significantly correlated with the choice of an entrepreneurial career (Shane et.al., 2003). Separately, scholars have also ascertained the prominence of entrepreneurial traits such as Social Orientation (Stam et.al., 2014) and Self-belief (Boyd and Vozikis, 1994) towards firm performance. Each of these personality traits are reported to influence how entrepreneurs get to see and pursue opportunities, what their attitudes and intentions are and finally regulate their behaviour towards performance. We anticipate each of these traits to be relevant for understanding the behaviour of VLEs and how the performance of CSCs is impacted.

2. Acquired Traits – Education, Prior Business Experience and VLE Training

Besides the intrinsic personality traits that are inherent to VLEs as unique individuals, VLEs also acquire additional traits both before they start their CSC business operations and post their entrepreneurial beginnings. For example, education is one of the major traits through which VLEs acquire the necessary capabilities to constructively engage with what the CSC scheme provides as a business opportunity and what the needs of their respective communities are. It is quite natural that differences in acquired levels of education will have different levels of control over the individual's ability to overcome the uncertainties across the cycles of CSC business. Prior research (Oosterbeek, 2010; Unger et.al., 2011; Fossen and Tobias, 2013) have shown that formal education and training has a positive correlation to development of an entrepreneur's skill-set and ultimately his/her productivity. Additionally, entrepreneurs who have previous experience in running businesses are found to establish better-performing ventures. Their prior experiences and learning exposure enable them to generalise knowledge from one setting and apply it effectively to another. Both individually and collectively, these acquired traits are crucial in help us understand the behaviour of VLEs and to put the heterogeneity of performance of CSCs in perspective.

3. Other Traits – Demographics and VLE Family's Income

While the intrinsic and acquired traits of VLEs explain the drivers of CSCs' performance to a certain degree, it is also important to observe that other demographic factors such as age, ethnicity, gender and family income have potential to impact CSCs' performance. There is mixed empirical evidence which on one hand demonstrates there is no role of impact of gender on the performance of small firms (Kalleberg & Leicht, 1991) while on the other hand, women are noted to be at relatively greater disadvantage in running small business (Loscocco et.al., 1991). Additionally, the dichotomy of necessity vs. opportunity is of salience to individuals in their decisions to become entrepreneurs given their socio-economic characteristics. For example, there are studies that demonstrate the linkages between parental entrepreneurial nature, family's business and income sources to the likelihood of the individual deciding either in choosing to become an entrepreneur considering the opportunity or feeling compelled to become one due to family reasons (Giacomin et.al., 2011). In the context of CSC scheme, we explore the relevance of each of these demographics of the VLE towards the performance of the CSC.

2.3 VLE Strategies

A vast amount of previous academic literature on entrepreneurship points to the importance of not just how individual characteristic traits of entrepreneurs matters to firm performance but also on the firm-level strategies deployed. This is key to answering the question on why a set of small firms (CSCs) are active and more successful vs. why others are dormant. What should the VLEs do to strengthen their ventures and ensure that they are growing? Now, among a host of potential strategies, we shortlist five of them based on the relevance for the CSC scheme. These strategies could be broadly categorized as operational, services-mix related, financial, marketing and human capital in nature.

1. Operational & Human Capital Strategies

The relationship between entrepreneurial success and human capital – including education, experience, knowledge and skills has been an area of keen interest to researchers and policy makers. Extant literature on entrepreneurship distinguishes human capital investments (education/experience) and the outcomes of such investments (knowledge/skills) in driving the entrepreneurial success. Human capital is considered important if it is task-related and if it consists of outcomes of human capital investments rather than human capital investments. (Unger et.al., 2011). This insight is intrinsically related and linked to the questions of:

1. Whom will VLEs hire to aid their CSC business operations?
2. How much are they willing to invest in developing the support staff?
3. What are implications of such human capital decisions – financial & operational costs?

Firstly, families and small businesses have often been treated as naturally separate institutions, but there is enough evidence in the literature that they are inextricably intertwined (Dyer et.al., 1994). Given that resource mobilization is time consuming affair and there are costs of acquiring and maintaining talent to run their entrepreneurial ventures, VLEs will have a default choice of deploying a family member to run the CSC operations. Now, this choice allows for controlling the hours of CSC operations (longer hours with lesser cost implications) and free-flowing development of “in-house” talent and skills. Given that it is his/her own family member(s), VLEs can share critical CSC-specific knowledge and skills while also allowing to have them contribute in flexible modes - full-time or part-time. Having a family member as

staff reduces the need to expend money on an individual outside one's family and hence contributes to the overall profit margins. Now, if the need for additional staff members is higher or if the productivity or effectiveness of family member is lower than what is expected, then the VLE will have a choice to decide on his/her hiring strategies. While there are costs of hiring non-family members as CSC staff, there could be potential positive branding implications such as building of goodwill for the VLE in the community and word-of-mouth promotion of the services offered through the CSC.

2. Financial, Services Mix & Marketing Strategies

Compared to the large firms, small businesses like CSCs that are set up in rural areas often rely on their social relationships and personal networks to survive and thrive. Entrepreneurs use their networks to not only leverage various kinds of capital and in return offer products and services to their respective communities. One of the main resources that entrepreneurs derive from their social networks is the financial capital to build and grow their businesses. Extant literature also points to the resource constraints (particularly lack of financial capital) that stifle the creation of new ventures and entrepreneurial growth process. In the absence of institutional financing to promote entrepreneurial ventures, small business owners often resort to financial bootstrapping (Winborg & Landström, 2001). In Indian rural contexts, where there is still a gap in traditional banking services that offer financial capital to small scale businesses, entrepreneurs often put in either their personal/family savings to start their ventures or borrow through high interest loans from local private money lenders and/or cooperative societies and chit funds.

Based on the individual traits of the VLE and available access to financial capital, VLEs take decisions on what kinds of resources they want to pool up, when and at what costs. For example, personal and family savings is one of easier and cheaper access. Loans from trusted personal networks often come at negligible interest rates over extended pay back periods – almost in the form of patient capital. Lending from cooperative societies and chit funds could be the next best option given the relatively lower interest rates compared to private money lenders charging exorbitant rates. All these choices have trade-offs and strategies to access the required financial capital from corresponding sources in a timely and cost-effective fashion determines the levels to which VLEs can respond to market forces, offer services that are in demand and potentially grow their CSC operations.

The relationship between marketing strategies and entrepreneurial success has been an area of keen interest to researchers and policy makers. Particularly in emerging markets context, there has been extensive research to highlight both explorative and exploitive tactics and strategies that entrepreneurs employ to drive sales growth (Vila et.al., 2015). Also, it is not just one-time transaction that will help the CSC become sustainable. Rather, it is the ability of the VLE to promote timely and useful services mix to his/her local community members – not just once in a particular service category but volumes of them across a variety of services. Having the necessary pulse on what individual citizens value/need and being able to continuously promote and sell such services requires the VLEs to not only have the technical know-how of such offerings but also on the ability to have and develop multiple types of ties with the citizens for repeat business. Research also suggests the impact of having such multiple ties with a customer on sales growth and in overcoming volatility in sales volumes (Tuli et.al., 2010).

VLEs can deliver a host of internet-based products and e-governance services to their local communities. Among all the viable products and services mix, it is the strategic choice of the VLE to highlight and promote some of them based on the market opportunities and his/her understanding of what the local citizens might value. For example, the G2C services on the integrated CSC portal would be different from the ones offered by the private businesses. The commissions earned for each service transaction type would be different and correspondingly the efforts and strategies needed to drive the volumes of transactions would be different. Reacting and responding to the citizens' demands for services or capitalizing on the existing awareness of a service through CSCs is one type of strategy. However, there could be additional ways of creating market in relatively underserved markets by creating awareness about newer services through targeted promotion campaigns. Again, the social networks of the VLEs and their entrepreneurial orientation would determine the explorative strategies and thereby the performance of the CSCs.

2.4 Environmental Factors & State GDP per Capita

1. Public Perception towards Entrepreneurship

Besides intrinsic traits and firm-level strategies that entrepreneurs use to drive business outcomes, an important external factor that influences entrepreneurial success is the public attitude towards entrepreneurship itself. Extant literature also points to how nascent entrepreneurs perceive the state of environment and takes up actions to give shape to their ideas (Edelman and Yli-Renko, 2010). In the context of CSC scheme, the public perception comprises of the outlook of people in community towards becoming and being a successful entrepreneur. This perception impacts the number of newer people who aspire to become VLEs and how much support and reception existing VLEs receive from the local citizens for their CSC business. If the local community has a favourable view of the value created by the entrepreneurship profession, it aids the likelihood of success for the CSC business.

2. CSC Infrastructure and State GDP per Capita

Infrastructure available within CSCs is a critical resource that VLEs access and leverage to deliver a host of services to respective rural communities. Extant literature considers infrastructure as a key dimension that not only facilitates and constraints individual entrepreneurship (Van de Ven, 1993). CSCs provides new digital infrastructure such as computers and other internet-based services offered both by private businesses and governments. By providing infrastructure that was previously non-existent, CSCs address the infrastructural uncertainty that often plagues small firms and engage in resource allocation that aids entrepreneurs to supplement the efforts of the government. An interesting follow on is how the availability of infrastructure in turn fosters entrepreneurship by aiding citizens to avail digital services at existing VLEs to train, empower and plan their own ventures.

There is considerable research in literature that points to the influence of macroeconomic factor such as GDP on the levels of business activity and entrepreneurship in a given region (Carree et.al., 2002). Since different Indian states have different GDP figures, it would be worthwhile to explore if there are any systematic differences between what kinds of individuals are opting to be VLEs across states and how they are comparing against CSC performance.

3 Data and Research Methods

This impact assessment study draws on multiple sources of data, including archival information on transactional volume and revenue from operations of the CSC for the year ended 2018; field surveys of key stakeholders, including VLEs, citizens and village heads; and detailed qualitative interviews with these stakeholders. The field surveys explore traits, conduct and strategies of the VLE as well as impact created by them while the qualitative interviews help us better understand the mechanisms underlying the observed impact. In the following section, we explain in greater detail the process employed for data collection and the research methodology used in our analyses.

3.1 Data Collection

Our sample of 1000 VLEs was selected basis two key criteria. First, to ensure representativeness of the sample with respect to the reference population, we selected VLEs from all four geographic regions of the country:

1. Punjab and Uttar Pradesh in the North
2. Assam, Bihar, West Bengal and Odisha in the East
3. Gujarat and Maharashtra in the West
4. Telangana and Karnataka in the South

In addition to facilitating statistical inference, this geographical representativeness allows us to explore variance between and across states in the impact of VLEs as well as drivers of such impact. In turn, the sample allows for more careful and differential policy formulations that are state agnostic and state specific. States are selected to include heterogeneity in population density ([Appendix I](#)); five states have a higher population density than the national average of 382 persons per sq. km., and five have a lower than mean population density. In brief, the sample allows an assessment of whether the impact of CSCs is significant, systematic, pervasive.

Second, our sample includes VLEs from those states that have not been assessed in an immediately prior impact assessment effort. For example, consider the CSC impact assessment study conducted in 2014 by the Administrative Staff College of India (ASCI) - Centre for Innovations in Public Systems, Hyderabad. As we can see from [Appendix I](#), the study by ASCI included seven States and our study excludes all but two of them – Telangana, which was a part of Andhra Pradesh until June 2014, and Uttar Pradesh, the largest Indian state in terms of population.

In each state, we picked districts that were collectively representative of that state’s geographical, linguistic and cultural diversity, wherever possible. The final list of sample districts by state for each of the 10 states is provided in [Appendix II](#). We used stratified random sampling method to choose CSCs from each district. From these districts, we picked the number of CSCs representative of the proportional number of CSCs in the state ([Appendix II](#)). The number of CSCs chosen was proportional to the number of CSCs present in that district. Once the corresponding VLEs were identified for a geographical location, village heads from the same location and citizens serviced by that CSC were selected for administration of village head and citizen surveys respectively. The final number of respondents by category for each of the field surveys and qualitative interviews is presented in **Table 1**.

Respondents	Field Surveys	Qualitative Interviews
VLEs	1,000	100
Citizens and Village Heads	1,500	30
CSC State Heads	NA	10

Table 1: Sampling Numbers – Respondent-wise

Our sample selection strategy is summarized in **Figure 4** below.

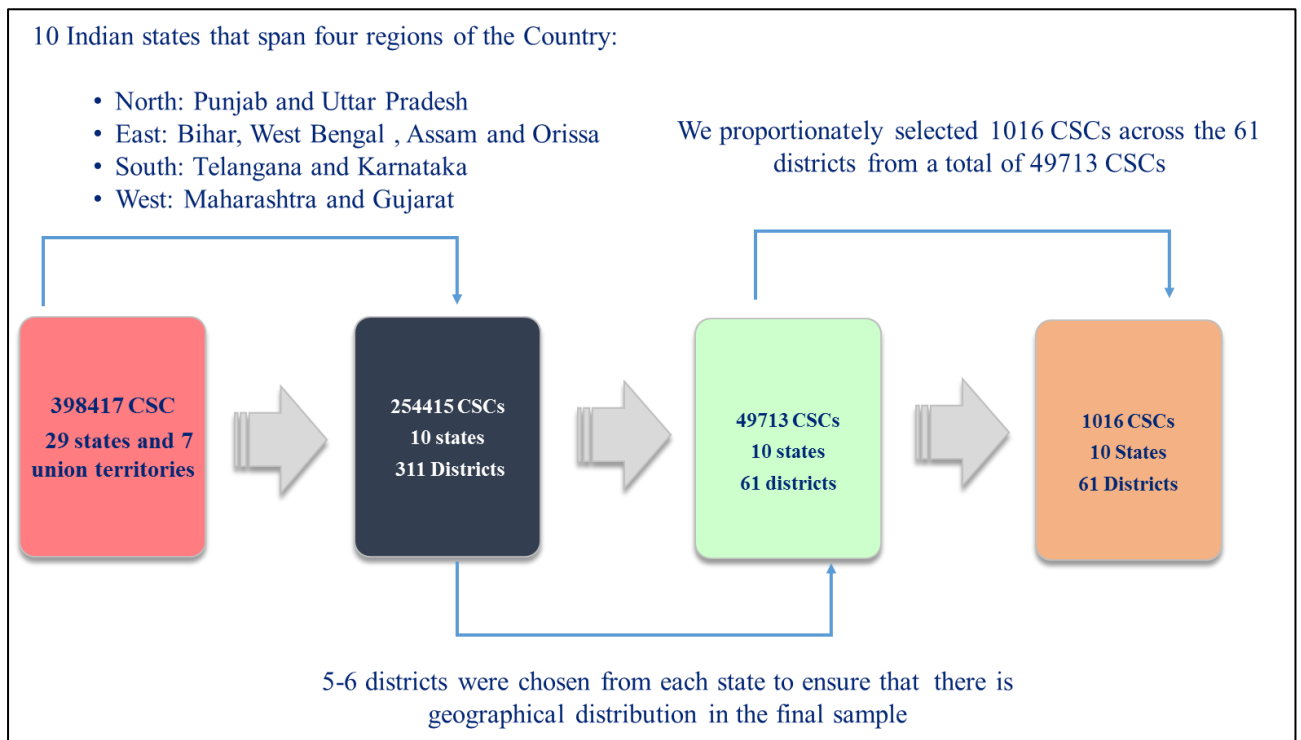


Figure 4: CSC Sample Selection Strategy

3.2 Survey Instruments

The VLE Survey (provided in [Appendix III](#)) is aimed at identifying the following factors:

- Motivation of the VLE to enrol in the CSC program and successfully run the CSC
- Intrinsic attributes of the VLE that drive performance
- Aid and assistance available to the VLE in running the CSC
- Service mix and business model selected by the VLE
- Strategies pursued by the VLE to drive growth and performance of the CSC

The Citizen survey ([Appendix IV](#)) and Village Head survey ([Appendix V](#)) are aimed at identifying the following factors:

- Services provided by the CSC
- Gap in services required and provided by the CSC
- Social and economic impact of the CSC
- Engagement with the CSC

3.3 Qualitative Interviews

The results of the regression analyses of the above survey data are subject to causal ambiguity. For example, while we theorize and observe that VLE strategies are driven by the quality of infrastructure of the CSC, it could also be that strategies dictate the quality of infrastructure of the CSC. In general, given that strategies are self-selected by the VLE, their impact assessment is subject to endogeneity concerns – the strategies may be correlated with unobserved factors that also drive impact. We used the data from the qualitative interviews that we conducted in conjunction with the survey to help address this issue to get closer to a causal explanation. The qualitative interviews help us understand mechanisms underlying the documented and demonstrated impact of the CSC program from four different perspectives:

- VLEs
- Citizens & Village Heads
- CSC State Heads

We conducted phone interviews with State Heads, who drive the CSC program locally, to understand the scope of the program and identify potential beneficiaries. The qualitative interviews with the State Heads ([Appendix VI](#)) were directed at understanding the scope of socio-economic changes brought about by the CSC program in their respective states, the area of focus of the CSC program, and the sustainability of the program. The VLE qualitative interviews ([Appendix VII](#)) focused on understanding the VLE’s motivation to enroll in the CSC program, the incentives and the skills needed to run the CSC, and the strategies pursued by the VLE to drive growth and performance of the CSC. The Citizen qualitative interviews ([Appendix VIII](#)) and Village Head qualitative interviews ([Appendix IX](#)) assess the social impact citizens see as a result of the CSCs and the likelihood of their continuing to engage with the CSCs and consume their services.

3.4 Translations and Transcriptions

All the instruments corresponding to the field surveys and qualitative interviews were originally developed in English and were later translated to the regional languages corresponding to each of the 10 states.

Language	States
Assamese	Assam
Bengali	West Bengal
Gujarati	Gujarat
Hindi	Bihar, Punjab, Uttar Pradesh
Kannada	Karnataka
Marathi	Maharashtra
Oriya	Odisha
Telugu	Telangana

Table 2: State-wise Translations & Transcriptions – Surveys & Interviews

To ensure that the quality of translated responses was not compromised, we selected survey administrators proficient in the regional language and in English for the translation. Each of the responses received in the local languages were translated into English and further transcribed into word documents that were further utilized as part of the qualitative data analysis.

3.5 Field Staff Training

Data was collected by a trained group of field staff who visited the CSCs and conducted detailed interviews and surveys. The initial training of the field staff at Indian School of Business (ISB) included complete familiarisation with the scope of the project, the importance and nuances of the survey instruments, and the research protocols required to be followed to minimize bias and measurement error. For example, field staff were trained in the fundamental guidelines for conducting interviews – for example, not to interrupt the respondent mid-conversation, not to nudge the respondent to favor any particular outcome and to extract as much information possible from the respondent for a given question. With regard to the survey, each member of the field staff was equipped with a digital tablet to record the quantitative responses, a digital recorder to record the qualitative interviews, a digital camera to take pictures of the CSC, and a GPS monitor to record the geographical location of the CSC. Some of the pictures from the field staff training and CSC visits are detailed in [Appendix X](#). Additionally, each member of the field staff was accompanied by senior researchers to conduct surveys and interviews at specific CSC locations, and was monitored for accuracy and objectivity in data gathering. Field staff were chosen based on their proficiency in their regional language, proficiency in English and their experience with collecting data.

3.6 Research Methods

In this section, we shed light on the various data that we collected from the VLE survey and elaborate on the various research methods employed in our analyses.

3.6.1 Data & Variables

The final VLE survey dataset contains 1016 responses which are translated and coded as per our requirements. **Table 3** below details the description of the key variables used in the empirical analysis.

Variable Name	Variable Measure
Performance Variables	
LOG_SALES_COUNT	Natural Logarithm of the yearly sales count of the VLE
LOG_SALES_AMT	Natural Logarithm of the yearly sales amount of the VLE
Intrinsic Traits	
ACHIEVEMENT	A factor score representing achievement motivation of the VLE was constructed using the following questions: 1. I accomplish a lot at work because I love my job 2. When my way of running the business is not successful, I experiment with new different ways of running the business 3. When I get what I want, it is usually because I worked for it
SOC_ORNTN	A factor score representing social orientation of the VLE was constructed using the following questions: 1. I frequently come in contact with people who are different from me 2. I feel comfortable to talk to people who are different from me
SELF_BELIEF	A factor score representing self-belief of the VLE was constructed using the following questions: 1. It is chiefly a matter of fate whether or not I have few friends or many friends 2. It is not always wise to plan too far ahead since many things turn out to be a matter of good or bad fortune 3. Most leaders have reached their positions because they were lucky enough to be in the right place at the right time
Acquired Traits	
ED_GRAD	A dummy variable indicating if the VLE is a Graduate degree holder
ED_PGRAD	A dummy variable indicating if the VLE is a Graduate degree holder
PRIORBIZEXP_FLAG	A dummy variable indicating if the VLE had any business experience before opening the CSC
VLE_TRAINING_DUR	The total number of hours of training the VLE received since the inception of the CSC

Table 3: Description of Data Variables – VLE Survey

Variable Name	Variable Measure
VLE Controls	
GENDER_FEMALE	A dummy variable indicating if the gender of the VLE is female
LVLE_AGE	Natural Logarithm of the age of the VLE in years
MARITAL_STATUS_MARRIED	A dummy variable indicating if the VLE is married
MARITAL_STATUS_DIVORCED	A dummy variable indicating if the VLE is divorced
MARITAL_STATUS_WIDOWED	A dummy variable indicating if the VLE is widowed
INTERNET_USAGE_HOME_HRSPWEEK	Number of hours per week the VLE uses internet at home
SMARTPHONE_USAGE_YN	A dummy variable indicating if the VLE uses a smartphone
CSC Controls	
COUNTERS_N	Total number of counters in the CSC
CSC_NVILLAGES	Total number of villages covered by the CSC
COMPUTERS_N	Total number of computers in the CSC
PRINTER_SCANNER_COPIER_N	Total number of printers and scanners in the CSC
DIGICAM_WEBCAM_N	Total number of digicam/web cameras in the CSC
Operation Strategies	
LHRS_PERDAY_CSC	Natural Logarithm of the number of hours the VLE spends per day working in the CSC
EMP_TRAINING_DUR	The total number of hours of training on CSC operations provided to the CSC employees
Marketing Strategies	
MKTING_CAMPAIGNS_YN	A dummy variable indicating whether the VLE undertakes marketing campaigns to promote CSC services
Services Mix	
G2CSHARE1	Fraction of Government services in the most availed services by citizens provided at the CSC
B2CSHARE1	Fraction of non-Government services in the most availed services by citizens provided at the CSC
Funding Strategies	
LCHITS_CC_PCT	Natural Logarithm of the percentage of amount invested to set up the CSC that was sourced from chits/credit cards
LLOANS_MONEYLENDER_PCT	Natural Logarithm of the percentage of amount invested to set up the CSC that was sourced by borrowing from family and friends
LLOANS_FAMILYFRNDS_PCT	Natural Logarithm of the percentage of amount invested to set up the CSC that was sourced by borrowing from family and friends
LLOANS_COOPSBANKS_PCT	Natural Logarithm of the percentage of amount invested to set up the CSC that was sourced by borrowing from cooperative banks

Table 3: Description of Data Variables – VLE Survey (Continued)

Variable Name	Variable Measure
Human Capital	
LFAMILY_FULLTIME	Natural Logarithm of the number of family members working at the CSC on full time basis
LFAMILY_PARTTIME	Natural Logarithm of the number of family members working at the CSC on part time basis
LPAID_FULLTIME_EMP	Natural Logarithm of the number of paid employees working at the CSC on full time basis
LPAID_PARTTIME_EMP	Natural Logarithm of the number of paid employees working at the CSC on part time basis
Other Variables and Controls	
INCOME_AGRI_FARM_FAM	Annual agriculture/farm income of the VLE's family
ENTRE_ENV_MEAN	A factor score representing the VLE's perception of the entrepreneurial environment in his/ her state was constructed using the following questions: Please indicate your opinion on the conditions for entrepreneurship in your district 1. Public attitude toward entrepreneurship 2. Promotion of entrepreneurship success 3. Training of entrepreneurial skills 4. Recognition of entrepreneurial success 5. Economic growth and market opportunity for entrepreneurs
LOG_GDPPERCAP	Natural logarithm of GDP per capita of VLE's State
INCOMESOURCE_SELF_CSC_B2C	A dummy variable indicating whether a part of VLEs family income comes from non-government services to citizens
INCOMESOURCE_SELF_CSC_G2C	A dummy variable indicating whether a part of VLEs family income comes from providing government services to citizens

Table 3: Description of Data Variables – VLE Survey (Continued)

3.6.2 Factor Analysis

Exploratory factor analysis (EFA) of the survey indicators measuring entrepreneurial traits revealed three distinct first-order constructs - achievement motivation, social orientation, and self-belief. Factors with eigenvalues greater than 1.0 that cumulatively explained a high proportion of variance in the data were used as consideration criteria. The results were combined with the orthogonal methods of varimax rotation to identify the factor loadings of each of the survey indicators on the three factors. The indicators that loaded on to each of the three VLE intrinsic traits are reported in Intrinsic Traits section of Table 3. All factor loadings were above 0.40 emphasizing the quality of interpretation of each factor. We use the output matrix of factor score weights to calculate a weighted average score for each of the three intrinsic traits.

3.6.3 Regressions

We assess the impact of VLE traits and strategies on performance using pertinent regression models with robust standard errors. An examination of the descriptive statistics suggests that there is sufficient variation in the key independent variables used in the regressions. The low correlations among many of the independent variables suggest that multicollinearity is not a significant concern in our analyses. The various regression models used in our analyses are detailed below. In all cases, annual transactional volume and revenue from operations of the VLE are used as measures of VLE performance.

1. Effects of Traits on Performance

In order to understand the role of each of achievement motivation, social orientation and self-belief of the VLE in determining VLE performance, we use the following OLS estimation of performance with robust standard errors. In addition to controlling for VLE demographics, acquired traits, and other time-variant characteristics, we also control for time invariant state characteristics to better understand whether VLE performance and its drivers systematically vary across states. The performance specification is detailed below:

$$\begin{aligned} VLE_Performance_i &= \alpha + \beta_1 achievement_i + \beta_2 soc_orntn_i + \beta_3 self_belief_i \\ &+ \beta_4 VLE_Acquired_Traits_i + \beta_5 VLE_Controls_i + \beta_6 CSC_Controls_i \\ &+ \beta_7 State_Controls_i + \beta_8 Fixed_Effects_i + \epsilon_i \end{aligned} \quad (1)$$

2. Drivers of Entrepreneurial Traits

From a perspective of policy design and development, it is important to understand the drivers of entrepreneurial traits of VLEs. Therefore, we regress each of the three VLE traits on other VLE characteristics and state attributes. We are particularly interested in understanding whether the VLE's perception of entrepreneurial conditions in the state impacts the documented traits. In this context, it is important to note that the simultaneous OLS estimation of the three dimensions through multivariate regression will ignore potential correlation amongst the errors across equations; however, because the three traits are correlated and the independent variables are same across the equations, there may be contemporaneous correlation among errors across the three equations. Thus, we use the seemingly unrelated regression (SUR) model to estimate the three equations. Our use of SUR is consistent with results of the Breusch-Pagan test of independence of equations, which finds that correlation amongst the residuals of the equations for achievement motivation, social orientation and belief in self is significant ($p < 0.01$).

$$\begin{aligned}
VLE_Entr_Trait_i & \\
&= \alpha + \beta_1 entr_env_mean_i + \beta_2 VLE_Acquired_Traits_i \\
&+ \beta_3 VLE_Controls_i + \beta_4 State_Controls_i + \beta_5 Fixed_Effects_i + \epsilon_i \quad (2)
\end{aligned}$$

3. Effects of Strategies on Performance

We use the following OLS regression model with robust standard errors to understand the effect of various strategies followed by the VLEs on their performance. We are specifically interested in understanding the effect of scale of VLE operations, investment in marketing, service mix, funding strategies, and investments in human capital development on overall VLE performance.

$$\begin{aligned}
VLE_Performance_i & \\
&= \alpha + \beta_1 CSC_Operation_Strategies_i + \beta_2 CSC_Mktng_Strategies_i \\
&+ \beta_3 CSC_Service_Mix_i + \beta_4 CSC_Funding_Strategies_i \\
&+ \beta_5 CSC_Human_Capital_i + \beta_6 State_Controls_i + \beta_7 Fixed_Effects_i \\
&+ \epsilon_i \quad (3)
\end{aligned}$$

4. Effect of Traits on Strategies

Finally, to understand how VLE traits impact the strategy employed by the VLEs, we use the following specification. Specifically, we follow a logit model to estimate the effect of VLE traits on marketing investments, employment of diverse funding strategies and investments in human capital; a fractional logit to estimate the effect on service mix; and OLS to estimate the effect on scale of operations.

$$\begin{aligned}
Strategy_i &= \alpha + \beta_1 achievement_i + \beta_2 soc_orntn_i + \beta_3 self_belief_i \\
&+ \beta_4 VLE_Acquired_Traits_i + \beta_5 VLE_Controls_i + \beta_6 CSC_Controls_i \\
&+ \beta_7 State_Controls_i + \beta_8 Fixed_Effects_i + \epsilon_i \quad (4)
\end{aligned}$$

As noted earlier in this report, the results of the abovementioned regressions, while establishing a relation between VLE traits, strategies and performance, are characterized by causal ambiguity. Therefore, we used the data from the qualitative interviews that we conducted in conjunction with the survey to help address this issue to get closer to a causal explanation.

4 Key Findings

This section of the report presents the key results of the abovementioned regression models that inform the final set of recommendations. Allied descriptive statistics and tests of robustness are presented in the [Appendix XII](#) to the report. For reasons of brevity, we do not report the results of the full model; rather, we only report those results that are salient to the specified estimation, significant, and robust to different empirical specifications.

4.1 Effects of Traits on Performance

Table 4 below presents the results for the estimation of (1) or the impact of VLE traits on VLE performance. While Columns (1) and (2) present the results without controlling for time invariant state attributes, columns (3) and (4) present the results after controlling for these state fixed effects. Together, the results offer insights into VLE traits that drive performance and the distribution of these traits within and across the sample states.

We find that highest education levels of the VLE, notably a postgraduate education, negatively relate to both transactional volume and revenue from operations. Specifically, transactional volume and revenue of VLEs with a post graduate degree is on average, lower than that of other VLEs by 52 percent and 67 percent respectively. The finding is consistent with prior academic research, which finds that education, to the extent that it increases job aspirations and expectations more than it increases the ability to attain, is likely to contribute to dissatisfaction with work. In the context of the VLEs, it seems that to the extent that running a CSC does not require a postgraduate education, postgraduates who take on these positions tend to be far less satisfied and in turn, less motivated to perform than VLEs with lower education levels. A similar explanation likely underlies the observed impact of average farm income of the VLE's family on sales count and amount.

Other demographic variables, notably, age and marital status also have a significant impact on performance. Older VLEs, after controlling for their prior experience, have greater revenue from operations. Similarly, Widowed VLEs outperform non-widowed VLEs although this could be because of the fact that the number of widowed VLEs in our sample is very small.

The results also emphasize the important role of the training received by the VLE in improving performance. The number of hours of training the VLE has received since induction, be it on operating the CSC efficiently and effectively or on identifying and delivering new services, also has a positive impact on VLE performance. The result is consistent with the findings from the qualitative interviews as well. The VLEs we interviewed generally viewed training provided by the CSC organization/ District Managers as crucial their understanding of the CSC operations and services. For example, below is a comment from one of the VLEs about the benefits of the training programs:

“They provided training one day workshop arranged. They given training on what type of services are there and how to provide them.... One day workshop was conducted by District Manager..... we were not aware where to apply for certificates; in training we got all information. They trained us adding biometric or to install it. Which website to go this information they provided”

In addition to training, size of CSC operations, as reflected in the number of villages covered by the CSC, and quality of infrastructure, as reflected in the number of printers, scanners and digicams, also have a positive impact on VLE performance. The results together emphasize that scale economies is an important element of CSC operations that positively influences VLE performance. Indeed, the results are marked by causal ambiguity – it is likely that high performing VLEs are able to make greater investments in quality infrastructure and scale their operations. Again, we use the findings from the qualitative interviews to address this issue. For instance, the VLEs that we interviewed remarked that greater digital infrastructure will allow them to offer additional number of services including training programs to the citizens.

“We have three systems and three persons are working. One does e-district works and other two banking works. If we would have more systems then we would have done more works. Currently, we cannot provide any training. If at all we have to do training centre, we have to have 8 to 10 computers and someone should be in the lab to do the training. Then people will come for training. If we have 2 systems, no one will come to us for training”

VARIABLES	(1) log_Sales_Cou nt	(2) log_Sales_AM T	(3) log_Sales_Cou nt	(4) log_Sales_A MT
achievement	0.054	0.144**	0.022	0.082
soc_orntn	0.149***	0.125*	0.105*	0.092
self_belief	0.048*	0.043	0.010	-0.036
ed_grad	0.004	0.092	0.091	0.202
ed_pgrad	-0.597***	-0.769***	-0.521***	-0.675**
priorbizexp_flag	0.075	0.150	0.031	0.127
vle_training_dur	0.012*	0.009	0.015**	0.009
gender_female	-0.455	-0.679**	-0.389	-0.625*
lvle_age	0.035	0.810*	0.173	0.918**
marital_status_married	-0.216	-0.214	-0.258	-0.247
marital_status_divorced	-0.980	-1.777	-1.192	-2.506
marital_status_widowed	2.201***	0.612	1.462***	0.331
internet_usage_home_hrspweek	-0.006	-0.006	-0.003	-0.003
smartphone_usage_yn	-0.066	0.051	-0.124	0.098
counters_n	0.087	0.104	0.101*	0.080
csc_nvillages	0.025***	0.026***	0.020***	0.026***
computers_n	0.008	-6e-04	-0.011	-0.022
printer_scanner_copier_n	0.235***	0.231***	0.289***	0.312***
digicam_webcam_n	0.095**	0.082	0.101**	0.057
income_agri_farm_fam	5e-06**	8e-06***	4e-06**	8e-06***
log_GDPperCap	0.146	-0.089	6.273	15.01**
Constant	2.479**	4.667***	-0.636	-2.641
State fixed effects			Yes	Yes
Observations	793	793	793	793
R-squared	0.110	0.090	0.134	0.122

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Regression Results – Effects of Traits on Performance

The results in **Table 4** also emphasize the important impact of the three behavioral traits – achievement motivation, social orientation and belief in self - on VLE performance. This finding is consistent with the prior academic research, which finds that each of these traits influence the success of businesses the individuals lead. For example, VLEs who have greater belief in themselves are more likely to not only pursue opportunities with confidence but also persist in the face of challenges. Similarly, the VLEs with higher social orientation would naturally connect with people from all walks of life from the respective

Interestingly, the magnitude and significance of the performance impact of these traits is significantly muted in the presence of state fixed effects, suggesting that these traits might systematically vary across states. **Figures 5-7** confirm this hypothesis. We find that the higher GDP states such as Maharashtra, Gujarat and Karnataka also house VLEs with higher than average achievement motivation, social orientation and self-belief.

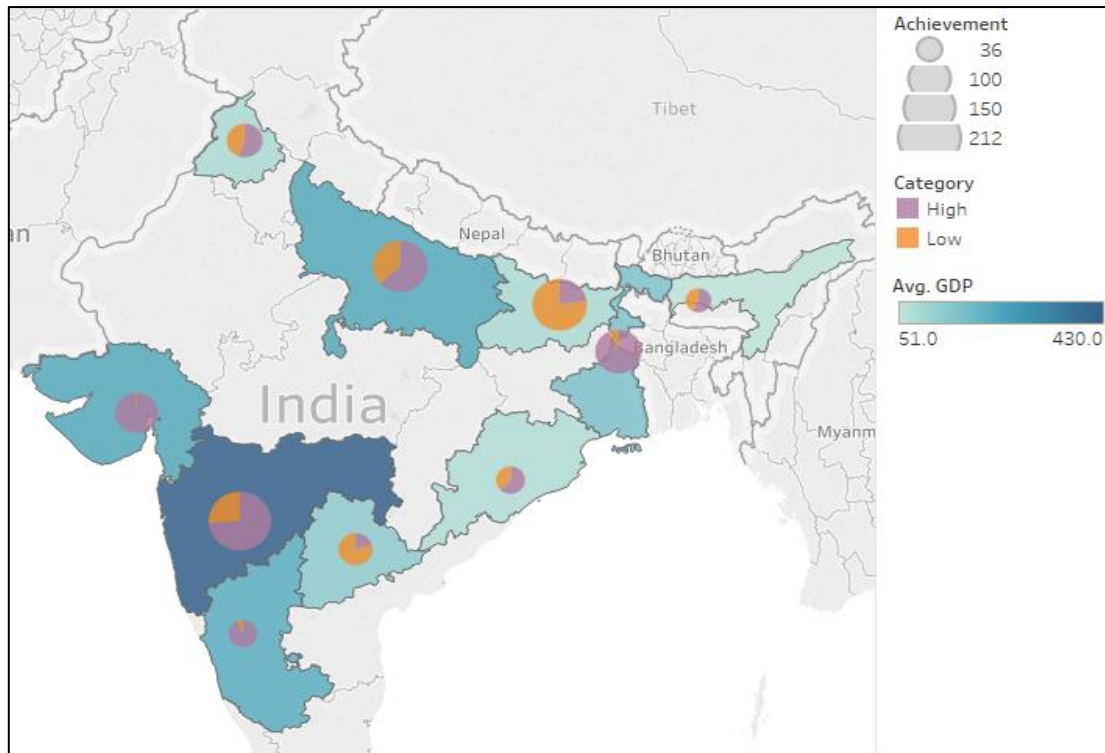


Figure 5: State-wise distribution of VLEs by Achievement Motivation

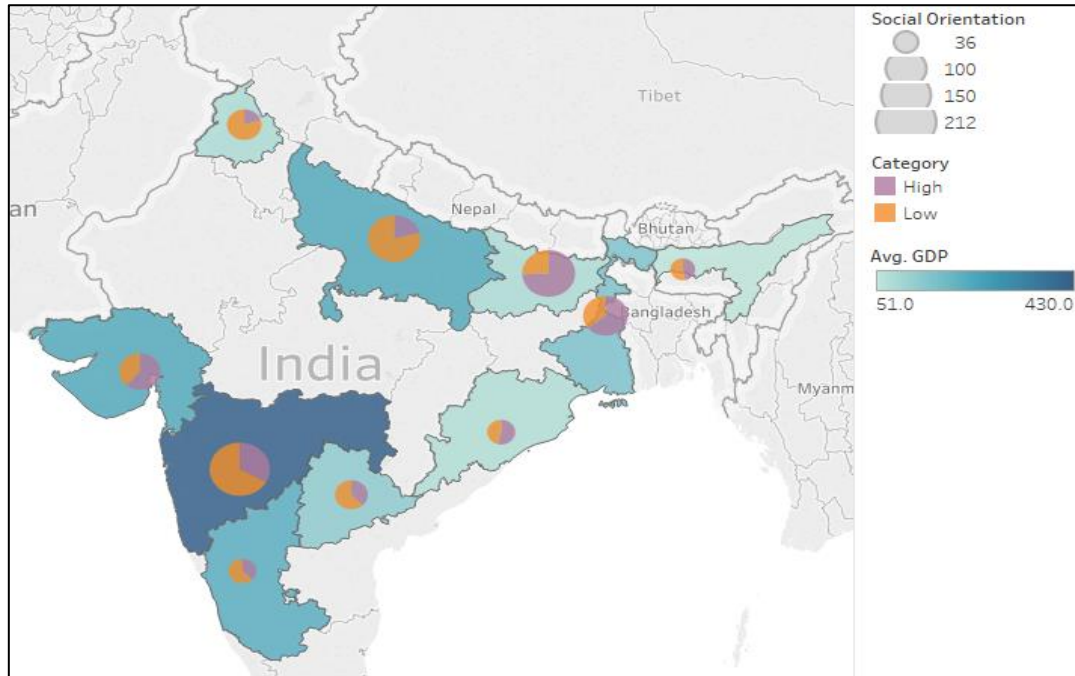


Figure 6: State-wise distribution of VLEs by Social Orientation

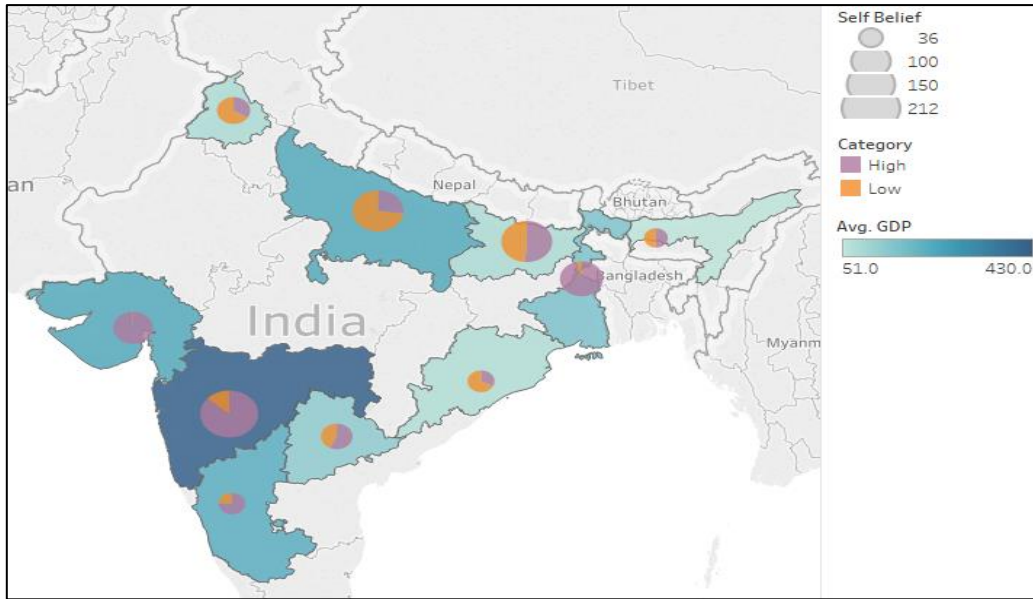


Figure 7: State-wise distribution of VLEs by Self-belief

A question that assumes importance in this light is: Why do the high GDP states produce VLEs that are systematically different from those in other states with respect to achievement motivation, social orientation and self-belief? Below, we attempt to answer this question by examining variance in the VLE’s perception of the entrepreneurial environment across the states and assessing whether such perception also impacts the observed VLE traits.

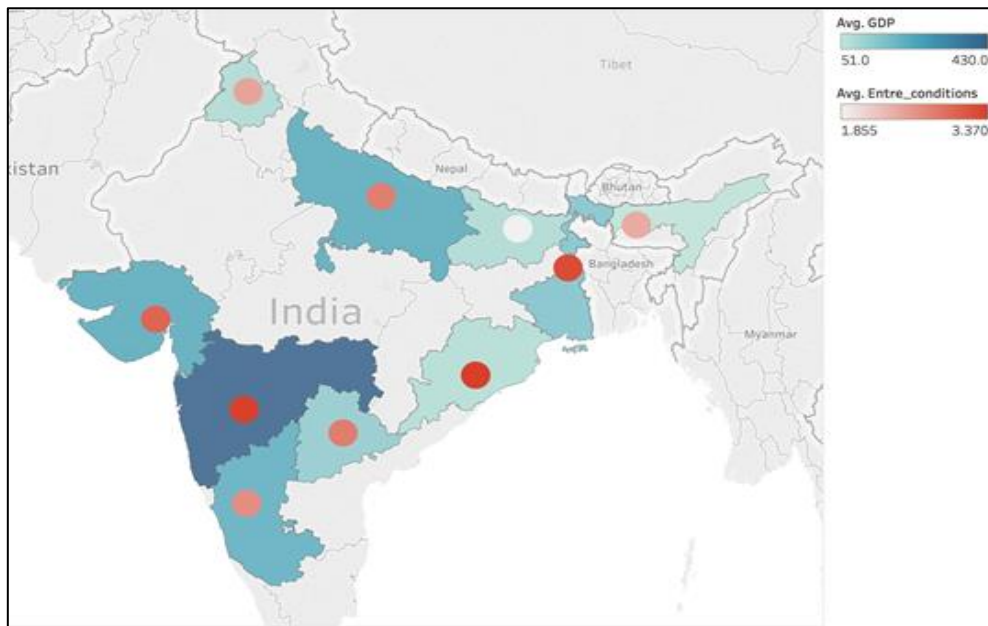


Figure 8: State-wise variation of Entrepreneurial Environment

As shown in **Figure 8**, we find a significant correlation between the VLE’s perception of the entrepreneurial environment in the state and the GDP of the state. High GDP states are also perceived as being more entrepreneur friendly in terms of dimensions such as public attitude toward entrepreneurship, promotion and recognition of entrepreneurship success, training of entrepreneurial skills, and economic growth and market opportunity for entrepreneurs.

Further, as shown in the results of the seemingly unrelated regressions in **Table 5** below, the VLE’s perception of the entrepreneurial environment also has a significant positive impact on VLE performance.

VARIABLES	(1) achievement	(2) soc_orntn	(3) self_belief
entre_env_mean	0.101***	0.073*	0.073
income_agri_farm_fam	-6e-07	-1e-06	-6e-06**
ed_grad	0.014	-0.047	-0.012
ed_pgrad	-0.054	0.114	-0.265
priorbizexp_flag	-0.035	0.183**	-0.204
vle_training_dur	4e-04	0.005	-0.009
gender_female	-0.119	0.040	-0.087
lvle_age	0.185	-0.250	0.555*
marital_status_married	-0.012	0.108	0.016
marital_status_divorced	0.169	0.186	0.196
marital_status_widowed	-0.008	-2.614**	-0.629
internet_usage_home_hrspweek	0.014***	0.008*	0.018**
smartphone_usage_yn	0.067	0.274	0.162
Constant	3.487***	5.807***	2.102*
State fixed effects	Yes	Yes	Yes
Observations	1,015	1,015	1,015
R-squared	0.283	0.085	0.420

*** p<0.01, ** p<0.05, * p<0.1

Table 5: Regression Results – Drivers of Traits

In addition to perception of the entrepreneurial environment, prior business experience and digital literacy are also an important determinant of VLE traits. Specifically, prior business experience has a significant positive impact on social orientation of the VLE – it is likely that such experience offers access to professional networks that characterize the VLE’s social orientation. Similarly, internet usage has a significant impact on all the three traits. The result is consistent with prior research, which finds that the Internet provides greater and more frequent access to information that is valuable but otherwise costly and difficult to acquire.

4.2 Effects of Strategies on Performance

Table 6 below reports the results of estimation of (2) or the relative performance impact of five key strategies – operational strategies, marketing investments, service mix, training and other investments in human capital, and funding strategies.

VARIABLES	(1) log_Sales_Count	(2) log_Sales_AMT
lhrs_perday_csc	0.474**	0.760**
mkting_campaigns_yn	0.314**	0.127
g2cShare1	0.522	0.188
b2cShare1	1.153*	2.774***
emp_training_dur	0.030**	0.042***
lchits_cc_pct	-0.006	-0.027
lloans_moneylender_pct	-0.039	-0.041
lloans_familyfrnds_pct	-0.001	0.023
lloans_coopsbanks_pct	0.001	0.002
lfamily_fulltime	0.015	0.012
lfamily_parttime	-0.050	-0.042
lpaid_fulltime_emp	0.001	0.005
lpaid_parttime_emp	0.002	-0.037
ed_grad	0.066	0.181
ed_pgrad	-0.540***	-0.677**
priorbizexp_flag	0.063	0.148
vle_training_dur	0.011*	0.003
gender_female	-0.304	-0.499
lvle_age	0.139	0.924**
marital_status_married	-0.304*	-0.280
marital_status_divorced	-1.598	-3.284
marital_status_widowed	1.132**	0.054
internet_usage_home_hrspweek	-0.003	-0.003
smartphone_usage_yn	-0.130	0.041
income_agri_farm_fam	3e-06*	7e-06***
counters_n	0.076	0.075
csc_nvillages	0.018**	0.024***
computers_n	-0.019	-0.029
printer_scanner_copier_n	0.253***	0.278***
digicam_webcam_n	0.084*	0.032
log_GDPperCap	6.770	15.86***
Constant	-1.859	-4.858
State Fixed Effects	Yes	Yes
Observations	794	794
R-squared	0.158	0.150

Table 6: Regression Results – Effects of Strategies on Performance

As we can see from **Table 6**, the share of B2C services impacts the VLE performance to the greatest extent compared to other variables both in terms of sales count and sales amount. Also, G2C does not drive sales amount and hence is insignificant in determining VLE performance.

The decision by a VLE to promote his/her services has a positive impact only on the sales count but not on the sales amount. The analysis from our qualitative interviews point to a positive impact of marketing campaigns as well.

“...And we try to do proper and correct work with least mistakes... My way of advertisement is mostly word of mouth publicity. I have made a visiting card and give to people. Sometimes I put up hoarding outside or distribute pamphlets. I don't do anything extra than this. This itself has been very effective and I have lot of work...”

“...We have put one board on our shop about CSC, according to digital India we have put a board, other than that the service what I am giving it is spreading like from mouth advertisement. Next what we are doing means we are making pamphlets and giving add in paper also, add up what are new schemes government are giving and the services and all we are doing through pamphlet, all these advertisements I am doing...”

In line with what we saw from the impact of traits on performance, the training duration a VLE receives from the CSC organization/District Managers is significant in driving VLE performance. We also see that the number of hours the VLE spends in a day is significant in driving VLE performance in terms of both sales count and sales amount.

Similar to what we observed in the results of effects of traits on performance from **Table 4**, education of the VLE has a negative effect on performance whereas age, marital status, number of villages covered by the CSC, and the number of printers and scanners have a positive impact on the VLE performance.

The state environment variable, identified as the farm income of the VLE's family has a positive impact on both the sales count and sales amount whereas the state GDP has a positive impact only on the sales amount.

A notable observation here is the significance of the impact of training provided to the employees of the CSC. It suggests that, a VLE who provides operational training to his/her employees will generally outperform the CSC who does not. Interestingly, the state fixed effects have an impact only on sales amount and not on sales count.

4.3 Effects of Intrinsic Traits on Strategies

Finally, we report the regression results for the analysis of traits that dictate strategies employed by VLEs – services mix, sources of funding, and operations & marketing.

Effects of Intrinsic Traits on Services Mix

VARIABLES	(1) incomesource_sel f_CSC_b2c (logit)	(2) incomesource_sel f_CSC_g2c (logit)	(3) b2cShare1 (fraclogit)	(4) g2cShare1 (fraclogit)	(5) b2cShare1 (reg)	(6) g2cShare1 (reg)
achievement	0.280***	0.124	-0.121	0.018	0.001	0.002
soc_orntn	0.084	-0.091	0.209**	-0.032	0.004*	-0.004
self_belief	0.103**	0.256***	0.204***	0.010	0.003**	0.002
ed_grad	-0.147	-0.011	-0.044	-0.047	-3e-04	-0.008
ed_pgrad	-0.486*	0.025	0.633*	0.031	0.010	0.004
priorbizexp_flag	-0.409**	-0.338	0.028	-0.038	0.007	-0.012
vle_training_dur	0.020*	-0.012	0.010	0.002	2e-04	2e-04
gender_female	-0.080	0.079	-1.384***	-0.154	-0.016**	-0.039
lvle_age	0.073	1.011*	-0.114	-0.169	-0.007	-0.032
marital_status_married	0.057	0.128	-0.252	0.266***	-0.002	0.054***
marital_status_divorced	-	-	0.549	-0.600	0.053	-0.142*
marital_status_widowed	-	-	-57.14***	-0.034	0.023	0.007
internet_usage_home_hr spweek	-0.011	0.001	0.017	0.006	3e-04	0.001*
smartphone_usage_yn	0.228	-0.044	0.176	0.017	0.001	0.002
income_agri_farm_fam	6e-06**	1e-06	5e-06	6e-08	4e-08	-3e-09
counters_n	-0.088	0.033	-0.113	0.161***	-0.001	0.033***
csc_nvillages	-0.006	-0.014	-0.017	-0.001	-1e-04	-4e-04
computers_n	-0.052	0.024	-0.014	-0.008	-0.001	-0.001
printer_scanner_copier_ n	0.375***	0.256*	-0.081	0.078**	-0.001	0.014**
digicam_webcam_n	0.294***	0.120	0.092	0.029	0.004**	0.005
income_agri_farm_fam	6e-06**	1e-06	5e-06	6e-08	4e-08	-3e-09
log_GDPperCap	59.25***	32.74*	-18.48	4.238	-0.702*	1.037*
Constant	-32.51***	-18.72**	6.723	-2.822	0.421**	-0.192
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	996	996	1,015	1,015	1,015	1,015
R-squared					0.065	0.198

*** p<0.01, ** p<0.05, * p<0.1

Table 7: Regression Results – Effects of Intrinsic Traits on Services Mix

As we can see from **Table 7**, achievement motivation has a positive impact on whether a VLE earns any income by providing B2C services through the CSC whereas social orientation has a positive impact on the share of B2C services provided by the VLE. Self-belief impacts both the share of B2C services provided and whether a VLE earns any income by providing B2C as well as G2C services through the CSC. An interesting observation to note is the negative coefficient of the gender variable in the share of B2C services provided indicating that women VLEs have a lower share of B2C services in the most demanded services at the CSC. We can also note that, most of the State fixed effects are significant for all the dependent variables.

Effects of Intrinsic Traits on Sources of Funding

VARIABLES	(1) source_LoansfromCoops ociety	(2) source_LoansfromMon eyLender	(3) source_FamilyMember FriendRe	(4) source_OwnSavings
achievement	0.085	0.007	0.153*	0.033
soc_orntn	0.063	0.118	-0.103	-0.107
self_belief	0.080*	-0.191***	-0.114***	0.064*
ed_grad	-0.193	1.185**	-0.104	0.378**
ed_pgrad	-0.472*	1.113*	-0.142	0.257
priorbizexp_flag	-0.244	0.386	0.292	-0.166
vle_training_dur	0.027***	0.006	0.011	-0.011
gender_female	0.393	-1.031	-0.361	-0.197
lvle_age	-0.293	0.522	-1.542***	1.850***
marital_status_married	0.335	-0.131	-0.152	-0.117
marital_status_divorced	0.518	-	-	-
marital_status_widowed	-	-	-	-
internet_usage_home_hrspweek	-0.010	0.007	0.006	0.003
smartphone_usage_yn	-0.707	-	0.302	-0.206
counters_n	0.118	0.008	0.077	0.027
csc_nvillages	0.005	-0.036	0.002	-0.013
computers_n	-0.003	-0.046	0.021	0.128***
printer_scanner_copier_n	0.263***	0.138	-0.043	-0.002
digicam_webcam_n	0.076	0.181	-0.028	-0.104
income_agri_farm_fam	1e-07	8e-07	5e-06	-2e-06
log_GDPperCap	19.27*	-2.628	-36.24***	40.81***
Constant	-11.79**	-6.013*	22.82***	-25.58***
State Fixed Effects	Yes	Yes	Yes	Yes
Observations	1,014	951	1,012	1,012

*** p<0.01, ** p<0.05, * p<0.1

Table 8: Regression Results – Effects of Intrinsic Traits on Sources of Funding

From **Table 8**, we see that self-belief has negative impact on borrowing funds from family and friends and money lenders to setup the CSC whereas it has a positive impact on using own savings to setup the CSC. Graduation dummy has a positive coefficient for both borrowing from money lenders and using own savings indicating that Graduate VLEs borrow more from money lenders and also use more of their own savings to setup the CSC than non-Graduate VLEs. An interesting observation is the impact of age on borrowing from family & friends and

using own savings which indicates that older VLEs tend to borrow less from family & friends and use more of their own savings.

Effects of Intrinsic Traits on Operations and Marketing

VARIABLES	(1) hrs_perday_csc (poisson)	(2) lhrs_perday_cs c (reg)	(3) emp_training_du r (poisson)	(4) emp_training_du r (reg)	(5) mkting_campai gns_yn (logit)
achievement	0.013	0.015	0.042	-0.048	0.201**
soc_orntn	0.011	0.016*	0.034	0.045	-0.150**
self_belief	-0.001	-0.003	-0.022	-0.028	-0.141***
ed_grad	0.009	0.003	-0.301	-0.661*	0.213
ed_pgrad	-0.031	-0.040	0.214	0.220	0.311
priorbizexp_flag	0.030*	0.027	-0.610***	-0.975***	0.374*
vle_training_dur	3e-05	1e-04	0.046***	0.169***	-0.005
gender_female	-0.034	-0.029	-0.481	-0.731	-0.240
lvle_age	-0.038	-0.027	1.075**	1.714*	-0.883**
marital_status_married	0.048**	0.059**	-0.181	-0.287	0.093
marital_status_divorced	0.126***	0.156***	2.582***	13.67	-1.236
marital_status_widowed	-0.213***	-0.167***	-13.14***	-2.987***	-
internet_usage_home_hrspweek	-0.002*	-0.002*	0.012*	0.017	0.026**
smartphone_usage_yn	0.022	0.019	1.081**	1.535***	0.024
counters_n	0.016**	0.018**	0.189**	0.398**	0.141
csc_nvillages	0.001	0.001**	-0.001	-0.006	0.015
computers_n	0.004	0.004	0.021	0.122	0.067**
printer_scanner_copier_n	0.025***	0.025***	0.187***	0.414**	-0.074
digicam_webcam_n	-7e-04	-0.002	0.120**	0.359**	0.080
income_agri_farm_fam	2e-07	8e-08	-5e-08	-1e-06	-3e-06
log_GDPperCap	0.998	0.874	-1.793	2.128	-0.761
Constant	1.680***	1.650***	-4.833	-9.514	3.940
State Fixed Effects	Yes	Yes	Yes	Yes	Yes
Observations	1,015	1,015	1,015	1,015	1,014
R-squared		0.111		0.175	

*** p<0.01, ** p<0.05, * p<0.1

Table 9: Regression Results – Effects of Intrinsic Traits on Operations and Marketing

From **Table 9**, we can see that intrinsic traits largely affect only marketing decisions. Achievement motivation has a positive impact on making the decision of promoting CSC services whereas social orientation and self-belief have a negative impact. We can also observe that marital status affects the number of hours spent in CSC and the duration of training received by the VLE significantly. Finally, training received by the VLE is affects the VLEs investments in employee training indicating that a VLE who received induction training is more likely to train their employees in CSC operations.

A caveat to note here is that since both the strategies and traits are taken from the same dataset, there could be causal ambiguity between in the regression results on various traits driving strategies. Specifically, since both the dependent and independent variables are self-selected which could lead to endogeneity problems in the regression results. For example, there could be other variables which we have not looked at which could be driving both the intrinsic traits of the VLE and the strategies they employ.

4.4 Impact on Citizens

From our analysis of citizen’s responses about CSCs, we infer that CSCs are acting as gateways for delivery of various services in far-flung areas. **Table 10** below summarizes the financial, temporal, and opportunity cost savings on the citizens as a result of CSCs delivering these services vis-a-vis nearest government offices. It is evident that the usage of CSCs is a more convenient and cheaper option to these citizens than the conventional means for availing services.

Average measure	CSC	Govt. Office	Difference
Travel Distance (km)	2.76	30.01	27.25
Time per Trip (min)	10.9	51.33	40.43
Cost per Trip (Rupees)	8.81	60.93	52.12
Waiting Time per Transaction (min)	9.82	79.27	69.45
Wage Loss (Rupees) per Trip	17.18	196.62	179.44
Service requests not successful	0.75	2.91	2.16

Table 10: Comparison Chart – CSCs vs. Government Offices

We also find that citizens’ experience with e-governance initiatives are strongly correlated with citizen satisfaction and participation. By incorporating citizen perspectives on ease of transaction, transparency and interactivity VLEs can become meaningful agents of modernisation for public service delivery and governance. However, to improve service delivery to match citizen expectations as well as to ensure self-sustenance of the CSC, supply of services by VLEs should align with the citizen demand for these services. Also, the government can encourage the co-location of CSCs in the Gram Panchayat buildings so that citizens have easier and closer access to CSCs.

In this context, it is interesting to note that the top services demanded by citizens do not necessarily align with top services offered by the VLEs as shown in the **Appendix XII - Services Offered by VLEs & Impact on Citizens**. A case in example would be high requirement of banking, education and job services by citizens. Even though there is a demand for these services, they tend to be lower in the supply list of VLEs. This mismatch in supply and demand becomes even more explicit when we split our analysis by the nature of services. Looking at only the G2C service mix offered by the VLEs, pan card and Aadhaar card services do not form substantial contributions to service offerings while other miscellaneous services provide the bulk of services offered. In contrast, the top G2C services utilised by Citizens brings up pan card and Aadhaar card applications as constituting the majority of services demanded as we can see from the insert reference to pie charts for G2C dissonance.

When we look at B2C services, citizens do not seem to widely use ticket booking services that are nonetheless offered as top services by the VLEs whereas citizens' demand for online services does not afford the same priority with VLEs as can be seen from the insert reference to pie charts for B2C dissonance. This inherent mismatch between the top most services and G2C as well as B2C services offered by the VLEs and the services usage by the citizens can be due to the following reasons.

Transaction value versus volume

VLEs consider certain services as profitable to the themselves although this might not be demanded by citizens in high volumes. This will implicitly create a mismatch between value of the service against the volume of demand. For example, VLEs might prefer to provide additional services which would augment revenues and profitability. However, such a service might not be demanded in high volume. Further VLEs might prefer to promote these high value services over other services.

Lack of promotion and marketing of services

Given the mismatch between value and volume of services, VLEs might tend to oversell or undersell certain services. The analysis suggests poor usage of certain top services offered. A lack of awareness and therefore utilization of services offered by the VLEs could imperil the growth and sustainability of the venture. This can be mitigated by educating VLEs about the

appropriate marketing mix that will enable them to achieve high levels of profitability and increased sustainability. Low-density population and lower income levels can translate to lower average revenue per user and thus increased promotion of the services becomes important. The VLEs need to be trained to provide a cluster of complete and integrated services to cater to a wider customer base- not just necessary G2C services but also B2C services in line with changing business functions and growth of rural businesses. This lack of awareness of services can be further substantiated by our qualitative interviews as well.

"...They don't know what to do and what not to do (through CSCs). They don't have awareness of services. For suppose Pan card is there, they don't know about the use and need of Pan card..."

Mismatch of services

While a wide range of services are offered by VLEs, there is a significant difference in the perception of required services. By understanding citizen demands better through tighter integration with the community, the VLEs can open up possibilities for providing citizens with better, more efficient services. Better integration into the community will enable rural entrepreneurs to get a better sense of the actual demand for services and will narrow the gap between perceived and actual demand and a more user-oriented approach would ensure complementary services in harmony with demand.

5 Policy Recommendations

The CSCs are envisioned as a platform that can enable government, private and social sector organizations to integrate their social and commercial goals for the benefit of rural populations in the remotest corners of the country through a combination of IT as well as non-IT services. The centers are envisioned to support a range of applications in areas such as health, banking, governance, and agriculture that contribute to the development agenda of rural communities. The empowerment and growth of rural entrepreneurs or VLEs is critical to this effort of the Government. Prior research documents many significant challenges faced by VLEs - financial, social and educational barriers, poor infrastructure, and inadequate support - that limit their growth and long-term sustainability. In this study, we have sought to identify certain traits of VLEs and strategies pursued by them that help them overcome contextual challenges and constraints to improve CSC outcomes. We also explore the interplay between traits and strategies to offer recommendations that improve long-term outcomes for the initiative.

We find that successful VLEs are motivated individuals who have strong ties to the community and feel responsible for their success. In turn, they optimistically and courageously seek out opportunities and solutions. These individuals are digitally literate and leverage their knowledge to offer a viable service mix that extends beyond G2C services, market to their community, and invest in human capital that helps with the growth of the centre. In contrast, less successful kiosk operators show little initiative, and tend to expect that initial investments and a basic set of G2C services will deliver a viable business. Viable businesses are perhaps even more difficult to sustain in the strident economic climate of rural areas; thus, the role of these traits is amplified in the context of the CSC scheme.

Three key recommendations follow from our results. First, given that the VLE's perception of the entrepreneurial environment in the state positively influences their achievement motivation, self-belief and social orientation, we recommend that the central and state government apparatus engage more in the promotion and growth of entrepreneurship. This could result in highlighting the benefits and prospects of taking up entrepreneurship as a career option. Both central and state governments can build awareness particularly in younger populations on the potential value and job creation that could be created by being rural entrepreneurs. They could be sensitized on the risks involved in this career option and sharing of stories of how entrepreneurs from similar backgrounds have addressed the risks and become successful. It

would be particularly helpful if examples and stories of specific strategies and actions that VLEs have taken to overcome the challenges inherent to being an entrepreneur in their respective villages. Inherent to promotion of rural entrepreneurship as an aspiring career option among the youth, governments must also lay the foundations necessary to promote internet-based entrepreneurship in rural areas. Broadband internet access and connectivity to the last mile would enable greater success rates of both existing and aspiring VLEs who want to set up and lead CSC centres across the far-flung areas of the country. With better connectivity, newer and richer set of services could be availed through CSC scheme and this could significantly strengthen the impact of VLEs in their respective communities. Both central and state governments can explore various modes of partnering with local ecosystem and private players to build, strengthen and expand the range of government and business services that could be made possible in rural villages with better connectivity. Higher levels of awareness and aspiration towards a career in entrepreneurship combined with greater internet connectivity would create a newer generation of rural Indians who would be ready to become

The next two recommendations pertain to investments in human capital. Our second recommendation is to provide training to the VLEs about business strategies, notably, marketing, finance, operations, and investments in human capital that facilitate identification of market opportunities and development of sustainable businesses around such opportunities. VLEs' enhanced understanding of the market linkages between the needs of his/her customers and the possible products and services in the market would empower VLEs to unleash their entrepreneurial potential better. It is crucial that the entire business value chain is envisioned not only by the government and private service providers but also by the last mile connectors – the VLEs who have the best opportunity to come up with solutions that bridge the existing gaps in the value chain. VLE's market savviness, business and ICT skills would remain the bedrock of a sustainable and thriving CSC scheme.

Our final recommendation begins with the observation that an important limitation in the use of CSC services is literacy levels of the population that it serves. Greater investments in the digital literacy of the citizens would enable them to a wealth of information and thereby their awareness of various products and services that they can afford and avail. CSC scheme and the VLEs can pave the path for digital empowerment of rural citizens through training programs and further enhance the local demand for newer products and services creating a self-sustaining cycle of business value and tech-enabled enterprise creation across India.

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7 Appendix

7.1 Appendix I – Population density and digital penetration in States

State	Population	Population density (persons per sq. Km.)	Included in ASCI 2014 Study
Lakshadweep	64429	2013	NO
Telangana	35193978	307	NO
Andhra Pradesh	49471555	308	YES
Himachal Pradesh	6856509	123	NO
Chhattisgarh	25540196	189	NO
Gujarat	60383628	308	NO
Kerala	33387677	859	YES
Chandigarh	1054686	9252	NO
Delhi	16753235	11297	NO
Madhya Pradesh	72597565	236	YES
Tamil Nadu	72138958	555	NO
Haryana	25353081	573	NO
Rajasthan	68621012	201	YES
Andaman and Nicobar	379944	46	NO
Meghalaya	2964007	132	NO
Goa	1457723	394	NO
Puducherry	1244464	2598	NO
Punjab	27704236	550	NO
Dadar and Nagar Haveli	342853	698	NO
Karnataka	61130704	319	NO
Daman and Diu	242911	2169	NO
Uttarakhand	10116752	189	NO
West Bengal	91347736	1029	NO
Mizoram	1091014	52	NO
Uttar Pradesh	199581477	828	YES
Odisha	41947358	269	NO
Maharashtra	112372972	365	NO
Sikkim	607688	86	NO
Tripura	3671032	350	NO
Jammu and Kashmir	12548926	124	YES
Manipur	2721756	122	NO
Assam	31169272	397	NO
Arunachal Pradesh	1382611	17	NO
Bihar	103804637	1102	NO
Nagaland	1980602	119	NO
Jharkhand	32966238	414	YES

7.2 Appendix II – District wise selection of CSCs

State Name	District Name	Total CSC	Proportion	Chosen CSCs
Assam		2075	2%	36
	Barpeta	390	5%	18
	Dhubri	619	2%	9
	Kamrup Metro	88	2%	2
	Nagaon	491	1%	2
	Hojai	25	16%	4
	Jorhat	143	1%	1
Bihar		7421	2%	152
	Gaya	833	2%	19
	Katihar	1233	2%	24
	Madhubani	1441	3%	42
	Patna	1246	1%	16
	Siwan	1130	2%	22
	Banka	420	2%	8
	Jamui	380	2%	8
	Buxar	421	2%	7
	Kaimur	317	2%	6
Gujarat		5871	2%	100
	Ahmadabad	1759	2%	37
	Banas Kantha	775	2%	13
	Bhavnagar	811	2%	12
	Rajkot	516	1%	6
	Vadodara	814	2%	20
	Mahisagar	312	1%	4
	Valsad	349	1%	4
	Kacch	535	1%	4
Karnataka		2340	4%	45

	Belagavi	738	2%	13
	Kalaburagi	547	2%	9
	Koppal	334	2%	6
	Shivamogga	421	2%	7
	Tumakuru	300	3%	10
Maharashtra		12166	2%	212
	Thane	1716	2%	30
	Buldhana	2084	2%	43
	Nagpur	1638	2%	32
	Nanded	2195	2%	34
	Pune	2104	2%	31
	Dhule	1063	1%	15
	Kolhapur	1366	2%	27
Odisha		2789	2%	46
	Balangir	569	3%	18
	Baleswar	1118	1%	12
	Koraput	191	1%	2
	Puri	632	1%	9
	Sambalpur	279	2%	5
Punjab		2749	3%	70
	Bathinda	426	2%	8
	Gurdaspur	465	2%	9
	Ludhiana	838	3%	24
	Patiala	649	3%	18
	Tarn Taran	371	3%	11
Telangana		3746	2%	63
	Karimnagar	910	2%	18
	Mahabunagar	1007	2%	15
	Nizamabad	354	2%	6

	Ranga Reddy	781	2%	13
	Khammam	501	2%	11
Uttar Pradesh		9260	2%	162
	Aligarh	1298	2%	22
	Allahabad	3051	2%	56
	Bijnor	1831	2%	32
	Jhansi	1051	2%	18
	Lucknow	2029	2%	34
West Bengal		8480	2%	130
	Hooghly	1116	3%	29
	Murshidabad	2364	2%	41
	Paschim Medinipur	1210	2%	21
	South 24 Parganas	1748	1%	12
	Puruliya	681	2%	12
	Bankura	852	2%	15
Grand Total		56897	2%	1016

7.3 Appendix III – VLE Questionnaire

Field survey for Village Level Entrepreneur (VLE)

Name of CSC:	CSC/ VLE ID:
Name of VLE:	Location (Lat- Long) _____
Name of respondent:	
Start time:	End time:
Number of footfalls (keep count from beginning of survey to end of survey, an approx. number will do)	
Date of survey: MMDDYYYY	

READ OUT INTRODUCTION.

My name is (SHOW ID CARD). CSCs are the access points for delivery of essential public utility services, social welfare schemes, healthcare, financial, education and agriculture services, apart from host of B2C services to citizens. CSC comes under E-Governance Services India Limited, a Government of India initiative. Indian School of Business Hyderabad is a renowned institution offering various management education. ISB is a not for profit organization.

ISB has been authorized to conduct a survey of the CSCs across India. This is an important survey that will help in designing services that are in demand by the citizens and finding more opportunity for the CSC operators. The responses you provide will be used exclusively for research and will not be disclosed to anyone outside. During the interview, you may choose not to answer any question that you do not want to.

- | | | | | |
|--|-----|---|-------------|---|
| 1. Can we start the survey please? | Yes | 1 | No, refused | 2 |
| 2. Can we contact you again regarding this survey? | Yes | 1 | No, refused | 2 |

START SURVEY

We will first start with some details about yourself. IF respondent is someone other than the VLE, collect details about the VLE

1. When did you start this CSC centre?	DDMMYYYY
2. Who was the main influencer in your decision to start a CSC? (Serves as warm-up)	Self Family member / Relative Friend / Colleague Govt Officer NGO / Other institution
3. What is your age? (Completed years)	
4. Are you;	Single Married Divorced Widowed
5. How many children?	
6. Your email ID please;	
7. Your mobile number please;	
8. Gender (Do not ask, Record)	Male / Female / Other
9. How much does an average agri labourer in this village earn per day?	Rs./-
10. How much does an average farmer in this village earn per month?	Rs./-

11. Of the many services you provide at the CSC, which ONE is the most utilized by the public? CAN BE ANY SERVICE, G2C, B2C Next? Next? GET TOP 5

12. How often is the CSC open?

- a) Never
- b) Daily
- c) Two to three times a week
- d) Once a week
- e) Only When there is a problem
- f) Only When there is a promotional campaign

13. How many hours do you spend per day at CSC? Normal Day, Average number of hours? _____
hours per day

14. How many employees are there in the CSC?

- a) Paid Full-time Employees _____
- b) Paid Part-time Employees _____
- c) Full-time Family Member(s) _____
- d) Part-time Family Member(s) _____
- e) Other __ (Please specify _____)

15. If applicable, please list out the family members who support you, the VLE, in running the CSC.
_____ (RELATIONSHIP)

16. If applicable, how much do you pay to the employee on average? _____ rupees per month

17. Who sits at the CSC and operates it on a daily basis?

- a) Self
- b) Family members
- c) Friends
- d) Outsourced
- e) Employees
- f) Others (Please specify _____)

18. How much funds did you invest for setting up the CSC? Rs./-

19. Source of funds for you for setting up CSC (Please tick all the options applicable and respective % of total setup costs):

- a) Chits/Credit Cards ___%
- b) Own savings ___%
- c) Loans from Money lender ___%
- d) Loans from Family members/ Friends/ Relatives ___%
- e) Loans from Co-op society/ Banks/ Financial Institutions ___%
- f) Other sources (please specify _____) ___%

20. If loan was taken what was the interest rate? _____ % per annum

21. What was your total earnings from providing CSC services during the last month?

22. Please tell me your annual / your household annual income from all sources? Please include all earnings; CSC, any rent, interest, farm, agriculture, salary etc.

Source	PI	HHI
1. CSC government services		
2. CSC non-government services		
3. Any other business		
4. Rent / Lease		
5. Agriculture / Farm Income		
6. Interest / Deposits		
7. Salary / Pension		
8. Other.....		

23. What was your average monthly income before setting up the CSC?

- a) < Rs.2000
 b) Rs.2000 – Rs.6000
 c) Rs.6001 – Rs.10,000
 d) Rs.10,001 – Rs.15,000
 e) Rs.15,001 – Rs.20,000
 f) Rs.20,001 – Rs.40,000
 g) > Rs.40,001

24. Apart from signing agreement with CSC e-Governance Services, how many additional permissions, licenses, approvals, authorizations, etc., did you have to take from the relevant authorities to start the CSC?

Organization	No. of permissions/approvals				
	0	Up to 3	4-6	7-10	More than 10
Local political leadership					
District administration / Revenue officials					
Village panchayat					
Police department					
Electricity dept.					
Telephone dept./ Agency					
Internet Service Provider					
Other Service Providers (Please specify _____)					

25. How long did it take to set up the CSC after formally putting an online application?

- a) Up to 1 month
 b) 1 to 2 months
 c) 2 to 3 months
 d) 3- 6 months
 e) more than 6 months

26. Were you trained on CSC operations? Y / N

27. Is your employee / Are the employees trained on CSC operations? Y / N

IF Y CODED, ELSE SKIP TO Q 31

28. Where was the training held?

CSC Office / Other Govt Office / NGO / Training Center / Friends or Other CSCs / Other

29. What was the nature of this training?

30. For how many days a week is the CSC open?

31. What is the total training duration you received? _____ hours since inception

	VLE	Employee
Where trained?		
Nature - Induction training (at the beginning of setting up CSC)		
Nature - Later training (when new services are launched)		
Nature – Both		
Training – Duration		

32. Opening time: _____ Closing time: _____

33. For how many days in a year (approx.) is the CSC closed due to unexpected reasons?

34. CSC infrastructure:

No of villages covered by CSC (including the village in which CSC is located):	
CSC floor area: SFT
On a normal day, how many hours do you have electricity? Hours
Do you have to work during mid-night / early morning due to power availability? <i>Explain:</i> Mid-night/ early morning or other unusual hours due to power being available only at that time?	Yes / No
Perception of internet speed:	a. Internet not available b. Very slow c. Slow d. Manageable e. Good f. Very good
Time taken to download a movie (in mins)	
No. of counters in the CSC	
Inventory of technical equipment available and working at CSC	Computers Printers Printers cum Scanners Printer cum Scanner cum Copiers Copy/Xerox machines Biometric/IRIS Scanner _____ Invertor / UPS Digital Camera/Web cam Lamination Machine Others (Please specify _____)
Do you allow customers to access/ use computers by themselves?	
Are the computers used for education/ training services?	
Are computers used for job search?	
Are computers used for consulting a doctor?	
Any other purpose that computers are used for;	

35. Distance of CSC in Kms. from the:

Nearest town	
Nearest post office	
District Headquarters	
Nearest bank	
Nearest CSC	

36. Please indicate your opinion on the conditions for entrepreneurship in your district.

Socio-economic conditions	Must be improved	Average	Fair	Good
Public attitude toward entrepreneurship				
Promotion of entrepreneurship success				
Training of entrepreneurial skills				
Recognition of entrepreneurial success				
Economic growth and market opportunity for entrepreneurs				

37. What are the different expenses you have at the CSC every month?

Category	Expense (Rs.)

49. Do you think that the usage of CSC services;

- a) Pick up / Grow
- b) Decline / Go down

50. Would you like to continue with the CSC business in the future?

- a) Yes
- b) No

Daily / Once a week / Once a fortnight / Once a month / Less often / Other (pl specify)

51. How often do you receive newsletters about the CSC program? _____
By newsletter I mean, printed brochure, pamphlet, handbill etc.,

52. How often do you read the newsletters about the CSC program? _____

53. How often do you check the CSC emails? _____

54. What is the reason why CSC services are frequented by people in the village? Next? GET TOP 5 REASONS

55. What do you think is the TOP reason why some villagers do not come more frequently to the CSC? Next? GET UPTO 5 TOP REASONS

56. In your opinion, what other services are needed to expand / increase business of CSCs?

57. How do you acquire new skills / knowledge on CSC services?

- a) Newsletter / e-mail
- b) Workshops / Trainings
- c) From other VLE
- d) By watching video materials
- e) Speaking to CSC staff

58. Have you learnt / used video for learning new things about CSC / Services?

- a) None
- b) Few / Some services
- c) All services

59. You watch these CSC videos on;

- a) WhatsApp
- b) YouTube
- c) Other

60. What do you think are the key factors for better business of CSCs? *Potential reasons/ prompts:*

1. Reduction in service charges	6. Lower deposit requirements to register CSC
2. Higher share of revenue in services	7. More freedom in offering products and services
3. Closing down traditional modes* of delivery of services	8. Additional share of income for VLEs involved in the marketing of services
4. Subsidy in operational costs (incurred on maintenance, electricity, internet connection etc.)	9. Better internet connectivity
5. Reduced interest on loans / Better and easier credit facilities	10. Others (please specify _____)

***Explain:** This refers to the usual way in which the services were delivered before the starting of the CSC

61. On average what is the downtime (not working) of the CSC backend/ IT system?

- a) ____ hours/ day
- b) ____ days/ week

FEW DETAILS ABOUT YOURSELF;

62. What have you studied? (Please share highest level completed)	Post graduate Professional (CA, ICWA, etc.) Graduate Intermediate or diploma (12 th pass, Diploma Complete) High school certificate (10 th Pass) Middle school certificate (7 th Pass) Primary school certificate Illiterate (Cannot read or write any language)
--	--

63. In total, how many members are there in your family? (Staying with you / Single kitchen)

64. How many adults, how many children?

65. How many are earning members? Working, Salary, Agriculture, Labour, Business etc.,

66. What type of house do you live in? (Main portion / Living Area) (SC)

- a) Tiled Roof
- b) Sheet Roof
- c) RCC Roof
- d) Thatched roof
- e) Others (plz specify) ____

67. Which of the following immovable assets do you own? I mean owned by the family. (MC)

- a) Residential house
- b) Commercial property/ Shops/Godown etc
- c) Agricultural/Farm Land
- d) Residential plot

68. Which of the following products do you own? (MC)

- a) Television
- b) Car
- c) Air Conditioner
- d) Computer/Laptop
- e) Refrigerator
- f) Two-wheeler
- g) Washing Machine
- h) Others (please specify _____)

69. When did you get this computer? _____ Month _____ Year

70. Do you have Internet access at home? Yes No

71. Do you use a Smart Phone? Yes No

72. Which apps do you most commonly use?

- a) Whatsapp
- b) Facebook
- c) Youtube
- d) Other
- e) Other
- f) Other

73. What is the occupation of your father?

- a) Agriculture
- b) Agri laborer
- c) Casual laborer / Coolie / Daily wage earner
- d) Salaried employee – Private
- e) Salaried employee – Govt
- f) Shop Owner / Business
- g) Contractor / Mason etc.,
- h) Other

74. What was your occupation immediately before running the CSC?
- a) Salaried/ Service/ employee (e.g. Professional: _____
 Financial Services, Pharma, IT, etc.): c) Unemployed
 _____ d) Student
 b) Businessman/ Self-Employed e) Other _____

IF 1 OR 2 CODED, PROCEED WITH Q 11 ELSE SKIP TO 12

75. Please provide the following details for all businesses that you have managed before starting this CSC:

*Please look at this card and indicate in which field was your last business/job?
 How were you involved? Please choose.
 How long did you run this / were you employed? Please choose
 Were you? Please choose.*

And before that? REPEAT

Sl	Business Type	Engagement type	Time period	Level of Engagement
1				
2				
3				
4				
5				

Business Type Code

Engagement Code

Convenience shop / store like provision, stationery, seeds, fertilizers etc.,	1
Owner / Partner	1
Services like photocopy, stamp papers, cable tv,	2
Employee Full time	2
Financial services like Insurance, Mutual funds, Fixed Deposits, Chit fund etc.,	3
Employee Part time	3
Mobile / Internet / Browsing Centre / Computer Sales, Service...	4
Advisor / Investor	4
Lorem ipsum lorem ipsum lorem	5
Other (specify)	5
Other (PI specify).....	6

Time Period Code

1 Year or less	1
1 to 2 years	2
2 to 3 years	3
More than 3 years	4

Level Codes

Full time	1
Part time	2
Only investor	3

76. Are any of your relatives or close friends involved in a business? Yes No

77. About how many hours per week, on average, would you say you use a computer at home?
 a) ___ hrs/ week b) I do not have a computer at home

VLE Traits (Please respond to each of the questions as per the corresponding scales)

78. Working hard is something I like doing very much.

5	4	3	2	1	0	1	2	3	4	5
Very false										Very true

79. When I am working, the demands I make upon myself are pretty high.

5	4	3	2	1	0	1	2	3	4	5
Very false										Very true

80. Other people think I don't work very hard.

5	4	3	2	1	0	1	2	3	4	5
Very false										Very true

81. It is chiefly a matter of fate whether or not I have few friends or many friends.

5	4	3	2	1	0	1	2	3	4	5
Very false										Very true

82. I accomplish a lot at work because I love my job.

5	4	3	2	1	0	1	2	3	4	5
Very false										Very true

83. When I get what I want, it is usually because I worked hard for it.

5	4	3	2	1	0	1	2	3	4	5
Very false										Very true

84. It is not always wise to plan too far ahead since many things turn out to be a matter of good or bad fortune

5	4	3	2	1	0	1	2	3	4	5
Very false										Very true

85. Most leaders have reached their positions because they were lucky enough to be in the right place at the right time.

5	4	3	2	1	0	1	2	3	4	5
Very false										Very true

86. When my way of running the business is not successful, I experiment with new different ways of running the business.

5	4	3	2	1	0	1	2	3	4	5
Very false										Very true

87. I closely monitor the areas where I need more practice.

5	4	3	2	1	0	1	2	3	4	5
Very false										Very true

88. I set goals for myself in order to direct my activities for making the business a success.

5	4	3	2	1	0	1	2	3	4	5
Very false										Very true

89. I figure out which things I do not understand well and adjust my strategies accordingly.

5	4	3	2	1	0	1	2	3	4	5
Very false										Very true

90. It is usually easy for me to stick to my aims and accomplish my goals.

5	4	3	2	1	0	1	2	3	4	5
Very false										Very true

91. I am confident that I could deal efficiently with unexpected events.

5	4	3	2	1	0	1	2	3	4	5
Very false										Very true

92. I can remain calm when facing difficulties because I can rely on my coping abilities.

5	4	3	2	1	0	1	2	3	4	5
Very false										Very true

93. When confronted with a problem, I can usually find several solutions.

5	4	3	2	1	0	1	2	3	4	5
Very false										Very true

94. Most people can be trusted:

1	2	3	4	5
Strongly Disagree	Disagree	Neutral/ Don't know	Agree	Strongly Agree

95. Those devoted to unselfish causes are often exploited by others:

1	2	3	4	5
Strongly Disagree	Disagree	Neutral/ Don't know	Agree	Strongly Agree

96. How long does it typically take you to generate a basic level of trust from a person you just met?

1	2	3	4	5
First meeting	After about 2 or 3 meetings	About month of working together/ Don't know	It takes at least 3 or 4 months	It happens over a year or more

97. I frequently come in contact with people that are different from me. :

1	2	3	4	5
Strongly Disagree	Disagree	Neutral/ Don't know	Agree	Strongly Agree

98. I feel comfortable to talk to people that are different from me. :

1	2	3	4	5
Strongly Disagree	Disagree	Neutral/ Don't know	Agree	Strongly Agree

99. Please take photos of CSC

- a. From outside b. From inside

Name of state: _____ Name of district: _____ Name of GP (where CSC is located): _____

Question	Yes / No
Is CSC prominently visible / noticeable with clear logo, sign boards etc?	
Is the CSC location easily accessible?	
Is CSC an existing cyber café or other shop which was converted into a CSC?	
Is the region/ area where CSC is located generally affected by Left- Wing Extremism?	

7.4 Appendix IV – Citizen Survey

Field Survey for Citizen

Demographics:

Name of the State:	CSC/ VLE code:
Name of the Citizen:	Gender:
Is the citizen Village Head? (Yes/No)	Is the citizen representing any local institution like school, post office, etc.? (Yes/No)
Marital status:	1. Single 2. Married 3. Divorced 4. Widowed
Age of the citizen (in completed years):	Number of children of Children:

1. What is the highest level of education that you have completed?
2. Citizen's occupation:
 - 1) Service (e.g. Financial Services, Pharma, IT, etc.): _____
 - 2) Businessman/ Self-Employed Professional: _____
 - 3) Unemployed
 - 4) Student
 - 5) Other _____
3. What are the top 5 services you use the most at the CSC?
4. What are your top 5 reasons for using the CSC?
5. What are your 5 new services (government or private) that you believe must be added to be available under CSC?
6. Please list down the schemes for which you have enrolled/ registered through the CSC.
7. Other than CSC, what are the alternative service providers in your village?
 - a. Post Office
 - b. Private Internet Kiosks
 - c. Anganwadi
 - d. PDS shops / FPS Shops
 - e. Others, please specify _____

8. Citizen engagement

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I will continue buying the products/services at CSC/ e-seva centre in the near future					
Am content with my transactions through the CSC/ e-seva centre.					
I do not get my money's worth when I transact through the CSC/ e-seva					
I am happy to refer the CSC/ e-seva centre to my friends and relatives					
Given that I use the CSC, I refer my friends and relatives to the the CSC/ e-seva centre					
I do not actively discuss about the CSC/ e-seva centre					
I love talking about my CSC/ e-seva experience					
I discuss the benefits that I get from the CSC/ e-seva centre with others					
I provide feedback about my experiences with the CSC/ e-seva centre to the VLE					
I provide suggestions for improving the performance of the CSC/ e-seva centre					
I provide suggestions/feedback about new product/service that can be provided by the CSC					

9. Convenience

Question	CSCs	Govt Offices
No. of trips you made in the last one year		
Average travel distance (in Kms.) you would travel for each government transaction		
Average time (in mins) taken for each government transaction		

Average travel cost (in rupees) for each government transaction		
Average waiting time (in mins) for each government transaction		
Average # of intermediaries/counters you had to go through to successfully complete each government transaction		
What was the average wage loss (in rupees) for each government transaction attempted		
Out of 10 works that you needed to get done, how many would be delayed on an average?		
Out of 10 works that you needed to get done, how many would be denied on an average?		

10. Please tell whether the following services are available at the CSC and the number of times you have used them in the past 3 months

Sl	Service	Know that it is available (Yes/ No)	Number of times used in the past three months
1	Consult an allopathic doctor		
2	Consult a homoeo doctor		
3	Consult an ayurvedic doctor		
4	Enroll and study for school/ university		
5	Enroll and study for IIT/ IAS coaching		
6	Enroll and study for skills training		
7	Apply for Aadhar		
8	Apply for PAN card		
9	Apply for passport		
10	Open and use bank accounts		
11	Purchase Insurance policies (life, health, others)		
12	Enroll in Pension plans (Atal PY, NPS, PMSBY)		
13	Online transfer of funds, UPI		
14	Training on digital payments, e-wallets		
15	Mobile and DTH payments, recharge		
16	Others _____ (Please specify)	Yes	

7.5 Appendix V – Village Head Survey

Field survey for Village Heads

Demographics:

Name of the State:	CSC/ VLE code:
Name of the Village Head:	Gender:
Age of the citizen (in completed years):	
Marital status:	5. Single 6. Married 7. Divorced 8. Widowed
Number of children of Children	

11. What is the highest level of education that you have completed? _____

1. Post graduate	5. High school certificate
2. Professional (CA, ICWA, etc.)	6. Middle school certificate
3. Graduate	7. Primary school certificate
4. Intermediate or diploma	8. Illiterate

12. Occupation:

- 6) Service (e.g. Financial Services, Pharma, IT, etc.): _____
- 7) Businessman/ Self-Employed Professional: _____
- 8) Unemployed
- 9) Student
- 10) Other _____

13. Please tell me your current annual household income from all sources? _____

Source	Amount
1.	
2.	
3.	
4.	
5.	

14. Convenience

Question	CSC	Govt Offices
No. of trips you made in the last one year		
Average travel distance (in Kms.) you would travel for each government transaction		
Average time (in mins) taken for each government transaction		
Average travel cost (in rupees) for each government transaction		
Average waiting time (in mins) for each government transaction		

Average # of intermediaries/counters you had to go through to successfully complete each government transaction		
What was the average wage loss (in rupees) for each government transaction attempted		
Out of 10 works that you needed to get done, how many would be delayed on an average?		
Out of 10 works that you needed to get done, how many would be denied on an average?		

15. How many drives or training sessions were provided by CSC on Digital Literacy/ Financial Inclusion (JAM Trinity – Jan-dhan - Aadhaar - Mobile penetration) last year?

- a. 0
b. 1-5
c. 6-10
d. >10

16. Village Head engagement

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I will continue buying the products/services at CSC / e-seva centre in the near future.					
My transactions through the CSC/ e-seva centre make me content.					
I do not get my money's worth when I transact through the CSC/ e-seva					
I enjoy referring the CSC/ e-seva centre to my friends and relatives					
Given that I use this brand, I refer my friends and relatives to the the CSC/ e-seva centre					
I do not actively discuss about the CSC/ e-seva centre					
I love talking about my CSC/ e-seva experience					
I discuss the benefits that I get from the CSC/ e-seva centre with others					
I provide feedback about my experiences with the CSC/ e-seva centre to the VLE					
I provide suggestions for improving the performance of the CSC/ e-seva centre					
I provide suggestions/feedbacks about the new product/services that can be provided by the CSC/ e-seva centre					

17. In your opinion, what are the top 5 services for your villagers to use at CSC?

18. In your opinion, what are your top 5 reasons for your villagers to be using CSC?

19. Please list down the schemes for which your villagers have been enrolled/ registered through the CSC this past year

20. What are the alternative service providers in the region?
(Post Office/Private Internet Kiosks/Anganwadi/ PDS Shops/ Others, please specify ___)

21. Please tell whether the following services are available at the CSC in your village

Sl	Service	Know that it is available (Yes/ No)
1	Consult an allopathic doctor	
2	Consult a homoeo doctor	
3	Consult an ayurvedic doctor	
4	Enroll and study for school/ university	
5	Enroll and study for IIT/ IAS coaching	
6	Enroll and study for skills training	
7	Apply for Aadhar	
8	Apply for PAN card	
9	Apply for passport	
10	Open and use bank accounts	
11	Purchase Insurance policies (life, health, others)	
12	Enroll in Pension plans (Atal PY, NPS, PMSBY)	
13	Online transfer of funds, UPI	
14	Training on digital payments, e-wallets	
15	Mobile and DTH payments, recharge	
16	Others (Please specify)_____	Yes

7.6 Appendix VI – State Head Questionnaire (Qualitative)

Qualitative Interview Guiding Questions for State IT & e-Governance Officials

The interview will be recorded and transcribed. The questions below act as guidelines and the interviewer will probe further

Impact of CSC in bringing socio-economic changes in rural areas	
Areas of Impact	What are some major areas of impact of the CSC scheme within your state?
Areas of Focus	How did your state utilize the CSC network particularly to drive any major initiatives at the village level? <ul style="list-style-type: none"> - Financial Literacy - Digital Inclusion - Social Protection - Skill Development - Vocational Trainings - Any other schemes or government programs?
Assessment of sustainability of CSC project	
Factors that enhance or inhibit VLE success	Who are the alternative service providers in the region? What motivates villagers to come to a CSC vis-a-vis a post office or an internet kiosk?
Measures of VLE or CSC success	What qualifies a successful VLE or CSC in your state? Can you provide any examples?
Incentives	How does your state IT department promote greater levels of entrepreneurship at the village level? What improvements would you recommend to the existing CSC scheme? What are some challenges that CSC scheme is facing particularly in your state?

7.7 Appendix VII – VLE Qualitative Interviews

Qualitative Interview Guiding Questions for Village Level Entrepreneurs (VLEs)

These questions act as guidelines, but the interviewer will use their skill to probe further

1. How did you come to know about the CSC programme? Did anyone refer you?
2. Why do you want to work in the CSC?
3. What are the kinds of incentives provided for selling non- government services and products (B2C)? How do these compare with the commissions that you get for G2C services? How do the B2C incentives compare with the effort you need to put for selling the B2C products?
4. What kind of trainings have you received from the service provider or from others? How have these trainings helped you?
5. What are some of the things that make your business difficult?
6. What changes do you see in footfall over different periods/ months? (Prompts - seasonality, certain segments coming more during certain periods, day of month effect, differences across services, G2C versus B2C, etc.)
7. How do your family members support you in running the CSC? (Prompt: who plays what role, frequency of working at the CSC, pattern - daily/ weekdays/ evenings, are there particular services they handle)
8. How do you promote the CSC and the services provided by the CSC? (Prompt: Word of Mouth, advertisement, differences in promotion of free versus paid, differences in promotion of G2C versus B2C)
9. What are the things about CSC business model that help your business? (Prompts: Training, Support, number of services, B2C products)
10. How different do you feel is selling B2C products compared to the G2C products/ services (Prompts: how different are the products themselves, what seems to be difference in demand and awareness among customers, what different skills and knowledge do you use to sell G2C versus B2C)
11. In addition to the services that you provide, what all kind of information do you provide? About government services, schemes, education, health, etc.
12. How did being a VLE change your status in your family, among your peers and within society?
13. Is computer used for training? What kinds of training programs are conducted? (Prompts: are there any certifications, who are the partners providing the content, what are the segments of population that come for the training, how do they benefit, how do they use this going forward)
14. What are your sources of income?

7.8 Appendix VIII – Citizen Qualitative Interview

Qualitative Interview Guiding Questions for Citizens

The questions below are in the nature of guiding the discussion and the interviewer would probe further

Impact of CSC in bringing socio-economic changes in rural areas	
1. Access to information	How have the CSC/ VLE helped in knowing more about government schemes and policies? (Prompt: what did you know before the CSC started and what do you know now, what were your sources of information before and what are they now?)
2. Costs (Reduced) for citizen engagement with government	What all costs were involved in getting any work done in government office before the CSC was started? What are the costs involved in getting the same work done at the CSC?
3. Empowerment and Skill Development	What skills development and training programs have been done at the CSC? How have you benefited from it? What behavioral shifts did you notice in your villagers post attending the trainings or opportunities created through CSC?
4. Measures of socio-economic change	How has the CSC changed your life in the village? (Prompts: access to information, considered as equal in the village, more opportunities, feel empowered, more income, etc.)
5. Financial Literacy, Digital Inclusion & Social Protection	How has the CSC helped you enroll for various schemes or programs of the government?
Assessment of sustainability of CSC project	
6. Factors that enhance or inhibit VLE success	Who are the alternative service providers in the region? What motivates you to come to a CSC vis-a-vis a post office or an internet kiosk?
7. Citizen's engagement with the CSC	Since how long has the citizen been coming to CSC?
8. Citizen's inputs on what services or products they wish at the CSC	What are some additional products or services that you prefer CSC to be having? Why do you believe so?

7.9 Appendix IX – Village Head Qualitative Questionnaire

Qualitative Interview Guiding Questions for Village Heads

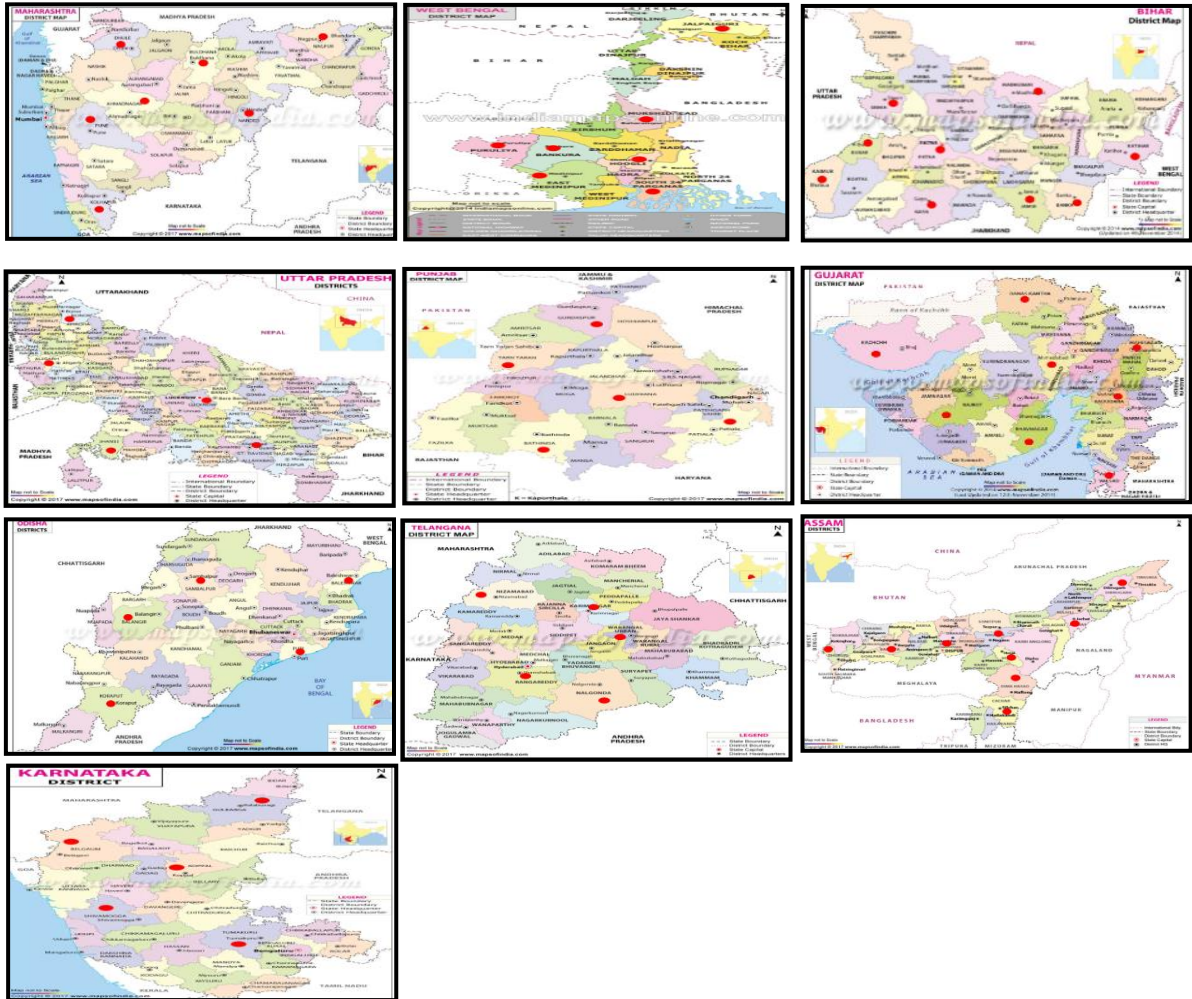
The interview will be recorded and transcribed. The questions below act as guidelines and the interviewer will probe further

Impact of CSC in bringing socio-economic changes in rural areas	
Access to information	How have the CSC/ VLE helped in knowing more about government schemes and policies? (Prompt: what did you know before the CSC started and what do you know now, what were your sources of information before and what are they now?)
Empowerment and Skill Development	What skills development and training programs have been done at the CSC? How have the villagers benefited from it? What behavioral shifts did you notice in the villagers post attending the trainings or opportunities created through CSC?
Measures of socio-economic change	How has the CSC changed the life of citizens in the village? (Prompts: access to information, considered as equal in the village, more opportunities, feel empowered, more income, etc.)
Financial Literacy, Digital Inclusion & Social Protection	How has the CSC helped you enroll for various schemes or programs of the government?
Assessment of sustainability of CSC project	
Factors that enhance or inhibit VLE success	Who are the alternative service providers in the region? What motivates villagers to come to a CSC vis-a-vis a post office or an internet kiosk?

7.10 Appendix X – Pictures from Field Staff Training and CSC Visits



7.11 Appendix XI – Geographical Location of districts Selected



7.12 Appendix XII – Descriptive Statistics of Variables of Interest

VLE Traits

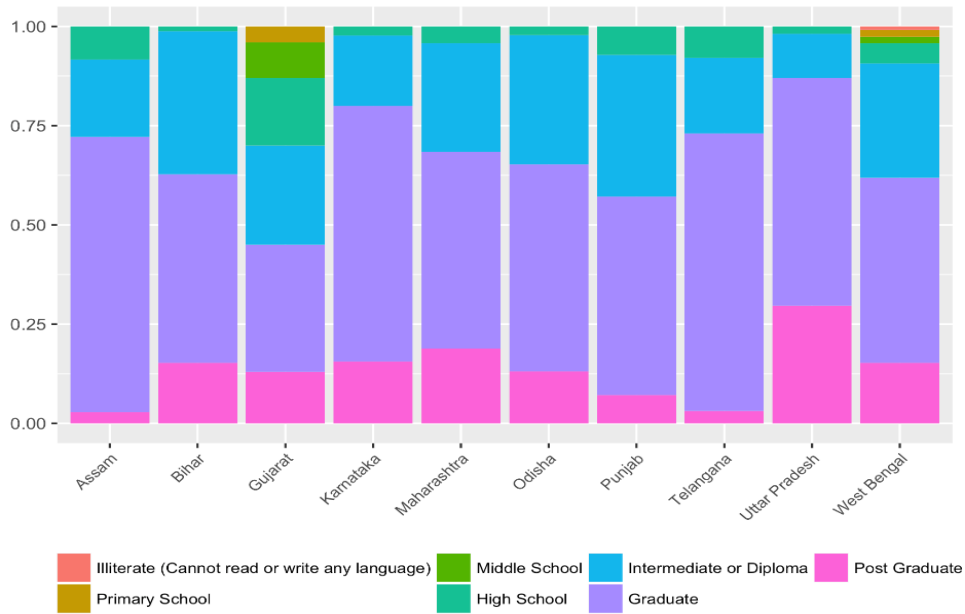


Figure 1: State-wise split of VLEs by Education

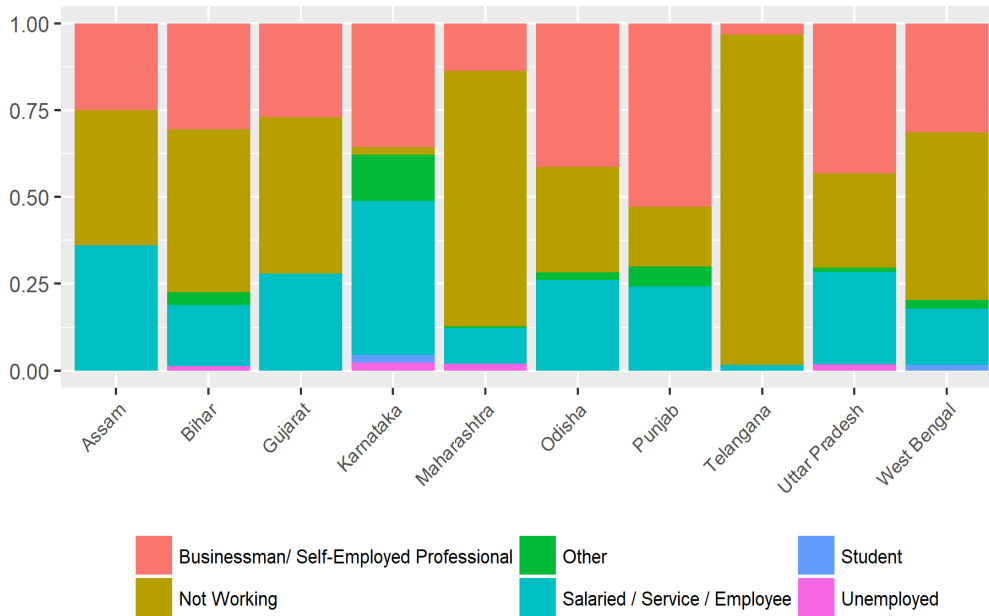


Figure 2: State-wise split of VLEs by their previous work experience

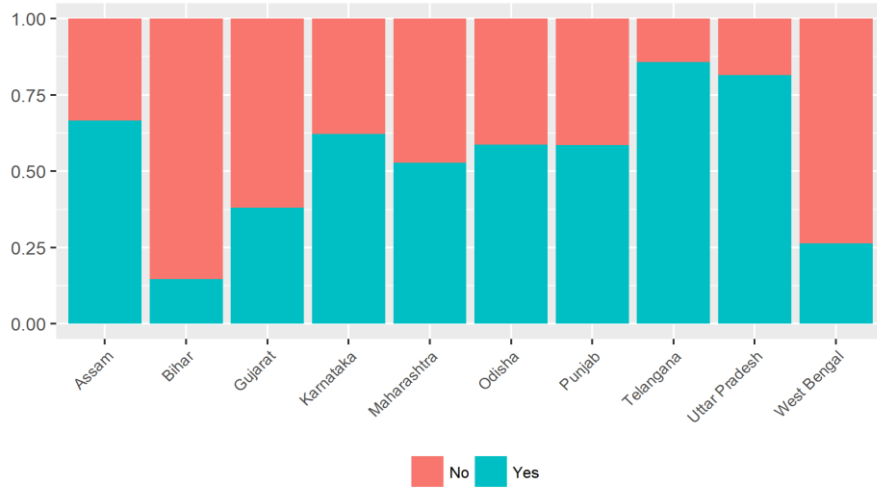


Figure 3: State-wise fraction of VLEs who received training

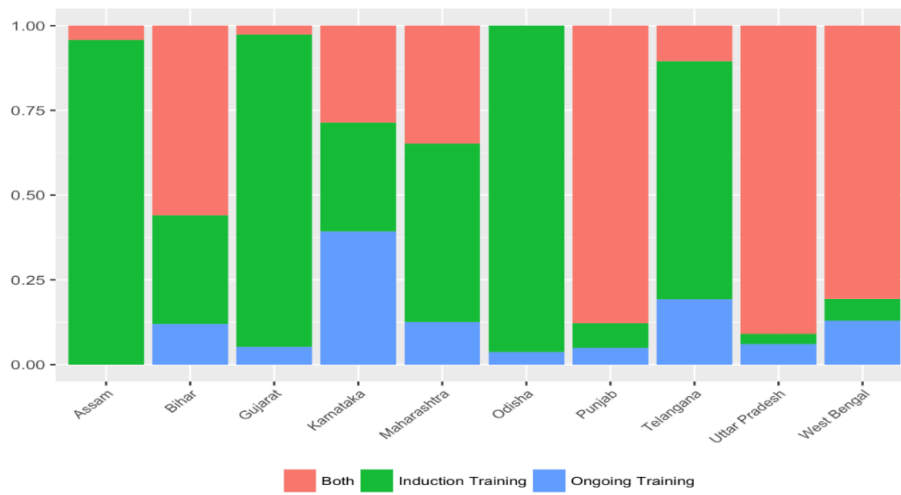


Figure 4: State-wise split of VLEs by the type of training received



Figure 5: State-wise split of training on CSC services consumed through videos

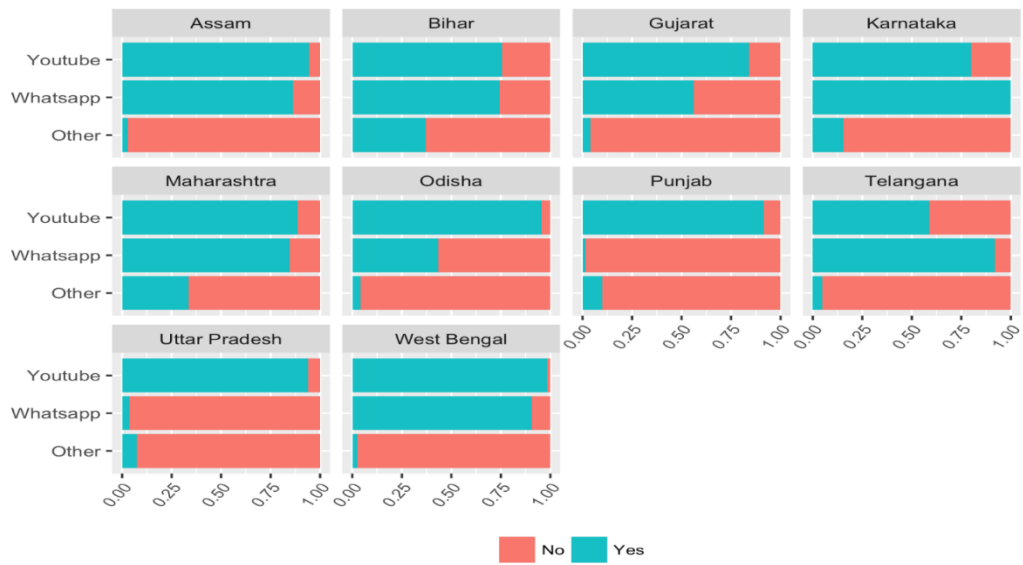


Figure 6: State-wise split of medium used to watch videos about CSC services

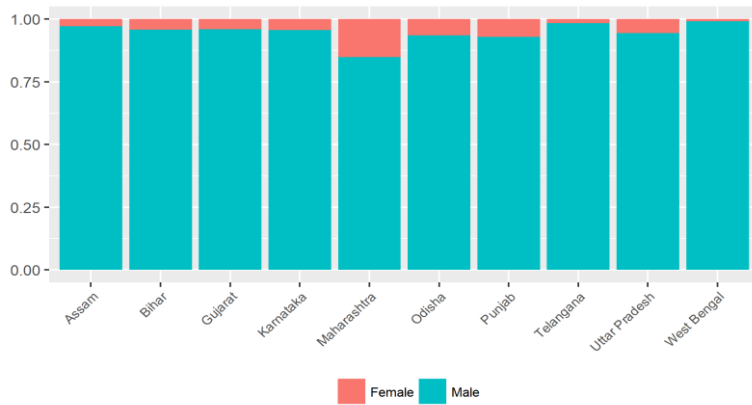


Figure 7: State-wise proportion of VLEs surveyed by gender

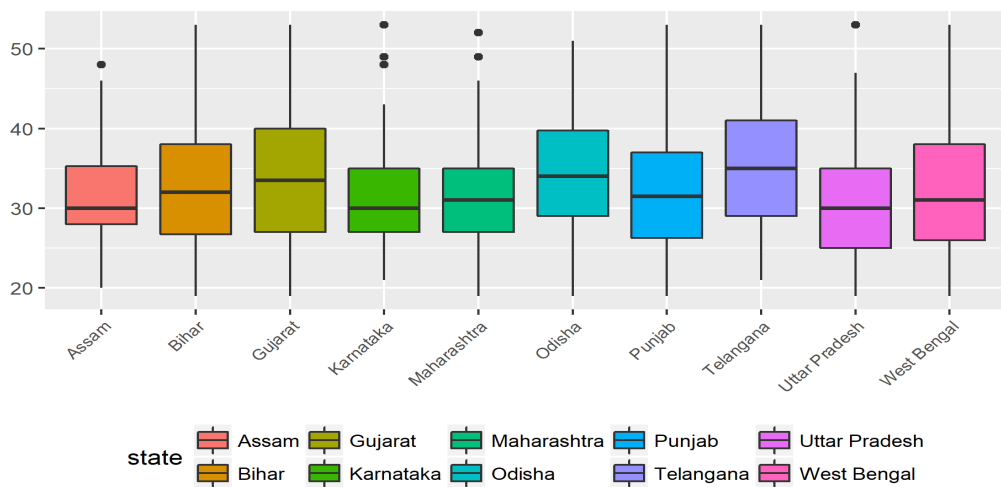


Figure 8: State-wise age distribution of VLEs surveyed

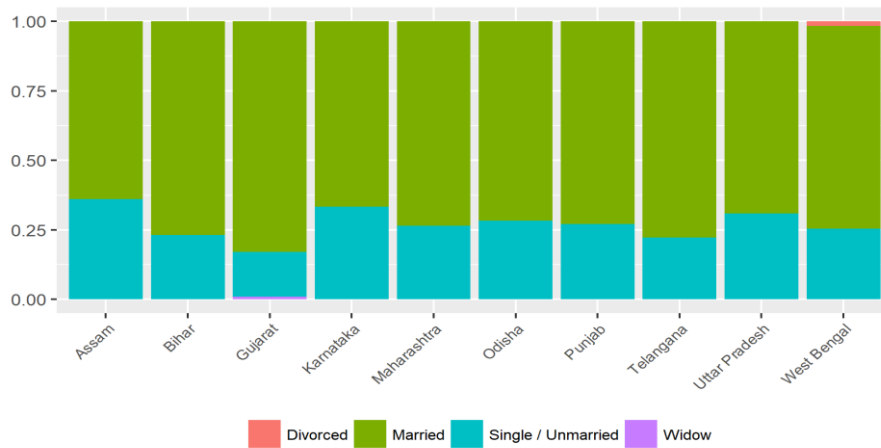


Figure 9: State-wise proportion of VLEs surveyed by marital status

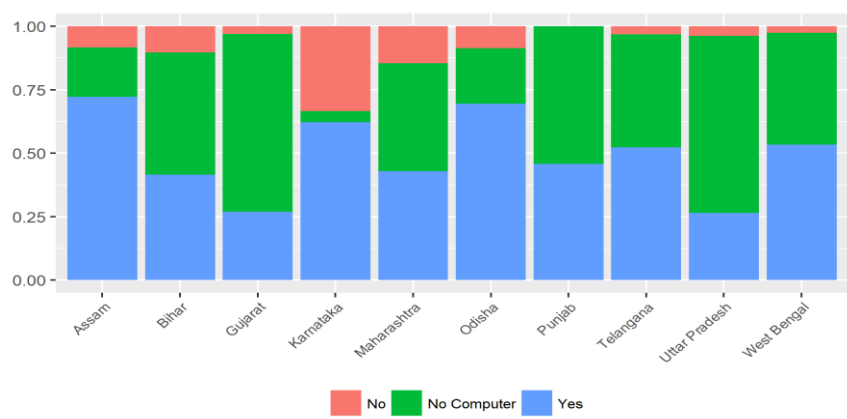


Figure 10: State-wise proportion of the VLEs surveyed by availability of internet connection at home

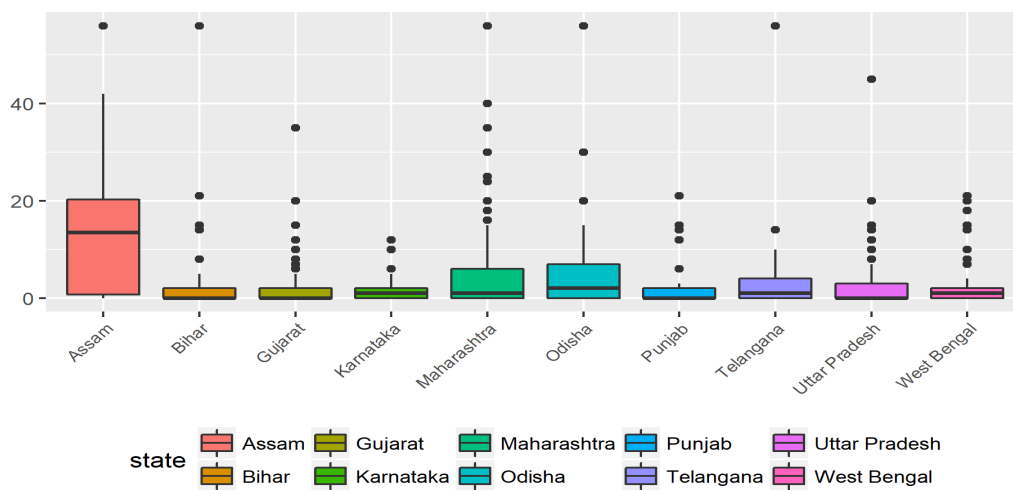


Figure 11: State-wise distribution of internet usage by VLEs surveyed – hours per week

VLE Strategies

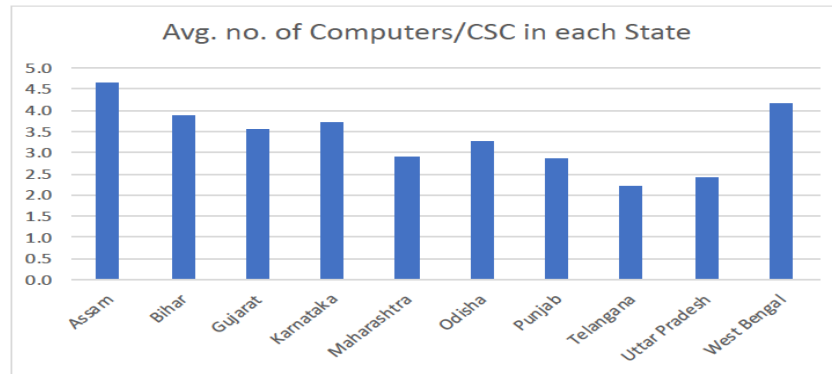


Figure 12: Average Number of Computers at CSCs

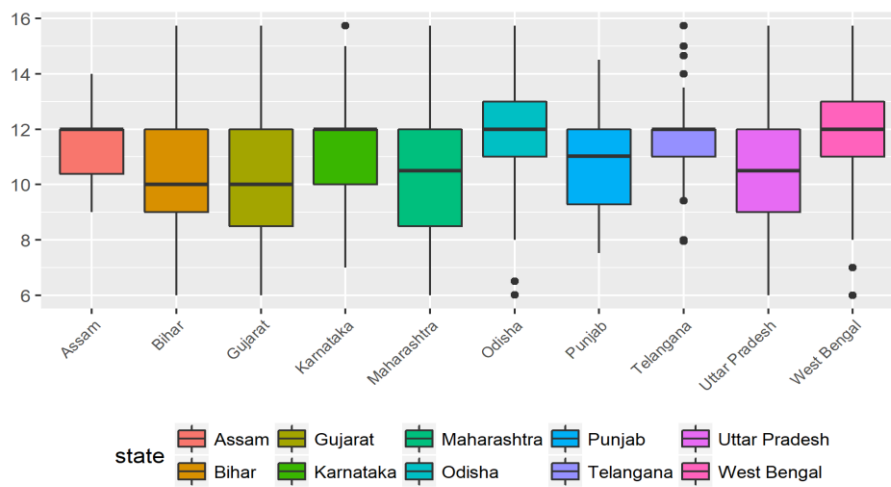


Figure 13: State-wise distribution of number of hours CSCs are open per day

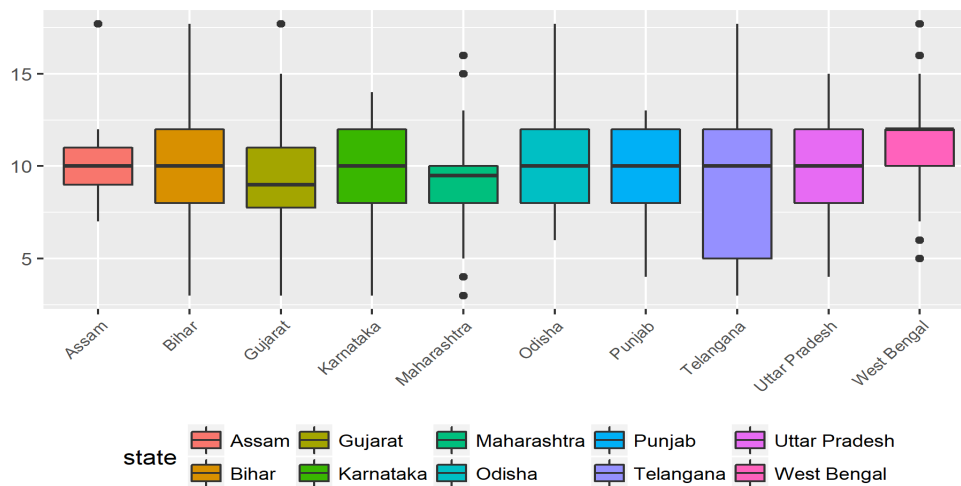


Figure 14: State-wise distribution of number of hours VLE spends at the CSC



Figure 15: State-wise proportion of the source of funds used by VLEs surveyed to setup the CSC

Environmental Factors

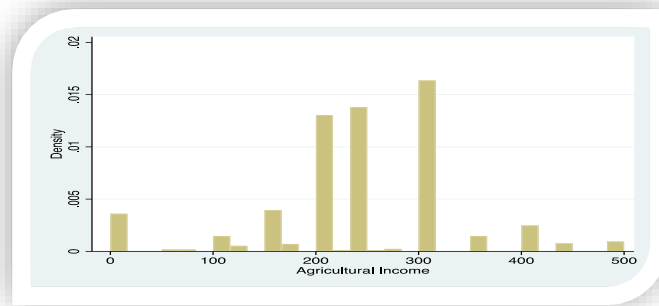


Figure 16: Distribution of agricultural income of the VLE family in rupees per day

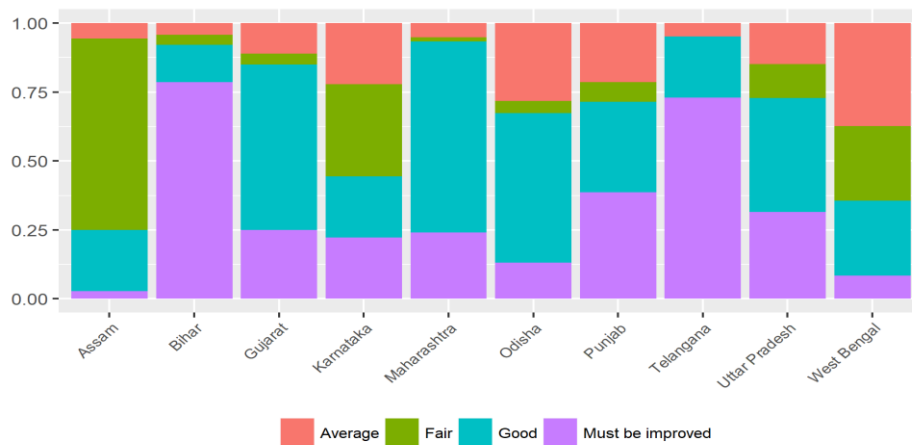


Figure 17: State-wise distribution of VLE perception of economic growth and market opportunities for entrepreneurs

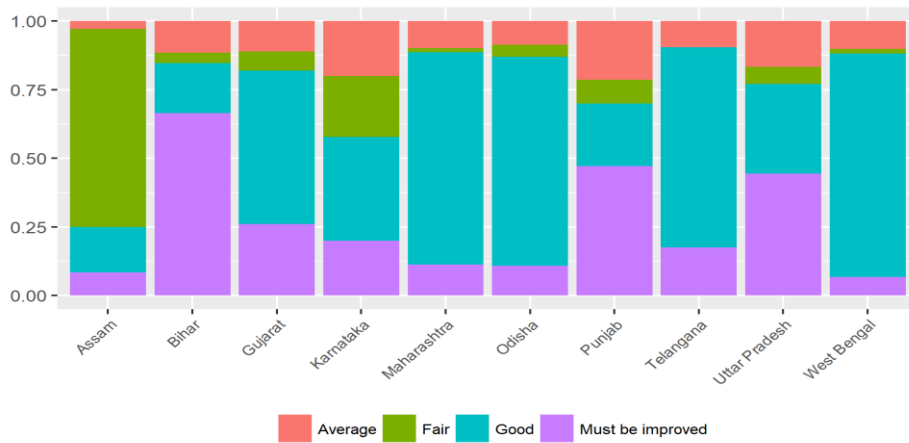


Figure 18: State-wise distribution of VLE perception of recognition of success of entrepreneurs

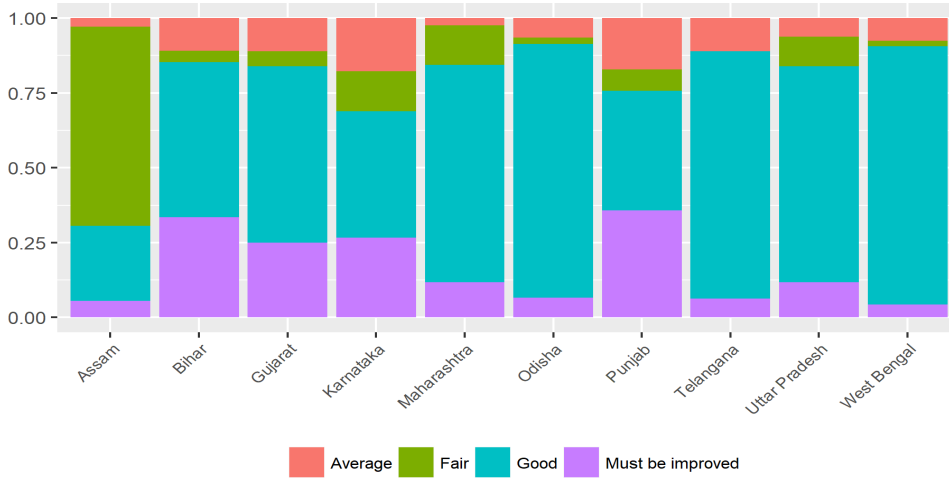


Figure 19: State-wise distribution of VLE perception of public attitude towards entrepreneurs

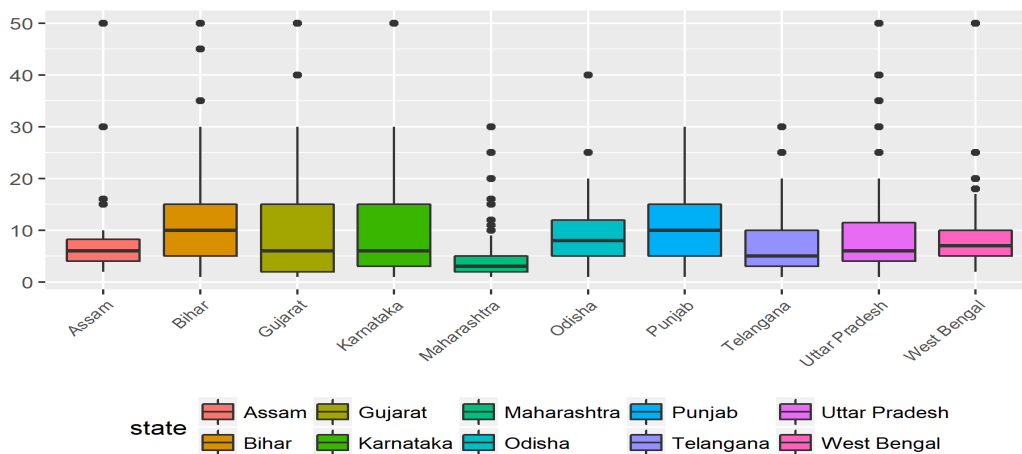


Figure 20: State-wise distribution of number of villages serviced by the CSC

Services Offered by VLEs & Impact on Citizens

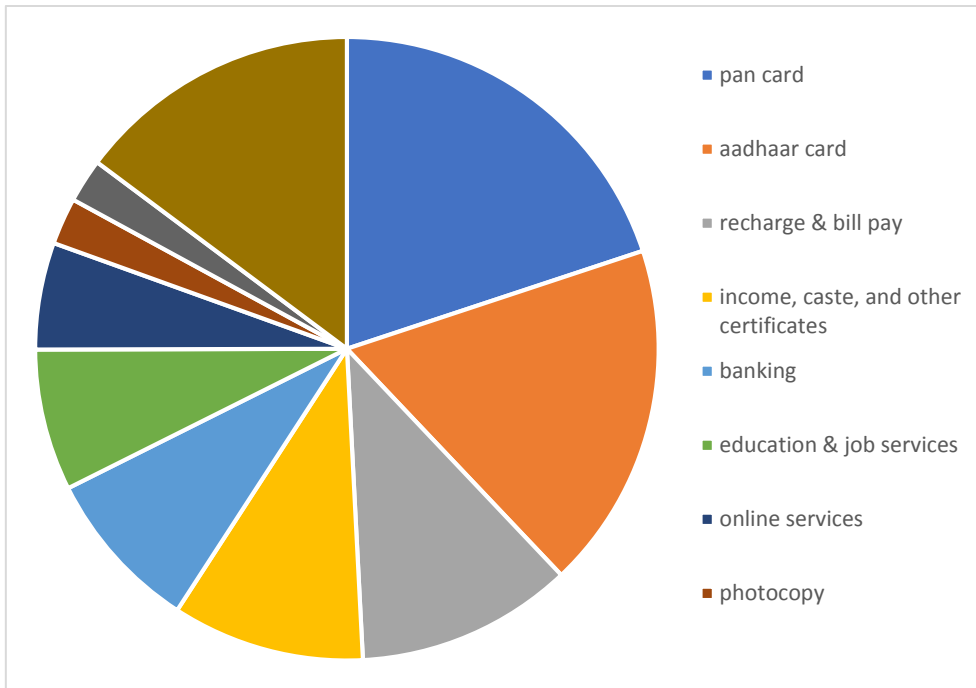


Figure 21 - a: Split of top most services used by Citizens

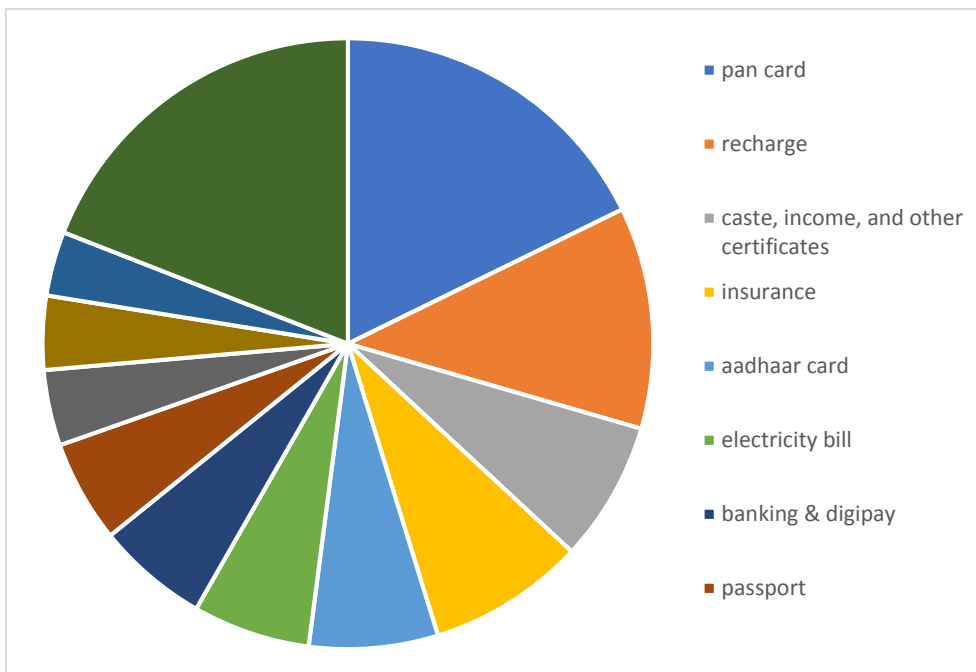


Figure 21 - b: Split of top most services used by Citizens

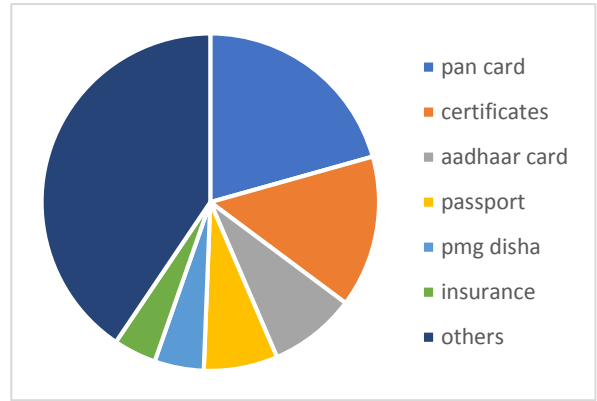
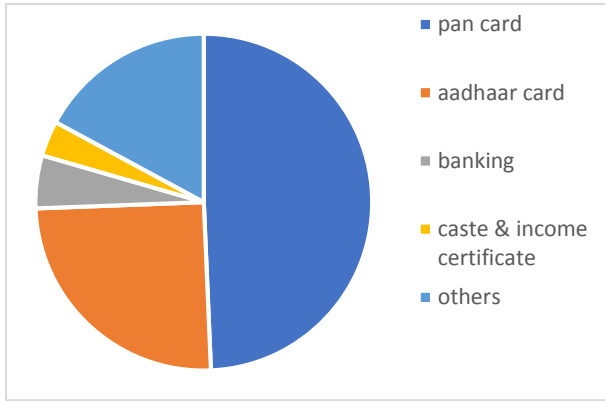


Figure 22 - a: Split of top most G2C services used by Citizen Figure 22 - b: Split of top most G2C services provided by VLEs

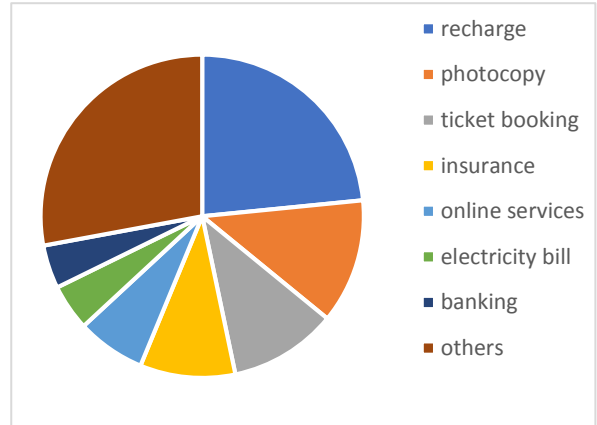
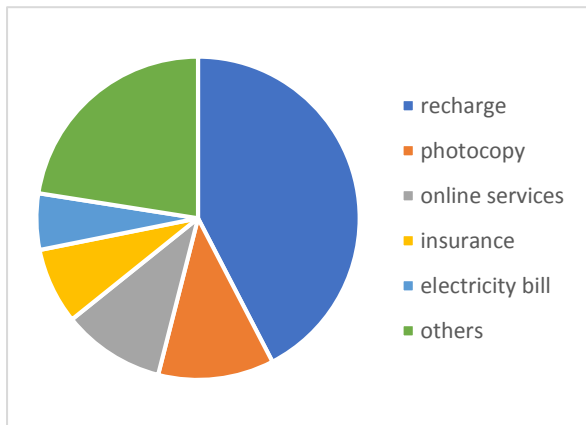


Figure 23 - a: Split of top most B2C services used by Citizens Figure 23 - b: Split of top most B2C services provided by VLEs