Access, Use and Impact of Rural Telecentres: Findings from a Village-Level Exploration

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Abstract—**The paper presents the findings of a village level exploration seeking to investigate the pattern of access and use of a telecentre and its services by different socio-economic groups. It also examines how the pattern of access and use is shaped by the characteristics of the village and the telecentre. It puts forth that in a village, households belonging to all socio-economic categories have availed services at the kiosk. However, there is some variation in number and type of services availed by the different socio-economic groups. Further, information and services are primarily generated by either occupational needs (both current and future) or by institutional requirements (again related to either livelihoods or capacity building).**

Index Terms— **ICT and Development, Telecentres, Drishtee, India**

I. Introduction

Telecentre is a generic term referring to all kinds of arrangements – Rural Knowledge Centres, Information Kiosks, Village Knowledge Centres, Common Service Centres, etc. that seek to provide shared and mediated access to information and services by using new technologies like computers and Internet [1]. The concept of shared access emerged as response to the perceived constraint that individual household in rural area cannot afford such technologies [2, pp.2]. Access is mediated because a telecentre entrepreneur mediates between information, technology and the people to overcome the barriers of low literacy, awareness about technology and availability of required skills [3].

In developing countries like India, telecentres have emerged as a popular ICT-enabled intervention for rural development. Telecentres bring about socio-economic development by providing connectivity, removing isolation and remoteness of rural areas, and integrating communities [4, pp.2]. They can enhance livelihood by generating employment, providing information related to market, better farming practices, and employment opportunities, etc. As delivery points for e-government services, telecentres can aid in improving government to citizen interface, increase reach, transparency, responsiveness, accountability, efficiency, effectiveness, citizen's empowerment and participation. Further, telecentres enable delivery of health and education services [1, pp. 1-2].

While the existing literature on telecentres is voluminous in the form of articles, case studies, and reports, systematic studies are few but emerging. The foci of existing studies on telecentres in rural India are varied, looking at process of telecentre deployment [5]-[10], diffusion [11]-[15], and impact [12], [16]-[18]. Many revolve primarily around the issue of telecentre sustainability [6], [19]-[22]. Formative evaluation and impact assessment studies of e-Governance projects have examined issues related to service delivery, implementation and usage [23]-[27]. Theoretical frameworks adopted by the studies are also eclectic, and derived from many areas of inquiry including diffusion of innovation [12][15], Sen's capability framework [17][30], governance [20], and trust [9][10]. Methodologically, the studies vary across the continuum from ethnography to ethnographic approaches to case studies and surveys. The use of mixed methods for collecting data is quite common and popular.

This study is a contribution to the existing body of literature on telecentres and development. The objective was to examine the socio-economic change brought about by a telecentre in the village. However, preliminary fieldwork revealed the elusiveness of observing, measuring and establishing the causal linkages between provision of technology/information and development. As interventions, telecentres are often deployed as part of broader development/business goals, making it difficult to map explicitly a particular development outcome like enhancement of the quality of life, increase in income or increase is efficiency of service delivery to the provision of information and new technologies via a telecentre. Further, the process of diffusion and adoption of such interventions is still underway and as pointed by many, it is still early to observe its actual impact [28]-[29]. Thus, the study examined the pattern of access and use of the telecentre and its services by household belonging to different socio-economic groups and how it is shaped by the characteristics of the village and the telecentre. It is based on the premise that technology access and appropriation is differentiated across different socio-economic groups and sections within the village; an examination of access/non-access and use/non-use

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of its services would give an indication of the possible impact on different groups and consequently to the village as a whole.

Existing studies lend support to this assumption. In a study on the SARI initiative in Tamil Nadu, a key finding was that telecentres may sustain existing socio-economic inequalities within communities because the dominant users tend to be young, male, students, relatively more educated, belonging to higher income households, and coming from socially and economically advanced communities [12]. Another comparative study of two different telecentre initiatives in the states of different states of Kerala and Andhra Pradesh indicates that access and use is differential across different developmental context [15]. Similar approach for assessing the socio-economic impact of telecentres by investigating the usage pattern has been adopted by many researchers (see [6], [12], [14], [15], [18], [30]-[31]). However, the study differs from existing ones in few aspects.

Firstly, the study considers household instead of individual users and non-users as the unit for data collection and analysis; reason being both conceptual and methodological. Conceptually, telecentres provide shared and mediated access. Thus, to focus only on users overlooks this basic assumption. Further, since mere provision of technology or information does not automatically translate to possible action, as it is dependent on required capabilities and resources, thus the possible impact of telecentres on individuals is also mediated by the telecentre intermediateries and other factors at household and village levels. As some studies reveal, focussing only on individuals as users or non-users is also fraught with the methodological issues of locating them since records are often not maintained properly [6], [11], [12], [23]. Also, the usage itself is seasonal, and at times only occasional.

Secondly, attempts have been made to distinguish between access and use. While the term access primarily has a technological connotation (since telecentres provide access to new technologies), it also has a physical, social and structured nuance. The telecentre has to be located at a place that is physically accessible to all, including women. And, it has to be socially accessible in that people are able to enter its premises irrespective of socio-economic status, caste, education etc. Access is considered as structured because the network orchestrator and the kiosk operator design it to be so. In contrast, use refers to the actual services availed by the people. Since telecentres provide shared and mediated access, use does not necessarily indicate that people have to use computers and Internet. Lastly, the study examines access and use for each category of available services separately and for each of the observable and measurable parameters that together constitute the socio-economic status of the household. Such an approach, not followed by any of the existing studies[1], enables linking access and usage of the telecentre and its services by various socio-economic groups to the specific characteristics of the telecentre model, and to the local village level contextual features.

[1]Existing studies have correlated differences between the demographic characteristics of users and non-users and/or made an attempt to correlate the socio-economic profile of the kiosk owner with that of his/her customers.

II. Conceptual Framework

The conceptual framework puts forth that access and use of the telecentre and its services is shaped by the village level characteristics, household characteristics and characteristics of the telecentre in the village. For the purpose of the study, village characteristics are examined along six interrelated dimensions: infrastructure, economic, social, cultural, institutional and political (see Table I).

TABLE I
VILLAGE CHARACTERISTICS

Dimension	Parameters
Infrastructure	Physical infrastructure (electricity, roads and transport, telecommunication)
Economic	Occupational pattern, Income and assets, Class structure
Social	Caste hierarchy, Educational status (gender and age)
Cultural	Norms (governing interactions between groups), Practices (social, religious, cultural)
Institutional	Formal and informal institutions in the village
Political	Representation of the village in elected bodies.

Physical infrastructure refers to the availability of telecommunication infrastructure, connectivity and computers, and the presence of supporting infrastructure like electricity, road and transport that enhances the ability of the people to take action based on the accessed information. ICTs can deliver potentially valuable information to end-users like market prices to poor rural farmers and medical advice to rural healthcare workers. However, market information is useless if there are no roads to transport goods, and medical advice is meaningless if there is no money to purchase medicines. The economic characteristics of a village are related primarily to the occupations professed by its inhabitants, which in turn would determine the relative income and assets of different socio-economic groups in the village and its class structure[2]. Caste[3] hierarchy forms another important indicator of the

[2] Traditionally an agrarian village society was commonly divided into two main classes – landlord and working class, based on the ownership or non-ownership of land and other productive assets. And class was looked as a system of conflict and contradiction [32, pp.947]. However, in recent times, class is puts forth as a segment of society that is defined primarily by property, wealth, occupation, income and education [32, pp.945]. Classes are differentiated from each other by the economic attributes of the individuals and households that are their members.

[3] Caste is defined as a small and named group of persons characterised by endogamy, hereditary membership, and a specific style of life which sometimes includes the pursuit by tradition of a particular occupation and is usually associated with more or less distinct ritual status in a hierarchical system [33, pp. 46]. People belonging to same caste tend to live nearby. It is often difficult, and at times impossible to determine the exact, or even the approximate, place of each caste in the hierarchy [34, pp. 59]. A caste may dominant when it preponderates numerically over the other castes, and when it also wields preponderant economic and political power [34, pp. 57].

socio-economic structure of the village [12], [19, pp. 68]. Culture is examined in terms of norms guiding the interactions and relationships among the various groups. Institutions and political support often play a role in initiating the telecentre venture, enabling access and at-times shaping the impact.

Village level characteristics are reflected in the characteristics of the households, where both users and non-users of any telecentre belong. Table II gives the parameters for examining the household characteristics. The socio-economic status or class of the household can be examined in terms of the occupational pattern of the different members of the household, their monthly or annual income and expenditure, and in terms of assets like land, possession of household items like television, washing machine, etc. The socio-economic status would in general reflect the ability to pay for the services at the telecentre. Along with other factors like caste and gender, the socio-economic status influences either directly or indirectly the technology is adopted and its outcomes as they often define the capabilities of the people to access productive resources, credit, basic education and health facilities. These factors also determine the norms guiding the interactions and relationships among the various groups.

TABLE II
HOUSEHOLD CHARACTERISTICS

Dimension	**Parameters**
Economic	Socio-economic status (occupation, and assets)
Social	Caste, Religion, Educational status
Institutional/ Political	Membership/ Affiliation

While some characteristics of the telecentre like ownership of kiosks, business model, services and technology deployed are largely determined by its network orchestrator, others characteristics are local and contextual. These include the nature of intermediation in terms of background and qualifications of the kiosk owner/entrepreneur, location of the kiosk, its ambience and time of operation, and provision of localized services (see Table III).

TABLE III
CHARACTERISTICS OF THE TELECENTRE IN THE VILLAGE

Parameters
Ownership and Management (kiosk owner, staff and volunteers)
Technology and Services
Structuring of Access (intermediation, location, ambience, timings)

Caste is differentiated from class in that membership in a caste is by birth, and a person does not change his caste by changing his income, occupation or employment status. Further, every major caste contains members who belong to a variety of social classes [32, pp. 947].

III. METHODOLOGY

The study is an exploratory case study research using mixed methods for data collection. The unit of analysis is the particular telecentre located within the village. The fieldwork was conducted during April-May 2006 at village Kesarpur in Barielly district of Uttar Pradesh, India. The *Drishtee Soochna Kendra* located at Kesarpur had been functioning for around two years and was considered to be "successful" by the network orchestrator i.e. *Drishtee* Dot Com Ltd. (hereby *Drishtee*). *Drishtee* facilitated access to the field and the key informant was the kiosk entrepreneur. The researcher stayed in the village for fifteen days and collected data via observation, semi-structured interviews and group discussions.

Observation and group discussion with farmers, agriculture labours/ sharecroppers and women revealed the socio-economic and institutional characteristics of the village. Sixty-six semi-structured interviews, consisting of both closed and open-ended questions, were conducted to collect the details about the selected households and the nature of their interaction with the telecentre. The households were grouped to cover those (a) belonging to different socio-economic categories within the two dominant religious groups, (b) at least one representative household from the multiple castes in the village and (c) had availed some specific services like education or soil testing. Tentative criteria for determining the socio-economic status of a households and a preliminary list of households in each category was prepared at the start of the fieldwork in an informal group discussion with the villagers. Both the list and the socio-economic status (SES) of households were validated and updated thru observation and repeated checks during the interviews. The sixty-six households in the sample were divided into four socio-economic categories based on the criteria and attributes defined in Appendix B. Analysis of data is done by grouping the households on various socio-economic parameters and examining the number and type of services availed by the households.

IV. FINDINGS

Kesarpur in Bithri Chainpur taluka is located 22 kilometers (kms) from Bareilly, the district headquarters in the northern state of Uttar Pradesh, India. It has an area of 90.25 sq kms and population of 3771 in 586 households [35]. The sex ratio is 874. Kesarpur is a fairly large as compared to its neighbouring 20-25 villages and acts as a junction point for this cluster of villages. It is well connected by road and various modes of transport with neighbouring villages and big towns like Bareilly, Rithura, etc. and hence attracted people from nearby rural and urban areas.

On the outskirts of Kesarpur was a settlement of migrants from neighbouring smaller villages. They earned their living by doing petty daily wage jobs in the village or by traveling to and fro to neighbouring big towns like Bareilly, Bhuta and

Rithaura. Kesarpur has a thriving market place in and around the bus *adda* or the bus stop of the village. The market has as many as 300 big and small shops – catering to all types of requirement – from agriculture inputs to medicine to jewellery etc. Many shops belonged to medical practioners, cloth merchants and other smaller traders from Bareilly. They commuted on a daily basis from Bareilly to Kesarpur, taking advantage of the good connectivity, low establishment costs and high volume. On Thursdays and Sundays the business was especially brisk as people congregated at the weekly *haat* held on the ground just next to this marketplace. Located in the market place was also an open-air cinema hall, branches of two leading nationalized banks with linkages to more than 100 Self Help Groups (SHGs), a small BSNL telephone exchange with around 100 connections, and 12-15 public telephone booths or PCOs. While the village had no cellular service providers, but being proximate to big towns, signal was available at most places and hence mobile phones were fairly common. The village also had a post-office and a credit society for farmers.

The *Patel Drishtee Soochna Kendra* is located in a rented shop at this market and is adjacent to the telephone exchange, and the two bank branches. The kiosk actually consists of three small adjacent shops. The main shop houses the computer and other equipments. The generator is kept inside the shop on the left. The shop on the right is the small classroom for the "theory" classes. The kiosk is registered in the name of a thirty-year-old, graduate, male entrepreneur; belonging to the dominant *Kurmi* community. Farmer by occupation, he owns around sixteen acres of land. As a member of a prominent Hindu organization, the entrepreneur is fairly active politically. He is also a member of the governing council of a local school. The entrepreneur is well known in the village for his ability to mix with people and take business risks. Prior to his involvement with *Drishtee*, he had dabbled in couple of ventures including farming capsicum and tomato. His immediate family consists of his mother, two younger brothers, wife and two children. He manages the daily operations of the kiosks with the help of his two younger brothers.

The three most popular[4] services were digital passport photography, digital photostat and checking examination results on the Internet availed by 61, 41 and 27 percent of households in the sample (see Table IV) While the first two services are availed all the year round, the third one is seasonal, peaking only once or twice times in a year. Remaining services have been availed by less than 20% of the households in the sample. E-Governance at Kesarpur is mainly sale of Photostat copies of applications and forms of various welfare schemes. Computer education consisted of training modules provided by *Drishtee* and taught by a local college-going student. Soil testing was one agriculture extension service provided by private fertilizer companies seeking to expand their market reach. Internet was accessed only for obtaining examination results, otherwise even casual browsing is limited. Services under the other category include sale of inverter batteries, books, and insurance. The two popular services are offline, localised services with almost no direct contact between customers and computers or the Internet.

While the percentage of households in each class availing services like photo, photostat and soil testing is comparable for the first three socio-economic categories, it is slightly more for the group with high socio-economic status. Households with low SES have bought forms related to schemes like old-age and widow pension; those with middle SES have bought application forms for vacancies in government like para-teachers. The rich have not availed any e-Governance service. Only one household with low SES had availed education related services like computer training and examination results. Thus, while households belonging to all socio-economic categories have availed some services at the kiosk, the usage pattern differs across services. Of the 66 households in the sample, 46 households or around 70% have availed atleast one service at the kiosk. The percentage of user households in each of the four classes - low, low-middle, middle and high SES is 50, 67, 76 and 92 respectively.

Of the twenty households that have not availed any services at the kiosk, 10 belong to low socio-economic category. Nineteen households either do not posses any land or own less than 2.5 acres. The percentage of user households among landless is 50 and thereafter it is 68, 83, 100 and 100 for marginal, small, middle and big farmers respectively. Examining further, the percentage of user households among those with least asset index (see Appendix A) is 38, almost half of the other groups and indicating that households with less assets access and use telecentres less than others (see Table V).

[4] Popularity of a service was measured in terms of the number of households who have availed the particular telecentre service atleast once.

TABLE IV
DISTRIBUTION OF HOUSEHOLDS BY SOCIO-ECONOMIC STATUS, NUMBER AND TYPE OF SERVICES AVAILED

Particular	Socio-Economic Status of Households				Total (N=66)
Number of Services	Low (N1=20)	Low-Middle (N2=12)	Middle (N3=21)	High (N4=13)	
0	10 (50)	4 (33)	5 (24)	1 (8)	20 (30)
1	4 (20)	1 (8)	7 (33)	2 (15)	14 (21)
>1	6 (30)	7 (58)	9 (43)	10 (77)	32 (49)
%User Household	50	67	76	92	70
Service Availed					
Digital Photograph	10 (50)	8 (67)	11 (52)	11 (85)	40 (61)
Digital Photostat	7 (35)	4 (33)	7 (33)	9 (69)	27 (41)
Examination Results	1 (5)	2 (17)	10 (48)	5 (38)	18 (27)
Government Forms	5 (25)	1 (8)	6 (29)	-	12 (18)
Soil Testing	2 (10)	2 (17)	4 (19)	3 (23)	11 (17)
Computer Education	-	2 (17)	4 (19)	2 (15)	8 (12)
Others	-	1 (8)	4 (19)	3 (23)	8 (12)

Note: (a) %User Household is the percentage of households in each socio-economic category who have availed at least one service at the kiosk, (b) Figure in parentheses is in percentage of the number of households in respective category.

TABLE V
DISTRIBUTION OF HOUSEHOLDS BY ASSET INDEX, NUMBER AND TYPE OF SERVICES AVAILED

Particulars	Asset Index					Total (N=66)
Number of Services	0-2 (N1=13)	3-5 (N2=12)	6-8 (N3=15)	9-11 (N4=11)	>11 (N5=15)	
0	8 (62)	4 (33)	4 (27)	2 (18)	2 (13)	20 (30)
1	1 (8)	3 (25)	4 (27)	3 (27)	3 (20)	14 (21)
>1	4 (31)	5 (42)	7 (47)	6 (54)	11 (66)	32 (49)
%User Household	38	67	73	82	87	70

TABLE V (CONTD.)
DISTRIBUTION OF HOUSEHOLDS BY ASSET INDEX, NUMBER AND TYPE OF SERVICES AVAILED

Particulars	Asset Index					Total (N=66)
Services Availed	0-2 (N1=13)	3-5 (N2=12)	6-8 (N3=15)	9-11 (N4=11)	>11 (N5=15)	
Digital Photograph	5 (38)	8 (67)	10 (67)	6 (55)	11 (73)	40 (61)
Digital Photostat	4 (30)	3 (25)	6 (40)	4 (36)	10 (67)	27 (41)
Examination Results	-	2 (17)	3 (20)	7 (63)	6 (40)	27 (41)
Government Forms	3 (23)	1 (8)	3 (20)	2 (18)	3 (20)	12 (18)
Soil Testing	1 (8)	1 (8)	4 (27)	2 (18)	3 (20)	11 (17)
Computer Education	1 (8)	1 (8)	1 (7)	2 (18)	3 (20)	8 (12)
Others	-	-	2 (13)	2 (18)	4 (36)	8 (12)

Note: (a) %User Household is the percentage of households in each category who have availed at least one service at the kiosk, (b) Figure in parentheses is in percentage of the number of households in each category.

Occupation, caste and religion are three important indicators of the socio-economic status of a household. Hindus and Muslims constitute the two dominant communities and are almost equal in numbers. Within Muslims, almost all belong to the *Ansari* community under other backward class (OBC) category and are engaged in Zari-related work in various capacities ranging from owners of large "Zari house" to big/ small bidders to tailor/designers/embroiderer. Prior to the introduction of *Karchobi* or *Zari* embroidery to the community around 10-12 years back, Muslims were primarily engaged as agricultural labours. Except for the few, who have their own business, for most households, the income generated from this source is highly seasonal and subject to the trends and demands of the fashion industry in Delhi and other big places. During peak demands, all the households and all members of the family including small children are engaged in embroidering. Some families have shops in the market place while others have diversified into construction work.

Comparatively, Hindus are more segregated in terms of caste and occupation. Around fifteen households belong to forward castes consisting of *Brahmins or Pandits and Baniyas*; small in numbers but are fairly influential because higher socio-economic status as they own number of small and big business including gold shop, informal lending, a sailor mill, etc. Dominating by numbers are the *Kurmis* or *Patels*, belonging to OBC category. They have been the traditional landowners and cultivators. Rice, wheat and sugarcane are the main crops grown in the area and they are cultivated using modern agriculture implements and methods as popularized during the green revolution. However, in recent times, most households belonging to this group give their land on *batai*, or sharecropping. The change can be attributed firstly to the availability and capability to take up jobs, both government and private; Secondly many households have diversified into self-employment in the form of petty trade, business to small enterprises as in brick kilns, flour mills etc. Sharecroppers and tenants primarily belong to the SC category and include *Jatav* and *Bhurji* Still lower in the caste hierarchy are *Teli, Nai, Mochi, Prajapati* and *Valimiki*. They work as agriculture labors or coolies on daily wage basis. Of late, some households are also engaged in *Zari* related work, which otherwise have been dominated by the Muslims. All the three households belonging to the forward castes have availed atleast one service at the kiosk (see Table VI).

While the percentage of user households among the other two caste categories is comparable at around 67-68%. However, there is much variation between the two religious communities. Around 90% of the Hindu OBC households have availed atleast one service at the kiosk, but it is only 40% for the Muslim OBC households.

TABLE VI
DISTRIBUTION OF HOUSEHOLDS BY RELIGION, CASTE-CATEGORY, NUMBER AND TYPE OF SERVICES AVAILED

Particulars	Religion and Caste Category				Total (N=66)
	Hindus (NA=44)			Muslims (NB=22)	
	General (N1=3)	OBC (N2=29)	SC (N3=12)	OBC (N4=22)	
Number of Services					
0	-	3 (10)	4 (33)	13 (59)	20 (30)
1	-	4 (14)	4 (33)	6 (27)	14 (21)
>1	3 (100)	22 (76)	4 (34)	3 (15)	32 (49)
%User Household	100	90	67	40	70
Service Availed					
Digital Photograph	3 (100)	23 (79)	8 (67)	6 (27)	40 (61)
Digital Photostat	3 (100)	18 (62)	4 (33)	2 (9)	27 (41)
Examination Results	1 (33)	14 (48)	-	3 (17)	27 (41)
Government Forms	-	10 (34)	2 (17)	-	12 (18)
Soil Testing	-	11 (38)	-	-	11 (17)
Computer Education	-	5 (17)	-	3 (17)	8 (12)
Others	1 (33)	6 (21)	-	1 (5)	8 (12)

Note: (a) %User Household is the percentage of households in each religious and caste category who have availed at least one service at the kiosk, (b) Figure in parentheses is in percentage of the number of households in each category.

The pattern can be partly explained by the occupational characteristics of the two communities. Hindus are primarily farmers who availed agriculture loan from the bank or credit societies. To do so, they need passport size photo and photostat of documents; the two services available at the *Drishtee* kiosk. On the other hand, Muslim households are primarily engaged in *Zari/ Zardozi* related work. The majority of them work as *karigars* or embroiders for the large business houses and do not necessarily avail loan from formal sources. Households headed by housewives and government employee have availed atleast one service at the kiosk (see Table VII).

Farmers constitute one dominant occupational group availing service at the kiosk. Soil testing, being a farmer centric service has been availed primarily by households headed by farmers or have farming as main household occupation. Except for carpenters and masons, all other occupational categories have availed some services. Passport photo and photostat were the most common as they are required for opening bank account, availing loans, filling forms for study, job applications, welfare schemes etc.

TABLE VII
DISTRIBUTION OF HOUSEHOLDS BY OCCUPATION, NUMBER AND TYPE OF SERVICES AVAILED

Particulars	Occupation of the Head of the Household							Total
	Carpenter/ Mason (N1=4)	Petty Trade/ Driver (N2=5)	Daily Wage Labour (N3=11)	Businessman (N4=16)	Farmers (N5=20)	Govt Service (N6=3)	Others (N7=7)	(N=66)
Number of Services								
0	4 (100)	2 (40)	5 (45)	5 (31)	2 (10)	-	2 (29)	20 (30)
1	-	2 (40)	2 (18)	5 (31)	4 (20)	-	1 (14)	14 (21)
>1	-	1 (20)	7 (63)	10 (63)	14 (70)	3 (100)	2 (29)	32 (49)
%User Household	0	60	55	69	90	100	71	70
Service								
Digital Photograph	-	3 (60)	6 (55)	8 (50)	15 (75)	3 (100)	5 (71)	40 (61)
Digital Photostat	-	1 (20)	4 (36)	6 (38)	10 (50)	3 (100)	3 (43)	27 (41)
Examination Results	-	1 (20)	-	6 (38)	8 (40)	2 (67)	1 (14)	27 (41)
Government Forms	-	-	2 (18)	3 (19)	3 (15)	1 (33)	3 (43)	12 (18)
Soil Testing	-	-	-	-	9 (45)	-	2 (67)	11 (17)
Computer Education	-	-	1 (9)	2 (13)	3 (15)	1 (33)	1 (33)	8 (12)
Others	-	-	-	1 (6)	6 (30)	1 (33)	-	8 (12)

Note: (a) %User Household is the percentage of households in each occupational category who have availed at least one service at the kiosk, (b) Figure in parentheses is in percentage of the number of households in respective category.

The educational status of the households is examined in terms of both the education of the head of the household and highest education in the family. While in as many as 22 households, the head of the family is illiterate, only in eight households the highest educational status is zero. With more schools within the village and improved road connectivity to nearby senior schools and colleges, the educational statuses of households have improved through successive generations[5]. As the educational status increased, there is an increase in the percentage of user households (see Table VII and Table IX). However, education does not appear to be necessary for availing services like Photo, Photostat and buying application forms. Unlike computer education, where the student is directly using the computer, other services do not require the customer to actually use the computer or Internet. .

In sum, at the Drishtee kiosk at Kesarpur, photo and photography were the two services availed by households belonging to all socio-economic categories. e-Governance services were availed primarily by households belonging to low and middle class, albeit for different purpose. The poor have primarily brought forms for applying in welfare schemes, while the other group job applications. As expected, service like soil testing was primarily availed by households with main occupation related to agriculture. An eclectic

[5] Kesarpur had five primary/ secondary schools and one high secondary school. All other institutions of higher learning were in the nearby towns and cities.

group of students from varied socio-economic backgrounds availed computer education. The only common factor is that the member availing computer education is a graduate or post-graduate. Otherwise, the educational status of the household does not play much role as access to services were either mediated or offline.

TABLE VII
DISTRIBUTION OF HOUSEHOLD BY EDUCATION OF THE HEAD OF HOUSEHOLD AND SERVICES AVAILED

Service	Education of Head of the Household (Number of years of formal schooling/college)					Total (N=66)
	0 (N1=22)	1-5 (N2=8)	6-9 (N3=16)	10-12 (N4=12)	>12 (N5=9)	
Digital Photograph	9 (41)	5 (63)	10 (63)	9 (75)	7 (81)	40 (61)
Digital Photostat	5 (23)	3 (38)	8 (50)	6 (50)	5 (55)	27 (41)
Examination Results	3 (14)	-	7 (44)	3 (25)	5 (55)	27 (41)
Government Forms	5 (23)	-	3 (19)	2 (17)	2 (22)	12 (18)
Soil Testing	3 (14)	1 (13)	3 (19)	1 (8)	3 (33)	11 (17)
Computer Education	2 (9)	1 (13)	2 (13)	-	3 (33)	8 (12)
Others	-	2 (25)	1 (6)	2 (17)	3 (33)	8 (12)
%User Households	50	75	69	83	100	75

TABLE IX
DISTRIBUTION OF HOUSEHOLD BY HIGHEST EDUCATION AND SERVICES AVAILED

Service	Highest Education					
	0 (N1=8)	1-5 (N2=7)	6-9 (N3=12)	10-12 (N4=16)	>12 (N5=23)	Total (N6=66)
Digital Photograph	3 (38)	2 (29)	5 (42)	11 (69)	19 (83)	40 (61)
Digital Photostat	2 (25)	1 (14)	2 (17)	8 (50)	14 (61)	27 (41)
Examination Results	-	-	1 (8)	4 (33)	13 (57)	27 (41)
Government Forms	2 (25)	-	2 (17)	2 (17)	6 (26)	12 (18)
Soil Testing	-	-	2 (17)	3 (25)	6 (26)	11 (17)
Computer Education	-	-	-	-	8 (35)	8 (12)
Others	-	-	-	2 (17)	6 (26)	8 (12)
%User Households	38	29	50	81	100	70

Further, physical access to the telecentre is not denied because a person belongs to a particular caste or religion category. While individuals accessing the kiosk belong to all age groups, women users are very less. Women belonging to both the communities usually come when it is absolutely necessary for them e.g. to have a photograph for becoming a member of an SHG. For services like education, that requires the individual to spend some time at the telecentre, only two girls have enrolled till date and both are related to the kiosk owner.

V. Discussion

Existing studies have indicated that telecentre users often belong to the affluent, socially and economically advanced communities [6] [22] [26]. A key finding of this study is that access and use of a telecentre is more nuanced. Households belonging to all socio-economic categories have availed services at the kiosk. However, there is some variation in number and type of services availed by different groups. Households belonging to all class categories had availed generic services like digital photo and photostat. It is also because the *Drishtee* kiosk is the only shop in and around the village providing these two services. The need for these two services arise for all - people need photographs to open bank account, avail loans, fill forms for study, job applications, apply for ration card, scholarships etc. Similarly for photostat. The presence of banks in the vicinity, the propensity of the local people to form self-help groups and start borrowing-lending etc are some of the contextual level characteristics generating the demand for these two services. While service like e-governance have been availed primarily by the poor, those with higher socio-economic status have availed services like computer education, insurance and examination results on the web. Though the percentage of user households in the low socio-economic category is comparatively less than the others, it needs to be statistically validated with larger sample data.

At Kesarpur, while caste and religion do play a strong role in the socio-economic, cultural and political interactions within the village, social access to a telecentre is not denied to because he/she belongs to a particular caste or religion[6]. Households belonging to all castes accessed the telecentre and its services, though the percentage of user households among scheduled castes, and dalits was comparatively less than the OBCs and General. And the percentage of Muslim households availing services at the kiosk is comparatively less than Hindu households. This study disagrees with the findings of the existing literature indicating that caste and religion acts as a social barrier [6], [12]. Neither does the kiosk owner discriminates against people belonging to some castes, nor do people belonging to particular caste communities self-exclude themselves or feel hesitant to access a kiosk located in an area occupied by other caste communities. This can be attributed to the entrepreneurial nature of the kiosk, its location in the village and the type of services available at the telecentre.

The *Drishtee* kiosk at Kesarpur is an entrepreneur-based, for-profit entity that functions just like any other business venture in the market place. In order to remain financially sustainable, it needs to earn revenues by catering to as many clients as possible. Hence, it catered to all its customers irrespective of their socio-economic backgrounds. Further, the kiosk was located in a busy market place, next to public spaces like nationalised banks and it focussed on services like photo and photostat. The socio-economic status, occupation, caste, religion, institutional and political affiliations, gender, age and educational status of the kiosk entrepreneur and other intermediateries did not appear to play any role in the pattern of access and use by the households staying in Kesarpur because these services did not require prolonged interaction with the kiosk operator and spending much time inside the telecentre. Most activities related to the kiosk happened on the common corridor in front of the kiosk – it is the waiting space for the customers, it serves as a studio for taking photographs. At Kesarpur, caste and religion was linked to the household occupation and the socio-economic status of the household and thus determining the need for particular services.

The benefits of the *Drishtee* Kiosk was primarily in terms of convenience and reduction in transaction cost provided by its services like digital photo, photostat and checking of results on the Internet. No other shop provided these services in near vicinity or with reduced costs. People from within the village and nearby locations did not have to travel to the city to avail these services. However, it is difficult to ascertain the extent to which the reduction in travel time and other transaction/opportunity cost translated to savings to have a significant impact on the overall household income and consequently the well-being of the family. Though it did generate some additional income and form of engagement for the kiosk entrepreneur.

[6] At Kesarpur, the interplay of class, caste and religion manifested in almost all economic, social and political aspects of the local context. Households belonging to the same religion or caste community were clustered at one place and, each cluster was separated from the other by *kuccha* brick-laid lanes. Social interactions between various caste and religious communities was defined and limited by economic transactions, related to *zari* business. During peak seasons, the small and big bidders got orders from outside and need extra hand. Apart from the Muslim families, Hindu households, especially those who belonged to low and low-middle groups also took to *karchobi* for additional income. Thus, for distribution and collection of work and payment, boys and men from both the communities visited the households of the other community. In general, social interactions between middle and upper class families of both the religious communities were very limited. The young boys and girls hesitated to move around freely in the area dominated by other caste or religious communities. Children from both the religious communities went to separate schools. Although the practice of untouchability was no longer prevalent, caste and religion subtly influenced social interactions. People from lower castes and also Muslims confirmed acceptability with their guests from other community and caste before offering water, tea or food. Inter-religion and inter-caste marriages were rare.

VI. IMPLICATIONS

At the time of the study, *Drishtee*'s aim was to *create and implement a sustainable, scalable platform of entrepreneurship for enabling the development of rural economy and society through the use of Information and Communications Technologies*. It envisaged that the ICT-enabled platform would be used by both public and private service providers for delivering various kinds of fee-based services to the rural population and benefit the people in three ways: (a) by increasing the per capita income of a village though ventures like e-commerce, BPO and micro-finance, (b) reducing the unit cost of service versus its conventional delivery system as in e-governance, computer education and health, thus inducing savings and,(c) by providing an avenue to better utilize disposable income as in buying insurance. The *Drishtee* model was thus oriented more towards provision of services than enabling communication or giving access to information via the Internet. The services popular at the Kesarpur kiosks were more localised, driven by the demand perceived by the kiosk entrepreneur within the village. Although *Drishtee* did pilot its initiatives in the areas of e-Health, e-Commerce, Agriculture Services and Computer Education, it met with little success in mainstreaming them.

The Dishtee kiosk at Kesarpur was one of the many information channels available in the village. In the village, television and radio are primarily used as source of entertainment whereas landline, mobile phone or public telephone booths are used for communication with relatives, friends and business associates. There was also a craze for reading newspapers. Few people actually bought the newspaper, but it was a fairly common practice to borrow and read, sometimes a day old newspaper also. Regarding computers and Internet, apart from the *Drishtee* kiosk, there was just one more house that had both. At the institutional level, there were computers in only one school and one bank. The *Panchayat* was not yet computerised and none of the related officials were aware of any possibility in the near future.

While there is no big hospital in the village, health facilities at Kesarpur were fairly adequate. There is a primary health centre within the village that also caters to the nearby villages. The village had around seven-trained midwives in the village. Further, medical practioners of modern and alternate medicine have a shop in the village since the establishment costs are low and volumes high. Most travel daily from Bareilly. Quacks, especially dentists also have makeshift shops in the marketplace. People with money and easy facility of travel usually preferred to consult their doctor in Bareilly for big and small health related issues. Thus, *Drishtee*'s telemedicine project using tablet PCs did not become very popular because of the presence of multiple alternatives providing face-to-face consultations and fixing of incentives of the various stakeholders including doctors, midwives, Kiosk entrepreneur and network orchestrator. A key insight is that the potential benefits of technology are greater if they are deployed as part of a larger system. Telecentre as an access point for healthcare services should be deployed as part of the complete telemedicine project implemented by an agency belonging to the health sector. And not in a manner that kiosks are deployed by one agency and then efforts are made to establish links with doctors and hospitals. When deployed as part of a larger initiative, computerization of back-end would simultaneously take place with front-end deployment. Delivery of services via telecentres would thus not be limited by the lack of back-end computerization and systemic process change.

Similar lack of institutional linkage was also observed in case of the e-Commerce and agriculture extension. The telecentre was not part of the existing and established value chain, or other institutions related to the *Zari* business. It thus made it difficult for the network orchestrator to source patterns and designs that are often propriety of the business and fashion houses located in big cities and fiercely guarded. Further, there were no mechanisms that ensured that when the customer selects a design over the Internet, the corresponding embroiderer would get work. Moreover, landline and mobile phones were the common and preferred mode of one-to-one communication between businessmen and their clients.

About agriculture services also, the kiosk did not procure or sell. It just acted as a facilitator for other private companies dealing with agricultural equipments and fertilizers. These companies availed the platform provided by the network orchestrator to conduct meetings in the village. Some farmers felt it was a positive outcome of having the kiosk in the village. They were able to know about particular products and more importantly, such meetings became an occasion for the farmers to come together and exchange notes. Thus, information was exchanged though not by surfing the Internet. However, the farmers were sceptical about the motives of the private firms in making particular recommendations.

Further, for some services like education, the inclination and constraints of the kiosk owner contribute towards its popularity or non-popularity. Computer education was conducted only for about two batches, although students came from very eclectic background in terms of class, caste, community, and occupation. The only common factor was that all of them were at least graduates and perceived that if not at present, computers would advance their career or business in some ways in future. The other common factor was that they all personally knew the kiosk entrepreneur and could be coaxed by him to at least try out a new service. After the two batches got over, the kiosk owner himself became disinterested in the service. Compared to other kinds of services, education requires more time, effort, patience and coordination. Further, revenue needs to be shared with both with the network orchestrator and the teacher, making the cost high and hence

no takers in the village. Also, the unpredictability and almost non-availability of electricity forces the use of generators, at least for the "practical" classes, increasing the cost of delivery. Also because of proximity to a big town with fairly good road connectivity, students from the village prefer to commute regularly and study at bigger and more popular training centers there.

Thus, on the whole the efficacy of the telecentre initiative in generating new jobs in rural areas, increasing efficiency and reach of e-Governance and other basic services, enhancing livelihoods and well-being of the people, and overcoming the rural-urban divide was limited. Further, the findings of the study indicate that although households belonging to all socio-economic categories access some service at the kiosk, the percentage of households with asset base below a certain threshold are less frequent users. Similarly, only around 50% of those without land have availed at least one service. At Kesarpur, a household which cannot access credit or loans from formal sources, has no land or ration card, cannot participate in any welfare scheme, or is not sending the children to school, has no reason to visit the kiosk even for services like photograph or photostat. This finding from a micro context substantiates the findings of the study [30] indicating that when people are excluded from mainstream process of development, they in general find no need to access and use services provided at the telecentre.

VII. Conclusion

Telecentres were envisaged to bring about much transformation in the rural areas of developing countries by proving access to information, services and means of communication. However, in practice they have fallen much short of the expectations; constrained by both contextual and model characteristics. This study highlights that the socio-economic and institutional characteristics of the village like, the occupational pattern, caste and religion often shape the pattern of access and use by generating demand for information and services, defining resources and capabilities of households, facilitating or hindering access and use. The characteristics of the telecentre model and its instance shape access and use by defining the ownership of kiosk, the services provided and their delivery structure.

As of now, telecentres appear to maintain the status-quo in the village. The pattern of access and use reflects the social structure. Services are accessed by households with different socio-economic categories as per their needs, resources and capabilities. Existing socio-economic divides are neither alleviated nor exacerbated since the information or services accessed at the telecentre are not central to the lives and livelihoods of the people. Telecentre is one of the many information or communication channels within the village. Access and use by particular set of households do not leave others at a disadvantage.

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APPENDIX A: CONSTRUCTING THE ASSET INDEX

The asset index is calculated on the basis of select household assets and amenities. Items like type of household, availability of electricity etc. display a pattern across different socio-economic groups; while items like livestock etc. is not considered. For example, almost all farmers irrespective of farm size keep a pair bullocks. And simultaneously there are well-off farmers who do not keep any animals because they no longer have people in their houses to look after them. The minimum value of this aggregate is zero and the maximum is eleven. Higher values for the index indicate more number of assets and correspondingly relatively better economic condition.

PARAMETERS AND VALUES FOR CONSTRUCTING THE ASSET INDEX

Sl. No.	Particular	Attribute Values
1	Type of House	Kuccha (0), Mixed (1), Pucca (2)
2	Availability of Closed Toilet	No (0), Yes (1)
3	Cooking Fuel	Coal/Wood (0), Mixed/Kerosene (1), Gas / Gobar Gas (2)
4	Electricity Available	No (0), Yes (1)
5	Vehicle	None (0), bicycle (1), motorcycle/scooter (2), car/jeep (3)
6	Possess Landline Telephone	No (0), Yes (1)
7	Possess Mobile Connection	No (0), Yes (1)
8	Possess Radio	No (0), Yes (1)
9	Possess Television	No (0), Yes (1)
10	Possess Refrigerator	No (0), Yes (1)
11	Possess Washing Machine	No (0), Yes (1)

APPENDIX B: PARAMETERS AND CRITERIA FOR CATEGORISING HOUSEHOLDS INTO DIFFERENT CLASSES

Criteria	Socio-economic Status (class)			
	Low (20)	**Low-Middle (12)**	**Middle (21)**	**High (13)**
Land	0 to 2.5 acres	2.5 to 5 acres, also Muslim HH with less than 1.5 acres Land is acquired and usually given on *theka* / *batai* because acquisition of land is an investment, a sign of prosperity.	5 to 12.5 acres. Households with less than 5 acres are either are Muslims buying land or Hindu nuclear house, supplemented by some business.	> 12.5 acres
Primary occupation of the head of the household	Bank peon on daily wage, Small Bidder, Carpenter, Iron-Smith (*lohar*), *Chowkidar*, Daily wage (agriculture and construction), Farmer, *Kabadiwala*, Midwife, Potter, *Rajgir* (*mistry*), *Tongawala*	Small Farmer, Deliveryman, Driver, Labour (construction), Rajgir (mistry)	Farmer, Ayurvedic Medical Shop, *Gallawala,* Bank Employee (III or IV), Mini-Bidder, Workshop, *Thekedar*	Large Farmers, *Daroga,* School Teacher Other government employee, Gold Shop owner / Shop-Building Materials/ *Zari* House
Landholding status	Self Cultivator	Self Cultivator, *Batai*, *Makhta*	Self Cultivator, *Batai*, *Makhta*, Landlord	Self Cultivator, Landlord
Type of Irrigation	Rain fed	Rain fed	Part Rain fed; Some have well	Majority have well
Monthly Household Expenditure	Less than or equal to rupees 1500/-	Greater than rupees 1500/- and less than equal to 3500/-	Greater than rupees 3500/- and less than equal to 5500/-	> 5500
Type of House	Primarily *Kuccha*	Half *Kuccha*, Half *Pucca*	Majority have *Pucca*	All *pucca* house
Cooking Space	Most do not have a separate cooking space	Half have separate, other do not	Majority have a separate cooking space	Almost all have separate cooking space
Availability of Toilet	Majority defecate in the open	Majority defecate in the open	Half have closed toilets, others defecate in the open	Majority have closed toilets
Source of Drinking Water	Common tap/ well and piped	Common tap/ well and piped	Majority piped	Piped and private wells
Cooking Gadget	Almost all use *chulha*	Almost all use *chulha*, some mixed	Part *chulha*, gas, mixed	Majority use gas
Availability of electricity	Most do not have	Almost all have	Almost all have	All have
Possession of white goods	None	None	None	Fridge/ Washing m/c
Possession of Media Related items	Radio, couple of them have TV	Radio, television,	Radio, television, DD Direct, landline	Radio, television, DD Direct, landline