



Measuring the Perceived Impact of Internet on Individuals in Rural India

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Introduction

Internet has greatly influenced the way individuals socialize, create and exploit economic opportunities and knowledge resources. However, previous studies on assessment have been limited to examining the factors influencing adoption and usage of Internet from a social and economic perspective and do not consider the role of knowledge enhancement and exchange in assessing impact. In addition, few studies measure impact in an integrated manner. Further, studies based on a theoretical foundation are limited. Consequently, the constituent dimensions of impact, their inter-relationships and their intensity have not been articulated. A theoretical foundation that examines the aspects of social, economic and knowledge enhancements in an integrated manner would help in understanding the phenomena that constitutes impact of Internet use.

To develop a construct for measuring impact, we have examined past studies and augmented these with two theoretical and complementary domains: Social Capital and Social Cognitive Theory. Social Capital refers to the network of near and distant social ties that individuals draw upon for enhancing their information base, knowledge, influence, solidarity for economic or other benefits such as better status or professional standing (Adler and Kwon, 2002, Coleman, 1988; Dekker and Uslaner, 2001; Dolfisma and Dannreuther, 2003; Putnam, 1995; Putnam, 2000). Such networks provide the underlying mechanism for individuals to enhance their knowledge and support knowledge seeking behaviour by providing an environment for knowledge exchange (Lane and Lubatkin, 1998; Snowden, 1998; Wellman and Wortley, 1990). Prior studies indicate the influence of social capital on Internet use (Chiu, et al, 2006; Hsu and Hung, 2013; Wellman, et al, 2001). However, to impute causation is often difficult. Thus, social

networks and knowledge exchanges within the social network could play an important part in influencing economic outcomes.

Social Cognitive Theory posits that an individual's personal cognition (comprising of knowledge and beliefs) and the social network (Gecas, 1989; Huber, 1991) influence and control behavior. The related concept of self-efficacy - beliefs regarding one's ability to perform specific tasks - and outcome expectations - judgment regarding the consequences of performance, are two constructs used within the SCT to study computer use and Internet behaviors (Compeau and Higgins, 1995; Hsu and Chiu, 2004a; Hsu and Chiu, 2004b; Luarn and Lin, 2005). Outcome expectations, level of social interactions, shared knowledge and language drive the quality and quantity of knowledge sharing (Chiu, et al, 2006).

Thus, while theory of Social Capital explains the role of ties in a social network and how these contribute to both economic benefits and knowledge enhancements, Social Cognitive Theory explains impact in terms of self-efficacy and outcome expectations.

Since the Internet is considered a network for social exchanges, a study of impact of Internet would need to take into account the aspect of social capital consequent to adoption and usage of Internet. On another dimension, usage of Internet could lead to increase in economic capital due to enhanced opportunities for business or profession. Internet is also a source of knowledge that could enhance economic or social benefits by creating opportunities for businesses or professional growth. Thus what constitutes impact is a complex construct broadly manifested along social, economic and knowledge dimensions. Further, most such studies have not examined the role of outcome expectations and self-efficacy in driving Internet use. Our study is driven by the need to develop theoretical constructs for measuring impact by identifying the underlying dimensions that constitute impact and create a construct for measuring the same.

Another driver for this study was the lack of studies of impact of Internet in developing countries, especially in rural areas. A large number of studies of Internet have focused on developed countries. The studies in developing countries have been largely limited to urban areas. This was largely due to paucity of Internet in rural areas. Further, most studies have focused on the household as the unit of analysis. Recent government policies of deployments in rural areas and availability of Internet on mobiles has created the need to focus on the impact of Internet for rural individuals.

Literature Review

A study of the literature on impact of Internet largely focuses on adoption factors. Several of these are based on empirical observations (Balboni, et al, 2011; Choudrie and Dwivedi, 2005; Hoffman, et al, 2000; Keegan Eamon, 2004; Madon, 2000; Ooi, et al, 2011; Rice and Katz, 2003). Few focus on the theoretical foundations for measuring impact. We highlight some of these below.

Social Capital

As per Putnam (2000), “Social Capital” is a set of “horizontal associations” among community members for leveraging resources embedded in the network. According to Coleman (1988, 1990), Social Capital is considered an inherent part of the social network and the relationships that constitute the network. Social Capital has the potential to provide growth, productivity, equality, and pecuniary gains (Lin, 2001; Helliwell and Putnam, 1995; Knack and Keefer, 1997; Temple, 2001). Yang (2007) states that though Social Capital is a collective property, individuals draw personal benefits at different levels through the social groups or networks that each individual member can access and hence Social Capital should be measured at the individual level. Social Capital allows individuals to draw on the social ties, information and other

resources of individuals in the network for better working and living conditions, social status, happiness or self-esteem (Glaeser, et al, 2002).

Another way of examining Social Capital is through the lens of types of relationships in a social network (Adler and Kwon, 2002). In this perspective, two kinds of Social Capital have been identified. A focus on external relations constitutes “bridging” forms of social capital, whereas a focus on internal ties or ties with similar groups or individuals refers to “bonding” forms of social capital (Woolcock, 2001, Adler and Kwon, 2002; Dekker and Uslaner, 2001; Uslaner, 2001). On the other hand, Pénard and Poussing (2010) focus on strength of Internet based virtual ties.

Other studies Nahapiet and Ghoshal (1997) have considered the components of Social Capital as i) structural, consisting of the ties and relationships embedded in the network, ii) relational, consisting of factors such as trust, motivation etc. and iii) cognitive consisting of shared vision, motivation etc. In the following, we delve upon the details of each of these dimensions.

Structural Capital

The structural component usually refers to the interactions between the actors. In our case, this refers to the bonding and bridging capital identified above. The role of bridging networks in creating economic capital by supporting employment and enhancing incomes has been established (Beugelsdijk and Smulders, 2003; Lancee, 2010; Leonard, 2004; Ryan, 2011). Since interactions with others allow individuals to leverage their social characteristics, Social Capital may be linked to economic capital (Glaeser, et al, 2002). Thus social capital consists of the aspects of bridging and bonding that may be leveraged for creating or enhancing economic capital.

Measurement of social capital using the structural dimensions has been done by measuring attributes such as number of ties with close and distant friends (Franzen, 2003; Granovetter, 1973; Kraut, et al. 2002), frequency of interactions that measures strengths of ties and enumerating the different organizations the individual is a part of (Glaeser, et al, 2002; Pénard and Poussing, 2010; Putnam, 2000).

Relational Capital

The relational dimension refers to those aspects linkages between actors in the social network that are based on trust and motivation. These enhance actors' willingness to share information. It also enhances motivation to solve problems in a joint manner.

Knowledge Capital

There is an increasing body of work that examines the knowledge or cognitive dimension of social capital (Arrow, 1974; Cicourel, 1973; Conner and Prahalad, 1996; Grant, 1996; Kogut and Zander, 1993; Kogut and Zander, 1996; Monteverde, 1995; Nahapiet and Ghoshal, 1998; Orr, 1990). A large part of the work in this area has examined this from the perspective of an organization, or community of interest. To understand the aspects of knowledge capital in the context of individual, we examined the literature on the creation of Intellectual Capital.

Existing intellectual resources, both in the form of tacit and explicit knowledge, may be combined in different ways to produce new knowledge. Some part of the Knowledge capital is embedded in a social context. Individual knowledge is created both through individual processes of cognition and also through a socialization process (Nonaka, 1994). Nahapiet and Ghoshal (1998) refer to Knowledge Capital as a dimension of Social Capital. Thus knowledge capital is

closely interlinked to the social processes and relationships (Chiu, et al, 2006; Chou, 2010; Hooff and Winter, 2011; Tsai and Ghoshal, 1998).

Thus, Social Capital theory embeds the concept of Knowledge Capital (Nahapiet and Ghoshal, 1998). The process of combination and exchange, inherent in the development of new knowledge, requires individuals to be able to access the available knowledge. A part of this knowledge may be embedded in the individual's social network. Thus, the social network of the individual supports creation of Knowledge Capital.

Another factor that motivates an individual's creation and exchange and recognition of value of new knowledge is "cognition of knowledge". This refers to the willingness of users to "search and notice" knowledge. Other studies that have recognized the role of cognition of knowledge as driver of exchange and dissemination (Chou and Tsai, 2003; King and Ko, 2001). Cognition of knowledge is considered to be made up of two parts: the willingness to notice new knowledge and the process used to search new knowledge. In order to gain new knowledge, individuals may use search tools. Other aspects related to cognition of knowledge are the ability to solve problems using knowledge, identify useful information, willingness to spend time to search for useful knowledge. In the context of the Internet, cognition of knowledge could be through search engines, specialized websites, communities of interest and user based virtual communities.

The opportunities for individuals to create Knowledge Capital have significantly increased with the advent of the Internet. Individuals have access to a variety of knowledge resources through various websites, educational software, databases etc. For example, access to Internet also allows individuals to enroll for distance learning in a college/university of their choice (Madon, 2000), thus increasing their knowledge capital. Internet also facilitates knowledge cognition, by facilitating awareness of new knowledge through user forums, social networks and emails. It also facilitates the process of searching for new knowledge through search tools such as Google

search engine. For individuals to participate in the knowledge creation and sharing there must be an expectation of value creation. Further, research on Internet usage also shows that increasingly it is being used for gathering and structuring information, which creates a knowledge capital (Chiu, et al, 2006).

Social Capital can be “converted” to other kinds of capital as the social network may be leveraged for economic gains or knowledge enhancements (Adler and Kwon, 2002). On the other hand, both knowledge and economic capital could lead to development or enhancement of Social Capital. The perceived impact of Internet thus could be in terms of structural or relational capital created or shared, knowledge capital and economic capital as a consequence of using the Internet.

Economic Capital

Increased productivity and innovation, value chain re-composition, access to public services and information, savings in transport time, timely access to health and education services, construction effect (multipliers) have been the major economic impacts of Internet.

Internet enables growth in scope of earning and induces behavioral changes with respect to new ways of earning more (increasing scope/scale of doing business, increased customer base/supplier base, enhanced product portfolio, enhancing employment opportunities etc).

Social Capital has positive associations with job prospects, career, compensation, resource exchanges (Hsu and Hung, 2013). It has been found that at home and at work the skills and behaviors related to Internet use are rewarded in the labor market and hence have an economic impact (Balboni, et al, 2011; Grazzi, 2011; Navarro, 2010).

Interactions

The knowledge embedded in the social interactions could lead to creation or enhancement of social aspects such as strengthening the bridging and bonding or/and creation and enhancement of economic capital. This shows how Social Capital facilitates creation of Knowledge Capital (Coleman, 1988).

A review by Hsu and Hung (2013) examined studies focused on social capital in the area of Information Systems, found that a large number of them assessed the role of social capital in terms of its constituent elements namely structural, relational, and cognitive and regarded these as independent elements. These studies have examined the elements of social capital and its impact on various dimensions of Information Systems, largely in an organizational context (Chiu, et al, 2006; Hsu and Hung, 2013; Kirsch, et al, 2010). Other studies have examined the impact of social capital on attributes such as commitment, knowledge sharing, quantity of knowledge sharing etc., (Chiu, et al, 2006; Hooff and Huysman, 2009; Hooff and Winter, 2011). Yet others have tried to estimate the effect of the structural and relational elements on knowledge creation and exchange (Atuahene-Gima and Murray, 2007; Chiu, et al, 2006).

Internet has provided an effective means for enhancing Social Capital by facilitating bonding and bridging and leveraging the embedded knowledge within these interactions. Such interactions could lead to economic benefits such as increase in job opportunities. Horrigan (2002) links Social Capital to ICT access in institutions by showing how Internet acts as a medium that reduces transaction costs, and hence helps build Social Capital. Therefore, Internet can be said to facilitate linkages of information exchange that can boost cooperation and hence strengthen Social Capital. Some studies have indicated interactions between the three dimensions in the context of IS projects in organizations (Hsu and Hung, 2013). The use of social capital for

generating economic capital and enhancing knowledge have been elaborated in (Mariscal, 2005; Quan-Haase and Wellman, 2004; Wellman, et al, 2001).

While several studies have attempted to explain the causal relationships between the three elements of social capital identified by Nahapiet and Ghoshal (1997), based on cross-sectional data, later studies indicate that such data are insufficient for showing causality.

Social Cognitive Theory

Social Cognitive Theory posits that an individual's personal cognition (comprising of knowledge and beliefs) and the social network (Gecas, 1989) influence and control behavior. The concept of self-efficacy - belief regarding one's ability to perform specific tasks and outcome expectations - judgment regarding the consequences of performance are two constructs used within the Social Cognitive Theory to study computer use and Internet behaviors (Larose, et al, 2001). The beliefs in one's capability to organize for performing tasks on the Internet is an important driver of adoption and usage and hence Perceived Impact. Outcome expectancy and prior Internet use has played an important role in self-efficacy (Eastin and LaRose, 2006). Outcome expectations, level of social interactions, shared knowledge and language drive the quality and quantity of knowledge sharing (Chiu, et al, 2006).

Summary

Perceived Impact is measured in terms of outcome expectations that could result from enhancement of social, economic or knowledge capital. However, there are few studies of impact that have examined the theoretical basis for measuring it. Although the overall impact has been considered individually over the three dimensions of structural, relational and knowledge, there are hardly any studies that examine the components of impact.

Our objective is to uncover the underlying dimensions that constitute impact, their inter-relationships and the strengths of the inter-relationships using the Social Capital and Social Cognitive Theory. While Social Capital theory identifies the dimensions of impact and their relationships, Social Cognitive Theory identifies the drivers of impact based on outcome expectation of increased social, knowledge or economic capital.

We use the theory and prior empirical work to develop constructs along the three dimensions identified above for measuring impact.

Methods

We used a survey based instrument as our underlying tool. The main dimensions on which we collected data were on the perceived impacts on social, economic and knowledge enhancements. Items for data collection were based on the literature survey.

Principal Component Analysis (PCA) was used to identify the latent perceptual dimensions that constitute impact as PCA would help to reveal the internal structure of the data in a way that best explains the variance in the data. Subsequently, using the dimensions uncovered in PCA, we used linear regression to posit the strengths of each identified dimension in contributing to Perceived Impact.

Sampling

We used quantitative methods based on survey of Users of Internet in rural areas of India to develop a tool for measuring impact.

Since the research was based on ‘Perceived Impact’ and perceptions are contextual, the researchers conducted focused group discussions (FGDs) of Internet users to assess the

contextual nature of the perceived notions about the Internet impact. We covered users who had used the mobile internet or data card or wired internet for surfing/browsing. The sampling technique used in the case was systematic random sampling.

Pilot

The researchers developed a structured questionnaire for a pilot study. The aim of the pilot study was to: 1) Ascertain that the questionnaire correctly captured the phenomenon that the researchers desired; 2) Verify that the questions asked were understood as desired by the researchers; 3) Determine that no important aspect of impact dimensions were left out; 4) Capture any new insight that might come up from a respondent at the time of interview.

The two pilot projects that we assessed were in rural areas and covered:

- a. Ranchi district, in the state of Jharkhand, India
- b. Guna district, in the state of Madhya Pradesh, India

Appendix 1 provides the details of both the locations.

Constructs and Measurement

Constructs

A literature review was done to generate a comprehensive list of items to measure the dimensions of Perceived Impact of Internet.

For generating our constructs, we used theory underlying social capital and social cognitive theory. However, our context of individual user of Internet, did not give scope to use the relational construct that constitutes social capital. We used the structural and knowledge constructs. We also added the construct of economic capital based on the aspect of outcome expectations posited by social cognitive theory. The logic of convertibility of social capital to

knowledge and economic capital articulated above also supported our thesis of developing construct along this dimension.

Structural Capital: For measuring the change in structural capital, we have used the concept of bridging, bonding and linking through assessing perceptions in change in modes of social engagement, enhanced communication with friends, enhanced bonding with the community. To assess different aspects of impact, respondents were asked whether Internet enabled them to intensify their linkages with their social circles, facilitated their being able to be in touch with friends, intensified off line being in touch due to on-line coordination, increased their social circle, increased their knowledge about the welfare of their friends and relatives, increased their scope of well-being by increasing the number of people they could be in touch with in emergencies and increased the number of people who could help in improving their current ability to earn. Other than the last two, the above factors have been verified/tested by (Pénard and Poussing, 2010). The last two attributes were identified based on our FGDs and pilot study. The first attribute is based on our understanding that respondents in rural areas feel vulnerable in being able to deal with emergencies due to paucity of physical and institutional infrastructure and hence rely on their social networks for help. The second attribute arose from the views of respondents in light of lower wages and opportunities available to them and hence their focus on the current ability to earn.

Knowledge Capital: The survey instrument rated users' perceptions on their ability to search for and understand the subjects that they would not have been able to do otherwise, exchange ideas about work with other people, chance to share knowledge with others who have the same area of interest, the extent of usage of video for increasing understand, extent of facilitation regarding understanding the linkages among different topics. These factors were based on the literature

¹ <http://www.oecd.org/insights/37966934.pdf>, accessed on October 6, 2014

survey that linked social networks as contributors to individual knowledge, personal cognition, creation of knowledge through a process of combination, and search processes available.

Economic Capital: We identified items that reflect the i) scope of enhancing business such as increased number of customers/suppliers, selling of new products, geographical reach, intensified competition, existing business and new business opportunities ii) increase efficiency of business such as efficient business related transactions, reduced travel time, waiting time and cost of supplies and iii) scope of collaboration and feedback and iv) facilitating business and work related information. This selection was based on the theoretical work listed above and prior empirical work in developed and developing countries.

Survey Instrument

Table 1 gives an overview of respondent profile. Besides demographic data, respondents filled in data regarding their age, gender, educational levels, type of house, asset ownership, household income, occupation, sources of information, travel requirements and awareness of Internet (22 items). For measuring impact, we used increase in scope, efficiency, Internet usage, effectiveness of increasing business and social ties, types of social ties and their strength, and knowledge structuring as broad categories for measuring the impact along the three dimensions: Social, Knowledge and Economic (29 items).

A five point Likert-type scale was used where 1= Strongly Disagree, 2= Disagree, 3= Neither Agree or Disagree, 4=Agree and 5= Strongly Agree to measure the items. The number of survey respondents was 319. The significance threshold was set at .05.

SPSS 16.0 was used for running various tests. Likert scale used in the study is treated as variables with interval scale category. The descriptive (Appendix 2) gives an overview of basic statistics of the data that includes minimum, maximum, mean, standard deviation, and variance.

Table 1: Respondent Profile

Category	Sub-Category	Number	%	Coding for Analysis
District	Guna	149	47	-
	Ranchi	170	53	-
Age	Up to 25 years	106	33	0
	Above 25 years	213	67	1
Occupation	Business	143	45	0
	Others	176	55	1
Digital Literacy	Digitally Less Literate	112	35	0
	Digitally More Literate	207	65	1
Earnings	Up to Rs 15,000	211	66	0
	Above Rs 15,000	108	34	1
Education	Up to SSC/HSC and College	168	53	0
	Graduation/Post Graduation	151	47	1
Gender	Male	295	92	-
	Female	24	8	-

Missing Values

Analysis of the responses of various questionnaires showed some missing values for some items in a particular response. The ‘non-response’ responses were rejected and these are reported in the respective questions wherever applicable. In the questionnaires, the missing data can be classified as Missing Completely at Random (MCAR).

Validity and Reliability:

Personal interviews with the users were conducted. Since the instrument had questions related to perceptions, investigators were trained to understand the nuances of the items of the Likert scale and administer it properly in the field. Each interview took about one hour each. At the end of this process, we came up with 16 items on economic, 5 items on the social, 5 on knowledge and 2 on economic and knowledge and 1 one social and economic dimension.

Internal Consistency Reliability

Item Reliability was examined by using internal consistency of the items by using Cronbach Alpha. We also used standardized score to estimate reliability. Positive correlation is needed for the alpha coefficient because variables measure a common entity. For all the dimensions, the Cronbach Alpha was .988. This was greater than the suggested value of 0.70 given by Nunnally and Bernstein (1994) and fairly close to 1. Appendix 3 gives a detailed account of reliability analysis. Cronbach Alpha if items were deleted was .987 which is very high. Hence none of the items were dropped from further analysis.

KMO-Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy score varies between 0 to 1 with a minimum suggested value of .6. The value closer to 1 is considered to be a better score and our test results gave us a score of .977 (Appendix 4). KMO-Bartlett's Test of Sphericity gave us an indication that our results have passed the minimum standard to qualify for a principal components analysis to be conducted.

Principal Component Analysis

Principal Component Analysis (PCA) was used to identify the latent perceptual dimensions that constitute impact as PCA would help to reveal the internal structure of the data in a way that best explains the variance in the data. Subsequently, using the dimensions uncovered in PCA, we used linear regression to posit the dimensions of impact and the strengths of each identified dimension in contributing to impact.

We conducted PCA with factor extraction and VARIMAX rotation to examine the unidimensionality/ convergent and discriminant validity. Eigen values of over 1 were taken into consideration. Table 2 gives an account of how factors were loaded and percentage of variance

explained. The PCA gave us three components that explained 40.89%, 36.53% and 8.71% of variation. Appendix 5 gives the detailed results of PCA.

Based on the underlying semantics of the attributes that respectively loaded on to each of these dimensions, these were labeled as:

1. Enhanced Scope of Work
2. Empowerment
3. Transactional Efficacy

Enhanced Scope of Work: This component explains the highest level of variance (40.89%). This attribute reflects growth in business or support for professional growth. The attributes that load on this relate to skill enhancement and selling of new products, increase in business, new opportunities, geographical reach, reduction in travel time, availability of new information, intensified competition, efficiency, reduction in waiting time and bringing down the expenses, professional contacts and searching for new topics.

The component that explains the second highest level of variance (36.53%) is labeled as Empowerment. The attributes loaded into this may be broadly divided into four dimensions:

- a) **Informational Power:** The ability to have accurate information gives a sense of empowerment, especially in a rural context where availability of accurate information is an issue.
- b) **Structural Social Capital:** This is measured by attributes such as ease of staying in touch, ability to maintain near and distant social ties.
- c) **Management of Vulnerabilities:** This is related to ability to contact people during emergencies, improving current ability to earn and managing hardships associated with

physical travel related to work (in rural areas, infrastructure and services related to travel are poor).

- d) Knowledge Creation and Cognition: The attributes that relate to this are help in viewing videos for learning and understanding subjects, getting a chance to talk to people interested in same topics, understanding linkages among related topics, exchanging ideas about work, help in being more confident, in expectation of work/job requirement. We see that knowledge creation and cognition loads on the dimension that has many variables from the social dimension.

We label the third dimension as Transactional Efficacy which explains 8.7% of variance. The two attributes related to it are a) Extent of on-line transactions and b) Getting feedback on business/work related issues

Table 2: PCA Loadings and Variance

Sr No	Components	Loading	% of Variance
Enhanced Scope of Work			
Internet Use:			
1	Helped me sell new products using the same channel / Helped me find new ways of enhancing my skills at work (indirect economic benefit)	0.84	40.888
2	Increased my existing business/work/ job opportunities	0.833	
3	Increased my new business/work/ job opportunities	0.832	
4	Increased the geographical reach of my business (customer/suppliers) than before/ Increased my professional circle as I am more connected	0.828	
5	Has reduced my travel time for business/work related activities	0.827	
6	Helped me in searching for new information related to business/work	0.826	
7	Has intensified competition/ I feel competitive pressure	0.823	

Sr No	Components	Loading	% of Variance
8	Helps me conduct my business/work related transactions efficiently (deal with more people in the same amount of time)/	0.821	
9	Increased the number of customers/suppliers for my business / number of professional contacts that I need to be in touch with for work	0.813	
10	Helped searching information on topics related to Business/work	0.81	
11	Helped me collaborating with others for business/ work	0.809	
12	Has reduced my waiting time for business/work related activities	0.8	
13	Brought down the cost of my supplies as I get competitive rates from different vendors/ Brought down my work cost as I get accurate information from the Internet related to my work (I spend less time so there is less work cost)	0.8	
Empowerment			
Internet Use:			
14	Increased the number of people who can help in improving my current ability to earn	0.815	36.527
15	Helped viewing videos for learning and understanding in a better way	0.815	
16	Helped searching and understanding the subjects that I would not have been able to understand otherwise	0.809	
17	Helped in getting a chance to talk to other people who are interested in the same topics as I am interested in	0.807	
18	Enabled me to be in touch with my friends' friends which has increased my social interactions	0.806	
19	Increased my knowledge of welfare and whereabouts of friends & relatives outside the city?	0.803	
20	Has increased my interactions with my relatives/friends (through emails/social networking sites etc)	0.795	
21	Helped in understanding the linkage among related topics better because of Internet	0.788	
22	Helped in exchanging ideas about work with other people	0.782	
23	Has made it easy for me to stay in touch with relatives/friends with whom I would not have otherwise stayed in touch.	0.772	
24	Helped in being more confident in expectation of my work requirement/job role	0.696	
25	Helped in getting accurate information	0.687	

Sr No	Components	Loading	% of Variance
26	Helped to do some part of my work without being at the place of work, physically	0.686	
27	Increased the number of people who I can turn to in case of emergency	0.649	
Transactional Efficacy			
Internet Use:			
28	Helped in banking online for business/work related transactions /conducting online transaction (booking railway, airline, bus etc./shopping for clothes/shoes/electronic items/books etc.)	0.799	8.711
29	Helped in Getting feedback on business/work related issues	0.698	

Correlation Matrix

Enhanced Scope of Work - The correlation matrix reveals that the variables in this construct are strongly correlated with Pearson correlation value of more than .843 for all variables. The p values of the test are significant at the 0.01 level.

Empowerment - The correlation matrix reveals that the variables show a good Pearson correlation values expect for one factor. For the question related to “people who can be contacted during emergency” the Pearson coefficient values are comparatively lower and range from .493 to .644. However, these values are acceptable. For rest of the factors the Pearson coefficient is on a minimum of .622. Overall the group shows strong correlation with p values significant at the 0.01 level.

Transactional Efficacy – This group had only two variables that displayed a correlation of .703 with a significant p value at the 0.01 level. Appendix 6 gives a detailed account of correlation results.

Regression

To uncover how the three latent dimensions that constitute Perceived Impact are related and their relative contribution to Perceived Impact, we ran a multiple regression, using the principal components identified above as the independent variables and the Perceived Impact as the dependent variable. Subsequently, we ran a second regression to control for effects of digital literacy, gender, age and household income by introducing dummy variables corresponding to these attributes. These were coded as binary variables with the following scheme:

1. Age: 0 = Up to 25 years, 1 = Above 25 years
2. Occupation: 0 = Business, 1 = Others
3. Digital Literacy: 0 = Less Literate, 1 = Digitally Literate
4. Earnings: 0 = Up to Rs 15,000, 1 = Above Rs 15,000
5. Education: 0 = Up to SSC/HSC and College, 1 = Graduation/PG

Bootstrapping and PLS Algorithm

We used Smart PLS V3.2.3 for bootstrapping which is a resampling technique to obtain accurate results and PLS Algorithm for multiple regression. Bootstrapping and PLS Algorithm was a two-step process:

Step 1: Without controlled variables

Step 2: With controlled variables

Step 1: Without Controlled Variables

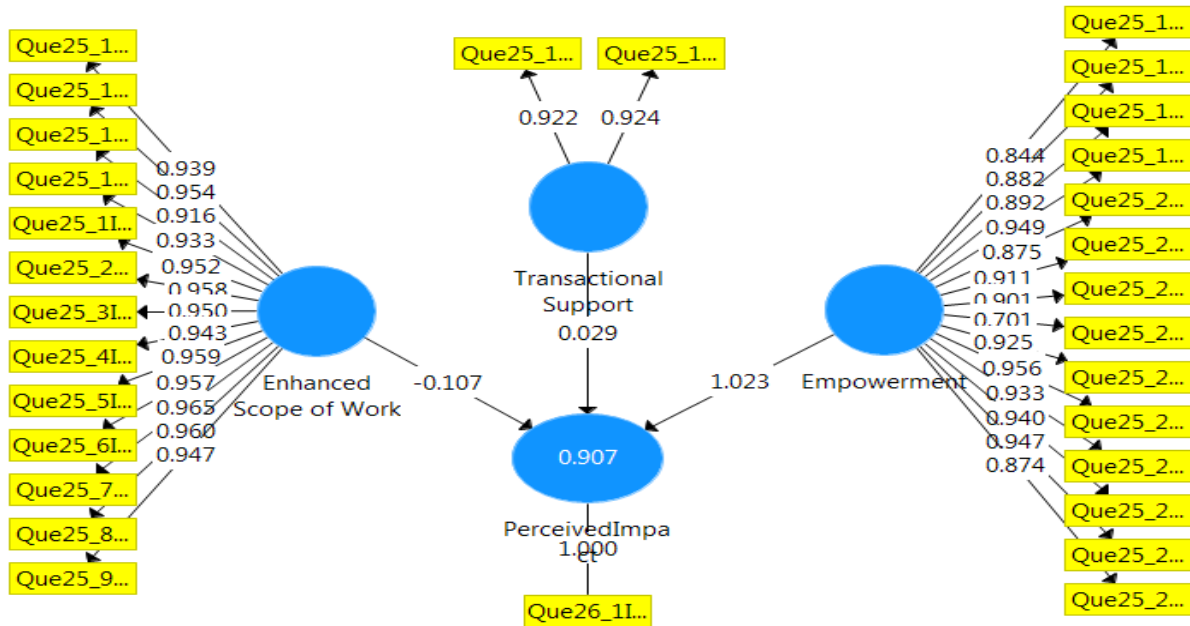
Table 3 and Figure 1 indicate the significance, loadings of respective constructs and R^2 on the Perceived Impact

Table 3: Significance and Loadings on Perceived Impact

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Empowerment -> Perceived Impact	1.023	1.024	0.030	33.698	0.000
Enhanced Scope of Work -> Perceived Impact	-0.107	-0.107	0.037	2.894	0.004
Transactional Efficacy -> Perceived Impact	0.029	0.028	0.018	1.571	0.117

The path loadings for ‘Empowerment’, ‘Enhanced Scope of Work’ and ‘Transactional Efficacy’ turned out to be 1.023, -0.107 and 0.029. Out of the three factors, only ‘Empowerment’ and ‘Enhanced Scope of Work’ were significant with p-values < 0.001 and 0.004. The path loading of ‘Transactional Efficacy’ despite being positive was insignificant with a p-value of 0.117. R² value for model was 0.907 showing that a very high amount of variation is explained by the model.

Figure 1:



Step 2: With Controlled Variables:

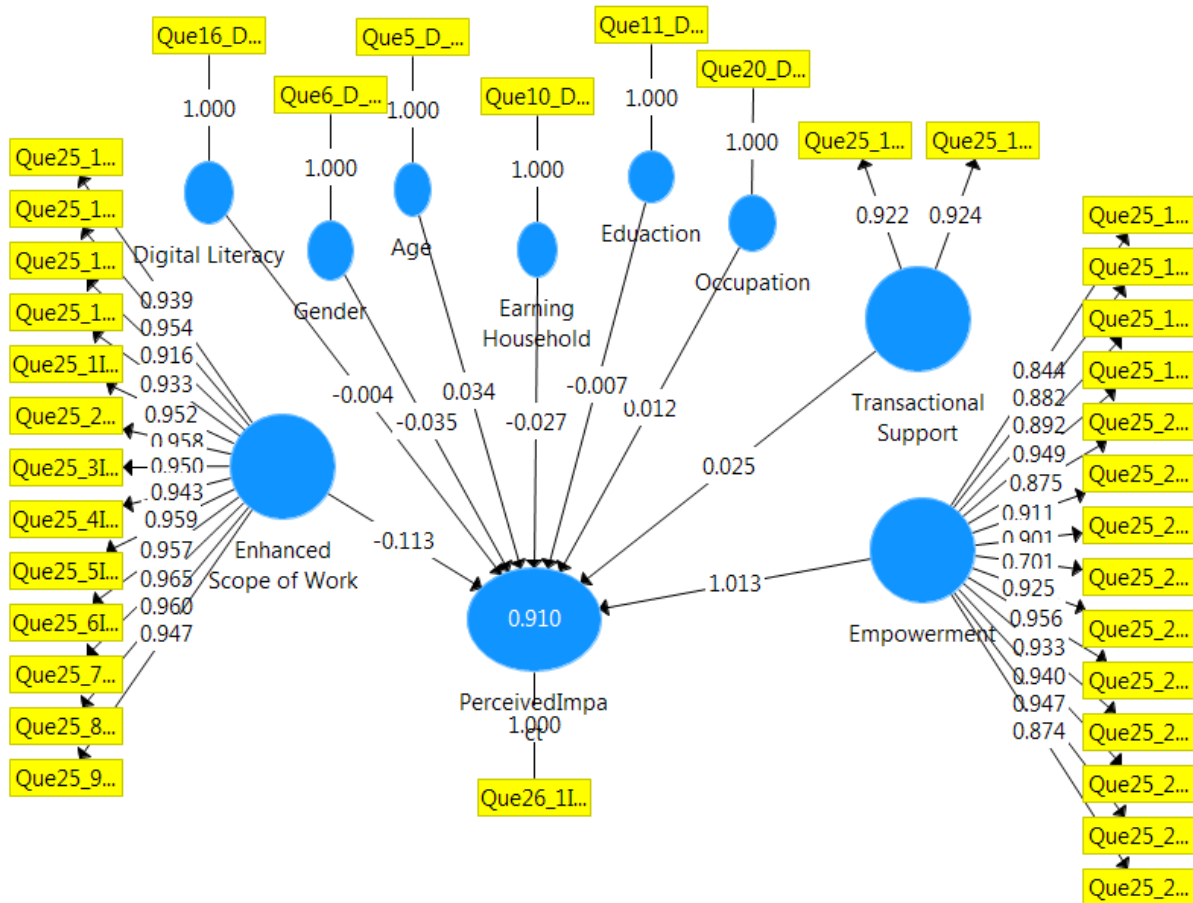
Table 4 and Figure 2 indicate the significance, loadings of respective constructs, control variables and R² on the Perceived Impact.

Table 4: Significance and Loadings on Perceived Impact

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Age -> Perceived Impact	0.034	0.033	0.018	1.952	0.051
Digital Literacy -> Perceived Impact	-0.004	-0.004	0.033	0.116	0.908
Earning Household -> Perceived Impact	-0.027	-0.026	0.022	1.251	0.212
Education -> Perceived Impact	-0.007	-0.006	0.018	0.422	0.673
Empowerment -> Perceived Impact	1.013	1.013	0.034	29.652	0.000
Enhanced Scope of Work -> Perceived Impact	-0.113	-0.112	0.044	2.573	0.010
Gender -> Perceived Impact	-0.035	-0.034	0.017	2.015	0.044
Occupation -> Perceived Impact	0.012	0.013	0.017	0.721	0.471
Transactional Efficacy -> Perceived Impact	0.025	0.024	0.021	1.200	0.231

After the introduction of controlled variables, path loadings for ‘Empowerment’, ‘Enhanced Scope of Work’ and ‘Transactional Efficacy’ changed to 1.013, -0.113 and 0.025. Out of the three factors, ‘Empowerment’ and ‘Enhanced Scope of Work’ were significant with p-values < 0.001 and 0.010. The path loading of ‘Transactional Efficacy’ despite being positive was still insignificant with a p-value of 0.231. Out of the five control variables introduced in this model, ‘Age’ was somewhat significant with a p-value of 0.051 and loading of 0.032 and ‘Gender’ with p-value of 0.044 and loading of -0.035. The other factors such as ‘Digital Literacy’, ‘Earning’ and ‘Occupation’ were insignificant. The R^2 for this model increased by a small amount to .910 indicating a good fit.

Figure 2:



Multiple Linear Regression

A multiple linear regression was done to predict Perceived Impact. The regression equation was $(F(8,310) = 391.227, p < .001)$, with an R^2 of .910. Enhanced Scope of Work and Empowerment were significant predictor of Perceived Impact.

$$\text{Perceived Impact} = 1.013 * (\text{Empowerment}) - 0.113 * (\text{Enhanced Scope of Work}) + 0.034 * (\text{Age}) - 0.035 * (\text{Gender})$$

As would be expected, the ‘Perceived Impact’ for women is lower for reasons cited earlier in the text.

Multicollinearity

The VIF values for all the independent factors are less than 10. Hence we can conclude that multicollinearity does not exist in the given model. Appendix 7 gives an account of multicollinearity results.

Results

- a) The effect of Empowerment on Perceived Impact is significant and positive. This is intuitive and logical. The aspect of dealing with using Internet for overcoming vulnerabilities, in terms of the information, physical and institutional infrastructure was highlighted by the high factor loadings of attributes related to this aspect. This aspect has not been considered in previous studies.

- b) The effect of Enhancement of Scope of Work on Perceived Impact is significant and negative. The negative sign is counter-intuitive. However, this could be explained by understanding the theory behind satisfaction formation. Disconfirmation theory stipulates that satisfaction from Internet use is mainly determined by the gap between cognitive standards and desires or expectations, and perceived performance (Khalifa and Liu, 2003; Khalifa and Liu, 2016; O’Neill, et al, 2003; Staples, et al, 2002; Suh, et al, 1994). Negative disconfirmation arises when the perceived performance, especially for Internet based services is below expectation or desires. A study to develop model for expectations and desires as drivers of satisfaction with Internet based services has indicated that desire disconfirmation, expectation disconfirmation and perceived performance need to be considered together to assess satisfaction with Internet based services (Khalifa and Liu, 2002).

In the context of our study, the above indicates that possibly the individuals who used the Internet had high levels of desires and expectation on ‘Enhancement of Work Scope’ by

using the Internet. The outcomes on this dimension were lower than their desires and expectations, leading to a negative perception. This gap could be due to the novelty factor and the changing nature of scope of features and services available on the Internet that create dynamic determinants of satisfaction. Such changes could lead to users possibly having low self-efficacy and higher negative disconfirmations. This gap could also be due to the individuals not getting enough support for enhancing their scope of profession as there may not be enough or relevant content for individuals in rural areas. In addition, lack of content in local language, poor presence of local websites, inadequate quality of Internet connectivity and meagre Internet penetration (Balboni, et al, 2011; Jain, 2012) lead to low levels of perceived performance. Thus, high expectations and desires could be driving the negative disconfirmation and hence the negative sign on this dimension. On the other hand, the 'Enhancement of Scope of Work' is significant in terms of its Perceived Impact.

- c) The effect of 'Transaction Efficacy' on Perceived Impact is insignificant. This could be due to the low levels of transactions by the survey respondents. This could be because Internet services in the survey area had become available only a few months back and may not be have levels of service quality in the initial phases. Studies of Internet adoption indicate that users initially begin with the usage of Internet for social purposes. Only when they feel comfortable with various uses of Internet and see the benefits of on-line transactions, they may graduate to it. On-line transactions for e-commerce are a relatively newer phenomena and many individuals in rural areas may not be able to participate on account of not having Internet banking, delivery of services to rural area, lack of trust in on-line transactions. .

Conclusions

While several prior studies have focused on an organization or a community context, our study focused on the rural individual.

We developed a model for assessing Perceived Impact of Internet use. The model took into account the inherent dimensions of structural and knowledge capital from the theory of social capital and added economic capital in assessing impact. We also used self-efficacy and outcome expectations as constructs from Social Cognitive theory to drive the development of our survey instrument. We used PCA and multiple regression to identify the inherent dimensions and their contributions to Perceived Impact.

We identified two constructs that help to explain Perceived Impact as ‘Empowerment’ and ‘Enhanced Scope of Work’. The ‘Empowerment’ construct contributes positively and statistically significantly to Perceived Impact. The ‘Enhanced of Scope of Work’ construct has statistically significant contribution though has negative sign. Theory of Disconfirmation regarding satisfaction of Internet services vis-à-vis desired and cognitive expectations in relation to the perceived performance of Internet services at the current levels of Internet penetration and adoption help to explain this aspect.

Knowledge creation and cognition on the Internet is perceptually recognized as having a social dimension. The role of Internet in overcoming vulnerabilities, in terms of the information, physical and institutional infrastructure in rural areas was highlighted by the high factor loadings of attributes related to this aspect. This aspect had not been considered in previous studies.

Areas of Further Work

This study was done at an early stage of Internet deployment in the rural areas. At this stage adoption was not high and service quality may not have been adequate. These factors could influence the Perceived Impact. Although our model does not take into account the Quality of Service (QoS) explicitly, it is possible that users' decision to adopt certain features of Internet services may depend on it. For example, poor QoS could lead individuals to not adopt on-line banking. They may not be sure whether their transaction would go through given the poor quality of services.

A longitudinal study to study how the different dimensions of Perceived Impact change over time would provide rich data on the stages of Perceived Impact of Internet.

This study focused only on Internet users. Further work needs to be done to make it applicable to a general population.

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Appendix 1: Pilot Project Details

1. **Ranchi:** It is situated in one of the most backward states of India (Figure 3). As in most backward rural areas, many villages in Ranchi district had poor connectivity. Airjaldi, has covered around 60 villages in five blocks near Ranchi (Ormanjhi, Kanke, Angara, Gola, Patratu), by providing them low cost wireless Internet broadband. The population of all the five blocks included is 14,34,649 approximately.

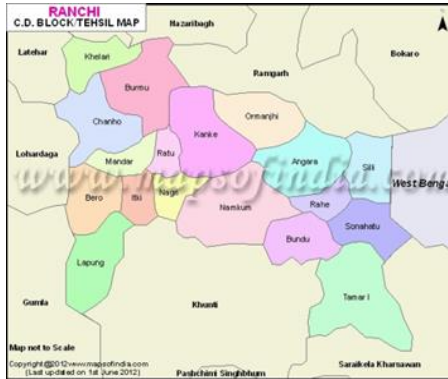


Figure 3: Ranchi district map Source: Maps of India.com accessed on 28th February, 2015

2. **Guna:** The second site was also in an economically backward part of India, at Guna, in Madhya Pradesh (Figure 4). The population of Guna is 137175. DEF has provided wireless Internet broadband in this part through innovative low cost technology. DEF largely provided connectivity on the periphery of the two small towns of Guna and Shivpuri and six villages around them that were away from the city.



Figure 4: District map of Guna Source: Mapsofindia.com accessed on 28th February, 2015

Appendix 2: Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Que25_1IncProfCont	319	1.00	5.00	3.5455	1.50167
Que25_2EnhSkillWk	319	1.00	5.00	3.5266	1.52084
Que25_3IncGeoReach	319	1.00	5.00	3.5361	1.48508
Que25_4IntensifiedCompetition	319	1.00	5.00	3.4828	1.52098
Que25_5IncExtJobOpp	319	1.00	5.00	3.4984	1.51071
Que25_6IncNewJobOpp	319	1.00	5.00	3.4577	1.52255
Que25_7ConductTransEff	319	1.00	5.00	3.4984	1.50445
Que25_8ReducedTvIT	319	1.00	5.00	3.4953	1.52314
Que25_9ReducedWaitingT	319	1.00	5.00	3.5392	1.50184
Que25_10BroughtDownSup	319	1.00	5.00	3.4608	1.54519
Que25_11SrInfoBwk	319	1.00	5.00	3.4890	1.57387
Que25_12onlineTrans	319	1.00	5.00	2.9185	1.44270
Que25_13CollaboratingB	319	1.00	5.00	3.4044	1.45675
Que25_14SrInfoWk	319	1.00	5.00	3.3730	1.47581
Que25_15FeedbackWk	319	1.00	5.00	2.8088	1.36365
Que25_16InfoAccurate	319	1.00	5.00	3.3574	1.38189
Que25_17WkWithoutPhysicaly	319	1.00	5.00	3.5580	1.30875
Que25_18IntMoreConfident	319	1.00	5.00	3.5674	1.40115
Que25_19IncInteractionFrnd	319	1.00	5.00	3.6301	1.42568
Que25_20EasyStayTouch	319	1.00	5.00	3.4734	1.40252
Que25_21touchmyFrndsFrnd	319	1.00	5.00	3.5078	1.45340
Que25_22IntOutsideTheCity	319	1.00	5.00	3.4828	1.53334
Que25_23IncPeopleEmergency	319	1.00	5.00	3.0690	1.47781
Que25_24ImprCurrentAbilitYrn	319	1.00	5.00	3.5204	1.54148
Que25_25UnderstandSubject	319	1.00	5.00	3.6458	1.51406
Que25_26ExchangIdeas	319	1.00	5.00	3.6301	1.46054
Que25_27talkToInterestedSameTopic	319	1.00	5.00	3.5862	1.52483
Que25_28VideosLearning	319	1.00	5.00	3.6238	1.56701
Que25_29LinkageTopics	319	1.00	5.00	3.3887	1.54370
Valid N (listwise)	319				

Appendix 3: Inter Reliability Analysis

Case Processing Summary

		N	%
Cases	Valid	319	100.0
	Excluded ^a	0	.0
	Total	319	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.988	.988	29

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Que25_1IncProfCont	96.5298	1286.527	.913		.987
Que25_2EnhSkillWk	96.5486	1286.211	.904		.987
Que25_3IncGeoReach	96.5392	1289.155	.898		.987
Que25_4IntensifiedCompetition	96.5925	1287.487	.892		.987
Que25_5IncExtJobOpp	96.5768	1286.383	.909		.987
Que25_6IncNewJobOpp	96.6176	1285.419	.911		.987
Que25_7ConductTransEff	96.5768	1284.912	.927		.987
Que25_8ReducedTviT	96.5799	1284.886	.915		.987
Que25_9ReducedWaitingT	96.5361	1286.514	.913		.987
Que25_10BroughtDownSup	96.6144	1285.049	.900		.987
Que25_11SrInfoBWk	96.5862	1281.677	.914		.987
Que25_12onlineTrans	97.1567	1319.875	.622		.989
Que25_13CollaboratingB	96.6708	1294.561	.863		.988
Que25_14SrInfoWk	96.7022	1291.015	.886		.988
Que25_15FeedbackWk	97.2665	1321.265	.646		.988
Que25_16InfoAccurate	96.7179	1304.423	.810		.988
Que25_17WkWithoutPhysicaly	96.5172	1303.603	.866		.988
Que25_18IntMoreConfident	96.5078	1296.899	.875		.988
Que25_19IncInteractionFrnd	96.4451	1292.342	.905		.987
Que25_20EasyStayTouch	96.6019	1303.121	.810		.988
Que25_21touchmyFrndsFrnd	96.5674	1296.473	.846		.988
Que25_22IntOutsideTheCity	96.5925	1293.324	.829		.988
Que25_23IncPeopleEmergency	97.0063	1319.377	.611		.989
Que25_24ImprCurrentAbilitYrn	96.5549	1289.631	.859		.988
Que25_25UnderstandSubject	96.4295	1286.252	.908		.987
Que25_26ExchangIdeas	96.4451	1291.512	.891		.987
Que25_27talkToInterestedSameTopic	96.4890	1287.854	.886		.988
Que25_28VideosLearning	96.4514	1284.607	.891		.987

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Que25_1IncProfCont	96.5298	1286.527	.913		.987
Que25_2EnhSkillWk	96.5486	1286.211	.904		.987
Que25_3IncGeoReach	96.5392	1289.155	.898		.987
Que25_4IntensifiedCompetition	96.5925	1287.487	.892		.987
Que25_5IncExtJobOpp	96.5768	1286.383	.909		.987
Que25_6IncNewJobOpp	96.6176	1285.419	.911		.987
Que25_7ConductTransEff	96.5768	1284.912	.927		.987
Que25_8ReducedTvlT	96.5799	1284.886	.915		.987
Que25_9ReducedWaitingT	96.5361	1286.514	.913		.987
Que25_10BroughtDownSup	96.6144	1285.049	.900		.987
Que25_11SrInfoBWk	96.5862	1281.677	.914		.987
Que25_12onlineTrans	97.1567	1319.875	.622		.989
Que25_13CollaboratingB	96.6708	1294.561	.863		.988
Que25_14SrInfoWk	96.7022	1291.015	.886		.988
Que25_15FeedbackWk	97.2665	1321.265	.646		.988
Que25_16InfoAccurate	96.7179	1304.423	.810		.988
Que25_17WkWithoutPhysicaly	96.5172	1303.603	.866		.988
Que25_18IntMoreConfident	96.5078	1296.899	.875		.988
Que25_19InclInteractionFrnd	96.4451	1292.342	.905		.987
Que25_20EasyStayTouch	96.6019	1303.121	.810		.988
Que25_21touchmyFrndsFrnd	96.5674	1296.473	.846		.988
Que25_22IntOutsideTheCity	96.5925	1293.324	.829		.988
Que25_23IncPeopleEmergency	97.0063	1319.377	.611		.989
Que25_24ImprCurrentAbilitYrn	96.5549	1289.631	.859		.988
Que25_25UnderstandSubject	96.4295	1286.252	.908		.987
Que25_26ExchangIdeas	96.4451	1291.512	.891		.987
Que25_27talkToInterestedSameTopic	96.4890	1287.854	.886		.988
Que25_28VideosLearning	96.4514	1284.607	.891		.987
Que25_29LinkageTopics	96.6865	1296.398	.795		.988

Appendix 4: KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.977
Bartlett's Test of Sphericity	Approx. Chi-Square	1.581E4
	df	406
	Sig.	.000

Appendix 5: Principal Component Analysis

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	21.898	75.511	75.511	21.898	75.511	75.511	11.858	40.888	40.888
2	2.049	7.066	82.577	2.049	7.066	82.577	10.593	36.527	77.415
3	1.029	3.549	86.125	1.029	3.549	86.125	2.526	8.711	86.125
4	.491	1.692	87.818						
5	.437	1.507	89.324						
6	.340	1.171	90.496						
7	.276	.953	91.449						
8	.232	.799	92.247						
9	.218	.751	92.998						
10	.207	.714	93.713						
11	.182	.628	94.341						
12	.164	.567	94.908						
13	.157	.542	95.449						
14	.144	.496	95.945						
15	.130	.449	96.395						
16	.127	.436	96.831						
17	.116	.399	97.230						
18	.108	.371	97.601						
19	.100	.346	97.947						
20	.088	.303	98.249						
21	.084	.291	98.540						
22	.078	.268	98.808						
23	.065	.224	99.032						
24	.060	.208	99.240						
25	.054	.186	99.427						
26	.050	.172	99.599						
27	.044	.151	99.750						
28	.041	.142	99.892						
29	.031	.108	100.000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix^a

	Component		
	1	2	3
Que25_2EnhSkillWk	.840	.398	.223
Que25_5IncExtJobOpp	.833	.408	.234
Que25_6IncNewJobOpp	.832	.420	.215
Que25_3IncGeoReach	.828	.406	.215
Que25_8ReducedTvlT	.827	.417	.249
Que25_14SrInfoWk	.826	.399	.195
Que25_4IntensifiedCompetition	.823	.407	.205
Que25_7ConductTransEff	.821	.444	.240
Que25_11IncProfCont	.813	.445	.211
Que25_11SrInfoBwk	.810	.420	.279
Que25_13CollaboratingB	.809	.377	.214
Que25_9ReducedWaitingT	.800	.447	.238
Que25_10BroughtDownSup	.800	.442	.206
Que25_24ImprCurrentAbilitYrn	.399	.815	.196
Que25_28VideosLearning	.426	.815	.233
Que25_25UnderstandSubject	.466	.809	.203
Que25_27talkToInterestedSameTopic	.439	.807	.200
Que25_21touchmyFrndsFrnd	.420	.806	.119
Que25_22IntOutsideTheCity	.373	.803	.189
Que25_19InclInteractionFrnd	.484	.795	.182
Que25_29LinkageTopics	.301	.788	.286
Que25_26ExchangeIdeas	.473	.782	.190
Que25_20EasyStayTouch	.390	.772	.153
Que25_18IntMoreConfident	.570	.696	.097
Que25_16InfoAccurate	.535	.687	-.013
Que25_17WkWithoutPhysicaly	.573	.686	.083
Que25_23IncPeopleEmergency	.068	.649	.566
Que25_12onlineTrans	.399	.214	.799
Que25_15FeedbackWk	.493	.192	.698

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Appendix 6: Correlation Matrix

Enhanced Scope of Work

Correlations

	Que25_1IncProfCont	Que25_2EnhSkillWk	Que25_3IncGeoReach	Que25_4IntensifiedCompetition	Que25_5IncExtJobOpp	Que25_6IncNewJobOpp	Que25_7ConductTransEff	Que25_8ReducedTvIT	Que25_9ReducedWaitingT	Que25_10BroughtDownSup	Que25_11SrInfoBwk	Que25_13CollaboratingB	Que25_14SrInfoWk
Que25_1IncProfCont Pearson Correlation Sig. (2-tailed) N	1 .000 319	.942** .000 319	.903** .000 319	.910** .000 319	.918** .000 319	.895** .000 319	.905** .000 319	.898** .000 319	.879** .000 319	.878** .000 319	.898** .000 319	.852** .000 319	.864** .000 319
Que25_2EnhSkillWk Pearson Correlation Sig. (2-tailed) N	.942** .000 319	1 .000 319	.923** .000 319	.897** .000 319	.921** .000 319	.906** .000 319	.909** .000 319	.897** .000 319	.891** .000 319	.887** .000 319	.898** .000 319	.863** .000 319	.876** .000 319
Que25_3IncGeoReach Pearson Correlation Sig. (2-tailed) N	.903** .000 319	.923** .000 319	1 .000 319	.914** .000 319	.915** .000 319	.891** .000 319	.896** .000 319	.892** .000 319	.888** .000 319	.861** .000 319	.888** .000 319	.878** .000 319	.867** .000 319
Que25_4IntensifiedCompetition Pearson Correlation Sig. (2-tailed) N	.910** .000 319	.897** .000 319	.914** .000 319	1 .000 319	.930** .000 319	.908** .000 319	.894** .000 319	.898** .000 319	.862** .000 319	.840** .000 319	.874** .000 319	.843** .000 319	.865** .000 319

	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	319	319	319	319	319	319	319	319	319	319	319	319	319
Que25_5IncExtJobOpp	Pears on Correlation	.918**	.921**	.915**	.930**	1	.940**	.909**	.906**	.882**	.877**	.897**	.864**	.871**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	319	319	319	319	319	319	319	319	319	319	319	319	319
Que25_6IncNewJobOpp	Pears on Correlation	.895**	.906**	.891**	.908**	.940**	1	.923**	.909**	.908**	.907**	.891**	.848**	.882**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	319	319	319	319	319	319	319	319	319	319	319	319	319
Que25_7ConductTransEff	Pears on Correlation	.905**	.909**	.896**	.894**	.909**	.923**	1	.950**	.922**	.906**	.927**	.863**	.890**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	319	319	319	319	319	319	319	319	319	319	319	319	319
Que25_8ReduceTviT	Pears on Correlation	.898**	.897**	.892**	.898**	.906**	.909**	.950**	1	.932**	.905**	.907**	.855**	.884**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	319	319	319	319	319	319	319	319	319	319	319	319	319

Que25_9ReducedWaitingT	Pears on Correlation Sig. (2-tailed) N	.879** .000 319	.891** .000 319	.888** .000 319	.862** .000 319	.882** .000 319	.908** .000 319	.922** .000 319	.932** .000 319	1 319	.908** .000 319	.898** .000 319	.840** .000 319	.864** .000 319
Que25_10BroughtDownSup	Pears on Correlation Sig. (2-tailed) N	.878** .000 319	.887** .000 319	.861** .000 319	.840** .000 319	.877** .000 319	.907** .000 319	.906** .000 319	.905** .000 319	.908** .000 319	1 319	.914** .000 319	.840** .000 319	.858** .000 319
Que25_11SrInfoBwk	Pears on Correlation Sig. (2-tailed) N	.898** .000 319	.898** .000 319	.888** .000 319	.874** .000 319	.897** .000 319	.891** .000 319	.927** .000 319	.907** .000 319	.898** .000 319	.914** .000 319	1 319	.878** .000 319	.893** .000 319
Que25_13CollaboratingB	Pears on Correlation Sig. (2-tailed) N	.852** .000 319	.863** .000 319	.878** .000 319	.843** .000 319	.864** .000 319	.848** .000 319	.863** .000 319	.855** .000 319	.840** .000 319	.840** .000 319	.878** .000 319	1 319	.892** .000 319
Que25_14SrInfoWk	Pears on Correlation	.864**	.876**	.867**	.865**	.871**	.882**	.890**	.884**	.864**	.858**	.893**	.892**	1

Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
N	319	319	319	319	319	319	319	319	319	319	319	319	319	319

** Correlation is significant at the 0.01 level (2-tailed).

Empowerment

Correlations

	Que25_16InfoAccurate	Que25_17WkWithoutPhysically	Que25_18IntMoreConfident	Que25_19IntnInteractionFrnd	Que25_20EasyStayTouch	Que25_21touchmyFrndsFrnd	Que25_22IntOutsideTheCity	Que25_23IncPeopleEmergency	Que25_24ImpCurrentAbilityYr	Que25_25UnderstandSubject	Que25_26ExchangeIdeas	Que25_27talkInterestedSameTopic	Que25_28VideosLearning	Que25_29LinkageTopics
Que25_16InfoAccurate	1	.851**	.852**	.800**	.717**	.733**	.693**	.493**	.745**	.797**	.742**	.749**	.754**	.682**
		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	319	319	319	319	319	319	319	319	319	319	319	319	319	319
Que25_17WkWithoutPhysically	.851**	1	.871**	.832**	.738**	.780**	.749**	.549**	.772**	.832**	.794**	.797**	.791**	.717**
	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	319	319	319	319	319	319	319	319	319	319	319	319	319	319

Que25_18IntMoreConfident	Pearson Correlation	.852**	.871**	1	.863**	.735**	.794**	.750**	.560**	.784**	.835**	.804**	.803**	.815**	.725**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	319	319	319	319	319	319	319	319	319	319	319	319	319	319
Que25_19InteractionFrnd	Pearson Correlation	.800**	.832**	.863**	1	.847**	.862**	.847**	.644**	.858**	.904**	.879**	.870**	.878**	.796**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	319	319	319	319	319	319	319	319	319	319	319	319	319	319
Que25_20EasyStayTouch	Pearson Correlation	.717**	.738**	.735**	.847**	1	.784**	.856**	.538**	.812**	.823**	.795**	.796**	.788**	.732**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	319	319	319	319	319	319	319	319	319	319	319	319	319	319
Que25_21touchmyFrndsFrnd	Pearson Correlation	.733**	.780**	.794**	.862**	.784**	1	.853**	.596**	.843**	.848**	.840**	.846**	.853**	.771**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000	.000	.000	.000	.000	.000	.000
	N	319	319	319	319	319	319	319	319	319	319	319	319	319	319

Que25_22IntO tsideTheCity	Pea rson Corr elati on Sig. (2- taile d) N	.693**	.749**	.750**	.847**	.856**	.853**	1	.583**	.830**	.839**	.845**	.824**	.836**	.763**
Que25_23IncPe opleEmergency	Pea rson Corr elati on Sig. (2- taile d) N	.493**	.549**	.560**	.644**	.538**	.596**	.583**	1	.662**	.653**	.622**	.653**	.660**	.657**
Que25_24Impr CurrentAbilitYrn	Pea rson Corr elati on Sig. (2- taile d) N	.745**	.772**	.784**	.858**	.812**	.843**	.830**	.662**	1	.896**	.850**	.860**	.877**	.790**
Que25_25Unde rstandSubject	Pea rson Corr elati on Sig. (2- taile d) N	.797**	.832**	.835**	.904**	.823**	.848**	.839**	.653**	.896**	1	.920**	.898**	.905**	.819**

Que25_26ExchangeIdeas	Pearson Correlation	.742**	.794**	.804**	.879**	.795**	.840**	.845**	.622**	.850**	.920**	1	.888**	.883**	.805**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000	.000
	N	319	319	319	319	319	319	319	319	319	319	319	319	319	319
Que25_27talkToInterestedSameTopic	Pearson Correlation	.749**	.797**	.803**	.870**	.796**	.846**	.824**	.653**	.860**	.898**	.888**	1	.941**	.831**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000	.000
	N	319	319	319	319	319	319	319	319	319	319	319	319	319	319
Que25_28VideosLearning	Pearson Correlation	.754**	.791**	.815**	.878**	.788**	.853**	.836**	.660**	.877**	.905**	.883**	.941**	1	.863**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		.000
	N	319	319	319	319	319	319	319	319	319	319	319	319	319	319
Que25_29LinkageTopics	Pearson Correlation	.682**	.717**	.725**	.796**	.732**	.771**	.763**	.657**	.790**	.819**	.805**	.831**	.863**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
	N	319	319	319	319	319	319	319	319	319	319	319	319	319	319

** Correlation is significant at the 0.01 level (2-tailed).

Transactional Efficacy

Correlations

		Que25_12onlineTrans	Que25_15FeedbackWk
Que25_12onlineTrans	Pearson Correlation	1	.703**
	Sig. (2-tailed)		.000
	N	319	319
Que25_15FeedbackWk	Pearson Correlation	.703**	1
	Sig. (2-tailed)	.000	
	N	319	319

** . Correlation is significant at the 0.01 level (2-tailed).

Appendix 7: Regression and Multicollinearity

Variables Entered/Removed^b

Model	Variables Entered	Variables Removed	Method
1	LatentOccupation, LatentAge, LatentEnhancedScopeofWork, LatentGender, LatentEarnings, LatentDigitalLiteracy, LatentTransactionalSupport, LatentEmpowerment ^a		Enter

a. All requested variables entered.

b. Dependent Variable: LatentPerceivedImpact

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.954 ^a	.910	.908	.30456	.910	391.227	8	310	.000

a. Predictors: (Constant), LatentOccupation, LatentAge, LatentEnhancedScopeofWork, LatentGender, LatentEarnings, LatentDigitalLiteracy, LatentTransactionalSupport, LatentEmpowerment

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	290.319	8	36.290	391.227	.000 ^a
	Residual	28.755	310	.093		
	Total	319.075	318			

a. Predictors: (Constant), LatentOccupation, LatentAge, LatentEnhancedScopeofWork, LatentGender, LatentEarnings, LatentDigitalLiteracy, LatentTransactionalSupport, LatentEmpowerment

b. Dependent Variable: LatentPerceivedImpact

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-9.223E-5	.017		-.005	.996	-.034	.033		
	LatentEmpowerment	1.010	.033	1.010	30.389	.000	.945	1.076	.263	3.800
	LatentEnhancedScopeofWork	-.108	.039	-.108	-2.763	.006	-.186	-.031	.189	5.301
	LatentTransactionalSupport	.023	.026	.023	.903	.367	-.028	.074	.432	2.315
	LatentAge	.034	.018	.034	1.902	.058	-.001	.069	.923	1.084
	LatentDigitalLiteracy	-.006	.024	-.006	-.246	.806	-.053	.041	.501	1.997
	LatentEarnings	-.028	.021	-.028	-1.364	.174	-.069	.012	.680	1.470
	LatentGender	-.035	.018	-.035	-1.904	.058	-.071	.001	.860	1.162
	LatentOccupation	.012	.018	.012	.658	.511	-.024	.048	.873	1.146

a. Dependent Variable: LatentPerceivedImpact

Collinearity Diagnostics^a

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions									
				(Constant)	Latent Empowerment	Latent Enhanced Score of Work	Latent Transactional Support	Latent Age	Latent Digital Literacy	Latent Earnings	Latent Gender	Latent Occupation	
1	1	3.323	1.000	.00	.02	.01	.02	.00	.03	.02	.01	.00	
	2	1.180	1.678	.00	.00	.00	.05	.44	.00	.09	.02	.06	
	3	1.063	1.768	.00	.00	.00	.01	.06	.01	.02	.01	.67	
	4	1.000	1.823	1.00	.00	.00	.00	.00	.00	.00	.00	.00	
	5	.885	1.937	.00	.00	.01	.02	.05	.00	.02	.83	.00	
	6	.679	2.212	.00	.00	.00	.03	.41	.04	.58	.00	.00	
	7	.482	2.626	.00	.01	.00	.24	.00	.63	.01	.07	.11	
	8	.254	3.614	.00	.50	.02	.46	.03	.14	.23	.02	.15	
	9	.132	5.020	.00	.46	.95	.17	.00	.13	.02	.03	.01	

a. Dependent Variable:
Latent Perceived Impact