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EFFECTS OF ORGANIZATIONAL CULTURE ON M-GOVERNMENT ADOPTION: A CASE STUDY ON E-PURJEE IN BANGLADESH

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Abstract

With the rapid growth of mobile technology, m-government services, which are an extension of e-government, are increasingly becoming an effective alternative. However, similar to other information and communications technology innovations, m-government faces multiple known and unknown challenges at various levels. Although organizational culture has been mentioned in extant literature, this challenge has not been explored in detail, particularly in terms of the dimensions, nature, and overall strength of influence on the innovation itself. This study attempts to fill this void by exploring a particular innovation through an in-depth study in Bangladesh. The framework by Detert et al. (2000) is used as a guide to investigate the various dimensions of organizational culture and characterize the context under study. The paper highlights strong influence of organizational culture and underlines the importance of delving deeper into this influence at every step of such innovation in a developing country, from planning, design, and implementation.

Keywords: Organizational culture, m-government adoption, ICT4D, e-government, mobile technology innovation.

1. INTRODUCTION

Governments of different countries seek to expand their citizen services through mobile technology in the form of m-government (Waema & Musyoka 2009). The term "mGovernment" extends the reach of e-government in public service delivery and includes the strategy and implementation of various types of wireless and mobile technology, applications, and services by the government or public institutions to provide information and services to citizens, businesses, non-profit organizations, and themselves (Kiki & Lawrence 2006; Kim et al. 2004; Kushchu & Kuscu 2003). mGovernment service delivery can be "Web-based" and "non-Web-based". Web-based m-services are generally conducted with greater emphasis on m-portals or m-apps in developed countries, whereas non-Web-based services in the form of short message service (SMS) and interactive voice response (IVR) are primarily used in developing countries (Hussain & Imran 2014). Existing research has failed to explore and explain fully the evolution of these innovations within the complexities of local organizational culture as well as the role and influence of this organizational culture on overall diffusion of m-services. In other words, a dearth of knowledge exists on how mobile technology innovation and diffusion occur in the public sectors of developing countries. Through a case study conducted in Bangladesh, this paper seeks to explore the nature of the relationship between the different dimensions of organizational culture and m-government services and to understand how these relationships can be exploited to design and implement better m-services for developing countries. Bangladesh is a least developed country with a population of 158.5 million (UNFPA 2014). The exponential growth of mobile phones presents a great potential for m-services to benefit countries such as Bangladesh.

Organizational culture is a popular but highly complex concept that has been identified as a factor that influences the success or failure of promoting change in an organization (Iivari 2005). Based on an extensive review, Leidner and Kayworth (2006) concluded that culture is studied at the organizational level mainly to understand "information systems development," "information technology adoption and diffusion," and "IT use and outcomes." Leveraging mobile technology, both public and private sectors of developing country brings a change in its service delivery and it is important for the change agencies to understand organizational culture in its change process. Prevailing cultural characteristics, particularly those of the public sector of developing countries, are likely to hinder the expected change through innovation. Implementing cultural change in any organization is extremely difficult especially in terms of values and assumptions. Thus, deeper understanding and knowledge about the interrelationship among the various value dimensions of organizational culture will offer a more strategic and manageable set of actions that can increase organizational effectiveness. However, limited focus has been given to the identification of the elements of organizational culture that affect m-government adoption. The present study seeks to address this gap through a case study on the adoption of electronic (e-) purjee, an m-government innovation, in Bangladesh.

2. LITERATURE REVIEW

Organizational culture falls under the broader concept of culture, which has been extensively studied in anthropology, as well as in the physical and social sciences. Culture implies certain levels of structural stability that are difficult to change after its development and covers all of a group's functions and influences, aspects of how an organization deals with its primary task, various environments, and internal operations (Schein 2010). According to Hofstede (1980), "culture is to a human collectivity what personality is to an individual" (p. 24). In the same way that personality guides and constrains individual behavior, culture guides and constrains the behavior of members of a group through the shared norms, values, and assumptions of that group (Sathe 1983; Schein 2010).

Organizational culture determines how work should be done and evaluated, as well as how employees should relate to each other and to significant others, such as customers, suppliers, and government agencies. Organizational culture can be analyzed from the tangible level to deeply embedded intangible levels. Schein (1984) refers to these levels as artifacts, values, beliefs, and underlying assumptions. On the surface level, culture is manifested through most observable artifacts such as organizational structure, its architecture, technology, office layout, manner of dress, public documents as charters, employee orientation materials, and stories that are easy to obtain but have an underlying cultural meaning that is difficult to interpret. Leidner and Kayworth (2006) pointed out that information technology is not culturally neutral and may represent a host of values driven by underlying assumptions. At the next level, analyzing why the members of a group behave as they do often requires looking for the *values* that govern behavior (Schein 1984). Values and beliefs define what is important in a particular culture and what ought to be done in an organization (Rowlands et al. 2014). At the deepest level, *basic assumptions* are at the core of culture; these assumptions are typically unconscious, invisible, and preconscious and therefore cannot be studied easily (Leidner & Kayworth 2006). Many researchers prefer the term *basic values* to describe this level (Schein 2010). Cultural values are also tightly linked to subsequent behaviors and actions of social groups (Posner & Munson 1979). Leidner and Kayworth (2006) argued that the understanding of organizational values may explain certain behaviors with respect to how social groups interact with and apply IT in organizational contexts. As values are difficult to observe directly, these can be inferred by interviewing key members of the organization or by analyzing the contents of documents (Martin & Siehl 1983). Accordingly, this study examines the values of an organizational culture and its influence on m-government adoption through interviews with stakeholders and organizational employees at various levels, as well as through case observations and analysis of secondary data.

Several studies on mobile government focused on the "what" rather than the "why" aspect of adoption. Previous research identified factors that affect m-government adoption or acceptance or influence demand (Hung et al. 2013; Madden et al. 2013) and framework or model (Abdelghaffar & Magdy 2012; Mohamedpour et al. 2009; Nan et al. 2009; Shareef et al. 2012; Wang et al. 2011). Some studies on m-government adoption were conducted with a limited group of respondents, either with highly educated respondents or with a group of respondents aged 16 to 23 years (Abdelghaffar & Magdy 2012; Shareef et al. 2012), who represent a small segment of m-government users. Some case studies such as that conducted by Khamasey and Lawrence (2010) identified the factors that contribute to successful mobile government in Australia but did not engage any theoretical framework.

Prior research also addressed various issues related to Web-based mobile services but lacked discussions on the non-Web-based mode of delivery. However, non-Web-based services are dominant in developing countries. For example, almost all public sector agencies in Bangladesh, including Bangladesh Road Transport Authority, Soil Resource Development Institute, Dhaka Electric Supply Company, BSFIC, and Department of Disaster Management, still use non-Web-based SMS and/or IVR services for their mass users.

Detert et al. (2000) performed qualitative content analysis by reviewing relevant articles published over the past two decades and proposed eight general dimensions of organizational culture. These general dimensions correspond to the specific values and beliefs that underlie the adoption of total quality management (TQM). Their framework addresses cultural relationships to systemic improvement initiatives and provides a solid base for theoretical and empirical work on organizational culture. The eight dimensions of organizational culture are briefly presented in Table 1.

Dimension	How the dimension is measured
Basis of truth and rationality (hard data versus personal experience)	Extent to which organizations determine what is true and how it is determined
Nature of time and time horizon (short term versus long term)	Extent to which organizations focus on long-term planning and goal setting or on here-and-now concerns
Motivation (external versus internal; rewarded or punished; manipulating others' motivation)	Extent to which humans are motivated
Stability versus change/innovation/personal growth (risk averse "good enough" versus risk takers)	Represents a mindset in which situations are viewed as "good enough" or finds the need for continuous study of processes and products to ensure improvement
Orientation to work, task, and co-workers (process versus results)	Extent to which work is viewed as an end in itself through accomplishment and productivity or as a means to other ends, such as a comfortable life
Isolation versus collaboration/cooperation (individual effort versus task around groups)	Extent to which organizations encourage collaboration among individuals for better decisions and overall output or encourage individual work efforts for accomplishments
Control, coordination, and responsibility (centralized versus autonomous decision-making)	Extent to which control is concentrated around a few individuals at the top or shared; loosely controlled; flexibility and autonomy of workers are cherished
Orientation and focus: internal and/or external (internal versus external)	Extent to which organizations assume control, or are controlled by, the external environment

Table 1.   General dimensions of organizational culture (Detert et al. 2000)

We used the preceding framework to examine the existence of various dimensions of organizational culture and the strength of their influence on e-purjee adoption and innovation. The framework of Detert et al. (2000) was chosen because the authors reviewed more than 25 multi-concept frameworks and developed a set of eight overarching, descriptive dimensions of culture. Although we are convinced that the framework of Detert et al. (2000) consolidates existing organizational culture efficiently, we kept our options open in exploring other dimensions or issues that could emerge from the data that may not have been captured by the framework we used.

The following section describes methods, background of e-purjee case, results, and analysis of interview data and other documents to show managerial implications. Discussion and conclusion are presented subsequently.

3.   METHODS

Bangladesh is chosen as representing a developing country context, which has targeted the establishment of an ICT enabled resourceful Bangladesh to emphasize development in areas like agriculture, education, healthcare, land and water resources, disaster management, manpower export. So, the government introduced a number of m-government services to support a mass population through services like e-purjee for poor farmers; Aponjon for giving care to mothers and new born; early warning system for disseminating disaster related information; notification service by Bangladesh Road Transport Authority and so on but the country is yet to make remarkable progress in terms of effective ICT implementation particularly on e-government (Imran & Gregor, 2010). Other reason for selecting Bangladesh is the authors' good understanding and insights into the local context as well as research experience in the same field.

e-Purjee case was chosen because this is one of the first digital innovations by the government after the country implemented the Digital Bangladesh program, and received many awards, including the Indian Manthan Award (in 2010). The analysis of the case on the use of e-purjee utilized two sites, namely, the state-owned Padma Sugar Mills Ltd. (PSML) and Jamuna Sugar Mills Ltd. (JSML), which adopted the m-service during the 2010−2011 period. Pseudonyms were used for ethical purposes. Sites were chosen randomly in North Bengal, where most of the sugar mills are located. Two "gatekeepers" (Remenyi 2012) were identified through personal contact; being influential local leaders, these gatekeepers have good connections with relevant people starting from the top authority to the bottom performers and growers.

A total of 31 respondents were approached and interviewed to cover a broad spectrum of the value chain of the cane production and delivery process. Three interviews were excluded from the analysis because one respondent was reluctant to continue participating and two respondents provided exaggerated information not supported by documentary evidence. These interviews, which were conducted at the Prime Minister's Office Access to Information cell, the Head Office of the BSFIC, and two sugar mill premises considered various stakeholders at different organizational levels as well as growers, to gain complete understanding of the phenomenon from multiple perspectives. A summary of the information of interviewees is provided in Table 2.

Name	Designation and number of interviewees	Total number of interviewees
Top level of organizations at two state-owned sugar mills, A2I and BSFIC.	GM (Agriculture) (1) IT Manager (A2I) (1) GM, Cane Administration and Input Supply (CAIS) In Charge (1) DGM, Cane Procurement (2)	5
Middle and low level at both sugar mills	Center in Charge (CIC) (1) Cane Development Assistant (CDA) (3) Head Assistant, Cane Procurement (1) Data Entry Operator; Computer Operator (2) Purjee Writer (1)	8
Growers	Cane Growers at PSML (6) Cane Growers at JSML (9)	15

Table 2.   *Summary of the information of interviewees*

In addition, field notes, office notes, brochures, leaflets, images, reports, and video clips were collected to assist in analysis, triangulation, and confirmation. A semi-structured interview guide and protocol was developed. Ethical clearance was obtained from the university prior to the fieldwork. Information was collected between mid-May and mid-July 2014. Pre-testing was conducted to eliminate any early mistakes and to develop skills for deepening the probing technique, particularly those that will guide in contextualizing the results to the local situation. Based on the pre-testing, minor changes were made in the interview technique by using local terms that differ from commonly used Bengali terms. Interviews with the top-level sources lasted approximately 45 minutes to 1 hour

on average. Those with the middle- to low-level sources lasted around 30 minutes and those with the growers lasted around 15 minutes or less. All the interviews were audio recorded with the consent of the participants. The interviews were conducted in Bengali and were subsequently translated into English. Data analysis consists of three courses of activities, namely, data reduction, data display, and conclusion drawing (Miles & Huberman 1994). Data reduction was done through focusing, selecting, and transforming information that appear in the interview transcripts, site documents, and field notes. Subsequently, the reduced data were organized and compressed to better display the links established with respondents to determine the strongly referred comment or moderately referred comment. Strongly referred comment is the comment that is referred by either many or important referrals for a specific issue or a combination of issues. Important referrals can be anyone from the top management to the individual poor farmer depending on the issue and circumstance. Analytic explanation was formulated to serve as basis for drawing conclusion.

4. BACKGROUND OF E-PURJEE CASE STUDY

Sugar mills play a vital role in the food industry of Bangladesh, the main raw materials of which comes from the sugarcane cultivated by poor or illiterate sugarcane farmers and growers scattered in various places in the country. A total of 15 state-owned sugar mills operate in Bangladesh, among which 11 started their production before the country's independence in 1971. In 1976, a presidential order facilitated the merging of two separate corporations, namely, Bangladesh Sugar Mills Corporation and Bangladesh Food & Allied Industries Corporation, into a single corporate body named Bangladesh Sugar & Food Industries Corporation (BSFIC). Each of these 15 sugar mills was set up near a sugarcane production region. The relationship between each of the sugar mills and farmers is complimentary because the mills purchase all production quantity of canes from the farmers, such that the farmers have no choice but to deliver their harvest to these mills. BSFIC centrally controls these 15 state-owned sugar mills. Each of the mills communicates, assists, and advices growers. Growers cannot deliver canes until they obtain a "purjee," a paper-based purchase order or permit to deliver cane to sugar mills. For over 200 years, the purjee was sent out to cane growers across Bangladesh.

This purjee contains basic information on growers, including name, address, passbook number, name of unit and cane purchasing center, date of delivery, and amount of sugarcane. Mills crush canes from November to January each year for approximately 100 days and issues around 100,000 purjee. A large demand-supply crisis occurs in each mill because 27,000 to 30,000 growers operate but mills issue only approximately 1,200 to 1,500 purjee per day. Each purjee permits delivery of 1,200 kg to 1,400 kg (1.2 metric tons) to the mill authority. Approximately 1,000 metric tons are crushed everyday, which are accumulated within 24 hours of production. Mills cannot take more than the required cane volume each day as canes dry up quickly when kept 24 hours after extraction. Growers also cannot afford to wait long after harvesting as cane weight begins to decrease after 24 hours, thereby affecting the return value (price) of the product. Thus, during cane-crushing season, a high level of corruption, competition, and power exercise becomes the norm in each mill. As the matter worsened every year, the issue was raised to the government authority. Thus, the e-purjee was introduced in 2009 through the initiative of Access to Information (A2I) at the Prime Minister's Office and BSFIC. The e-purjee is a new concept developed by A2I as a part of the national "Digital Bangladesh" program. The paper chit (purjee) is replaced by an SMS notification (e-purjee) to be sent from the mill authority to the eligible cane growers. Each SMS message mentions the actual date when the grower can deliver cane to the mill, which is sent around three days ahead of the delivery date. E-purjee was able to make a breakthrough in the old traditional system of sugarcane procurement by introducing an SMS notification system to the growers (A2I Handbook). First, a pilot program on the e-purjee was

implemented in two sugar mills from 2009 to 2010. Later, during the 2010 to 2011 season, 13 sugar mills also introduced the e-purjee program.

The scenario in the past was appalling, which caused significant trouble to the farmers. For example, if a purjee was made at the mill (e.g., on the 15th of the month) for the cane delivery on the 18th, it was generally dispatched in the afternoon. On the next day (16th), the purjee would be collected for delivery to 8–10 "cane-purchasing centers" through a "messenger." These centers are approximately 10–40 miles away from the mill location. The messenger spends a day handing over the purjee to these centers, where the purjee is collected by a "purjee distributor" (PD) assigned to one or two centers.

Each PD enters the purjee in a register and prepares a list. In most cases, PDs are able to paste the list in respective centers on the third day (17th) and starts distributing the purjee among the growers. Often, a cane development assistant (CDA), who is appointed by the mill authority, works at the field level and is the primary contact with growers who also prepares a purjee gazette from which the purjee is prepared. The PD hands over these purjee to a third party or a known middleman who often forgets or fails to turn over the purjee to the original grower on time. In most cases, the growers obtain the purjee when the delivery date is already due or has passed. Upon receipt of the purjee, the grower has several tasks to do, including arranging labor and a transport cart, which are often extremely difficult because of the large demand during the season. Usually, the poor and small growers face maximum trouble in receiving the purjee. Meanwhile, as influential growers have developed a good relationship with the CDA or PD, they always obtain purjee information on time; sometimes, these growers also collect the purjee of other growers without the latter's knowledge and delivers cane in their own name. Tracing the identity of the person carrying the purjee is impossible because thousands of purjee are issued every day, and cane is procured and weighed. Thus, the purjee collection and cane delivery process become a vicious cycle.

The legitimate growers had to buy the purjee at a price of Tk 500 to Tk 1000 to deliver their cane on time. Often, large-scale and influential growers, with the help of corrupt officials (mainly CDA), cause artificial delays to earn additional money, which affects the operations of poor growers.

Meanwhile, the SMS notification system permits growers to receive the purjee ahead of time (around two to three days), which enables these growers to have sufficient time to prepare for delivery of orders. The new initiative is a solution to existing malpractices and intended to improve the situation for cane growers in general. It also permits a continuous flow of cane in the mill, thereby minimizing "mill breakdown," which incurs a huge cost, and ensuring a supply of fresh cane to increase overall sugar production. Today, approximately 200,000 sugarcane growers around the country benefit from this SMS service, which has increased sugar production by 62% (Minges, M. et al. 2011).

5.   RESULTS AND ANALYSIS

Several dimensions of organizational culture affected m-government development and adoption in the two sugarcane companies under study. These were analyzed based on the framework proposed by Detert et al. (2000), which is presented in Table 3.

Dimension	Influence on e-purjee
Basis of truth and rationality	Personal experience: Weight of cane measurement in the field E-purjee concept development Tone of message (strongly referred) Hard data: increased rate of recovery

Nature of time and time horizon	Long term: pre-planning for name entry Short term: "On request" phone numbers (strongly referred) Absence of Bengali written message
Motivation	External motivation: social recognition (strongly referred) Internal motivation: less expensive
Stability versus change/innovation/personal growth	Stability: resistance to change (Head Assistant, CDA, CIC) (strongly referred) Change: effort taken through training to change
Orientation to work, task, and co-workers	Process: work as a means to other ends (moderate) Results: none
Isolation versus collaboration/cooperation	Isolation: none Collaboration: Group involvement for harvesting cains, training on e-purjee and understanding SMS (strongly referred)
Control, coordination, and responsibility	Centralized: Problem identification and concept of innovation Strict adherence to chain of command for series of approvals for *purjee* creation and issuance, information dissemination of innovation (strongly referred) Autonomous: selection of trainees
Orientation and focus	Internal: none External: software development Training Cane procurement and sugar selling Involvement of large-scale growers (strongly referred)

Table 3.   Nature of influence of organizational culture on e-purjee

5.1   Basis of truth and rationality

In both case sites, personal experiences and relationships were measured against hard data to determine the basis of truth and rationality. The purjee problem was identified through personal experiences; no hard data indicated financial or social loss. Two decades of timing issues, malpractices related to purjee were identified, and long-awaited solutions through m-government innovation were introduced in 2009 based on the personal experience of a person who was raised in a sugar mill, who joined the A2I office subsequently and currently serves as IT manager. Aware of the contextual circumstances of the mill environment and the locals, he was able to provide a contextual solution through SMS services. Majority of the growers (the uneducated segment) learned about receiving SMS by mobile phone through their personal experience of hearing the ringtone of their mobile phone [comment from CDA, CIC, growers, GM (agriculture)]. In the absence of weight-measuring machine in the field, they harvested sugarcane and loaded the cart based on their experiences of weighing 1.2 tons of the crop. Hard data were used as reference to identify the rate of recovery at the end of the fiscal year.

5.2   Nature of time and time horizon

Mills have a short-term rather than long-term orientation; in other words, these focus on the "here" and "now" of the "local" dimension of the organizational cultural model (The Hofstede Centre). Mobile numbers were needed for effective development, implementation, and use of the e-purjee in the long run. Thus, A2I requested each mill to prepare a database that includes the name of each grower. However, even after four years of implementation, many "on request" phone numbers appeared in both of the sugar mills growers' database. These "on request" phone numbers are not the original phone numbers of growers rather a number belongs to either influential large-scale grower or CDA/CIC. We found a summary of the list of growers in each mill where more than 70% of the phone numbers were "on request," which was confirmed by a data entry operator in the server room

of PSML. According to the data entry operator, *"It is seen that one phone number is given for 25 growers. It is an impossible thing.... There may be one or two 'on request' numbers"* (Interview, 20/05/2014; 12:30 pm). Absence of long-term orientation was also found in settling the sugar price. Decreasing the sugar price for four times in the last three years did not increase the sale of sugar resulting in the piling up of a stock of 178,000 tons (Hasnat 2014). The sugar industry incurs huge losses almost every year over the last few years due to absence of a long-term plan (Hossain 2014). In addition, the contents of the message ignore the long-term orientation as it is still written in English, which many growers do not understand because majority cannot read English (comment from CDA, growers).

5.3　Motivation

Humans may be motivated from within or by external forces through reward or punishment; humans may also manipulate the motivation of others. Rowlands et al. (2014) considered cost versus value in examining the concept of motivation. Only "large-scale influential big growers" were given the opportunity to participate in providing e-purjee training to growers, and they were proud of this privilege. At the operational level, CDA and CIC were also motivated for being recognized by the family members of growers. The government as stakeholder is motivated by the Manthan Award, an external distinction that acknowledges the "Digital Bangladesh" program. Mills have realized the value of the e-purjee because, according to one DGM, *"Financial involvement is minimal, I meant cost is less;"* thus, mills are internally motivated.

5.4　Stability versus change/innovation/personal growth

Organizations conducted training in each sugar mill to raise awareness among users and promote change because initially resistance to change was evident due to the fear of poor growers and loss of self-interest of large-scale growers. As the head assistant of PSML commented, *"We were ruled by Britain and Pakistan for many years. This inscribed fear among us and the fearful attitude has remained. We cannot accept new things easily"*. Vested interest groups were benefited from the training given by mills. Guided by "external experts," mills conducted training for "progressive growers." "Progressive growers" are educated, large-scale growers who can play an influential role. These growers and CDAs were invited to participate in the training and were asked to inform others about the innovation. However, as these growers had an influential role in purjee distribution, they did not want to train poor, uneducated growers about the innovation. These poor growers wanted to continue feeling "good enough" with what they have in a means-oriented culture that emphasizes risk avoidance. The training staff also exerted limited effort in providing training. The marketing promotion efforts lacked creativity and growers who lived far from the mills remained unaware of the e-purjee. Traditional promotional materials such as posters, banners (around the mill gate), and leaflets were used, but creative below-the-line advertisements were absent.

5.5　Orientation toward work, task, and co-workers

Work is considered as a means to "a comfortable life." Productivity was not focused on as the purjee problems existed for a long time and purjee-related delays dried up the sugarcane. The e-purjee mechanism increased the productivity of the organization because the raw material inputs were fresh. Staff members felt that personal problems were considered (The Hofstede Centre) and such is reflected in the following CDA statement: *"suddenly he (grower) talks about his daughter's marriage. Then e-purjee which is given to a different grower's name, was brought up and managed saying (to that different grower) brother, father, uncle* [it is a cultural tradition in Bangladesh to call anyone brother, father, uncle for asking any of his favor]*, he (grower) is in need of purjee, please give to him; next time you will be given more"*. This statement reflects the overall socioeconomic condition

of Bangladesh. Official staff members manage to convince other locals to issue purjee as the situation demands. Thus, in an organization, effectiveness is means-oriented, such that the interests of individuals are emphasized over the interests of organizations.

5.6   Isolation versus collaboration/cooperation

For the diffusion of m-government SMS services, family members, peers, and relatives played a significant role for the majority who could not read SMS. Any SMS received was shown to a group in the local tea stall for understanding and authenticity. For harvesting, laborers are also gathered in a group. By contrast, a group of experts from A2I, BSFIC, and mill management appeared at the training session to train a group of approximately 250 growers and CDAs. Cooperation, collaboration, and mutual understanding between stakeholders and mills were crucial for e-purjee diffusion. Bangladesh as a developing country scores high in collectivism, which represents a tightly knit social structure where individuals can expect their relatives or the members of a particular group to look after them (The Hofstede Centre).

5.7   Control, coordination, and responsibility

Resolutions and decisions were taken and passed down centrally either from the head office or from the managing director of each mill. Loyalty toward the boss or superiors was more important and prominent than any other issues. This finding confirms the "local" dimension of the "organizational cultural model' (The Hofstede Center), where control is concentrated around a few individuals at the top. For example, although the problem persisted for a long time, the concept was developed by an external expert and subsequently, instructions were directed to the mill; as the DGM of a mill surprisingly admitted, *"All on a sudden we found a letter from the head office BSFIC that was forwarded from the Prime Minister Office stating that through a2i, such program will be introduced"*.

A series of protocol that covers procedures from the field to purjee preparation are in effect. In this series, the CDA prepares the purjee gazette and analyzes many criteria, including loan, quantity of cane, and size of growing operations. The gazette is approved by the sub-zone head, then goes to the GM (agriculture), who provides instructions to the DGM (cane procurement), who in turn refers to the purjee controller. Purjee controller then assigns purjee writers to prepare the purjee and a summary sheet that is signed by the purjee controller and proceeds to the server room for computer input and dispatch of SMS. The CDA has an autonomous role in selecting suitable individuals for training.

5.8   Orientation and focus

With respect to orientation and focus, m-government innovation development is highly driven by external A2I or BSFIC. Software, SMS contents, training materials, and procedures were all developed and controlled from BSFIC or A2I. A memorandum of understanding was also signed between the external honorable chief advisor and the additional secretary of the Ministry of Industry to solve the purjee crisis. BSFIC supervises each mill innovation development, such as the amount spent on required infrastructure, including rooms and selection of a telecommunication operator to send SMS. The top manager of each mills implements appropriate controls to decide which Internet package to purchase locally and select participants and trainers to undergo training. Guidance, directions, formalized rules, and suggestions for the mill are forwarded by BSFIC. According to a staff member, *"With the way they dictate and put forward suggestions, we cannot even sell 1 kg sugar without their permission or purchase a single cane"*.

Additional factor

In addition to the factors mentioned by Detert et al. (2000), another contextual factor, vested interest, which was presented in other studies (Imran & Gregor 2011), was found prominent in the Bangladesh purjee case.

In general, IT involvement affects the organizational and institutional settings, which in turn challenges the vested interests of bureaucratic organizations (Ke & Wei 2008; Tseng et al. 2008). However, in a developing country such as Bangladesh, the vested interests of a few particular groups hamper IS adoption (Imran & Gregor 2011). The present research found undue influences by major vested interest groups at the time of innovation introduction, which threatened and obstructed the smooth adoption of m-government. According to one DGM, *"I have told you many things; I can tell you many more, which I don't think would be appropriate"*. Our investigation revealed further issues. We found that vested interest groups, including CDAs, CICs, and influential large-scale growers, prohibit the adoption of e-purjee through intervention. They do not want the e-purjee to be effective because they believe that this mechanism threatens their self-interest (comment from CIC of JSML). Thus, these influential growers instructed CDAs and a few CICs to manipulate phone numbers while creating a database. The phone numbers of many growers were not updated, informing that the growers do not have phone and only a few particular numbers (those of CDA or large-scale growers) were given. As one DGM said, "*we had to use CDA number.*" It is seen from the growers list that only one phone number is used for approximately 25 growers, which is absurd (comment from computer operator). As mentioned, the summary list of growers showed that around 70% of the phone numbers of growers were still "on request". Vested interest was also observed in preparing the purjee gazette, based on which the purjee office writes and issues the permits. Based on the discussions with large-scale growers, the CDA prepares the purjee gazette and lists names of those they obtain unauthorized payment from (e.g., growers). Again, sometimes, the CDA places appropriate eligible growers name in the gazette, but in the purjee office, few names is discarded upon the instruction of large-scale growers. In selecting people for training, only large-scale growers believed to represent the industry were selected; together with CDA, these participants underwent training and achieved the benefits of e-purjee. Most of the growers located far from the mill were not even aware of the purjee SMS.

6.   DISCUSSION AND CONCLUSION

The various dimensions of organizational culture outlined by Detert et al. (2000) helped to characterize the organizational culture surrounding the e-purjee innovation, which can be summarized as means-oriented versus goal-oriented, internally driven versus externally driven, easygoing work environment versus strict work discipline, local versus professional, open system versus closed system, and employee orientation versus work orientation (The Hofstede Centre). In addition, a high degree of acceptance of the leadership style exists because the decisions in the organization are channeled from the top, and the leadership styles of large-scale growers are admired. Proper understanding of organizational culture can guide policy makers or innovation implementers in developing appropriate strategies of innovation development and diffusion. Checkpoints that require additional care can be identified. The strength of organizational culture can be both an advantage and a disadvantage. If the environment is changing, strong cultures can be a liability (Waddell et al. 2000). In the private sector, the business environment in Bangladesh welcomed mobile use in various business dealings, such as money recharge, money transfer and payment, and sending notifications, among others through in-depth understanding of customer requirements. However, in the public sector, centralized control through external stakeholders provided a superficial idea of the implementation of the e-purjee concept. Chemistry among the marginal growers, large-scale growers, CDAs, and CICs was not triggered well because decisions were made by only a few officials at the

top central level. This situation is reflected in the statement of one DGM that *"the whole program is actually dealt by them (BSFIC)."* Thus, the involvement of various stakeholders in different stages of innovation seems to be missing. Further, lack of communication flow and awareness at all levels in relation to the innovation failed to yield actual benefits, especially for the ordinary growers.

Issues started to surface during the preparation of the "list of growers" for updating the database. As the promotion of e-purjee was conducted through conventional channels (leaflets, banners, and billboards) and ignored non-conventional channels (staging dramas in theaters, announcements by religious leaders in places of worship) to reach the target segments (majority of uneducated poor farmers), many farmers were unaware of the SMS notification mechanism. Thus, at present, the list of growers has 70% of phone numbers marked "on request." One of the growers commented, *"Purjee notification is SMS, I didn't know about it. I just heard it today that through SMS purjee notification is given."* Even if purjee requests are made through the gazette, growers still do not receive SMS notifications because the purjee office discards their names; one disappointed grower said, *"....then we find that my name is in the gazette but after 4 to 5 days when we go to purjee office it is not there. (That) means they gave another name (in the purjee)"*. Evidence from the interview with growers indicates that even after using a mobile phone for over five years, majority of users are familiar only with calling functions and do not know how to navigate through SMS. Those who know how to open such messages do not know how to read English SMS. Thus, the same purjee notification should be provided through IVR using the same message with date customization.

Training was also ineffective because only a few selected people were given training by the external experts. One CIC comments, *"The biggest problem for us is that for example, e-purjee message is received today stating that one has to deliver cane after three days; however, the person harvests the cane on the day the message was received. This is the biggest problem. They don't understand that they have to deliver it after three days."* Social recognition in terms of a good relationship between large-scale growers and CDAs hinders the proper distribution of purjee among growers. Power is exercised in the unit, which has become the norm accepted by other people involved. Informally, the CDA/CIC in the unit has allowed this situation to continue. Large-scale growers were involved more in the purjee distribution, such that known face obtained privileges, whereas unknown face has to buy the permits. We are uncertain whether the CDA receives money from the sale but officially, CDAs cannot sell to growers; therefore, a middle agent (large-scale grower) is involved. All these issues could have been anticipated if the dimensions of organizational culture were explored in-depth and exploited and interactions were identified. Small-scale and marginal growers who operate away from mills have expressed frustration with the purjee system; one of them stated, *"Purjee! Purjee is the cause of the crisis. I have few canes. At first (they) give one purjee, but canes fill 8 to 10 carts (*one purjee for one cart*). No news of the rest of the purjee.... Canes get spoiled, dries up; canes need to be loaded on the shoulder and taken to other places; and then we are bound to buy purjee. There is no other choice but to do it."*

Although one can argue that the lapses and drawbacks noticed throughout the innovation process were due to the lack of proper knowledge and non-adherence to the prescribed innovation process, such as implementing a feasibility study, proper planning, and formulating a customer-centric design of innovation with stakeholder engagement and so on, all these activities were indeed the result of the existing organizational culture.

This study explored the nature and interactions among different dimensions of the organizational culture in the e-purjee innovation. This study aimed to identify interactions among different dimensions of organizational culture on m-government adoption through a case study of two different sites in a developing country. The dimensions represent the cultural orientation of internal and

external stakeholders involved in the e-purjee development and adoption program. An external expert involved in all phases exercises a centralized role and approves relevant procedures as well as directions to the mill authority for the innovation development and adoption. However, the chemistry of interactions among different stakeholders in various dimensions signals the need to improve the diffusion of the e-purjee mechanism.

Future research is needed to conduct multiple case studies on the same phenomenon. Web-based m-service is widely available in developed countries; therefore, a comparative study of these dimensions in the context of developed and underdeveloped countries can provide a broad and rich picture. Furthermore, a quantitative approach is recommended to identify the degree of intensity of the dimension phases.

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