Mobile Phones and Business Networks among Malaysian Micro and Small Enterprises: A comparative network approach

Tom Erik Julsrud
Institute of Transport Economics, Department of Mobility and Organisation,
Oslo, Norway
tej@toi.no

Ma. Divina Gracia Z. Roldan
De La Salle University Manila, Philippines
ma.divina.roldan@dlsu.edu.ph

Abstract: Malaysia has experienced significant economic growth, and mobile telephony has now reached a large majority of the population. This paper explores how different types of Malaysian micro and small enterprises use the mobile phone to sustain and support their work relations. This study is a comparative case study, combining personal qualitative interviews with a quantitative study of individual call patterns. Findings show that the mobile phone serves as the most frequently used media and communication tool for both managers and employees within the retail, farming, and professional sectors; and that the popularity of the hand phone goes beyond business sector boundaries. The study reveals the gaps that exist between employees and managers in different business areas. Insights on how mobile communication technology influences relationships and social networks are crucial for policymakers who intend to improve the efficiency and livelihood of the micro and small enterprises.

Keywords: Malaysian micro and small enterprises, mobile phones, social networks, regional development

The growth of personal mobile phone has been remarkable during the last decades, even compared to the diffusion of personal computers or the Internet. As for now, an estimated four billion people are using mobile phone on a daily basis, or more than 50% of all people on earth (The World Bank, 2009). In contrast to the personal computer, however, the mobile phone has also become the communication tool for the less affluent part of the human population. The largest growth of mobile phone users in the world today is in developing countries in Asia and Africa, and the mobile phone is now probably the most widely used personal media in the world.

The situation has caused important changes in many areas of the society. On a macro-level, studies have indicated that mobile phone adoption is related to economic growth (Banerjee & Ros, 2004; Dholakia & Harlam, 1994; Lam & Shiu, 2010). The mobile phone's contribution to economic growth in developing countries have been established indicating that an extra 10 mobile phones per 100 people in a typical developing country leads to an additional 0.59 percentage points of growth in Gross Domestic Product (GDP) per person; and an extra 10 percentage points in mobile phone penetration led to an extra 0.44 percentage points of growth (Waverman, Meschi, & Fuss, 2005).

When it comes to small businesses, there have in particular been a lot of hopes and expectations as to the potential impact of mobile phones in Asia and Africa. Some hallmark studies have been conducted documenting how mobiles phones can give small companies better information access and better market access (Aker & Mbiti, 2010; Goodman, 2005; Jensen, 2007; Samuel, Sah, & Hadingham, 2005). Still, most of these expectations of the potential impact of mobile phones for small businesses are based on hopes and assumption, and the empirical evidence available is scarce and it often gives rather contradictory findings (as will be further discussed below). An important shortcoming of the current literature is a tendency to treat all small companies as if they were a homogenous group, when they in fact

constitute a large variety of businesses and trades. Terms like "SME" (Small and medium sized enterprises), "MSE" (Micro and small enterprises) or "MSME" (Micro, small, and medium sized enterprises) are very broad, and also often defined differently across statistical traditions. There has therefore recently been a call for research that *differentiates* on how mobile phones affect different types of small enterprises. As a review of the literature on the mobile telephony among MSE recently stated: "Most studies to date have been either sector specific or explanations or broad aggregate surveys. An important path for future study would apply comparative analyses to assess and predict impact of mobile use by different classes of MSEs" (Donner & Escobari, 2009, p.7).

This paper takes up this challenge and explores the way mobile phones are used by three different types of MSEs: professionals, retailers, and farmers. Based on data from a sample of Malaysian enterprises, we provide new insights in how these groups differ in the way they use mobile phones, and how the mobile phone is used to sustain and support their work relations. Furthermore, we will look at how these groups used different sets of media, including mobile talk, SMS, and email.

Our study is done in Malaysia, a market where mobile phones have reached high saturation and where the numbers of MSEs are significant. Alongside countries like Singapore and South Korea, Malaysia has experienced significant economic growth, and mobile telephony has now reached a large majority of the population. Even among small shop keepers and in family businesses, mobile phones have become part of the standard tools. This rapid adoption makes Malaysia interesting when it comes to the potential impact of mobile phones on day-to-day communication patterns. However, Malaysia is also an economy were small enterprises represent a vital part of the economy, and there are high hopes that the information and communication technology (ICT) can help strengthen the small enterprises position in a more globalized economy (Saleh & Ndubusi, 2006). According to recent

statistics, as much as 99.6% of all enterprises are classified as micro, small, or medium sized (Aris, 2007).

Even though there is little doubt that mobile phones have had an impact on the flow information, *the way* this information affects on the MSEs' networks is far from clear. This paper will pursue this goal by looking at how mobile phones are used by managers and employees to support, maintain, and exploit various *work relations*. At this point we will draw on a rich tradition of studies emphasizing the value of social ties and bonds for the performance of the small enterprise. We will start this paper with a brief review of contributions pointing at the importance of networks for small enterprises, and how mobile phones might interconnect with these networks. Next, we will present findings from a study of call patterns in 12 Malaysian MSEs; a study that give new information on differences in mobile use. Subsequently, we will discuss these findings, implementing interview data from the qualitative study.

Networks, Relations, and Small Enterprises

There is plenty of evidence at hand indicating that the number, quality, and constellation of social relations are of critical importance for small businesses. In the literature, an analytical distinction is often drawn between three general types of relations: *informal social relations, market relations, and hierarchical relations*. The difference and current transformation between these networks in modern markets is widely discussed in economic literature (Adler, 2001; Adler & Heckscher, 2006; Ouchi, 1979). In its most fundamental form, hierarchical relations are based on formal agreement and coordinated through authority. The market relations, on the other hand, rely on price mechanisms to coordinate volatile connections between sellers and buyers. The informal relations are based on durable and affective bonds often described as trust. A

widely held argument is that the latter form of relations is becoming more and more important in modern organizations, at the expense of the other two, propelling a more community-based type of organization (Adler & Heckscher, 2006; Ouchi, 1979). However, most business relations consist of a mix of these dimensions rather than being purely market based, hierarchical, or social oriented (Adler & Kwon, 2002). In particular, relations in small enterprises tend to blur the distinction between the private/social, market related, and hierarchical (Shaw, 2006).

Small Business Networks

Informal relations have been the core area of interest for the bulk of social network studies (Breiger, 2004; Scott, 2000; Wasserman & Faust, 1994). Such relations are in turn often classified as *stronger or weaker*, where the weaker form is typical for occasional interaction between acquaintances while the stronger form is more typical for relatives and close friends. The concept was initially proposed by Mark Granovetter (1973). According to him, tie strength can be described as ties that have a combination of long duration, high emotional intensity, intimacy, and reciprocity.

Much research has elaborated on the distinction between strong and weak ties, and a general argument coming out of the "strength of weak tie" hypothesis is that weaker ties have benefits related to giving access to new information that make them particularly important for knowledge development and information access (Granovetter, 1973). Still, stronger ties have proven to be more important than weaker ones for the development of trust and stability as well as the transfer of tacit knowledge (Coleman, 1988; Hansen, Podolny, & Pfeffer, 2001; Krackhardt & Stern, 1988). In general, both weak and strong ties provide businesses with benefits, even though in a number of workplace studies have proved it difficult to make good categorizations between strong and weak qualities of relations. In practice, most work-based relations tends to fall somewhere "in

between" the weak and strong ties (Krackhardt, 1992; Nardi, Whittaker, & Schwarz, 2000).

Organizational studies of social networks usually make an explicit distinction between *business internal* and *business external links* (Kilduff & Tsai, 2003). For the owner of a small business much of the attention will often be on the surrounding environment of suppliers, partners, and collaborators. Yet there is also an important internal network of colleagues that needs to be considered, in particular, as the company grows in size the need for internal coordination of tasks increases (Tichy & Fombrun, 1979). The internal communication will also consist of colleague-to-colleague interaction during the work day.

From a more managerial point of view, a branch of studies has focused on the *quality and the quantity* of the enterprise managers' individual social networks (Shaw, 2006). One central finding from these studies is that because relations are created by processes of ongoing interaction, their structure fluctuates and their boundaries are usually "fuzzy" (Johannisson, 1986; Shaw, 2006). And because the managers are embedded in such fluctuating networks, it is unlikely that they will make decisions about their firms in isolation from these influences. The mangers of small enterprises are "embedded" in an array of social connections that are crucial for manager's actions and choices. Another central finding is that the size and constellation of the individual network affect the efficiency of the manager and their company. For entrepreneurs, the value of having a rich network of contact persons has been documented as vital, in particular in initial stages of the development (Greve & Salaff, 2003; Krackhardt & Kilduff, 2002). Still, these personal networks are not assembled within a single type of relations, but are found in private realms of life as well as among business colleagues or partners.

In network studies, some areas of work have been particularly occupied with analyzing the overall *structure of ties,* related to social capital benefits. From a whole-network point of view, social capital is a product not only of the kind of relation but the constellation of these ties in denser or more open structures (Burt, 2005; Coleman, 1988). The value of denser communities is sometimes contrasted with the benefits of more open and wide spanning networks connecting distant clusters. Over the last decade, some evidence has been provided for the structural hole argument, indicating that entrepreneurs can take advantage of disconnected areas in a network (Burt, 2001). Still, empirical evidence suggests that the value of particular constellations must be seen in relation also to the *type of relations* involved and the particular type of organizational context involved (Hansen et al., 2001; Podolny & Baron, 1997). While structural holes can be beneficial for some purposes, it might be detrimental for others.

The informal business relations, then, is assumed to be of significant value for performance and innovation within and across small enterprises. In studies following a network analytical path, it is usually assumed that the numbers of informal connections in the region and the country affect the general "social capital" of such districts (Coleman, 1988; Fukuyama, 1995; Lin, 2001). In this perspective, the number of informal ties across small enterprises may be of vital importance not only for the individual manager and his business, but also for the economic and political development of the region he or she belongs to.

In examining social networks in a Malaysian setting, it is important to note that informal relations often play a particularly important role for many small enterprises in Asia (Millington, Eberhardt, & Wilkinson, 2006; Sin, 1987). In an Asian context, having informal ties to partners and vendors is usually crucial for all kind of trades. The art of developing and sustaining important business ties is part of the "guangxi –tradition". For this reason, small businesses in China and other parts of Asia are often more intertwined in extensive networks of stronger ties, than European or North American enterprises.

Mobile Media and its Impact on Social Relations

A broad tradition of studies have documented that there is a connection between telecommunications and economic development. A bidirectional relationship between teledensity and economic output measures (GDP, TFP) have been found in studies in Europe, USA, and Asia (Chakraborty & Nandi, 2003; Cieslik & Kaniewska, 2004; Wolde-Rufael, 2007). Lately, this relationship has been documented also for mobile telephony (Banerjee & Ros, 2004; Lam & Shiu, 2010). Still, little is known as to how mobile phones affect the small enterprises' day-to-day work patterns *and in what way* the mobile can help the small business to be more efficient and competitive. Following a network perspective, mobile phones (and related technologies) are tools that help people to build, exploit, and sustain their social relationships. In today's world, technical tools are increasingly having an impact on people's social relations. Yet, these tools are not only used to support existing relations, they are also making it possible to build new ties, adjust roles in networks, impact hierarchies, and also change on forms of power (Contractor & Eisenberg, 1990; Kim, Kim, Park, & Rice, 2007; Licoppe & Smoreda, 2004).

Mobile phones, then, are technologies whose main function is to develop and sustain social relationships; and this indicates how the mobile phone can be an important tool for the owner of a small enterprise. So far, however, the evidence is not clear as to how mobile media and ICT in general affect on small businesses' social relations or network. Argumentation seems to follow two slightly different pathways: On the one hand, it is argued that ICT (including the mobile phone) makes larger markets more accessible for small businesses and also attract customers from wider areas. Local middlemen can be bypassed by small traders accessing buyers and sellers directly. As such, the mobile phone seems to make emerging markets more efficient and dynamic. This "*increased access*" argument has been prominent in the economic-oriented literature on mobiles and economic development (Duncombe & Heeks, 2002; Jagun, Heeks, & Whalley, 2008). There are some empirical evidence supporting that mobile phone makes the markets more efficient: The aforementioned study of fishermen in Kerala showed that mobile phones had made the fish market in this Indian fisher village work in more efficient ways. Jensen explained that: "The adoption of mobile phones by fishermen and wholesalers was associated with a dramatic reduction in price dispersion, the complete elimination of waste and near-perfect adherence to the law of one price. Both consumer and producer welfare increased" (Jensen, 2007, p. 879). A later study of grain traders in Niger also found that mobiles opened up the markets for buyers and sellers (Aker, 2008).

On the other hand, it has been argued that mobile communication network do little to build a wider network of customers and clients, but rather *strengthen existing relations*. Donner (2004) found in a study in MSEs in India that mobile phones seemed to be of little importance for recruiting new customers to the micro enterprises, compared to face to face communication. Similarly, Molony (2006), in his study of Nigerian small enterprises, found that mobiles were mainly used to sustain trust in relationships that already had an established face-to-face relationship. According to these studies, the mobile tended to strengthen already existing bonds, instead of establishing new ones. As stated by Molony (2006), "…mobile phones can be seen as a facilitating technology for existing trust-based relationships" (p. 78). Also in support of the second argument, Goodman (2005) found in two (non-representative) surveys from South Africa and Tanzania that mobile phone users were more active in participating in local community groups than non-users. The mobile users also had a wider network of both weaker and stronger relations than non-mobile users.

The idea that the mobile phone can change the structure of the business networks, usually associated to the "increased network" argument by allowing MSEs to bypass middlemen, has

been controversial. According to this argument, the mobile phone can help small enterprises to go directly to the wholesalers or buyers and as such, increase their revenues and create less centralized structures. Some initial studies found evidence that middlemen where bypassed (Bayes, 2001). Yet, other evidence suggests that mobile phones may actually strengthen the role of intermediaries, rather than bypass these. In a recent study of mobile phone use in the Nigerian cloth weaving industry, Jagun and his colleagues argued that there was: "no support for those studies that saw a disintermediation effect. Rather it was intermediaries who were driving the adoption of new technology in this supply chain. And it was intermediaries who found their roles consolidated with a new form of intermediary even emerging" (Jagun et al., 2008, p. 61)

Related to the discussion earlier on the important role of close relationships in Asian culture, it is to be expected that mobile phones will be used by intermediaries to keep in touch with, maintain, and strengthen relations with their existing network, making it more difficult for other intermediaries to come in. In the Asian context, trust established through personal, face-to-face interaction sustained over time is reinforced and supplemented by mediated communication using technologies such as the mobile phone.

Objectives of the Study

This study intends to follow-up on the ongoing discussion on how mobile phones may affect MSEs business-related networks. At stake in these discussions is both what kind of social relations the mobile phone is used to initiate or strengthen, but also how the mobile phone over time contributes to changes in the structure of the small business owners' social networks.

A further understanding of these questions need to be explored by empirical studies of small enterprises in the setting of their day-to-day work. As mentioned above, there is a lack of studies that address differences across business sectors, and also recognize the differences in communication

technologies available to the MSEs in question. This paper contributes to this firstly by providing new insight in the general use of mobile phones, relative to other important communication tools (e.g., landline, fax, email). Secondly, it looks closer at the types of *relations that are supported by mobile phones*. For both questions we will address potential differences between business sector and managers and employees. Thus, four central research questions are explored in this paper:

Research questions related to mobile phone use:

1. What differences in the use of mobile telephony exist between employees and managers in MSEs?
2. What differences in the use of mobile telephony exists between employees and managers within farming, retail, and professional MSEs?

Research questions related to work relation support:

1. What kind of work relations are supported with mobile telephony by managers and employees?
2. What kind of work relations are supported by mobile telephony among managers and employees within farming, retail, and professional MSEs?

Methods

This study is a comparative case study, combining personal qualitative interviews with a quantitative study of individual call patterns. A limited set of companies was selected across three businesses sectors, including professionals, retailers, and farmers.

While companies in the first two sectors were located in the Selangor district outside Kuala Lumpur, the small farmers were located in the Pahang region, further north. Within each of the cases, a questionnaire was distributed to all employees and managers in each company.

These particular sectors where chosen on the basis of different considerations. Firstly, they are crucial for most Asian economies and usually involve a large part of the workforce. Retailers represent the largest single group of MSEs within the service category, and there are at least 150,000 registered retailers in Malaysia today (Saleh & Ndubusi, 2006). Secondly, both agriculture enterprises have proved to be important forerunners for innovative use of mobile technologies. While the agricultural small businesses have been in focus for Asian and African countries (Bayes, 2001; Castelli, 2007; Jensen, 2007), the professionals have in particular been addressed in western countries (Faulconbridge & Beaverstock, 2010; Jensen, 2007; Ling, 2004, 2008). Third, as groups of employees with presumably distinct ways of working, they appeared as well suited for a comparative research design.

As this is a comparative case study, the aim is not to generate findings that are representative for Malaysia or SMEs in general. Our intention is to look for similarities and differences across a relatively small sample of selected cases. The cases are therefore *strategically sampled* from different groups with the intention to find interesting differences when it comes to the use of mobile phones and work relations. These kinds of empirical insights are valuable evidence that may be further used to build theory, or to verify in larger and more representative samples (Eisenhardt, 1989; Miles & Huberman, 1994; Yin, 2003).

This paper is based on a comparative set of cases, including 12 enterprises in agriculture, retail, and business professionals. The investigation of these cases applied a combination of qualitative and quantitative techniques. For the *qualitative part,* we conducted interviews with managers and, to avoid a "managerial bias", two to three employees in all enterprises. For each enterprise, three employees were selected randomly. The interview lasted for about 30-50 minutes and was recorded and later coded and analyzed with the appropriate software. In addition, we asked

the manager to draw out his network of relations of relevance for his daily work. A total of 39 interviews were conducted (see Table 1).

The *quantitative part* involved a short survey distributed to all employees in the companies. The questionnaire included a general information section asking about informants' age, type of work, media usage, subscription type, and work mobility. They were presented a list of media, and asked to indicate how often they used them in their work (Daily, weekly, Monthly, or Never). The second section was used to track the individuals' networks based on their most recent use of mobile phones. A traditional ego-network design was included to capture ingoing and outgoing phone calls, text messages, (SMS) and emails (Carrasco, Hogan, Wellman, & Miller, 2006; Wellman, 2007). Rather than using a traditional name generator, however, we based the personal network on the actual incoming and outgoing mobile traffic. To do this, we first asked the informants to open the call directory in their mobile phone. Then we asked them to read off and register the last 10 incoming and outgoing calls and messages, and classify them in accordance with seven pre-defined categories. The same procedure was then followed for SMS and email, if available (similar techniques were used in studies of telecommunication in developing regions; see Bertolini (2002) and Donner (2006)). The predefined categories made it possible to classify the latest interaction in accordance with the general network approach presented above: 1) Friend or family; 2) Supplier or vendor; 3) Customer; 4) person working in your company; 5) your manager; 6) Business acquaintances; and 7) don't know.

The call-log technique has the advantage that it gives a more detailed picture than traditional "average scores" of media use. It gives an indication of the type of relations that the media use to support, groom, instruct, or exploit. Tracking media use based on record logs is a more reliable way of getting data than based on informants' memory (Bernard, Killworth, & Sailer, 1982). There is of course a risk that

individuals do not register what they see in the log or that they change this to make them more "central" in the enterprise. We have no reason to believe, however, that this happened in our study.

Analyzing social networks based on mediated interaction runs the risk of being one-eyed and concerned about only a few media channels, forgetting about communication taking part in other media and channels (Julsrud, 2008). We should not expect the networks expressed through media-based to reflect a "total" picture of social relations or communication going on in the enterprise. What it *does* give is an indication of what kind of relations that mobile phones and SMS were used to support. Here we will balance the traffic diagrams with the information from the qualitative inquiry.

A total of 108 questionnaires were filled in and returned from 73 males and 35 females. The average age was 33 years.

Studies of small enterprises usually address the manager of the company, since he or she takes most decisions and communicate most with partners and collaborators. Yet a lot of communication goes on between the manager and the others in the company, as well as between the employees. To capture also the internal communication in the MSE, we have chosen to target both the managers and the employees.

Comparative case studies usually draw on a combination of different data sources, qualitative and quantitative (Eisenhardt, 1989; Yin, 2003). This paper will start by presenting some important differences across the cases, relying on the quantitative data. In particular we will pay attention to the call patterns, and a variance analysis (ANOVA) is conducted to calculate differences between the three sectors. Key ANOVA tables are placed at the end of this article.

Results

Quantitative

This section discusses findings based on the analysis of mobile media use among the 108 employees and managers across the 12

Table 1

Overview of Business Cases, Main Business, Size (Employees), Number of Qualitative Interviews and Received Survey Questionnaires.

No.	Group	Company Name (Pseudonym)	Main Business	Employees	No of qual. Interv.	No of survey quest.
1	Professionals	AA Insurance Agency	General Insurance	25	4	15
2	Professionals	OR Management	Insurance	10	4	8
3	Professionals	GX Properties	Real Estate	20	4	13
6	Professionals	MW Properties	Real estate	4	4	4
4	Retail	KZ Herbs	Medicines & Groceries	3	3	3
5	Retail	MC Motor	Sell & repair Motor cycles	3	3	3
7	Retail	LH Wholesale	Wholesale of Food & Beverage	25	3	29
8	Retail	AE Automobile	Car distributor & importer	20	2	5
9	Agriculture	EC Agro	Manufacture palm oil mass	25	2	9
10	Agriculture	FM Fruit Farm	Planting brinjal and lady fingers	9	4	9
11	Agriculture	ST Fruit farm	Planting corn, orchids, guava	13	3	7
12	Agriculture	HI Agro	Palm oil production	5	3	3
	Total			162	39	108

enterprises. Table 1 provides an overview of all interviews and cases analyzed in the study. We will start by looking at the use of mobile telephony and then move over to analyze the call patterns across the three sectors and between managers and employees.
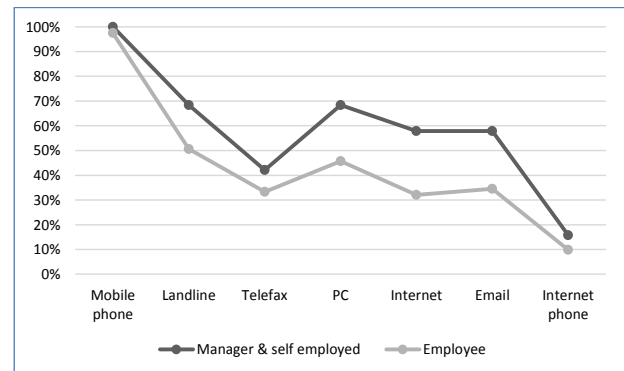
Use of Mobile Telephony

Difference in the use of mobile between managers and employees. Mobile phone is the most used media for both managers and employees across all sectors. As indicated in the figure below, 98% of the sample reported that they used the mobile phone on a daily basis.

Traditional landline phone and fax continues to be an important part of the small enterprises media environment, and as approximately every second respondent indicate that they use landline on a daily basis, and every third uses a telefax daily. According to our informants, the main reasons for keeping a landline were to make sure that the communication with the customers is as good as possible. The customer relations are clearly of critical value for the MSEs and they cannot afford to lose customers due to a lack of fixed line connection.

About 70% of the employees paid for the mobile phones that they used at work, and this proportion was very similar across the sectors. The difference here was related to the status at the workplace, and almost every second managers and self-employed got their phone bill covered by the company. For regular employees (part time and full time) the corresponding numbers were 20%.

Their mobile phone was used every day by both managers and employees and neither were there any big differences in the use of landline or telefax (Figure 1). The computer-based media, most notably PC and the Internet, were however slightly more frequently used among the managers.

Figure 1. Daily media use for employees and managers across all business sectors (%)

Difference in use of mobile phones across the sectors. The mobile phone was used on a daily basis by MSE managers and employees across all three business sectors. In general, however, the professional used a wider set of media than the farmers and the retailers. The professionals were more active users of PC, Internet and email than farmers and retailers. The most significant difference was related to the use of email on a daily basis, used by 80% of the professionals and only 10% of the farmers and retailers (Figure 2). There were also significant differences across the sectors related to access to PC and Internet at the workplace: While 10.7% of all in agriculture had PC/Internet connection at work, this increases to 27.5% for the small retailers and to 92.5% for the business professionals (sig.=0.000). Looking at daily use across the business sectors, it is interesting to note that traditional media (i.e., landlines and telefax) still are commonly used among the professionals. Thus there were few signs of a "fixed-mobile substitution", as often predicted by mobile phone providers even in our most advanced group of MSEs (See Castelli, 2007).
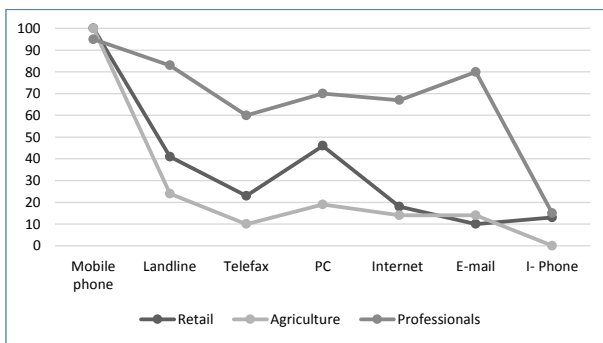
Figure 2. Daily media use for retailers, farmers and professionals (% within category)

There are variations when it comes to what type of mobile phone subscriptions the MSEs prefer. Usually the larger and more established enterprises tended to rely on post-paid subscriptions, where they get a regular invoice from the mobile network operator. The other main solution—prepaid—was more widespread among regular consumers and micro-enterprises (Castelli, 2007). In this sample, prepaid was more widespread than postpaid for retailers and farmers. As much as 77% of the retailers had prepaid, compared to 68% of farmers and 20% of the professionals. These MSEs preferred to buy call time on a phone card, rather than get billed for used call time every month or 14th day. For postpaid the trend was opposite, as this was used by 80% of the professionals, 31% of the farmers, and 28% of the retailers. In many countries in Asia it has become common to have multiple SIM cards, and to switch to the operator that has the best offer for the particular region or type of call the user wants to make (Fjuk, Furberg, Geirbo, & Helmersen, 2008). In this sample, however, the majority used the same SIM for work and private. Interestingly, as much as 50% of the professionals had multiple SIM cards, compared to 7.7% of the retailers and 4.5% of the farmers. Thus "one SIM for all calls" was a phenomenon valid for farmers and retailers, but not for professionals.

Relational support by mobile phones. The informants were asked to classify their calls and messages in accordance to a set of pre-defined options. This gave us a chance to see what kind of work relations they "supported"

Table 2
Distribution of All SMS and Mobile Voice Traffic Based on Last 10 Calls/Messages (in and out).

Relation	N	Mean	Median	Std. Deviation	Sum (connections)
Mobile_friends_all	108	7.0	6.0	6.4	758
SMS_friends_all	108	6.4	5.0	6.0	689
Mobile_Internal_all	108	4.4	2.0	5.8	477
SMS_Internal_all	108	2.6	0.0	5.5	284
Mobile_Business_all	108	2.2	0.0	3.3	233
SMS_Business_all	108	1.2	0.0	2.8	132
SMS_Customer_all	108	1.4	0.0	3.4	154
Mobile_Customer_all	108	1.6	0.0	3.1	168

with their mobile phone. In general, the largest share of the traffic was used to connect to *friends and family*. Collapsing SMS and mobile calls, looking across incoming and outgoing messages/calls, this category consisted of close to 50% of the traffic. The second largest category was *other colleagues* in the company or managers (i.e "internal traffic") capturing approximately 25%. The average number of mobile talks to friend and family relationships was 7 out of 10, and the average number of messages 6 out of 10. Interestingly, even though SMS clearly was a tool to keep in touch with friends/family, it was also sometimes used to connect to customers and business partners.

The call patterns indicate whom the managers and employees in the small enterprises had communicated with recently. The number of incoming and outgoing calls and messages was very similar within each category, indicating that a person who *make* a high number of calls to friends, is very likely also to *receive* a high number of calls from friends, and so on. In other words, the overall *reciprocity* in the selection of communication partner was high. Note that we do not measure reciprocity on an individual level, but based on numbers of calls falling in the same relational category. Measured as correlations of number of incoming and outgoing calls within the same relational category all are correlated on a 0.01 level (Table 3).

Table 3

Correlations Between Incoming and Outgoing Calls for Mobile Calls, SMS and Email Messages

Relation and ICT	Pearson r	Sig (2-tailed)
Mobile friends & family	0.818	.000
Mobile Customer	0.697	.000
Mobile Business contact	0.676	.000
Mobile Internal	0.916	.000
SMS Friends & family	0.967	.000
SMS Customer	0.771	.000
SMS Business	0.799	.000
SMS Internal	0.967	.000
Email Friends & family	0.708	.000
Email Customer	0.84	.000
Email Business	0.8	.000
Email Internal	0.865	.000

Difference between managers and employees. The mobile usage followed different patterns for employees and managers (Figures 3 and 4). Employees had a slightly higher share of calls/messages to family friends, while managers (as expected) had more mobile-phone contact with business relationships and customers. The difference between the managers' and employees' use of mobile phone is most apparent for business calls and business SMSs (sig.=0.000). More

surprisingly perhaps, is it to see that the employees used the mobile phone as much for business internal calls as the managers do. Thus, the mobile phone has truly become an instrument for coordinating work tasks between *all* employees in our cases, not just between managers and employees.

Some earlier studies have found that short SMS are more commonly used for private communication, while email is more common

for business purposes (Igarashi, Takai, & Yoshida, 2005; Kim et al., 2007). Looking at the general use of these three media channels, we find that mobile talk and SMSs actually follow a very similar pattern; both preferred for talking to family and friends, and (secondly) for internal communication. Thus the "strong tie relationships" were more frequently supported by mobile voice and SMS. Yet, among the managers in our case studies, SMS was also much used to communicate with customers. The average number of messages to this group of relationships actually exceeded the number of calls. Email messages on the other hand were used on a lesser scale and mainly for business relations and customers.
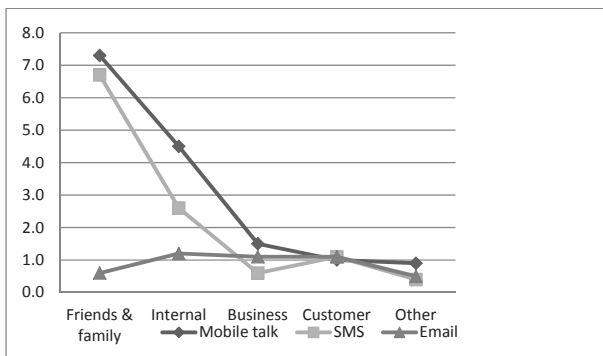
Differences across the business sectors. The small enterprises in our sample did use the mobile phone in different ways, supporting different types of relations (Figure 5). Looking first at the mobile voice patterns, two differences were striking: First, that the retailers had a significantly higher share of internal calls than the two other sectors (sig.=0 .000). The professionals, however, had significantly higher proportions of mobile calls to customers than farmers and retailers (sig.=0.000). Secondly, communication with friends was important across all sectors, although the share of friends and family talks was highest among the retailers. In this category of MSE, as many as nine out of 10 calls from or to a friend or a family member was recorded.

Figure 3 Employees last 10 messages/calls (in and out) and relation type (mean values)

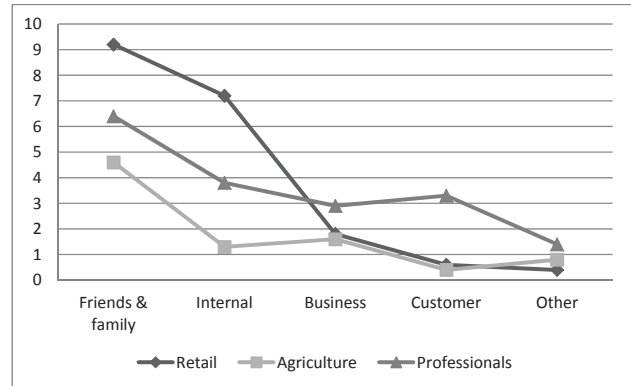**Figure 5**. Mobile voice calls and work relations across three business sectors based on last 10 calls (in and out) (mean values)

Figure 4. Managers' last 10 calls/messages (in and out) and relation type (mean values)
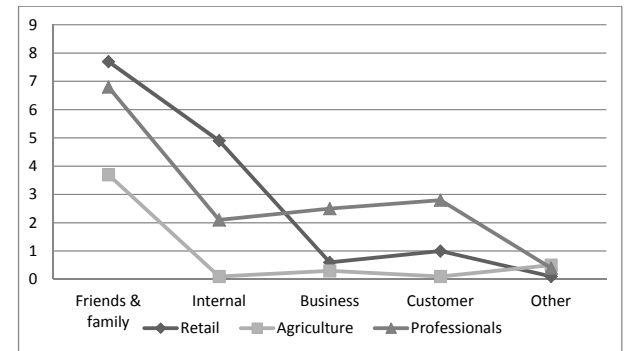

Figure 6. SMS exchanges and work relations across three business sectors based on last 10 messages (in and out) (mean values)

For the SMS communication we find much of the same patterns. The retailer had a significantly higher proportion of internal messages than the farmers (sig.=0.000) and also higher than that found among the professionals. For retailers, the average number of internal messages was 5 out of 10. The professionals on the other hand, had a significantly higher proportion of messages to/from customers (sig.=0.003) and business contacts (sig.=0.001).

Most emails were sent and received by the professional MSEs, and they had significantly higher proportions of email messages in all categories, except for friend & families.

To summarize, we have seen that the professionals had access to PC/Internet on a broader scale than the farmers and retailers, and they also used "traditional" landline phones and fax more frequently than the other businesses. The call pattern analysis indicated that largest share of the mobile phone traffic was to relations classified as friends and family followed by internal traffic between colleagues/managers. The high share of traffic to family/friends was similar across all sectors, and for both managers and employees. We have also seen that managers used the mobile phone more for talk to business customers, while the use of mobile voice for dialogues for internal work coordination was as common among employees as managers.

Regarding the sector-wise differences, the professionals used the mobile phone more frequently for customer contacts, and they also sent significantly more SMSs to business partners than the other small enterprises. The retailers, on the other hand, used the mobile phone more for internal communication than the other types of enterprises. Farmers used the phone for family/friends as well as for partners, but less so than the other business categories.

The results provided here are based on a relatively small sample of enterprises and informants. As such, they should be interpreted carefully, and we cannot assume that they are representative for the larger universe of Malaysian MSEs. Yet, the findings are indicators of different ways and "approaches" to the use of mobile phones among MSEs. In this last section we will discuss these results a bit further, drawing on insights from the qualitative interviews. We will explore potential reasons for the high shares of family/friends calls and messages through mobile phones, and reasons for the different "orientation" in the mobile media use between the retailers, farmers, and professionals.

Qualitative

The strong private - work interconnections. The high interconnections between family and work spheres is in many ways a natural consequence of a mobile device being carried between the spheres of home and work places. The mobile phones have a functionality that makes it possible to "bring work home" and vice versa. As we saw, in the majority of Malaysian MSEs, the mobile phones are the employees' personal device, and as such, they have to pay for the traffic themselves. The fact that fixed line phones was mainly used for customer contacts, probably reinforced the private orientation of the mobile phone.

The high number of family calls should also be related to the nature of small businesses in Malaysia: Small enterprises in farming and retail often operated in very close circles, relying heavily on family and friends. The networks of business partners were in most cases long-time relations that were based on trust rather than on formal contracts. This is in line with what has been written earlier on Chinese family businesses as having "strong family ties, sharing and pooling of resources, efficient use of manpower practice of thrift, use of low gearing and flexibility of operations" (Sin, 1987, p.182). From our cases, it appears that many of the MSEs in Malaysia—in particular retailers and farmers—had developed their business much in accordance with these traditions. In particular, for the smallest enterprises, family and work were hard to separate, and sisters, brothers, and parents were as much colleagues as family members. An example

was LH wholesale, a small MSE selling foods and grocery goods. The managers, a Chinese Malay had built the enterprise around a network of five brothers operating several small outlets.

> My second brother is in Ampang, after that it is (name of brother), fourth brother is with me in front at the counter, number five is in Raja Laut nearby the hotel and number six is in Old Klang Road. They are the controller in each outlet. (Male manager, LH wholesale)

Obviously, in this whole sellers business network, family and business relationships were impossible to separate.

A third aspect that seemed to reinforce the family-work interconnection was the high number of immigrants working in farming and retail. An estimated 1.8 million or 16% of the Malaysian labor force are contract migrant workers, with roughly over 500,000 to over a million as irregular migrants. Our study confirms earlier ethnographic studies showing that the migrant workers are relying on the mobile to keep in contact with their families at home (Roldan, 2009). Some employees said that their main motivation to purchase mobile phones was to make long distant phone calls to their home countries. This clearly contributed to the large number of family and friends calls. One Indonesian farm worker told us how he used his newly purchased mobile phone to call home several times a day:

> I call back 3 to 4 times about 2-3 ringgit a day to talk with my son. My friends only call back Indonesia once a week but I cannot, I call back 3 to 4 times a day but did not talk long (…) I give him instruction because now he is in school and he does not have a mom to take care of him. He is staying with grandfather and grandmother. He is not comfortable with the getting instruction from the grandparents. (Male worker, FM fruit farm)

We should also note that the high shares of traffic to friends and family is not surprising, looking at earlier studies of MSEs in other countries. A survey of micro-entrepreneurs in Rwanda, Africa, using mobile phone call logs, found that as much as two thirds of all calls were to family and friends. In a follow-up survey it was found that calls to friends involved as much as 45% of all calls, and family members 26% (Donner, 2004, 2006). The findings from our case studies—that every second call is to family and friends—seems to be well aligned with these earlier findings.

The fact that the bulk of mobile communication was to forge, support, or exploit ties with family and friends should probably not be seen as an indicator of mobile phones becoming a medium for non-work relations only. On the contrary, mobiles were also used heavily to support communication with colleagues and partners during work time. In all MSEs it functioned as a working tool, used to coordinate a myriad of tasks during the day. The point is that the "pure business relations" represented a smaller number of calls for the MSEs, related to the more informal ones. The mobile phone then will therefore probably continue to connect across private and work settings for small enterprises in Asian countries. At this point it may even make the boundaries even more blurred than they already are in all sectors.

The internal orientation of the retailers. Another finding emerging out of our sample of MSEs was the tendency for retailers to have a significantly higher number of mobile dialogues and messages to *internal* contacts than the farmers and the professionals. There are at least two important factors coming out of our interviews with retailers that should be mentioned as possible explanations. One is that the somewhat larger retailers /wholesaler companies the mobile phone was widely used as a tool to coordinate work during the day. At LH wholesale, the mobile phone was used to inform each other continuously about detailed work instructions, check out prices, and give instructions to the two lorry drivers. The manager explains that also the temporary workers use their mobile phone to coordinate work tasks:

Like our driver, floor seniors and among the family members. These are the common line we use to talk to each other. (…). The others they even have their own phone especially those foreign base workers, they come in, and they fast go and look for one good handset and go for prepaid mostly. (Male manager, LH wholesale)

SMS was here seen as particularly convenient for communicating detailed information that needed to be "documented" or remembered. This documentation was also seen as an advantage communicating with foreign workers. As such, it had become something of a channel for coordinating internal tasks, perhaps similar to how email functions in larger and more bureaucratic organizations (Tyler, Wilkinson, & Huberman, 2005).

…sometimes SMS is better. Talk to phone also plentiful to make sure the index is not wrong and not giving any wrong info. Just to keep a mark of the pricing quoted is not wrong rather than talk on phone. (Male manager, LH wholesale)

Another reason, related to lower frequencies of calls/SMS to business partners and customers (compared to professionals) was a salient preference for face–to-face interaction with both these types of relations. For most retailers the working hours was spent in the shop, serving visiting customers. A female co-owner of a small herb shops explained:

Normally we communicate face-to-face for the customers, only the suppliers we use the mobile"(…) they come here to park their car, choose their item and then pay at the counter and take away. (Female co-manager KZ herbs)

As such, the motivation for calling customers was probably less sound than for professionals. Customers, usually locals, walked directly into the shop. This had developed a preference for doing business face-to-face. The preference for face-to-face contact among retailers was also salient for the supplier and vendor contact. As noted by one of our informants who is running a small herb shop, partners usually came to share experiences face-to-face.

Basically they are my friends; they will come here one to two times a month to share their experience in terms of the pricing, the medicine, the quality of the medicine, how to mix the medicine and herb because different herb have different use. (Male manager, KZ herbs).

The external orientation of the professionals. The professionals in our sample tended to have a more external orientation in their mobile call patterns, using it more for customers and business contacts. The interviews indicated that these enterprises addressed customers from wider geographical settings than the retailers and farmers. This was typically the case for the real estate companies. One of our cases—MW Properties—tried in particular to attract customers outside the country, since their central business idea was to help foreigners buy second homes in Malaysia.

For local people it is to voice call, SMS is more of internal link. What we have been done, we will inform the rest of the team by SMS. Local is more on SMS. Even we use Skype for local and we have many offices. (Female manager, MW Properties)

Even though a lot of the communication with the partners and potential house buyers abroad was supported by Internet telephony (Skype), it generated a lot of SMS and voice-calls as well.

A second reason for the high level of customer interaction among the professionals was that the process of selling typically involved intense communication over a short time-span. The manager of AA Insurance, a company that had specialized in insurance of container ships, explained how this often involved short deadlines. The process duration in this particular type of insurance was typically limited in time but it also usually involved a possibility for high earnings and significant risks.

In our business, time is essence. The ship is going to sail, it can't wait. Like cargo is loaded and they want to know whether it can insure or not, so we have to decide fast. Like now it is the monsoon period, I just have a shipment, they only give us 2-3 hours to decide how the insurer are and how much we charge (…) the sales people or the manager go out to meet the customer because to understand the risk you must see the risk. Let's say you insured a construction site, you must look at the building, so this people go out to look for the building and they come back and do the risk to be insured. (Male manager, AA Insurance agency)

To improve their possibility to win a customer and close a deal, face-to-face communication was central, although these meetings were usually backed up with all available media. Employees in both GX Properties and MW Properties told us that they often used SMS to initiate contact or get early information from customers intending to sell or buy houses. This contact was later followed up with face-to face meetings and circulation of email messages.

Finally, the professionals appeared to have a higher mobility at work than the farmers and the retailers, which probably also affected the use of portable media, and communication with customer and partners. Some of the real estate workers actually conducted a lot of work directly from the car, or other places outside the office:

For me both PC and mobile is important. I like to have a notebook and I was having a mobile station for two years. Operate everything from the car. The mobile phone, the notebook, the printer and the scanner are in the car. (Male employee, GX Properties)

Conclusion

The rapid growth of mobile phones is related to a number of changes in society that so far is not very well understood. It seems to be transforming multiple arrays of modern life including communication patterns in small

enterprises. This paper has shed some light on how mobile phones are used in a sample of MSEs in Malaysia focusing in particular on the way it is used to support work relations.

Firstly, the study found that mobile phones were the most frequently used media for both managers and employees within retail, farming, and among professionals. Even though most retailers and farmers actually had access to a PC with an Internet connection, they mostly relied on their mobile phones for their communications needs during the day. Thus the popularity of the "handphone" goes beyond the business sector boundaries. The professional MSEs, however, had access to a wider set of media to support their relations, and in particular they used PC and Internet more frequently.

Secondly, analysis of mobile call patterns indicated that the largest share of the mobile traffic on the work phones was to friends and family relations. This was true for mobile voice traffic as well as for text messages (SMS). Collapsing SMS and mobile calls, this category consisted of close to 50% of the traffic. As discussed, there are several reasons for this, related to high degree of overlap between family and work relationships, as well as a high proportion of immigrants working in the MSEs in Malaysia. Also, the tradition in many Malaysian MSEs, that employees have to buy their own phones, tend to stimulate a blurring of family and business calls. This is so even though employees in most cases get their work related expenses covered.

Thirdly, and related to the above findings, we found that retailers and farmers tended to use their mobile phone more to support stronger ties—that is, to colleagues, family members and friends— while professionals used the mobile phone more frequently to communicate with customers and business partners. The internal-oriented use of the mobile phone, most evident among the retailers, may be related to a preference for face-to-face interaction with customers as well as a particular need to coordinate internal tasks during the day. In the retailer businesses investigated, the mobile phone was much used to coordinate tasks during

work hours. The professionals, on the other hand, used the phone to support more "distributed" networks of contacts, along with face-to-face contact, email, and Internet telephony. The higher intensity of calls to customers and business contacts among professionals was related to work processes that had a more limited time-frame with higher risks. To put this in Granovetters' terms, the study indicates that while most MSEs used their mobile phone to support stronger ties, the professionals had started to use the mobile phone to a larger extent also for their weaker (and more distant) work ties.

Insofar as intermediaries are concerned, the use of mobile phone has not decreased their role especially seen in the cases of agriculture MSEs. The mobile phone facilitated communication between farmers and middlemen despite the geographic distance between farm and town center where produce needed to be sold. The previously-established relationship between farmers and middlemen in MSEs studied were maintained contrary to notions that relationships with the use of mobile technology can be cut by farmer-producers directly accessing markets with direct communication through the mobile phone as tool. The same pattern was found among the retailers. It must be noted that these relationships were built on trust that had been deeply-ingrained by virtue of reputation, social reliability, and length of time of personal interaction. There are cases when dealings with intermediaries have been there for generations. Hence, in the case of agriculture and retail MSEs examined, the role of intermediaries is reinforced with easier and faster communication through the mobile phone. For the professionals, however, the middlemen positions were less salient, and the mobile phone was frequently used to develop new business contacts outside the region. As such, the argument that mobile phones may give small enterprises "increased access" to new markets seemed to have relevance for the professionals but not the farmers or the retailers.

We should note that this study has some important limitations. The sample consist of a small number of relatively small numbers of cases in two regions in Malaysia. Methodologically analyzing call pattern based on the 10 last calls or messages does not necessarily give an exact picture. The findings presented here should therefore be seen as indicators of new and emerging patterns of mobile phone use among a targeted group of cases, but not as not findings representative for a larger universe of Malaysian MSEs. Areas for future research may be on large enterprises and those in the industrial sectors showing similarities or differences on how mobile communication technology influences communication patterns within and outside organizations. We believe that a social network approach is well suited for this. For Asian enterprises—where social networks have always been crucial—a clear understanding of the impact of new technologies on business ties may be of particular importance.

While the current study has documented differences across Malaysian MSEs in agriculture, retail, and business professionals, later studies should try to include experiences from other Asian countries, as well as other business areas. Understanding how mobile phones are a significant force for transforming social relationships within and between small enterprises is vital for policy makers seeking ways to improve the latter's efficiency which in turn, enable them to contribute more to the economy.

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Annex I

ANOVA (one-way). Mobile calls and status at work (1= manager or self employed; 2= employee)

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Mobile_friends_all	Between Groups	41.049	1	41.049	1.010	.317
	Within Groups	4308.914	106	40.650		
	Total	4349.963	107			
Mobile_Internal_all	Between Groups	7.611	1	7.611	.225	.636
	Within Groups	3582.639	106	33.798		
	Total	3590.250	107			
Mobile_Business_all	Between Groups	237.723	1	237.723	26.397	.000
	Within Groups	954.601	106	9.006		
	Total	1192.324	107			
Mobile_Customer_all	Between Groups	6.967	1	6.967	.702	.404
	Within Groups	1051.700	106	9.922		
	Total	1058.667	107			
Mobile_Other_all	Between Groups	4.849	1	4.849	1.177	.280
	Within Groups	436.587	106	4.119		
	Total	441.435	107			

Annex II

ANOVA (one-way). Exchange of SMS and status at work (1= manager or self employed; 2=employee)

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
SMS_friends_all	Between Groups	88.444	1	88.444	2.470	.119
	Within Groups	3794.991	106	35.802		
	Total	3883.435	107			
SMS_Internal_all	Between Groups	1.573	1	1.573	.052	.820
	Within Groups	3213.612	106	30.317		
	Total	3215.185	107			
SMS_Business_all	Between Groups	171.225	1	171.225	26.713	.000
	Within Groups	679.442	106	6.410		
	Total	850.667	107			
SMS_Customer_all	Between Groups	57.127	1	57.127	5.287	.023
	Within Groups	1145.281	106	10.805		
	Total	1202.407	107			
SMS_other_all	Between Groups	.637	1	.637	.507	.478
	Within Groups	133.021	106	1.255		
	Total	133.657	107			

Annex III

ANOVA. Mobile calls and business type (1=retail, 2= agriculture, 3= professionals)

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Mobile_friends_all	Between Groups	364.584	2	182.292	4.803	.010
	Within Groups	3985.379	105	37.956		
	Total	4349.963	107			
Mobile_Internal_all	Between Groups	610.250	2	305.125	10.751	.000
	Within Groups	2980.000	105	28.381		
	Total	3590.250	107			
Mobile_Business_all	Between Groups	40.246	2	20.123	1.834	.165
	Within Groups	1152.079	105	10.972		
	Total	1192.324	107			
Mobile_Customer_all	Between Groups	205.113	2	102.557	12.616	.000
	Within Groups	853.554	105	8.129		
	Total	1058.667	107			
Mobile_Other_all	Between Groups	21.032	2	10.516	2.626	.077
	Within Groups	420.404	105	4.004		
	Total	441.435	107			

Annex IV

ANOVA (one-way). Exchange of SMSs and business type (1= retail, 2= agriculture, 3=professionals)

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
SMS_friends_all	Between Groups	88.444	1	88.444	2.470	.119
	Within Groups	3794.991	106	35.802		
	Total	3883.435	107			
SMS_Internal_all	Between Groups	1.573	1	1.573	.052	.820
	Within Groups	3213.612	106	30.317		
	Total	3215.185	107			
SMS_Business_all	Between Groups	171.225	1	171.225	26.713	.000
	Within Groups	679.442	106	6.410		
	Total	850.667	107			
SMS_Customer_all	Between Groups	57.127	1	57.127	5.287	.023
	Within Groups	1145.281	106	10.805		
	Total	1202.407	107			
SMS_other_all	Between Groups	.637	1	.637	.507	.478
	Within Groups	133.021	106	1.255		
	Total	133.657	107			