Relationships Among Uncertainty Avoidance, Individualism-Collectivism, and Usability of Personal Management Information as Perceived by German and Indonesian Users

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Eidesstattliche Erklärung

Hiermit erkläre ich, dass ich die vorliegende Arbeit selbstständig verfasst und keine anderen als die angegebenen Hilfsmittel verwendet habe.

Yogyakarta, April 3, 2012

Arief Fahmie
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## Contents

1. Abstract ......................................................... 1

2. Chapter 1: Introduction ....................................... 3

3. Chapter 2: Research Paradigm ............................... 29

4. Chapter 3: Uncertainty Avoidance and Usability of Personal Information 38

   Management

5. Chapter 4: Do Individualistic and Collective Persons Measure Usability of Personal and Group Information Management differently? A Culturability Study with German and Indonesian Users 71

6. Chapter 5: Summary and Conclusion ...................... 108

7. References ..................................................... 112

8. Appendix ....................................................... 142

9. Curriculum vitae .............................................. 153
Zusammenfassung

Chapter 1: Introduction

There are various factors which connect with the ways users perceive usability of Personal Information Management (PIM). This dissertation aims to explore the correlation between cultural background and the usability of PIM perceived by users from Germany and Indonesia. This introduction chapter begins with explanations about PIM and usability, followed by models of culture, competition, cooperation, and uncertainty across culture and Usability. The completion of the chapter describes the purpose and research question. Some ideas and themes of Chapter 1 are repeated in the introduction of Chapter 3 and 4. This was necessary because both chapters are to be submitted for publication to a peer-reviewed psychological journal.

Chapter 2 outlines the methodological paradigm that is related to the hypothesis and the manner in which the research question is outlined. Chapter 3 and Chapter 4 explore how the level of usability is related to the cultural background of the individual users from Germany and Indonesia. The dissertation deals with cultural dimensions and for this reason Chapter 3 focuses upon Uncertainty avoidance; Chapter 4 investigates individualism-collectivism. Chapter 5 contains a summary and general discussion whilst exploring comparatively theories and technologies explored in the two previous chapters.

Personal Information Management and Usability

In a complex world where people routinely manage large amounts of information, people are constantly challenged to handle and use the digital information that they are responsible for. Such environments encourage the emergence of online Personal Information Management (PIM). An earlier definition is explained by Lansdale (1988) describing PIM as procedures and
methods to organize, to categorize, and to retrieve information for daily activities. In the same way, Bellotti, Ducheneaut, Howard, and Smith (2003) conceptualize PIM as a process through which information is ordered by classification, placement, or embellishment to retrieve easily when needed. It is clear that such definitions of PIM are defined from an established information management point of view. From this perspective, information necessary to store can be recalled when later needed. The more complex definition is explained by Boardman (2004) and by Moran and Zhai (2006). They define PIM as the way to organize a set of personal information items to provide support users’ roles and tasks. A PIM tool, as a result, is software that supports a user to manage his or her personal information. The main functions of such a tool are to support for acquisition, for organization, for maintenance, and for retrieval. A personal information cloud denotes the fundamental change in PIM systems which means personal information is being moved from the traditional desktop to the networked world or beyond the desktop (Moran & Zhai, 2006). Therefore, in this research personal information collections are stored remotely on network drives, or online PIM systems. The extra complexity of considering PIM on multiple computers and mobile devices are avoided.

PIM is defined as an individual activity, but users also manage collective information that emerges a collaborative work-related term: Group Information Management (GIM) (Erickson, 2006). As an online tool for group purpose, GIM has to have a facility or feature to allow members of a group to access either personal or group information. Research about GIM focuses on the system and social rules underlying the information sharing.

Nowadays, multiple devices for instance cell phones, laptops, and desktops are frequently used to manage users’ personal or group information. Boardman (2004) identified typical PIM tools on a modern desktop computer including: personal file systems, email, web bookmark
management, and calendar. A personal file system is used to store personal document files provided by operating systems as a default area, such as MyDocuments in Microsoft Windows and by website, such as Google Document. Files can be created in several formats, for instance spreadsheets, text documents, presentation. The email tool has a facility to manage electronic messages, including attached text documents, or embedded web addresses. Web bookmark management is different to email tools as they do not contain user-defined content but it manages pages stored on remote websites. By using calendar tools, a user is able to arrange both individual and group appointments and also provide various levels of access depending on the setting arrangement. One may have access solely to view the calendar, but the other is able to add entries or to book appointments, even to change existing entries. Other PIM-tools are reference managers, image collections, to-do lists, contact managers.

Boardman (2004) also concluded some trends in PIM usage: increasing numbers of users, more collections of personal information, and increasing PIM-tool complexity. Brush and Turner (2005), for example, found that 51% (317 persons) used their digital calendars at work and 38% (233 persons) of their 621 respondents primarily used paper calendars. In recent years, research in PIM is serious area of investigations from a wide-ranging scientific and engineering discipline, including cognitive psychology, human-computer interaction, database management, information retrieval, and library and information science (Teevan & Jones, 2006).

This research aims to explore usage of PIM software by German and Indonesian users. The reasons to carry out this research are growth of PIM technology in Germany and Indonesia and their cultural background (uncertainty avoidance and individualism-collectivism). The cultural background topic will be discussed later. It is reported that the number of active Internet users in Germany is 65,125,000 Internet users for March 2011 representing 79.9% penetration of
the whole population. The data also describe users growth of Germany from 2000-2011 is 171.4%. It is concluded that Germany is the Europe’s largest on-line population (IWS, 2011a). In contrast, at the end of 2010, Indonesia estimated 30 million Internet users, 20% increase compared to 2009. This represented less than 13% of the population (IWS, 2011b). The Internet growth is hindered by the less developed communication infrastructure, on the other hand, many believe that Indonesia has highly prospective as an on-line market (Budde.com.au, 2008).

IT for facilitating PIM in both Germany and Indonesia has been built up by several organizations and personal users. For instance, to support an effective and safe scheduling of working groups, Chemnitz University of Technology, Germany, provides Google’s web-based applications as a PIM tool for the staff as well as the students. In addition, individual users in Germany have been utilizing PIM systems to organize their data, such as Advanced File Organizer (AFO). The features of AFO allow users to make access files and folders, to set the data according to any properties, and in categories and subcategories that they share. 334 users (92%) felt that the software is useful compared to 30 (8%) who said not (De.giveawayoftheday.com, 2008). In Indonesia, Google Apps at Universitas Widyatama allows students to organize their activities with an on-line calendar. Students can keep a calendar, share another with their friends, and subscribe to public calendars to stay updated on all the great events on campus. Another example is PT NEC Indonesia that uses PIM tools to support Human Resource Departments in managing the personal data of their employees.

Beside the extensive development of online calendar usage, the primary is a lack of evaluation. Most PIM interfaces have not been evaluated with exceptions including studies by Bellotti et al., (2003) and Dumais, Cutrell, Cadiz, Janke, Sarin, and Robbins (2003). Without an effective interface, a PIM tool is not able to be efficient. A properly designed interface must
be part of the considerations for technology applications, systems, and devices that involve personal information collection, access, and communication (Karat, Brodie, & Karat, 2006). This also contributes to the quality and usability of the system (Chou & Hsiao, 2006; Noiwan & Norcio, 2005).

The ideal condition, when PIM is compatible with characteristics of users, is associated to the software characteristic called usability. Usability is explained in several definitions, some of which will be mentioned here. Previous definitions of usability typically focused on performance and result-related criteria for example effectiveness and ease of use (Shackel, 1991); nevertheless more lately the theory of usability has been extended to comprise subjective sides, such as user satisfaction (ISO, 1998). A comprehensive definition of usability is offered by Pearrow (2000) as the “discipline of applying sound scientific observation, measurement, and design principles to the creation and maintenance of the Web sites in order to bring about the greatest ease of use, ease of learn ability, amount of usefulness, and least amount of discomfort for the humans who have to use the system” (p.50). This definition is expected mainly at websites, but it can also include software applications. Another definition of usability is proposed by Cato (2001) who said that “Usability is being able to do the things you want to, not the things you have to” (p.3). This indicates usability is the degree to which the product supports the user in reaching his/her goal or jobs (Levi & Conrad, 2000).

Hornbaek (2006) noted that various studies reported explorations of specific attitudes towards the interface, for example annoyance and anxiety (Bailey, Konstan, & Carlis, 2001), complexity (Corbett & Anderson, 2001), control (McGrenere, Baecker, & Booth, 2002), engagement, flexibility, fun (Drucker, Glatzer, De Mar, & Wong, 2002; Isbister & Nass, 2000), intuitive, learnability (Czerwinski, van Dantzich, Robertson,& Hoffman, 1999; McGrenere, et
Gaver and Martin (2000), Hassenzahl (2003), and Zaharias and Poylymenakou (2009) also suggest that there is a strong need for empirical works that go beyond the purely cognitive and task-oriented paradigm. Affective parts of interaction are the main issues to investigate while trying to recognize the user practice. This is in line with the current ideas in Human-Computer Interaction (HCI) research field where a key challenge is to deal with user affect. It is acknowledged that systems designers assess the range of potential affective conditions that users may have while operating with the system (Hudlicka, 2003).

The definitions, in particular those of the ISO, lend themselves properly to the study and they form the origin of the accepted usability definition for this study. Though the definition of usability proposed by ISO has been criticized because it is too abstract (e.g., Seffah, Donyae, Kline, & Padda, 2006), however, Hornbaek (2006) studied 180 usability articles and suggested that the ISO definition is commonly accepted. In line with Hornbaek’s study, Alshamari and Mayhew (2009) conclude that most of definitions of usability emphasize efficiency, effectiveness and user satisfaction. As a result, for the aims of this study, aspects of usability will be defined as follows:

a. Effectiveness is how well the user is able to achieve that which must be done by using the system and can be measured in terms of accuracy and completeness.

b. Efficiency is the amount of resources, in this study it refers to time, required to complete the desired task.

c. Satisfaction is a subjective feeling relating to the attitude of the user towards the system.

There are several current issues based on the factors affecting usability testing and its results, for instance evaluator’s role, number of users, and tasks (Alshamari & Mayhew, 2009).
The evaluator’s role is crucial in usability testing (Hertzum & Jacobsen, 2003), and a number of studies have confirmed that problem detection varies clearly (Vermeeren, Kesteren, & Bekker., 2003). Hertzum and Jacobson (2003) illustrated the evaluator’s role as a latent obstacle in a usability study involving four evaluators. It is reported that only 20% of the 93 problems were identified by all evaluators. The major reasons for these results were evaluators’ interpretation, a lack of methodological analysis skill, and evaluators’ mistakes to prove problems that they had already found out. To solve the problems caused by evaluator, Norgaard and Hornbaek (2006) recommended three approaches: to perform a comprehensive data analysis, to discuss with other evaluators about the problems that have not been clearly identified, and, lastly, to have the analysis conducted by different evaluators.

Number of users and tasks are also important in usability studies. Nielsen (2000) has proposed that in order to discover 85% of usability problems, the study needs five users. Similarly, Turner, Nielsen, and Lewis (2006) reveal that the first five users are able to identify nearly all usability problems and each added user is unlikely to discover other usability problems. In contrast, Lindgaard and Chattratchart (2007) discovered that one study with five users identified only 35% of all usability problems. Therefore, if the website has different types of users, it is vital to think critically about number of users and their characteristics.

Though usability testing tasks simply refer to what users do to achieve a goal, they are able to seriously effect usability evaluation. For instance, Wilson (2007) explains selecting tasks as an important activity in usability testing. In one of Wilson’s (2007) study, selecting the incorrect group of tasks led to many protests when the tasks were selected to investigate merely the interface of the website. There is no important usability problems were identified during the usability test.
Regarding usability issues related to PIM and GIM, Lee (2003) concluded that four topics had emerged between the two systems. Firstly, an application problem occurs related to who take advantages from GIM applications. In PIM context, the advantages when adopting an online calendar system, such as saving time, working more effectively, are enjoyed simply and directly by the users. Conversely, a different situation takes place in GIM application. For example, a group of employees input their temporal schedule of meeting, then their managers requesting the meeting receive such benefits or even they edit the schedule. Secondly, factors that influence PIM and GIM are different. As a personal tool, PIM relies on individual motivation to adopt the tool, but for GIM users, the organization and the colleagues may also coerce them to use the system. Therefore, external factors are more crucial for the efficiency and effectiveness of GIM tools, compared to PIM tools, to support the users to accomplish their tasks. Thirdly, to increase the level of acceptance, GIM provides features used in PIM. For example, calendar usage is a very personal activity in which the user manages various types and detail of personal information and retrieves it in a specific way. By providing calendar leads GIM as an idiosyncratic tool and as a result minimizes the effectiveness of GIM as a communication device. Fourthly, to use GIM efficiently and effectively, sharing personal privacy with other members is important for the users. For instance, by presenting personal schedules to the group calendar, one is open about preferences and privacy; in reality, most users are hesitant to do this. Consequently, the ability of PIM and GIM tools to protect privacy, for example by providing features to manage the level of access, cause the users’ subjective satisfaction with the tools.
Hofstede’s Model of Culture and the Applications in Usability

Culture is a crucial factor to think when trying to predict, describe, or modify behaviour. It has an effect on the way individuals perceive and engage with the physical world during their daily activities, at work, schools, and other places (Triandis, 1995, 2001). There are several definitions and models of culture, although there is no conclusion on a specific definition and model of culture (Hoft, 1996; Vohringer-Kuhnt, 2003). For instance, Triandis (1995, 2001) defined culture as a system that forms the magnitude of external and internal stimulus, their interpretations, and the major reactions to the interpretations. According to Bodker and Pederson (1991), culture is a system of meaning that underlies routine and behaviour in everyday working life. Hofstede (2001) described culture as the collective programming of the mind that distinguishes the members of one group or category of people from another, where the mind stands for feeling, thinking and acting, with consequences for attitudes, beliefs and skills.

As opposed to trying to create a universal definition, it is more essential to develop a definition of culture that supports a specific field of research (Honold, 2000). Several of the previous definitions refer to culture as influencing the technique in which communication occurs. As noted previously, usability requires communication and interaction between the user and the system, particularly when using an interactive system. Thus, for the purposes of this study, we define culture as the patterns of view, emotion, and behaviour that influence the way in which users communicate with computers and, for the GIM context, amongst themselves as well.

As it stated earlier, culture influences the approach in which people interact with others in social environments and with the physical environment, including computers. Contact between the system and the user is unavoidable when using interactive systems to complete tasks because the user interface is the means by which the user and the system interact (Dix, Finlay, Abowd, &
Beale, 1998). The interface has to assist users to use their particular communication styles (Massey, Hung, Montoya-Weiss, & Ramesh, 2001). Web interface has to assist the learning of the system as well as ease of use, guaranteeing that the information is communicated in a cognitively well-organized way (Chau, Cole, Massey, Montoya-Weiss, & O’Keefe, 2002). Therefore, global interfaces should contain several of communication styles to offer support for the cultural variety of the users.

In the global environment, cross-cultural usability is in relation to making websites a successful means of interaction between a global web site owner and a local user (Jagne, Smith, Duncker, & Curzon, 2004). Because users are from different languages, regionals, and countries, their desires of websites are determined mostly by their local cultural standpoints. Thus, user behaviours become more understandable and predictable when the user’s cultural point of view is considered (Barber & Badre, 2001; Massey et al., 2001). Consequently, websites need to exhibit culturability that means designing the interface should take into account the cultural biases and preferences to improve the usability of the interface and the system (Barber & Badre, 2001).

Nevertheless, there are two opinions in opposition to the effect and consequent of culture in HCI field occur. The first opinion is influenced by the cultural convergence perspective (Norton, 2002). This perspective proposes that cultures have an indication to become similar caused by global industrialization and technology impacts (Bryan, McLean, Smith, & Burn, 1994). Then, all computer users, irrespective of their country of origin, have a computer sub-culture that employs a particular language, set of symbols, standards and protocols for behaviour (Norton, 2002). Mrazek and Baldaccini (1997), for instance, found that for both Asian and European users, the use of a garbage symbol indicating the removal of files is frequently
considered to be an error, because the users may not distinguish the icon. But, if users have earlier been exposed to this icon, they will not only identify it, but will also expect it.

On the other hand, theory of cultural divergence counteracts the convergence perspective. The divergence point of view suggests that global pressures will not automatically ignore particular cultural values and practices (Bryan et al., 1994). According to de Souza and Dejean (1999), constant pressures from other cultures will produce an outburst of thoughts of protection of national and regional uniqueness as well as expressions of the fear of an integration of habits, races, and religions. Subsequently, sub-cultures are vital, but they are old-fashioned by the culture of the country (Marti & Muller, 2003). Therefore, convergence and divergence approach should be combined as follow: cultural convergence almost certainly takes place in work structures, while divergence approach occurs in work practices. For instance, it is found that the work completed by information systems professionals is theoretically similar across cultures (convergence approach), however the technology does not constantly reduce variations in cultural values and traditions (divergence approach) (Bryan et al., 1994).

The second opinion in opposition to the effect of culture in HCI relates to the aims of website usages. The main aims for web interfaces are information seeking, hobbies, social contact, and e-commerce (Chau et al., 2002). In line with Chau et al. (2002) and Fitzgerald (2004), the most main aspect influencing on-line buying behaviour is how much users used the web to look for product information. For that reason, Fitzgerald (2004) argues that the aspect that most affects attitudes and behavioural reactions to websites is the aim of website usage, rather than culture. Conversely, some studies found that culture influences website usability. For instance, Chau et al. (2002) concluded that US users utilised websites mostly for seeking out information, while Hong Kong users perceived the Internet as a social contact instrument.
Moreover, US users would be more accepting of website interfaces that provide efficient systems for looking for product information. On the contrary, website interfaces for Hong Kong users providing efficient system for a virtual community-like environment will be perceived as useful. For that reason, it is concluded that cultural differences is important and that it is essential to include for cultural variety in software products and Internet sites to accommodate the desires of the culturally different market.

A demand for models of cross-cultural software development is a reason of concern in the cultural dimension models (Fitzgerald, 2004). However, the use of cultural models has been critiqued because some academics disagree with stereotypes (Bourges-Waldegg & Scrivener; 1998) and not each person fits into the cultural mean since there are a wide variety of individual differences (Jagne et al., 2004). Various definitions of culture described by researchers form the foundation for the development of diverse models of culture. The models offer a more comprehensive analysis of culture, by identifying some cultural dimensions that are used to categorize cultural data (Evers, 2001). Whereas a number of the dimensions identified by the different definitions have been shown to overlap, they do differ considerably in how the researchers view and conceptualize culture. Three major models of culture developed by Trompenaars, Schwartz, and Hofstede will be reviewed in brief and one for use in this research will be identified.

1. Trompenaars’ Model of Culture

Trompenaars’ (1993) model focused on determining the system in which a group of people attempt to solve problems in their life. He identified seven dimensions of culture that illustrate the way cultures solve problems.
a. Universalism vs. particularism. Universalism people are rules-based, for that reason, in a serious situation involving other people; Universalists have a tendency to apply rules of morality right despite their relationship with the other person. On the contrary, people of a particularist view base their way out to the problem on the relationship that they have with another person, and even are prepared to break the rules if needed.

b. Neutral vs. emotional. This is a count of the variety of emotions that people communicate when dealing with others. A neutralist, in contrast, keeps their emotions in check and focus on arguments. Emotionalists, in contrast, express reactions and anticipate emotional reactions in return.

c. Individualism vs. collectivism. This dimension refers to the balance between the needs and wishes of individuals and groups.

d. Specific vs. diffuse. In specific-oriented cultures, there is a clear separation between public and private life. While in diffuse cultures, communications need the development of strong personal relationships, for example trust, prior to co-operation.

e. Achievement vs. ascription. Achievement oriented cultures attain status by individual achievements. Ascribed status, conversely, comes from being in a definite position or role, and is frequently based on age, social relationships, education and gender.

f. Time. The time dimension in Trompenaar’s (1993) model includes polychromic and monochromic time, in addition to a cultural approach to the past, the present and the future as well as the relationship of the three to each other. Polychronic time is where people prefer to perform many tasks at once. On the contrary, monochronic time is where people do one thing at a time, and as a result they show characteristics of low context, commitment to the job, and adhere strictly to plans.
1. Environment. This dimension explains the attitudes that different cultures have towards their capability to manage nature. The major difference between cultures is in the belief that it is either valuable to try to control nature, for instance Brazil and China, or not valuable, for instance Switzerland and Singapore.

2. Schwartz Values Framework

According to Schwartz and Bilsky (1987), individual values in general include a consistent composition within a country. Groups of individual values at the individual-level of analysis categorize ten motivational value types: security, power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, conformity, and tradition. Since the groupings of individual values were measured notably different from those at the individual-level of analysis, new theoretical definitions for the country-level motivational value types were proposed (Schwartz, 1994, 1999):

a. Conservatism: maintenance of the status quo and control of disruptive actions.

b. Intellectual autonomy: desirability of individuals expressing their own notions.

c. Affective autonomy: desirability of individuals communicating affectively constructive knowledge and skills.

d. Hierarchy: legitimacy of an imbalanced distribution of authority, positions, and resources.

e. Egalitarianism: go beyond self interests and voluntarily and support welfare of others

f. Mastery: reaching ahead through dynamic self-assertion

g. Harmony: fitting harmoniously into the environment

3. Hofstede’s Model of Culture

In line with his definition of culture explained earlier, Hofstede (2001) concentrates his model on determining the patterns of thinking, emotion, and behaviour that form a culture’s
mental programming. Based on the results collected from 40 countries which were then extended to 50 countries, he classified cultural dimensions into four types: power distance, uncertainty avoidance, masculinity/femininity, and individualism/collectivism. Finally, in the late 1980's, he identified a fifth dimension based on Chinese values, namely time orientation. An overview of the cultural dimensions is explained below.

a. Power distance (PD): the level to which less powerful members suppose and allow imbalanced power distribution within a culture. This dimension has two opposing sides: high power distance and low power distance.

b. Uncertainty avoidance (UA): the way in which people deal with uncertainty and risk. This dimension has also two opposing sides: high uncertainty avoidance and low uncertainty avoidance.

c. Masculinity vs. femininity (MF): gender roles, but different from physical characteristics, and usually characterized by the degrees of tenderness or assertiveness in the user. The two opposing sides of this dimension: masculinity and femininity.

d. Individualism vs. collectivism (INCOL): the position of the individual and the group, and is distinguished by the degree of ties between an individual in a society or organisation. This dimension has two opposing sides: individualism and collectivism.

e. Time orientation: people’s concerns with time (the past, present and future). Its two opposing sides: short-term orientation and long-term orientation.

It is clear that there is no perfect model of culture. The models proposed by Trompenaars, Schwartz, and Hofstede are criticized for being outdated (the dimensions were proposed in the 1980s and 1990s, respectively), and particularly archaic in their practice of utilizing geographical borders between nation-states as boundaries for cultures. Conversely, through the accelerating
process of globalization, cultures are gradually more recognized as fluid and never absolute, but constantly in transition (see, e.g., Morley & Robins, 1995). It is well-known here that rigid classifications of populations encourage stereotypes, and moreover the world has changed rapidly since the 1970s and 1980s. However, communication patterns nowadays still resonate with the cultural dimensions recommended decades ago (Würtz, 2005). Therefore, the models are still relevant but should be implemented carefully (Fitzgerald, 2004).

Various studies on the relationship between Human Computer Interaction (HCI) and cultural dimensions have been conducted. Some studies, such as by Würtz (2005) who focused on Hall’s model, explored various topics of HCI based on non-Hofstede’s model, but many researchers (e.g., Kamppuri, Bednarik, & Tukiainen, 2006; Veiga, Floyd, & Dechant, 2001; Matias & Miguel, 2010) concluded that Hofstede’ (2001) model is well-known model in research in HCI field. Moreover, based on the Hofstede’s model, Veiga et.al, (2001) also summarized some empirical and theoretical research on the effect of national culture, on usability, web design, and IT acceptance. Part of this popularity may be due to the simplicity of the model (Oshlyansky, 2007).

Although often criticized, similar to the previously mentioned studies, this research will also use Hofstede’s (2001) theoretical framework as its point of departure. Several researchers used and tested Hofstede’s (2001) cultural dimensions to investigate influence on systems design and user interface (Bernard, 2000; Dunbar, 1991; Evers & Day, 1997; Marcus & Gould, 2000). Not only it is the most famous model in HCI field but also this model is relevant with usability of PIM. The literatures provide adequate theoretical and empirical evidences to defend the applications of Hofstede’s (2001) cultural model as the foundation for managing the cultural dimensions of interface design. Specifically, various studies about the relationship between
Hofstede’s (2001) cultural model and usability were conducted; three of them are explained in more detail. Firstly, Smith & Chang (2003) investigated the extent to which Hofstede’s (2001) model related to level of Chinese users’ acceptance of interfaces. User acceptance is associated with usability in terms of subjective usability measurement (Davis, 1993; Nielsen, 1999; Vohringer-Kuhnt, 2003). The Smith and Chang’s study found that Chinese users had a preference to choose sites showing high power distance, masculinity, and individualism characteristics. Furthermore, each dimension contributed differently to the level of acceptance. Power distance provided 22% to the variance in user preference which is higher than masculinity and individualism that had lower contributions of 9% and 2%. It is concluded that there is a relationship between subjective usability and culture, and different cultural dimensions may have a weaker or stronger correlation on usability.

Secondly, Forer and Ford (2003) explored effects of usability heuristics and subjective culture on objective usability. It is found that speed and accuracy between the interfaces were significantly varied but there were no major differences for overall satisfaction between the interfaces. It was also concluded that the use of an interface showing a matched cultural profile increase usability than the use of an interface opposing a cultural profile, irrespective of whether or not usability heuristics are included. This offers some empirical evidence that there is a correlation between subjective culture and objective usability.

Thirdly, Hall, Lawson, and Minocha (2003) proposed that culture provides the context within which diverse answers to the same problem can be recognized and the problems solving, then, depends on the cultural context around the users. A study by Marcus and Gould (2000), for instance, explored preferred ways that will attract users to the site as a regular problem faced by designers of web interfaces. The individual agendas for individualist culture and on goals of the
groups for collectivist culture are most likely the best solutions. This problem-solving based on user context can be also implemented to the other dimensions, such as uncertainty avoidance, power distance. Again, this shows a correlation between Hofstede’s (2001) model and usability, as the context of implementation impacts on the usability of the IT product.

The research aims to explore usability of PIM software from German and Indonesian users based on Hofstede’s model (2001), particularly uncertainty avoidance (UA) and individualism-collectivism (INCOL) which are more related to usability of PIM. Moreover, collectivism is related to the acceptance of hierarchy and social inequality; therefore, a collectivistic culture tends to be a high power distance culture (Gouveia & Ros, 2000; Schwartz, 1994). To avoid conceptual overlaps, it is proposed that the power distance index is dropped from the discussion here. Bagchi, Cerveny, Hart, and Peterson (2003) indicated that IT promotes more cooperation at work places, improved quality of life and these values are supported in nations with low masculinity-feminity. Yet, it is also possible that in a country with high level of masculinity there would also be a constructive attitude toward implementing IT if the technologies support competition, raise the chance of success and develop performance, which are all main elements of a masculine culture. As a result, it is concluded that Masculinity-Feminity dimension has a mixed effect on the IT usage and is also dropped from the consideration in this research.

Different levels of UA and INCOL of Indonesia and Germany are starting points to explore culturability. Obviously, not all Indonesian will have exactly the same values and beliefs, nor will the German. According to Hofstede (1980) dimensions, Indonesia has score at 48 (fairly low UA), contrasted with the greater Asian average of 58 and a world average of 64. The scores describe a more moderated effect of UA within the Indonesian society. In contrast,
Germany scored 65 points on Hofstede’s UA index. The score is only 2% above the world average score for UA, but 36% higher than Indonesia.

From cognitive-behavioural model, UA is quite similar to intolerance of uncertainty which together with negative problem orientation, cognitive avoidance, and positive beliefs about worry which are identified as factors on the development and maintenance of worry (Dugas, Gagnon, Ladouceur, & Freeston, 1998; Dugas, Gosselin, & Ladouceur, 2001). Intolerance of uncertainty is frequently defined as a cognitive bias that impacts on one’s perception and response to confusing or ambiguous situations (Dugas et al., 1998; Laugesen, Dugas, & Bukowski, 2003). When facing uncertain situations, individuals who are intolerant of uncertainty are incapable to effectively engage with the problem solving or decision-making process (Buhr & Dugas, 2006). Intolerance of uncertainty has always appeared as possessing a strong connection with and as the top predictor of worry level among clinical and non-clinical populations (Buhr & Dugas, 2006; Laugesen et al., 2003).

Research has also found that people high on UA make choices for uncertain results that contain gains (Ladbury & Hinz, 2009). For instance, people can be stimulated to involve voluntarily for treatment in a randomly assigned situation if they are provided with a monetary reward (Harrison, Lau & Rutstrom, 2009). Taken together, this concludes that individuals with a high level of intolerance of uncertainty have a cognitive predisposition favouring the threatening understanding of all information, the bias appears when the individuals face unclear information and understand such information, and it is linked to emotional, cognitive, and behavioural reactions to such threatening conditions.

Characteristics of UA that impacts on choice behaviours are the key factor of correlation between such cultural dimension and information technologies. It is proposed that people with
low UA are likely to be more unprejudiced in searching for information and in the alternative of new improvement. As Ladbury and Hinsz (2009) found that UA has complex effects on decision making, including on information technology usage in free-ware software and sharing of personal information contexts. A lack of trust may arise when users perceive lack of control over their personal information. A study conducted by Joinson, Paine, Buchanan, and Reips (2006) found that trust building processes are influenced by two aspects of perceived privacy called anonymity and confidentiality. High level of AU is related to usability because norms are clear and well-defined to obey and as result, people behave precisely based on specified norms. On the other hand, people with loose culture are able to have more flexibility in behaviour (Triandis, 1995), including in usability issues.

Germany and Indonesia have different level of INCOL. Based on Hofstede’s cultural index (1980), Indonesia is one of the least individualistic societies which has score 14 ranked 47th out of the 53 countries and regions studied, while Germany was ranked 15th on this dimension (score = 67) and is labelled as individualistic societies. In addition, Triandis, Leung, Villareal, and Clack (1985) studied nine diverse nations and concluded that Indonesia as the most collectivistic country among them. People, at an individual level, can be represented by the terms idiocentric versus allocentric related to individualistic and collectivistic (Triandis, Bontempo, Villareal, Assai, & Lucca, 1988). Idiocentric individuals, who endorse more individualistic values, have an independent self-construal, focus on personal achievement, and multiple group memberships; whereas allocentrics, who endorse more collectivistic values, are more concerned with social support and report low alienation (Triandis et al., 1988). However, there is a concern within the culture that means not all Indonesian will have exactly collectivistic values and beliefs and German users are always individualistic persons. Therefore, it is
interesting to explore whether individualistic and collective persons from Germany and Indonesia measure usability of PIM and GIM differently when accomplishing task individually and in group.

*Figure 1. FITT (Fit between Individuals, Task and Technology) framework (Ammenwerth, Iller, & Mahler, 2006)*

To analyse the correlation between the INCOL dimension and usability of PIM-GIM, this research adopts the FITT (Fit between Individuals, Task and Technology) framework (Ammenwerth, Iller, & Mahler, 2006). It is based on the idea that IT adoption depending on the fit among the qualities of the users such as computer skills, cultural background, of the characteristics of the technology such as performance, usability, and of the characteristics of the tasks and processes such as task complexity. The purpose of IT management is to reach the most compatibility among technology, user and task. As a result, users must have an adequate amount of enthusiasms and knowledge to perform a certain task. The technology is required to provide an adequate functionality and performance to support a particular task and at the same time the user must be sufficiently qualified to use a specified technology adequately. A lacking compatibility perhaps direct to troubles such as stressful users, low quality of results, or inefficiency technology usage during implementation projects.
The FITT framework extends the other models such as the Technology Acceptance Model (TAM) of Davis (1993), Technology-Task Fit (TTF) of Goodhue, Klein, and March (2000). Davis (1993) suggested that other factors should be integrated in his model, for instance user experiences with the system, and attributes of the task. Also, TTF solely focuses on the compatibility between task and technology as well as between user and technology. TTF does not include the interaction of user and task, which is an important factor in this research. Based on The FITT framework, usability is an attribute of technology needed to accomplish a given task. Moreover, the attribute of the individual is INCOL dimension and the attribute of the task is working on processes that have to be completed by the user either individually or collectively and that are supported by the given technology. Since the aim of this research is to explore the correlations among INCOL, working process, and usability, therefore FITT is more appropriate for this research.

In term of FITT frameworks, users from a collectivistic culture prefer to perceive usability aspects of GIM as higher than usability PIM. According to Hornbaek (2006), the main aspects of usability consist of both perceptions of usability (satisfaction) and actual usability (effectiveness and efficiency). Survey about evaluation of users’ subjective impressions of usability is the tool to assess perceptions of user satisfaction. Data of effectiveness are collected by recording users’ performance to assert whether he or she is able to fulfil a task, while data of efficiency is gathered by recording time needed to complete certain tasks. Wagner (1995) found that in group work, a high level of collectivism increased the level of cooperation. Cooperation is crucial for achieving success in group work, especially in the context of GIM. Collectivism is also able to forecast the group performance as compared with individual tasks. Jung and Avolio (1999) suggested that collectivism moderates the relationship between group achievement and
leadership. On the contrary, in individualistic cultures, a new IT application will be more likely viewed as useful when it is perceived as a tool to enhance the individual achievements (Anandarajan, Igbaria, & Anakwe, 2000; Veiga, Floyd, & Dechant, 2001).

Research Purpose and Question

The studies focus on human-computer interaction (HCI) in relation to ethnic culture continues to grow. An example of such development is issues around the relationship between culture and usability of PIM and GIM. The reasons why developers are interested in users’ behaviour influenced by cultural matters are able to be traced back to transformations in both technology and the user base. PIM and GIM technology spread outside Western countries and the new global software markets became rapidly an essential element of software developers’ business. As a result, the user base moved from primarily Western users to users representing varied cultural backgrounds.

Culture is related to almost all of the psychological aspects of human interaction, for instance perceptions, attitudes and personality, which in turn are revealed by our behaviour (Hofstede, 2001). In terms of software usage, cultural background, tasks and usability are connected and there are dynamic compatibilities among them (Ammenwerth, et.al, 2006, Barber & Badre, 2001, Marcus & Gould, 2000). In this research, aspects of usability (efficiency, effectiveness, and satisfaction) of PIM and GIM are explored based on two cultural orientations, UA and INCOL. PIM usage often forces the users to share sensitive personal information. This leads the users to postpone the inputting of their data, until they accept assurances, or the ability and reliability of the software to keep their sensitive information (Joinson, et al., 2006). Theoretically, it is predicted that German users will have higher level of UA compared to
Indonesian users. This may influence time to finish the task, the number of errors, and positive feeling to the PIM software. This research will recruit novice users, therefore order task (first vs. second task) may correlate with their probability to make errors compared to expert users, for example learning from first task improves the performance when accomplishing second task.

Next, in the context of GIM, it is important to consider cooperation for attaining success in group work. Collectivism that values on harmony and relationships and places high prioritises on groups is able to predict the performance of a group as Jung and Avolio (1999) concluded that collectivism moderates the correlation between group performance and leadership. In individualistic cultures, IT application will be perceived as a useful tool when it is able to improve the users’ performance (Anandarajan, et al., 2000; Veiga, et al., 2001). When both individualism and collectivism are explored, for instance in an e-learning context, Gaspay, Legorreta, and Dardan (2009) found collectivist students enjoyed the non face to face learning environment more than individualistic students. The facilities of e-learning supported the collectivist group to have a feeling of being connected to the other members and the group also recognized the openness of asynchronous communication. These refer to the research questions: for German and Indonesian users, how are UA and INCOL related usability aspects of PIM software? With regard UA, how does task order correlate with aspects of usability? And do Individualistic and Collective people measure usability of PIM and GIM differently?

Chapter 1 introduces the background of the research and Chapter 2 explores the research paradigm. The following two studies (Chapter 3 and 4) will assert the purpose of comparing German and Indonesian users. In Chapter 3, the purpose of the research aims is to explore the relationships, from German and Indonesian users’ viewpoints, between usability aspects of PIM software (efficiency, effectiveness, and satisfaction) and UA. In Chapter 4, the aim of the
research is to provide empirical evidence based on the analysis of usability aspects of PIM software related to INCOL from German and Indonesian users’ perspectives. In the experiments, German and Indonesian users perform two different tasks (individual and group tasks) using PIM and GIM.

In terms of cultural background and research methodology, Chapter 3 and 4 are equivalent since each of them explored one cultural background but the experiments had to be divided into two studies because the cultural backgrounds required different research designs. On the Chapter 3, beside UA it was important to explore the effect of first vs. second tasks. On the Chapter 4, INCOL entailed differences on aspects of Usability when users accomplish different ways to complete: individual vs. group tasks. Also, Chapter 3 focuses more on the culture between country (Germany vs. Indonesia) while Chapter 4 concentrates on the culture between and within country (Germany vs. Indonesia and individualism vs. collectivism).

This research chose Germany and Indonesia as the countries to study because of two reasons. Firstly, Germany has a higher amount of its population online (82 million compared to 30 million) as well as internet penetration (79.1% compared to 12.3%) than Indonesia. However, both countries show potential markets for PIM and GIM usage as it is reported that Germany has the largest online population in Europe and Indonesia is one of five leading countries on internet users’ growth. Secondly, both countries traditionally represent Western and Eastern country stereotypes, however, it is important to note that nationality is different from culture. It means all Indonesian users will not have the same values and beliefs, nor will German users. As Ford, Kotze, and Marcus (2005) and McCoy, Galletta, and King (2005) argued that two persons probably have dissimilar cultural characteristics although they live in the same country.
Previous studies compared usability of IT applications perceived by users from different national backgrounds, mostly representing Western (US) and East Asia (e.g., Fang & Rau, 2003; Hall, De Jong, & Steehouder., 2004). Nielsen (1990) and Boehner, Vertesi, Sengers, and Dorish (2007) caution that outcomes of usability tests, carried out in the software’s country of origin, are probably not valid statistically on a national level. It is important to test the software in the target market to guarantee that the software is acceptable to and suitable with the target community. Thus, by comparing German and Indonesian users, this research provides empirical evidence about the manner in which users behave in using PIM software affected by their cultural background.
Chapter 2. Research Paradigm

Life in the rapidly evolving cyber world transcends distance, time, place, and national borders, and alters our attitudes of them. This has been influenced by the revolutionary advances in information technologies that are changing the world in fundamental ways. Global instant communicative access is transforming the nature, speed, reach, and loci of human influence. Thus, it alters how people work, educate, relate to each other, correspond, and conduct their business and daily affairs (Bandura, 2002). The progress of new technologies, their implications, and societal effects are determined, mostly, by technological socio-structural factors (Alshamari & Mayhew, 2009). Any research of human adaptation and change in the electronic era must consider the dynamic interplay of technological developments and a variety of psychosocial and structural determinants. Therefore, this research is concerned about different cultural background and usability of PIM technology.

Moreover, this chapter deals with the methodology paradigm that is related to the ways in which we answer the research questions of this research and to deal with the hypotheses. The research questions are: for German and Indonesian users, how are UA and INCOL related usability aspects of PIM software? With regards to UA, how does task order correlate with aspects of usability? And do individualistic and collective people measure usability of PIM and GIM differently? We note that PIM tools that are designed to be natural for particular target users may not be universally optimal. People from different cultures or countries are likely to bring different expectations and methods to learn the tools. This is why identifying the target users’ behaviours is an intrinsic part of the design process. The focuses of this research are, explored in Chapter 3, to explore the difference between Indonesian and German users in term of aspects of usability (effectiveness, efficiency, and satisfaction) of PIM and, explored in Chapter 4,
relationship between cultural background (UA and INCOL) and the aspects of usability.

As described earlier, UA is the extent to which people feel threatened by confusing situations (Hofstede, 2001). Generally in the field of PIM tool usage, German users do not like ambiguity and have a tendency to a high need for security as well as a strong belief in experts and their knowledge. They tend to seek a level of detail of procedures. On the other hand, Indonesian users tend to achieve relatively lower score compared to German on the UA dimension analysed by Hofstede and though Indonesian users are still somewhat risk averse, they are more willing to accept the risks that are associated with unknown situations.

It is difficult to decrease uncertainty in PIM usage especially for novice users. For a simple reason, PIM software requires its users to classify and systematize information, for example, name, address, and telephone number, is an annoying job caused by deficiencies in the interface, or unsatisfactory menus in the PIM software on the computer. Tungare and Perez-Quinones (2009) also found that to organize personal information was known as a frustrating task. When the quality of on-line content is difficult to discern (as well as the ways to explore the menus), PIM users who dislike uncertainty, and want complete information about the contents before they select it, are likely to be discouraged by the features’ incapability to retrieve all the information they want. As a consequence, the users are likely to conclude the experiences in using PIM less pleasurable, harder to use, and less useful than other users who do not require detailed information before making a selection.

Moreover, the correlation between aspects of usability and UA is also caused by order of task. Activities of the first task and the second one support a transfer of learning. Users may be able to decide the influence of future actions, for example completing second task, based on their past interaction history. The experience can be transferred to other computer related tasks when
interacting with a new system. Therefore, in this case, there are two central interests: firstly, generalising which is defined as transfer of knowledge of a specific to similar interactions and, secondly, the consistency which refers to univocal naming or use of keys (Ziefle, 2002).

Next, two patterns of values and self-views that broadly illustrate Western and Asian cultures are individualism and collectivism (Kashima, 2001). These ideas will apply to this research that investigates German and Indonesian users. However, it is mentioned that individualism may be a culturally contentious issue in contemporary Asian society. For example, more than one review paper has concluded that the Japanese are not really more collectivistic than North Americans (Matsumoto, 1999; Oyserman, Coon, & Kemmelmeier, 2002; Takano & Osaka, 1999). This suggests that not all Germans and Indonesians will have exactly the same cultural background.

Individualism is the predisposition of people to do things for themselves; as a result individualistic people are not very impressed by the importance of the tasks of the other or their identity (Hofstede, 2001). Conversely, collectivistic people prioritize activities in a different way by representing group behaviours (Hofstede, 1980; Triandis, 1990). The existing cross-national literature shows a relationship between INCOL and psychological outcomes of interest such as values, cognitive processes, self-concept; and recommends that culture influences process (e.g., if the focus of perception is a significant figure or the associations among figures) as well as content (e.g., how people think about themselves) (Goncalo, Polman & Maslach, 2010; Jackson, Colquitt, Wesson, & Zapata-Phelan, 2006; Kirkman & Shapiro, 2001; Oyserman & Lee, 2008).

Many PIM tools support the needs and interests of users as individuals in managing his or her personal information. Hall, et.al., (2004) found that Internet users with individualistic preferences are proud to be different from other users, prefer to take a personal perspective in
their actions and decisions, and tend to use features which they can emphasize personal goals. For that reason, individualistic users may see PIM tool as a useful, enjoyable way to solve their own problems. Conversely, the meaning of collectivism suggests that highly collectivistic people prefer to put aside their own self-interests in deference to the interests of their group and are likely to place great emphasis on group identity, smooth interpersonal relations, and social acceptance. This implies that teams with a higher number of collectivists will probably be more cooperative rather than individualists (van Ginkel & van Knippenberg, 2008), and therefore more readily support the high level of interdependence and cooperation which is characteristic of a high degree of teamwork in a GIM environment. As cooperative team behaviours are usually connected with higher levels of team effectiveness (Goncalo & Staw, 2006; Goncalo, et.al, 2010), GIM effectiveness should similarly be higher when team members support teams.

Research Paradigm

A key concept in the research paradigm of cultural research is the distinction between emic and etic approaches (Benet–Martínez, 2006; Berry, 1980; Helfrich, 1999). The emic approach observes the phenomenon from a position inside the system (indigenous) and explores just one culture. Then, the criteria approved are relative to internal characteristics of the culture. With this approach, instruments and theories to the target culture are developed by a systematic process through interviews, content analyses of media, focus groups, or culturally-informed scale development techniques that, afterwards, create a set of original attributes and stimuli (Benet–Martínez, 2006). This approach considers that context is important for understanding human behaviour. This implies that the reasons underlying the behaviour that must be understood based on the research subjects’ views are more important than the causes (Helfrich, 1999).
On the contrary, the etic approach investigates the phenomenon from a position outside the system and studies many cultures. The etic approach comprises the use of instruments that are either translated into the local language or imported in their original form. The results are, then, reviewed general or universal psychological characteristics across cultures (Benet–Martínez, 2006). Matsumoto and Fontaine (2008) have the same opinion with such definitions but Helfrich (1999) argued that in taking an epic approach, the descriptive system used must be equally valid for all cultures and offers the representation of both differences and similarities between cultures. Beside the descriptive system, the measures are also equivalent so that the results allow for comparisons amongst the cultures. In this way, culture becomes an external factor that is able to expose the differences among the cultures and to decide which psychological results can be generalized from one cultural situation to another one.

Emic and etic viewpoints are not without critics. According to Greenfield (2000), a dilemma with the etic approach is that it believes that the construct studied is described in the culture of interest culture in precisely the same approach as it is in the culture where the construct and measure were. This allows the culture-specific aspects of the construct to be excluded once using translated instruments. The outcomes from cross-cultural studies relying on this approach are not completely interpretable. On the other hand, emic approach is suited to discover culture-specific elements of a construct, but it is costly and provides empirical comparisons across cultures, which is complicated (Church & Ortiz, 2005).

There are some ideas to solve the emic-etic debate and two of them are described here in more detail. Helfrich (1999) suggests a conceptual framework, named the triarchic resonance principle, to unlock the impasse of emic-etic debate. The principle focuses on relationships among culture, the individual, and ecological task demands. The term ‘resonance’, which is
borrowed from acoustics, illustrates dynamic relations among the three elements. This principle explains that every individual has a basic biological potential whose characteristics can be either developed or undeveloped by external factors which is described as the totality of experiences. Furthermore, exponents of the experiences are the situational demands or tasks and the culture. Therefore, to describe an observed behaviour as a result of the relations among culture, individual and task, etic as well as emic views are indispensable. The comparisons involve an etic approach and the comparability can be assured by the emic approach.

The other solution to the emic-etic debate is known as a combined emic-etic approach (Benet-Martinez, 2006; Yang & Bond, 1990) which is explained by the three following steps. The first step is to identify the emic components of the construct collected from interviews, focus groups, content analysis, etc, in the target culture, then to develop and to manage measures that effectively tap these constructs. The second step is to manage translated measures of the construct, which are imposed-etic tests, as well as the emic measures. The final step is to statistically measure the specificity and overlap between the imported (etic) and indigenous (emic) measures. This last step is to quantify the level of different or overlapping between imported and indigenous constructs then to clarify the meaning of the non-overlapping indigenous components.

This cross-cultural study adopts etic strategy because the research questions and hypotheses are more relevant to deal with etic approach rather than the emic approach. The focus of this research is, firstly, to measure the difference between Indonesian and German users in term of aspects of usability (effectiveness, efficiency, and satisfaction) of PIM and, secondly, to explore relationship between cultural background (UA and INCOL) and the aspects of usability. According to Helfrich (1999) and Mio (2000), those who attempt to identify universal
characteristics of people across cultures—in this research they are usability and cultural dimensions—which permits the representation of similarities as well as differences between individual cultures, are approaching human behaviour from an etic approach. The research aims to compare between German and Indonesian users. The comparisons have no intention to describe the phenomenon of culture, but rather to study susceptibility to cultural impacts on individual usability. The cultural backgrounds are identified as factors that relate to differences in learning processes and behaviour patterns of usability.

An etic strategy compares cultures in line with a common external framework (Hofstede, de Hilal, Malvezzi, Tanure, & Vinken, 2010). In the current research an etic approach was used in which an instrument developed in a culture was translated from its original language (English) into two different languages (German and Indonesian). By using the same tool in different languages, the etic view evades the potential confounding caused by the use of different instruments or items in the different cultures. Consequently, the etic view allows clear-cut explanations of the function of cultural diversities per se. Though the etic approach may ease cross-cultural comparisons; it may overlook important specific aspects of UA, INCOL, and usability. Nonetheless, it is beyond the span of the current research to study the lexicon of such cultural backgrounds and usability in different cultures.

Research Design

In general, user testing in human-computer interaction randomly chooses users and asks them to accomplish tasks using different system designs with the intention of determining the better-quality design. To accomplish such design, comparable user populations can be created. To address the research questions and to deal with the hypotheses related to cross culture, this
research chose an etic approach. The problem encountered when using an etic approach is that culture is defined as a set of independent variables placed on the external position of an individual (Helfrich, 1999; Valsiner, 1995), however it is impossible to randomly assign a culture to the users. According to Helfrich (1999), culture does not provide any independent variables in an experimental context. Cultural factors are not identified as experimental treatment factors, but rather organismic variables. In a true experiment, participants are randomly assigned to a treatment factor, but the tasks of subjects to the different organismic factor levels is a selection in relation to their natural membership in a particular factor level which already exists previously. In this case, the cultural backgrounds of German and Indonesian probably have impacts on the test situation of usability but cannot be controlled. Therefore, the research method which is appropriate with this situation is named quasi-experimental (Trochim, 2006).

According to Matsumoto and Fontaine (2008), one of the major limitations of cross-cultural comparisons conducted by quasi experimental design is that empirically justified interpretations about culture as the source of group differences are not presented. When the results show the group differences, it is usually interpreted that the cultural source have influenced the differences, but in fact the mere documentation of between-group differences does not validate such inferences. The problem in conclusions appears when researchers conclude that the source of group differences is culture without giving any empirical evidence for this. Matsumoto and Fontaine (2008) name these misinterpretations as a cultural attribution fallacy. To avoid these mistakes in interpretations, this research conducted the following steps based on Matsumoto and Fontaine’s recommendations. The research actually measured level UA and INCOL of both German and Indonesian users, found the cultural differences, and showed that it accounted for the cultural-group differences on aspects of usability (efficiency, effectiveness, and
satisfaction). The research designs in more detail (e.g. participants, materials, procedures, and designs) will be explained in the methodology section of the Chapter 3 and Chapter 4.
Chapter 3: Uncertainty Avoidance and Usability of Personal Information Management

Abstract

The concept of usability of IT applications is related with the cultural background of the individual users. Online PIM systems have proliferated in Germany and Indonesia as several organizations and personal users in both countries began to realize the benefits of utilizing such technologies to advance business processes and to increase productivity. In this context the research aims to provide empirical evidence based on the analysis of usability aspects of PIM software related to uncertainty avoidance from German and Indonesian users’ perspectives. Some of the evidence are statistically significant and for this reason developers of PIM software with an international user group need to be aware that the results of usability measurements by novice users in various cultures may be different.

Keywords: uncertainty avoidance, personal information management, usability

The term Personal Information Management (PIM) emerged firstly in the 1980s when people expected to enhance human ability to process and manage information by using personal computers (Lansdale, 1988). In that time, development of PIM tools, with basic support for managing appointments, to-do lists, and contact information, also started growing. Research in PIM in recent years is a growing area of investigations from a wide-ranging scientific and engineering discipline, including human-computer interaction, cognitive psychology, information

1 This paper was written together with Josef Krems and Hede Helfrich-Hölter (Chemnitz University of Technology, Department of Psychology). It will be submitted for publication to a peer-reviewed psychological journal. The paper is presented here in its original form ready for submission, so that some repetitions of the introduction above in the paper were inevitable.
retrieval, database management, and library and information sciences (Teevan & Jones, 2006).

Moran and Zhai (2006) define Personal Information Management (PIM) as the process of acquiring, storing, managing, retrieving and using digital documents to support the users´ roles and tasks. Functions provided by a PIM system are to acquire, to organize, to maintain, and to retrieve items or information into the PIM systems (Barreau, 1995). In a gradually more complex world where individuals normally deal with large amounts of information, they are continuously challenged to handle and to use the information that they are responsible for. E-mail is the example of an information overloading application, other applications include maintaining addresses and contacts, scheduling, and organizing various documents and bookmarks that are of interest to the user.

The reason to investigate the usability of PIM is the trend of online PIM reports. For instance Brush and Turner (2005) found that 38% (233) of the 621 respondents mainly used paper calendars at work, while 51% (317) used their digital calendars. Moreover, research in PIM nowadays has emerged as an important area of investigations from a wide-ranging scientific and engineering discipline. This has included: cognitive psychology, human-computer interaction, database management, information retrieval, and library and information science (Teevan & Jones, 2006). The issue is without an useful interface, a PIM tool is impossible to be efficient. An appropriately designed interface have to be part of the considerations for technology systems, applications, and devices that support personal information collection and communication (Karat, et.al., 2006). A properly design also increases to the quality and usability of the system (Chou & Hsiao, 2006; Noiwan & Norcio, 2005).

The focus of this research is on the correlation between culture and usability of PIM software from a cross-cultural perspective. Barber and Badre (2001) define the merging of
culture and usability as culturability, when cultural elements are important factors in web site
design and are estimated to directly influence the way an end-user interacts with the site. From
an IT tool developer’s perspective, variations of usability may be found in character sets,
graphics, colour, symbols, pictures, icons, date and time format, phrases, and so forth (Fang &
Rau, 2003). However, many problems may appear because of the differences in cultural and
behavioural variety. Some navigation, metaphors, interaction, or the web-site appearance might
be confused and misunderstood, or even violate the users (Evers & Day, 1997; Marcus & Gould,
2000; Mahemoff & Johnston, 1998). It is also found that differences and similarities in Web site
design can be brought out through Hofstede’s cultural model (Callahan, 2006)

This study focuses on uncertainty avoidance (UA) which is defined as the extent to which
members of a culture feel threatened by uncertain or unknown situations (Hofstede, 2001). Tight
is an appropriate term for high uncertainty avoidance cultures since norms are clear and well-
defined, and people are supposed to act precisely as specified by those norms; loose cultures,
thus, allow more flexibility in behaviour (Triandis, 1990). According to Ladbury and Hinsz
(2009), culturally-relevant dispositions such as uncertain avoidance is able to have complex
effects on judgement, including information technology usage in free-ware software and in the
sharing of personal information. For instance, a lack of trust may arise when users perceive a
lack of control over their personal information. Joinson, et al (2006) found that perceived privacy
(anonymity and confidentiality) is an important factor in the trust building process. Therefore, if
the users perceive less control over personal information, this has a striking effect on their
willingness to use on-line PIM.

In order to simplify the analysis of data, the span of the study is constrained in the
following ways:
a. Personal information collections stored remotely on network drives, as a result this research excluded the complication of considering PIM on various computers and mobile devices.

b. The type of users involved in this study is novice. In other words, participants are in the early steps of PIM usage.

c. The research investigates two PIM-activities: calendar and files. Due to time limitation, it was decided to focus the research on those commonly-used PIM-tools though within the context of one tool, users often use a wide and varying range of features.

The research is proposed to investigate usability aspects of PIM software from German and Indonesian users from cross-cultural perspectives. Significant development of PIM technology and the different levels of UA are the reasons to conduct this research. According to Businesswire.com (2007), Germany is the Europe's largest online population. In a new report “Germany: Online Overview”, they estimated that in 2006, the number of active Internet users in Germany is 40 million, and it is estimated to surpass 65 million in 2011 (Internetworldstats.com, 2011). On the other hand, broadband Internet services in Indonesia are still less developed. At the end of 2007, Indonesia estimated 25 million Internet users, a 20% increase compared to 2006. This represented only less than 9% of the population. Problems with inferior telecommunication infrastructure are likely to continue to obstruct Internet growth in the future. However, Indonesia is considered to have enormous potential as an on-line market (Budde.com.au, 2008). Moreover, it is estimated that the number of users will in Indonesia climb up to 40% if the price of bandwidth decreases (Detikinet.com, 2008). The adoption of the Internet is largely dependent on a number of hard aspects such as technical infrastructure and economic development.

In Germany and Indonesia, IT for facilitating PIM systems has been developed by several
organizations and personal users. For example, Chemnitz University of Technology, Germany uses Google’s web-based applications that enable students and staff to create an effective and safe scheduling of working groups (departments, project teams, etc.) within the University.

Personal users in Germany also have been utilizing PIM systems to organize their data. A good example is The Advanced File Organizer, an excellent catalogue for digital collection. It has tools to make accessible files and folders, to add comments to the search function, to group the data according to any properties, as well as in categories and subcategories for sharing. It is found that 334 users (92%) agreed that the software is useful, compared to 30 (8%) who said no (De.giveawayoftheday.com, 2008). Furthermore, Google Apps at Universitas Widyatama, a university in Indonesia, facilitates students to manage their activities. By using the on-line calendar, students are able to make a personalised calendar, distribute it with their friends, and subscribe to open calendars to follow up dated information about all the events on campus.

Moreover, a different level of UA in Indonesia and Germany is a starting point to explore culturability. According to Hofstede (2001), UA is an enduring characteristic of a culture and affects a variety of choice behaviours within cultures. Individuals in cultures low in UA tend to be more open-minded in searching for information and in the choice of new innovations. As such, games requiring innovation and involving high levels of ambiguity are played more often in low UA countries such as Great Britain and Hong Kong as against high UA countries such as Germany and Japan (Sutton-Smith & Roberts, 1981). Indonesia, on the Hofstede (1980) dimensions, has a score at 48 which shows fairly low UA (the Asian average is 58, a world average is 64). This explains a modest influence of UA on Indonesian people. On the other hand, Germany has 65 points on Hofstede’s UA index which is just 2% higher than the world average score for UA, but 36% more than Indonesia. Therefore, it is predicted that German users will
have higher degree of UA contrasted with Indonesian users.

Several reports found that UA correlates with IT applications, such as E-learning (Downey, et al, 2005), web-based testing systems (Zaharias, et al., 2001). However, there is still a lack of investigation into relationships between UA and usability of PIM, particularly with German and Indonesian users. The majority of cross cultural and usability studies has been conducted comparing Chinese, Japanese, Korean, or Indian participants with U.S. Americans (Fischer & Smith, 2003). To achieve greater validity, therefore, more areas have to be covered.

Usability of Personal Information Management

Usability is a quality or attribute that describes how easy human computer interfaces to use (Nielsen, 1999). It has served as a key idea for capturing the “quality of use” of interactive systems, inspiring many investigations on the effectiveness and efficiency of system employment (Schneiderman & Hochheiser, 2001). On closer observation, according to the International Standards Organization (1997), system usability is defined as “the extent, to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use” (ISO, 1998).

Hornbaek (2006), and Sauer, Seibel, and Rüttinger (2010) found that the ISO definition is mostly accepted, and there is a differentiation made in the survey between subjective and objective usability. Based on this distinction, usability is defined as a construct involving user’s perceptions of user satisfaction, joint with the real effectiveness and efficiency of the software. Thus, in this research, ways to measure usability of software are divided into two broad categories: objective performance measures (measurement of the users’ capability in using the software), and subjective user preference or also named satisfaction measures (assessment of
level of the users’ enjoyment with the system experience).

The concept of usability is somewhat situation dependent in that the characteristics of the context (such as the user, tasks, and environment) influence usability. Many studies have examined various kinds of factors influencing PIM usability aspects and, based on the contexts of user theory by Peerce, Rogers, and Sharp (2002), they are explained as follows:

a. The Users

Characteristics of the intended users (skills, knowledge, physical attributes, attitude, motivation, job characteristics, role, culture, etc.) are significant factors that influence usability of PIM software. For example, it is found that bookmark organization is influenced by the age of users and this is fully mitigated by Web ability. Nevertheless, the impact of Web experience is not fully mediated by Web experience (Kurniawan & Ellis, 2001). Blandford and Green (2001) in their study about the usability of Meeting Maker, a computerised time management tool, reported that compared to staff who travel little, most of the managers mention that a higher of accessibility of a shared diary from multiple locations, especially when travelling overseas.

Regarding the effect of culture, Zhang, Ribiere, and Chintakovid (2008) found that both Chinese and American students prefer to share personal knowledge with in-group than with out-group members. The results also showed that the same working experience between two groups had more significant influence than the same cultural background in perceptions towards knowledge sharing. In email usage, American users tend to retain larger numbers of email messages than Latin American users. Also, European countries tend to file more of their email into folders and Asian countries tend to do this less so (Tang, et.al. 2009).
b. The Tasks

Relevant characteristics of the tasks (task characteristics, task execution, task flow, task demand on users, and task safety) can influence usability in many ways. For example, Proctor, Ali, and Vu, (2008) conducted an experiment about personal information, privacy, and usability. The subjects perceived that longer policies admitting many privacy goals would provide better assurance of privacy than shorter policies. From a usability of PIM point of view, it gives a guidance to improve the design of PIM software regarding the types and amount of personal information and safety. Task demand is also important factor of perceived usability. Grudin (1994) found that employees that have responsibility to maintain online calendars concluded that the tools are less important compared to managers that enjoyed the benefits of the tools. This happens because the employees perceived that maintaining online calendars as additional job.

c. The Environment and equipment contexts

There four components connected to the environment and equipment contexts in usability: organisational, social, physical, and social environment. For instance, Markus and Connolly (1990) studied the influence of social factors on the adoption of group ware tools and concluded that top-down approach was necessary for the use of these tools to reach critical mass. Moreover, the Orlikowski's study (1992) in a widely-cited case of group ware adoption found a high-level mandate to use Lotus Notes gained a mixed response. However, interestingly, the technical support staff having no mandate to utilize Notes, adopted it successfully.

Uncertainty Avoidance (UA) and Usability of Personal Information Management

In many theories of behaviour, psychological uncertainty is assumed to be an important mediator of human responses in situations with unpredictable outcomes. For example, according
to decision theories, an individual’s estimates of the probabilities of indecisive outcomes are determinants of her or his choices (e.g., see Kahneman & Tversky, 1979). Along with theories of health behaviour, if persons will take on health protective behaviour is a meaning of their perceived likelihood of contracting a definite situation, for instance, for the health belief model. Theories of jury behaviour apply individual probability ideas and probability thresholds to illustrate the processes involved in decisions of reasonable uncertainty (Dane, 1985).

Uncertainty avoidance (UA) is defined as the level to which the persons in a certain cultural background feel threatened by unknown or uncertain situations (Hofstede, 2001). Triandis (1990) elaborates on Hofstede’s dimension of uncertainty avoidance through his discussion of loose and tight cultures. Triandis explains that loose cultures encourage freedom and deviation from norms, whereas in tight cultures, norms are promoted and deviation from those norms is punished. Therefore, individuals in tight cultures prefer “predictability, certainty, and security,” whilst individuals in loose cultures prefer creativity and diversity (Triandis, 1990).

Several critiques argue with Hofstede’s theory of cultural dimensions over the years. The most interesting debate is sparked by an essay by McSweeney (2002) on the journal Human Relations. He undermined Hofstede’s theory by arguing that it is based on faulty assumptions. In particular, McSweeney (2002) criticized the assumptions that organizational culture of IBM, the research locations, is homogeneous across nations, with the intention that the variations in culture represent national cultures. Employees of one company are representative of the whole nation and the main dimensions of national culture can be assessed simply by a questionnaire. He also disagreed that culture can be identified by response to difference analysis. He explained how people’s behaviour in the workplace is mirrored in other areas of their lives. McSweeney’s (2002) criticisms were answered by several researchers, including Hofstede. Though Hofstede’s
model was ignored, Veiga et.al, (2001) summarized some theoretical and empirical studies on the influence of national culture which was based on Hofstede’s model, on IT acceptance and implementation. For example, high UA cultures may only adopt less risky and older IT; whilst fear of the unknown situations affect the technology and makes employees more resistant to technological change.

It should be stated that cultural variables as developed by Hofstede (1980) were not designed exclusively for research in usability. But, Hofstede’s cultural dimensions have been applied and tested by a number of academicians to study effects on user interface and systems design (e.g., Bernard, 2000; Dunbar, 1991; Evers and Day, 1997; Marcus & Gould, 2000). They also compared the usability of IT applications based on users’ perspectives from different cultural backgrounds, mostly representing Western and East (e.g., Fang & Rau, 2003; Hall, Menno, & Steehouder, 2004) but no study has solely investigated users from Indonesia and Germany.

Regarding the relationship between UA and usability, some studies reported that psychological characteristics of UA substantially connect with IT usage. Individuals in high UA cultures are uncomfortable with ambiguous and uncertain situations therefore they will be expected to reduce uncertainty. Some research using Hofstede’s cultural dimensions have confirmed that cultures with high UA are less open to innovations like the Internet as a new medium of communication. They tend to have fewer efficacies about their ability to competently use the Internet than the users in less UA countries (Hermeking, 2005). Moreover, the link between stress and uncertainty suggests that intolerance of uncertainty increases the negative impact of stressors on anxiety levels (Chen & Hong, 2010). Taken together, for beginners, they are frequently worried about the interaction with the system, regardless of their eagerness to
expend attempt. This is line with Adams, et al.’s study (2005) that found many novice users may disbelieve that they will ever be able to work successfully with computers.

Many online PIM systems are freeware editions. According to *The Free On-line Dictionary of Computing* (Howe, 1993), freeware means that a software provided without charge. It is a common class of small applications available for downloading and used in most operating systems. In the context of PIM, personal information cloud should be secure and private at an appropriate level (Moran & Zhai, 2006). According to Joinson, et al (2006), perceived privacy that consists of anonymity and confidentiality is a key element in the trust building process. Empirical studies also have found that financial services consumers are often reluctant to share personal information from the fear that their financial life will become an open book to the Internet universe (Bestavros, 2000). Taken together, regarding freeware and sharing of personal information, a lack of trust arises from users´ perceived lack of control over the access others have to their personal information. This implies that if the users perceive little control over information, then such condition has a striking influence on their satisfaction in using online PIM systems.

Also, Tungare and P´erez-Quiñones (2009) revealed how the organization of contacts, such as name, address, phone number, was recognized as a frustrating task caused by deficiencies in the interface, or insufficient features in the PIM software on the computer and on the phone. It should be noted that participants in this research were in the early steps of PIM usage with the presumption that they had no experience with the software. Lazar and Norcio (2003) state novice users have higher probability for making errors increases than experts. The emphasis is on the extent to which UA correlate with feeling threatened or anxious about an unknown situation. High UA signifies that a culture tends to recognize ambiguous situations,
such as arranging online calendars for novice users, as threatening and then they will tend to evade such situations. If the users perform repeated tasks, it indicates a relationship between UA and learnability of PIM software. Learnability is defined as a measure of the degree to which a user interface is able to be learned effectively and quickly (Nielsen, 1999). This is supported by a study by Zaharias, et. al. (2001) that found UA had a correlation with learnability of a web-based testing system. Consequently, in this research, German users who have higher UA culture will be less efficient and effective to use online PIM system than Indonesian users who have a lower UA culture.

From the standpoint of HCI, the cultural factor makes it understandable why usability of PIM is crucial. However, the task order may also contribute to the degree of relationships between aspects of usability and UA. According to the Constructivism perspective, learning is underlined as the internal thought processes of the learner as opposed to the external stimuli emphasized by behaviorism. Constructivism has been applied in teaching and pedagogy areas. This approach sees the learner as an active information processor; therefore, the previous knowledge of the learner is the basis for learning new things and the context of learning impacts learning outcomes (Marton & Booth, 1997). This is related to the transfer of learning from the first task to the next task which is important for novice users as they frequently make errors when learning a new computer task and spend a large portion of their time trying to recover from errors (Frese, et.al, 1991; MacDorman, Whalen, Ho, & Patel, 2011). Errors in PIM usage as well as the time to recover from errors may raise not only the level of performance (effectiveness and efficiency) but also the level of subjective satisfaction.

Using PIM software to complete the second task which is similar to the first task refers to a concept called skill acquisition. It consists of three stages that confirm the idea of conceptual
knowledge and interrelation of procedural abilities. The first stage is defined as cognitive phase. During this phase, the learner stores to memory a collection of information or facts which are associated to the skill. Next, in the second phase referred to as the associative stage, the learner begins to organize the facts into a procedural model. The procedural model consists of step-by-step directions for performing certain behaviour. Finally, in the third phase which is called autonomous phase, the procedure becomes more automated and rapid inevitably requires less processing resources. In short, conceptual knowledge grows into an efficient skill when it is practised many times (Anderson, 1980). Therefore, PIM users especially novice ones become more used to the procedure to complete second task and need only a small amount of time when they already finished the first task. For this reason there is a probability that led many to believe that PIM usability in first task is lower than in the second task.

As it is stated earlier, the relation between aspects of usability and UA is probably also influenced by the order of the task. This is could be related to the transfer of learning from the first task to the next one. According to Ziefle (2002), based on their experiences, learners or novice users in this research may be able to determine the effect of future actions. Then, the experiences are able to be transferred to the next computer related tasks. Adeoye and Wentling (2007) studied the relationships between national culture and usability of an e-learning system. The subjects accomplished 10 tasks related to using the e-learning system in general. The task was to log into the system, to locate specific modules within the system, to locate the course syllabus, to electronically submit a class assignment, and to open synchronous class archives. It found that there was a significant relationship between UA and time to learn. This is an indication that subjects with higher levels of UA were likely to have higher scores for time to learn. Furthermore, compared to those with high UA, subjects in the low UA group had a higher
memorability path, an error rate measurement by counting the number of clicks (actual paths as compared to expected paths). The research also found that the transfer of learning, together with UA, will increase effectiveness and efficiency in completing tasks and provide users with a greater satisfaction in using a PIM tool. Therefore, Indonesian users who have a lower level of UA would exhibit a significantly greater level of usability of both first and second task than German users. Moreover, there are negative correlations between the level of UA and aspects of usability (effectiveness, efficiency, and satisfaction).

In conclusion, uncertainty occurs as a cognitive state in many situations, for example when a person feels anxious in his/her own state of knowledge, when required information is contradictory or even unavailable, and when details of any situation are confusing, complex, and irregular. This may also influence how users perceive usability of particular software. This study aimed to find out whether UA has a correlation with usability aspects of PIM as well as the difference between German and Indonesian users in perceiving usability of PIM. Firstly, the subjects filled in a UA questionnaire and then they accomplished two tasks to notice the extent to which PIM is able to solve their tasks (efficiency), to account for the amount of time needed (efficiency), and to assess subjective assessments on the software (satisfaction). The tasks orders were carried out by using the principle of counterbalance to avoid the carry over effect. It is essential to consider that UA is also related to the learning process, meaning that there will be opportunities for users to increase their understanding of the tasks and software while working on the second task. In that instance, the situation would probably be more certain, more predictable, and not irritating. Finally, the data obtained was analyzed to distinguish the difference from German and Indonesian groups in terms of aspects of usability and to analyze relationship between UA and aspects of usability.
Hypotheses

The concept of usability in some situations depends on in that the characteristics of the context, such as the users’ cultural background influence usability (Barber & Badre, 2001; Marcus & Gould, 2000). Using PIM often requires the sharing of sensitive personal information. Users will not input data unless they are confident and receive assurances, about the reliability and ability of the software to protect the sensitive information (Bestavros, 2000; Joinson, et al., 2006). German users, which are predicted members of higher UA culture than Indonesian users, will prefer to take time to be active until they acquire sufficient knowledge and information to resolve unclear and unstructured situations when using PIM applications. For novice users, such situations are more complicated. For instance, Lazar and Norcio (2003) state novice users have a higher probability for making errors compared to experts and they need time to increase their performance level (Bartholomé, Stahl, Pieschl & Bromme, 2006). This leads to our hypotheses:

1. German users will have a higher level of UA than Indonesian users.

2. Indonesian users would exhibit a significantly greater level of usability of both first and second task than German users, as demonstrated by means of effectiveness, efficiency, and satisfaction.

3. Levels of aspects of PIM usability when both groups of users accomplish first task are lower than second task, as demonstrated by means of effectiveness, efficiency, and satisfaction.

4. There are negative correlations between the level of UA and scores of aspects of usability (effectiveness, efficiency, and satisfaction).

4a. For both groups, there is a negative correlation between level of UA and effectiveness. The higher level of UA, the less numbers of right answers.
4b. For both groups, there is a negative correlation between level of UA and efficiency. The higher level of UA, the more time to fulfil the tasks.

4c. For both groups, there is a negative correlation between level of UA and satisfaction. The higher level of UA, the less numbers of users who are satisfied with.

Method

Participants

In this research, the sample was carefully selected from two distinct populations: The first group of sample is psychology undergraduate students in Germany and the second one is the same sample but from Indonesia. Though university students are not likely to represent characteristics of the population as a whole, cross cultural research however have used similar student samples for research (Sauer, et. al, 2010; Shneiderman & Hochheiser, 2001). Both groups show some differences in samples compositions and selections. The German samples consisted of 4 male and 22 female students, while their counterparts from Indonesia involved 13 male and 27 female students. The average age of the German samples is 23.68 years which is higher than the Indonesian age average of 20.43 years.

The recruitment processes of the subjects from both groups were similar. To recruit the German samples, an invitation letter was forwarded to the mailing list of the university students informing them about the aims of experiment, the time and place, and the requirements for potential participants. Those interested in taking part in this study confirmed their participations to us. The German sample participations were voluntary and the Indonesian users were invited to join the experiments. Furthermore, there was a difference in the incentives available to participants. The German participants earned two credit hours by participating in the
experiments, whereas the Indonesian sample gained two Euros as research incentive. Instead of cultural background, it was important to control GoogleApps usage experience because this study focused on novice users. For this purpose, software knowledge and ability were moderately controlled by choosing those who had no prior experience in GoogleApps usage based on their responses on the questionnaires.

**Apparatus**

The PIM tool used in this study (GoogleApps) have future or planned interaction records to provide better support for users. Common features of Google Calendar, one of the applications in GoogleApps, include reminding users of their appointments, suggesting possible time slots for group meetings, and giving a warning when time conflicts occur. The features of this electronic calendar are not limited to time management but taking a holistic approach, Google Calendar combines information items and analysis of calendar entries in other tools to support information and task management. The use of such PIM tool can also allow the user to enter a calendar event that describes a schedule to attend a conference. The calendar entry contains digital information, for example the date, name, and location of the conference. Relevant documents also exist in the user’s file and email folders. When sending a reminder about an event, this PIM tool also includes links to potentially relevant documents (e.g., a link to a file folder that has a name similar to the calendar event).

The tasks named task A and task B were to arrange two schedules using the software, including uploading required documents and setting access to the schedules completed by both German and Indonesian users. The tasks were constructed from the tutorial video provided by Google and from the examples of personal calendaring presented in Faulring and Myers’ (2006)
study. The tutorial video explains features provided by the software and how to use the menus. Faulring and Myers (2006) investigated about the availability bar defined as an visualization and interaction method for complex calendar scheduling constraints. To ensure that task A and task B were equal, we conducted a pre-test with 4 students from each university. Task A began with a preliminary activity intended to make them familiar with the usability testing. For this activity, all subjects were given the following problem: “You are a member organization of the Student Affairs and are responsible to organize a yearly meeting within three months. As a dedication to the organization and response to suggestions from the other five members, you want to discuss the plan with them. Use the internet to handle your agenda. “ Then participants were requested to accomplish the following tasks, which consist of five items per task.: (1) to hold the meeting on next week at 13:00 o’clock, (2) to change the color of the event to orange, (3) to send such temporary schedule of meetings to other five members to gain their approval, (4) to upload the document "Proposals activities" in the folder with the name "Meeting", in addition to the invitation, and finally (5) to provide access to other members so that they can download, revise, and upload the document again. In the same way, Task B started on this priming instruction: “You need to set the schedule because you have to complete a difficult task in the course during this semester. Scheduling and storage of documents with the internet will make you have a test scores better than other students.” Then the following tasks were completed: (1) to create a folder with the name either "Task 1" or “Task 2”, (2) to upload an important article from a folder, (3) to give note that the article is very important, (3) to duplicate the article and store it in the folder "Archive", (4) to read the text books for 1 hour every Tuesday from 13.00-14.00 o’clock and the schedule also will remind you to do it on every Monday, (5) to read some scientific journals for
30 minutes on every Monday, Wednesday, and Friday and this schedule cannot be accessed by other people.

Data of usability were gathered based on the main components of usability: perceptions of usability (satisfaction) and actual usability (efficiency and effectiveness) (Hornbaek, 2006). To collect data of effectiveness, every subject was recorded if he or she was able to accomplish completely a task. Time needed to complete the task was a variable in this study; therefore no time limits were given. To check if participant was able to complete the task, the answers were checked. Then the “yes or no” (binomial) data were saved for all tasks completed by the user. To measure efficiency, time to finish the tasks was recorded. Start time was calculated when the participants pressed the “start” button and began reading the task; and stop time was recorded when the participants had completed the task and pressed the “finish” button. To assess perceptions of user satisfaction, the participants were required to answer 19 items of The Computer System Usability Questionnaire (CSUQ) developed by Lewis (1995) to measure perceptions of user satisfaction regarding system usability (system usefulness, the information quality, and the interface quality).

Additionally, a UA Scale was adopted from Mealy, Stephan, & Abalakina-Paap (2006), based on the definition of UA provided by Hofstede. It provided subjects with 10 statements with which they could agree or disagree on a 6-point scale. The items in this scale were balanced and reverse scored as necessary (Cronbach’s alpha = .76). All the statements mentioned personal feelings of uncertainty, such as, “I prefer social situations where everyone knows what is expected of them” and “I wish I had more control over the future.”
**Procedure**

This research utilized quasi-experiments known as ‘naturally occurring experiments’ due to the nature of culture (Shadish, Cook, & Campbell, 2002) because it is obviously impossible to manipulate UA because this independent variable is already in place. The experiments had a 2x2 mixed MANOVA design-Country (Germany or Indonesia) X task order (first task or second task) with country as a between-subjects variable and task trial as a within subject variable. Country and task order were independent variables while aspects of usability (effectiveness, efficiency, and satisfaction) were dependent variables. Task order was a repeated factor. The reason to select task order as one of independent variables is task order may contribute to the level of relationship between aspects of usability and UA, especially for novice users, as it is found that people with higher levels of UA were likely to need more time to learn new software (Adeoye & Wentling 2007).

There were no essential differences in the procedure between the experiments in Germany and Indonesia, except the time when the experiments were carried out and the language used in the experiments. For German participants, each of them chose one of schedules the experiments in February 2009 while for Indonesian groups they joined the experiments either in 18 or 19 September 2008. Each session of the experiments in both countries needed approximately two hours. Regarding the language, all the translations (testing script, questionnaire, tasks) were approved by bilingual, English and German/Indonesia, university students in psychology. The questionnaires and the tasks were presented in their own language, while the software was in English because there was no German version of the PIM software when the experiments were conducted and most software used in Indonesia are in English. Even though Google provides an Indonesian version of the PIM software but most Indonesian users
prefer to use software in English version. To ensure that the experiment procedure was equal for both groups, we directed the experiments by using a testing script.

Before starting the experiments, the researcher explained about the process of the experiment and gave each participant a new Google-email that would be used during the experiment. A short video of GoogleCalendar tutorial with 10 minutes duration was shown to introduce features and menus of the software. Then, participants from both the German and Indonesian groups were given two identical tasks to complete using GoogleApps, especially calendar and document features. Using two scenario-based tasks, a number of activities were identified as being likely tasks that the participants would perform. These individual tasks included reading two tasks, learning the software, and arranging two events by using GoogleCalendar. Then they logged in to the system to start performing the first task. After finishing it, the participants needed to fill out the questionnaire to express their satisfaction with using the GoogleCalendar. To complete this first task, each participant needed around 30 minutes. After that, they were asked to complete the second task and the questionnaire again. The tasks and the questionnaire were presented online not only to organize the experiments effectively but also to record time to perform tasks.

**Results**

*Hypothesis 1: German users will have higher a level of UA than Indonesian users.*

Hypothesis 1 could be tested by statically comparing scores of UA in both samples. The tests showed the averages of UA scores differ significantly between the German and the Indonesian users. It was predicted based on the Hofstede’s report that German users would have more scores of UA than Indonesian users. In line with it, there was a significant difference in the
UA scores of the German users ($M=42.73$, $SD=6.78$) and of the Indonesian ones ($M=38.98$, $SD=6.07$); $t(64) = 2.346, p < 0.05, d = .60$ (medium), thus Hypothesis 1 was accepted.

Hypothesis 2: Indonesian users would exhibit significantly greater level of usability of both the first task and the second task than German users, as demonstrated by means of effectiveness, efficiency, and satisfaction.

Table 1
Mean and Standard Deviations of Usability Aspects (Effectiveness, Efficiency, Satisfaction) by Country

<table>
<thead>
<tr>
<th>Score</th>
<th>Germany ($N = 26$)</th>
<th>Indonesia ($N = 40$)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td><strong>First Task</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effectiveness</td>
<td>3.46</td>
<td>1.10</td>
</tr>
<tr>
<td>Efficiency</td>
<td>1,834.62</td>
<td>557.18</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>68.50</td>
<td>23.05</td>
</tr>
<tr>
<td><strong>Second Task</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effectiveness</td>
<td>3.42</td>
<td>.857</td>
</tr>
<tr>
<td>Efficiency</td>
<td>1,280.85</td>
<td>380.99</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>62.04</td>
<td>18.03</td>
</tr>
</tbody>
</table>

A mixed MANOVA was carried out to test if there was a difference between participants in the German group and participants in the Indonesian group regarding the amount of change that occurs over time (first and second task) in scores on three different aspects of PIM usability measures. In this analysis, country (Germany and Indonesia) was entered as between-subjects factor, while task order (first or second task) was within the subject variable. Table 1 summarizes the means and standard deviations of the three dependent variables by group. Scores for effectiveness, efficiency, and satisfaction of the first task and second task were entered as the dependent variables. In addition, task order, as a repeated factor, was counterbalanced for
learning and carry over effects.

Before conducting the main analysis, the assumptions of MANOVA were analyzed. Linearity is able to be measured through matrix scatter plots and univariate normality can be assessed using plots to help assess the normality assumption. It is best to have approximately equal cell sizes but this study shows that the largest cell (40) is more than 1.5 times the smallest (26). If sample sizes are not equal, than Box's M test can be conducted to check equality of covariance matrices. As Box’s M (29.8) was not significant, \( p (.186) > \alpha (.001) \), the assumptions were not violated and Wilk’s Lambda is a suitable test to use.

The MANOVA found that there are significant multivariate main effects of country as well as time, but these are not qualified by country and task order. The Between-Subjects MANOVA results showed a significant main effect of country (Germany/Indonesia), Wilk’s \( A = .832, F (1, 64) = 4.170, p < .05, \eta_p^2 = .17 \) (large). This indicates that the linear composite of effectiveness, efficiency, and satisfaction differs for German and Indonesian users. The within-subjects MANOVA results showed a significant main effect of task order (first/second), Wilk’s \( A = .757, F (1, 64) = 6.647, p < .01, \eta_p^2 = .24 \) (large) indicate that the linear composite differs for different tasks. But this main effect was not qualified by the interaction between task order (first/second) and country (Germany/Indonesia), Wilk’s \( A = .978, F (1, 64) = .474, p > .05, \eta_p^2 = .02 \) (small). Next, the Levene's test indicates that there is heterogeneity of variances for efficiency of second task, \( F (1, 64) = 5.17, p < .05 \) and it is advised to transform that variable to equalize the variances. Given that the Box test is not significant and the results study found only the main effects of country and of task order (since the interaction is not significant), the test should not be strongly affected by this violation. Therefore, this study conducted the next analysis.
To examine the effect of country further, then we conducted univariate tests of significance using analyses of variance. The tests showed a significant main effect of country only on satisfaction, \( F(1, 64) = 11.280, p < .01, \eta_p^2 = .15 \) (large) with Indonesian users (\( M = 76.73, SD = 16.142 \)) outperforming their counterparts (\( M = 62.04, SD = 18.030 \)), while effect of the country on effectiveness, \( F(1, 64) = 1.197, p > .05, \eta_p^2 = .02 \) (small) as well as means of efficiency, \( F(1, 64) = .198, p > .05, \eta_p^2 = .00 \) (small) were not significant. This revealed a statistically significant difference between the results obtained for both German and Indonesian users, but only on the satisfaction level which demonstrates that the Indonesian users have more positive feeling to the PIM software compared to the German users. Therefore Hypotheses 2 was partially supported.

**Hypothesis:**

3. Level of aspects of PIM usability when both groups of users accomplish first task is lower than second task, as demonstrated by means of effectiveness, efficiency, and satisfaction.

Next, based on the within-subjects MANOVA presented earlier, it was found that there was a significant main effect of task order (first/second) but this main effect was not qualified by the interaction between task order (first/second) and country (Germany/Indonesia). Furthermore, there were only two levels of the within-subjects variable (first vs. second task) that created sphericity are exist and all epsilons are 1.0, and, as a result, sphericity was not an issue in this study. When each of the three dependent variables was considered separately, significant effect of task order was only on efficiency, \( F(1, 64) = 19.527, p < .01, \eta_p^2 = .23 \) (large) with efficiency of second task for each group (\( M_{\text{Germany}} = 1,280.85, SD_{\text{Germany}} = 380.99, M_{\text{Indonesia}} = 1412.05, SD_{\text{Indonesia}} = 665.23 \)) is higher than the first one (\( M_{\text{Germany}} = 1,834.62, SD_{\text{Germany}} = 557.18, \)).
$M_{\text{Indonesia}} = 1,802.80, SD_{\text{Indonesia}} = 707.658)$. This displays follow-up repeated measures ANOVAs for each dependent variable, which reveal that the main effect of time (change from first task to second task) is significant only for level of efficiency, but the interaction between country and time is not significant. This means the Hypotheses 3 was supported partially.

**Hypothesis:**

4a. For both groups, there is a negative correlation between level of uncertainty avoidance and effectiveness.

4b. For both groups, there is a positive correlation between level of uncertainty avoidance and efficiency.

4c. For both groups, there is a negative correlation between level of uncertainty avoidance and satisfaction.

A series of Pearson correlations were calculated in order to determine the associations among the variables: UA scores and scores of all usability aspects (Table 2).

Table 2

*Pearson’s Correlation among Uncertainty Avoidance and Aspects of Usability (Effectiveness, Efficiency, Satisfaction)*

<table>
<thead>
<tr>
<th>Country</th>
<th>First Task</th>
<th>Second Task</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EFFE</td>
<td>EFFI</td>
</tr>
<tr>
<td>Germany</td>
<td>(.05)</td>
<td>.34*</td>
</tr>
<tr>
<td>($N = 26$)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>.15</td>
<td>.43*</td>
</tr>
<tr>
<td>($N = 40$)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EFFE = Effectiveness, EFFI = Efficiency, SAT = Satisfaction

* = $p<0.05$
For German users, there were moderately strong, positive correlations among UA and efficiency of both Tasks (first task, $r(64) = .34, p < .05$, second task, $r(64) = .32, p < .05$) and negative correlations among UA and satisfaction of both Tasks (first task, $r(64) = -.39, p < .05$, second task, $r(64) = -.34, p < .05$). Conversely, the results found that that correlation between UA and effectiveness of first task, $r(64) = .15, p > .05$ as well as between UA and effectiveness of second task, $r(64) = .13, p > .05$ were not significant. For Indonesian users, the results revealed the same patterns. UA scores of Indonesian users were related significantly to efficiency of first task, $r(64) = .43, p < .05$, efficiency of second task, $r(64) = .43, p < .05$, satisfaction of first task $r(64) = -.44, p < .05$, and satisfaction of second task $r(64) = -.46, p < .05$ but their UA scores were no related to effectiveness of first task, $r(64) = .15, p > .05$ as well as effectiveness of second task, $r(64) = .13, p > .05$. These results concluded that Hypothesis 4a was not supported but Hypotheses 4b and 4c were supported. The more the users accept familiar and unfamiliar risks, the more they are satisfied with the software and accomplish the tasks quickly. Those users who believe that they can deal with the tasks with the software that they learned lately have a better awareness of potential difficulties and, as a result, trust the software more than the users who have tendency to perceive this new software as unacceptable, results in stress and frustration, and reflects badly on it.

**Discussion**

The results found some hypotheses were supported and that others were not. Hypothesis 1 was accepted because compared to Indonesian users, German users showed a higher level of UA. But Hypotheses 2 that claimed Indonesian users would exhibit a significantly greater level of usability (effectiveness, efficiency, and satisfaction) of both the first task and the second task
than German users was supported partially. Only on the satisfaction levels did the Indonesian participants demonstrate a higher level compared to German users. Hypotheses 3 were also supported partially because the interaction between country and time was not significant and the main effect of time was only significant for the level of efficiency. Finally, the results concluded that Hypotheses 4b (positive correlations between UA and efficiency of both Tasks) and 4c (negative correlations among UA and satisfaction) were accepted but Hypothesis 4a was not (negative correlation between level of UA and effectiveness).

In Indonesia online applications in daily activities, for instance online calendars, are more limited compared to Germany. From the micro genetic perspective of the task (Helfrich, 1999), using the software as a task evokes different forms of time required to accomplish tasks, of effectiveness, and of judgmental process about satisfactory level of the software depending on the users’ prior experience with similar software. One is able to complete a tasks automatically, when she or he carried out it repeatedly. Based on this, both group users that have dissimilar environments related to IT development should demonstrate a different level of usability aspects measurements.

Regarding the usability aspects of first task and second task, a doubly repeated measures mixed-design MANOVA was carried out to analyze the differences. The results show that Hypothesis 2 was supported partially. The Between-Subjects test found that country has a significant main effect on satisfaction in which Indonesian users have a higher score than German users. But, there are no main effects of it on effectiveness and efficiency.

It is important to note that the comparison was calculated based on absolute values. Numerous issues should be considered in deciding if the data should be standardized. Statistics based on standardized data are preferred on the basis of arguments of opinions of interpretability,
common metric, or emic approach (Malhotra, Agarwal, & Peterson, 1996; Singh, 1995). The researchers who support the standardization argue that statistics based on standardized coefficients are easier to understand. In addition, the standardization transforms the variables calculated on scales to a common metric that allows comparative analysis of the effects of different independent variables. In regression analysis, for instance, under certain conditions it is substantial to use the absolute values of the standardized regression coefficients as measures of relative significance of the predictor variables. Since the data for each culture are standardized independently, analyses based on such data reveal an emic comparison pattern. Because the regression coefficients are adapted on the basis of within-sample variability, the standardized coefficients comprise the equivalent metric within a culture, however not across cultures. Therefore, standardized estimates reduce any across-culture diversities on account of differences in variances.

On the contrary, a number of researchers choose to standardize the variables within each culture based on comparability across cultures, structural invariance, and an etic approach. They argue that statistics based that valid comparisons of statistics across cultures can be conducted only if the statistics are based on non standardized data. Structural invariance implies that statistics, for example non standardized regression coefficients, correspond to structural parameters that are invariant across different samples obtained from the same culture. According to Singh (1995), structural invariance prefers to hold for statistics based on non standardized data then on standardized ones. Statistics based on non standardized data reveal an etic comparison standard for the reason that they are unadjusted for within-sample variability. Because this cross-cultural study adopts etic approach, thus, statistics based on non standardized data is more appropriate. However, future research should consider the issue of if data should be standardized
since there are some the benefits of statistics based on standardized data, for example interpretability, common metric.

It should be noted that one of the problems with this within-subjects design is that it is subject to order effects or carryover effects. These take place when having been tested under one situation and influence how participants behave in another one (Myers & Hansen, 2005). In this design, the problem occurred during the experiments as the users did not complete the tasks with counterbalance order. Therefore, it is possible that carryover and practice effects occurred as the subjects performed better at the task over time because of practice in the previous conditions.

Peerce, et al. (2002) reveal that relevant characteristics of tasks, for instance task characteristics, task execution, task flow, task demand on users, and task safety, are able to correlate with usability aspects in various ways. The within-subjects MANOVA results support this by showing a significant main effect of task order (first/second) on usability aspects, though it was not qualified by the interaction between task order (first/second) and country. The univariate tests did show a significant main effect of the task on efficiency; while the effects on effectiveness as well as satisfaction were not significant (Hypotheses 3 were supported partially). Furthermore, from the effect size calculation, 23% of the variability in the scores of efficiency was explained with the task order.

The results showed that there is a significant increase in efficiency and a decrease but not significant in both effectiveness and satisfaction. Regarding to the benefit throughout learnability time, the results showed that the performances improved from the first to the second task. Both groups which were novice users needed time to improve the performance level and the software allowed them to understand easily how to handle a specific device within a short amount of time. This is in line with previous studies about novice users and efficiency (e.g., Bartholomé, et.al,
However, the scores of both effectiveness and satisfaction decline. This occurs probably because the participants worked with new software to accomplish two identical tasks. This made using the software for the second time was less interesting for them. According to Lee, Lee, Kim, and Kim (2002) and Sweeney and Soutar (2001), satisfaction is influenced by emotional value that means mental or psychological needs of users. In this research, when a novice user has less fun while using same software for two identical tasks, she or he is not able to fulfil her or his emotional value.

Furthermore, according to Lim (2004), when a learning task is challengeable and utilizes intrinsic factors, such as challenge, fantasy and curiosity to present learning content, learners will sustain a high level of motivation. Lim explained that several researchers have reported learning motivation as the single most important factor that predicts students’ learning achievement. For the subjects of this study, the less enjoyable situation when using the software for second time probably created a preference to accomplish second task inaccurately. The consequence was the decrease of scores of satisfaction and effectiveness of first task to the second task for both groups.

With regard to UA, according to Hofstede (1980), Merrit (2000), Murphy-Berman and Berman (2002), Sudarwan and Fogarty (1996) Indonesia is a less UA country compared to Germany. As expected, German groups scored significantly higher than Indonesian groups on the UA measure (Hypothesis 1 was accepted). From the further analysis for both group users, the results reported that the same patterns occurred. When each was analyzed separately, both UA scores were related to efficiency and satisfaction (Hypotheses 4b and 4c were supported); nevertheless their UA scores were no related to effectiveness (Hypothesis 4a was not supported).
This result suggests that the more the users are at ease and comfortable with an unknown situation, the more satisfied they perceive the software to be and the faster they fulfil the tasks.

We propose some explanations about the correlations among UA and usability factors. Firstly, organizing the online calendar was recognized as a annoying task, perceived as stressor, and increasing the anxiety levels. Chen and Hong (2010) found that intolerance of uncertainty increases negative impacts. Therefore, users with low UA performed and learned the software more effectively and quickly than ones with high UA. Secondly, as novice users, the subjects were in the early steps of PIM usage with the intention that they had no experience with the software. Then it is possible that the beginners with high UA score were uncomfortable with learning and using the new software because in freeware and sharing of personal information context, lack of trust took place. Such situations may reduce their perception of the satisfaction level in using this online PIM system. This is in line with by the study established by Flavian, Guinaliu, and Gurrea (2005) about relationships between trust and website satisfaction. Thirdly, Lazar and Norcio (2003) state that novice users have a higher chance for having problems in using software compared to experts; however different from the hypotheses, there were no significant correlations among UA and effectiveness of both tasks. The reason is probably there was no time limit given since time to accomplish the tasks were a variable in this research. As a result, the users preferred to accomplish both tasks carefully and focused on how to find out the way to answer the questions correctly.

This study of German and Indonesian users has implications that UA need to be taken into account when developing online PIM applications, specifically those intended for use by novice users from various countries. This is supported by a study by Marcus and Baumgärtner (2004) that found, ranked by experts; UA is the third most important cultural characteristic for
system development. It is suggested, to consider issues of trust and privacy to reduce personal risk as well as simplicity and learnability to facilitate novice users to learn and to take time in completing tasks. However, it should also be noted this study shows that within analysis is more important than between analysis. UA will correlate to usability aspects of PIM if it is explored in within culture analysis.

As with any research, our study has certain limitations. We did not take into consideration how users behave in the real situation, such at work, or by arranging their factual activities. Future research should include these additional variables and investigate the differences between laboratory and real-life situations to investigate how novice users handle uncertainty in daily IT usage. Moreover, the present study does not include a method of handling uncertainty. Thus, future work should explore how German and Indonesia users adapt with uncertainty, for example based on the theory of uncertainty orientation (Sorrentino & Roney, 2000; Sorrentino, Otsubo, Yasunaga, Kouhara, Szeto, & Nezlek, 2003) which is a formal theory of self-regulation. The theory states that people have various ways to adjust with unfamiliar situations. At opposite ends of a continuum are those who are considered certainty-oriented (CO) persons and those who are considered uncertainty-oriented (UO) persons. Moreover, because this study examined a single attempt’s data from all participants, future research should be conducted over a longer period of time or a longitudinal study with the purpose of offering a depth view of the methods of handling uncertainty.

The other restrictions are the sample size, the representativeness of gender, and social economic status and stratifications. There were 64 subjects in this study divided into two groups of users, 26 German and 40 Indonesian university students. Most of the participants are women (75%). Gender has an important role in IT usage behaviour as Venkatesh and Morris (2000)
found that for men, perceptions of usefulness is the most significant factor in computer usage, but for women, they are more influenced by the perceptions of ease of use and subjective norms. The next limitation of this research is that the participants were university students. Such samples are often found in psychological differences studies, but, unfortunately, this practice has lead to an over-representation in mainstream cultural research and IT adoption especially with reference to Indonesia. According to Church and Ortiz (2005), many researchers in psychology rely on samples of convenience for their cross cultural studies. Such choice is, in general is driven by cost, logistical, and co-worker availability concerns. Church and Ortiz (2005) concluded that in cross cultural studies using samples of convenience, the choice of culture is not theory-driven and, as a result, the research questions as well as the conclusions are frequently haphazard. Consequently, such conditions enforce future studies to increase number of participants, to recruit participants with other social economic status, and to consider balance in gender.
Chapter 4: Do Individualistic and Collective Persons Measure Usability of Personal and Group Information Management differently? A Culturability Study with German and Indonesian Users

Abstract
The research is proposed to provide experimental evidence based on analysis of the usability aspects of PIM software related to INCOL from German and Indonesian users’ perspectives. In this research, German and Indonesian users completed two different tasks (individual and group tasks) using Personal Information Management (PIM) and Group Information Management (GIM). The context of the research is set across the culture within and between countries; for that reason the subjects of each country were divided into two groups totalling eight groups (Germany-individualism, Germany-collectivism, Indonesia-individualism, and Indonesia-collectivism), and each group performed tasks individually and in group. The data were then analysed to distinguish the difference usability aspects perceived by the four groups as well as to describe the correlation between INCOL and usability aspects. Some of the evidences are statistically significant. As a result, to develop PIM software for international market, it is essential to realize that the outcomes of usability measurements by novice users in diverse cultural background may be different.

Keywords: individualism, collectivism, personal information management, group information management, usability

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2 This paper was written together with Hede Helfrich-Hölter and Josef Krems (Chemnitz University of Technology, Department of Psychology). It will be submitted for publication to a peer-reviewed psychological journal. The paper is presented here in its original form ready for submission, so that some repetitions of the introduction above in the paper were inevitable.
The correlation between culture and usability of software is an emerging and significant topic in the field of Human-Computer Interaction. Culture has an influence how people perceive and sense during their activities because it is a crucial element to consider when trying to analyse, explain, or modify behaviour (Triandis, 1995). It forms the scale of external and internal stimulus, the interpretations, and the key reactions to those interpretations. Barber and Badre (2001) state the correlation between culture and usability, called culturability, occurs when software developers involve cultural factors in software design and users behave in accordance with their respective cultural background. The studies of IT usability have shown that not only cross-cultural variations in using IT tools such as computers, but also specific pathways of creating these differences also vary (Barnett & Sung, 2006; Callahan, 2006; Krishnan, 2004, Lee, 2002). For example, varied options or contents allowing the expression of users’ identities or personalities must be offered for mobile Internet users with a high index in individualism, in order to distinguish each person independently (Lee, Kim, Choi, & Hoi, 2010).

Culturability also occurs in the PIM and GIM contexts. For PIM usage and accomplishing individual tasks, individualistic users compared to users with collectivist inclinations prefer to take a personal point of view in their decisions and activities. They also have to emphasize personal goals and enjoyment rather than social norms when using an information system tool, such as a group decision–support system (de Mooij, 2003; Hofstede, 1980; Watson, Ho, & Raman, 1994). Furthermore, GIM usage to perform group tasks need computer-mediated computer that generally refers to text-based communications such as e-mail, chat rooms (Postmes, Spears, & Lea, 2000). In these distributed conditions, the users cannot send information quickly, and they can no longer look over and check on one’s team-mate or “read” the non-verbal behaviours. When members are distributed, each member’s awareness of the
current situation could be significantly reduced if communication is not appropriate among members. Moreover, according to Castella, Abad, Alonso, and Silla, (2000), in order for someone to detect or to know a task is uncompleted in a distributed environment, there must be visual access to, or auditory or written communication with someone in that environment. When no such communication types exist, either a written message about the task status must be sent or an inquiry about the task status is needed. It is likely that certain forms of coordination or teamwork behaviours will be especially important for working within distributed groups, and therefore collectivism value is important in this situation.

Online PIM and GIM systems have proliferated in Germany, the largest on-line population in Europe, as well as in Indonesia which is one of five leading countries on internet users’ growth (Internetworldstats.com, 2011). Various personal users and organizations in Germany and Indonesia began to recognize the benefits of utilizing PIM technologies to move forward business process and to improve productivity. Although various research reports (e.g Erumban & de Jong, 2006; Puck, Mohr, & Holtbrügge, 2006) found that compared to collectivism, individualism is more positively related to web tools adoption, such as e-commerce, email; however, to increase usability based on INCOL context also depends on whether the purposes of IT tools is for individual or group purposes. For example, regarding the implication of Group Support System (GSS), cognitive researchers proposed that collectivism is associated with the value placed on certain kinds of knowledge (Greenwald & Pratkanis, 1986). In a collectivistic team, then, knowledge and feedback pertaining to the group is more valuable than is knowledge pertaining to anyone individual member of the group. But, individualistic groups set a low respect on knowledge pertaining to the group and dismiss the belief that the group can be effective. Thus, for individualistic groups, group efficacy may not have an
immediate impact on actual group effectiveness (Gibson, 1999). The implication for GSS is that facilitators should support on building the group’s belief in its competencies to work effectively and this leads to actual increased group effectiveness and higher level of group achievements.

Germany and Indonesia show significant differences on INCOL. In Hofstede’s cross-cultural comparisons (1980), Indonesia (score = 14) has been concluded as one of the least individualistic societies, ranked 47th out of the 53 countries and regions studied, compared to Germany (score = 67) that was ranked 15th on this dimension. Triandis et al. (1985) found that Indonesia shows as the most collectivistic country of nine diverse nations which was assessed. Obviously, not all Indonesians will have precisely the equal beliefs and values, nor will the Germans. As it is stated earlier, the notion of usability of IT tools is associated with the cultural orientation of the personal user. Consequently, it is interesting to investigate if individualistic and collective people from Germany and Indonesia evaluate usability of PIM and GIM in a different way when completing task individually or in a group.

Individualism-Collectivism

The concept of INCOL has been the central topic of cross-cultural research. Swaidan and Hayes (2005) concluded that INCOL is the major aspect of cultural variability explored by researchers from various disciplines to describe varieties in behaviour patterns. INCOL refers to the extent to which a community underpins interpersonal relationships and either individual or collective achievement.

Moreover, individualistic culture has characteristics: more trusting in social relationships with others, innovative, respect on challenge, autonomy, private time, and such external motivators as rewards. Individualistic culture, also reflects the degree to which a person
emphasises his or her own goal over those of his or her group. On the other hand, collectivism values interpersonal relationships and social harmony and places a high priority in groups. As a result, people are expected to avoid conflicts and destructive ways of dealing with the group or communal reasons of protecting social face and sustaining long term relationships (Hofstede, 1980; Triandis, 1990). However, van de Vijver and Leung (2000) categorize INCOL as unclear concept though it is broadly referred in the academic text, for instance social psychologists have published most of the articles focusing on INCOL (Ng, Loong, He, Liu, & Weatherall, 2000).

Definitely there is extensive discussion over the cultural dimensions and the following behavioural model needed to define the dimensions. Hofstede’s (1980) research is widely cited as contemporary research in the field of INCOL (e.g. Chan & Cheng, 2010; de Mooij & Hofstede, 2010; Lawrence, 2010). Hofstede categorized cultural dimensions into four groups which displayed variations across the IBM branches in 40 countries and he labelled the dimensions: power distance, individualism, uncertainty avoidance, and later on he added one cultural dimension: Long vs. short term orientation, based on his study with Bond (Hofstede, 2001). Some critics about Hofstede’s cultural dimensions arose but several researchers, including Hofsede himself, answered the critics and continue to use Hofstede’s model as a basis for international research on cultural dimensions. The model is used in a variety of ways, for instance, as a means of definition and classification as a construct for assessment, and as a basis for the development of additional scales (Bowen & De Clercq, 2008; Fischer, Ferreira, Assmar, Redford, Harb, Glazer, Cheng, Wong, Kumar, Kärtner, Hofer, & Achoui, 2009; Fischer, Vauclair, Fontaine, & Schwartz, 2010; Rapp, Bernardi, & Bosco, 2011; Schimmack, Oishi, & Diener, 2005).
The first discussion about Hofstede’s model is that the cultural dimensions are probably useful as a general explanation of cultures; however the lack of ability to control cultural variables makes them less useful as aspects for personal behaviour (Gudykunst & Matsumoto, 1996). For example, using individualism to distinguish between cultures and researchers in cross cultural studies may risk missing a variety within every single culture as well as risk of creating stereotypes (Wink, 1997). This leads to a characterisation of countries, where the West is perceived as individualist and the East is perceived as collectivist. Though some research still used this characterisation (e.g., Daniel, Oludele, Baguma, & der Weide, 2011; Pfeil, Zaphiris, & Ang, 2006), however, the others (e.g., Chu & Chu, 2010; Lee, et al., 2007; Tapanes, Smith, & White, 2009) adopted Hofstede’s model and answered this critic by measuring subjects’ cultural dimensions with some additional items.

Secondly, the study represented only 40 countries, which is below half of the world’s countries. Consequently, the results excluded data from the ex-communist and African countries. McSweeney (2002) disapproved of the statement that organizational culture of IBM, the research sites, is homogeneity across nations, with the aim that the variants in culture symbolize national cultures. Nevertheless, Hofstede (2002) argued that in his research, the objects of the measurement were differences between national cultural background. Any set of comparable samples from national populations are able to offer data and verification about such differences. He also confirmed that the wide validation demonstrate that the country scores reached high correlations with all types of other data, including results collected from representative samples of whole national populations.

Thirdly, the items addressing the subsequent cultural findings were relatively few, for instance items for assessing the INCOL index were six in total, only three items for each cultural
dimension. McSweeney (2002) pointed out that the major dimensions of national culture are difficult to be assessed merely by a questionnaire. A recent study about culture within Brazil by Hofstede and his colleagues (Hofstede, Hilal, Malvezzi, Tanure, & Vinken, 2010) also identified this issue. By contrasting regional cultures, the researchers found that the Hofstede’s Values Survey Module (VSM) were not able to explore the finer cultural nuances between Brazilian states. Additional locally defined items to make the studies more meaningful to Brazilians were needed. Therefore, the recent reports using Hofstede’s model, including this research, develop other questionnaires which consists of more items to measure cultural backgrounds (see Chu & Chu, 2010; Sánchez-Franco, Martínez-López, & Martín-Velicia, 2008).

Finally, this model displays each of the dimensions on a single continuum, for example the U.S is the highest country on the individualism Index whilst Venezuela is the lowest. This represents generalisations about cultures within geo-political borders and accordingly in reality individualism and collectivism exist at the same time. However, recent research by Fischer, et.al, (2009) conceptualized INCOL as bipolar in relation to specific groups across contexts. In their research, the individualistic and collectivistic items were presented separately to a small sample of subjects. The results yielded bipolar factors and negatively correlated factors. This showed that people are not able to satisfy individualistic as well as collectivistic tendencies at the same time when considering norms. To summarise, Hofstede’s model still provides the basis for both theoretical and empirical work (see Rapp, et.al, 2011). Therefore, this research replicated previous research but use critically and carefully the model.
Personal Information Management and Group Information Management

Bellotti et al. (2003) define PIM as a method through which information is categorised by classification, placement, or embellishment. This information then can be retrieved easily when needed. In the same way, Lansdale (1988) describes PIM as procedures and methods to organize, classify, and recover information for daily activities. Such definitions of PIM are collected from an recognized information management perspective. From this point of view, information is necessary to store and when needed, people can recall it at a later time. Furthermore, Boardman (2004) based on Barreau’s research (1995) defines PIM as the techniques and procedures to organize a set of personal information items. PIM tool is software that supports a user to organize his or her personal information. The main purpose of such tools is support for acquirement, for organization, for protection, and for recovery. Moran and Zhai (2006) state that personal information cloud indicates the essential transformation in PIM systems. It means personal information is being moved from the conventional desktop to the beyond the desktop or networked world. As a result, personal information collections in this research are stored on online PIM, or network drives, and the research will avoid more complexity of considering PIM on mobile devices and multiple computers.

Though PIM is usually an individual activity, users frequently share personal information surfacing a collaborative work-related term called Group Information Management (Erickson, 2006). Erickson explains that GIM must have the ability to share personal information items amongst members of a group, focusing on the procedures and social norms underlying the information sharing and the ways in which the involved participants discuss those norms in response to a variety of appearing tensions. For example, a student may share his individual calendar to more easily schedule group discussion with his or her friends. But this calendar
sharing activity may lead to technical and organizational problems: the calendar may be
disorganized and the student may have another appointment with her or his family. When the
student and her or his friends share the schedule, they may create common calendar entries to
decide a realistic time for arranging a group discussion.

Recently, various IT applications for PIM and GIM are available, such as mailing list,
Web pages, and Wikis. It is not the aim of this study, however, to explore all types of PIM and
GIM tools; rather, it focuses on online calendaring as the main application to explore. Using the
features of this application, the user is able to organize personal and group appointments and, in
addition, provide different levels of access which depend on the setting arrangement. A user may
have access only to check the calendar, but the other can book appointments, and yet to modify
existing entries. However, the level of the user acceptance for each PIM and GIM applications is
different. Online calendaring, for example, encountered resistance when it was first introduced
(Lutters, Ackerman, & Zhou, 2007). But the continual uses of online group calendar by large IT
companies have broadened its appeal (Lee, 2003). Moreover, since the Internet became
increasingly popular, technology is increasing at an exponential rate; various web-based
calendar applications have been launched. Even, many web-sites then offer free solutions for
access to an on-line database of calendars.

This research focuses on the usability of PIM and GIM based on one INCOL. Various
definitions of usability have been proposed over the years, some of which will be mentioned
here. ISO 9241-11 defines usability as “the extent to which a product can be used by specified
users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified
the implementation of scientific measurement, observation, and design rules to the product and
maintenance of the Web sites with the intention to create the most ease of use, ease of learnability, quantity of usefulness, and least amount of dissatisfaction for the users. For the aims of this study, as a result, usability aspects derived from a combination of the two definitions will be defined in three terms: efficiency, effectiveness, and satisfaction.

The growth of online calendar usage is extensive but studies on comparisons between PIM and GIM reveal four main issues related to usability aspects (Lee, 2003). Firstly, there is a gap between the users and the persons who receive benefits from GIM applications. When using an online calendar system, the benefits (e.g., saving time, working more effectively) are enjoyed directly and easily by users of PIM. On the other hand, users of GIM often input temporal information about a meeting but their managers asking to arrange the meeting get the benefits.

Secondly, PIM acceptance depends mainly on personal motivation to use as internal factor but for GIM usage, the colleagues and the organization probably enforce the adoption of the system. As a result, the efficiency and effectiveness of PIM and GIM tools supporting the users to deal with their roles and to accomplish their tasks depend on external factors as well. Thirdly, to encourage acceptance, GIM has to offer features used in PIM. By nature, calendars are very personal tools in which the user arranges a various form and detail of information and recovers it in a special way. By providing facilities for PIM, GIM becomes an idiosyncratic tool and minimizes the usefulness as a communication tool. Fourthly, different from implementation of PIM, to share privacy with others is obligatory for users of GIM. By presenting personal temporal information to the group, one is opening about time schedule and preferences though, in fact, mainly users are uncertain to do it. Therefore, the capability of PIM and GIM applications to assurance privacy, such as providing features to set level of access, influences the users’ subjective satisfaction of these tools.
Correlation between INCOL and PIM-GIM with German and Indonesian Users

The opposite position in INCOL dimensions and the potential market for PIM and GIM are the reasons for choosing Germany and Indonesia users as research participants. The score comparison between Germany and Indonesia on the individualism score is 67 (ranked 15th out of the 53 countries) and 14 respectively (ranked 47 out of the 53 countries). According to this analysis, Germany is concluded as a higher individual society compared to Indonesia. Other reports also found equivalent results, for instance by Gouveia & Ros (2000), Kemmelmeier, Burnstein, Krumov, Genkova, Kanagawa, Hirshberg, Erb, Wieczorkowska, & Noels (2007), Merritt (2000), Murphy-Berman & Berman (2002), Thomas and Pekerti (2003). Furthermore, PIM and GIM usage in both Germany and Indonesia have proliferated because several organizations, mainly companies and universities, as well as individual users apply PIM and GIM to support their daily roles, for example Chemnitz University of Technology, Universitas Widyatama. It is noted that online population in both countries show different amounts, particularly compared to the total populations. From 82 million populations in Germany there are 65 million users for 2010 (79.1% penetration) while in Indonesia 30 million of the total 243 million population have internet access (12.3% penetration) (Internetworldstats.com, 2011).

A number of reports found that INCOL correlated with usability of personal and group tools. Tung (2002) presented a comprehensive review of the differences in use of Group Support Systems (GSS) by INCOL. From this review, it is concluded that INCOL plays a role in the use of GSS. For instance, Watson, et.al., (1994) found US groups (high in individualism) had a lower pre-meeting consensus compared to Singaporean groups (low in individualism). Moreover, Tan, Wei, Watson, Clapper, and McLean (1998) discovered Singaporean participants were less likely
to challenge majority sayings than US participants. This indicates that while GSS provides facilities for group discussions, INCOL influences need to be taken into account. More recent study by Hornik and Tupchiy (2006) revealed that a high level of collectivism contributes a positive attitude of technology mediated learning, which brings about higher satisfaction in learning.

Nevertheless, there is still a lack of research about correlations between INCOL and usability of PIM and GIM in particular with German and Indonesian users because mostly usability studies compared North American or Europeans with East Asians such Japan, South Korea, or China (e.g. Lee, et.al., 2010; Puck, et.al., 2006; Wallace & Yu, 2009). Though some cross cultural studies included participants from Indonesia and Germany the studies did not focused solely on both countries and the research topics were not about usability. For example, Schmitt, Allik, McCrae, and Benet-Martínez (2006) aimed to explore the factor structure of the English Big Five Inventory (BFI) fully replicated across cultures, the validity of the BFI trait profiles of individual nations, and the distributions of personality traits throughout the world. The BFI was translated from English into 28 languages and administered to 17,837 individuals from 56 nations including Indonesia and Germany. Also, Matsumoto and Fontaine, (2008) surveyed display rules across a wide range of cultures. Over 5,000 respondents, some of them Indonesian and German, in 32 countries accomplished the Display Rule Assessment Inventory. The authors tested five hypotheses concerning the connection between display rules and INCOL. The latest cross cultural research comparing Germany and Indonesia was carried out by Haar and Krahé (1999). They analyzed preferred approaches chosen by adolescence (Indonesia vs. Germany) for responding to interpersonal problems as a function of cultural orientation and gender in a cross cultural study with 261 adolescents from both countries.
The cultural fit between usability and INCOL in this study is derived from the Fit between Individuals, Task and Technology (FITT) framework developed by Ammenwerth, et.al., (2006) and then applied to PIM and GIM usability research. The concept of fit or congruence is at the midpoint of the framework. Fit is rooted in the concept of matching or aligning individual or organisational resources with environmental opportunities and threats. The framework refers to the interaction approach. Based on this perspective, Gallivan and Srite (2005) argued that IT and culture may interact to create diverse outcomes. Among such outcomes may be acceptance and effective use of IT if there is a fit with the culture or the outcomes are probably user resistance, rejection, or even sabotage if there is some misfit between IT and culture. In line with these ideas, Weber, Romm, and Pliskin, (1991) claimed that most IT applications have cultural assumptions embedded in them that possibly will be incompatible with a given beliefs, values, and norms. They argued that such embedded assumptions make technologies as culture bound, and that it is essential to carry out a cultural analysis to anticipate the likelihood of either fit or misfit between a prospective IT and a culture.

The FITT framework is developed from the more complex notion than compatibility between IT and culture. The framework focuses on understanding how three key factors: users,
technology, and tasks which interact with each other’s functionality to produce effective IT implementation. Aspects of the users consist of personal characteristics, such as computer skill, cultural background. Characteristics of the technology are, for instance, performance, usability, while an example of characteristics of the tasks is task complexity (Ammenwerth, et.al., 2006). Where such misfits among three factors occur, the outcome will be user resistance, rejection, or even outright sabotage. The interactionist perspective assumes that both the technology and the culture as characteristic of users are fixed in the short run. Researchers, such as Robey (1994) consequently suggested considering culture as a binding constraint when implementing IT, though some believe that culture is potentially malleable over the long run. It is virtually impossible to develop the fit by changing the culture since, in the short run, culture is a binding constraint in IT implementation.

Beside user-technology fit, other types of fit theories have been proposed as well, such as by Goodhue, et.al., (2000). They explain the necessity for compatibility between the nature of the task and the specific technology employed. If task-technology fit is poor, then users will either ignore the technology or users will lead to ineffective results. However, task-technology fit does not contain an important element in this research: the interaction of user and task. According to FITT framework, in this research the attribute of technology refers to usability, the element of users is INCOL dimension and the characteristic of the task is working processes that are related to the ways to accomplish tasks (individually vs. in group) and that are facilitated by the given technology (PIM and GIM). As described earlier, investigating the connections among INCOL, working process, and usability is the aim of this research; for that reason, FITT is more suitable for this research.
The FITT framework explains that an IT implementation will succeed or fail through the interactions of user, task, and technology (Ammenwerth, et.al., 2006). From this perspective, one can explain why members of different cultures, for instance individualism vs. collectivism, respond differently to the same system as well as why members of the same cultures respond differently to different tasks. The framework holds that three components (user, technology, and task) will interact to produce high quality outcomes by reaching a most compatibility among the components. To achieve maximum outcomes, the user must be highly motivated and have required skills to perform a given task, either individually or in group. Also, the proper technology (PIM vs. GIM) is vital to support a satisfactory functionality and performance in accomplishing a particular task (individual or group task) and, simultaneously, the user must be able to use the technology effectively. In other words, the PIM and GIM technologies that work well technically may nonetheless be resisted by the user in such instances; the resistance arises from an incongruity among the system design features, the personal culture, and the ways to complete the task. A lacking compatibility possibly leads to various problems during the PIM and GIM implementations, for instance low satisfied users, poor results, or ineffectiveness and inefficiency technology usage.

Some research reported the importance of compatibility among user, technology, and task. According to Wagner (1995), high degree of collectivism increases the degree of teamwork in group work. Teamwork, specifically in the context of GIM, is fundamental for achieving achievement in group work. Collectivism is, moreover, able to estimate group performance compared with individual achievement. According to Jung and Avolio (1999), collectivism moderates the relationship between group achievement and leadership. In contrast, in
individualistic cultures, new IT application will perceived as useful when it is viewed as improving the achievements of individuals (Anandarajan, et al., 2000; Veiga, et al., 2001). It has also been pointed out that collectivist students were more satisfied with the distance learning climate more than individualistic students because the features of e-learning allowed the collectivist group to have a sense of being connected to their peers and the group also perceived the openness of asynchronous communication (Gaspay, et.al., 2009).

This study aimed to analyse the manner in which German and Indonesian users perform two different tasks (individual and group tasks) and how these activities differ based on INCOL context. The subjects of each country were divided so that there were two four groups (Germany-individualism, Germany-collectivism, Indonesia-individualism, and Indonesia-collectivism), and every group completed tasks both individually and in group. Similar to Chapter 3, the data were after that analyzed to decide the difference usability aspects identified by the four groups and to explain the relationship between INCOL and usability aspects.

Hypotheses

Culture influences nearly all of the psychological programs of human aspects such as attitudes, personality, satisfaction, perceptions, which in turn are reflected by our behaviour (Hofstede, 2001). Moreover, theoretically tasks, cultural background and usability are connected and there is dynamic compatibility among these aspects (Ammenwerth, et.al, 2006). In a group situation, one might also predict that collectivistic values will encourage cooperation and enjoyment. The collective effort, member interaction, and suitable feature provided by the system would be expected to influence the behaviours exhibited by the users. The values and level of INCOL will contribute to accuracy and completeness of users, time to complete the
desired task, and positive response relating to the attitude of the user towards the system. According to Trubisky, Ting-Toomey, and Lin (1991), members from collectivistic cultures utilized a collaborative conflict resolution approach more often than those who are from individualistic cultures in group task. These individualistic persons are more interested about their own concerns and less about the interests of the whole group. Also, Oishi, Schimmack, Diener, and Suh (1998) found that culture and type of task are related. They found that individualistic members who focus on self-independence are less likely to engage in cooperative behaviour in group settings, whereas collectivist members valuing interdependence among group members are more likely to be cooperative in their behaviour. We expect that a higher proclivity toward individualism would lead to weaker tendencies by user to be effective, efficient, and satisfied when accomplishing group task and vice versa. As a result, the following hypotheses are proposed:

1a. German and Indonesian Individualistic users would exhibit significantly greater level of usability of the individual task than of the group task, as demonstrated by means of effectiveness, efficiency and satisfaction.

1b. German and Indonesian Collectivistic users would exhibit significantly greater level of usability of the group task than of the individual task, as demonstrated by means of effectiveness, efficiency and satisfaction.

2. There are correlations among INCOL and aspects of usability.

2a. For German and Indonesian groups when both groups accomplish group task, there is negative correlation between level of individualism and each aspects of usability (effectiveness, efficiency and satisfaction).

2b. For German and Indonesian groups when both groups accomplish group task, there is
positive correlation between level of collectivism and each aspects of usability (effectiveness, efficiency and satisfaction).

2c. For German and Indonesian groups when both groups accomplish individual task, there is positive correlation between level of individualism and each aspects of usability (effectiveness, efficiency and satisfaction).

2d. For German and Indonesian groups when both groups accomplish individual task, there is negative correlation between level of collectivism and each aspects of usability (effectiveness, efficiency and satisfaction).

Method

Participants

To determine participants' eligibility to participate in the experiments, this research required German and Indonesian students to complete a brief screening questionnaire, INCOL Scenario Questionnaire (Triandis, Chen, & Chan, 1998). In each country, university students of a Psychology lecture invited to participate in this subsequent experimental sessions had to fulfil two requirements: reporting no previous experience in using GoogleCalendar and having the highest scores on total scores of either Individualism sub scale or Collectivism sub scale. From the questionnaires, we chose 16 individualistic persons and 16 collectivistic persons from each country. Those who were considered as potential participants then were invited to take part the experiment and they had to confirm their participations to us.

There are 97 German participants (85 women and 12 men, mean age was 21.35, $SD = 3.91$) studied in a university in Eastern part of Germany and 108 Indonesian participants (91 women and 17 men, mean age was 19.86, $SD = 1.41$) studied in a university in the middle of...
Java, Indonesia participated in the screening test. The INCOL scores of both groups before some of them were selected to participate in the experiments are presented in Table 1.

Table 1

*Score Distributions of INCOL*

<table>
<thead>
<tr>
<th>Culture</th>
<th>German <em>(N = 97)</em></th>
<th>Indonesian <em>(N = 108)</em></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>M</em></td>
<td><em>SD</em></td>
</tr>
<tr>
<td>Horizontal Individualism</td>
<td>28.29</td>
<td>10.845</td>
</tr>
<tr>
<td>Vertical Individualism</td>
<td>37.99</td>
<td>7.612</td>
</tr>
<tr>
<td>Individualism</td>
<td>66.28</td>
<td>17.739</td>
</tr>
<tr>
<td>Horizontal Collectivism</td>
<td>33.63</td>
<td>7.687</td>
</tr>
<tr>
<td>Collectivism</td>
<td>61.75</td>
<td>13.025</td>
</tr>
</tbody>
</table>

The total sample included 64 participants. The German sample consisted of 32 students (28 women and 4 men) enrolled at the Chemnitz University of Technology, while the number of the Indonesian sample was also 32 (25 women and 7 men) students from Islam University of Indonesia, Indonesia. From each country, there were two groups: individualistic and collectivist groups. Individualistic group consisted of 16 participants who had highest scores on individualism sub scale (*M* *Germany* = 75.34, *SD* *Germany* = 9.07, *M* *Indonesia* = 65.12, *SD* *Indonesia* = 5.52) while members of collectivist group were 16 participants who had highest scores on collectivism sub scale (*M* *Germany* = 67.05, *SD* *Germany* = 8.32, *M* *Indonesia* = 74.86, *SD* *Indonesia* = 7.93). The mean age of the German sample was 21.14 years (*SD* = 3.64), while the mean age of their partners from Indonesia was 19.45 (*SD* = 1.25). For their participations in the experiments, the German group gained 1.5 credit hours and the Indonesian one earned money equivalent to $2.6.
Design

A 2x2x2 mixed MANOVA design was used in which there were (1) two countries (Germany or Indonesia); (2) two types of cultural dimensions-INCOL (individualism or collectivism); and (3) two types of task (individual or group task) with country and cultural dimensions as between-subjects variables and task as a within subject variable. Task was counterbalanced for learning and carry over effects. Countries, INCOL, and task were independent variables, while aspects of usability (effectiveness, efficiency, and satisfaction) were dependent variables.

Material

The software used in the experiments was GoogleCalendar because it has characteristics of PIM tools needed in this research such as for developing, managing, and sharing calendar. In PIM context, Google Calendar is a part of an integrated GoogleApps that consist of various PIM tools, such as tasks, contacts, notes, email, file storage, calendar and bookmarks which can be shared with other members in the users groups. In reality, users may utilize more than one tool in managing personal or group information. In this experiment, although the participants mainly used calendar features, they also were allowed to use other tools to support their works. There were two tasks: individual task and group task, the subjects had to complete both tasks in these experiments. The subjects performed both comparable tasks in different ways, either individually or in group. The tasks sent by email to their new Google email required part participants to arrange an event by using calendar features provided by GoogleCalendar.

To construct tasks completed by users in the experiments, this research modified the
tutorial video provided by Google and the scenario of online calendar in Beard, Palaniappan, Humm, Banks, Nair, and Shan’s study (1990). The video teaches Google users about how to use such application to handle effectively and efficiently their personal and group agendas. Moreover, in their study, Beard et al (1990) aimed to design a visual calendar for scheduling group meetings and created a scenario accomplished by the participants in a controlled experiment comparing automatic scheduling with a priority-based, graphical scheduling system named Visual Scheduler (VS) to manual scheduling. Because these experiments required group based performance, the participants were instructed to accomplish two equal tasks consisting of individual task and group task. The contents were equal for both tasks but the participants had to perform and finish the tasks individually and then in group, or in opposite order according to the counterbalance standard.

Each task had seven schedules to arrange and one problem to solve. The tasks asked the participants to arrange the agendas of five persons and availabilities of two rooms in one online calendar; each of the agendas and the availabilities had different calendar colour. In more detail, to accomplish task A, the participants helped Mr. A, a meeting organizer, scheduling a one-hour lab meeting during the next week with four other people (Mr. B, Mr. C, Ms. D, Mr. E). The participants should consider two sets of availability: the availability of each invitee and the availability of rooms capable of holding five people. Finally, the participants had to decide the best time to hold the lab meeting. Equally, the aim of task B is to help Ms. White, a secretary in the Computer Science Department, scheduling a two-hour meeting the following week, with two professors, Prof. Brooks and Prof. Fuchs, and two graduate students, Ms. Pink, Mr. Orange, and Mr. Blue. Again, the participants then were required to find the time to hold the meeting. The participants completed task A and B in counter balance design. This will be explained in the next
section.

Hornbaek (2006) suggests the main components of usability as both perceptions of usability and actual usability. Consequently, to measure the actual efficiency and effectiveness of the software, participants were observed as they used the software. To measure the effectiveness, a participant was recorded whether he or she was able to fulfil completely a task. No time limits were given since time to complete task was a variable in this experiment. The answers then were verified to prove either participant could not finish the given task or perfectly completed it; after that the “yes or no” (binomial) data were kept for all tasks attempted by the user. The efficiency was measured by recording task timing. Time to begin was recorded when the participants clicked the “start” button and started reading the task; and time to stop was calculated when the participants had finished the task and clicked the “finish” button. To measure subjective user satisfaction, the participants were surveyed to evaluate their subjective impressions of usability. The Lewis’ Computer System Usability Questionnaire (CSUQ) (1995) was used to assess subjective user’s satisfaction with respect to system usability, and comprises 19 items related to system usefulness, the information quality, and the interface quality.

**Procedure**

Firstly, the participants working in group were told that they had to finish a task with other three group members and were only able to communicate with them by online, including sharing the information by e-mail or discussing in chatting feature. The information about the tasks was separated into four parts and each member in a group received different part in order to force each member to share and to work together with others. Before started accomplishing the group task, they were given a new Google mail, a list of others’ email, and our email; then, they
were able to log in and to start performing the group task. After each group found the correct answer, each participant sent it to our email.

Comparison between group and individual data collection is explained as follow. In this study, one experiment was conducted with German participants on October 26, 2009 and November 2, 2009 and the other one was carried out with Indonesian participants on July 27, 2009. The participants in each country were divided into two groups, Individualistic and Collectivistic groups. To avoid an order effect, then each group was divided into two groups each of which included four subgroups, and each subgroup consisted of four participants. Two sub groups completed the task A first and afterwards they performed the task B whereas the other two sub groups reversed the order. For the two sub groups that began by completing the task A, one sub group was asked to complete the task individually and another sub group had to accomplish the task in group. The same procedures were made for the other two sub groups that performing the task B. This counter balance steps were also used for the Collectivistic group.

The research design is described on the table below.

**Tabel 2**

*Counter Balance Used In the Research Design*

<table>
<thead>
<tr>
<th>Country</th>
<th>Individual Task</th>
<th>Group Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>Individualistic Group</td>
<td>Collectivistic Group</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Individualistic Group</td>
<td>Collectivistic Group</td>
</tr>
</tbody>
</table>

To ensure equality of the experiment procedure, the experiments for both groups were guided by a testing script translated their own language. All the materials were translated to
either German or Indonesian language and were approved by bilingual university students in psychology. The testing script, the questionnaires, and the tasks were in either German or Indonesian language, while the software was English version. The reason behind it was for Indonesian users, they are more familiar with the English version because most IT applications used in Indonesia are in English. Moreover, there was no German version of the PIM software, especially for calendar menu, when the experiments were conducted. The experiments in Germany were conducted by the researcher guided by a German testing script, whereas the experiments in Indonesia were managed by a colleague, a researcher in psychology, guided also by an Indonesian testing script and was trained for the experimental procedure.

**Results**

**Hypotheses:**

1a: *German and Indonesian Individualistic users would exhibit significantly greater level of usability of the individual task than of the group task, as demonstrated by means of effectiveness, efficiency, and satisfaction.*

1a: *German and Indonesian Collectivistic users would exhibit significantly greater level of usability of the group task than of the individual task, as demonstrated by means of effectiveness, efficiency, and satisfaction.*

Two hypotheses above (Hypothesis 1a and 1b) explore the interactions among country, task, and culture; and the partial supports were demonstrated. The within-subjects MANOVA revealed no main interaction effects of task, *Wilk's A = .968, F (1, 62) = .646, p > .05, ηp² = .03* (small), nor Task X Country, *Wilk's A = .977, F (1, 62) = .454, p > .05, ηp² = .02* (small), and nor Task X Country X INCOL, *Wilk's A = .994, F(1, 62) = .118, p > .05, ηp² = .02* (small). In
contrast, the analysis found that the main interaction effect of Task X INCOL was statistically
significant, Wilk’s $\Lambda = .532$, $F (1, 62) = 17.1037$, $p < .01$, $\eta_p^2 = .46$ (large). Since only two levels
of the within-subjects variable (first vs. second task) producing sphericity are exist and epsilons
are 1.0, therefore, in this study, sphericity is not a concern. After the within-subject analysis,
accompanying analyses of variance with repeated measures were conducted to explore the results
of effects of interaction between task and INCOL on effectiveness, efficiency, and satisfaction.
Firstly, for the effectiveness analysis, the results indicated no main interaction effects for
interaction between task and INCOL, $F (1, 62) = .104$, $p > .05$, $\eta_p^2 = .03$ (small). Next, for the
efficiency analysis, the main interaction effect between task and culture, $F (1, 60) = 24.75$,
$p < .01$, $\eta_p^2 = .29$ (medium) was significant. In the same way, the ANOVA analysis of satisfaction
did prove a significant effect of the interaction, $F (1, 60) = 33.53$, $p < .01$, $\eta_p^2 = .359$ (medium).

Table 3
*Mean and Standard Deviations of Usability Aspects (Effectiveness, Efficiency, Satisfaction) of
German Participants*

<table>
<thead>
<tr>
<th>Score</th>
<th>Individualistic Group</th>
<th>Collectivistic Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$N = 16$</td>
<td>$N = 16$</td>
</tr>
<tr>
<td></td>
<td>$M$</td>
<td>$SD$</td>
</tr>
<tr>
<td><strong>Individual Task</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effectiveness</td>
<td>6.39</td>
<td>2.14</td>
</tr>
<tr>
<td>Efficiency</td>
<td>1,193.21</td>
<td>376.31</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>79.58</td>
<td>13.95</td>
</tr>
<tr>
<td><strong>Group Task</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effectiveness</td>
<td>3.42</td>
<td>.857</td>
</tr>
<tr>
<td>Efficiency</td>
<td>1,569.54</td>
<td>481.76</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>63.28</td>
<td>11.93</td>
</tr>
</tbody>
</table>
Table 4

*Mean and Standard Deviations of Usability Aspects (Effectiveness, Efficiency, Satisfaction) of Indonesian Participants*

<table>
<thead>
<tr>
<th>Score</th>
<th>Individualistic Group</th>
<th>Collectivistic Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( N = 16 )</td>
<td>( N = 16 )</td>
</tr>
<tr>
<td></td>
<td>( M )</td>
<td>( SD )</td>
</tr>
<tr>
<td>Individual Task</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effectiveness</td>
<td>6.24</td>
<td>1.89</td>
</tr>
<tr>
<td>Efficiency</td>
<td>1,224.67</td>
<td>388.02</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>76.74</td>
<td>12.86</td>
</tr>
<tr>
<td>Group Task</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effectiveness</td>
<td>3.42</td>
<td>.857</td>
</tr>
<tr>
<td>Efficiency</td>
<td>1,506.96</td>
<td>478.29</td>
</tr>
<tr>
<td>Satisfaction</td>
<td>65.48</td>
<td>13.01</td>
</tr>
</tbody>
</table>

Moreover, much like with the multivariate omnibus tests, the univariate ANOVA follow-ups provide overall group effects for any aspects of PIM usability. With the purpose of investigate the specific mean differences, as a consequence, it is not necessary to conduct individual t-tests about the mean difference, but rather to interpret the descriptive statistics table, particularly the data divided by the interaction between task and culture. It shows that for efficiency of individual task, individualistic group needed less time (\( M = 1,208.94, SD = 387.89 \)) than collectivistic group (\( M = 1,555.13, SD = 472.25 \)). Conversely, for efficiency of group task, individualistic group needed more time (\( M = 1,538.25, SD = 480.02 \)) than collectivistic group (\( M = 1,189.88, SD = 379.98 \)). The descriptive statistics of satisfaction also displayed the same patterns. For individual task, individualistic group demonstrated higher positive attitude (\( M = 78.16, SD = 13.19 \)) compared to those are members of collectivistic group (\( M = 65.44, SD = 13.14 \)). On the other hand, for group task, members of individualistic group demonstrated lower positive attitude (\( M = 64.38, SD = 12.38 \)) compared to their counterparts from collectivistic
This shows that compatibility between task and culture is important to decrease time required to complete task as well as to increase level of satisfaction in PIM usage.

**Hypotheses:**

2a: for German and Indonesian groups when both groups accomplish group task, there is negative correlation between level of individualism and each aspects of usability (effectiveness, efficiency, and satisfaction).

2b: for German and Indonesian groups when both groups accomplish group task, there is positive correlation between level of collectivism and each aspects of usability (effectiveness, efficiency, and satisfaction).

2c: for German and Indonesian groups when both groups accomplish individual task, there is positive correlation between level of individualism and each aspects of usability (effectiveness, efficiency, and satisfaction).

2d: for German and Indonesian groups when both groups accomplish individual task, there is negative correlation between level of collectivism and each aspects of usability (effectiveness, efficiency, and satisfaction).

Next, an analysis using Pearson's correlation coefficients demonstrates relationships among INCOL and usability factors, except for the effectiveness of group task that was analyzed by Spearman's correlation due to the non-normal distribution of the data. The Hypotheses 2a, 2b, 2c, and 2d were supported partially because INCOL correlated with efficiency and satisfaction, but not effectiveness. The correlation tests revealed significant correlations among culture of Culture (Germany-individualism, Germany collectivism, Indonesia-individualism, and
Indonesia-collectivism), efficiency of individual and group task satisfaction of individual and group task. For efficiency, the correlation between German-individualism and efficiency of group task is $r(16) = 0.76$, $p<0.01$, $r^2 = 0.57$, between German-collectivism and efficiency of individual task is $r(16) = 0.60$, $p<0.05$, $r^2 = 0.36$, between German-collectivism and efficiency of group task is $r(16) = -0.53$, $p<0.05$, $r^2 = 0.28$, between Indonesia-individualism and efficiency of individual task is $r(16) = -0.67$, $p<0.01$, $r^2 = 0.45$, between Indonesia-individualism and efficiency of group task is $r(16) = 0.55$, $p<0.05$, $r^2 = 0.30$, between Indonesia-collectivism and efficiency of individual task is $r(16) = 0.51$, $p<0.05$, $r^2 = 0.26$, and between Indonesia-collectivism and efficiency of group task is $r(16) = -0.53$, $p<0.05$, $r^2 = 0.28$.

Table 5

<table>
<thead>
<tr>
<th>Country</th>
<th>Culture</th>
<th>N</th>
<th>Effectiveness</th>
<th>Efficiency</th>
<th>Satisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Individual Task</td>
<td>Group Task</td>
<td>Individual Task</td>
</tr>
<tr>
<td>Germany</td>
<td>Individualism</td>
<td>16</td>
<td>$r = 0.63^{**}$</td>
<td>$r = -0.47$</td>
<td>$r = 0.49$</td>
</tr>
<tr>
<td></td>
<td>Collectivism</td>
<td>16</td>
<td>$r = -0.31$</td>
<td>$r = -0.20$</td>
<td>$r = 0.60^*$</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Individualism</td>
<td>16</td>
<td>$r = 0.15$</td>
<td>$r = -0.48$</td>
<td>$r = -0.67^{**}$</td>
</tr>
<tr>
<td></td>
<td>Collectivism</td>
<td>16</td>
<td>$r = -0.06$</td>
<td>$r = -0.10$</td>
<td>$r = 0.51^*$</td>
</tr>
</tbody>
</table>

$^* = p<0.05$, $^{**} = p<0.01$

However, the exception appeared on the correlation between culture of German-individualism and individual task that was not significant though there was a trend toward significance, $r(16) = 0.49$, $p = 0.55$, $r^2 = 0.24$. The correlations among Culture of both groups and satisfaction of both tasks showed a similar pattern with the correlations among Culture of both groups and efficiency of both tasks. The correlation between German-individualism and
satisfaction of individual task is \( r(16) = 0.60, p < 0.05, r^2 = 0.36 \), between German-individualism and satisfaction of group task is \( r(16) = -0.59, p < 0.05, r^2 = 0.34 \), between German-collectivism and satisfaction of individual task is \( r(16) = -0.61, p < 0.05, r^2 = 0.37 \), between German-collectivism and satisfaction of group task is \( r(16) = 0.56, p < 0.05, r^2 = 0.31 \), between Indonesia-individualism and satisfaction of individual task is \( r(16) = 0.52, p < 0.01, r^2 = 0.27 \), between Indonesia-individualism and satisfaction of group task is \( r(16) = -0.70, p < 0.01, r^2 = 0.49 \), between Indonesian-collectivism and satisfaction of individual task is \( r(16) = -0.66, p < 0.05, r^2 = 0.43 \), and between Indonesian-collectivism and satisfaction of group task is \( r(16) = 0.63, p < 0.05, r^2 = 0.39 \). As a conclusion, for efficiency and satisfaction, the higher level of individualism the users have, the less time the users require to accomplishing individual tasks and the more satisfied the users apply the PIM tool. This also applies to collectivism, the higher level of collectivism the users have, the less time the users require to accomplishing group tasks and the more satisfied the users apply the GIM tool.

On the contrary, the results indicated that no significant correlations among culture of Groups and effectiveness of individual and group task, excluding the correlation between culture of Germany-individualism and group task. The correlation between German-individualism and effectiveness of group task is \( r(16) = -0.47, p > 0.05, r^2 = 0.22 \), between German-collectivism and effectiveness of individual task is \( r(16) = -0.31, p > 0.05, r^2 = 0.09 \), between German-collectivism and effectiveness of group task is \( r(16) = -0.20, p > 0.05, r^2 = 0.04 \), between Indonesia-individualism and effectiveness of individual task is \( r(16) = 0.15, p > 0.05, r^2 = 0.02 \), between Indonesia-individualism and effectiveness of group task is \( r(16) = -0.48, p > 0.05, r^2 = 0.23 \), between Indonesian-collectivism and effectiveness of individual task is \( r(16) = -0.06, p > 0.05, r^2 = 0.15 \), and between Indonesian-collectivism and effectiveness of group task is \( r(16) = -0.10 \),
Although there is a significant correlation between German-individualism and effectiveness of individual task, $r(16) = 0.63$, $p<0.01$, $r^2 = 0.39$, it is concluded that both individualism and collectivism of German and Indonesian users have no relationships with whether the users were able to perform individual and group tasks (effectiveness).

**Discussion**

Hypotheses 1a and 1b were partly supported. In conclusion it surfaced that there were no main interaction effects of Task, nor Task X Country, and nor Task X Country X INCOL, but it was found that the main interaction effect of Task X INCOL was statistically significant. Secondly, the results supported partially Hypotheses 2a, 2b, 2c, and 2d. For efficiency and satisfaction, the higher level of individualism the users have, the less time the users require accomplishing individual tasks and the more satisfied the users are to apply the PIM tool. This also applies to collectivism, the higher level of collectivism that users have, the less time the users require in accomplishing group tasks and the more satisfied the users are to applying the GIM tool. But it is concluded that both individualism and collectivism of German and Indonesian users have no relationships with the level of effectiveness of individual and group tasks with an exception that there was significantly correlation between German-individualism and the effectiveness of individual tasks.

Next, the results support partially Hypotheses 1a and 1b. They mention the significant correlations among culture of Groups (Germany-individualism, Germany collectivism, Indonesia-individualism, and Indonesia-collectivism), efficiency of individual and group task, and satisfaction of individual and group task, except the correlation between culture of German-individualism and individual task that was not significant. Nevertheless, the results
indicated that no significant correlations among culture of groups and effectiveness of individual and group task, excluding the correlation between culture of Germany-individualism and individual task. In general, the research concluded that there was a correlation between the cultural background and the type of task increase required time to complete task (efficiency) as well as with positive feelings toward the PIM and GIM tool (satisfaction), but not the level to which the PIM and GIM tool facilitates the users in accomplishing the intended tasks (effectiveness).

The results show that correlations among INCOL and usability aspects of PIM-GIM tool (efficiency, satisfaction, and effectiveness), from the FITT perspective, depending on the fit among the characteristics of the users, the technology, and the tasks and processes. For efficiency and satisfaction, the results indicate that the higher level of individualism the users have, the less time the users require to accomplishing individual tasks. It is in line with Kirkman and Shapiro’s study (2001) that found individualistic persons reach a higher level of performance if they worked individually and for individual purposes. According to the theory instrumentality and self-efficacy, arranging an online meeting appointment using a PIM tool is associated with ability to manage effort and frustration, and also to endorse perceived enjoyment (Bandura, 2002; Husman, Derryberry, Crowson, & Lomax, 2004; Igbaria, Parasuraman, & Baorudi, 1996). Therefore, when individualistic users engage in instrumental behaviour such as working individually, they are motivated to complete their tasks in a timely manner, focused, and efficient with a least of irritation (Tuckman, 2003). They also do not want to be distracted from their activities, then intrinsic satisfaction perhaps offer the internal reward needed to achieve a completely focused mind and cognitive-absorption (Hall, et.al., 2004).
Similarly, collectivism correlates with efficiency and satisfaction of group tasks, which is in line with some previous research (e.g. Chu & Chu, 2010; Tapanes, et.al., 2009; Workman, 2001). Barron (2003) proposes that to cooperate with each other for a shared task, every group member has to deal with an interdependent dual-problem space in a virtual working environment. It means a group must manage a content space involving the problem to be answered and a relational space comprising the social interaction opportunities and challenges. In this research, the content space is arranging a group calendar by using GIM tool and the relational space is interaction among the team members. How they manage these cognitive and social factors is essential to the result of their work. It is easier to perform in collectivistic cultures because the needs of the group or clan are more important than a single individual’s needs in such a cultural dimension. In collectivistic cultures, the group is seen as the major source of identity, loyalty, and achievement. Kirkman and Shapiro (2001) found that teams higher, compared to lower, in collectivistic value were more empowered, creative, and supportive.

As it stated earlier, Hypothesis 2a, 2b, 2c, and 2d were accepted partially because the present study showed that efficiency and satisfaction were connected to cultural orientation but not effectiveness. This is different from previous works that found supports for the potential value of collectivism as a predictor of a group member performance (effectiveness) (e.g., Jackson, et.al, 2006; Goncalo & Staw, 2006). For effectiveness when accomplishing the tasks in group, the difference may be due to some social factors, such as social loafing. Suleiman & Watson (2008) found that social loafing, where team members decrease individual effort when performing in groups compared to when they perform individually, occur in teams operating in a technology-driven realm.
There is also no significant correlation between effectiveness when accomplishing the task individually. For this result, the reason may be due to motivational loss. The users did not exert maximal effort during accomplishing the individual tasks because they performed the tasks in an experimental condition. The dilemma in research of PIM is to manage privacy aspect and motivational process. In experimental condition, users are able to keep their privacy but this may decrease their motivation to show their optimal performance. On the other hand, if users use their own personal information, this may break their privacy (Teevan & Jones, 2006; Karat et al., 2006). The other reason may be the characteristic of users who are novice users. Lazar and Norcio (2003) found that the chance for making errors rises when novice users solve problems in a networked environment, such as the Internet. Level of complexity increases, involving all of the procedures and unpredictable network connections, and in such situation, therefore, there are various new chances for mistakes to take place.

The results of this study not only provide some evidences for the value of INCOL; they also shed light on a popular counter argument. The notion that users from western country act simply as individualistic persons and users from eastern country act as collectivistic persons, do not receive support from this research. Thus, the assumption that persons belong to only a single cultural group, based on their nationality, is too simplistic. By using within analyse, the research raise concerns about whether INCOL is valid predictor for level of usability aspects of PIM-GIM in both western and eastern countries. Also, the results of this study provide interesting points for PIM-GIM tool development on how to improve performance time and level of subjective satisfaction for novice users by considering the compatibility between cultural background and type of tasks.

It is important to discuss if INCOL values for Germans vs. Indonesians are
representative. Sampling problems have been a recurrent feature in ethnic research. Samples in ethnic research are often small and drawn from local participants. This makes generalizations difficult, especially for Indonesia. The Indonesia population comprises very different ethnic groups with their own specific characteristics and cultures. From a geographical point of view, Indonesia is formed from 18,000 islands (of which only about 3,000 are inhabited). It is a volcanic archipelago stretching across the equator for more than 5,000 km, and its area is 1,919 million square kilometers. The present discussion is based on university student samples, a small, not truly representative sample of the country (out of many millions), so that the research conclusions should be regarded as preliminary. A previous study by Merritt (2000) investigated relationship between national culture and cockpit behavior. The study highlighted the need for understanding the respondents’ occupational context when replicating Hofstede’s work. Therefore, for future research it is necessary to explore such relationship with more representative users which reflect economic, geographic location, age, and education diversity although this involves logistical problems and can be both difficult and costly.

Moreover, a misinterpretation to the results may occur because, traditionally, Western countries such as Germany represent individualistic countries and Indonesia always is characterized as a collectivistic country. Conversely, many studies found different conclusion that Western people sometimes show less individual compared to Asian people, for example Kashima, Halloran, Yuki, & Kashima (2004) discovered that the mean Individualist Behaviour score was significantly lower in Australia than in Japan. It is suggested, then, to conclude carefully the representatives of the respective countries because the between-subject design in this research compared not only Germany vs. Indonesia but also individualism vs.
collectivism in each country.

It is essential to bear in mind that comparison Germany vs. Indonesia was based on the absolute values. There is a debate among researchers about if absolute values should not be compared between different cultures. Malhotra, et.al, (1996) and Singh (1995) recommended that general etic comparisons across cultures should be calculated based on unstandardized data, assuming that construct equivalence has been achieved. But, comparisons in emic approach within a culture should be made on the basis of standardized data. In place of standardizing the variables across the sample within each culture, occasionally to attain scalar equivalence, it may be desirable to standardize the data by respondent. Such a method produces in relative statistics for variables for every culture. These standardized statistics can be used for relative comparisons of the variables rather than absolute comparisons. In the special case when the concern is to classify the etic dimensions of individual difference, it is suggested to use a sequential standardization procedure (Singh, 1995). As a result, as this cross-cultural study chose etic approach, comparison of German vs. Indonesian users was made on the basis of standardized data. Future research, therefore, should think about whether data should be standardized because there are some the advantages of statistics derived from standardized data, for instance interpretability.

In this research, level Power Distance (PD) is not used in statistical analysis. Though it shows that Germany is considered as low PD and Indonesia is high PD, this cultural dimension is excluded because, according to the research design, it is irrelevant with individual usage of PIM and GIM. In low PD countries, people in lower hierarchy are more likely to express their opinions and participate in process of decision making without psychological restrictions. On the other hand, in high PD countries, older age group are
respected as well as parents and teachers require obedience from children and students (Hofstede, 2001). Thus, based on PD perspective both users probably show different psychological responses depend on the involvement of processes since there was an option for users: either their participations were voluntary or compulsory. For German users, it was voluntary while for Indonesian users, it was mandatory. The Indonesian users believe that they were not supposed to disagree with the researcher their reliance upon the opinions of people researcher will be more marked when assessing the PIM and GIM software than for individuals from Germany. This probably endorses the Indonesian users to evaluate the software more positive than their counterparts from Germany. Further research should consider this phenomenon by providing empirical evidence.

Another noticeable limitation to this research is that the participants were undergraduate students working in groups that met for only a short period of time. Therefore, it cannot be assured that the results would generalize beyond laboratory groups. Also, to accomplish a shared task in group, every team member has to solve the problem and to deal with social interaction (Barron, 2003). Because this research measured usability aspects, it explored more on content space and, as a result, relational space was not fully tested. Future research should be conducted to test the prepositions using a naturalistic setting and exploratory method.

The other limitations are the number of participants was relatively small and the imbalance in gender. The current study was conducted with four groups from Germany and Indonesia in which two groups (individual and collectivism) in each country and 16 students in each group. The participants were also predominantly women (German: 28 women and 4 men; Indonesian: 25 women and 7 men). Venkatesh & Morris (2000) discovered that men’s
decisions on computer usage were strongly affected by their perceptions of usefulness; while for women, the perceptions of and subjective norm ease of use were more influential. Therefore, these phenomena might offer possibilities for future studies by involving more participants with balance in gender.
Chapter 5. Summary and General Discussion

Contacts between PIM software (GIM if the users work in group) and the users need the compatibility between the characteristics of both the software and the users. Nowadays, because of differences in linguistic, regional, and country boundaries, not only technical considerations but also their local cultural standpoints direct the users’ requirements of software. Culture is a key issue to think about when trying to analyse, explain, or change behaviour. It has a result on the way individuals observe and feel during their activities at schools, office, and other places (Hofstede, 2001; Triandis, 1995). PIM software, then, needs to disclose culturability that is defined as designing the interface by considering the cultural unfairness and preferences to advance the usability of the interface and the system. To recognize and to predict PIM user behaviours, consequently, the process of software development considers the user’s behaviour based on their cultural point of view. This research intended to investigate the correlation between culture and usability of PIM software perceived by German and Indonesian users reported in two experiments. Developments of PIM technology in both countries and their cultural values, in particular UA and INCOL, are the reasons to carry out this research.

The links between Study 1 and Study 2 are the examination of cultural backgrounds and the research methodology. Both studies are comparable because each chapter explored one cultural background. However, based on the research methodology, the experiments were separated into two studies because each cultural background needed dissimilar research designs: UA would be related first vs. second task and INCOL would be studied with two different ways to complete (individual vs. group task). While Study 1 focused on the comparison between
Germany vs. Indonesia culture, Study 2 concentrated on cultures between (Germany vs. Indonesia) and within country (individualism vs. collectivism).

Some theoretical explanations were developed regarding relationship between culture and usability as well as task order and ways to complete tasks influencing the relationship. Predicted as higher UA culture than Indonesian users, German users would prefer to need more time to be active until they have adequate information to deal with vague and unstructured circumstances when using PIM applications. The situations are more problematical for novice users as Lazar and Norcio (2003) conclude, compared to experts, novice users have a lower possibility of performing effectively and efficiently. Learning may interact with usability, for instance novice users need more time to improve their performance levels (Bartholomé, et.al, 2006).

Also, based on FITT frameworks, we expected that a higher level of individualism would direct PIM users to be less effective, efficient, and satisfied when completing tasks in groups compared to accomplishing tasks individually and vice versa. Wagner (1995) found that a high level of collectivism raises the cooperation intensity in group work. Collectivism is also able to predict group performance group compared with individual performance. Jung and Avolio (1988) suggested that collectivism moderates the correlation between group achievement and leadership. On the contrary, Anandarajan, et al. (2000) and Veiga, et al. (2001) found that in individualistic cultures, new IT would be more likely perceived as useful when it is viewed as improving the individuals performance. Thus, cooperation is essential for achieving success in group work, in particular in the context of GIM while individual achievement motivation is a key factor in completing individual task by using PIM.

The results showed some conclusions. It is concluded German users showed a higher
level of UA than Indonesian ones. Only on the satisfaction level Indonesians demonstrated a higher level compared to German users and the main effect of time was only significant for the level of efficiency. The results also revealed that there were positive correlations between UA and efficiency of both tasks as well as negative correlations among UA and satisfaction but no negative correlation between level of UA and effectiveness. Furthermore, regarding INCOL, it is concluded that the main interaction effect of Task X INCOL was statistically significant. For efficiency and satisfaction, the higher level of both individualism and collectivism the users have, the less time the users require to accomplishing individual tasks and the more satisfied the users apply the PIM and GIM tool. But it is concluded that both individualism and collectivism of German and Indonesian users have no relationships with level of effectiveness.

New perspectives on Hofstede’s theory, theory of usability, FITT framework, and PIM-GIM technology are occured. This research ignores the assumptions that people coming from the Western countries, for example Germany, behave simply as individualistic persons and vice versa those from East, for example Indonesia, act as collectivistic persons. The statement that persons belong to merely a particular cultural group, based on their nationality, and then they behave based on their nationality is very simplistic. Theoretically, a user can manage both personal and group appointments by using calendar tools, and also offer different levels of access. On the other hand, the results found that not country but cultural orientation, in this case UA and INCOL, demonstrated effects on aspects of usability, especially efficiency and satisfaction, which were moderated by task order and ways to complete the task. This has proven that FITT framework focusing on the fit among the characteristics of the users, the technology, and the tasks and processes are important. Collectivism correlated with efficiency and satisfaction of group task, while individualism correlated with the two aspects of usability of
individual task.

Furthermore, some suggestions for future research are recommended. Firstly, how novice users handle daily IT usage between in laboratory and real-life situations; and a longer time or even a longitudinal study with the aim of providing a detail explanation of the pattern of handling uncertainty are suggestions for the next studies. Secondly, this research should be extended by increasing sample size, balancing gender of samples, and involving other social economic status.
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Appendix A

Uncertainty Avoidance Questionnaire

For each of the following statements, please indicate how you feel about each one by choosing the appropriate letter as your answer.

A = strongly disagree
B = disagree
C = somewhat disagree
D = somewhat agree
E = agree
F = strongly agree

1. I like people that are predictable.
2. I would like to have more control over the future.
3. I feel threatened by unfamiliar situations.
4. I prefer settings where I know exactly how to behave.
5. I think all societies should have clear rules and guidelines for social behavior.
6. I frequently feel nervous about how others are going to behave.
7. I don’t like social deviants.
8. I prefer people who have good manners.
9. I prefer social situations where everyone knows what is expected of them.
10. I get anxious when I don’t know what to expect from other people.
Appendix B

Individualism-Collectivism Questionnaire

Instruction: The following is a set of 12 scenarios. All these scenarios are related to various aspects of students’ life. Each scenario is followed by four options. Please imagine these situations, read all four options, and rate each option according to how you personally would react to this situation. Please remember there is no right or wrong answer in this task.

Use the following scale:

Strongly disagree = 1
Somewhat disagree = 2
It is difficult to say = 3
Somewhat agree = 4
Strongly agree = 5

I. Happy university life is attained by

1. Being loyal to one’s student community and ready to sacrifice one’s interests for the benefit of it.

2. Linking with a lot of friendly people and sharing thoughts and feelings with them.

3. Being independent and doing what one likes.

4. Beating other students at different tasks (studying, sports, arts, etc).

II. A student must buy clothing for a major social event at the University. The best criterion for deciding what to buy is:

5. The student likes it.

6. The student’s parents like it.

7. The student’s friends like it.

8. It is so elegant that it will dazzle everyone.
III. Imagine a student is selecting a band to play at a social event at the University. What is the right way to make a decision about what band to choose?

9. To choose a band which this student really likes.
10. To choose a band which the person’s friends approves of.
11. To choose a band which the administration of the University approves of.
12. To choose a band that is very famous and popular in the city.

IV. A student is going over Graduate Programs brochures in order to decide which program to attend. What is the most important factor in making this decision?

13. It is a very competitive program and one of the best.
14. The student’s professor/supervisor approves of it.
15. It is the program most of student’s classmates are going to.
16. It is the program which fits student’s interests and needs the most.

V. A controversy has developed in a student’s class, and the student needs to take a position. Which is the most likely course of action?

17. To listen to all the facts and independently take his or her own position.
18. To discuss it with a professor and support the professor’s position.
19. To discuss it with the student’s friends and take their views into account.
20. To consider which position will most likely benefit the student in the future.

VI. A student needs to choose one more class for next semester. Which is the right way to determine what class should be selected?

21. The one that will help this student get ahead of everyone else.
22. The one the student’s professor/supervisor suggests.
23. The one the student’s friends plan to take.
24. The one that seems most interesting to the student.
VII. A big event is taking place in a University, and a student has received four requests from people to stay with him or her overnight while they are in town. The student only has space for one guest. Which one does he or she invite?

25. A friend.
26. A high-status member of a student’s community.
27. The person who is the most fun to have around.
28. Someone well connected in political circles.

VIII. A student is starting a small business, and he or she is looking for a partner. Who is the right partner?

29. Someone with the same business interests.
30. Someone who is competitive and ambitious.
31. A relative or close friend.
32. A high status member of a student’s community.

IX. A student is considering joining a campus organization. Which factor is most important in deciding which organization to join?

33. The one in which the student will have the most fun.
34. The one that will look best on his or her resume.
35. The one that some of the student’s friends and classmates are already members of that organization.
36. The one suggested by a professor or a high status members of a student’s community.

X. The best society is one where

37. People get more money and recognition if they contribute more to the society.
38. People have more or less equal incomes and equal opportunities.
39. People can live their lives independently, and do the things which they enjoy.
40. People are ready to sacrifice their interests for the sake of their society.
XI. What are the most important behaviors to show in a student community?

41. To share thoughts and emotions with other students.
42. To be loyal to the community and obedient to a leader.
43. To be self-reliant and able to think for oneself.
44. To compete with other students and get higher status in the community.

XII. How does a student prefer to handle difficult class assignments?

45. Work alone.
46. Work with a group of classmates.
47. Discuss the assignment with the professor to get ahead of the others who did not do that.
48. Take charge of a group of classmates, parcel out tasks to make each person’s job easier and the completion of the assignment successful.
Appendix C

Computer System Usability Questionnaire (CSUQ)

This questionnaire gives you an opportunity to tell us your reactions to the system you used. There are 19 statements about the system and we would like you to indicate whether you agree or disagree with the statement based on your experiences today. Your responses will help us understand what aspects of the system you are satisfied with and which need improvement.

Please, fill in the table number before fill in the questionnaire. To as great a degree as possible, think about all the tasks that you have done with the system while you answer these questions.

Please read each statement and indicate how strongly you agree or disagree with the statement by choosing a number from the dropdown list. If a statement does not apply to you, skip it and continue with the next one. After you have completed this questionnaire, we may go over your answers with you to make sure we understand all of your responses.

Thank You!

Your participant number: ____

1 = Strongly Disagree; 7 = Strongly Agree. Skip this statement if not applicable

<table>
<thead>
<tr>
<th>Statements</th>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Overall, I am satisfied with how easy it is to use this system</td>
<td>O O O O O O O O</td>
<td></td>
</tr>
<tr>
<td>2. It was simple to use this system</td>
<td>O O O O O O O O</td>
<td></td>
</tr>
<tr>
<td>3. I could effectively complete the tasks and scenarios using this system</td>
<td>O O O O O O O O</td>
<td></td>
</tr>
<tr>
<td>4. I was able to efficiently complete the tasks and scenarios using this system</td>
<td>O O O O O O O O</td>
<td></td>
</tr>
<tr>
<td>5. I was able to complete the tasks and scenarios quickly using this system</td>
<td>O O O O O O O O</td>
<td></td>
</tr>
<tr>
<td>6. I felt comfortable using this system</td>
<td>O O O O O O O O</td>
<td></td>
</tr>
<tr>
<td>7. It was easy to learn to use this system</td>
<td>O O O O O O O O</td>
<td></td>
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<td>---</td>
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</tr>
<tr>
<td>8.</td>
<td>I believe I could become productive quickly using this system</td>
<td>O</td>
</tr>
<tr>
<td>9.</td>
<td>The system gave error messages that clearly told me how to fix problems</td>
<td>O</td>
</tr>
<tr>
<td>10.</td>
<td>Whenever I made a mistake using the system, I could recover easily and quickly</td>
<td>O</td>
</tr>
<tr>
<td>11.</td>
<td>The information (such as on-line help, on-screen messages, and other documentation) provided with this system was clear</td>
<td>O</td>
</tr>
<tr>
<td>12.</td>
<td>It was easy to find the information I needed</td>
<td>O</td>
</tr>
<tr>
<td>13.</td>
<td>The information provided for the system was easy to understand</td>
<td>O</td>
</tr>
<tr>
<td>14.</td>
<td>The information was effective in helping me complete the tasks and scenarios</td>
<td>O</td>
</tr>
<tr>
<td>15.</td>
<td>The organization of information on the system screens was clear</td>
<td>O</td>
</tr>
<tr>
<td>16.</td>
<td>The interface of this system was pleasant</td>
<td>O</td>
</tr>
<tr>
<td>17.</td>
<td>I liked using the interface of this system</td>
<td>O</td>
</tr>
<tr>
<td>18.</td>
<td>This system has all the functions and capabilities I expect it to have</td>
<td>O</td>
</tr>
<tr>
<td>19.</td>
<td>Overall, I am satisfied with this system</td>
<td>O</td>
</tr>
</tbody>
</table>
Appendix D

Two Tasks of Study 1

Welcome to the Research on Software for Personal Information Management (PIM)

The following are the task that you must complete the research by using the GoogleApps. You can explore menus/features in this software.

TASK 1

You are a member organization of the Student Affairs and are responsible organize a yearly meeting of 3 months to come. As a dedication to the organization and response to suggestions from members of the senior, you want to discuss the plan with members of the senior. One of the senior members suggests that these meetings held next week at 13:00 o’clock. You send a temporary schedule of meetings to 5 senior members to gain their approval (make sure that they know you are involved in this research). In addition to the invitation, you also need to upload the document "Proposals activities" in the folder with the name "Meeting". After that, you provide access to them so that they can make down-load, revise, and upload the document again.

TASK 2

You need to set the schedule because you have to complete a difficult task in the course during this semester. Scheduling and storage of documents with the internet will make you have a test scores better than other students. You need to create a folder with the name "Task 1" and upload an important article from your USB. Give note that the article is very important to increase the quality of your work. Duplicate the article and store it in the folder "Archive". In addition, you plan to read the text books for 1 hour every Tuesday from 13.00-14.00 o’clock and the schedule also will remind you to do it on every Monday. You also want to read some scientific journals for 30 minutes on every Monday, Wednesday, and Friday. This schedule cannot be accessed by other people.

Thank you for your participation
Appendix E

Two Tasks of Study 2

Task 1

Ms. White, a secretary in the Computer Science Department, has to schedule a two-hour meeting the following week, with two professors, Prof. Brooks and Prof. Fuchs, and three graduate students, Ms. Pink, Mr. Orange, and Mr. Blue. This scheduling problem involves the availability of a two-hour time-slot of mutual acceptability to the five individuals and the availability of a meeting room. Below is the following week’s composite schedule of the five individuals and two meeting rooms:

The availability of Room 101:
Mon. 09.30-11.30, Wed. 08.00-12.00, 15.00-17.00, Thu. 14.00-17.00.

The availability of Room 102:
Mon. 13.00-16.00, Tue. 08.00-11.00, Fri. 09.00-12.00, 15.00-16.30

Brooks’ schedule:
Mon. 08.00-10.00: Lecture
Thu. 12.00-14.00: Lunch with guest

Fuchs´ schedule
Wed. 16.30-18.00: Lecture
Fri. 09.00-11.00: Meeting

Pink’s schedule
Tue. 09.30-11.30: Meeting
Wed. 09.00-11.00: Seminar

Orange’s schedule
Mon. 11.00-11.30: Go to the library
Fri. 10.00-11.30: Lecture

Blue’s schedule
Mon. 14.00-14.30: Appointment with doctor
Thu. 16.00-18.00: Colloquium

Tasks:

a. Arrange all schedules in one online calendar. Each schedule should have different colour.

b. When and where should the meeting be held? If possible, you can give more than one answer.

Task 2

Mr. A, the meeting organizer, wants to schedule a one-hour lab meeting sometime during the next week with four other people (Mr. B, Mr. C, Ms. D, Mr. E). He should consider two sets of availability: the availability of each invitee and the availability of rooms capable of holding five people. Mr. A plans to go to the library on Tuesday at 09.00-11.00 and to go to the conference on
Thursday at 08.30-10.30. On Monday at 10.00-11.30, Mr. B will attend a colloquium and he will give a lecture on Friday at 15.00-16.30. Mr. C’s schedule for the next week are as follows: lecture on Monday at 08.00-10.00 and lunch with guest on Thursday at 12.00-13.00. Ms. D has scheduled a workshop on Wednesday at 14.00-16.30 and a lecture on Friday at 08.30-10.00. She has an appointment with student to discuss on Monday at 13.30-14.30, while on Thursday at 14.00-15.30, she will join for a colloquium. Room “Black” is available for the meeting on Monday at 13.30-14.30, Wednesday at 08.00-11.00 and 14.30-16.30, and Thursday at 13.30-16.00. No one will occupy Room “White” on Monday at 09.00-10.30, Tuesday at 08.30-10.30, and Friday at 08.30-11.00, 14.30-17.00.

Tasks:

a. Arrange the schedules of 5 people and availability of 2 rooms in one online calendar. Each of them should have different calendar colour.

b. When and where should the meeting be held? If possible, you can give more than one answer.
Appendix F

Screen Shots of Google Calendar
Curriculum Vitae

Arief Fahmie

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Date of birth: 04.10.1975 in Yogyakarta, Indonesia

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Practical activities

2001-present Lecturer at Department of Psychology, Islamic University of Indonesia, Indonesia

2000- 2001 Human Resource Manager of SSCT, Indonesia

1998- 2000 Human Resource Management Staff of SSCT, Indonesia

Study

2005- 2006 MA Human Resource Management, the University of Bolton, United Kingdom.

2001- 2002 Psychologist, Gadjah Mada University, Indonesia

1993- 1998 Bachelor of Psychology, Gadjah Mada University, Indonesia
Liste der Veröffentlichungen

_Paper._ International Congress of the International Association for Cross-Cultural Psychology, July 27-31, Bremen, Germany


Fahmie, A. (2003) Computer Anxiety within E-Government. _Psikologika_. Vol XII, Iss. 2; pg. 2-4. (in Bahasa Indonesia)
