

DETERMINISTIC BEHAVIORS TOWARD INFORMATION TECHNOLOGY DIFFUSION WITHIN SMALL AND MEDIUM-SIZED FIRMS IN INDONESIA^{*)}

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ABSTRACT

Artikel ini mengungkap beberapa temuan awal tentang perilaku deterministik dalam proses adopsi dan penyebaran (difusi) teknologi informasi di kalangan usaha kecil dan menengah di Indonesia. Keyakinan dasar adalah bahwa usaha kecil dan menengah mempunyai kemampuan menampilkan keluwesan pengelolaan sumberdaya organisasional, mengeksplorasi keunikan jejaring sosial, dan mengambil manfaat dari inovasi berbasis teknologi informasi. Pertanyaan penelitian yang diajukan adalah bagaimana pemilik sekaligus manajer usaha kecil dan menengah memandang teknologi informasi dan bagaimana mereka menyelesaikan masalah-masalah bisnisnya dengan menggunakan bantuan teknologi informasi. Studi kasus dilakukan untuk menjawab pertanyaan penelitian tersebut dan mengungkap aspek-aspek kualitatif mengenai faktor kunci kesuksesan inovasi berbasis teknologi informasi. Temuan dalam studi ini adalah bahwa kompleksitas inovasi di kalangan usaha kecil dan menengah muncul karena adanya interaksi berbagai faktor kelembagaan yang harus dipikirkan sebelum fenomena keberhasilan inovasi yang dimaksud dapat diraih dan disebarluaskan.

Keywords: *ICT, diffusion, adoption, social networks, SMF*

INTRODUCTION

This paper is part of a longitudinal study on the diffusion and adoption of information and communication technologies (ICT) within small and medium-sized firms (SMF) in Indonesia. The term of ICT in this paper encompasses all forms of technology involved in capturing, manipulating, communicating, presenting and using data, which is transformed into information. This includes computer hardware, software and communication networks (Martin *et al*, 2002). The paper addresses the questions of how owner-managers of the firms in Indonesia

perceive about ICT and how do they resolve problems related to assessing the value of such technological innovations in the firms.

Assesing the value of information and communications technologies is a long-standing issue in the area of diffusion of innovations. A continuing debate on IT paradox (Brynjolfsson, 1993) indicate the divergence views not only in defining the scope and size of its impacts, but also in describing unique behaviors of firms in adopting and utilizing of such technological innovations. A number of studies show that SMF have distinct characteristics from large

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firms in many aspects (Brynjolfsson *et al.*, 1994; Dodgson and Bessant, 1996; Utomo and Dodgson, 2000). As far as this paper is concerned, SMF tends to adopt pragmatic approaches in acquiring the value of ICT-based innovations by employing flexible resource allocations within unique social networks environment. Owner-manager of small firms prevalently rely on informal information systems in making decisions about technological innovations (Duncombe and Heeks, 1999). This is so because the diffusion of technological innovation is a kind of social change by which coalition members of the institutions, who commonly have divergence views toward technological innovation, accept possible alteration within institutional systems, processes or procedures (Rogers, 1995). Social networks in this regard may have the capacity to orchestrate the divergent views amongst members of the firms or target institutions, as well as cope with social uncertainty pertaining to network externalities such as cumulative effects of inter-relatedness and systemic nature of technological innovation.

SMF in Indonesia is used as objects of the study to represent the complexity of ICT-based innovations in the firms in which many institutional factors that have to be considered and which are to be defined before success stories can be acknowledged. This empirical study provides both theoretical validation and some policy implications for the Indonesia's future technological innovation although the experience of this particular country, with some adjustments, may be applied to other developing countries.

The paper is organized as follows. Section II assesses the concept of deterministic behaviors and its relevance on the diffusion of technological innovation. Section III is research approach. Section IV describes the empirical evidence of the study. Section V comprises conclusions and implications.

RESEARCH CONTEXT ON ICT DIFFUSION

The term deterministic behaviors has been conceptualized in numerous ways, ranging from classic oriented in the investment and financial market in which the behavior of the constituents can be explained as rational pursuit of goals to loosely social and political constituencies that seek control over the decision making process (Hirt and Block, 1990; Holman and Devane, 1999). For the purpose of this study, deterministic behaviors consist of varying groups of people who interact with each other in a relatively identifiable boundary to achieve common goals. The current view considers a firm as a means as opposed to an end for achieving homogeneity of interests amongst people within the firm's boundary although potential differences between the constituents are also considered.

The classic oriented uses rigid chains of command in a firm set up by leader or manager to guide its members in order to achieve a goal or sets of goals. Meanwhile, recent development in the diffusion theory regards the importance of social networks and political struggles amongst members of a firm or an institution (Rogers, 1995). This development brings major implications for empowering of small and medium-sized firms by which sets of goals can be exercised through various approaches such as cellular versus divisional or top-down versus bottom-up, although none of these approaches is claimed as superior over the other.

In a dynamic business environment, owner-manager of a firm exhibits sensitive dependence on human behaviors in which decisions are made based on both local randomness as well as deterministic condition within social networks. Research on information technology area tends to focus on the *role* of networks whilst the field of social and management are interested in exploring the *function* of networks (Baets, 1998; Al-Hawamdeh and

Hart, 2002). Divergent views on these semantic terms are apparently broadened the constituents' space and time to define the appropriate approach in attaining institutional goals and objectives. This is so because the presence of formal institutions, such as trade association, chamber of commerce or other development agencies sometimes is inactively reflected on its role as facilitators or change agents for members of the society toward ICT-based innovations (King *et al.*, 1994; Hanna *et al.*, 1995).

Ideally, the availability of social networks supports the constructive efforts and encourages coalition member of the firms to perform their activities optimally especially in the diffusion of innovations. The deterministic behaviors are concerned with two areas in this regard: (1) to influence and (2) to regulate people or coalition members. The first relates to persuasive control over the practice, rules and systems whilst the latter relates to direct or indirect intervention towards behavior of those people through sanctions or other affirmative means. Yet demarcation lines between the two are ambiguous and subsequently create contingent situations by which members of a firm have to decide whether their involvement in technological advancement in a firm is mandatory or voluntary.

Previous studies have identified broadly concerning the level of influence or pressure from change agents on technological diffusion within the level of the firms (King *et al.*, 1994; Harrison *et al.*, 1997; Lai and Guynes, 1997). These studies are mainly concerned with the roles of external factors and discounted the internal capabilities to respond proactively to institutional influences. Previous studies also focused on identifying the influence of formal institutions with less attention has being given on assessing the influence of informal institutions on the diffusion of technological innovation.

However, recent studies attempt to open new frontiers by exploring the internal factors

of firms to foster ways of the diffusion of IT innovations (Thong, 1999; Zhao *et al.*, 2002; Utomo, 2002). The studies elicit some of the factors and claim that IT knowledge amongst people within firms have fostered the diffusion rate and improved the extent to which small and medium-sized firms adopt ICT. Perceived benefits of IT, combined with strong attitudes of these people towards organisational learning and change management, also contribute to boost IT diffusion within firms although it is difficult to single out which factor(s) strongly affect the other (Kautz and Pries-Heje, 1996; Utomo and Dodgson, 2001).

The traditional framework on technological diffusion has relied on communication channels to persuade people to adopt and use the latest improvement on innovations (Rogers, 1995). The framework portrays adopters as relatively passive and relies most crucially on the activities conducted by facilitators or change agents. However, recent literature has broadened the views and focused its debate over the concept of networking through which new ideas on technological innovations are diffused (Larsen and McGuire, 1998; Fichman, 2001). The importance of networks is articulated in numbers of situation where institutions need to develop and to access external knowledge and expertise. Thus, networks provide an interface by which members of the institutions may acquire and implement external ideas on the diffusion of the innovation process.

Three types of networks are commonly cited in the literature: inter, intra and extra-organisational networks (Laudon and Laudon, 2002). The most obvious form of networks is inter-organisational networks by which institutional linkages is developed on the basis of contractual or formal agreements although in any type of institutions there is an important role of informal-type constituent supported by personal networks. Although there is continuing debate over the type of networks that may significantly affect diffusion of IT,

the role of specific aspects, such as social networks is still not adequately addressed. Further investigation that considers this particular aspect will enhance general understanding concerning institutional factors on IT diffusion. Hence, appreciation of the structure of social networks is another critical point in the study of technology diffusion.

In short, research directions on the role and function of social networks in relation to firms' behavior toward technological diffusion and innovation are diverse. Preliminary assessments of institutional influence on technological diffusion reveal that both internal and external factors can be activated either as facilitators or inhibitors on this matter. This suggests a broader angle is required not only to open linkages of these factors but also to improve the level of understanding pertaining to social networks.

RESEARCH APPROACH

This study adopts *case studies* as preferred approach to answer detailed research questions of *how* IT innovations in firms occurs (Yin 1993; Yin, 1994). The distinguishing characteristic of case studies is the ability to reach the qualitative aspects of ICT-innovations at the level of the firm. These were systematically applied to each case study to provide a consistent base for analysis. The cases do not represent testimonials to the success of ICT diffusion and adoption in SMF in general. Nor do they claim quantum leaps in improvement in small and medium-sized firms productivity. However, they do represent academically researched cases that provide some crucial points to the many issues have not been discussed in the literature.

The study used semi-structured interviews for collecting data from SMF across the region in Indonesia. This paper is based on selective information from five individual firms reflecting the diversity of ICT diffusion process. Research findings are based on triangulation of interviews with designated

people within firms and on extraction of selected documentation of information gathered from newspapers, business magazines, professional journals as well as company reports.

RESEARCH FINDINGS AND DISCUSSIONS

These illustrative case studies cover the practice of IT adoption in firms both in 'high-tech' and 'low-tech' industries. Ranges of factors contributing to diffusion and adoption are discussed. These case studies show that firms with extensive support from friends or family members have succeeded in acquiring and managing the technology in firms whilst other firms rely on the existence of supports from external networks.

Case 1 : A Multi Block Machines Manufacturer

This case is set in the 1999-2001 period. The company was formally established in 1981. The owner-manager stated that his previous experience had taught him how to deal with other parties and maintain their relationships effectively especially in dealing with technological innovations. In the first five years, he developed and tested various kinds of multi-blocks machines dedicated to construction industry. His creativity was inspired by his obsession to have construction machinery built and produced in Surabaya. In early 1987, the company had completed his challenging experiment by having machine technology from overseas are built locally. Three years later, he made another copy of a multi-block machine that was also originally made in overseas. He was impressed with the newer technology because of its reliability and durability. He decided to manufacture a multi-block machines similar to newer technology but in smaller size to accommodate local demand. During 1991-92 the company produced 20 units of multi-block paving stone

machines. Twelve months later the company doubled its production capacity to 40 units.

Target market for the company's products was the construction industry in major cities in the Central and Eastern parts of Indonesia. The products gained rapid acceptance in these markets area because of its low price, reliability and durability. For example, the price of a multi-block machine from local manufacturer was just one-third of those from the price of Uchida, Japan. Reliability can be identified from customers' feedback mentioning that the company provides an excellent technical support and after sales services.

A brief history indicated that the company did not have a clear business and ICT strategy. The owner-manager of the company relies mostly on "good luck" and "guts felling" by which he manages and controls the business. However, his ability to grasp opportunities during his social gathering and turned into products helped the company surviving and growing. He is also very bright in absorbing the benefits social and family gathering and converted into sources of innovation. For example, when he know that his relative carried an expertise in a chemical engineering, he asked him to join in the company and assigned him to develop special type of heavy-duty roof paints.

Another example was given when he discovered the idea of using coal ashes as supplement raw materials to improve roof tiles' durability. He got the idea of using coal ashes from his social gatherings and by visiting a cement producer who also used coal ashes to have the floor tiles' durability improved. He experimented in the factory and launched the first roof tile products added with coal ashes in early 1996. By using coal ashes, he had production costs reduced and offered very competitive price in the market. In fact, the price of coal ashes is very cheap as it was considered a 'by product' or waste generated

from one of electric power supply in West Java.

Meanwhile, the company is keenly involved in finding substitute for imported raw materials to reduce production costs and keep his local customers doing business. He mentioned that his relationships with customers did not terminate as purchase orders had been made. The company has long-term commitments to provide excellent after sales services, such as technical supports for installations, maintenance and training for operators. Most importantly, the company continuously maintain the business relationships by catering for around 20 per cent of customers' need to produce either floor tiles or roof tiles, such as coal ashes, fiber steel, roof paints and other machinery components.

Even though the owner-manager of the firm appeared tireless in managing his creativity in the business, he admits his limitation as a 'single fighter' in the company. Therefore, looking into the future, he is thinking of either employing a professional manager or delivering his position to his son in managing the business. At present, he is assigning his older son to manage and control the roof tile business.

Points of Interests

- Social and family gatherings can be used as sources of idea for technological innovation. It is believed that social harmony is considered as one of qualifying factors for success in the business. As the owner-manager said: "doing a business is part of worship to Allah (God) whilst having a good friendships is sustaining the business." This statement reflects three major components underlying the importance role of social networks especially on technological diffusion: friendships, doing business and faith. Friendships will determine the level of personal rapport and trust amongst people within the institution's boundary.

- Ability of the owners or managers of small businesses to acquire relevant ICT knowledge will speed up the learning process and organisation change. The linkages between small businesses and the higher education or research institutions usually bring the idea of technological innovation although they have to rely on their own capabilities to implement the innovation idea into business practices.
- A “good luck” can be associated with individual history that contributes to the success of the firm. However, further investigation should be made to verify whether ‘good luck’ is part of learning process through institutional linkages or individual heredity in nature.

Case 2 : Export-Oriented Furniture Manufacturer

The company is a family-owned business making wooden and rattan furniture that has an outstanding performance in selling its products in export markets. The owner, who formerly worked as a local government officer in Department of Cooperatives, (now Department of Cooperatives and Small-Medium Scale Industry Development) can be used as an example of a success story of an indigenous entrepreneur in Indonesia.

The company was established in 1993 initially as a sub-contractor for furniture from other companies. The owner-manager of the company has excellent human resources’ capability within his family. He received great support from his older brother to develop the target market and to get access into financial institutions. Meanwhile, he assigned his younger sister to manage administrative tasks for the company. In the area of marketing, the company employed a young-talented people who is the son of his close friend.

The company has grown-up as a family business with strong social values. Social interactions between members of the family

have strongly influenced investment decisions, including the decision to adopt ICT. Therefore, family gatherings are commonly used as a means for sharing knowledge amongst members. Other important sources of influence over the adoption of ICT are customers and financial institutions, such as a venture capital. It seems that the involvement of venture capital in the adoption of ICT in this firm doesn’t very sensible. However, a venture capital firm supported the company’s adoption and installation of ICT for the business because they were concerned about administrative performance, especially in preparing financial reports. The venture capital firm was concerned about pay back assurance of the money invested in the company. Therefore, they were monitoring cash flows of the firm regularly.

Points of Interests

- The diffusion of ICT-based innovations the firm is explained by mixture of influences coming from various sources of institutional networks. Amongst these potential sources of influence, activities within business associates, family gatherings and religious meetings are intense although the involvement of other formations in relation to this matter is also examined. For example, the firm is delighted to have generous supports such as technical and market assistance from local government despite the involvement of the government institutions in IT innovation is still very limited.
- Another potential source of influence comes from the firm’s interactions with customers. Respondents of the study claim that their customers, mostly other private firms, become an important source of influence to adopt ICT although the level of such influence varies between firms or industry categories. For example, the decision to install Internet technology was influenced by customers. This invites

speculation concerning the existence of pressures from overseas trading partners in relation to the adoption and use of ICT for the business.

Case 3 : Mechanical Tubes and Galvanized Pipes Manufacturer

The company is manufacturer of various types of mechanical tubes and galvanized pipes that are commonly used in the automotive, industrial property and construction industries. The company was established in 1990 in the city of Semarang of the Central Java. Unlike other Indonesian small and medium-sized firms, which are commonly started and run as a family business, the company is set up as a joint venture of three commercial firms: two foreign firms from Japan and one local firm.

The company had installed computers and its peripherals since the company started up in 1990. The director of the company perceived the installation of computers as a strategic necessity rather than merely technological support for the business. He pointed out how the company could lag behind competition in the pipes and tubes industry if the company did not install and use computers for the business. Therefore, almost all of the functional activities (production, marketing, accounting and personnel) within the company are now attached to computers. He also said that the company continuously upgrades computer software application within the human resource division to accommodate any changes or improvement in the system, such as integration between employee performance and the bonus plan.

The management board has a policy to apply gradual improvement in IT adoption. Therefore, the company set up IT division that carries responsibility for monitoring all activities related to computer applications. IT manager has also been assigned to be in charge of this new division as well as acting as a counter part in the software development project with the software house. The IT

manager then reports any progresses or changes of computer applications to the director. The company has developed an on-line system between factory I in Semarang and factory II in Jakarta through a leased line of telecommunication services.

The level of IT knowledge amongst members of management board has strongly influence of the creation of a sound investment environment including the decision to invest in IT. For example, the director of the company is a computer engineer and has a master degree in business administration from overseas. Other members of the management board also have IT knowledge because they are computer engineers. Accordingly, they are well informed with current development on computer applications.

Another important source of influence on the adoption of IT is the parent firms. For example, one of the parent firms from Japan has strongly encouraged the company to adopt advanced technology in manufacturing steel products. The Japanese firms concerned with protecting their technological innovation including patent, site license and commercial uses of the technology. Therefore, the company assigned selected staff to participate in workshops conducted in parent companies not only to mastery the technology but also to familiarize with the Japanese firms' value systems.

Points of Interests

- The company made substantial progress in terms of its sophistication by upgrading the computer facilities to become integrated across the business functions. Although the managing director of the company said that the main purpose for computerization was directed to supportive functions, the long-term plan is aligning between the IT applications and strategic direction of the company which is supported by computer skills of the internal staff.

□ There are some indications that the company uses collaborative efforts with higher education and research institutions to gain access into new technological innovation although it is not directly to IT. The director of the company described that his continuous connections with academics and other university resources improved his theoretical basis for managing the business. His computer skills and literacy, which is developed during his study in the business school, helps him in managing the business as well.

Case 4: Steelworks Industry

The company is one of firms in the steelworks industry in Central Java. The company was established in 1978. The main products of the firm are offshore pumping units, automotive parts and forklifts components. The company currently employs 138 equivalent full-time staff with various educational backgrounds. Since the beginning of the firm, the firm has relied on telephone and facsimile to have business communications with other parties done. Online computers have not been installed and used for this purpose. The firm has currently installed 3 units of stand-alone personal computers. The first computer installed in the firm was just in 1994. Of the three unit personal computers, two machines are used extensively in the administrative section and the other is used in the design and production section.

The firm has no specific ICT policy which can be used to guide staff members in relation to utilisation of this technological innovation. The decision to adopt and use ICT was made based on personal judgement of the managing director although preliminary discussions usually being made between him and the management staff. As far he is concerned, the adoption of ICT is made merely because of costs-consciousness consideration. There is no specific plan to date to incorporate computers in strategic decision of the firm in the long-

term. Meanwhile, standard off-the-shelf computer software applications are used in the firm to perform word processing, spreadsheets and databases. Computer Aided Design is being used to support in the design and production section. Other software applications are not known in the firm, even the Internet is not installed.

Points of Interests

- In relation to the role of business associations, respondents claimed that their involvement with the institutions has no more than social and political purposes. The owner(s) or managers of the firms reported that their involvement in business associations as a small exercise in accelerating ICT diffusion, yet many of them enjoy meeting people in a cozy environment and having good business recognition in return.
- Activities within the business associations as well as the chamber of commerce is minimal. However, the company may get benefits from these type of institutions by assessing informal matters concerning technological innovation.

Case 5: Food Industry

The company is a family-owned business specializing in producing snack food of cassava chips. The owner the firm started the business in Jakarta as a home-based industry in early 1979. He got the idea of producing cassava chips when he worked as a snack food canvasser for several years in another firm. He then decided to leave his job as a canvasser and build his talents as an entrepreneur because he thought that he could be better off in living if he took advantage of his skills and experience to a job within his own firm. At the beginning, he was all rounder starting from picking up raw cassava at growers; juggling with a frying pan in the kitchen; doing packaging and labeling for the products then

distributing it to small retailers on a consignment basis.

In 1988 the firm exported its products to Holland for the first time. Since then firm has expanded the export orientation to include Australia, England and the Saudi Arabia. On average, the firm is exporting three medium-sized containers (size around 20 feet) a month spread over to these countries. This volume accounts for around 20 per cent of total production a month. Meanwhile, the demand for cassava chips in the domestic market is also growing and the firm focuses its products to serve customers in middle to upper class. These market segments are concerned with premium taste on the cassava chips but agree to pay on a competitive price for the products.

The adoption of ICT in the firm mainly directed to support administrative tasks, such as accounting and finance. No portion has been allocated for supporting production functions.

The company plans to have the Internet facility installed in the near future although there is no specific date has been stated. the family have strongly influenced investment decisions, including the decision to adopt IT. Family gatherings are commonly used as a means for sharing knowledge amongst members and become the major important source of influence over the adoption of IT.

Points of Interests

- The most significant variable that determines the extent of ICT-based innovations is family and business associates. Although business associates or friends is not being actively involved during the implementation stage of IT-based innovation, the business interactions can be developed through informal and personal networks. The result is consistent with the study describing that the level of IT knowledge amongst the owners or managers influence the extent of IT adoption within small businesses.
- The company does not have a formal internal ICT department, the owners or managers usually rely on the external IT experts, such as computer vendors or consultants to provide technical assistance until the small businesses are confident in working with IT. However, in a number of occasions the study found that the relationship between IT vendors and the company goes beyond selling the products or services to become personal networks that influence on the decision to adopt and use such technological innovations in the firm.

CONCLUSIONS AND IMPLICATIONS

The diffusion of IT within small and medium-sized firms in Indonesia, at least as it appears in this study, flows through informal institutional networks at the first stage and goes into more in depth interactions with formal institutions. Nonetheless, the results should be interpreted with caution as the data gathered may incur the possibility of having industry and situational effects. Respondents for the study came from various industries and the interviews were conducted in various situational settings. Similarly, an increased tension within social and political environment especially during the data collection period may have had some impact on the perception of the owner-managers towards trustworthiness of the local government as well as other government supported institutions. Despite technical constraints within data sets, the results of the study support the previous literature relating to the influence of deterministic behaviors on technological diffusion and innovation.

The deterministic behaviors must be considered as an important component in controlling firms' intention the adoption and use of ICT-based innovations. The coexistence of deterministic behaviors and social networks can be used either as the major source knowledge or the facilitator for ICT diffusion

although there are evidence explaining the critical role of these factors in both areas. The diffusion of ICT within SMF in Indonesia is also influenced by the activities of inter-organisational networks. Although the major concerns of the study are defining institutional factors on technological diffusion, another point can also be made to acknowledge the importance of personal as well as organisational networks.

The study shows that small and medium-sized firms with extensive supports from friends or family members in businesses have succeeded in acquiring and managing ICT. The findings imply that the use of informal information systems contributes to successful diffusion of technological innovations in firms. This phenomenon in line with previous study indicating that the diffusion of technological innovation as a kind of social change by which coalition members of the institutions, who commonly have divergence views toward technological innovation, accept possible alteration within institutional systems, processes or procedures.

This type of networks constitutes direct interface through which organisational networks are mediated and supported. The personal networks can also be developed in extra-organisational networks, such as business associations, customers and business consultants, which are considered as important factors in accelerating technological diffusion. With regard to intra-organisational networks, there is an indication that internal staffs of the firms are also supporting the management of technological innovations. This suggests that the idea of 'learning by learning' as opposed to 'learning by doing' amongst employees or internal staff accelerates the diffusion of the innovation process at the level of the firm.

The influence of social networks on ICT diffusion is also reflected in the capacity of the firms to orchestrate the divergent views of its impacts and level of uncertainty pertaining to network externalities such as cumulative

effects of inter-relatedness and systemic nature of technological innovation. This empirical study provides both theoretical validation and some policy implications for the Indonesia's future technological innovation although the experience, with some adjustments, may be applied to other developing countries.

A couple of policy implications may be derived from this study. First, there is little doubt that the diffusion of ICT within small and medium-sized firms will continue and probably accelerate during the Indonesian economic recovery. Therefore, local government may launch technical assistance units in collaboration with professional consultants as well as higher education or research institutions to set up "help desks" centre to solve technical problems of ICT diffusion for small and medium-sized firms. The centre will also continuously monitor the implementation of ICT-based innovation within small businesses and dedicate this "help desks" as a primary source for future studies on improvement and IT diffusion in Indonesia.

Second, the availability of soft-infrastructure, such as laws and regulations and its enforcement, can be seen as crucial factors to ensure that the diffusion of ICT-based innovations can be implemented successfully. This suggests urgent needs to undertake some new amendments on Indonesian business laws to comply with general practice, especially legal transactions through the digital technologies. A new business laws act in Indonesia should address specific issues with regard to the adoption and uses of ICT at firm levels to include law of contract, consumer protection and jurisdictional matters.

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