Lecture Notes in Networks and Systems 527

Leonard Barolli
Hiroyoshi Miwa *Editors*

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The 14th International Conference on Intelligent Networking and Collaborative Systems (INCoS-2022)

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Leonard Barolli · Hiroyoshi Miwa
Editors

Advances in Intelligent Networking and Collaborative Systems

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Welcome Message from the INCoS-2022 Organizing Committee

Welcome to the 14th International Conference on Intelligent Networking and Collaborative Systems (INCoS-2022), which is held from September 7 to September 9, 2022.

INCoS is a multidisciplinary conference that covers the latest advances in intelligent social networks and collaborative systems, intelligent networking systems, mobile collaborative systems, secure intelligent cloud systems, etc. Additionally, the conference addresses security, authentication, privacy, data trust and user trustworthiness behavior, which have become crosscutting features of intelligent collaborative systems. With the fast development of the Internet, we are experiencing a shift from the traditional sharing of information and applications as the main purpose of the networking systems to an emergent paradigm, which locates people at the very center of networks and exploits the value of people's connections, relations and collaborations. Social networks are playing a major role as one of the drivers in the dynamics and structure of intelligent networking and collaborative systems.

Virtual campuses, virtual communities and organizations strongly leverage intelligent networking and collaborative systems by a great variety of formal and informal electronic relations, such as business-to-business, peer-to-peer and many types of online collaborative learning interactions, including the virtual campuses and eLearning systems. Altogether, this has resulted in entangled systems that need to be managed efficiently and in an autonomous way. In addition, the conjunction of the latest and powerful technologies based on Cloud, mobile and wireless infrastructures is currently bringing new dimensions of collaborative and networking applications a great deal by facing new issues and challenges.

The aim of this conference is to stimulate research that will lead to the creation of responsive environments for networking and the development of adaptive, secure, mobile and intuitive intelligent systems for collaborative work and learning.

The successful organization of the conference is achieved thanks to the great collaboration and hard work of many people and conference supporters. First, we would like to thank all the authors for their continued support to the conference by submitting their research work to the conference, for their presentations and

discussions during the conference days. We would like to thank PC Co-Chairs, Track Co-chairs, TPC Members and External Reviewers for their work by carefully evaluating the submissions and providing constructive feedback to authors.

We would like to acknowledge the excellent work and support by the International Advisory Committee and our gratitude and acknowledgment for the conference keynotes for their interesting and inspiring keynote speeches.

We greatly appreciate the support by Web Administrator Co-Chairs. We are very grateful to Springer as well as several academic institutions for their endorsement and assistance.

Finally, we hope that you will find these proceedings to be a valuable resource in your professional, research and educational activities.

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INCoS-2022 Keynote Talks

Fundamental Model of Online User Dynamics Based on a Causal Framework

Masaki Aida

Tokyo Metropolitan University, Tokyo, Japan

User dynamics in online social networks have come to have a great impact not only on online society but also on real life. Therefore, understanding online user dynamics is an important issue. Of course, it is difficult to understand all of the complex online user dynamics, but it may be possible to describe their characteristics in a particular way. This talk introduces an attempt to give a mathematical model of online user dynamics based on a causal framework in which the mutual influences working between users are propagated at finite speeds via an online social network. This model can theoretically explain various phenomena including the intensity of user dynamics diverges, such as online flaming phenomena, and the phenomenon that information propagation is restricted only within a specific community, such as polarization.

Big Data Analytics on COVID-19 Epidemiological Data

Carson K. Leung

University of Manitoba, Manitoba, Canada

In the current era of big data, high volume of big data can be generated and collected from a wide variety of rich data sources at a rapid rate. Embedded in these big data are useful information and valuable knowledge. Examples include healthcare and epidemiological data such as data related to patients who suffered from viral diseases like the coronavirus disease 2019 (COVID-19). Knowledge discovered from these epidemiological data via data science helps researchers, epidemiologists, and policymakers to get a better understanding of the disease, which may inspire them to come up with ways to detect, control and combat the disease. This talk presents big data analytics solutions for analyzing COVID-19 epidemiological data. The solutions help users to get a better understanding of information about COVID-19 cases. Evaluation on real-life COVID-19 data across Canadian provinces shows the benefits of big data analytics in discovering useful knowledge from COVID-19 epidemiological data.

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Implementation of CSR and Family Governance in Increasing Competitiveness Through Agile Innovation in SMEs: A Conceptual Model

Winarsih(✉), Chrisna Suhendi, and Kiryanto

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Abstract. SMEs in Indonesia play a crucial role in the national economy; thereby, the government has established a Long-Term Development Plan (2005–2025). One of its strategic programs is to strengthen the position of SMEs so that they have a competitive value. The problem faced by SMEs is economic factors. It has a weak corporate governance mechanism, which families mostly manage. Accordingly, the monitoring mechanism and good family governance will enable SMEs to carry out financial accountability by preparing comprehensive financial reports as a form of modern business management. In addition, SMEs' awareness of digital transformation can improve workforce competence, provide technical and financial support to SMEs, and strengthen data communication infrastructure. Thus the digital transformation approach with agile innovation for SMEs can quickly adapt to existing and sustainable changes, mainly for increasing competitiveness.

Keywords: Family governance · Agile innovation · Increasing competitiveness · SMEs

1 Introduction

In Indonesia, SMEs have a significant role in the growth of the economic sector, such as opening more job opportunities, reducing poverty, and providing safety nets, especially for people affected by the financial and economic crisis after the Covid-19 pandemic. SMEs also encourage economic growth and increase people's incomes. SMEs are still dominated by family and micro businesses that operate informally with low business productivity. The participation and contribution of SMEs to the broader market, such as exports, is also still lacking. The impact of this condition resulted in the low level of competitiveness of SMEs in Indonesia. Competitiveness is the company's ability to generate higher income for shareholders and business sustainability in the era of international competition [9].

There are several problems with increasing the competitiveness of SMEs due to economic factors; the weakness of the corporate governance mechanism. Governance problems, in general, are in the management of SME organizations, where most of the managers are family (family governance).

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Most SME actors still run their business conventionally and have not implemented good corporate governance principles. The guidelines and regulations regarding the implementation of good corporate governance are aimed at large-scale companies. The performance of governance principles in SMEs will directly impact the proper execution of recording and accounting and disclosure of information that can increase investor confidence in these SME scale companies [1] and [4]. The implementation of family governance refers to a system that regulates and oversees the company's running and balances all stakeholder interests to ensure responsible organizational behavior and achieve company efficiency and profitability.

Along with technological developments, SME actors must adapt to these changes. In addition, there is a need for various rapid innovations related to technology adoption. SMEs can accept the digital transformation by applying the Agile Innovation approach. It is to adapt to all existing conditions, have competitive value, and be sustainable according to current demands to have a competitive advantage.

Based on the explanation above, this study aims to conceptually describe the implementation of CSR and family governance for tightening competitiveness in SMEs through agile innovation. Thus the results of this study can be used as a discourse for SME actors to increase competitiveness in this technological era.

2 Literature Review

2.1 Increasing Competitiveness in SMEs

Competitiveness is the company's ability to produce higher income for shareholders and business sustainability in the era of international competition (9). Determining the size of SME competitiveness can be seen from aspects of product quality, customer service, differentiation and innovation, competitive prices, cost control, offering according to consumer tastes, and serving a niche market [12].

The competitiveness of SMEs can be influenced both internally and externally. Internal influences include productive resources, market conditions/demand, market share, and sustainable output growth. Meanwhile, external influences are in the form of institutions and policies related to their line of business. Porter's model and other competitiveness models also serve as references for [5] and [10] in developing a conceptual model of SME competitiveness. The competitiveness of SMEs is described as the result of a complex relationship of various internal and external factors, both at the input level and output, involved in the production and post-production processes. In this study, competitiveness is seen from family governance, as a business manager, and agile innovation, which is the adoption of digital transformation.

2.2 Family Governance Implementation in SMEs

Governance implementation generally refers to the good corporate governance guidelines issued by the National Governance Policy Committee (KNKG) in 2006 and other sectoral approaches. This guideline is not formal legislation with permanent legal force in its implementation. However, it is an essential guideline for companies in ensuring

the company's sustainability under business ethics. SMEs are vital to the economy; regardless, governance studies are mostly taken from large and go-public companies. SMEs often overlap with family businesses and may have some research and practical implications [7]. Implementing good governance in SMEs is still debatable in previous research in several countries. The concern is how appropriate governance norms or rules are [4]. Research in Indonesia indicates good governance in SMEs is relatively new and has received little attention. One of the latest research explains that an effective good governance mechanism in SMEs is characterized by applying all principles of good corporate governance. The stronger application of indicators on aspects of transparency, accountability, responsibility, independence, equality, and fairness, the more effective the governance mechanism will be. Family governance is a system that regulates and controls the company's running and balances all stakeholder interests to ensure responsible organizational behaviour and achieve company efficiency and profitability.

2.3 Agile Information in SMEs

Industrial Revolution 4.0 enables SMEs to make changes in mindset to keep up with changes in the existing environment by digital, especially during the Covid-19 Pandemic. SMEs must change the mindset and culture of making business, from manufacturing technology to managing perceptions, to a productive digital transformation process [11]. Digital Transformation that SMEs can accept is by applying the Agile Innovation approach. The goal is to see the existing problems by developing concepts for MSMEs, adapting to all current conditions, and having competitive value and competitive advantage.

Changes in business strategy make SME actors change their paradigm in doing something related to the context in which business actors are active in making changes so that they can be accepted in the market due to the determined modifications [6]. The starting point of transformation is a radical change in the economic or market context [8]. The speed of innovation (agile innovation) will affect the economic improvement of SMEs in facing market competition in general. Thus, the changes made can follow the development of the existing market so that SMEs can adapt and be competitive with the products they produce and how to market their products. Simultaneously digital technology enables the fundamental reshaping of business towards cross-functional, modular, and distributed processes [3]. This development increases business agility and empowers SMEs to act in a volatile environment such as an ecosystem, adapt to changing conditions, and have more competitive value than others.

2.4 Hypothesis Development

Family governance refers to a system that regulates and oversees the running of the company and balances all stakeholder interests. It ensures responsible organizational behavior and achieves company efficiency and profitability to have a competitive value. The implementation of family governance in SMEs is for the SME business actors who need additional resources (such as finance, assets, and technology) to grow. Applying Good Corporate Governance principles will improve the bankable and investable status

of the company. It is also in line with the efforts of the capital market to provide opportunities for MSMEs to go public [2] in the development board group, so the hope is to increase the competitiveness of MSMEs. Based on the description above, the proposed hypothesis is:

H1: Family governance has a positive effect on increasing competitiveness in SMEs.

The application of family governance is one of the issues that must be disclosed to encourage fairness principles in the operations of SMEs, which families mostly own. If family governance is implemented correctly, then to improve SMEs' prospects, it can be done quickly to adapt to environmental changes that are currently happening. Changes in the context of digital transformation require the assistance of information technology by relying on economic improvement and winning the market competition. This development enhances agile innovation and empowers SMEs to act in a rapidly changing environment. Based on the description above, the proposed hypothesis is:

H2: Family governance has a positive effect on agile innovation in SMEs.

The application of agile innovation to SMEs will develop businesses to increase the economic value of each SME in facing future business challenges. The use of digital technology can make SMEs adapt to today's global challenges and provide sustainable economic value to increase their competitiveness. Based on the description above, the proposed hypothesis is:

H3: Agile innovation has a positive effect on I = increasing competitiveness in SMEs.

Based on the previous section's literature review and hypothesis development, the conceptual model is as described in Fig. 1.

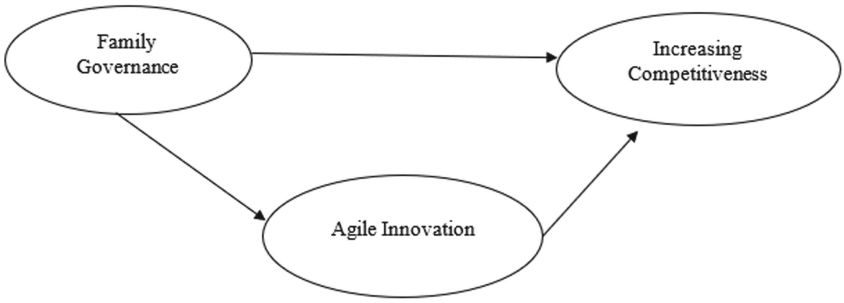

Fig. 1. Conceptual model

3 Research Methods

The population in this study involves SMEs in Central Java. The number of SMEs in Central Java year 2020 is 4,174,210 units. It consists of; 3,358 large business units, 354,884 small business units, 39,125 medium business units and 3,776,843 micro business units (jatengprov.go.id, 2020). The sample is taken using a purposive sampling technique based on criteria (a). The business runs for at least three years, (b). Use technology media in transactions and (c) Operate in all sectors. (d) managed by the family.

To determine the minimum sample size below is the formula:

$$\frac{N}{N(e)^2 + 1}$$

$$n = \frac{4.174.210}{4.174.210 \times 0,05^2 + 1} = 399,9 = 400$$

In which:
n: Sample
N: Population
e: sig (0, 05).

The minimum sample is 400 SMEs, but this study will use 450 SME actors. The data belongs to primary data by giving questionnaires to SME business actors. The analytical tool uses SPSS version 24 software and PLS.

4 Conclusion

CSR and Family Governance implementation in the Small and Medium Enterprises (SMEs) sector is necessary to provide competitive opportunities. Good governance mechanisms in SMEs are effective so that all the principles of good corporate governance include aspects of transparency, accountability, responsibility, independence, equality, and fairness. The more effective the governance mechanism will be. Furthermore, with the rapid development of technology, SME actors can quickly adapt to these changes. The use of digital technology enables SMEs to face global challenges to provide sustainable economic value and increase their competitiveness.

The implication of this research is the need to explore further the family governance dimension that is more suitable to support the creation of a good corporate governance mechanism in SMEs and the implementation of CSR to increase the competitiveness of SMEs. In addition, agile innovation's role is very important to adapt to technological developments.

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