Leonard Barolli
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Makoto Ikeda   *Editors*

# Complex, Intelligent, and Software Intensive Systems

Proceedings of the 13th International
Conference on Complex, Intelligent,
and Software Intensive Systems
(CISIS-2019)

# Advances in Intelligent Systems and Computing

## Volume 993

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Leonard Barolli · Farookh Khadeer Hussain ·
Makoto Ikeda
Editors

# Complex, Intelligent, and Software Intensive Systems

Proceedings of the 13th International
Conference on Complex, Intelligent,
and Software Intensive Systems (CISIS-2019)

Springer

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# Welcome Message of CISIS-2019 International Conference Organizers

Welcome to the 13th International Conference on Complex, Intelligent and Software Intensive Systems (CISIS-2019), which will be held from July 3 to July 5, 2019, at University of Technology Sydney (UTS), Sydney, Australia in conjunction with the 13th International Conference on Innovative Mobile and Internet Services in Ubiquitous Computing (IMIS-2019).

The aim of the conference is to deliver a platform of scientific interaction between the three interwoven challenging areas of research and development of future ICT-enabled applications: software intensive systems, complex systems, and intelligent Systems.

Software intensive systems are systems, which heavily interact with other systems, sensors, actuators, devices, other software systems, and users. More and more domains are involved with software intensive systems, e.g., automotive, telecommunication systems, embedded systems in general, industrial automation systems, and business applications. Moreover, the outcome of Web services delivers a new platform for enabling software intensive systems. The conference is thus focused on tools, practically relevant and theoretical foundations for engineering software intensive systems.

Complex systems research is focused on the overall understanding of systems rather than its components. Complex systems are very much characterized by the changing environments in which they act by their multiple internal and external interactions. They evolve and adapt through internal and external dynamic interactions.

The development of intelligent systems and agents which is each time more characterized by the use of ontologies and their logical foundations build a fruitful impulse for both software intensive systems and complex systems. Recent researches in the field of intelligent systems, robotics, neuroscience, artificial intelligence, and cognitive sciences are very important factor for the future development and innovation of software intensive and complex systems.

CISIS-2019 is aiming at delivering a forum for in-depth scientific discussions among the three communities. The papers included in the proceedings cover all aspects of theory, design, and application of complex systems, intelligent systems,

and software intensive systems. The conference received 166 papers and accepted 45 papers (about 27% acceptance rate), which were selected after a careful review process.

We are very proud and honored to have two distinguished keynote talks by Prof. Wanlei Zhou, University of Technology Sydney, Australia, and Dr. Nadeem Javaid, COMSATS University Islamabad, Pakistan, who will present their recent work and will give new insights and ideas to the conference participants.

The organization of an international conference requires the support and help of many people. A lot of people have helped and worked hard to produce a successful CISIS-2019 technical program and conference proceedings. First, we would like to thank all the authors for submitting their papers, the Program Committee Members, and the reviewers who carried out the most difficult work by carefully evaluating the submitted papers. We are grateful to Honorary Co-Chairs Prof. Makoto Takizawa, Hosei University, Japan, and Prof. Jie Lu, University of Technology Sydney, Australia, for their guidance and advice.

This year in conjunction with CISIS-2019 we have seven international workshops that complemented CISIS-2019 program with contributions for specific topics. We would like to thank the Workshops Co-Chairs and all Workshops Organizers for organizing these workshops.

Finally, we would like to thank Web Administrator Co-Chairs and Local Arrangement Co-Chairs for their excellent and timely work.

We hope you will enjoy the conference and have a great time in Sydney, Australia.

<div style="text-align: right">

Leonard Barolli
Farookh Khadeer Hussain
CISIS-2019 General Co-Chairs

Omar Hussain
Hiroaki Nishino
Kin Fun Li
CISIS-2019 Program Committee Co-chairs

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# Welcome Message from CISIS-2019 Workshops Co-chairs

Welcome to the Workshops of the 13th International Conference on Complex, Intelligent and Software Intensive Systems (CISIS-2019), which will be held from July 3 to July 5, 2019, at University of Technology Sydney, Sydney, Australia.

We are pleased that for this edition of CISIS International Conference we have seven international workshops. Some of these workshops are in 9th, 10th, 11th, 12th, and 13th editions. The objective was to complement as much as possible the main theme of CISIS-2019 with specific topics of different workshops in order to cover topics from the three challenging areas of ICT-enabled applications: software intensive systems, complex systems, and intelligent systems.

The list of workshops is as follows:

1. The 13th International Workshop on Engineering Complex Distributed Systems (ECDS-2019)
2. The 12th International Workshop on Intelligent Informatics and Natural Inspired Computing (IINIC-2019)
3. The 10th International Workshop on Frontiers in Complex, Intelligent and Software Intensive Systems (FCISIS-2019)
4. The 10th International Workshop on Virtual Environment and Network-Oriented Applications (VENOA-2019)
5. The 9th Semantic Web/Cloud Information and Services Discovery and Management (SWISM-2019)
6. The 6th International Workshop on Hybrid/Cloud Computing Infrastructure for E-Science Application (HCCIEA-2019)
7. The 1st International Workshop on Knowledge Creation and Innovation in Digital World (IKIDW-2019)

These workshops bring to the researchers conducting research in specific themes the opportunity to learn from this rich multidisciplinary experience. The Workshop Co-Chairs would like to thank CISIS-2019 International Conference Organizers for their help and support. We are grateful to the Workshops Organizers for their great

efforts and hard work in proposing the workshops, selecting the papers, the interesting programs, and the arrangements of the workshops during the conference days. We are grateful to Web Administrator Co-Chairs for their excellent work and support.

We hope you enjoy the workshops program and proceedings.

Mohammad Alshehri
Tomoya Enokido
Beniamino  Di Martino
Workshops Co-chairs of CISIS-2019 International Conference

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# Welcome Message from ECDS-2019 International Workshop Co-chairs

It is our great pleasure to welcome you to the 13th International Workshop on Engineering Complex Distributed Systems (ECDS-2019), which will be held in conjunction with the 13th International Conference on Complex, Intelligent and Software Intensive Systems (CISIS-2019) from July 3rd to July 5th, 2019, at University of Technology Sydney (UTS), Sydney, Australia.

In the past, this field included technology concerns related to middleware solutions, dealing with the heterogeneity of the miscellaneous hardware and software environments and computing infrastructure. These technologies have been used to address the integration of existing legacy applications and improve the interoperability between applications across enterprises. The advances in wireless communication and pervasive computing extend this traditional wired area of distributed systems and make the new advanced application possible. The complexity of today's applications requires additional approaches to be able to realize an enterprise application time- and cost-saving. This includes the ability to model business processes, business policies, and event-oriented aspects of large systems and express these models through design solutions to address the complexity of enterprise applications and ease software design efforts. In addition, the engineering of complex distributed systems also requires a good understanding of the problem areas of concern for information systems and business administration, such as process management, supply chain management, security issues, and electronic business. These topics need to be addressed in order to deal with the complexity of today's increasingly dynamic, mobile, cross-organizational, and cross-jurisdictional systems.

In this workshop, various aspects of the design and implementation of distributed systems will be discussed. The scope of the presented papers ranges from engineering approaches and techniques to applications.

This workshop would not have been possible without the help of many people. First of all, we would like to thank all the authors for submitting their papers to our workshop. We also like to thank the Program Committee Chair, Program

Committee Members, and additional reviewers, who carefully evaluated the submitted papers.

We hope that you find the ECDS-2019 program inspiring and that the workshop provides you with the opportunity to interact, share ideas with, and learn from other distributed systems researchers from around the world. We also encourage you to continue to participate in future ECDS workshops, to increase its visibility, and to interest others in contributing to this growing community.

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Leonard Barolli
Makoto Takizawa
ECDS-2019 Workshop Co-chairs

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# Message from IINIC-2019 International Workshop Organizers

Advanced information processing technologies have the potential to significantly accelerate research in different fields. In particular, techniques from artificial intelligence, machine learning, and data mining can assist researchers in the discovery of new knowledge for next-generation applications. This workshop aims to attract state-of-the-art solutions and novel attempts in this direction.

The 12th International Workshop on Intelligent Informatics and Natural Inspired Computing (IINIC-2019) will provide a platform for researchers to meet and exchange their thoughts. IINIC-2019 will be held in conjunction with the 13th International Conference on Complex, Intelligent and Software Intensive Systems (CISIS-2019) from July 3rd to July 5th, 2019, at University of Technology Sydney (UTS), Sydney, Australia.

Many people contributed to the success of IINIC-2019. We wish to thank the Program Committee Members for their great effort. We also would like to express our gratitude to the main organizers of CISIS-2019 for their excellent work in organizing the conference. Last but not least, we would like to thank and congratulate all the contributing authors for their support to the workshop.

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Takahiro Uchiya
Leonard Barolli
IINIC-2019 Workshop Co-chairs

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## IINIC-2019 Organizing Committee

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| Farookh Hussain | University of Technology Sydney, Australia |

# Message from FCISIS-2019 International Workshop Organizers

It is our great pleasure to welcome you for the 10th International Workshop on Frontiers in Complex, Intelligent and Software Intensive Systems (FCISIS-2019). The workshop will be held in conjunction with the 13th International Conference on Complex, Intelligent and Software Intensive Systems (CISIS-2019) from July 3rd to July 5th, 2019, at University of Technology Sydney (UTS), Sydney, Australia.

The objective of FCISIS Workshop is to foster the discussion in a rich inter-disciplinary context of the three challenging areas of ICT-enabled applications: software intensive systems, complex systems, and intelligent systems. FCISIS-2019 is conceived in terms of special papers, which were also carefully selected, from the organizers.

We would like to thank all participants of the workshop for submitting their research works and for their participation and look forward to meet you again in forthcoming editions of the workshop.

Leonard Barolli
FCISIS-2019 Workshop Chair

## FCISIS-2019 Organizing Committee

## Workshop Chair

Leonard Barolli          Fukuoka Institute of Technology, Japan

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# Message from VENOA-2019 International Workshop Organizers

Welcome to the 10th International Workshop on Virtual Environment and Network-Oriented Applications (VENOA-2019), which will be held in conjunction with the 13th International Conference on Complex, Intelligent and Software Intensive Systems (CISIS-2019) from July 3rd to July 5th, 2019, at University of Technology Sydney (UTS), Sydney, Australia.

The past eight workshops were very successful, and many high-quality papers were presented and published in these workshops. We are pleased to announce the continuation of this workshop for serving as a forum for the exchange of information and ideas in the field of 3D computer graphics, virtual reality (VR), augmented reality (AR), mobile communications, IoT, and Web and network applications. We again received many unique and high-quality paper submissions in this workshop. We strictly followed the CISIS review procedures and finally selected excellent papers for publication and presentation. The program shows a variety of research activities with high relevance to the scope of the workshop.

This workshop cannot be organized without hard and excellent work of CISIS-2019 conference organizers. We would like to express our sincere appreciation to VENOA-2019 Program Committee Members and reviewers for their cooperation in completing their efforts under a very tight schedule. We also give our special thanks to all authors for their valuable contributions. We hope that these papers will have significant impacts and stimulate future research activities.

Yong-Moo Kwon
Hiroaki Nishino
VENOA-2019 Workshop Co-chairs

## VENOA-2019 Organizing Committee

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# Message from SWISM-2019 International Workshop Organizers

Welcome to the 9th International Workshop on Semantic Web/Cloud Information and Services Discovery and Management (SWISM-2019), which is held in conjunction with the 13th International Conference on Complex, Intelligent, and Software Intensive Systems (CISIS-2019) from July 3rd to July 5th, 2019, at University of Technology Sydney (UTS), Sydney, Australia.

SWISM-2019 will bring together scientists, engineers, computer users, and students to exchange and share their experiences, new ideas, and research results about all aspects (theory, applications, and tools) of intelligent and semantic methods applied to Web- and Cloud-based systems, and to discuss the practical challenges encountered and the solutions adopted.

The program of SWISM-2019 includes papers related to information retrieval, ontologies, intelligent agents, intelligent techniques for management and programming of Cloud services and business processes. The program for the conference is the result of the excellent work of reviewers and Program Committee Members. We hope you will find the final program enriching and stimulating.

We believe that all the papers and topics will provide novel ideas, new theoretical and experimental results, and will stimulate the future research activities in this area.

The papers collected in this international workshop were carefully reviewed by reviewers. According to the review results, the Program Committee Members selected high-quality papers to be presented in this workshop.

We would like to express our sincere appreciation to all Program Committee Members for their cooperation. We are thankful to Honorary Co-Chairs, General Co-Chairs, Program Committee Co-Chairs, and Workshops Co-Chairs of CISIS-2019 for excellent conference organization. It was a great pleasure in working with them.

Last but not least, we are grateful to all authors for their valuable contributions and attendees who contributed to the success of the program with their papers and speeches on their research results, and with their participation in the conference.

We hope you will enjoy the workshop and conference and have a great time in Sydney, Australia.

<div align="right">

Beniamino Di Martino
Salvatore Venticinque
Antonio Esposito
SWISM-2019 Workshop Co-chairs

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## SWISM-2019 Organizing Committee

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# Welcome Message from HCCIEA-2019 International Workshop Chair

On behalf of the Organizing Committee, we would like to welcome you to the 6th International Workshop on Hybrid/Cloud Computing Infrastructure for E-Science Application (HCCIEA-2019) which will be held in conjunction with the 13th International Conference on Complex, Intelligent, and Software Intensive Systems (CISIS-2019) from July 3rd to July 5th, 2019, at University of Technology Sydney (UTS), Australia.

The workshop aims to promote research and development activities focused on E-science applications using distributed computing infrastructure, such as grid, Cloud computing, and hybrid system. With the rapid emergence of software systems and their applicability, the amount of data is growing exponentially. Existing computing infrastructure, software system designs, and use cases must take into account the enormity in volume of requests, size of data, and computing load. A complementary goal is to identify the open issues and the challenges to fix them, especially on security, flexibility, reliability, and privacy aspects.

Cloud computing has become a scalable services consumption and delivery platform in the field of services computing. Cloud is a platform or infrastructure that allows execution of code in a managed and elastic way. We want to put the emphasis of scientific and technologies progress on Cloud solutions and infrastructures, in particular concerning research activities on scalability and adaptability using effective scheduling for the virtualization.

All people involved in this workshop (authors and PC members) are researchers with high expertise, working on related research areas and projects. We are really grateful for their support, and we thank them for contributing their knowledge toward a successful event.

We would like to thank CISIS organizers for giving us the opportunity to organize HCCIEA Workshop series. We hope that the results of this event will advance the related research in multifold ways.

Olivier Terzo
HCCIEA-2019 chairs

## HCCIEA-2019 Organizing Committee

## Workshop Chair

Olivier Terzo          LINKS Foundation, Italy

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Leonard Barolli        Fukuoka Institute of Technology, Japan
Vincenzo Romano        INGV, Italy

# Welcome Message from IKIDW-2019 International Workshop Co-chairs

Welcome to the 1st International Workshop on Knowledge Creation and Innovation in Digital World (IKIDW-2019). The workshop will be held in conjunction with the 13th International Conference on Complex, Intelligent and Software Intensive Systems (CISIS-2019) at University of Technology Sydney, Australia, from July 3rd to July 5th, 2019.

The value of most organizations today greatly exceeds their net tangible assets. The IKIDW-2019 workshop aims to address contemporary issues in managing knowledge, intellectual capital, and other intangible assets in the digital world with the help of IT application. The digital era contributes to the amount of knowledge available in various qualities. This is a challenge for business people in strategic decision making. IT application is expected to reduce knowledge ambiguity so that it will improve the quality of organizational decisions. Beginning with a view that knowledge becomes strategic assets, the workshop will discuss the fundamentals of managing knowledge and intellectual capital, understanding some of the measurement issues, processes, and cycles involved in their management and the specific issues in managing knowledge, especially with the availability of big data and with the help of IT application.

We would like to express our sincere gratitude to the members of the Program Committee for their efforts. We thank the 13th International Conference on Complex, Intelligent, and Software Intensive Systems (CISIS-2019) for co-hosting IKIDW-2019. Most importantly, we thank all the authors for their submission and contribution to the workshop.

We hope all of you will enjoy IKIDW-2019 and find this a productive opportunity to exchange ideas with many researchers.

Olivia Fachrunnisa
Ardian Adhiatma
IKIDW-2019 Workshop Co-chairs

# IKIDW-2019 Organizing Committee

## Workshop Co-chairs

| | |
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| Ardian Adhiatma | UNISSULA, Indonesia |

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| Chih-Peng Chu | National Dong Hwa University, Taiwan |
| Shu-Ling Chen | National Dong Hwa University, Taiwan |
| Farookh Hussain | University of Technology Sydney (UTS), Australia |
| Omar Hussain | University of New South Wales, Canberra, Australia |

# CISIS-2019 Keynote Talks

# Trust, Security and Privacy in Low-Cost RFID Systems

Wanlei Zhou

University of Technology Sydney, Sydney, Australia

**Abstract.** Radio Frequency Identification (RFID) enables the automatic identification of objects using radio waves without the need for physical contact with the objects. RFID has been widely used in various fields such as logistics, manufacturing, pharmaceutical, supply chain management, healthcare, defense, aerospace and many other areas, apart from touching our everyday lives through RFID enabled car keys, ePassports, clothing, electronic items and others. However, the wide adoptions of RFID technologies also introduce serious security and privacy risks as the information stored in RFID tags can easily be retrieved by any malicious party with a compatible reader. In this talk, we will introduce some trust, security and privacy challenges in RFID technologies, and based on our research, we will outline a number of schemes for authentication, ownership transfer, secure search and grouping proof in Low-cost RFID systems.

# Intelligent Context Awareness in Internet of Agricultural Things

Nadeem Javaid

COMSATS University Islamabad, Islamabad, Pakistan

**Abstract.** Variability in climate and recession in water reservoirs, diminishing the agrarian sector ecosystem production day by day. There is an imperative requirement to restore robustness and ensure high production rate with the use of smart communication infrastructure. Moreover, the farmers will be able to make resource efficient decisions with the availability of modern monitoring systems like Internet of agricultural things (IoAT). However, the data generated through IoAT devices is disparate which needs to be handled intelligently to bring artificial intelligence (AI), machine learning (ML) and data analytic (DA) techniques into play. In this talk, we will recommend the intensive use of coordination between AI, ML and DA at middleware to optimize the performance of IoAT system along with context awareness. Additionally, it will enable horizontal functionality for diverse services to mitigate the problem of inter-operability. An analysis is carried out using TOWS matrix to consider the effects of internal and external factors on the performance of automation techniques collaboration. This analysis points out various opportunities to innovate the livelihood of agrarian society around the globe.

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**The 1st International Workshop on Knowledge Creation and Innovation in Digital World (IKIDW-2019)**

# The 1st International Workshop on Knowledge Creation and Innovation in Digital World (IKIDW-2019)

# Communal Identity and Shared Value Toward Organizational Performance in the Context of Religious Knowledge Management

Nurhidayati[✉] and Olivia Fachrunnisa

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Sultan Agung Islamic University, Semarang, Indonesia
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**Abstract.** The purpose of this study is to develop a model of religious communal identity in strengthening organizational performance. Shared religious values as an organizational asset are able to play professional working behavior guidance among the group members and increase organizational performance. However, gender and culture community sometimes hamper and make more complex of the relationship. Thus, this study offers a conceptual model to maximize organizational performance, particularly, which running by women manager. In this article, the understanding of the concept and dimensions of shared religious values and religious communal identity and its relation to organizational performance will be discussed.

**Keywords:** Religious communal identity · Shared religious values · Collective engagement

## 1 Introduction

Community of practice (CoP) becomes a phenomenon in knowledge-based economy especially to support the lack of and dispersion of knowledge among the community. CoP defined as a group people who agree to develop expertise, which basis of knowledge or experience or expertise that they have. In knowledge-based economy, CoP is encouraged comprehensively use in identifying problems, evaluating, retrieving and sharing all the organizational information and practices to improve the performance of the organization among the community members.

Recently, the spiritual or religious paradigm gradually increases getting an attention from scholars to seek an understanding relationship between religious and organizational performance. Moreover, religion as a significant social force on organizational practices yet has been relatively under examine in the organizational theory. The problem arises from the study literature is the lack of studies on religious shared values and the impact to organizational performance. In the organization that is bonded with particular value such as religious shared, people will lead to act, perform and obey in the religious framework.

Prior studies of employee engagement is important to contribute in this study placed the concept on individual level, thus drawing up a description concept of

collective engagement in a group or collective level is important to explore in this study. Therefore, the aim of this study is to offer a conceptual model for maximizing organizational performance, which is tied to religious values, in particular, by female managers. Subsequently validation the dimension and scale of measurement of the basic concepts will develop.

## 2 Literature Review

### 2.1 Shared Religious Value

Religion defined as "a particular institutionalized or personal system of beliefs, values, and practices relating to the divine – a level of reality or power that is regarded as the 'source' or 'ultimate', transcending yet immanent in the realm of human experience" [1]. The concept of religion in line with institutional logics principal, which is state that in social community there is a belief system or code of living and intensity in term of obedience, reverence, and worship towards a divine and imagined ultimate power that is considered superhuman [2].

Social communities are formed based on the specific aspects such as race, nationality, religion, and others. Culturally, in Indonesia, community that attracting to join is a community based on religion. Community-based religious values generates social processes that able to create social capital, empower resources, and provide arrangements for members and community change efforts to relate religious principles [3]. The benefits that the members are able to obtain when they participate in a community-based religious, they might create the organization as a place to share and collect religious knowledge (religious thought). Then, the members will apply shared religious knowledge into their business and daily life. Furthermore, a person's self-resolution in community-based religious releases with the group followed [4].

The members receive social support and transfer in term of information and knowledge among the members in community-based religious. This support leads to a positive impact on business performance and quality of life [5]. Social interactions among the members also improve quality relationships between members [6], so that a sense of mutual support and transfer knowledge in term of shared religious arises. Thus, it will strengthen religious communal identity.

### 2.2 Collective Engagement

Collective means the individual feels an attachment to the organization the individuals is participating in [7]. The strong feeling is felt by the individuals and they considers that the organization is a part of him. Engagement occurs when the individuals are able to express themselves actively within the organization [8]. The individuals regard the organizational environment is a very comfortable place so that they are able to be strongly involved in the organization. Collective engagement becomes a sign that the organization's environment motivates its members to do something such as doing a business.

## 2.3    Religious Communal Identity

Identity theory states that a person's sense of who they are based on their group membership which the groups are an important source of pride and self-esteem. Becomes the member of the group society, people try to interpret themselves in the society. Identity influences individuals' act and decision in making a policy [9]. There is a cause why individuals join a community, it is because they share similar identity to one another [10]. Identity is a longlife construction process [11]. It clings on the individuals, that is why it is important. Therefore, in joining a community, there will be religious organizational values or knowledge matching with individual values.

Religion and spirituality have positive effect on today's business environment [12]. Religion basic organization is able to create a social process which create social capital, empower sources, and give the settings to all members in linking the religious principal and the effort to change the society [3]. The values cover in the organization also create some supports from the members and the result is, they will perform well in the organizational performance.

Religion communal identity leads the individuals to be bounded with the organization followed [7]. Identity and values of the organization are being part of himself, in term of trust, support, profile, etc., that would be accepted automatically. When the individual is able to tie himself in the organization, then it can be said that the individuals own the strong organizational identification. In the program or activity which is held by the organization, the individuals would join with high enthusiastic as they feel pride. They will support each other and proud to be the part of the organization. From the explanation, it can be concluded that the identity bonding is able to create self-esteem and high confidence to perform better.

## 2.4    Task Sharing Household Responsibility

Women managers often experience double roles that lead to work-family conflict. Particular in patriarchy culture society, such in Indonesia, where social role dichotomy is evidence. Women's main role is not as a breadwinner of the family, but they have main responsibility in domestic roles, as a wife and a mother. Recently, women are doubled roles. Women managers are confident that they are able to run business as well as men managers. Particular in small business entrepreneur (SME), prior studies find that characteristic of profit is influenced by gender [13]. Particularly, women prefer to run small and simpler business than men as women try to avoid personal conflict which is usually emerge in the bigger business size [14].

As work-family conflict is the evidence for women with double roles [15], thus, sharing of household tasks are critical to achieve better performance and reduce such conflict. Spouse supports this term is able to reduce tension of work targets. There are some ways to measure the success of a business, there are resilience, profit, investment, sales growth, number of employees, happiness, reputation of cooperation, etc. [16]. Communal religious identity will lead women managers to be more confident in doing their job. They will do the job without guilty as they have to conflict with work-family responsibility as long as the relation moderates with task sharing from spouse and family members.

# 3   Conceptual Model

Based on literature review in the previous section, the conceptual models can be described in Fig. 1 and hypothesis proposed as follows:

H1:   Shared religious value will increase religious communal identity
H2:   Collective engagement will increase religious communal identity
H3:   Religious communal identity will increase organizational performance
H4:   Task sharing will moderates the relationship between communal identity and organizational performance
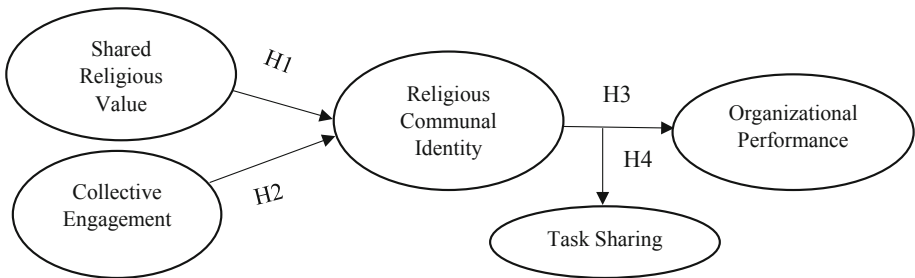


**Fig. 1.** Conceptual model of religious communal identity and organization performance

# 4   Conclusion and Further Research

The concept of religious communal identity and shared religious value toward organizational performance have not been widely discussed in the current literature. This article aims to build a conceptual model for shared religious value, collective engagement, religious communal identity, tasks sharing and organizational performance. In the future, authors plan to further validation the proposed model, in steps follow:

1. Develop concept of religious communal identity and shared religious values.
2. Develop a measurement of each variable in this study.
3. Conduct some pilot studies to improve variable measurement.
4. Conduct a survey to the respondents to test the validity of each instrument developed by structural and nomological.
5. Test the proposed model.

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