



# PROGRAM BOOK of 8<sup>th</sup> International Conference on Sustainable Information Engineering and Technology 2023

Bali, Indonesia, October 24<sup>th</sup> - 25<sup>th</sup> 2023

*"Empowering Digital Technology Innovation  
for a Resilient Future"*



**Program Book of  
8<sup>th</sup> International Conference on  
Sustainable Information Engineering and Technology 2023**

Bali, Indonesia

October, 24<sup>th</sup> - 25<sup>th</sup> 2023

Organized by:



Faculty of Computer Science  
Universitas Brawijaya



## **WELCOME MESSAGE FROM THE DEAN OF FACULTY OF COMPUTER SCIENCE UNIVERSITAS BRAWIJAYA**



On behalf of the Faculty of Computer Science, Universitas Brawijaya, I welcome you all to this very important International Conference and National Seminar. Your presence here is clear evidence of our commitment to presenting innovation and advanced thinking in the field of computer science. The field of computer science is one of the most dynamic and important in the development of information technology. I believe the **2023 8th International Conference on Sustainable Information Engineering and Technology (SIET)** in conjunction with with Seminar Nasional Teknologi dan Rekayasa Informasi (SENTRIN) 2023 will be an extraordinary platform for all of us to share the latest knowledge, the latest trends, and the best discoveries in computer science.

We are honored to have Prof. Keiko Okawa from Keio University Japan, Prof. Riri Fitri Sari from University of Indonesia, and Assoc. Prof. Ivan Lee from University of South Australia to deliver keynote speech at SIET 2023. The participation and insight you brought to this conference was invaluable and has given it a special feel.

Universitas Brawijaya is one of the major universities in Indonesia, which has always been committed to implement its vision to become outstanding world-class university, and is able to play an active role in nation building, through a process of education, research and community service. The Faculty of Computer Science has a strong commitment to support the vision of Universitas Brawijaya, therefore this international conference will be a special event to increase our contribution to the international research community.

I then express my sincere gratitude for the willingness of all attendees, keynote speakers and all organizing committees for the maximum effort that has been made to obtain the selection of relevant papers with better innovations, creativity and scientific contributions.

Finally, this event is hopefully able to provide inspiration of better and more optimal research for the success and prosperity of all mankind from the developed science and technology. We wish you success in this conference and may you feel enjoy and comfortable during this conference.

Sincerely,

**Prof. Wayan Firdaus Mahmudy, Ph.D.**  
Dean of the Faculty of Computer Science  
Universitas Brawijaya

## WELCOME MESSAGE FROM THE CONFERENCE CHAIR OF 7<sup>TH</sup> SIET 2023



We would like to extend our warmest welcome to all participants of the **2023 8th International Conference on Sustainable Information Engineering and Technology (SIET)**. We are also pleased to have outstanding academia, researchers, business entrepreneurs, practitioners, and policymakers as conference speakers to share their insights across varying areas in delivering intelligent solutions through leveraging intelligent computing to create and enabling a smart environment for supporting the future.

As for the theme for SIET 2023 “**Empowering Digital Technology Innovation for a Resilient Future**” invited speeches are presented by Prof. Keiko Okawa from Keio University Japan, Prof. Riri Fitri Sari from University of Indonesia, and Assoc. Prof. Ivan Lee from University of South Australia. We strongly believe these enlightening speeches could inspire our scholarly endeavors and practitioners to advance the synergy among information technology, address global challenges, foster innovation, and enhance communication and collaboration in the future.

This year, we received **205 papers from 10 countries**, including the Philippines, Japan, Bangladesh, Norway, India, Thailand, Pakistan, Taiwan, Australia, and Indonesia. Each paper underwent a meticulous evaluation process, with three reviewers employing the double-blind review method. After thorough assessment, the editorial team determined that a total of 103 papers met our acceptance criteria. Furthermore, 91 papers were registered.

The organization of SIET 2023 requires the continuous efforts and great support from our conference organizing team members and conference paper reviewers. We would like to sincerely thank all individuals who have rendered their support in every possible way to make this conference a reality. We would also like to express our gratitude to all the paper authors and registered participants for their stimulating academic contributions to the vibrant intellectual exchange at this conference.

We hope that this conference will not only meet your expectations but exceed them in every way. Together, let us embark on a journey of discovery, learning, and collaboration that will leave an indelible mark on our lives and our field.

Thank you!

Sincerely yours,


**Edita Rosana Widasari, Ph.D.**

The 8<sup>th</sup> SIET 2023 Conference Chair


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## CONFERENCE INFORMATION

**Date** : Tuesday-Wednesday, October, 24<sup>th</sup> -25<sup>th</sup> 2023  
**Organizer** : Faculty of Computer Science, Universitas Brawijaya  
**Venue** :  **Hybrid, on site and online via Zoom Meeting**

**On site: The Sakala Resort Bali**

 Jl. Pratama No.95, Benoa,  
Kecamatan. Kuta Sel.,  
Kabupaten Badung, 80363,  
Bali, Indonesia



 Phone : +62 361 775216


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 Web : <https://www.sakalaresortbali.com>


**Online: Zoom Meeting**


*<Zoom meeting detail is available in the email and printed version>*

**Official Language** : English

**Secretariat**  Faculty of Computer Science, Universitas Brawijaya  
8 Veteran Street, 65145  
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**Conference Website** : <https://siet.ub.ac.id/>



## VENUE MAP

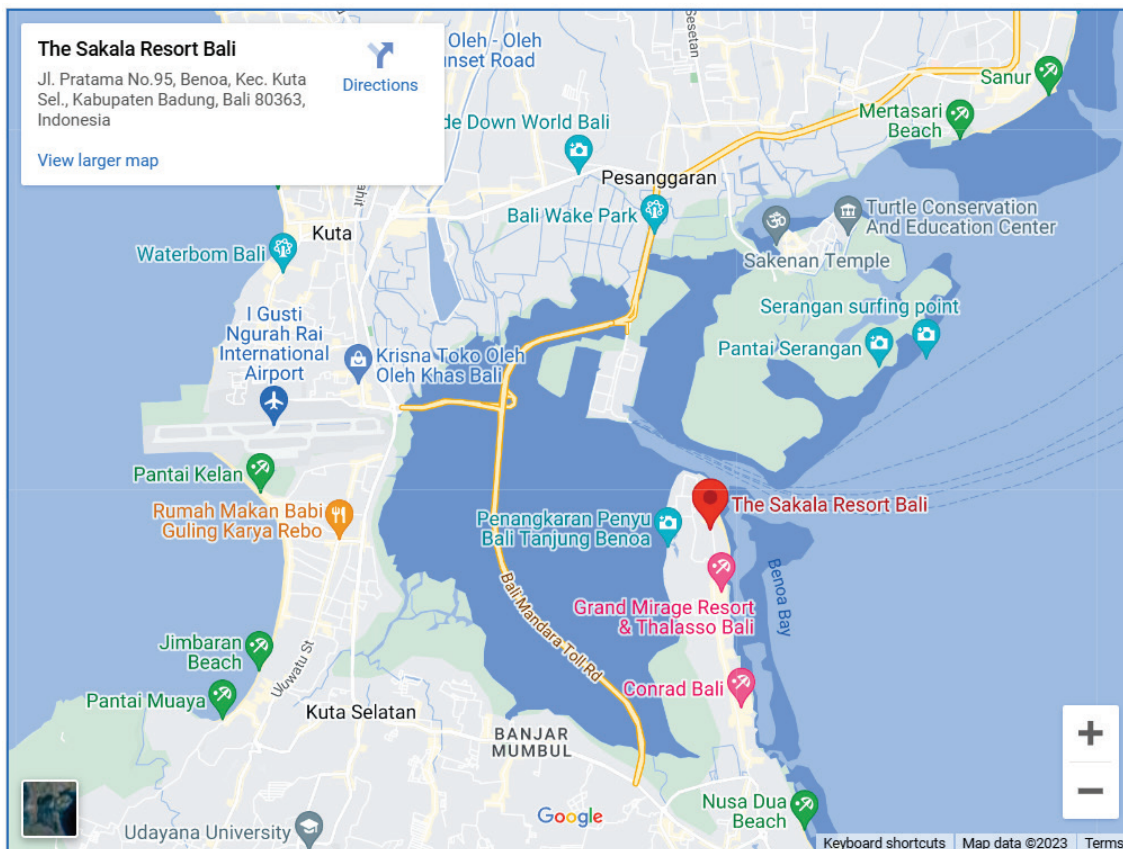
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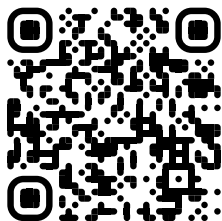
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#### On-site Venue Map



#### Map URL:

<https://me-qr.com/l/sietsentrin2023map>

#### Online Zoom:

#### Zoom URL:

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## **SCOPE OF THE CONFERENCE**

Topics of interest include, but are not restricted to:

### **Smart systems**

- Smart city
- Smart Home and Building
- Smart cloud technology
- Smart appliances & wearable computing devices
- Robotic systems
- Smart sensor networks
- Information infrastructure for smart living spaces
- Intelligent transportation systems

### **Domain specific frameworks and applications**

- Energy independent
- Sustainable Technology
- IT management and governance
- e-Government and public sector
- e-Healthcare, e-Learning, e-Manufacturing, e-Commerce
- ERP and supply chain management
- Business process management

### **Models, methods and techniques**

- Conceptual modeling, languages and design
- Software engineering
- Information-centric networking
- Human computer interaction
- Media, game and mobile technologies
- Data mining
- Information retrieval
- Information security
- Image processing and pattern recognition
- Remote sensing
- Natural language processing

## TECHNICAL PROGRAM

Tuesday, October 24 <sup>th</sup> , 2023-CONFERENCE		
Time (UTC+8)	Agenda	Location
08:00-09:00	Registration and preparation	Main
09:00-09:05	Opening by MC	Main
09:05-09:10	Opening speech from the Chair of SIET-SENTRIN 2023  <b>Edita Rosana Widasari, S.T., M.T., M.Eng., Ph.D</b>	Main
09:10-09:15	Opening speech from the Dean of Faculty of Computer Science, Universitas Brawijaya  <b>Prof. Ir. Wayan Firdaus Mahmudy, S.Si, M.T., Ph.D.</b>	Main
09:15-09:30	<i>Photo Session and Transition</i>	Main
09:30-10:15	Keynote Speech I  <b>Assoc. Prof. Ivan Lee, B.Eng, M.Com, MER, Ph.D, from University of South Australia, Australia</b>	Main
10:15-10:20	<i>Session Break and Transition</i>	Main
10:20-11:05	Keynote Speech II  <b>Prof. Keiko Okawa, Ph.D, from Keio University Graduate School of Media Design, Japan</b>	Main
11:05-11:10	<i>Session Break and Transition</i>	Main
11:10-12:00	Keynote Speech III  <b>Prof. Dr. Ir. Riri Fitri Sari, M.M., M.Sc. from University of Indonesia (UI), Indonesia</b>	Main
12:00-13:00	<i>Lunch Break</i>	Main
13:00-15:00	Parallel Session SIET-SENTRIN 2023 (Breakout Room)  <b>SIET Parallel Session 1, 2, 3, 4, 5, 6, 7, 8</b>	Parallel Room
15:00-15:15	<i>Session Break and Transition</i>	Parallel Room
15:15-17:15	Parallel Session SIET-SENTRIN 2023 (Breakout Room)	
	<b>SIET 9</b>	<b>SENTRIN 1, 2, 3</b>
	<b>SIET 10, 11, 12, 13</b>	<b>SENTRIN 4</b>
17:15-17:30	Closing Ceremony and Announcement	Main
19:00	<b>Gala Dinner</b>	

*\*) Time is in local time using Waktu Indonesia Tengah (WITA)/Central Indonesia Time Zone (UTC+08:00)*

## KEYNOTE SPEECH

<b>Main Room</b>	<b>October 24<sup>th</sup>, 2023 09:30-10:15</b>
<p><b>Intelligent Sensor and Multimedia System for Food Science and AgTech</b> Ivan Lee</p>	
<b>Main Room</b>	<b>October 24<sup>th</sup>, 2023 10:20-11:05</b>
<p><b>Fostering Sustainable Futures through Collaborative Innovation: Lessons from the AI3/SOI-Asia Project</b> Keiko Okawa</p>	
<b>Main Room</b>	<b>October 24<sup>th</sup>, 2023 11:10-12:00</b>
<p><b>Synergizing Sustainability in the Age of AI and Blockchain Technology</b> Riri Fitri Sari</p>	

## PARALLEL SESSIONS

<b>PARALLEL SESSION: SIET-1</b>	<b>October 24th, 2023 13:00 - 15:00</b>
<b>[1570947391]</b>	<p><b>Hybrid Feature Selection Framework for Building Resource Efficient Intrusion Detection Systems Model in the Internet of Things</b> Tirana Noor Fatyanosa and Mahendra Data</p>
<b>[1570942974]</b>	<p><b>Stressed Speech Recognition Using Smartphone and Embedded Device Integration</b> Barlian Henryranu Prasetio, Dahnia Syauqy, and Edita Rosana Widasari</p>
<b>[1570940784]</b>	<p><b>Application of Data Augmentation on SSD Mobilenet for Detection of Kenaf Plant Disease and Pest</b> Agus Wahyu Widodo, Alfita Rakhmandasari, Wayan Firdaus Mahmudy, Muh Arif Rahman, and Diva Kurnianingtyas</p>

**PARALLEL SESSION: SIET-13**  
**Online via Zoom****October 24th, 2023**  
**15:00 - 17:00**

- [1570946650] **Design of Application Framework for Vital Sign Monitoring and Remote Doctor Consultation**  
Zubairi Yahya, Mohammad Reza Faisal, Radityo Adi Nugroho, Dodon Turianto Nugrahadi, Andi Farmadi, Rudy Herteno, and Vina Yulia Anhar
- [1570950217] **Feature Location Using Extraction of Code Documentation**  
Achmad Arwan, Siti Rochimah, and Chastine Fatichah
- [1570946669] **Correlation Between Social Media and Non-Technical Business Process Management in Small and Medium Enterprises**  
Sharfina Febbi Handayani, Lolanda Hamim Annisa, Nanda Kurnia Wardati, and Rachmah Agus Putri
- [1570946417] **Gratitude and Hope as Conditions for the Psychological Well-Being of Social Media Users**  
Rani Fitri and Sharlin L
- [1570929335] **Application of UI/UX in Tourism Information Service Problems: A Review**  
Bernand Trianda Firmansyah, Markus Jonathan, Jose Andreas, Samuel Philip, and Hidayaturrahman Hidayaturrahman
- [1570944813] **Implementing Welsh-Powell Algorithm on Coloring the Map of West Java**  
Dimas Dani Zaini, Howsen Vincensius, Kevin Aurelian Nathanielle Untung Widjaja, Nurhasanah Nurhasanah, and Alif Tri Handoyo
- [1570948486] **Electric Lighting on the Fishery Boat Lift Net of Tomini Bay Using a Portable PV-Generator System**  
Yuli Asmi Rahman, Khairil Anwar, Ahsan Mardjudo, and Muhammad Din
- 

*\*) No-show papers will be excluded from the proceedings and will not be indexed by ACM.*



8<sup>th</sup> International Conference  
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Bali, Indonesia, October 24<sup>th</sup> - 25<sup>th</sup> 2023





# Correlation Between Social Media and Non-Technical Business Process Management in Small and Medium Enterprises

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## ABSTRACT

Small and Medium Enterprises (SMEs) have an essential role in economic development, so business people must be able to adapt to market and technology developments. Regarding the issue of the implementation of information technology, one of the innovations currently widely used in SMEs is the implementation of social media, so it is important to identify aspects of social media usage. Previous theoretical and empirical evidence has revealed that the Technology-Organizational-Environment (TOE) framework has become a popular model for examining various issues of implementing information technology innovations and finding antecedents in the information systems domain. Besides the implementation of social media, the existence of Business Process Management (BPM) in SMEs plays an important role in maintaining the efficiency and effectiveness of the organization's operations. BPM is an involved process and requires many technical and non-technical capability aspects. Most previous research focused on the technical capability aspects of business processes less successfully applied in Indonesian SME conditions. This study aims to analyze the non-technical capabilities of BPM that have yet to be studied in previous research. The data was collected by analyzing the results of interviews and observations on two garment SMEs in Surabaya, Indonesia. The contribution of this research is to provide new knowledge and studies on the relationship of the non-technical capabilities of BPM to the implementation of social media in SMEs. The results show the linkage between non-technical capabilities aspects and the implementation of social media in information search and sharing, marketing and branding, and playing an important role in customer relations.

\*Place the footnote text for the author (if applicable) here.

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## CCS CONCEPTS

• **Applied Computing**; • **Enterprise Computing**; • **Business Process Management**; • **Business Process Management Systems**;

## KEYWORDS

business process management, SMEs, social media, non-technical capabilities

## ACM Reference Format:

Sharfina Febbi Handayani<sup>1</sup>, Lolanda Hamim Annisa, Nanda Kurnia Wardati, and Rachmah Agus Putri. 2023. Correlation Between Social Media and Non-Technical Business Process Management in Small and Medium Enterprises. In *International Conference on Sustainable Information Engineering and Technology (SIET 2023)*, October 24–25, 2023, Badung, Bali, Indonesia. ACM, New York, NY, USA, 9 pages. <https://doi.org/10.1145/3626641.3627209>

## 1 INTRODUCTION

Small and Medium Enterprises (SMEs) have an important and strategic role in building the national economy. Apart from playing a role in economic growth and employment, SMEs also play a role in distributing the results of development. Based on data from the Bank Indonesia, nearly 99% of all business units were categorized as SMEs, employing around 97% of the private sector workforce. These SMEs also significantly contribute to economic expansion with the share of the Gross domestic product (GDP) amounting to 61%. Furthermore, in 2018 SMEs exhibited robust GDP growth at a rate of 9,6% [1]. Most SMEs in Indonesia depend on business owners to survive and develop. Without owners, not much happens in SMEs because owners are responsible for making important decisions regarding products, markets, employee motivation, expansion plans, and other strategic matters [2][3]. For SMEs to be competitive in the global market, SME owners must be able to adjust to technological developments. Previous studies have shown that SMEs are often identified with limited resources, limited knowledge of information systems, and a need for more information technology expertise [4]. These constraints cause information technology to become an important issue for SMEs. Social media is one of the information technology innovations currently widely used in SMEs. Various studies have investigated social media use in business and found that social media has many benefits [5][6]. Other findings show that social media is a solution and plays an important role in marketing and business for small businesses with two or more employees and can create new opportunities and communication media with customers [7].

Social media can create open communication that helps companies understand customer needs and motivates companies to respond efficiently to customer needs. SMEs can use social media because of its low cost and minimal technical requirements [8] [9]. This has resulted in the use of social media continuing to grow exponentially among businesses. It is quickly becoming a phenomenon for companies and consumers to transact and relate to each other in mutually beneficial ways [10]. The more use of social media by organizations, the more important it is to identify the factors associated with the successful implementation of social media technology. One of the previous empirical evidence reveals that the Technology-Organizational-Environment (TOE) framework has become a popular model in studying various issues of information technology adoption. Previous research findings confirm that the TOE framework is useful for understanding the application of information technology innovation [11]. In addition, social media allows customers to respond to needs proactively and efficiently [12] [13]. The TOE framework, which outlines the adoption of innovation, provides a valuable analytical model for investigating how various types of technologies are embraced and integrated. It is particularly applicable when examining the incorporation of social media, as the utilization of social media relies on internet-based technology advancements and is influenced by both internal organizational factors and external pressures from the environment. As a result, the TOE framework has been widely adopted as a theoretical foundation for examining the implementation of social media in SMEs [14].

When considering social media as a digital innovation within the TOE framework, it can be complemented by Business Process Management (BPM) [15]. Organizations need to incorporate social media initiative into their operational procedures and improvement strategies to maximize benefits. Linking social media with BPM help develop processes centered around customer needs and offer insights from stakeholders about the progression of BPM processes in relation to customer service, thus guiding decisions for enhancing processes. This part will explore market shift related to social media, the contribution of Social Oriented Process Modeling in updating business models and services, focusing on customer results, and discussions about automation versus retention of certain processes [16]. BPM plays a crucial role in integrating social media into SME activities to enhance efficiency and effectiveness. Social media, a widely used IT application, is anticipated to improve SME Performance. The Task-Technology Fit model suggests that social media's functionality should align with SME tasks and recommends its alignment with business processes using the Process Classification Framework (PCF). Business process performance is evaluated based on cost efficiency, time management, quality levels, and adaptability [17]. However, in SMEs, these crucial business processes often get overlooked by key stakeholders, leaving them oblivious to their own performance in managing business processes. Most existing research on business processes primarily focuses on technical capability associated with technology which is common in large corporations. Only a few studies have dared to explore non-technical capability aspects of the process [18] [19].

Based on these problems, this research will analyze correlation between non-technical capabilities of BPM as influence factors of

social media implementation in SMEs. The non-technical capabilities of BPM consist of process management, process-oriented culture, and process-oriented structures [15] [20]. This is evident in the emphasis on process management, a culture oriented towards processes, and organizational structures that support business innovation through the social media usage in SMEs [21]. The social media implementation is not limited to marketing and information technology but also relates to customer relations. It engages customers in collaborative conversations to provide mutual value in a trusted business environment. Therefore, the problems that will be discussed in this study relate to non-technical capabilities aspects of business process management which have a lot to do with human resources, culture, and organizational structure in influencing the social media usage in garment SMEs. Garment SMEs were chosen because based on data from the Creative Economy Agency (Bekraf) and the Central Bureau of Statistics (BPS), the fashion industry is currently the most popular, and its growth has reached 63 percent, supported by 16 other creative economy sub-sectors whose contribution has reached 28.75 percent. The fashion sub-sector contributed the highest export value at 56 percent. This is in line with the growing public awareness of the need for clothing and to reflect the lifestyle of the wearer [22][23]. Regarding issues of information technology or information systems, several previous studies have stated that SMEs are often identified with limited resources, limited information systems, and a lack of information technology expertise [24][25], so investment in information technology innovation is an important issue for SMEs.

## 2 RELATED RESEARCH

This section contains a literature review used as a reference and basis for conducting research.

### 2.1 Process Capabilities of Business Process Management (BPM)

A business process is defined as a collection of coordinated activities that have certain standards based on the company's functionality and are carried out by a group of people or machines and require one or more inputs and form an output that has value so that it can be useful [26]. Meanwhile, [27] defines a business process as a set of interrelated events, activities, and decision points which involve actors and objects, jointly bringing valuable results to at least one of its customers. Business processes and information technology play an equally important role in business innovation, such as realizing information technology-enabled processes or soliciting customer feedback. Business innovation carried out by information technology is called digital innovation, where information technology plays an important role in organizational domains and strategies and information technology is used in internal and external operations to create competitive advantage. As result, Business Process Management (BPM) has emerged as an essential domain for providing methods, techniques and management principles to strategically align business process for improve results, compliance, and enduring competitiveness [28]. Business process excellence can be achieved by increasing critical success factors, known as process capabilities [29]. Previous research has designed and validated a framework that categorizes the process capabilities of 69

maturity sample models that focus on specific business processes within an organization. This framework comprises upper and lower layers, which must achieve process excellence [30]. The lower layer contains capabilities that must exist in every business process, including process modeling, deployment, optimization, and management. Such capabilities refer to the traditional business process life cycle [26], where phases between departments are logically and iteratively interrelated in cycles. Process management capabilities support the other three process capabilities in the process lifecycle. The top layer contains capabilities that support business process excellence consisting of a process-oriented culture and a process-oriented structure [31]. Process-oriented culture means business processes are generally seen as a way of doing business. In contrast, process-oriented structures describe institutions within an organization, for example, by appointing a manager who coordinates all process owners [32] which methodologically supports process capabilities at lower levels. As for showing the correlation between process capability and digital innovation, the process capability framework [33] is divided into technical process capability and non-technical process capability. Process management takes a human perspective on business processes and can be better classified as a non-technical capability.

## 2.2 Technology-Organization-Environment (TOE) Framework

Technology-Organization-Environment (TOE) framework was developed by Tornatzky and Fleischer to evaluate technology adoption. This framework is consistent with the theory of innovation diffusion within organizations. TOE framework is an integrative scheme that combines technological characteristics, contingent organizational factors, and elements from the macro environment [33] [34]. There are several reasons why the TOE framework was chosen as the theoretical framework to support this study. First, the TOE framework is suitable for studying adoption in small company context, such as in this study which focuses on SMEs. Second, the TOE framework has a clear theoretical basis and consistent empirical support. Third, TOE is consistent with other IT innovation theories at the organizational level, such as DOI theory which is argued to strengthen and enhance the explanatory power of the framework [36].

## 2.3 Implementation of Social Media in Small Medium Enterprises

The internet's growing use has tremendously influenced social interactions between individuals, communities and society. The rapid expansion of the internet has facilitated two keywords: social media and online search engines. In business area, social media acts as a new channel for direct engagement between business and their customers. It offers an efficient virtual platform for accessing dependable and current information [38] [39]. Social media is categorized as media that focuses on participation and peer-to-peer communication between individuals, with sites providing the ability to develop user-generated content and exchange messages and comments between users [39]. User-generated content refers to the capabilities provided by web 2.0 technology where end users are activated with various media content in the form of video, audio,

images, and comments [40]. Social media is an essential instrument for improving the flow of information and relationships between individuals and organizations. Some main reasons for using social media in business include customer satisfaction, loyalty, engagement, and increased sales [41]. Previous studies have explored the implementation and impact of social media on Small and Medium Enterprises (SME), social media technologies enhances business opportunities and reconfigures resources in Spain technological firms [42], the role of social media in improving marketing and R&D interfaces for better new product performance in manufacturing companies [43], social media apps are used for B2B communication and business performance [44].

## 3 RESEARCH METHODS

This research activity was conducted at two garment SMEs in Surabaya, Indonesia. Each interview lasted about 1 to 1.5 hours. Analyzing interview results is one of the author's steps in gathering data and information so that the author can build an initial theoretical framework for further research. Interviews are an effective method used to understand the underlying reasons behind the complexity of decisions and human behavior [45], and it allows unexpected responses to be explored in more detail when these complexities arise [46]. The informants of this study were 2 owners of Garment SMEs in Surabaya who have the ability and experience of approximately 5 years in the garment sector and understand the use of social media in SMEs. Furthermore, an owner is a person who has the right to make a final decision in SME business operations, including the implementation of social media in SMEs. Informant 1 and Informant 2 are parties who are important to all decisions in the implementation of social media as well as parties who understand and understand the company's business processes and are responsible for the social media accounts used.

The research informants were selected according to the criteria for qualitative research informants, namely individuals who have comprehensive knowledge about the conditions of the established SMEs. A purposive technique was used in this approach, meaning that the sample was not intended to represent the population, but rather to represent information. Many studies have examined the implementation of social media in SMEs, but there is a lack of research exploring the link between social media technology and non-technical capabilities of BPM, specifically in relation to human, cultural, and structural aspects within SMEs. Consequently, this research serves as an extension of an initial study conducted to obtain a theoretical study of analysis of the antecedents of social media implementation in SMEs and an analysis of the non-technical capabilities that contribute to the success of implementing social media in Indonesian SMEs [21]. This study develops an initial theoretical framework based on the experience of two garment SME owners in Surabaya, Indonesia in a particular context, combined with a review of previous research studies. Thus studies on the implementation of social media in SMEs and studies on business processes in two garment SMEs are used to design research interview questions.

This study uses a grounded theory approach. This approach was chosen because grounded theory suitable for qualitative research in exploring in-depth information about the implementation of social media and non-technical capabilities in two garment SMEs

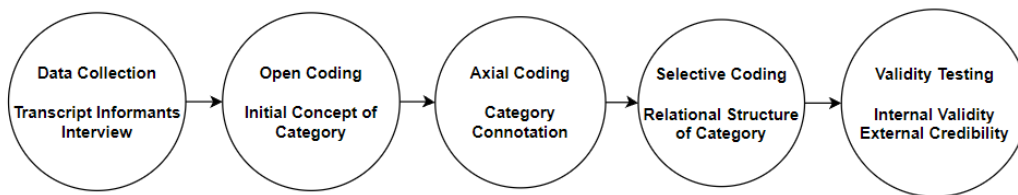


Figure 1: Stages research of grounded theory approach

Table 1: Categorization of open coding

Subcategory	Original data statement (initial concept)
Process Management	Currently, for the administrative department, customer service can run independently from Monday to Sunday without the owner’s involvement. The warehouse is operating independently with its own staff, so the handling of incoming and outgoing goods no longer requires the owner’s intervention. Regarding content, although the owner still acts as a supervisor and manages the timelines, there is now a team in place, including a graphic designer and a copywriter who write and create content. (daily management)
Process Oriented Culture	The company’s culture has not been formalized yet, and structured brainstorming hasn’t been established. So, the important values for us are honesty, integrity, continuous learning, competence, and empathy with the team and the environment. (process-oriented values)
Process Oriented Structure	Regarding the administrative team, we usually hold small meetings where all feedback is discussed together with the employees. If a customer complains about an incorrect quantity in their order, we capture it as a case to avoid similar mistakes in the future. We analyze why the mistake happened and consider it as a weekly case, with customer feedback coming through direct messages and comments. (Process-oriented governance)
Information Sharing and Searching	We also conduct market research on our competitors using hashtags to identify emerging trends such as colors and styles. We closely monitor what our competitors and market leaders are doing to read these trends and determine what products to develop. Typically, we follow and observe their business patterns, posting strategies, and IT tools they use. (Search and share competitor information)
Marketing and Branding	For branding, when someone enters our platform, we already have a portfolio of content and products (Instagram feed). It’s a brand activation for our customers on social media. In the realm of social media, having an equal number of followers is vital for customers to know that our Instagram content is always up-to-date and active. We post something every day. Our branding also includes testimonials from people who have previously made purchases from our Instagram page. (Branding)
Customer relations	Through Instagram, we build our reputation and gain new followers. We successfully keep in touch with them. When it comes to marketing and interacting with people. So, the acquisition of new customers begins with them becoming our followers, and we maintain contact through newsletters to keep them updated and engaged. (Catch new customers)

in Surabaya. The initial goal of grounded theory is to generate formal theory inductively through open coding, selective coding, and theoretical coding of the interview results. In the early stages, the researcher conducted open coding by grouping raw data (interview transcripts) for each informant, then labeling the interview transcripts’ results. In the next stage, the researcher conducted selective coding by making categories and relationships between labels in the previous stage and digging deeper into these relationships in integrative memos. This was intended to describe the relationships between categories and build theoretical sampling. In this study, the authors combined the labels and categories of interview results with theoretical findings from previous studies depicted in Figure 1.

## 4 RESULTS AND DISCUSSION

### 4.1 Open Coding

In this research, meticulous and word-for-word evaluations of the interview outcomes were carried out to choose original data declarations and initiate them. This process resulted in a total of 346 original data statements along with their corresponding initial concepts. Given that these initial concepts are intricate and exhibit some overlap, original data statements sharing the same concept were further consolidated and classified, referencing existing literature and group discussions. Ultimately, this led to the identification of 22 initial concepts and 6 subcategories. The categorization of open coding results are shown in Table 1.

**Table 2: Categorization of axial coding**

Primary category	Corresponding subcategory	Category connotation
Non-Technical Capabilities	Process Management	Business innovation, Business strategy, daily management, digital innovation
	Process Oriented Culture	Process-oriented values, attitudes and behavior, assessment and rewards
	Process Oriented Structure	Process-oriented organizational structure, Process-oriented governance
Social Media Implementation	Information Sharing and Searching	General information search and sharing; Search and share competitor information; Search and share customer information
	Marketing and Branding	Branding, Product and service advertising, Market research
	Customer relations	Communicating with customers; Receive customer feedback; Catch new customers

**Table 3: The typical relational structure of primary categories**

Typical relationship structure	Connotation of relational structure	Representative statement
Non-Technical Capabilities → SMEs	Process Management is the business process aspect which affect SMEs by non-technical capabilities	We started selling through Facebook and later became active on Instagram. We also began sales through LINE and WhatsApp without any specific strategy, just by posting photos and uploading them using our phones. (digital innovation → SMEs)
	Process Oriented Culture is the business process aspect which affect SMEs by non-technical capabilities	The company’s culture has not been formalized yet, and structured brainstorming hasn’t been established. So, the important values for us are honesty, integrity, continuous learning, competence, and empathy with the team and the environment. (process-oriented values → SMEs)
	Process Oriented Structure is the business process aspect which affect SMEs by non-technical capabilities	We usually hold small meetings where all feedback is discussed together with the employees. We analyze why the mistake happened and consider it as a weekly case, with customer feedback coming through direct messages and comments. (Process-oriented governance → SMEs)
Social Media Implementation → SMEs	Information Sharing and Searching is the TOE framework aspect which affect SMEs by implementation of social media	We also conduct market research on our competitors using hashtags to identify emerging trends such as colors and styles. We closely monitor what our competitors and market leaders are doing to read these trends and determine what products to develop. Typically, we follow and observe their business patterns, posting strategies, and IT tools they use. (Search and share competitor information → SMEs)
	Marketing and Branding is the TOE framework aspect which affect SMEs by implementation of social media	For branding, when someone enters our platform, we already have a portfolio of content and products (Instagram feed). It’s a brand activation for our customers on social media. In the realm of social media, having an equal number of followers is vital for customers to know that our Instagram content is always up-to-date and active. Our branding also includes testimonials from people who have previously made purchases from our Instagram page. (Branding → SMEs)
	Customer relations is the TOE framework aspect which affect SMEs by implementation of social media	We usually hold small meetings where all feedback is discussed together with the employees. If a customer complains about an incorrect quantity in their order, we capture it as a case to avoid similar mistakes in the future. We analyze why the mistake happened and consider it as a weekly case, with customer feedback coming through direct messages and comments. (Customer feedback → SMEs)

## 4.2 Axial Coding

Due to the natural relationships identified among the subcategories in the open coding process, we organized the six subcategories into two primary categories (non-technical capabilities and social media implementation) based on the interconnections and logical hierarchy among these subcategories. The primary categories and their respective subcategories are detailed in Table 2.

## 4.3 Selective Coding

After systematically coding the data, it became clear that both primary categories are centered on small and medium enterprises (SMEs). As a result, SMEs have been designated as the central category, and the overarching narrative within this core category can be distilled as follows: both primary categories, namely, the non-technical process capabilities of BPM and the implementation of social media, have a beneficial impact on Garment SMEs. The relational patterns of these primary categories can be found in Table 3.

#### 4.4 Theoretical Construction

The non-technical capabilities of BPM are closely related to the human, cultural and structural aspects. Process management, process-oriented culture, and process-oriented structure describe non-technical process capabilities. In this study, the elaboration of non-technical capabilities of the components discussed was adapted to the conditions of the two research object SMEs. The theory used as a reference in the literature in analyzing non-technical aspects is a process capability framework called the process capability framework [15]. This framework divides process capability into two aspects, namely technical aspects and non-technical aspects. This research focuses on examining the non-technical aspects of process capability in SMEs as research objects. Categories that can arise from non-technical aspects include process management, process-oriented culture, and process-oriented structure. Process management in SMEs aims to maintain communication between process actors and external relations related to business processes (customers, suppliers, and other stakeholders). Process-oriented culture in SMEs aims to maintain process-oriented attitudes and behaviors and process-oriented values related to business processes. Based on the findings of these aspects, the process-oriented structure is related to integrated organizational structure, governance, and leadership.

Previous studies have examined the relationship of the antecedent factors underlying the implementation of social media to the potential contribution of SME businesses, which resulted in significant findings that open collaborative business model innovation is needed to implement social media in business processes, and the integration of leadership can create ownership and responsibility in SMEs [47]. Several studies related to the background factors and the impact of using social media on SMEs have also been studied by adopting DOI theory and the TOE framework as a reference for research constructs [39] [40] [5] [12] [50]. Implementing social media in business process management is closely related to the human, cultural, and structural aspects. In this study, the description of the non-technical aspects of the SMEs as the research object is only adjusted to the conditions of the SMEs as the research object. This research focuses on examining correlation between non-technical capabilities of BPM and the implementation of social media in SMEs as research objects. Areas of social media implementation related to searching and sharing information found in SMEs as research objects include searching and sharing general information on SMEs, searching and sharing information on competitors, and searching and sharing customer information. Marketing and branding found in SMEs research objects include social media playing a role in branding, social media playing a role in advertising promotion of products and services, and social media playing a role in marketing research. In customer relations found in SMEs, research objects include social media to communicate with customers, social media to help with customer activities, social media to receive customer feedback, and social media to help find new customers. The theoretical framework that emerges from the research findings illustrates a relationship between non-technical capabilities of BPM and the implementation of social media in SMEs. In particular, these findings relate to existing business activities in 2 different SMEs. The

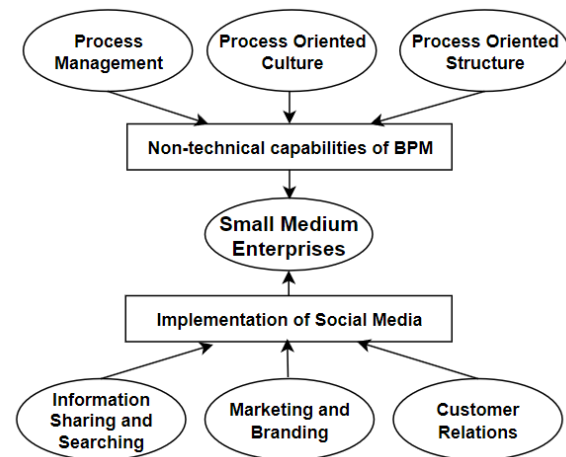


Figure 2: Research mode

analysis results based on the research that has been done produce the research model depicted in Figure 2.

Based on Figure 2, the findings of this research produced an analysis of the influence of non-technical capabilities of BPM on the implementation of social media in both SMEs. Non-technical capabilities of business process management influence the enhancement of social media implementation in terms of searching and sharing information. This is realized through the roles and responsibilities of SME owners and employees who manage social media to create product content and present information about current trends, new product launches, or content related to general SME information. Non-technical capabilities of business process management affect the implementation of social media in terms of marketing and branding in SMEs. This is manifested by both researched SMEs having implemented social media from the beginning of their business operations, and currently being able to apply appropriate process strategies through advertising strategies using ads, endorsements, and influencer collaborations to assist with product promotion, marketing, and branding. Non-technical capabilities of business process management impact the implementation of social media in terms of customer relations within SMEs. This relates to external relationship communication by implementing social media for interaction with customers through surveys (polling questions) regarding proposed products derived from customer feedback. Non-technical capabilities which are culture-oriented processes and structure-oriented processes influence the implementation of social media in terms of customer relations within SMEs. This is manifested by attitudes and behaviors that consistently offer polite greetings when serving customer orders via social media while maintaining a friendly demeanor when handling complaints or complaints (responding to chats) with good words.

#### 4.5 Data Validity Testing

Data validity checks are performed to verify whether the research conducted is indeed scientific and to examine the acquired data. It also aims to determine whether a study is accurate from the



**Table 4: The triangulation methods**

Triangulation methods	1 <sup>st</sup> SMEs	2 <sup>nd</sup> SMEs
Data source	Owner of garment SMEs	Owner of garment SMEs
Data collection technique	Interview and observation	Interview and observation
Data collection time	May, 5 <sup>th</sup> 2019; June, 25 <sup>th</sup> 2019; August, 14 <sup>th</sup> 2019	August, 7 <sup>th</sup> 2019; September, 10 <sup>th</sup> 2019; September, 20 <sup>th</sup> 2019

**Table 5: The transferability testing**

Research Finding	1 <sup>st</sup> SMEs	2 <sup>nd</sup> SMEs
Business Strategy	Transitioning from reseller to self-manufacturing; establishing a production facility; paid advertising and endorsement; Instagram giveaway to attract new customer; collaboration with Instagram influencers; creating marketing content through Instagram; studying suitable methods for implementing social media to engage customers and increase like and comments to attract more customers	Transforming square and pashmina hijab production into instant hijabs; expanding its hijab business by increasing production capacity; utilizes Instagram ads as a advertising strategy and creates campaign videos tailored to the target market; Aligning business processes with business goals (production quantity with targets achieved, product rejection rate, and the number of product orders per week)
process-oriented attitudes and behavior	Honesty, continuous learning, diligence, competence, and empathy; greeting customers politely and apologizing for service errors; attitude in resolving customer problems and complaints;	Responsible and sincere attitude towards tasks and work, as well as being friendly and nurturing towards customers; demonstrating understanding towards customers when there are complaints and concerns about products
Catch new customers	Instagram is used to build reputation and grab new customers; advertising and endorsements through social media play a role in introducing products to people and acquiring new customers	Collaborating with influencers whose style and taste align with the product; matching influencers with the target market; utilizing Instagram ads

perspective of the researcher, participants, or research report readers. Data validity refers to whether research findings accurately reflect the situation and are supported by existing evidence. In this qualitative research, data validity testing is conducted through credibility testing (internal validity) and transferability testing (external credibility). Internal validation testing in this research is conducted using the triangulation method. Triangulation can be defined as the process of cross-verifying data from various sources, using different methods and at different times. There are three types of triangulation methods: data source triangulation, data collection technique triangulation, and data collection time triangulation. Data source triangulation involves checking data obtained from multiple sources. In this research, data source triangulation is carried out by mining information from a single perspective, which is the business owner, as they have a better understanding of the entire business process and are the individuals using social media in SMEs. Data collection technique triangulation is done by cross-checking data from the same source using different techniques or by checking data from different informants using the same technique. The primary data source obtained from this research comes from interviews. Interviews are conducted using a set of questions presented to the informants. Data collection technique triangulation in this research is accomplished by conducting follow-up interviews with different informants who possess nearly the same knowledge as the main informant (owner). This is supplemented by direct observations

at the SME office, observing employee activities, monitoring the SME's social media accounts, and studying company documents related to business processes and social media implementation. Time-based data collection triangulation is performed by gathering data repeatedly from informants at different times and locations. This is because each informant has varying availability in terms of time and location, so not all questions can be addressed during a single interview session. The triangulation methods shown in Table 4.

Transferability testing is conducted to ensure that the research findings can be applied to other case studies that share characteristics similar to the one used in this study. This testing is done by systematically organizing the research findings report and explaining that the results of this research can be applied to other research objects that have similarities in characteristics with the case study in this research. The transferability testing details are shown in Table 5.

## 5 CONCLUSION

Based on the research results and the findings obtained, it can be concluded that there is a correlation between non-technical capabilities of BPM and social media usage in 2 garment SMEs in Surabaya, Indonesia. Non-technical aspects of process management can influence the implementation of social media in terms of information

search and sharing, marketing and branding, and customer relations. Meanwhile, the non-technical aspects of process-oriented culture and process-oriented structures only influence the implementation of social media regarding customer relations. Plus, there needs to be a standard that regulates customer service (service level agreement) relating to the time to reply to customer messages, the time to confirm orders or the response time to customer complaints in SME-scale business processes. This research can be used as implementation conceptual model that provides an overview of correlation between the non-technical capabilities of BPM and social media in SMEs. The study of non-technical BPM capabilities can be applied to improve the organizational structure present in SME. An example is the case study used as the object in this research, where two garment SMEs have implemented non-technical BPM capabilities, enabling them to run more efficient business processes. The implementation of social media can be carried out by involving employees who manage social media in training related to content writing, thereby enhancing the implementation of social media for customer relations. This is recommended so that the implementation of social media in SMEs will become more optimal.

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# Correlation Between Social Media and Non-Technical Business Process Management in Small and Medium Enterprises

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## 1 ABSTRACT

Small and Medium Enterprises (SMEs) have an essential role in economic development, so business people must be able to adapt to market and technology developments. Regarding the issue of the implementation of information technology, one of the innovations currently widely used in SMEs is the implementation of social media, so it is important to identify aspects of social media usage. Previous theoretical and empirical evidence has revealed that the Technology-Organizational-Environment (TOE) framework has become a popular model for examining various issues of implementing information technology innovations and finding antecedents in the information systems domain. Besides the implementation of social media, the existence of Business Process Management (BPM) in SMEs plays an important role in maintaining the efficiency and effectiveness of the organization's operations. BPM is an involved process and requires many technical and non-technical capability aspects. Most previous research focused on the technical capability aspects of business processes less successfully applied in Indonesian SME conditions. This study aims to analyze the non-technical capabilities of BPM that have yet to be studied in previous research. The data was collected by analyzing the results of interviews and observations on two garment SMEs in Surabaya, Indonesia. The contribution of this research is to provide new knowledge and studies on the relationship of the non-technical capabilities of BPM to the implementation of social media in SMEs. The results show the linkage between non-technical capabilities aspects and the implementation of social media in information search and sharing, marketing and branding, and playing an important role in customer relations.

## 14 ACS CONCEPTS

• Applied Computing; • Enterprise Computing; • Business Process Management; • Business Process Management Systems;

## KEYWORDS

business process management, SMEs, social media, non-technical capabilities

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## 1 INTRODUCTION

Small and Medium Enterprises (SMEs) have an important and strategic role in building the national economy. Apart from playing a role in economic growth and employment, SMEs also play a role in distributing the results of development. Based on data from the Bank Indonesia, nearly 99% of all business units were categorized as SMEs, employing around 97% of the private sector workforce. These SMEs also significantly contribute to economic expansion with the share of the Gross domestic product (GDP) amounting to 61%. Furthermore, in 2018 SMEs exhibited robust GDP growth at a rate of 9,6% [1]. Most SMEs in Indonesia depend on business owners to survive and develop. Without owners, not much happens in SMEs because owners are responsible for making important decisions regarding products, markets, employee motivation, expansion plans, and other strategic matters [2][3]. For SMEs to be competitive in the global market, SME owners must be able to adjust to technological developments. Previous studies have shown that SMEs are often identified with limited resources, limited knowledge of information systems, and a need for more information technology expertise [4]. These constraints cause information technology to become an important issue for SMEs. Social media is one of the information technology innovations currently widely used in SMEs. Various studies have investigated social media use in business and found that social media has many benefits [5][6]. Other findings show that social media is a solution and plays an important role in marketing and business for small businesses and two or more employees and can create new opportunities and communication media with customers [7].

<sup>2</sup>Place the footnote text for the author (if applicable) here.

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Social media can create open communication that helps companies understand customer needs and motivates companies to respond efficiently to customer needs. SMEs can use social media because of its low cost and minimal technical requirements [8] [9]. This has resulted in the use of social media continuing to grow exponentially among businesses. It is quickly becoming a phenomenon for companies and consumers to transact and relate to each other in mutually beneficial ways [10]. The more use of social media by organizations, the more important is to identify the factors associated with the successful implementation of social media technology. One of the previous empirical evidence reveals that the Technology-Organizational-Environment (TOE) framework has become a popular model in studying various issues of information technology adoption. Previous research findings confirm that the TOE framework is useful for understanding the application of information technology innovation [11]. In addition, social media allows customers to respond to needs proactively and efficiently [12] [13]. The TOE framework, which outlines the adoption of innovation, provides a valuable analytical model for investigating how various types of technologies are embraced and integrated. It is particularly applicable when examining the incorporation of social media, as the utilization of social media relies on internet-based technology advancements and is influenced by both internal organizational factors and external pressures from the environment. As a result, the TOE framework has been widely adopted as a theoretical foundation for examining the implementation of social media in SMEs [14].

When considering social media as a digital innovation within the TOE framework, it can be complemented by Business Process Management (BPM) [15]. Organizations need to incorporate social media initiative into their operational procedures and improvement strategies to maximize benefits. Linking social media with BPM help develop processes centered around customer needs and offer insights from stakeholders about the progression of BPM processes in relation to customer service, thus guiding decisions for enhancing processes. This part will explore market shift related to social media, the contribution of Social Oriented Process Modeling in updating business models and services, focusing on customer results, and discussions about automation versus retention of certain processes [16]. BPM plays a crucial role in integrating social media into SME activities to enhance efficiency and effectiveness. Social media, a widely used IT application, is anticipated to improve SME Performance. The Task-Technology Fit model suggests that social media's functionality should align with SME tasks and recommends its alignment with business processes using the Process Classification Framework (PCF). Business process performance is evaluated based on cost efficiency, time management, quality levels, and adaptability [17]. However, in SMEs, these crucial business processes often get overlooked by key stakeholders, leaving them oblivious to their own performance in managing business processes. Most existing research on business processes primarily focuses on technical capability associated with technology which is common in large corporations. Only a few studies have dared to explore non-technical capability aspects of the process [18] [19].

Based on these problems, this research will analyze correlation between non-technical capabilities of BPM as influence factors of

social media implementation in SMEs. The non-technical capabilities of BPM consist of process management, process-oriented culture, and process-oriented structures [15] [20]. This is evident in the emphasis on process management, a culture oriented towards processes, and organizational structures that support business innovation through the social media usage in SMEs [21]. The social media implementation is not limited to marketing and information technology but also relates to customer relations. It engages customers in collaborative conversations to provide mutual value in a trusted business environment. Therefore, the problems that will be discussed in this study relate to non-technical capabilities aspects of business process management which have a lot to do with human resources, culture, and organizational structure in influencing the social media usage in garment SMEs. Garment SMEs were chosen because based on data from the Creative Economy Agency (Bekraf) and the Central Bureau of Statistics (BPS), the fashion industry is currently the most popular, and its growth has reached 63 percent, supported by 16 other creative economy sub-sectors whose contribution has reached 28.75 percent. The fashion sub-sector contributed the highest export value at 56 percent. This is in line with the growing public awareness of the need for clothing and to reflect the lifestyle of the wearer [22][23]. Regarding issues of information technology or information systems, several previous studies have stated that SMEs are often identified with limited resources, limited information systems, and a lack of information technology expertise [24][25], so investment in information technology innovation is an important issue for SMEs.

## 2 RELATED RESEARCH

This section contains a literature review used as a reference and basis for conducting research.

### 2.1 Process Capabilities of Business Process Management (BPM)

A business process is defined as a collection of coordinated activities that have certain standards based on the company's functionality and are carried out by a group of people or machines and require one or more inputs and form an output that has value so that it can be useful [26]. Meanwhile, [27] defines a business process as a set of interrelated events, activities, and decision points which involve actors and objects jointly bringing valuable results to at least one of its customers. Business processes and information technology play an equally important role in business innovation, such as realizing information technology-enabled processes or soliciting customer feedback. Business innovation carried out by information technology is called digital innovation, where information technology plays an important role in organizational domains and strategies and information technology used in internal and external operations to create competitive advantage. As result, Business Process Management (BPM) has emerged as an essential domain for providing methods, techniques and management principles to strategically align business process for improve results, compliance, and enduring competitiveness [28]. Business process excellence can be achieved by increasing critical success factors, known as process capabilities [29]. Previous research has designed and validated a framework that categorizes the process capabilities of 69



maturity sample models that focus on specific business processes within an organization. This framework comprises upper and lower layers, which must achieve process excellence [30]. The lower layer contains capabilities that must exist in every business process, including process modeling, deployment, optimization, and management. Such capabilities refer to the traditional business process life cycle [26], where phases between departments are logically and iteratively interrelated in cycles. Process management capabilities support the other three process capabilities in the process lifecycle. The top layer contains capabilities that support business process excellence consisting of a process-oriented culture and a process-oriented structure [31]. Process-oriented culture means business processes are generally seen as a way of doing business. In contrast, process-oriented structures describe institutions within an organization, for example, by appointing a manager who coordinates all process owners [32] which methodologically supports process capabilities at lower levels. As for showing the correlation between process capability and digital innovation, the process capability framework [33] is divided into technical process capability and non-technical process capability. Process management takes a human perspective on business processes and can be better classified as a non-technical capability.

## 2.2 Technology-Organization-Environment (TOE) Framework

Technology-Organization-Environment (TOE) framework was developed by Tornatzky and Fleischer to evaluate technology adoption. This framework is consistent with the theory of innovation diffusion within organizations. TOE framework is an integrative scheme that combines technological characteristics, contingent organizational factors, and elements from the macro environment [33] [34]. There are several reasons why the TOE framework was chosen as the theoretical framework to support this study. First, the TOE framework is suitable for studying adoption in small company context, such as in this study which focuses on SMEs. Second, the TOE framework has a clear theoretical basis and consistent empirical support. Third, TOE is consistent with other IT innovation theories at the organizational level, such as DOI theory which is argued to strengthen and enhance the explanatory power of the framework [36].

## 2.3 Implementation of Social Media in Small Medium Enterprises

The internet's growing use has tremendously influenced social interactions between individuals, communities and society. The rapid expansion of the internet has facilitated two keywords: social media and online search engines. In business area, social media acts as a new channel for direct engagement between business and their customers. It offers an efficient virtual platform for accessing dependable and current information [38] [39]. Social media is categorized as media that focuses on participation and peer-to-peer communication between individuals, with sites providing the ability to develop user-generated content and exchange messages and comments between users [39]. User-generated content refers to the capabilities provided by web 2.0 technology where end users are activated with various media content in the form of video, audio,

images, and comments [40]. Social media is an essential instrument for improving the flow of information and relationships between individuals and organizations. Some main reasons for using social media in business include customer satisfaction, loyalty, engagement, and increased sales [41]. Previous studies have explored the implementation and impact of social media on Small and Medium Enterprises (SME), social media technologies enhances business opportunities and reconfigures resources in Spain technological firms [42], the role of social media in improving marketing and R&D interfaces for better new product performance in manufacturing companies [43], social media apps are used for B2B communication and business performance [44].

## 3 RESEARCH METHODS

This research activity was conducted at two garment SMEs in Surabaya, Indonesia. Each interview lasted about 1 to 1.5 hours. Analyzing interview results is one of the author's steps in gathering data and information so that the author can build an initial theoretical framework for further research. Interviews are an effective method used to understand the underlying reasons behind the complexity of decisions and human behavior [45], and it allows unexpected responses to be explored in more detail when these complexities arise [46]. The informants of this study were 2 owners of Garment SMEs in Surabaya who have the ability and experience of approximately 5 years in the garment sector and understand the use of social media in SMEs. Furthermore, an owner is a person who has the right to make a final decision in SME business operations, including the implementation of social media in SMEs. Informant 1 and Informant 2 are parties who are important to all decisions in the implementation of social media as well as parties who understand and understand the company's business processes and are responsible for the social media accounts used.

The research informants were selected according to the criteria for qualitative research informants, namely individuals who have comprehensive knowledge about the conditions of the established SMEs. A purposive technique was used in this approach, meaning that the sample was not intended to represent the population, but rather to represent information. Many studies have examined the implementation of social media in SMEs, but there is a lack of research exploring the link between social media technology and non-technical capabilities of BPM, specifically in relation to human, cultural, and structural aspects within SMEs. Consequently, this research serves as an extension of an initial study conducted to obtain a theoretical study of analysis of the antecedents of social media implementation in SMEs and an analysis of the non-technical capabilities that contribute to the success of implementing social media in Indonesian SMEs [21]. This study develops an initial theoretical framework based on the experience of two garment SME owners in Surabaya, Indonesia in a particular context, combined with a review of previous research studies. Thus, studies on the implementation of social media in SMEs and studies on business processes in two garment SMEs are used to design research interview questions.

This study uses a grounded theory approach. This approach was chosen because grounded theory suitable for qualitative research in exploring in-depth information about the implementation of social media and non-technical capabilities in two garment SMEs

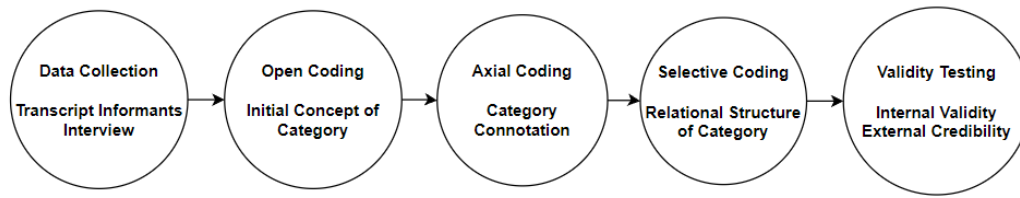


Figure 1: Stages research of grounded theory approach

Table 1: Categorization of open coding

Subcategory	Original data statement (initial concept)
Process Management	Currently, for the administrative department, customer service can run independently from Monday to Sunday without the owner’s involvement. The warehouse is operating independently with its own staff, so the handling of incoming and outgoing goods no longer requires the owner’s intervention. Regarding content, although the owner still acts as a supervisor and manages the timelines, there is now a team in place, including a graphic designer and a copywriter who write and create content. (daily management)
Process Oriented Culture	The company’s culture has not been formalized yet, and structured brainstorming hasn’t been established. So, the important values for us are honesty, integrity, continuous learning, competence, and empathy with the team and the environment. (process-oriented values)
Process Oriented Structure	Regarding the administrative team, we usually hold small meetings where all feedback is discussed together with the employees. If a customer complains about an incorrect quantity in their order, we capture it as a case to avoid similar mistakes in the future. We analyze why the mistake happened and consider it as a weekly case, with customer feedback coming through direct messages and comments. (Process-oriented governance)
Information Sharing and Searching	We also conduct market research on our competitors using hashtags to identify emerging trends such as colors and styles. We closely monitor what our competitors and market leaders are doing to read these trends and determine what products to develop. Typically, we follow and observe their business patterns, posting strategies, and IT tools they use. (Search and share competitor information)
Marketing and Branding	For branding, when someone enters our platform, we already have a portfolio of content and products (Instagram feed). It’s a brand activation for our customers on social media. In the realm of social media, having an equal number of followers is vital for customers to know that our Instagram content is always up-to-date and active. We post something every day. Our branding also includes testimonials from people who have previously made purchases from our Instagram page. (Branding)
Customer relations	Through Instagram, we build our reputation and gain new followers. We successfully keep in touch with them. When it comes to marketing and interacting with people. So, the acquisition of new customers begins with them becoming our followers, and we maintain contact through newsletters to keep them updated and engaged. (Catch new customers)

in Surabaya. The initial goal of grounded theory is to generate formal theory inductively through open coding, selective coding, and theoretical coding of the interview results. In the early stages, the researcher conducted open coding by grouping raw data (interview transcripts) for each informant, then labeling the interview transcripts’ results. In the next stage, the researcher conducted selective coding by making categories and relationships between labels in the previous stage and digging deeper into these relationships in integrative memos. This was intended to describe the relationships between categories and build theoretical sampling. In this study, the authors combined the labels and categories of interview results with theoretical findings from previous studies depicted in Figure 1.

## 4 RESULTS AND DISCUSSION

### 4.1 Open Coding

In this research, meticulous and word-for-word evaluations of the interview outcomes were carried out to choose original data declarations and initiate them. This process resulted in a total of 346 original data statements along with their corresponding initial concepts. Given that these initial concepts are intricate and exhibit some overlap, original data statements sharing the same concept were further consolidated and classified, referencing existing literature and group discussions. Ultimately, this led to the identification of 22 initial concepts and 6 subcategories. The categorization of open coding results are shown in Table 1.

**Table 2: Categorization of axial coding**

Primary category	Corresponding subcategory	Category connotation
Non-Technical Capabilities	Process Management	Business innovation, Business strategy, daily management, digital innovation
	Process Oriented Culture	Process-oriented values, attitudes and behavior, assessment and rewards
	Process Oriented Structure	Process-oriented organizational structure, Process-oriented governance
Social Media Implementation	Information Sharing and Searching	General information search and sharing; Search and share competitor information; Search and share customer information
	Marketing and Branding	Branding, Product and service advertising, Market research
	Customer relations	Communicating with customers; Receive customer feedback; Catch new customers

**11 Table 3: The typical relational structure of primary categories**

Typical relationship structure	Connotation of relational structure	Representative statement
Non-Technical Capabilities → SMEs	Process Management is the business process aspect which affect SMEs by non-technical capabilities	We started selling through Facebook and later became active on Instagram. We also began sales through LINE and WhatsApp without any specific strategy, just by posting photos and uploading them using our phones. (digital innovation → SMEs)
	Process Oriented Culture is the business process aspect which affect SMEs by non-technical capabilities	The company’s culture has not been formalized yet, and structured brainstorming hasn’t been established. So, the important values for us are honesty, integrity, continuous learning, competence, and empathy with the team and the environment. (process-oriented values → SMEs)
	Process Oriented Structure is the business process aspect which affect SMEs by non-technical capabilities	We usually hold small meetings where all feedback is discussed together with the employees. We analyze why the mistake happened and consider it as a weekly case, with customer feedback coming through direct messages and comments. (Process-oriented governance → SMEs)
Social Media Implementation → SMEs	Information Sharing and Searching is the TOE framework aspect which affect SMEs by implementation of social media	We also conduct market research on our competitors using hashtags to identify emerging trends such as colors and styles. We closely monitor what our competitors and market leaders are doing to read these trends and determine what products to develop. Typically, we follow and observe their business patterns, posting strategies, and IT tools they use. (Search and share competitor information → SMEs)
	Marketing and Branding is the TOE framework aspect which affect SMEs by implementation of social media	For branding, when someone enters our platform, we already have a portfolio of content and products (Instagram feed). It’s a brand activation for our customers on social media. In the realm of social media, having an equal number of followers is vital for customers to know that our Instagram content is always up-to-date and active. Our branding also includes testimonials from people who have previously made purchases from our Instagram page. (Branding → SMEs)
	Customer relations is the TOE framework aspect which affect SMEs by implementation of social media	We usually hold small meetings where all feedback is discussed together with the employees. If a customer complains about an incorrect quantity in their order, we capture it as a case to avoid similar mistakes in the future. We analyze why the mistake happened and consider it as a weekly case, with customer feedback coming through direct messages and comments. (Customer feedback → SMEs)

## 4.2 Axial Coding

Due to the natural relationships identified among the subcategories in the open coding process, we organized the six subcategories into two primary categories (non-technical capabilities and social media implementation) based on the interconnections and logical hierarchy among these subcategories. The primary categories and their respective subcategories are detailed in Table 2.

## 4.3 Selective Coding

After systematically coding the data, it became clear that both primary categories are centered on small and medium enterprises (SMEs). As a result, SMEs have been designated as the central category, and the overarching narrative within this core category can be distilled as follows: both primary categories, namely, the non-technical process capabilities of BPM and the implementation of social media, have a beneficial impact on Garment SMEs. The relational patterns of these primary categories can be found in Table 3.

#### 4.4 Theoretical Construction

The non-technical capabilities of BPM are closely related to the human, cultural and structural aspects. Process management, process-oriented culture, and process-oriented structure describe non-technical process capabilities. In this study, the elaboration of non-technical capabilities of the components discussed was adapted to the conditions of the two research object SMEs. The theory used as a reference in the literature in analyzing non-technical aspects is a process capability framework called the process capability framework [15]. This framework divides process capability into two aspects, namely technical aspects and non-technical aspects. This research focuses on examining the non-technical aspects of process capability in SMEs as research objects. Categories that can arise from non-technical aspects include process management, process-oriented culture, and process-oriented structure. Process management in SMEs aims to maintain communication between process actors and external relations related to business processes (customers, suppliers, and other stakeholders). Process-oriented culture in SMEs aims to maintain process-oriented attitudes and behaviors and process-oriented values related to business processes. Based on the findings of these aspects, the process-oriented structure is related to integrated organizational structure, governance, and leadership.

Previous studies have examined the relationship of the antecedent factors underlying the implementation of social media to the potential contribution of SME businesses, which resulted in significant findings that open collaborative business model innovation is needed to implement social media in business processes, and the integration of leadership can create ownership and responsibility in SMEs [47]. Several studies related to the background factors and the impact of using social media on SMEs have also been studied by adopting DOI theory and the TOE framework as a reference for research constructs [39] [40] [5] [12] [50]. Implementing social media in business process management is closely related to the human, cultural, and structural aspects. In this study, the description of the non-technical aspects of the SMEs as the research object is only adjusted to the conditions of the SMEs as the research object. This research focuses on examining correlation between non-technical capabilities of BPM and the implementation of social media in SMEs as research objects. Areas of social media implementation related to searching and sharing information found in SMEs as research objects include searching and sharing general information on SMEs, searching and sharing information on competitors, and searching and sharing customer information. Marketing and branding found in SMEs research objects include social media playing a role in branding, social media playing a role in advertising promotion of products and services, and social media playing a role in marketing research. In customer relations found in SMEs, research objects include social media to communicate with customers, social media to help with customer activities, social media to receive customer feedback, and social media to help find new customers. The theoretical framework that emerges from the research findings illustrates a relationship between non-technical capabilities of BPM and the implementation of social media in SMEs. In particular, these findings relate to existing business activities in 2 different SMEs. The

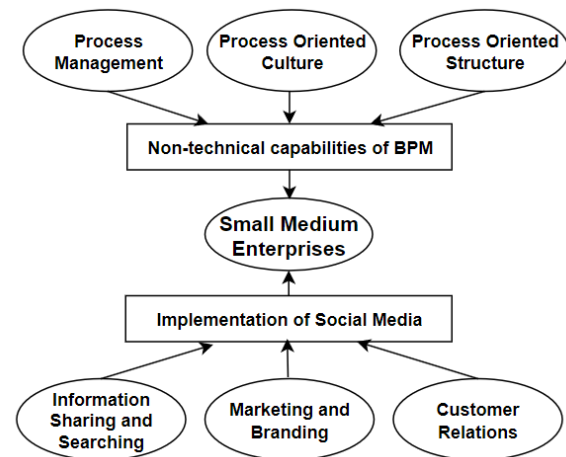


Figure 2: Research mode

analysis results based on the research that has been done produce the research model depicted in Figure 2.

Based on Figure 2, the findings of this research produced an analysis of the influence of non-technical capabilities of BPM on the implementation of social media in both SMEs. Non-technical capabilities of business process management influence the enhancement of social media implementation in terms of searching and sharing information. This is realized through the roles and responsibilities of SME owners and employees who manage social media to create product content and present information about current trends, new product launches, or content related to general SME information. Non-technical capabilities of business process management affect the implementation of social media in terms of marketing and branding in SMEs. This is manifested by both researched SMEs having implemented social media from the beginning of their business operations, and currently being able to apply appropriate process strategies through advertising strategies using ads, endorsements, and influencer collaborations to assist with product promotion, marketing, and branding. Non-technical capabilities of business process management impact the implementation of social media in terms of customer relations within SMEs. This relates to external relationship communication by implementing social media for interaction with customers through surveys (polling questions) regarding proposed products derived from customer feedback. Non-technical capabilities which are culture-oriented processes and structure-oriented processes influence the implementation of social media in terms of customer relations within SMEs. This is manifested by attitudes and behaviors that consistently offer polite greetings when serving customer orders via social media while maintaining a friendly demeanor when handling complaints or complaints (responding to chats) with good words.

#### 4.5 Data Validity Testing

Data validity checks are performed to verify whether the research conducted is indeed scientific and to examine the acquired data. It also aims to determine whether a study is accurate from the



**Table 4: The triangulation methods**

Triangulation methods	1 <sup>st</sup> SMEs	2 <sup>nd</sup> SMEs
Data source	Owner of garment SMEs	Owner of garment SMEs
Data collection technique	Interview and observation	Interview and observation
Data collection time	May, 5 <sup>th</sup> 2019; June, 25 <sup>th</sup> 2019; August, 14 <sup>th</sup> 2019	August, 7 <sup>th</sup> 2019; September, 10 <sup>th</sup> 2019; September, 20 <sup>th</sup> 2019

**Table 5: The transferability testing**

Research Finding	1 <sup>st</sup> SMEs	2 <sup>nd</sup> SMEs
Business Strategy	Transitioning from reseller to self-manufacturing; establishing a production facility; paid advertising and endorsment; Instagram giveaway to attract new customer; collaboration with instagram influencers; creating marketing content through instagram; studying suitable methods for implementing social media to engage customers and increase like and comments to attract more customers	Transforming square and pashmina hijab production into instant hijabs; expanding its hijab business by increasing production capacity; utilizes Instagram ads as a advertising strategy and creates campaign videos tailored to the target market; Aligning business processes with business goals (production quantity with targets achieved, product rejection rate, and the number of product orders per week)
process-oriented attitudes and behavior	Honesty, continuous learning, diligence, competence, and empathy; greeting customers politely and apologizing for service errors; attitude in resolving customer problems and complaints;.	Responsible and sincere attitude towards tasks and work, as well as being friendly and nurturing towards customers; demonstrating understanding towards customers when there are complaints and concerns about products
Catch new customers	Instagram is used to build reputation and grab new customers; advertising and endorsements through social media play a role in introducing products to people and acquiring new customers	Collaborating with influencers whose style and taste align with the product; matching influencers with the target market; utilizing Instagram ads

perspective of the researcher, participants, or research report readers. Data validity refers to whether research findings accurately reflect the situation and are supported by existing evidence. In this qualitative research, data validity testing is conducted through credibility testing (internal validity) and transferability testing (external credibility). Internal validation testing in this research is conducted using the triangulation method. Triangulation can be defined as the process of cross-verifying data from various sources, using different methods and at different times. There are three types of triangulation methods: data source triangulation, data collection technique triangulation, and data collection time triangulation. Data source triangulation involves checking data obtained from multiple sources. In this research, data source triangulation is carried out by mining information from a single perspective, which is the business owner, as they have a better understanding of the entire business process and are the individuals using social media in SMEs. Data collection technique triangulation is done by cross-checking data from the same source using different techniques or by checking data from different informants using the same technique. The primary data source obtained from this research comes from interviews. Interviews are conducted using a set of questions presented to the informants. Data collection technique triangulation in this research is accomplished by conducting follow-up interviews with different informants who possess nearly the same knowledge as the main informant (owner). This is supplemented by direct observations

at the SME office, observing employee activities, monitoring the SME's social media accounts, and studying company documents related to business processes and social media implementation. Time-based data collection triangulation is performed by gathering data repeatedly from informants at different times and locations. This is because each informant has varying availability in terms of time and location, so not all questions can be addressed during a single interview session. The triangulation methods shown in Table 4.

Transferability testing is conducted to ensure that the research findings can be applied to other case studies that share characteristics similar to the one used in this study. This testing is done by systematically organizing the research findings report and explaining that the results of this research can be applied to other research objects that have similarities in characteristics with the case study in this research. The transferability testing details are shown in Table 5.

## 16 CONCLUSION

Based on the research results and the findings obtained, it can be concluded that there is a correlation between non-technical capabilities of BPM and social media usage in 2 garment SMEs in Surabaya, Indonesia. Non-technical aspects of process management can influence the implementation of social media in terms of information

search and sharing, marketing and branding, and customer relations. Meanwhile, the non-technical aspects of process-oriented culture and process-oriented structures only influence the implementation of social media regarding customer relations. Plus, there needs to be a standard that regulates customer service (service level agreement) relating to the time to reply to customer messages, the time to confirm orders or the response time to customer complaints in SME-scale business processes. This research can be used as implementation conceptual model that provides an overview of correlation between the non-technical capabilities of BPM and social media in SMEs. The study of non-technical BPM capabilities can be applied to improve the organizational structure present in SME. An example is the case study used as the object in this research, where two garment SMEs have implemented non-technical BPM capabilities, enabling them to run more efficient business processes. The implementation of social media can be carried out by involving employees who manage social media in training related to content writing, thereby enhancing the implementation of social media for customer relations. This is recommended so that the implementation of social media in SMEs will become more optimal.

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