






Exploring the Role of Interdisciplinary Communication Theories in Diffusion of Innovations: A Review

Yumna Zahran Ramadhan¹, Muharman Lubis²,
Deden Witarsyah³, and Luthfi Ramadani⁴

^{1,2,3,4} Telkom University, Jl. Telekomunikasi, 40257, Indonesia
¹ezzayumna@student.telkomuniversity.ac.id

Abstract. This article discusses various interdisciplinary communication theories and their application in understanding complex social phenomena. The Diffusion of Innovations theory is discussed in detail, including its model, factors that influence innovation diffusion, and the role of communication theory in its application. Additionally, the Brand Trust-building Model is explored from the perspective of Social Information Processing Theory, discussing the concepts of trust and online brand trust, as well as factors that influence them. The article also discusses the relationship between capabilities, aspirations, and digital literacy, examining their respective characteristics and how they are interrelated. Furthermore, the role of social cues in written communication is explored, along with factors that influence their use. The article concludes by discussing the application of previous research on diffusion of innovation in understanding complex social phenomena and the use of capabilities and aspirations as analytical tools, including their strengths and limitations. Overall, this article provides valuable insights into interdisciplinary communication theories and their practical applications in understanding social phenomena.

Keywords: diffusion of innovations, brand trust-building, social cues, capability and aspiration

1 Introduction

In the rapidly developing era of globalization and advancing technology, the diffusion of innovation is crucial to ensure successful adoption of technology in society and the market [1]. However, this process is not easy and is influenced by various factors such as innovation characteristics, user characteristics, and communication between the parties introducing the innovation and those who will adopt it [2], [3].

To explain how an innovation spreads and is accepted by society, the Diffusion of Innovations (DOI) theory has been developed. This theory consists of various fields of science such as communication, sociology, and psychology, and the Diffusion of Innovations model is used to describe the stages in the innovation diffusion process [4]. In the field of wireless communication and signal processing, innovation diffusion is crucial to ensure successful technology [3]. Therefore, many studies have been conducted to understand the factors that influence the innovation diffusion process in this field.

However, to fully understand the innovation diffusion process, other interdisciplinary communication theories besides DOI are needed.

This paper discusses the role of interdisciplinary communication theories in the innovation diffusion process, especially in the context of wireless communication and signal processing. Some important concepts that will be discussed include the Brand Trust-building Model, trust and online brand trust, capabilities, aspirations and digital literacy, social cues in written communication, as well as the application of capabilities and aspirations as an analytical tool. This paper aims to provide useful insights for researchers and practitioners interested in the innovation diffusion process and the use of communication theories in the context of wireless communication and signal processing.

2 Ease of Use

2.1 Diffusion of Innovations: An Interdisciplinary Communication Theory

Diffusion of Innovations (DOI) is a theory that encompasses the fields of communication, sociology, and psychology, used to explain how an innovation spreads and is adopted by society [4], [5]. In DOI, the adoption of an innovation is defined as an individual's decision to use a particular innovation and involves five stages: knowledge, persuasion, decision, implementation, and confirmation. There are four main elements in the Diffusion of Innovations Model: the innovation, the communicator, the communication channel, and the adopter [6]. Positive innovation characteristics and individual characteristics such as attitudes, perceptions, values, and technology skill levels affect the adoption of innovation. Effective communication is also crucial in the process of diffusion of innovation [7]. DOI places communication as a key element in the process of diffusion of innovation [8]. Therefore, communication theories have an important role in understanding and managing the process of diffusion of innovation. In addition to DOI, interdisciplinary communication theories such as persuasion theory, social network theory, and technology acceptance theory can also be used in understanding and managing the process of diffusion of innovation [4], [9], [10]. Researchers can integrate various relevant communication theories in understanding and managing the process of diffusion of innovation to strengthen the use of communication theories in the diffusion of innovation [11].

2.2 Brand Trust-building Model – From Social Information Processing Theory Perspectives

In a study entitled "Brand Trust Development Model - From the Perspective of Social Information Processing Theory," Social Information Processing Theory (SIPT) was used to build brand trust [12], [13].

SIPT is a communication theory that explains how individuals process social information to form their perceptions and behaviors. In the context of brands, SIPT can be used to understand how individuals process brand information and build trust in the brand [14]. The Brand Trust-building Model (BTBM) was developed based on SIPT

and used to understand the factors that influence the formation of brand trust. This model consists of five main factors: brand communication clarity, brand consistency, brand reliability, brand expertise, and brand congruity [14]–[16]. This study also identifies three stages in building brand trust and explains how the components of the Communication Model of Credibility, Social Influence, Perceived Risk, and Trust (CMC-SIPT) can affect these stages in online brand communication [17]. Therefore these are three stages that occurred for the brand trust model as following figure 1;

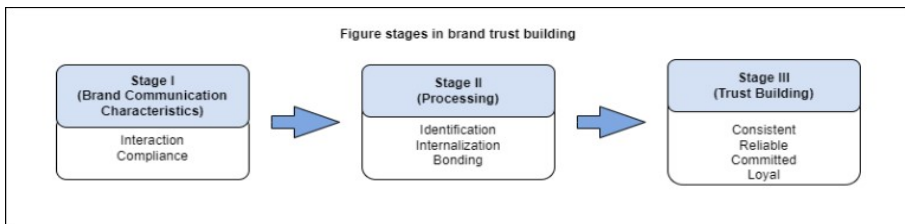


Fig. 1. Stages in Brand Trust Building

This study suggests that companies should consider these factors in their brand communication strategies to build trust in their brands on social media. Additionally, this study shows that trust involves an individual's evaluation of communication [18], [19]. Therefore, companies should consider credibility, social influence, and perceived risk when communicating with customers on social media to build trust in their brands [20]. In conclusion, this study concludes that the use of SIPT in BTBM can help companies understand how consumers process brand information and build effective communication strategies to build trust in their brands on social media.

2.3 Concept of Trust and Online Brand Trust

Trust is a complex concept that has been extensively studied in various disciplines such as psychology, sociology, and management [21], [22]. Trust refers to an individual's belief in the honesty, integrity, and ability of another person or organization to fulfill their promises or obligations. In the context of business, online brand trust is important for building long-term relationships between companies and customers [21]. Factors such as website quality, product quality, brand reputation, and customer interactions influence online brand trust. Strategies that focus on meeting these factors can help companies build strong and sustainable online brand trust [23]. Data security and privacy issues also need to be considered in building online brand trust.

Various disciplines such as management, sociology, and psychology have developed relevant trust theories for understanding the concept of online brand trust. The transactional trust theory in management assumes that trust is built through repeated interactions between parties involved in a transaction [24]. Institutional trust theory in sociology is also relevant because trust can be influenced by social norms and culture in society. In addition, psychological theories such as attachment theory assume that trust is built through safe and stable relationships [24], [25]. To build online brand trust, companies can use strategies that focus on meeting the factors that influence it. In the digital

and online era, companies can also use social media and other online platforms to interact with customers and strengthen online brand trust [25]. However, companies must also consider data security and privacy issues as these can affect consumer trust [26]. The concept of trust plays an important role in interpersonal relationships, group behavior, management effectiveness, and business interactions, and can form mutually beneficial and long-term relationships.

2.4 Capabilities, Aspirations, and Digital Literacy

Digital skills, aspirations, and literacy are interconnected concepts that discuss the skills, goals, and use of digital technology [27]. Skills refer to an individual's ability to carry out specific tasks, while aspirations refer to an individual's ambitions or goals in achieving success. Digital literacy refers to an individual's ability to use digital technology effectively to access, evaluate, and create information. In the context of digital literacy, proficiency in using digital technology is necessary to enhance digital literacy. Aspirations can motivate individuals to improve their skills and digital literacy [27], [28]. Various factors such as age, education, gender, and cultural background can affect an individual's level of digital literacy. Efforts need to be made to improve digital skills, aspirations, and literacy to reduce the digital divide and promote digital inclusion [28].

The capabilities approach is often used in ICT4D research to develop new frameworks. Education plays a crucial role in the capabilities approach as it can enhance an individual's ability to develop in society and can also be a predictor of internet knowledge and digital skills, which can ultimately be economically beneficial [27], [29].

The aspiration-based approach focuses on how an individual wants to become in the future and the skills needed to achieve it. This is different from the needs-based approach that is often used to enhance the skills of individuals or communities through ICT4D. However, basic needs and short-term goals must also be met before aspirations can be achieved [30]. Digital literacy is essential in achieving an individual's aspirations because it refers to an individual's ability to effectively use digital information to achieve desired goals. Adequate education and computer access are crucial in improving digital literacy, especially for those who aspire to higher goals such as becoming a university student [29], [30].

2.5 Social Cues over Written Communication

Social cues are information that provides insight into the feelings, thoughts, or desires of others in social interactions [31], [32]. Social cues are primarily visible in face-to-face communication, but in written communication such as emails or text messages, social cues are less visible. Nevertheless, the use of written social cues such as emojis or certain punctuation marks can help in understanding messages and avoiding misunderstandings [33]. The use of written social cues is also influenced by cultural factors, context, and personal preferences. In conclusion, social cues play a crucial role in human communication, including in written communication. However, online social cues

should be viewed critically and not overly relied upon for the information they provide [34], [35].

3 Research Method

3.1 Capability and Aspirations as an Analytical Tool

The concepts of capability and aspirations have become increasingly popular as analytical tools in many fields, including research. Capability pertains to the skills, knowledge, and resources possessed by individuals or groups to achieve their goals, while aspirations relate to long-term hopes, dreams, and objectives. This approach can help identify factors that influence goal attainment and desired aspirations [27]. However, the application of capability and aspirations concepts also has its advantages and disadvantages. One advantage is that it helps understand social and economic conditions more comprehensively and identifies gaps between capability and aspirations [36]. However, the limitation lies in the difficulty of objectively measuring capability and aspirations, as well as structural and social contextual factors that can influence the ability of individuals or groups. The following Figure 2 is an adaptation of the Adaption of "The Role Knowledge in the Information Value Chain" Model.

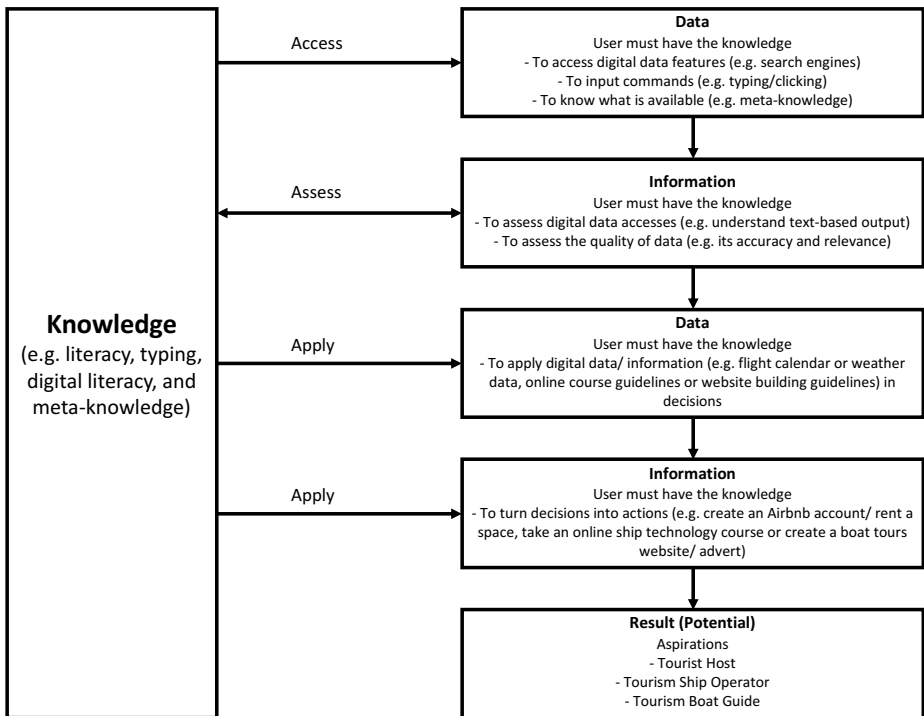


Fig. 2. Adaption of "The Role Knowledge in the Information Value Chain" Model

The capability and aspirations approach is an important analytical tool in research. This approach can be modified and combined with other theories and phenomena for use in ICT4D research. The capability approach considers an individual's ability to achieve their goals and aspirations, while the aspirations approach allows us to understand what individuals want to achieve and the factors that influence their aspirations. The combination of these two approaches can help understand how the use of ICT affects the capability and aspirations of individuals and communities. Although the approach model in the picture is based on a case study in Basti, this approach can be applied to contexts and communities worldwide. However, the application of capability and aspirations concepts must be tailored to relevant conditions and contexts. This involves collaboration among various stakeholders.

4 Design Analysis

4.1 Interdisciplinary of Relationship of Diffusion Research

The field of interdisciplinary studies has become increasingly vital in addressing complex issues that require a comprehensive approach, between diffusion theory, the Brand Trust-building Model, the Concept of Trust and Online Brand Trust, Capabilities, Aspirations, and Digital Literacy, and Social Cues over Written Communication. The Diffusion of Innovation theory explains the process of innovation diffusion throughout a community, while the Brand Trust-building Model employs Social Information Processing Theory to comprehend how trust is established in online branding. Furthermore, trust plays a significant role in online branding, and the development of digital capabilities, aspirations, and literacy are critical factors for individuals to achieve their goals. In written communication, social cues can impact the message's perceived meaning by the recipient. The Fig 3 bellow show how relationship happened,

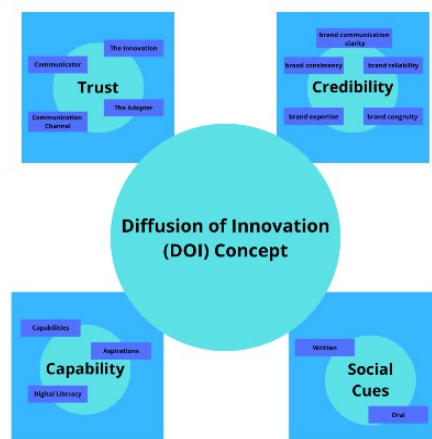


Fig. 3. "Interdisciplinary of Relationship of Diffusion Research" Model

4.2 Making Greater Use of Prior Diffusion Research

The diffusion of innovation has been a continuously studied topic in the field of innovation for several decades. Conducting a literature review of previous studies on the diffusion of innovation can help researchers identify trends and patterns in previous research [37], [38]. From here, researchers can develop ideas for their own research and strengthen previous findings with better data and methods. After collecting all the information from previous studies, analyzing and synthesizing these findings becomes very important in extracting useful insights and discoveries [39]. By critically analyzing previous studies, researchers can find differences, similarities, and gaps in research. Then, by synthesizing these findings, researchers can develop new ideas or stronger models in understanding the diffusion of innovation [40], [41]. Implications of previous study findings can also enrich the understanding of the complexity of the phenomenon of innovation diffusion [42]. By understanding the implications of previous study findings, researchers can develop new concepts that are more advanced and useful for practitioners and academics in the future. Like many previous studies, Banerjee et al.'s study (2019) confirmed the principle of homophily in the diffusion process (Rogers & Bhowmik, 1970). Instead of people with higher status in the social system, such as parents in the village who rarely interact with those who have lower status, informal opinion leaders (some of whom may also have high status) are trusted, easily accessible, and expert people who can help spread information and innovation effectively [43], [44].

These informal conversations (gossip) also reinforce the importance of proximity: the closer people are, the faster and wider the diffusion will occur in the social system. Although this study follows the core idea of leader-based diffusion strategies, this study shows some limitations that need to be seriously considered in future diffusion studies [45]. The diffusion theory shows other concepts that influence the adoption, implementation, and sustained use of innovation, such as complexity, relative advantage, compatibility, trialability, and observability (Rogers, 2003). In addition, previous studies have also emphasized the importance of social and cultural context in the diffusion process, such as institutional, political, and economic factors that can influence the adoption and diffusion of innovation (Dutta & Roy, 2017). In looking at the limitations of Banerjee et al.'s (2019) study, there are several things to consider. First, this study was only conducted in one village, so generalizing the findings to the entire population needs to be questioned. Second, this study only considers informal opinion leaders in the diffusion process and does not consider the role of formal or institutional leaders in the diffusion of innovation. Third, this study does not consider the influence of new technology and media in the diffusion process, such as the use of social media and digital technology that can accelerate and expand the diffusion of innovation [46]. Therefore, recommendations from a communication perspective for future diffusion studies are to expand the scope of research to various social and cultural contexts, consider the role of formal and institutional leaders in the diffusion process, and consider the influence of new technology and media in the diffusion of innovation [47], [48]. In addition, future diffusion studies can integrate qualitative and quantitative approaches in research to produce more comprehensive understanding.

4.3 Knowledge and Capabilities towards Aspirations

Knowledge and skills are important factors in achieving one's goals [49]. Knowledge refers to a person's understanding of a specific topic or concept, while skills refer to practical skills required to perform a certain action or activity. When discussing an individual's development in career or education, it is important to consider the relationship between knowledge, skills, and goals. Individuals who have relevant knowledge and skills to their career or educational goals tend to be more successful in achieving them. Factors that influence knowledge and skills are highly varied depending on the individual's context and environment. Some factors that may influence both are education, work experience, and opportunities to practice or develop skills [49], [50]. Therefore, it is essential for individuals to recognize these factors and strive to acquire the necessary knowledge and skills to achieve their goals. A theoretical model was created based on the goals of three participants in a sample group who had goals in the local tourism sector. This model shows the necessary path to achieve the digital literacy required to meet their goals [51]. Their goals consist of various professions observed in this study and have been adapted into an optimized Infoplaza scenario.

This model uses a multi-theory approach to consider the available skill landscape in more practical development strategies. In this model, prerequisite access to ICT and knowledge about ICT are necessary to acquire the required level of digital literacy to achieve their goals. However, digital literacy does not only include technical skills in using ICT, but also involves the ability to make decisions based on information and acquired skills. Therefore, digital literacy must be understood as broader skills and knowledge than just technical skills. This theoretical model emphasizes the importance of considering the available skill landscape in development strategies to achieve goals. Goals, in and of themselves, do not provide a complete view of the challenges and opportunities in the environment where they are met. Therefore, a multi-theory approach that considers the available skill landscape can help develop more practical development strategies to achieve these goals.

5 Acknowledgement

In conclusion, interdisciplinary communication is a valuable approach to understanding complex problems by combining knowledge from various fields. The diffusion of innovations theory and social information processing theory are two communication theories that can be combined to understand how innovation spreads and trust is built in online brands. Trust is an important factor in building brand reputation, and it can be built through factors such as customer interactions and the visual impression of the brand's website. The interrelated concepts of digital ability, aspiration, and literacy can be used to analyze how individuals can use their knowledge and skills to achieve their goals and aspirations. However, the implementation of these concepts also has limitations. Through a review of previous studies, researchers can analyze and conclude findings to gain a deeper understanding of the diffusion of innovations and its critical rules in the digital age.

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