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## Theories of Information and Communication in the face of risks from 1948 to 2024

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**Abstract:** The objective of this study was to review the literature regarding information and communication theories. A documentary, exploratory and retrospective study was carried out with a sample of sources indexed to indexed repositories. The results demonstrate the prevalence of five dimensions reactive to information, communication, opinion, meme and networks. In relation to the state of the art which highlights the importance of disaster risk communication, this work highlights the importance of reviewing the literature in order to model the relationships between hegemonic categories. This document highlights the importance of professional, academic and labor training based on the review of theories in the period from 1948 to 2024.

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### 1. Introduction

The information society dates back to the evolution of communication and information technology over time [1]. Communication was based on rudimentary forms such as spoken language and gestures [2]. The invention of writing marked an important milestone in the history of communication [3]. Early forms of writing, such as Egyptian hieroglyphs and Mesopotamian cuneiform, allowed the transmission of information from one generation to another [4]. In this period, information is limited to the description of events, but it was not until the invention of the printing press by Johannes Gutenberg in the 15th century that allowed the mass production of books and other printed materials. This led to greater dissemination of knowledge and the democratization of information. The Industrial Revolution brought with it advances in communication technology, such as the telegraph and telephone, which accelerated the speed of long-distance communication, but also the manipulation of codifiable information [5]. The 20th century witnessed rapid evolution in communication technology, with the invention of the mobile phone, television and the personal computer [6]. These advances laid the foundation for the modern information society. The creation of the Internet in the 1960s and its subsequent commercial expansion in the 1990s revolutionized the way information is accessed, shared, and processed. The Internet became the main means of communication and an almost unlimited source of knowledge.

The information society is characterized by a series of elements and dynamics that reflect the impact of information and communication technologies (ICT) on all aspects of daily life [7]. In the information society, there is unprecedented access to information. Thanks to the Internet and other digital technologies, people can access a wide variety of knowledge and resources from anywhere and at any time [8]. The production and consumption of

digital content are ubiquitous in the information society. People create and share a wide variety of content, including text, images, videos and music, through online platforms such as blogs, social networks and websites. However, the objective of this work is to compare the themes of the theoretical agenda with respect to the axes of discussion in the analysis of this literature. That is, people may believe that they are free to inform and communicate, but the Spanish sociologist points out that they are rather limited to a network of data that can lead to some knowledge.

Are there significant differences between the information society distinguished by freedom of choice, information and communication reported in the literature with respect to the observations of the present study?

In this way, the present work works from the premise according to which those who are structured in informational and communicative networks do not necessarily start from economic dichotomies.

## 2. Method

### Identification of Relevant Theories

Literature review or list of relevant theories in the field of information and communication [9]. Consulting reliable sources or using academic databases, books, journal articles, and other reliable resources to identify the most influential theories.

### Understanding Selected Theories

Analysis of key texts of each theory to understand its foundations, concepts and approaches [10]. Identification of historical context or understanding of the historical and social context in which these theories emerged, as well as their mutual influences [11]. Examination of case studies or examples and case studies that illustrate the practical application of each theory in different contexts.

### Critical Evaluation

Analysis of strengths and weaknesses, evaluating the strengths and weaknesses of each theory in terms of its applicability, relevance and coherence with the observed phenomena [12]. Comparison of theories or making comparisons between the selected theories, highlighting their differences, similarities and areas of overlap [13]. Consideration of controversies or examination of possible controversies, criticisms and debates surrounding each theory, as well as the responses and adaptations that have arisen as a result.

### Synthesis and Conclusions

Identification of emerging patterns and trends that cut across various theories, as well as areas of convergence and divergence [14]. Formulation of conclusions or summary of findings and conclusions about each theory, highlighting its contributions to the field of information and communication [15]. Proposing future directions for research based on identified limitations, emerging areas of interest, and needs of the field.

### Documentation and Communication

Writing a detailed report that documents your review of information and communication theories, including all the previous steps [16]. Presentation of results and conclusions in a clear and concise manner, using graphs, tables or other visual means if necessary [17]. Discussion and feedback on the review, allowing others to provide their perspectives and comments.

## 3. Results

Table 1 shows a comparison of the theories related to information. The prevalence of five interpretive frameworks related to communication, information, meme, opinion and network is appreciated. Inter- and multidisciplinary approaches are observed around basic sciences and engineering, as well as natural and social sciences.

*Table 1. Comparison of theories from 1948 to 1989*

Theory	Founder(s)	Year(s) of Development	Main Focus	Main Concepts	Applications
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Communication theory	Claude Shannon	1948	Communication and Transmission of Information	Entropy, Bits, Communication Channel, Noise	Digital Communications, Telecommunications
Information theory	George Miller	1956	Cognitive Information Processing	Short Term Memory, Processing Capacity, Chunking	Cognitive Psychology, Interface Design
Meme Theory	Richard Dawkins	1976	Cultural Evolution and Transmission of Information	Cultural Genes, Memes, Cultural Replication	Cultural Evolution, Memetic Studies
Opinion theory	Jurgen Habermas	1962	Social Communication and Formation of Public Opinion	Public Sphere, Ideal Communication, Communicative Action	Sociology, Social Communication, Politics
Network theory	Manuel Castells	1989	Impact of Information Technologies on Society	Communication Networks, Network Society, Flow Spaces	Sociology of Technology, Media Studies

The literature consulted highlights a fundamental theory of communicability, which encompasses all human communication in its subjective mode, with an equation for functional information equivalent in importance to that of structural information [18]. The state of the art enunciates the central tenet of media richness theory, derived from contingency theory, and identified important but untested assumptions about the relationships between information processing capabilities, demands, and performance [19]. The literature consulted introduces critical social theory as a new perspective to study the richness of communication in computer-mediated communication, moving away from Information Richness Theory (IRT) due to recent unfavorable empirical evidence [20]. The state of knowledge focused on defining relevant concepts of communication and governance in relation to the Internet and democracy, analyzing the causal links between technology and politics [21]. The literature provides strong support for the complementarity theory by comparing the use of communication channels for health information by victims of fake news [22]. The state of the art extends critical research in information systems to public discourse on information technology, proposing an approach to apply communication theory to Critical Discourse Analysis (CDA). The literature highlights situational crisis communication theory (SCCT) and attribution theory to explain public responses to disaster risks, highlighting the importance of distinctive information in shaping attributions [23]. The literature discusses the social information processing theory of computer-mediated communication and the hyperpersonal model, emphasizing how individuals and groups form impressions and develop relational communication online [24]. The state of the art conducts a field experiment based on media richness theory, information and communication technology (ICT) succession theory and socially mediated crisis communication (SMCC) model.) to inform disaster communication management and theory building.

#### 4. Discussion

Castells introduced the concept of "network society" to describe the interconnected nature of contemporary society [19,26]. In this view, networks are the fundamental structure underlying all social institutions, from business organizations to local communities to online social networks. Castells examines how information and

communication technologies are transforming work and the economy [19]. It describes the emergence of an information economy characterized by the production and exchange of information and knowledge as key resources.

At first glance, interconnectivity appears to be an amplified freedom in the choice of informative and communicative topics. The network society seems to indicate that these freedoms are capable of self-organizing and configuring an information context that would necessarily lead to knowledge which would translate into utilities, benefits and gains.

On the other hand, Marx indicates that the economic structure is the guideline for other superstructures such as the legal and political. The change in the economic base will define the transformation of any superstructure. Awareness of this process can only be established in social interaction. On the other hand, Castells (2001: p. 16) warns that access to information depends on the geography of the user and such a structure defines their location on the Internet as a user, disseminator or analyst. Structure for Marx (1859) is the relations of production and structure for Castells (2001) is the relations of information [25,26].

However, Castells' contribution to the information society does not lie in the structure of communication or the resulting knowledge. Rather, Castells (2001) discovers that this network society precedes the information, communication and knowledge society. Such a question is relevant in light of the dichotomy between freedom and equality. Although Website (1995: p.99) presents Castells as a disciple of Marx, such a statement is not entirely consistent with Marxist thought. The economic structure conditions the information and communication structure, but Castells seems to observe in society a network of equalities that reveals inequalities. Consequently, Marx (1859) and his theory of historical materialism where a society that evolves from contradictions is derived is far from Castells (2001) and his theory of the network society where networks are configured from informational and communicative relationships. not economical. Such asymmetry is due to the fact that although Castells (2001) shares with Marx (1859) a structure on which another superstructure is configured, in the end Castells advances towards a network society that Marx could not appreciate because he assumed the economic structure defines any superstructure. Castells seems to abandon dichotomous Marxism and move towards a reticular Castellismo.

## 5. Conclusion

The network society is Castells' central contribution, even though it is not entirely related to Marx's economic structure and is not made explicit as a result of the production relations exhibited in historical materialism. The network society is important in light of the fact that they precede the information society. If the informational society is distinguished by its real-time and emerging processes, the network society supposes a reversible transit of information and communication that would allow the self-organization typical of the informational society.

Castells is very distant from Marx, even though he starts from the same hypothesis according to which a structure gives rise to a superstructure, but they distance themselves regarding the result of this process. Marx suggests the emergence of a new transitory dictatorship of the proletariat and Castells simply suggests a fusion between the parties involved. While Marx legitimizes a single thought consisting of being for or against an oppressed class, Castells suggests that such a dichotomy disappears if it is assumed that information prevails in decisions and not ideology [25,26].

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- **Ethical approval:** The conducted research is not related to either human or animal use.
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