ON THE SIGNIFICANCE OF INFORMATION AND INFORMATION MANAGEMENT SYSTEMS IN CONTEMPORARY SOCIETY

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Abstract

In the evolving landscape of contemporary societies, the possession and management of information emerge as potent tools shaping power dynamics and societal progress. This work deals with the critical role of information, emphasizing its transformative potential and the challenges associated with its effective utilization.

The exploration begins by highlighting knowledge as a modern form of power, propelling societies towards new opportunities while concurrently addressing pressing social issues. The argument underscores the urgency of understanding information as a social category, essential for influencing phenomena, solving problems, and steering societal developments. Practical application is identified as a key driver, with specialized information system models under development to cater to diverse aspects of social life and work.

The interconnectedness of global progress and the imperative of information, emphasizing the need for collaboration, knowledge exchange, and a universal approach to information dissemination, is a focal point. The challenge of overcoming information concentration, a barrier that perpetuates narrow interests and raises concerns about misuse, is duly deliberated. It is suggested that the solution lies in fostering closer ties between nations, sharing knowledge, and engaging in dialogue to address global issues comprehensively.

We argue that organized information systems, both national and international, are essential for dynamic development. This emphasizes the necessity of a globally coordinated approach. Acknowledging achievements from other nations is essential to avoid redundancy and foster innovation.

Information, in various forms, emerges as the foundational element influencing effective decision-making. Decision-making in complex societal and international landscapes is scrutinized, revealing the indispensable role of information in scientific, technological, and socio-economic progress. The interconnected dimensions of socio-economic development and decision-making are explored, emphasizing the need for objective scientific analyses and a deep understanding of contemporary social processes.

We delve into the ethical dimensions of information handling, highlighting the positive contributions of information to science, technology, and societal relationships. Simultaneously, we address the concerns of information misuse, particularly in the creation and utilization of databases containing extensive citizen data. The challenge of balancing national interests with ethical data handling practices is presented, urging the establishment of universally agreed-upon rules for responsible data management.

This work underscores the ongoing global efforts to harness the potential of information. While acknowledging the positive commitment towards understanding the significance of information, it asserts that the problem is yet to be fully researched and resolved. The failure to grasp the true meaning of information and underutilization of its potential are identified as factors with profoundly negative consequences. Finding effective solutions to ensure that information contributes positively to global progress and the well-being of humanity, remains an open research problem.

Keywords: information management, knowledge as power, information systems, information concentration, decision-making, ethical dimensions, responsible data management, underutilization of information potential.

1 INTRODUCTION

The phrase knowledge is power is often attributed to Francis Bacon, and his work Meditationes Sacrae from 1597. The concept that knowledge confers power and influence has been present in various forms throughout history and across cultures. In modern terms, it reflects the importance placed on acquiring proper information through education and intellectual development.

However, the acquisition of knowledge is not a passive process; it requires persistent effort, consumes substantial resources, and demands a significant investment of time and cognitive energy. As knowledge integrates into social existence, collaboration between science and practical application becomes crucial, highlighting the imperative of proper information management in today's global context.

Information is inseparable from the humans as the creators and their labor. This puts significance of the information as the fundamental interface between individuals and the society. In a technologically advanced society, there is an emphasis on the necessity for affirmation of the creative and decisive societal position of the creators and maintainers of true and real informational values.

In the democratic paradigm of modern societies, information management takes central focus. Active participation, freedom, knowledge, and collective interest in social affairs hinge on the dissemination and utilization of information. Decision-making at all levels rooted in knowledge and self-determination is emphasized, challenging the influence of a minority with a monopoly on obscure information.

To ensure efficacious and judicious decision-making, access to information is imperative in contemporary societies. This approach empowers decision-makers to align their will, needs, and interests with collective goals while facilitating the evaluation of decision outcomes and re-harmonization with organizational dynamics.

Given these considerations, there is a compelling need to focus on the development of an information management system. This extends beyond institutionalized forms within societal processes to encompass theoretical frameworks governing the theory of information and information science.

Examining the role of information in societal management raises a central concern: how to ensure its availability, keep individuals informed about social functions, and enable managers to wield information effectively. The problem of information management in a social context goes beyond simplistic notions of possessing or lacking certain techniques and technologies, emphasizing its complex role in social and political relations.

Real information management holds considerable influence across domains and is a contemporary necessity, not only crucial for the present but also as an invaluable asset for the future. Information has the power to reshape societal value systems and alter the fabric of our world for the better.

The need for a thorough exploration of information management arises from the challenges posed by an ever-changing social landscape, prompting complex questions about the meaning and application of information. This work emphasizes the increasing significance of knowledge and awareness in influencing decision-making, execution, and control within management. Rather than providing a prescribed management model for social organizations, it acknowledges the complexity of information management and advocates for a comprehensive analysis of the relationships, interdependencies, and influences of various information phenomena and processes.

Information and its management in social organizations involve a multidisciplinary approach, demanding specialized knowledge from various scientific fields. Successful design, implementation, and development of information systems require leveraging scientific advancements in both natural and social sciences. In the modern world, information contributes significantly to scientific and technical progress, becoming a driving force for societal development and democratic social relationships. The increasing volume of information underscores the necessity for effective information management in societal management.

The abundance of information and data, coupled with the challenge of finding and selecting relevant and applicable information, poses a dual problem of information processing and societal management. Societal management is deemed impossible without information management, emphasizing the need to address the

complexities of information processing in social organizations. The theoretical emancipation of information, combined with practical application, is highlighted as a complex task that requires constructing theories grounded in modern scientific achievements.

Neglecting the study of information hinders societal progress, as inadequate information can lead to erroneous decisions and wasteful resource expenditure. This work recognizes that it only addresses a portion of the broader issue of information management, emphasizing the importance of an integrated approach. From a sociological standpoint, the paper seeks to explore, clarify, and advocate for a deeper understanding of information management within social organizations, encouraging a departure from schematic frameworks to address nuanced questions causing confusion in this domain.

2 DEFINITIONS AND CONCEPTS

The term "information" is approached and defined in various ways due to the extensive need for understanding it across different areas and levels of social life and international relations. This diversity in definitions stems from both theoretical and practical perspectives, influencing how information is perceived. The definition of information is not solely based on its content but is also shaped by its practical utility, leading to potential misunderstandings as theoretical perspectives coexist with numerous hypotheses awaiting clarification.

Finding a universally applicable definition for information is a challenging task due to reasons such as the multidimensionality and multidisciplinarity of the field. Terms like information, reporting, and data are often used interchangeably in theoretical discussions and everyday language, contributing to ambiguity. Despite efforts to precisely define the concept of information, achieving a universally agreed-upon result remains elusive.

The complexity of the science of information adds to the challenge, with some theorists opting not to provide a strict definition at all. The inherent multidimensionality of information, combined with its application across diverse disciplines, results in a coexistence of various definitions. The ongoing challenge lies in establishing a singular, universally accepted definition for information.

Efforts to compile an exhaustive list of existing definitions often fall short, given the vast array of interpretations that differ, complement, or even oppose one another. Despite this diversity, attempts to conceptually define information share a common objective: to explain what information is. As a result, various definitions related to the subject continue to emerge, reflecting the pervasive nature of information across different branches of science and real social relations.

According to Norbert Wiener (Wiener, 1950), information is the content of what we exchange with the external world as we adapt to it and influence it through our adaptation. The process of receiving and utilizing information is essentially our way of adapting to the external environment's coincidences and striving to live effectively within it. In the context of modern life, with its increasing needs and complexity, the information process is called upon to fulfill ever-expanding roles. Living effectively is synonymous with being well-informed. Consequently, communication and management of information are integral to the core of human inner life, just as they are fundamental to life within society.

According to Claude Shannon, information is a measure of the uncertainty associated with a message (Shannon, 1948). Shannon defines the amount of information in a message as the reduction in uncertainty that the message provides. Shannon's information theory is based on the idea of entropy, borrowed from thermodynamics, where entropy is a measure of disorder or randomness.

Andrey Kolmogorov, a prominent Soviet mathematician, is notable for his development of algorithmic complexity, also known as Kolmogorov complexity or algorithmic entropy (Kolmogorov, 1965). This is a concept closely related to the definition of information. The idea is to measure the complexity or information content of an object by the length of the shortest possible algorithm or program that can (re)generate that object. The shorter the algorithm, the less complex or more compressible the object is considered to be. In this context, information is tied to the idea of compressibility or predictability. If a string of data can be compressed into a shorter representation or algorithm, then it is considered to contain less information according to Kolmogorov. On the other hand, if the data is highly random or lacks regular patterns, it may be less compressible and, therefore, considered to contain more information.

The above authors and their perspectives lean heavily towards a mathematical and technical understanding of information, neglecting the broader context of human cognition, cultural nuances, and the dynamic nature of meaning. Their definitions fall short in capturing the intricacies of communication, perception, and the diverse ways in which information is processed and valued in different contexts. These frameworks primarily address technical systems and communication channels, neglecting the broader social and cultural aspects

of information.

The concept of information ought not be confined to machines; it is deeply embedded in human interaction, language, and societal structures.

Bateson (1972) discussed the concept of metacommunication, which involves communication about communication. This idea reflects his belief that information is not only transmitted through explicit messages but also through the broader context, non-verbal cues, and the overall pattern of communication within a system. While this work didn't provide a straightforward definition of information, it suggests that information is intricately tied to the context of communication and is not limited to the explicit content of a message. It involves understanding the broader system and the relationships within which communication takes place. The work emphasizes the idea that information is not just about the content of a message but also involves the context in which it is communicated.

The conveyance and reception of knowledge represent a crucial aspect of information, taking various forms such as spoken or written language, visual representations, and diverse expressions. Information, viewed as a message or signal, is transmitted through verbal communication, written documents, images, symbols, or any meaningful representation.

In the digital landscape, information takes on a new dimension as digital data, stored, processed, and transmitted by electronic devices. The value of information lies in its relevance, accuracy, and applicability for making informed decisions or taking specific actions.

Contrary to being static, information involves a dynamic process — a continuous cycle of learning and dissemination, where knowledge or news is shared between individuals or entities. In the contemporary societal context, information transcends raw data, delving into insight and understanding through data analysis.

This transformation involves processing and organizing raw data to present it in a way that imparts significance and utility, going beyond mere figures and algorithms. The evolution of information science challenges the traditional divide between natural and social sciences.

Various perspectives on the definition of information highlight the interdisciplinary nature of the concept, emphasizing that authors from different scientific disciplines bring unique viewpoints on the importance and nature of information.

Giddens (1984) has discussed the concept of structuration and the role of information in social practices. In this view, information is a crucial component of social structures, and it is through the use of information that individuals reproduce and transform social systems.

Bourdieu (1986) focused on the relationship between culture, power, and social reproduction. In this work concepts of cultural capital and symbolic power are relevant to understanding how information is used strategically within social contexts to confer advantages or reinforce social hierarchies.

Luhmann (1995) conceptualized information as a key element in the functioning of social systems. Luhmann shares some of the concepts of mathematical theory of information and views information as a form of communication that reduces uncertainty within a system. As uncertainty is undesirable, information plays a crucial role in maintaining the stability of social systems.

Castells (1996) argues that contemporary societies are characterized by the pervasive influence of information and communication technologies. Consequently, information is a fundamental element shaping power relations and social structures in the modern era.

The quest for a comprehensive definition of information is ongoing, lacking a universally agreed-upon answer at present. While examining information from specific aspects contributes to the development of information science, it falls short of providing a holistic understanding of the issue. The complexity of the information problem persists, necessitating a coordinated effort for its solution through collaborative work across scientific disciplines.

The development of information science requires an interdisciplinary approach and systematic collaboration. This involves incorporating insights from various branches of science to advance our overall understanding of information. In the absence of a universally agreed-upon definition, a proposed concise and global conceptualization of information is offered. This conceptualization transcends precise characterization and envisions information as substantive content capable of instigating or guiding human activities and behaviors.

This proposed definition recognizes the dynamic and multifaceted nature of information, emphasizing its role

as a driving force behind human actions and decision-making processes. By focusing on the motivating and influential aspects of information, the conceptualization aims to capture the essence of the term, accommodating its diverse manifestations across various contexts and disciplines.

2.1 Information Science

Information Science, a multidisciplinary field dealing with the knowledge, technology, and communication, in its essence, seeks to understand the acquisition, storage, and communication of information, exploring the ways in which data transforms into meaningful information.

In this dynamic realm, researchers and professionals draw upon principles from computer science, library science, and cognitive science to unravel the complexities of information processing. Information Science encompasses the study of diverse phenomena, from the algorithms powering search engines to the intricacies of human cognition and interaction with information.

Information Science plays a pivotal role in shaping how we harness, organize, and derive value from the wealth of information that surrounds us, influencing everything from decision-making processes to the advancement of knowledge across various domains.

In this section we explore the concepts of informatics and cybernetics, as these terms appear to be fundamental to the use of information and information science in general.

The term informatics, derived from the combination of "information" and "automatic," originated in France in the 1960s when Philippe Dreyfus, a French computer scientist, introduced it to describe the study of information processing. It gained popularity in Europe, especially in France and the United Kingdom. In 1966, the French Academy defined informatics as the systematic and efficient processing of information, particularly with the aid of machines. This field served as a medium for human knowledge and communication in technology, economics, and social sciences.

In the Soviet Union, informatics emerged later to replace the cumbersome term "scientific and technical documentation". This term was used globally to describe the methods for collecting, processing, preparing, and retrieving scientific information from publications. In the Soviet Union, informatics was closely associated with information theory and computer science, emphasizing mathematical and theoretical aspects of computation and information processing.

In the United States, informatics gained widespread usage in the 1980s and 1990s, particularly in the healthcare context. Health informatics, applying information technology to healthcare, aimed to enhance the management and delivery of health services. Simultaneously, the term documentation fell out of use, replaced by information science.

Europe uses informatics interchangeably with what the USA terms computer science. The expectation is that these interpretations will converge in the future. Information science and computer science, being interconnected, are likely to evolve into the unified entity of data science. Recognizing the inseparability of information systems from technical tools, and their critical role in management and decision-making, informatics should be understood as a synthesis of the above two distinct approaches.

The definition of cybernetics faces challenges similar to those encountered with the term information. Norbert Wiener is acknowledged as the founder of cybernetics after his 1948 work titled "Cybernetics: Or Control and Communication in the Animal and the Machine" (Wiener, 1948). Despite initial resistance, cybernetics is now recognized as a science worldwide. Wiener offered the following definition: Cybernetics is the scientific study of regulation, control, and feedback loops in electrical connections, machines, humans, and social aggregates.

Vladimir Moiseev, in his work "Central Ideas and Philosophical Principles of Cybernetics" (Moiseev, 1967), defined cybernetics as a scientific discipline addressing general issues related to the management and functioning, connections and logical operations of self-governing biological (living), technical (artificial), and socio-economic (societal) systems.

Cybernetics, with its focus on supplying specific information for various operational needs, relies on modern electronic devices such as computers. In the realm of societal management, it should function as an additional tool for handling social processes, particularly in the creation of new social values. While cybernetics cannot completely eliminate inherent social contradictions in societal management, its goal is to identify these contradictions' sources and propose optimal solutions. It's crucial to recognize that cybernetics is not intended to be a superior science; rather, it should be conceptualized within the domains of management and information. Its role is to provide scientific clarifications and practical applications within this framework.

3 INFORMATION AND SOCIETY

Given the role of information in today's world, a thorough exploration of its essence as a social category becomes imperative. Presently, there is significant research focused on the application of distinct models of management information systems to social relations. Specialized information system models are under active development for specific areas of social life and work (see e.g. Petter et al., 2008, and the references therein). This research is particularly relevant because our world is characterized by constant decision-making, and information plays a colossal role in providing increased opportunities for positive impacts — scientific, technical, economic, and cultural. In addition, information management also poses challenges for humanity: questions arise about overcoming the concentration of information that leads to the dominance of narrow interests via potential information misuse.

3.1 Global Progress and the Imperative of Informational Collaboration

The pursuit of progress in socio-economic, social, and cultural realms is a shared goal of society and social communities. This progress is realized through the acquisition of new knowledge, the unveiling of discoveries, and the attainment of accomplishments. It is crucial to recognize that this forward movement is inherently rooted in existing knowledge and discoveries.

Collaboration among societies is key to creating an environment conducive to dynamic development and enhanced security. In our contemporary era, no society can operate in isolation, highlighting the interconnectedness of global communities. The significance of scientific and technical discoveries is escalating, yet their accessibility to humanity is diminishing.

While scientific and technical advancements can emerge globally, their value tends to be confined within the boundaries of countries and languages. Overcoming these limitations requires goodwill for the collective benefit of humanity and a well-coordinated dissemination of information. Staying informed about global scientific and research progress, including developments within one's own country, necessitates awareness of a vast array of publications contributing to scientific, economic, and cultural knowledge.

Failing to stay updated and leveraging prior achievements, particularly the most significant ones, can result in lagging behind or duplicating efforts on discoveries already made and published elsewhere. The challenge lies in obtaining accurate, real, and timely information and having the means to effectively utilize it. A lack of such information and opportunities gives rise to problems, leading to wasted time and resources and contributing to a state of backwardness, dependence, and subjugation.

Backwardness is multifaceted, arising from factors such as the inability to apply scientific and technical advancements from other countries. This dependence, in turn, fosters the subjugation of less developed and poorer states or regions by more advanced and affluent ones. Recognizing and addressing these challenges is essential for fostering a more equitable and progressive global society.

The key to addressing global challenges lies in fostering closer ties, exchanging knowledge, promoting reconciliation, and engaging in dialogue among all countries, especially those that are poor, underdeveloped, or small. This collaborative approach serves as a comprehensive foundation for global progress and the well-being of people worldwide. A crucial element for this solution is the reliable and unhindered circulation and application of information.

Information serves as a catalyst for development, facilitating the integration of various sectors in social life. It not only saves time and money but also generates limitless opportunities for financial gain, playing a fundamental role in the advancement and application of science. Despite the continuous creation of information in science and technology, its dissemination often lacks proper organization or faces impediments.

Recognizing the significance of information and awareness in all aspects of life becomes integral to a sound scientific understanding of various forms, phenomena, and processes. Modern and effectively organized information systems, both national and international, are essential for ensuring the dynamic development and practical realization of scientific and technical achievements, playing a crucial role in facilitating the dynamic development of all social communities.

While countries are individually developing information systems to meet their informational needs, such efforts are insufficient for comprehensive success. The establishment of a nationally organized international system for information and communication, linking the information and information systems of individual countries functionally, is crucial for global success. Without such a global approach, efforts will be inadequate and increasingly insufficient.

As physical resources are consumed and limit the production of various goods, the wealth of human knowledge continues to grow. This knowledge can act as a substitute for depleted resources, providing abundant alternatives. For both new advancements and the utilization of existing ones, organized dissemination of information is indispensable.

3.2 Decision-Making in Complex Societal and International Context

The foundation of the decision-making process and the advancement of science, technology, and socio-economic development are deeply rooted in information. This connection is crucial, as decision-making and socio-economic development are interdependent dimensions that shape and complement each other.

Societies, operating across various levels and domains, are compelled to make decisions to influence processes and address relationships. Organizations, to navigate the dynamic landscape of internal and external relations, must determine and adapt their position, implying that decisions are essential for achieving set goals.

In any decision-making context, whether political, administrative, managerial, or international affairs, information in its diverse forms and communication means is indispensable. It holds substantial influence, increasingly becoming a prerequisite for effective decision-making. To influence the decision-making process, one must possess satisfactory knowledge of the relevant issues. Effective influence is only achievable when the decision-maker comprehends the problem at hand. In essence, without adequate knowledge, there is no influence, and without complete information, optimal decision-making remains elusive.

Participation and influence in decision-making require a grasp of political and economic realities and an understanding of their interdependencies. Acquiring such knowledge is challenging, as it necessitates a fundamental understanding of societal development and trends, contributing to more specific and individual awareness.

Every decision involves selecting a solution from various alternatives. The challenge lies in choosing a rational and efficient solution that fosters balance, stability, or the lowest degree of disorganization. In the current complex economic and political landscape, the key question is how to opt for the lesser evil.

Decisions can have short-term and far-reaching consequences, playing a pivotal role in the development of organizations, social communities, and international relations. Making sound choices in complex conditions is not straightforward. A good decision must meet several requirements, making the decision-making process a highly responsible endeavor that necessitates appropriate conditions, including the provision of adequate information and the opportunity to utilize it effectively.

3.3 Balancing National Interests and Ethical Data Handling

The positive perception of information's value is accompanied by concerns about its potential misuse in specific applications. When information is exploited to establish conditions of dependence, subordination, and dominance, it transforms into an uncontrollable power dictating individuals' existence. This issue is closely linked to the challenge of managing and deterring the misuse of data and information.

The complexity of controlling data and information, especially in databases, is shaped by societal dynamics and the international economic and political landscape. The prevention of information misuse presents a delicate balance between overcoming information withholding and addressing legitimate concerns about potential misuse, particularly in today's uncertain international political stage.

The fear of information misuse is supported by the argument that scientific and technological advancements are influenced by economic development, closely tied to each country's defense and security needs. As a result, crucial information remains secretive within national boundaries, contributing to insecurity, mistrust, exploitation, and subjugation among nations.

Simultaneously, the creation and utilization of databases, especially those containing extensive citizen data, pose significant risks if not handled responsibly. These databases, with vast information on individuals, can be abused, leading to the establishment of powerful regimes and encroachment on citizens' freedoms. To mitigate these risks and maintain a balance between the interests of individuals, data users, and society, it is imperative to establish robust rules governing the creation and use of databases.

The security of data becomes exceptionally vital when it pertains to information crucial for national defense, security, crime prevention, and citizen data. Safeguarding citizens' data in terms of collection and use is a complex matter, even when a country has stringent rules in place. The accuracy and security of citizen data depend on those responsible for collecting and using it, creating a self-referential paradox. Consequently,

ensuring control over the collection and use of citizen data within a country presents a formidable challenge.

In the contemporary landscape, data collection techniques enable automatic aggregation and processing of information globally, spanning across countries. This global accessibility raises concerns about the potential for unchecked collection, use, and abuse of data. To address these concerns and ensure data security internationally, there is an urgent need for universally agreed-upon regulations that each country should follow. These mandatory regulations would establish a framework for responsible and ethical data handling, mitigating the risks associated with uncontrolled data use and abuse across borders.

It is essential to recognize that the overarching problem is not just about the necessity and significance of information. Instead, challenges related to information stem from existing conditions at both national and international levels. Therefore, it is crucial to explore the root causes within each society and across societies. Consequently, continuous universal efforts should be dedicated to finding solutions that leverage information in the service of humanity's progress.

4 CONCLUSION

Efforts on a global and national scale are imperative for the precise evaluation and harnessing of information management, given its paramount importance in the contemporary world. These initiatives should collectively aim to elucidate the meaning of information, comprehend its effects, and determine practical implementations in real-world conditions. Despite the positive commitment to clarifying information's significance in today's civilization, the problem remains unresolved in alignment with its true meaning.

The failure to grasp the meaning of information and its underutilization carries significant negative consequences. Fortunately, valuable information tends not to remain exclusive to small groups but becomes part of society or humanity, contributing to accelerated global development, albeit potentially delayed.

In a world where the continued existence and progress depend on ever faster development, the indisputable importance of information and its role is evident. Information is poised to become a fundamental resource of the future, paralleling the significance of matter and energy. Currently grappling with challenges related to energy and raw materials, the world anticipates intensified issues in the future, necessitating solutions. Notably, the world also faces the challenge of information and communication, a crisis that may not be as palpable as others but is equally crucial.

The world faces a myriad of problems today, and a significant contributor to this is the information crisis. Accessing essential information has become a serious challenge, with conflicting perspectives on the abundance of available data. While there's a prevailing belief that people are overwhelmed with information daily, there is also a recurring theme that individuals often lack necessary information for effective problem-solving.

The paradox lies in the abundance of information itself. Despite the wealth of data, critical tasks are often approached with insufficient or contradictory information, leading to a crisis. This situation arises from the ineffective management of the available information, which remains unguided and inefficiently utilized. Failing to address this issue adequately poses a looming risk, with the potential for a decline in the availability of useful information in the coming decades if current behavior persists.

In the contemporary world, the lack of a unified long-term policy on information exacerbates the problem. Recognizing that challenges in scientific and technical development require a collaborative approach, countries need to move beyond isolationist strategies. While there are indications and initiatives, achieving a genuine dialogue to resolve this problem will likely take considerable time.

Despite existing difficulties and disagreements, countries must summon the resolve to establish a minimum balance. The dangers posed by the information crisis should drive nations to at least agree on a basic framework, acknowledging their shared responsibility in addressing these challenges.

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