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Information Logistics in Knowledge Organization: Concepts, Models, and Applications. New Perspective

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Abstract
Contemporary society is facing rapid and uneven transformation in epistemology, technological infrastructures, and cultural conceptualizations, particularly amid the rise of artificial intelligence. The field of knowledge organization (KO) is no exception. The current International Conference ISKO constitutes a marvelous opportunity to explore in depth the strategies, approaches and practices which could transform the field of KO, and in a significant way result in the creation of more just, balanced, and reflective systems of knowledge. The subject of the conference supposes the understanding of transformation as not only the normal adaptation of new instruments or contexts but also as a critical process in the renewed research of the fundamentals, functions and future of KO. These concern in works that investigate the way in which systems of classification, ontologies, metadata and other KO structures are embedded in social, historical and technological processes as well as how these may be reprojected in order to reflect pluralistic, epistemologies, cultural diversity and ethical obligations. Information Logistics (IL) has emerged as a strategic domain focusing on the efficient flow, delivery, and contextualization of information and knowledge. When integrated with knowledge organization, IL expands the traditional scope of classification, indexing, and metadata design to embrace dynamic, process-oriented information management. The paper examines the conceptual foundations of IL, its relationship with knowledge organization, and its implications for contemporary KO. The analysis highlights IL's role in enhancing information and knowledge accessibility, reducing cognitive overload, and supporting KO research and theory.
Keywords: Knowledge Organization. Information Logistics. Information flows. Knowledge flows. Information and knowledge streams.

1.0 Introduction

Science activity operates in environments characterized by data abundance, rapid information exchange, and complex knowledge structures. Traditional knowledge methods: classification schemes, ontologies, taxonomies and metadata remain vital but are insufficient on their own to support real-time contemporary information and knowledge organization needs. Information logistics addresses this gap by ensuring the timely, high-quality, and context-relevant distribution of information. It shifts the focus from static information repositories to dynamic systems that model, monitor, and optimize information flows and streams.

Information Logistics has emerged as a conceptual and practical response to increasing information overload and the growing need to deliver timely, relevant, and context-aware information in knowledge processes (Kardasz et al. 2022). The literature reflects IL's evolution from logistics-inspired information flow management toward a multidisciplinary

field intersecting with knowledge organization, knowledge management, and semantic technologies.

This article explores how IL intersects with KO to create a comprehensive framework supporting knowledge creation and organization. It is a creative development, after 10 years, of the problems raised in the article (Babik 2016), published in the series "Advances in Knowledge Organization", vol. 15, and its synthetic presentation using rational suggestions of artificial intelligence.

2.0 The Concept of Information Logistics and Knowledge Organization: A Complementary Perspective

Information logistics is the process of planning the acquisition, transformation, storage, and distribution of information, as well as managing its transfer. It serves to ensure the correct transfer of data and information, the minimization of losses, and the streamlining of information management. Information logistics can be defined as a conception of science for the activities of information transfer whose fundamental area for realization are the functionally specialized activities for information transformation along with defined benefits relating to the transfer of resources/flow of information. It supports the undertaking of decisions and the effective employment of intellectual resources (Sułkowski 2012). In such a systemic understanding, information logistics can be perceived as a science for the coordination of transfer processes/the circulation of information and its sources, and the leveling of all irrational activities/operations in this area, particularly those resulting from a improper organization of work (Babik 2025, 23). Here, the focus is primarily on rationalizing information-resource transfer flows within subsequent information-organization processes concerned with the creation of added value (Babik 2018).

Information logistics adapts principles from physical logistics: supply, distribution, and optimization to digital information environments. Its primary objective is the efficient orchestration of information supply chains. IL rests on several foundational concepts:

- The 5R model, delivering the right information to the right receiver (person, organization) at the right time, in the right form, and with the right quality.
- Flow optimization: reducing delays, redundancies, and interruptions in information exchange.
- Demand orientation: identifying and predicting use information needs.
- Quality assurance: ensuring accuracy, relevance, completeness, and currency.
- Scalability and flexibility: enabling adaptation as organizational processes evolve.

By treating information as a strategic resource, IL ensures that organizational actors can act effectively in knowledge organization contexts.

Knowledge Organization traditionally involves systematic structuring of information resources (Dahlberg 2014). Its main components include classification systems and taxonomies, ontologies and semantic networks, indexing and abstracting methods, metadata standards and knowledge representation models (Gnoli 2020). KO focuses on meaning, relationships, and the semantic structure of information, ensuring that content is comprehensible, searchable, and interoperable. However, KO often emphasizes storage

and retrieval (Hjørland 2016), whereas information logistics emphasizes distribution and use. Together, they form a dynamic ecosystem.

3.0 Integrating Knowledge Organization and Information Logistics

The integration of KO and IL creates a holistic framework that addresses not only how information and knowledge are organized, but also how it moves and how users interact with it/them. This can be achieved through structural and dynamic synergy in KO and the knowledge supply chain model. The first provides structures (metadata, vocabularies, classifications) and IL ensures motion (delivery pathways, routing, context-aware dissemination). Their integration supports personalized information and knowledge delivery, contextual search and retrieval, automated knowledge flows, reduction information overload, enhanced decision support. The second provides the opportunity to create appropriate information supply chains. When KO and IL are combined, information and knowledge flows resemble supply chains with the following stages: information and knowledge sourcing identifying relevant internal and external resources, semantic structuring using KO tools to ensure coherence, flow modeling mapping how information and knowledge should circulate, distribution delivering information and knowledge through appropriate channels, feedback loops monitoring usage to refine future flows.

Information logistics and KO can support a range of technologies, including knowledge management systems (KMS), enterprise search platforms, semantic technologies and knowledge graphs, workflow automation tools, machine learning systems for classification and recommendation and enterprise content management (ECM) tools. These technologies enable real-time, user-centric information and knowledge delivery and support interoperability across organizational silos.

4.0 Organizational Applications, Benefits, and Challenges

It can be applicated for example in academic and research institutions by automated dissemination and new publications, advanced research discovery tools and optimized scholarly communication workflows; in public administration by document routing systems, integrated service portals and legal and procedural knowledge bases; in business and industry by business intelligence dashboards, customer support knowledge bases and context-aware knowledge delivery for managers and employees. Across sectors, IL improves productivity, enhances information high quality, and supports knowledge organization.

Benefits for KO are improved decision–making, lower risk of information overload, enhanced user experience, greater operational efficiency and stronger organizational memory. The challenges primarily concern the complexity of mapping information and knowledge needs, maintaining metadata quality at scale, integrating heterogeneous data sources, ensuring security and privacy and organizational resistance to adopting new information and knowledge workflows. Successful implementation requires a socio-technical approach combining technology, processes, and cultural change.

5.0 From Information Logistics to Knowledge Logistics

Information logistics applies logistical principles such as efficiency, coordination, and demand orientation to information flows. It seeks to ensure that the right information is delivered at the right time, place, format, and quality. It is a principle frequently emphasized across foundational research (Weiland and Wierzbowski 2020). Knowledge organization provides the semantic and structural foundations that support information logistics in routing, contextualizing, and retrieving information efficiently. IL complements KO by introducing flow optimization and demand orientation. Knowledge logistics can use these IL processes to optimize knowledge flows and knowledge demand.

Information logistics allows one to arrange various means for the knowledge organization and knowledge employed in IT activities based on written and digital communication ("Information Logistics" n.d.). These concern bibliographical relations, thematic connections, the contacts maintained by academics, the means for information and knowledge transfer, the conceptualization of ideas and their development, citations, co-citations and self-citations, the structure of written and digital works and the birth of new academic disciplines, networks of academic contacts (of invisible colleagues), thematic links and connections, including the interdisciplinary and the multidisciplinary as well as the necessity for the multi-aspectual comprehension of research problems the most frequently cited, of the most often quoted academics and scientists, of the latest trends in science, of the transfer of concepts and new ideas, including streams of information as well as knowledge in combination with the statistics employed to rank and evaluate academic scientific publications and the innovativeness of academic works themselves, as equally the scientific articles contained in them. It is very important especially in areas with a shorter lifespan of knowledge and information.

6.0 Conclusion

Information logistics enriches the field of knowledge organization by introducing dynamic, flow-oriented principles that reflect the needs of modern organizations. By coordinating how information and knowledge are structured and how it circulates, IL and KO together support a more agile, informed, and knowledge-driven organizational environment. As data volumes grow and complexity intensifies, this integrated perspective will become increasingly essential for effective knowledge organization and management, and organizational success.

Research in networked knowledge organizations highlights that logistics information plays a crucial role in scenarios requiring fast access to distributed knowledge resources, particularly in non-routine and dynamic work contexts. IL leverages semantic networks, ontology engineering, and context modeling to support demand-oriented information and knowledge supply. Central to IL is information-flow management, which is essential for enabling knowledge creation and organization. Studies demonstrate that disruptions or inefficiencies in information flow adversely affect knowledge production and dissemination, underscoring KO's role in structuring flows that support organizational knowledge processes (Zeng 2008).

This study highlights significant gaps, including the need for unified conceptual models, consistent metrics for information flow performance, and cross-disciplinary integration KO and LI. It emphasizes that information flow is a prerequisite for effective knowledge

creation, organization, and use. Information flow models articulate how timely and accurate information exchange shapes knowledge organization development. The information logistics literature stresses the two-directional nature of information flow in supply chain settings and its essential role in coordinating activities and verifying transactions. These insights transfer to knowledge organization contexts, where information exchange precedes and enables knowledge sharing processes. This approach identifies bottlenecks and inefficiencies in knowledge flow across organizational units—key concerns within KO. It reveals that knowledge organization requires not only adequate information structures but also efficient routing, coordination, and flow management practices.

Digital transformation has intensified the need for IL and KO. Bibliometric studies of digital supply chains show increasing interest in information-centric and knowledge-centric flow management, integrating IL approaches with KO and knowledge management to address fragmented information ecosystems. Knowledge graph-based information systems demonstrate how semantic structuring, automated data integration, and personalized information delivery improve user experience and information accessibility as core IL principles aligned with KO.

Knowledge organization is a dynamic and evolving field that can be significantly enriched by Information Logistics. While KO structures knowledge, IL ensures its effective movement, contextualization, and timely delivery. Despite growing interest, the research landscape remains fragmented, highlighting the need for integrated theoretical frameworks and cross-disciplinary collaboration. Future research should explore unified models combining KO, IL, and KM, develop metrics for evaluating information flow performance and investigate applications in AI-augmented information and knowledge environments. There should be synergies between multidisciplinarity and transdisciplinarity in IL and KO to develop a new paradigm for knowledge organization. The paper intends to contribute a new research perspective to the debate on transforming knowledge organization, giving a new impetus to further research in this area.

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