JATLIM International

INTERNATIONAL JOURNAL OF APPLIED TECHNOLOGIES IN LIBRARY AND INFORMATION MANAGEMENT

http://www.jatlim.org

International Journal of Applied Technologies in Library and Information Management 11 (2) 12-130-140
ISSN: (online) 2467 - 8120

Manuscript Number: JATLIM - 2025-11.02/130-140

Theorizing Metaliteracy in Federal University Libraries: Foundations, Implications, and Directions

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Abstract

Metaliteracy, a dynamic and integrative framework that extends beyond traditional information literacy, emphasizes metacognitive awareness, critical thinking, collaboration, and ethical participation in digital environments. As federal university libraries in Nigeria navigate rapidly evolving educational technologies and learner expectations, there is a critical need to theorize metaliteracy within their institutional contexts. This paper presents a conceptual analysis aimed at establishing a theoretical foundation for metaliteracy integration in federal university libraries. Drawing on constructivist and socio-technical theories, the study maps the intersections between policy mandates, library practices, and evolving user competencies. The findings contribute a model that highlights the roles of librarians, institutional policy, and collaborative instruction in fostering metaliterate learners. The study proposes that without a strategic alignment of metaliteracy with national education frameworks and library services, federal universities risk marginalizing key 21st-century skills. Implications are discussed for library policy reform, professional development, and future research on assessing the impact of metaliteracy on student learning outcomes.

Keywords: *Metaliteracy, Federal University Libraries, Information Literacy, Digital Literacy, Library Policy, Academic Libraries and Theoretical Framework*

1.1 Introduction

Academic libraries worldwide have undergone profound transformations in response to the rapidly evolving dynamics of information production, access, and dissemination in the 21st century. Driven by the proliferation of digital technologies, these institutions have shifted far beyond their traditional role as custodians of print collections to become dynamic hubs of learning, innovation, and collaboration. Modern university libraries now operate as facilitators of participatory, networked, and co-creative knowledge environments, where students, faculty, and researchers are not merely consumers of information but active contributors to the knowledge ecosystem (Association of College and Research Libraries [ACRL], 2016; Lippincott, 2015). This redefined role aligns with the pedagogical emphasis on learner-centered approaches, critical thinking, and the cultivation of digital literacy skills essential for academic success and lifelong learning.

The transformation also reflects broader societal shifts in how knowledge is created, shared, and validated in an increasingly digital and interconnected world. With open access publishing, digital repositories, multimedia resources, and online collaborative platforms becoming integral to scholarly communication, libraries have evolved into socio-technical systems that blend physical and virtual services. They provide not only access to diverse information resources but also spaces—both physical and digital—that support experimentation, interdisciplinary engagement, and the co-construction of knowledge. In this way, academic libraries have repositioned themselves as central agents in shaping informed, critically engaged, and technologically adept graduates capable of thriving in a global knowledge economy.

In this changing landscape, the capacity of students, faculty, and library professionals to critically navigate, evaluate, and ethically contribute to information ecosystems across diverse media platforms has become paramount. The sheer volume, velocity, and variability of information in the digital age ranging from peer-reviewed research to user-generated content—require individuals to engage with information in ways that extend beyond the retrieval and use skills traditionally associated with information literacy. While the conventional concept of information literacy remains a vital foundation, it does not fully encompass the interdisciplinary competencies, technological fluency, and heightened metacognitive awareness demanded by contemporary knowledge environments.

This paper is organized into nine sections to provide a comprehensive exploration of metaliteracy in Nigerian federal university libraries. Following this introduction, Section 2 outlines the conceptual methodology guiding the study. Section 3 presents a detailed conceptual overview of metaliteracy and its core elements. Section 4 contextualizes the study within the Nigerian federal university library environment. The theoretical framework underpinning the analysis is introduced in Section 5. Section 6 examines practical approaches to embedding metaliteracy into library practices. The implications for key stakeholders, including librarians and policymakers, are discussed in Section 7. Section 8 identifies directions for future research, and the paper concludes in Section 9 by synthesizing key insights and emphasizing the strategic importance of metaliteracy for academic libraries.

1.2 Objectives of the Study

This paper responds to the need for a theoretical grounding of metaliteracy in the context of federal university libraries in Nigeria. It pursues the following objectives to:

1. theorize metaliteracy as a critical framework within Nigerian federal university libraries;
2. explore the foundational elements of metaliteracy and their relevance to academic library services;
3. analyze the implications for library practice, institutional policy, and pedagogy;
4. suggest future directions for research, implementation, and professional development.

1.3 Research Questions

Guided by a conceptual framework informed by constructivist learning theory and socio-technical systems theory, the paper considers the interactions between learners, librarians, institutional policy structures, and technological infrastructures. It seeks to answer the following research questions:

1. What are the theoretical foundations that justify the integration of metaliteracy into Nigerian federal university libraries?
2. In what ways can metaliteracy be effectively integrated into library practice,

institutional policy, and pedagogy?
3. What institutional factors enable or hinder the adoption of metaliteracy principles in academic libraries?
4. What strategies can guide future research, implementation, and professional development in relation to metaliteracy?

2.1 Literature Review

Metaliteracy, introduced by Mackey and Jacobson (2014), offers a more holistic pedagogical framework that responds to these demands by integrating information literacy with related domains such as digital literacy, media literacy, and visual literacy. It emphasizes the development of adaptable, self-reflective learners who can critically assess information sources, engage ethically in collaborative knowledge production, and contribute meaningfully across diverse digital platforms. Crucially, metaliteracy foregrounds metacognition—encouraging learners to reflect on their own learning processes—and promotes participatory learning models that position individuals not merely as consumers of information, but as active creators, curators, and ethical stewards within complex, networked knowledge ecologies. This approach not only strengthens academic engagement but also cultivates the resilience and agility needed to navigate rapidly evolving information landscapes.

Despite its growing global relevance, the concept of metaliteracy remains under-theorized and inadequately integrated within Nigerian federal university library systems. Although progressive strides have been made in embedding elements of digital literacy and information literacy into library instruction programs, these efforts often remain fragmented, skill-oriented, and predominantly tool-based, lacking the holistic, reflective, and participatory dimensions that metaliteracy promotes. The prevailing instructional models tend to emphasize functional competencies—such as database searching, citation management, and plagiarism avoidance—without sufficiently engaging learners in metacognitive practices, collaborative knowledge production, or the ethical responsibilities of digital participation.

This gap is particularly consequential in the context of Nigerian Federal Universities, where students are increasingly required to navigate multifaceted digital landscapes that encompass academic databases, open educational resources, social media platforms, and collaborative online tools. Without a robust conceptual framework like metaliteracy, learners may develop operational proficiency without the deeper critical engagement, ethical awareness, and content creation skills necessary for meaningful participation in the global knowledge ecosystem. As Ifijeh and Yusuf (2020) observe, the absence of such integrative pedagogies limits the capacity of higher education institutions to produce graduates who are not only information competent but also adaptable, reflective, and innovative in addressing complex real-world problems in a rapidly changing digital environment.

2.3 Conceptual Foundations of Metaliteracy

The concept of metaliteracy, introduced by Mackey and Jacobson (2011), emerged in response to the changing nature of the information landscape, characterized by user participation, social media, and collaborative technologies. Traditional literacies such as information literacy, media literacy, and digital literacy were no longer sufficient to equip learners with the comprehensive skills needed to navigate, evaluate, and contribute to information environments effectively. Metaliteracy redefines the role of the learner from a passive consumer to an active, reflective, and ethical participant in the creation and dissemination of knowledge.

Historical Development of Metaliteracy

Mackey and Jacobson (2011) argued for a reconceptualization of information literacy to include the dynamic and participatory dimensions of digital environments. They proposed metaliteracy as a framework that integrates various forms of literacy into a unified model suited for the digital age. This framework promotes critical thinking, collaboration, and responsible content creation—skills essential for learners in the 21st century.

Comparison with Traditional Literacies

While information literacy traditionally focuses on the ability to locate, evaluate, and use information effectively (American Library Association [ALA], 2000), medialiteracy emphasizes the analysis, evaluation, and production of media messages (Aufderheide, 1993). Digital literacy, as defined by Gilster (1997), involves the ability to understand and use information in multiple formats from a wide range of sources when it is presented via computers.

Metaliteracy encompasses and transcends these literacies by fostering a more holistic understanding of the learner's role in a digital environment. Unlike traditional models that often overlook the participatory and ethical aspects of information use, metaliteracy emphasizes metacognitive awareness, collaboration, and digital citizenship (Mackey & Jacobson, 2014).

Core Elements of Metaliteracy

Metaliteracy includes several core competencies that prepare learners to engage critically and responsibly in digital environments:

- **Metacognition:** Encourages learners to reflect on their thinking processes and learning strategies (Mackey & Jacobson, 2014).
- **Collaboration:** Highlights the importance of co-constructing knowledge through peer interaction and digital tools (Jacobson et al., 2018).
- **Ethical Participation:** Stresses responsible and ethical behavior in creating and sharing content online (Mackey & Jacobson, 2019).
- **Content Creation:** Supports learners as producers of information, capable of developing, publishing, and evaluating content in diverse digital formats.

Relevance to the 21st-Century Learner

The 21st-century information environment demands skills beyond basic search and retrieval. With the proliferation of misinformation, algorithmic bias, and the rise of AI-driven platforms, learners need to think critically about the sources and purposes of information. Metaliteracy provides a robust framework for fostering these competencies, especially within STEM fields, where collaboration, data interpretation, and ethical scholarship are essential (Mackey & Jacobson, 2014; Head et al., 2020). By integrating reflective thinking, collaborative learning, and ethical engagement, metaliteracy equips learners with the skills to navigate complex digital spaces and contribute meaningfully to academic and public discourse.

2.3 Federal University Libraries in Nigeria: Contextual Overview

Federal university libraries in Nigeria play a central role in supporting teaching, learning, and research in higher education. As part of the wider national educational infrastructure, these libraries are mandated to provide timely access to scholarly resources, facilitate academic inquiry, and serve as hubs for knowledge dissemination. However, like many academic institutions in developing countries, Nigerian federal university libraries face a range of systemic and technological challenges that impact their effectiveness particularly in relation to digital literacy and emerging frameworks such as metaliteracy.

Overview of the Federal University Library System

Nigeria currently has over 40 federal universities, each with its own university library system that serves as a key academic support structure. These libraries are typically organized under the purview of university administrations and coordinated nationally by bodies such as the National Universities Commission (NUC) and the Librarians' Registration Council of Nigeria (LRCN). Their primary functions include the acquisition and management of scholarly resources, user education, reference services, and research support across diverse disciplines, including STEM (Aguolu & Aguolu, 2002; Mohammed &Garba, 2020).

Technological Infrastructure and Digital Service Provision

In recent years, federal university libraries have made modest progress in integrating digital technologies into their operations. Many libraries have adopted automated library management systems (e.g., Koha, VTLS, and Evergreen), subscribed to electronic databases (e.g., Science Direct, JSTOR, and EBSCOhost), and established institutional repositories for open access research (Ogunniyi, 2020). Additionally, libraries have begun to offer ICT-based services such as online reference, digital cataloguing, and remote access to electronic resources through university portals.

Despite these advancements, disparities in digital infrastructure such as unreliable internet connectivity, outdated hardware, and inconsistent power supply continue to limit the seamless delivery of digital library services across federal universities (Anunobi &Okoye, 2008).

2.4 Challenges in Metaliteracy and Digital Integration

Several barriers hinder the full realization of digital and metaliterate practices in federal university libraries:

- **Policy Misalignment:** There is often disconnect between national education policies, ICT implementation plans, and library development strategies, resulting in inconsistent funding and unclear mandates for digital transformation.
- **Low Digital Literacy Integration:** Many library users, including students and faculty, lack adequate training in advanced digital literacy skills necessary for navigating complex online information environments (Ifijeh& Yusuf, 2020).
- **Underdeveloped Metaliteracy Practices:** Although federal university libraries conduct user education programs, these are often limited to traditional information literacy approaches. They rarely engage learners in the metacognitive, collaborative, and participatory practices that define metaliteracy (Adeleke & Emeahara, 2016).

2.5 Opportunities for Transformation

Despite these challenges, federal university libraries in Nigeria have several strategic opportunities to foster innovation and relevance:

- **Academic Partnerships:** Collaborations with departments, research institutes, and international organizations can facilitate capacity building, training in AI literacy, and collaborative research initiatives.
- **Digital Platforms:** The growing use of learning management systems (LMS), social media platforms, and digital repositories provides a foundation for more interactive and personalized library services.
- **Open Access Initiatives:** The global shift toward open access publishing and institutional repositories offers Nigerian university libraries the opportunity to

increase visibility, access, and impact of local research outputs (Ezema, 2011).

In summary, federal university libraries in Nigeria are at a critical juncture. With targeted policy reforms, improved infrastructure, and the integration of metaliteracy and AI-enhanced services, these libraries can play a transformative role in supporting STEM education and digital scholarship.

2.6 Theoretical Lens and Framework

Understanding the integration of metaliteracy into federal university libraries especially in the context of STEM education requires a robust theoretical foundation. This study draws on constructivist learning theory and socio-technical systems theory to conceptualize the evolving roles of academic libraries in fostering digital competencies and participatory literacies in a technologically mediated environment.

Constructivist Learning Theory

Constructivist learning theory, grounded in the work of Piaget (1972) and Vygotsky (1978), posits that learners construct knowledge through active engagement, social interaction, and contextual experiences. In this framework, learning is not simply the transmission of information but a process of meaning-making facilitated by collaboration, reflection, and real-world application.

Metaliteracy aligns closely with constructivism by emphasizing metacognition, collaborative learning, and knowledge co-creation. Learners are not passive recipients but active participants in shaping and evaluating information through digital platforms, open access repositories, and social technologies. Academic libraries, when framed through this lens, serve as facilitators of authentic learning environments where users engage in critical inquiry, content production, and ethical information sharing (Mackey & Jacobson, 2014).

Socio-Technical Systems Theory

Socio-technical systems theory (STS), introduced by Trist and Bamforth (1951), provides a complementary perspective by examining how people and technologies interact within organizational contexts. The theory asserts that optimal performance emerges when the social (people, roles, structures) and technical (tools, infrastructure, systems) components are harmonized.

This framework is particularly relevant to university libraries, which must balance the introduction of AI-powered tools, digital repositories, and automated library systems with the cultivation of user skills, attitudes, and cultural readiness. STS helps explain the institutional and infrastructural conditions required for metaliteracy to thrive emphasizing the need for policy alignment, professional training, and user-centered system design (Baxter & Sommerville, 2011).

Justification for Theoretical Integration

The integration of constructivist and socio-technical lenses is essential for a comprehensive understanding of metaliteracy in Nigerian university libraries:

- Constructivism explains how learners engage with information, supporting the pedagogical shift toward critical thinking, collaboration, and content creation.
- STS explains what institutional conditions must be in place (e.g., digital infrastructure, supportive leadership, adaptive services) for metaliterate practices to emerge and scale.

Together, these theories provide a dual lens for examining both the learning processes of users and the organizational transformation of libraries in the digital age as shown in figure 1.

Conceptual Framework Diagram

Below is a schematic model that integrates both theoretical orientations as shown in figure 1:

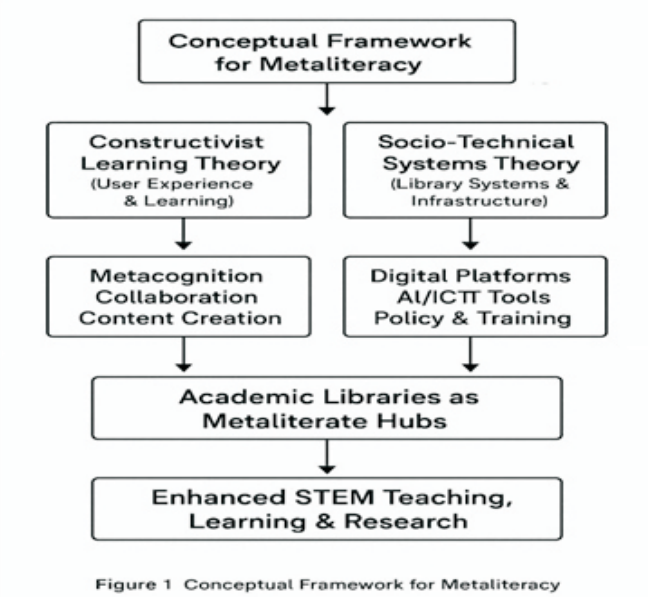

Figure 1: A schematic model that integrates both theoretical orientations for **Metaliteracy**

2.7 Mapping Metaliteracy into Federal University Library Practice

Metaliteracy is a holistic framework that expands traditional information literacy to include collaborative, digital, and reflective practices that are critical in today's participatory information environments (Mackey & Jacobson, 2011). Embedding this framework in federal university library systems enhances student engagement, critical thinking, and ethical digital citizenship.

Proposed Components of Integration

1. Policy Alignment: Aligning metaliteracy initiatives with national education standards and NUC benchmarks ensures institutional relevance and sustainability. The National Universities Commission (NUC) emphasizes the importance of preparing students for complex digital environments, aligning well with metaliteracy's core values.

2. Librarian Competencies and Training: Librarians must acquire competencies in ICT, instructional design, and digital content evaluation. According to Dime, Akporhonor, and Ogbomo (2020), librarians in South-South Nigeria demonstrated strong technological skills in managing electronic information resources, underscoring their readiness for metaliteracy instruction roles.

3. Curriculum and Co-Curricular Infusion: Federal universities can embed metaliteracy into General Studies and research methodology courses. Additionally, co-curricular activities such as digital literacy workshops and scholarly communication bootcamps enhance student capacity in information production and evaluation (Adeniran & Onuoha, 2018).

4. Digital Platforms and Open Pedagogy: Digital repositories, OER, and institutional LMS provide platforms for engaging students in participatory learning and content creation. These platforms support metaliteracy's emphasis on learners as producers of information, not just consumers (Mackey & Jacobson, 2011).

Institutional Examples

1. Federal University of Technology Owerri (FUTO): FUTO Library's community engagement aligns with metaliteracy's focus on social responsibility and participatory information sharing (Wikipedia, 2023a).

2. Redeemer's University, Ede: The

University's information literacy programs integrate critical thinking, ethical information use, and digital resource evaluation (Adeniran&Onuoha, 2018).

Role of Collaboration

Librarians and Faculty: Collaborative teaching and curriculum planning ensure that metaliteracy is seamlessly embedded into academic programs. Co-creating assignments and assessments strengthens student engagement and learning outcomes.

Librarians and ICT Units: ICT staff play a pivotal role in deploying digital tools, managing learning platforms, and supporting e-resource accessibility. Joint training enhances implementation success.

Librarians and Students: Student feedback helps librarians design relevant metaliteracy programs. Peer learning groups and student-led projects encourage participatory knowledge creation.

Integrating metaliteracy into federal university library practice promotes reflective, ethical, and participatory information use. By aligning with national standards, training librarians, leveraging digital platforms, and fostering collaboration, Nigerian universities can prepare students for lifelong learning in a digital world.

2.6. Implications of Metaliteracy Integration

The integration of metaliteracy into federal university systems holds transformative potential for multiple facets of higher education. It significantly affects library practice, educational policy, and scholarly research, paving the way for more engaged, participatory, and reflective learning environments.

For Library Practice

1. Redesign of Instructional Models: Traditional information literacy instruction must evolve to include participatory, digital, and critical dimensions of knowledge. Metaliteracy encourages instructional models that emphasize co-creation, reflective learning, and trans literacy across platforms (Mackey & Jacobson, 2011). Libraries must adopt flipped classrooms, experiential learning, and student-led inquiry as part of their instructional repertoire.

2. Librarian-Faculty Collaboration: Embedding metaliteracy in university curricula requires strong collaboration between librarians and faculty. Co-teaching, joint curriculum design, and integrated assessment strategies are essential for success (Adeniran & Onuoha, 2018). Librarians should be seen as academic partners rather than support staff.

3. Enhanced Student Engagement in Knowledge Production: Metaliteracy shifts students from passive information consumers to active producers of content. This transformation fosters engagement through research dissemination, student publishing in institutional repositories, and participation in open educational resource creation (Mackey & Jacobson, 2014).

For Policy

1. Need for Policy Frameworks Integrating Metaliteracy: Universities and regulatory bodies like the National Universities Commission (NUC) should update academic guidelines to formally incorporate metaliteracy competencies as graduate attributes. This ensures curriculum relevance and alignment with digital society demands (Ifijeh& Yusuf, 2020).

2. Recognition in Librarian Performance Metrics: Librarian appraisal systems must reflect new roles, including curriculum design, digital pedagogy, and student engagement. Inclusion of metaliteracy responsibilities in promotion and evaluation criteria incentivizes innovation in library practice (LRCN, 2023).

For Research

1. Calls for Empirical Studies Evaluating Metaliteracy Outcomes: There is a growing need

for empirical research assessing how metaliteracy influences student learning, academic integrity, and digital citizenship. Such studies will provide evidence for best practices and inform future teaching models (Mackey & Jacobson, 2013).

2. Assessment Tools and Indicators: Development of reliable and valid assessment instruments is essential. These tools should measure competencies such as ethical information use, collaboration, critical thinking, and content creation across digital platforms (Mackey & Jacobson, 2014). Current rubrics and frameworks can be adapted for local use in Nigerian universities.

The implications of metaliteracy are far-reaching. Libraries must reinvent instructional practices, policies must support integrated learning outcomes, and researchers must develop localized tools to measure impact. Through these coordinated efforts, metaliteracy can serve as a foundational competency for 21st-century education in Nigerian federal universities.

3.1. Methodology

This study adopts a conceptual research design, grounded in theoretical exploration rather than empirical data collection. Conceptual research enables the critical synthesis and reinterpretation of existing theories to develop a refined understanding of metaliteracy and its application within Nigerian federal university libraries (Mackey & Jacobson, 2014; Jacobson & Mackey, 2013). It is particularly suited for investigating emerging frameworks in contexts where limited empirical data exist. The study utilizes document analysis and literature synthesis as primary methods. Sources include peer-reviewed journal articles, books, policy documents, and institutional guidelines from bodies such as the American Library Association (2000), the Association of College and Research Libraries (2016), and the Librarians' Registration Council of Nigeria (2023). These documents were critically reviewed to identify recurring themes, theoretical perspectives, and contextual gaps relating to metaliteracy, digital literacy, and information management in academic libraries (Gilster, 1997; Head, Fister, & MacMillan, 2020).

The scope is limited to federal university libraries in Nigeria, selected due to their standardized structures, national coverage, and role in advancing higher education policy. These institutions represent a broad spectrum of library services, user needs, and infrastructural realities (Mohammed & Garba, 2020; Ogunniyi, 2020). The focus also reflects increased attention to digital literacy and resource integration across federal universities (Ifijeh & Yusuf, 2020).

4.1 Directions for Future Research

As metaliteracy continues to gain relevance in global education discourse, especially within the context of digital transformation in higher education, a deeper, empirically grounded understanding is necessary. The following research directions are proposed to build sustainable, context-sensitive applications of metaliteracy in Nigerian.

1. Longitudinal Studies on Metaliteracy and Student Success
2. Comparative Studies across Universities and Regions
3. Development of Context-Sensitive Metaliteracy Frameworks in Nigeria.

Conclusion

This paper has demonstrated the critical importance of theorizing and operationalizing metaliteracy within the evolving landscape of academic libraries in Nigeria's federal universities. As information environments become increasingly complex and technologically mediated, it is no longer sufficient for libraries to focus solely on traditional notions of information literacy. Instead, a more holistic, participatory, and reflective approach embodied in the concept of metaliteracy is needed to prepare students, especially in STEM disciplines, for the demands of 21st-century scholarship.

Drawing on constructivist learning theory and socio-technical systems theory, the paper provided a dual theoretical lens to understand both the learner's engagement with digital information and the systemic transformation required within libraries. These frameworks underscore the necessity of integrating pedagogy, technology, and institutional policy to create environments where learners can collaborate, create, evaluate, and ethically participate in knowledge ecosystems.

Key proposals highlighted include the redesign of instructional models to promote active learning, enhanced librarian-faculty collaboration in course development, and greater student involvement in knowledge production. On the policy front, the need for institutional frameworks recognizing metaliteracy and performance metrics that reflect librarians' evolving roles was emphasized. Additionally, the paper calls for empirical research and contextually relevant assessment tools to measure the effectiveness of metaliteracy programs.

Ultimately, the integration of metaliteracy into the strategies of federal university libraries in Nigeria is not optional it is imperative. Libraries must position themselves as active partners in digital education and innovation, not merely as repositories of information. By embracing this expanded vision, academic libraries can significantly enhance STEM teaching and learning, drive academic excellence, and ensure their continued relevance in the digital age.

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