

An International Journal on Grey Literature



Volume 20, Number 3, Autumn 2024

'HARNESSING, ADOPTING, AND SUPPORTING GREY LITERATURE'

GreyNet

The Grey Journal

An International Journal on Grey Literature

COLOPHON

Journal Editor:

Dr. Dominic Farace
GreyNet International,
Grey Literature Network Service
Netherlands
journal@greynet.org

Associate Editors:

Julia Gelfand, AAAS Fellow
University of California, Irvine
United States

Dr. Dobrica Savić
IAEA Consultant in Nuclear Knowledge Management

Dr. Joachim Schöpfel
University of Lille
France

Prof. Dr. Tomas A. Lipinski, J.D., LL.M., Ph.D.
School of Information Studies
University of Wisconsin--Milwaukee
United States

Dr. Plato L. Smith
University of Florida
George A. Smathers Libraries
United States

Technical Editor:

Jerry Frantzen, TextRelease

About TGJ

The Grey Journal is a flagship journal for the international grey literature community. It crosses continents, disciplines, and sectors both public and private.

The Grey Journal not only deals with the topic of grey literature but is itself a document type classified as grey literature. It is akin to other grey serial publications, such as conference proceedings, reports, working papers, etc.



The Grey Journal is geared to Colleges and Schools of Library and Information Studies, as well as, information professionals, who produce, publish, process, manage, disseminate, and use grey literature e.g. researchers, editors, librarians, documentalists, archivists, journalists, intermediaries, etc.

CIP

The Grey Journal (TGJ) : An international journal on grey literature / Dominic Farace (Journal Editor); Jerry Frantzen (Technical Editor) ; GreyNet International, Grey Literature Network Service. - Amsterdam: TextRelease, Volume 20, Number 3, Autumn 2024 - TIB (DE), CVTISR (SK), EBSCO (USA), KISTI (KR), NIS-IAEA (AT), NTK (CZ), and the University of Florida (USA) are Corporate Authors and Associate Members of GreyNet International.
e-ISSN 1574-180X (PDF)

Subscription Rate:

€240 institutional

Contact Address:

Back Issues, Document Delivery, Advertising, and Subscriptions:

TextRelease
Javastraat 194-HS
1095 CP Amsterdam
Netherlands
T +31 (0) 20 331.2420
info@textrelease.com
<https://textrelease.com/glpublications.html>

About GreyNet

The Grey Literature Network Services was established in order to facilitate dialog, research, and communication between persons and organizations in the field of grey literature. GreyNet further seeks to identify and distribute information on and about grey literature in networked environments. Its main activities include the International Conference Series on Grey Literature, the creation and maintenance of web-based resources, a Global Distribution List and Social Media, and The Grey Journal. GreyNet is also engaged in the development of distance learning courses for graduate and post-graduate students, as well as workshops and seminars for practitioners.

Full-Text License Agreement

In 2004, TextRelease entered into an electronic licensing relationship with EBSCO Publishing, the world's most prolific aggregator of full text journals, magazines and other sources. The full text of articles in The Grey Journal (TGJ) can be found in *Library, Information Science & Technology Abstracts* (LISTA) full-text database.

© 2024 TextRelease

Copyright, all rights reserved. No part of this publication may be reproduced, stored in or introduced into a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without prior permission of the publisher.

Contents

‘Harnessing, Adopting, and Supporting Grey Literature’

Harnessing the Power of AI for Managing Grey Literature	167
Dobrica Savić, IAEA Consultant in Nuclear Knowledge Management, Austria	
All in the Mind - Adopting an Agile Mindset as the Prerequisite to Agile Transformation	178
Alistair Reece, GeoScienceWorld, United States	
Grey Literature Supporting the Right to Knowledge	183
Silvia Giannini, Stefania Lombardi, and Anna Molino, Institute of Information Science and Technologies, ISTI-CNR, Italy	
Realizing the Potential of Grey Literature by Recognizing its Publishers: The PUBGREY Project and the Case of Climate Change	197
Dominic Farace, GreyNet International, Netherlands; Stefania Biagioni and Carlo Carlesi, ISTI-CNR, Italy	
Data from “Realizing the Potential of Grey Literature by Recognizing its Publishers: The PUBGREY Project and the Case of Climate Change”	204
Dominic Farace, GreyNet International, Netherlands; Stefania Biagioni and Carlo Carlesi, ISTI-CNR, Italy	
Identifying Possibilities of Emerging Technology Adoption in the Fashion Industry: Levering Insights from Grey Literature	207
Arianne Muthia Zahra, Wawan Dhewanto, and Akbar Adhiutama; School of Business and Management, Bandung Institute of Technology, Bandung, Indonesia	
Strategic Design of Performance Management for Ministerial Organizations: A Comprehensive Literature Review in the Public Sector	218
Didi Kurniadi Halim, Dermawan Wibisono, and Nur Budi Mulyono; School of Business and Management, Bandung Institute of Technology, Bandung, Indonesia	

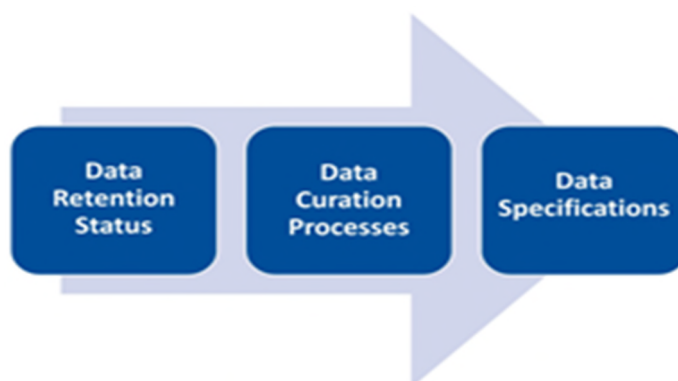
Colophon.....	164
Editor’s Note.....	166
On The News Front	
International Directory of Organizations Grey Literature	
4th edition, March 2024 - ISBN 978-90-77484-43-2.....	233
PUBGREY, Registry of Publishers in Grey Literature	
First edition, 2023 https://greynet.org/pubgrey.html	234
Advertorials	
INIS, The International Nuclear Information System.....	177
CVTISR, Slovak Centre of Scientific and Technical Information	206
GreyNet International, A publisher in Grey Literature	238
Author information.....	235
Notes for Contributors.....	239

EDITOR'S NOTE

The Korea Institute of Science and Technology Information (KISTI) and GreyNet International are collaborating in a joint research project entitled 'Global Information Repository Research for STI Development'. GreyNet an established community of practice in the field of grey literature for over thirty years has contacts with research organizations in more than 40 countries worldwide. GreyNet brings to this project its expertise in the promotion and management of scientific and technical information outside the sphere of commercial publishing.

This six-month collaborative research project was launched in the first week of April 2024 and will close the final week of September. GreyNet has made a selection of organizations listed in its 4th edition of the International Directory of Organizations in Grey Literature (IDGL) published earlier this year. This publication served in determining the initial survey population of the study.

During the course of the project, three questionnaires were carried out respectively.



The first dealt with data retention i.e. holdings of an organization. This was followed by a questionnaire on the data curation processes implemented. In August, the third and final phase of the project requested the data specifications in anticipation of data sharing for purposes of research and public awareness.

Dominic Farace
Journal Editor

Harnessing the Power of AI for Managing Grey Literature*

Dobrica Savić

IAEA Consultant in Nuclear Knowledge Management

Abstract

The use of artificial intelligence (AI) is already redefining the ways we engage with various types of information and data. In the wake of AI's unprecedented influence, its impact on grey literature (GL) remains an important yet underexplored domain. It is up to all GL professionals to integrate AI into their work and harness its power. This paper delves into the innovative applications of AI to bolster the efficiency of GL management, elevate metadata quality, and enhance user experiences. Four fundamental GL management facets, namely collection of GL, metadata creation, summarization, and user experience, offer great potential and a good starting point for using the power of AI. By harnessing AI's transformative capabilities, GL professionals can spearhead a paradigm shift in managing grey literature, promising extensive and far-reaching implications for the field.

Keywords AI, artificial intelligence, ChatGPT, grey literature, digital transformation

Introduction

When encountering a new topic in an article, book, illustration, or presentation, there are typically three questions that come to mind. Firstly, we often wonder, "What is this all about?" This paper focuses on the power of ChatGPT and related AI systems, which belong to a group of Large Language Models (LLMs).

Immediately following is a somewhat provocative question: "So what?" Many experts predict that 30 percent of all jobs will be replaced by AI in just a few years, while many others will undergo substantial transformation. Enough reasons to take this topic seriously.

Lastly, we might ask ourselves, "What's in it for me?" This paper caters specifically to information and knowledge managers operating in the realm of grey literature management. Apart from providing a brief overview of ChatGPT, it offers insights into potential ways of managing grey literature using this new technology, transitioning from current information management practices to AI-driven transformations.

Importance of Grey Literature

Let's briefly look at the definition of GL, its main facets, and some advantages.

Grey literature refers to any recorded, referable, and sustainable data or information resource of current or future value made publicly available without undergoing the traditional peer-review process (Savic, 2018).

According to GreyNet, there exist over 150 types of grey literature (GreyNet, 2004). These encompass reports, feasibility studies, dissertations, proceedings, news releases, newsletters, brochures, notes, posters, blogs, datasets, databases, and various others.

Grey literature originates from diverse sources, including individuals, businesses, public institutions, research centers, and local, national, or global organizations. It can exist in electronic or paper-based formats, generated by either machines or individuals.

The volume of GL is vast and boundless. Millions upon millions of GL items are already accessible, with more being generated daily.

* First published in the GL25 Conference Proceedings, February 2024 <https://doi.org/10.26069/grey-net-2024-000.508-gg>

However, a significant challenge lies in locating and identifying specific GL documents. One of the primary reasons for this challenge is that search engines lack mechanisms to distinguish GL specifically.

Nevertheless, GL offers several significant advantages (Exeter, 2023):

- **Diverse Perspective:** GL provides valuable insights from non-traditional sources such as government reports, conference proceedings, and unpublished research, thereby offering a broader perspective on a given topic.
- **Filling Information Gaps:** It often contains specialized and niche knowledge not readily available in mainstream publications, helping to address gaps in existing research.
- **Timely and Current Information:** GL is typically produced more rapidly than formal publications, serving as a valuable resource for staying abreast of the latest developments and trends in a particular field.
- **Supports Evidence-Based Decision-Making:** Access to GL empowers researchers, policymakers, and practitioners to make well-informed decisions by incorporating a wider range of evidence beyond peer-reviewed journals and books.

The Power of ChatGPT

Let's now delve into the capabilities of ChatGPT, beginning with a concise overview.

Chat Generative Pre-trained Transformer (ChatGPT) represents a sophisticated AI machine learning model adept at executing natural language processing (NLP) tasks with remarkable precision. It simulates human conversation, exhibiting a level of fluency that enables it to pass the Turing Test (McKinsey & Company, 2023).

Developed by OpenAI in 2021 and launched in November 2022, ChatGPT rapidly garnered an immense user base (OpenAI, 2023). Within a week of its release, it accrued 1 million users, reaching a staggering 57 million users in its inaugural month. By January 2023, it surpassed the 100 million user milestone. While over 180 million individuals have created ChatGPT accounts to date, approximately 100 million remain active users. Currently, the website experiences a staggering 1.8 billion visitors per month.

GPT-3 was trained on 175 billion parameters. However, its successor, GPT-4, launched on 14 March 2023, was trained on a colossal 170 trillion parameters (Bastian, 2023).

Notably, ChatGPT isn't the solitary Large Language Model (LLM) in circulation. Numerous major IT corporations have either developed or are in the process of developing their own iterations (Akshay, 2023). For instance, Baidu has the Ernie bot, Google's AI is referred to as Bard, Microsoft Bing incorporates GPT technology, Amazon unveiled Bedrock with Titan Text, similar to ChatGPT, and Elon Musk's AI startup, xAI, recently introduced its inaugural AI model named Grok.

This prompts the question: What attributes contribute to ChatGPT's widespread popularity, and how can it benefit us?

The scope of potential applications for ChatGPT is extensive (Nazarov, 2023):

- Integration and utilization of extensive knowledge from diverse sources like books, articles, and websites.
- Providing comprehensive answers across various topics.
- Generating coherent and contextually relevant texts, drafting emails, and crafting creative written content.
- Assisting in coding by offering snippets, code suggestions, explanations, and debugging aid.
- Facilitating multilingual text translation.

- Engaging in simulated conversations with users.
- Automating customer support, offering round-the-clock assistance sans human intervention.
- Categorizing, classifying, tagging, and auto-generating metadata.
- Summarizing lengthy texts, extracting pivotal information into concise summaries.
- Expanding users' knowledge base by delivering insights on diverse subjects, historical events, scientific concepts, and current affairs.
- Facilitating meetings by providing summaries and identifying key decisions and action items.
- Generating diverse content including images, jokes, stories, and poems.
- Adapting explanations to specific styles and successfully executing a multitude of other tasks.

The Power of ChatGPT - Examples

Here are just some notable instances showcasing the diverse applications of ChatGPT:

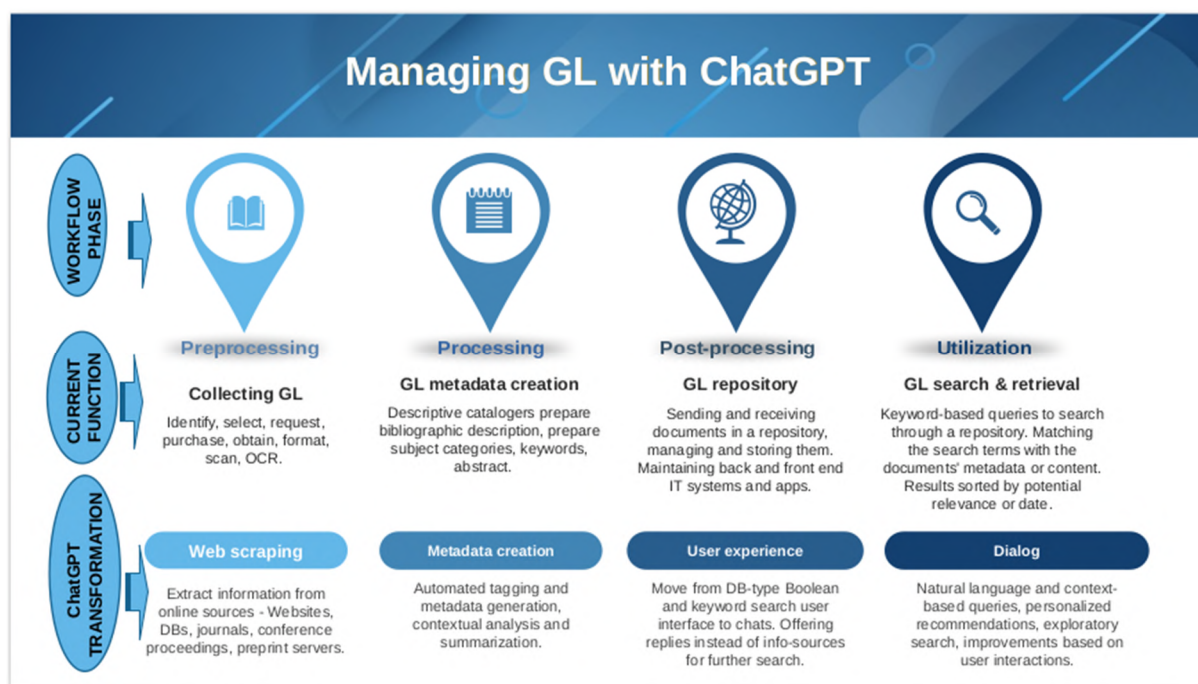
- Microsoft effectively employs ChatGPT to enable users to conduct searches and obtain results using a conversational interface.
- Duolingo, recognized as the world's largest platform for learning foreign languages, leverages ChatGPT to offer students comprehensive explanations in natural language, akin to guidance from a human tutor.
- Slack integrates ChatGPT to streamline workflow management, project administration, enhance productivity, and facilitate communication among team members.
- Octopus Energy, a prominent British renewable energy group specializing in sustainable energy solutions, delegates 44 percent of its customer inquiries to ChatGPT.
- Cheggmate harnesses ChatGPT's capabilities to assist students with assignments, providing support akin to interacting with human professionals.
- Freshworks significantly slashed the development time for complex software applications from 10 weeks to less than a week by utilizing ChatGPT.
- Udacity employs GPT-4 to craft an intelligent virtual tutor capable of delivering personalized guidance and feedback to students.
- Air India utilizes ChatGPT to elevate customer-centric offerings on their website, including FAQs, pilot briefings, and other related services.

These examples underscore the versatility and effectiveness of ChatGPT across diverse industries and applications, showcasing its ability to enhance processes, improve user experiences, and streamline operations.

Managing GL with ChatGPT

Upon reviewing the fundamental characteristics of GL and the capabilities of ChatGPT, let's explore how ChatGPT can enhance the management of GL.

To achieve this, we will first examine the primary workflow phases involved in managing GL. Subsequently, we will outline the current key functions performed within each phase. Finally, we'll explore the potential role ChatGPT can play in transforming these phases while fulfilling the necessary functions associated with each.



A high-level overview of the workflow for GL reveals four primary phases: preprocessing, processing, post-processing, and the utilization phase.

The preprocessing phase, involving the collection of grey literature, encompasses key functions such as identification, selection, acquisition (purchasing or requesting), obtaining items, formatting, and scanning, if necessary.

The processing phase is pivotal for creating metadata, achieved primarily through descriptive cataloging, preparing bibliographic descriptions, assigning subject categories and keywords, and crafting abstracts.

Post-processing activities entail managing a repository for grey literature. This includes sending and receiving documents, repository management, and maintaining associated IT systems on both the back and front ends.

The utilization phase, the final and probably the most important phase, is the phase when GR becomes available for search and retrieval. The search is typically accomplished through keyword-based queries that match search terms with document metadata or content. Results are usually sorted by potential relevance or date.

After identifying the basic phases, let's explore how ChatGPT can transform each phase of GL management and the improvements and benefits it can offer.

The traditional preprocessing phase, involving the collection of GL, can transition towards web scraping. ChatGPT, when appropriately directed, can efficiently extract information from various online sources like websites, databases, journals, conference proceedings, and preprint servers.

Metadata creation can potentially be replaced by automated tagging and metadata generation, alongside contextual analysis and summarization. This approach is already widely adopted by several information database and repository providers.

A significant shift in user experience will occur, moving from a database-style Boolean and keyword search user interface to conversational interfaces. A ChatGPT-based interface will offer specific replies through dialogue instead of merely providing a list of information sources for further search.

Closely related to user experience and maximizing the use of valuable information resources is ChatGPT's ability in natural language processing. It can comprehend context-based queries, conduct exploratory searches on related subjects, offer personalized recommendations, and

expand searches in unforeseen directions, uncovering unexpected facets and possibilities for the user's attention.

Web Scraping

Let's delve deeper into the techniques of web scraping, particularly exploring its significant features that render it highly valuable for enhancing the management of GL.

Web scraping offers **direct targeting of GL**. By fine-tuning the ChatGPT model through pertinent training data and specific prompts relevant to GL, it can effectively aid in retrieving and extracting targeted information from websites. This encompasses a wide range of parameters, including different geographical locations, organizations, specific journals, topics, and other predefined access frequencies.

ChatGPT possesses the ability to **cross-reference and verify** scraped information against reputable sources, ensuring the accuracy and reliability of publications. This validation process ensures that the gathered information is credible and meets requisite quality standards.

Another notable feature of ChatGPT is its capacity for **knowledge integration**. It can seamlessly integrate scraped grey literature with its existing knowledge base, providing supplementary context, related articles, historical data, or scientific background. This enrichment significantly enhances the overall comprehension of the topic.

Furthermore, ChatGPT's **multilingual capabilities** empower it to scrape grey literature from websites in diverse languages. This versatility broadens the scope of data collection and analysis, enabling a more comprehensive understanding across various linguistic domains.



Metadata Creation

Metadata creation stands as an area where leveraging ChatGPT can yield swift and substantial benefits. Through an analysis of specific document content and context, ChatGPT can automatically generate pertinent metadata, including author names, publication dates, journal titles, and other essential citation information. This automated process significantly streamlines cataloging and referencing of grey literature, resulting in considerable time and effort savings.

Capitalizing on its adept **contextual comprehension**, ChatGPT excels in identifying relationships between concepts, detecting nuances in terminology usage, and establishing connections across various research domains. Such capabilities empower researchers to attain comprehensive insights into specific topics, pinpoint knowledge gaps, and explore potential research trajectories.

The process of **automated tagging** involves ChatGPT analyzing the content of grey literature to extract key topics, concepts, and keywords that precisely represent the document's subject matter. These tags, when integrated with relevant knowledge organization systems, serve as invaluable metadata, enhancing efficient document organization, searchability, and retrieval.

ChatGPT's ability to **generate concise summaries** encapsulating the essence of lengthy scientific articles proves immensely beneficial. These summaries furnish researchers with an overview of a document's content, expediting the review of pertinent literature. They aid in filtering relevant



resources and significantly contribute to informed decision-making concerning the document's relevance and significance.

Metadata Creation - Example

Here is an illustration of how ChatGPT can effortlessly generate Dublin Core (ALA, 2003) metadata from an article.

In this instance, the article under consideration was one of my previous works titled "When is 'grey' too 'grey'? A case of grey data." This article was featured in the Conference Proceedings of the Twentieth International Conference on Grey Literature held in New Orleans, USA, in December 2018.

When is 'grey' too 'grey'? A case of grey data

Dobrica Savić, Nuclear Information Section,
International Atomic Energy Agency, NIS-IAEA, United Nations

Abstract

Conformity to facts, accuracy, habitual truthfulness, authenticity, information source reliability, and security have become important concerns. Trustworthiness of news and information, and of grey and other literature types has become of interest to the public, as well as to many information science and technology researchers. Starting with a definition of grey literature, and continuing with white, dark and grey data, this paper concentrates mainly on grey data as an emerging grey literature data type and its various 'shades' of trust. Special attention is given to data in the context of grey systems theory, anonymous data, and unstructured and unmanaged data. Based on a review of relevant literature and current practices, trustworthiness of grey data is analysed and elaborated. Guidelines and warning signs of grey data trustworthiness are identified, and conclusions offered.

Keywords: grey literature, grey data

Why are we concerned about the greying of grey data?

Recent research by the European Broadcasting Union (EBU) on misinformation shows that only 59% of people in the European Union (EU) believe what they hear on the radio, 51% believe the television news, and only 47% believe what they read (Financial Times, 2018). Widespread fake news, misinformation, disinformation, spam emails, computer bots, botnets, web spiders, crawlers, and viruses erode our trust in the information and data we encounter in our daily lives, making trustworthiness a concern.

To further illustrate the concern of trustworthiness, consider that 269 billion emails are sent and received each day, of which 60% is spam. 56% of all internet traffic is from automated sources — hacking tools, scrapers and spammers, bots, and other malicious programs. Therefore, conformity to facts, accuracy, habitual truthfulness, authenticity, information source reliability, and security are of increasing importance.

Another factor impacting trust is the amount of data surrounding us. 2.5 exabytes of data are produced every day, the equivalent of 250,000 Libraries of Congress and 90% of all the data in the world that has been generated over the last two years. 13 million text messages are sent every minute, 4.4 million videos are watched on YouTube every minute and 1.7 megabytes of new information are created every second for each human being on the planet.

Although the amount of information and data¹ around us is enormous, 99.5% of all data created is not currently being analysed and used. Still, we are hungry for information, as demonstrated by over 6.6 billion Google queries daily, 15% of which have never before been searched.

Grey literature

Various definitions of grey literature exist. The 12th International Conference on Grey Literature (GL12), held in Prague in 2010, defined it as "manifold document types produced on all levels of government, academics, business and industry in print and electronic formats that are protected by intellectual property rights, of sufficient quality to be collected and preserved by library holdings or institutional repositories, but not controlled by commercial publishers, i. e., where publishing is not the primary activity of the producing body" (Farace, D. and Schoepfel, J., 2010).

Uncovering deception and
estimating the veracity of
information and data is difficult
now and will be even more so
in the future.

¹ Data is 'facts or figures from which conclusions can be drawn'. Information is 'data that have been recorded, classified, organized, related, or interpreted within a framework so that meaning emerges'. www.statcan.gc.ca

Please create Dublin Core metadata from the article?

{
Full-text of the following article:
When is 'grey' too 'grey'? A case of grey data by Dobrica Savić.
Conference Proceedings: Twentieth International Conference on Grey Literature. New Orleans,
USA. December 3-4, 2018.
}

Here is the ChatGPT output which captured a comprehensive set of Dublin Core metadata.

DUBLIN CORE RECORD

Title: When is 'grey' too 'grey'? A case of grey data

Creator: Dobrica Savić

Contributor: Nuclear Information Section, International Atomic Energy Agency, NIS-IAEA, United Nations

Abstract: This paper discusses the importance of trustworthiness in news and information, particularly in the context of grey data. It covers various aspects of grey data, including its definition, characteristics, and challenges in ensuring its veracity and usability.

Keywords: grey literature, grey data, trustworthiness, information reliability, data integrity

Date: 2019

Type: Text

Format: PDF

Identifier: ISBN 978-90-77484-33-3

Source: Conference Proceedings: Twentieth International Conference on Grey Literature. New Orleans, USA. December 3-4, 2018.

Language: English

Coverage: European Union, United States, Russia, China, Japan

Rights: © TextRelease 2019

Beyond its proficiency in creating valid Dublin Core data records, ChatGPT showcases its capability to generate the entire metadata in a JSON format (w3schools.com, 2023) with a simple command. Here is an example of such a record in JSON format.

JSON format

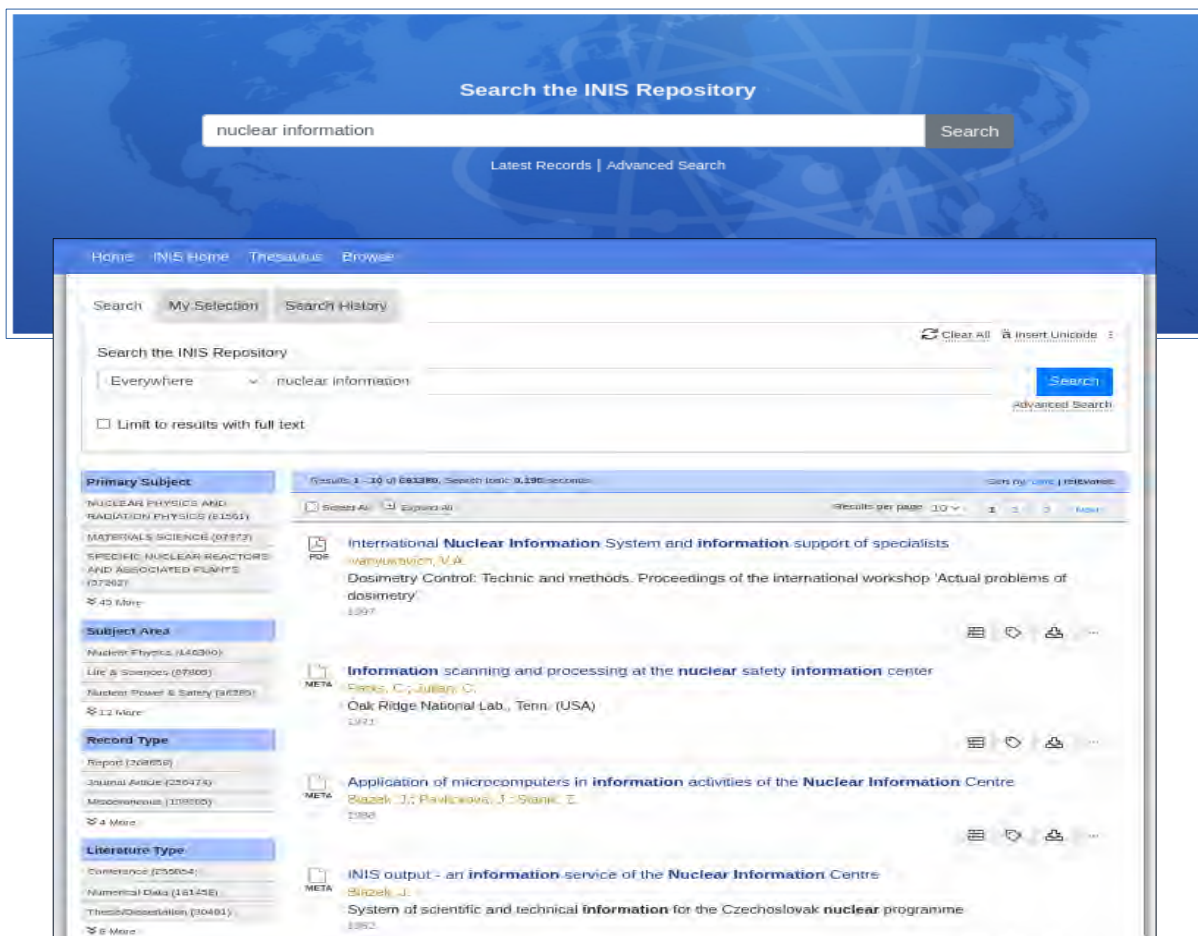
```
{
  "Title": "When is 'grey' too 'grey'? A case of grey data",
  "Creator": "Dobrica Savić",
  "Contributor": "Nuclear Information Section, International Atomic Energy Agency, NIS-IAEA, United Nations",
  "Abstract": "This paper discusses the importance of trustworthiness in news and information, particularly in the context of grey data. It covers various aspects of grey data, including its definition, characteristics, and challenges in ensuring its veracity and usability.",
  "Keywords": "grey literature, grey data, trustworthiness, information reliability, data integrity",
  "Date": "2019",
  "Type": "Text",
  "Format": "PDF",
  "Identifier": "ISBN 978-90-77484-33-3",
  "Source": "Conference Proceedings: Twentieth International Conference on Grey Literature. New Orleans, USA. December 3-4, 2018.",
  "Language": "English",
  "Coverage": "European Union, United States, Russia, China, Japan",
  "Rights": "© TextRelease 2019"
}
```

User Experience

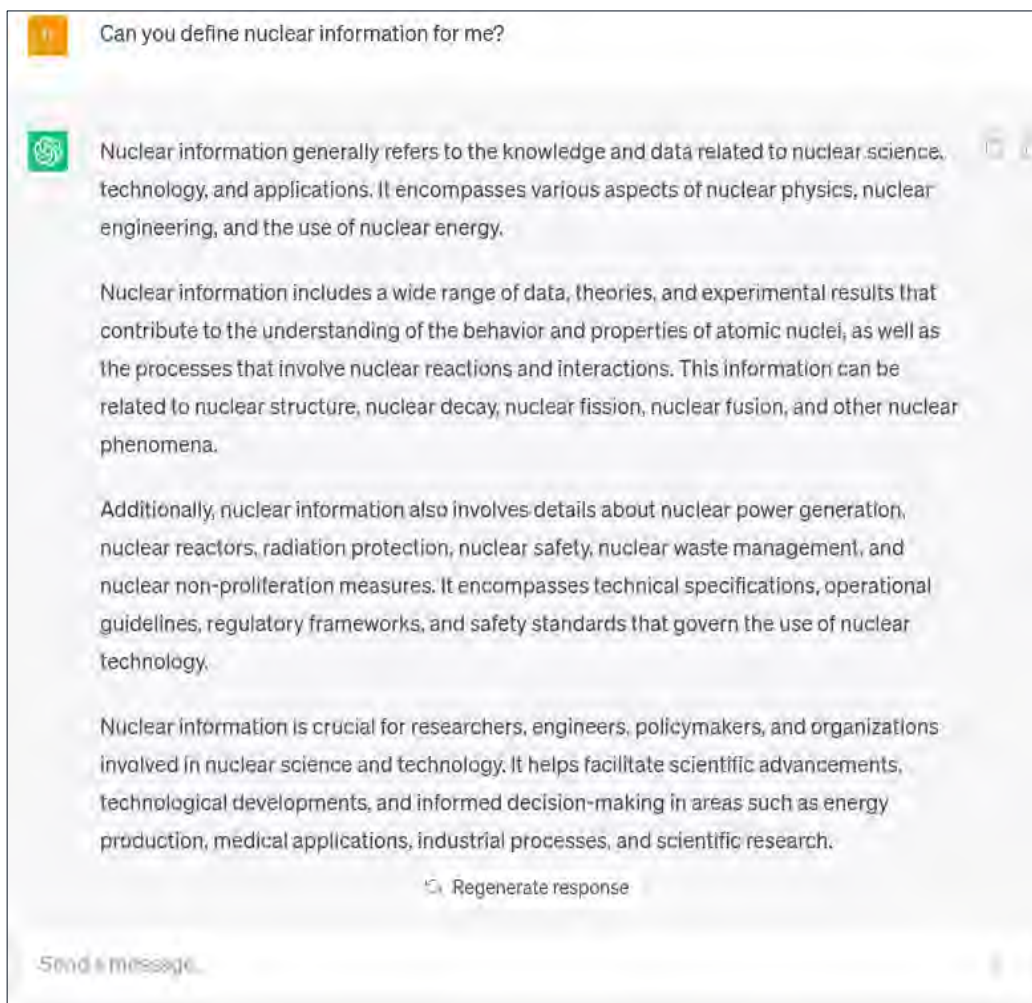
To illustrate the disparity between future user experiences and current interfaces, let's examine a sophisticated and widely used search interface within the INIS (International Nuclear Information System) repository (INIS, 2023). Additionally, we'll explore an example of utilizing ChatGPT to inquire about the same subject, specifically, 'nuclear information.'

The INIS repository's search interface offers diverse search options, allowing users to explore all content, bibliographic records, or exclusively access full-text content. Furthermore, it provides the ability to refine results to those with full-text access. Boasting nearly 700,000 identified results, users can sort findings by relevance, date, and the number of records displayed per page. Further granularity is available through primary subjects, subject areas, record and literature types, conference and journal titles, publication years and ranges, country of publication, language, descriptors, and INIS volume. It stands as a robust and all-encompassing search engine

offering numerous search facets. However, the user's specific requirement was simply a definition and potential clarification of 'nuclear information.'



In contrast, ChatGPT swiftly analyzed the search prompt, providing a succinct definition of nuclear information accompanied by a descriptive overview of its coverage, associations, likely related areas, and significance. This stark contrast in output signifies the potential time-saving for searchers aiming to grasp the initial definition and core elements of nuclear information. In contrast, ChatGPT swiftly analyzed the search prompt, providing a succinct definition of nuclear information accompanied by a descriptive overview of its coverage, associations, likely related areas, and significance. This stark contrast in output signifies the potential time-saving for searchers aiming to grasp the initial definition and core elements of nuclear information.



It's important to note that this comparison doesn't establish superiority but highlights a distinct approach. Ultimately, users can determine which method best aligns with their needs. A blend of both interfaces might present the most advantageous and practical solution.

Dialog

Moving from a DB-type Boolean search (Socialtalent, 2023) user interface to a ChatGPT interface offers several advantages. Here are five major benefits of a search system that provides replies instead of simply pointing to external info-sources:

Natural language interaction: ChatGPT's conversational interface allows users to interact with the system using natural language queries and receive responses in a conversational manner. This eliminates the need for users to formulate complex Boolean queries or understand the underlying database structure. It also makes the search process more intuitive and user-friendly, resembling a conversation with an expert rather than navigating through a rigid search interface.

Contextual Understanding: ChatGPT's advanced language model enables it to understand the context of user queries and provide relevant and contextualized responses. Instead of providing a list of potential sources for further search, ChatGPT can directly address user queries, offer explanations, or provide specific information within the conversation. This contextual understanding enhances the user experience by reducing the cognitive load associated with searching for and evaluating multiple sources.

Personalized recommendations: ChatGPT can leverage its understanding of user preferences and previous search queries to offer personalized recommendations. By analyzing user behavior and feedback, the system can adapt and refine its responses, ensuring that the information provided aligns with the user's needs and interests. This personalized approach enhances the

user experience by tailoring the search results to individual requirements and increasing the relevance and usefulness of the information provided.

Improved efficiency and time saving: With a ChatGPT interface, users can quickly obtain relevant information without the need to browse through multiple sources or sift through lengthy search results. The conversational interface allows users to directly ask questions and receive concise answers or summaries, saving time and effort. Additionally, the system can provide additional context, related information, or follow-up questions to further refine the search and provide a more comprehensive understanding of the topic.

Collaboration and knowledge sharing: ChatGPT can facilitate collaboration among users by enabling features like document sharing, commenting, and annotation. Users can engage in discussions, share insights, and collectively contribute to the repository's content.

Conclusions

In conclusion, it is evident that grey literature is a valuable information resource. It provides diverse perspectives, bridges existing information gaps, delivers timely and current information, and substantiates evidence-based decision-making.

ChatGPT presents an exceptional opportunity for leveraging grey literature. It boasts outstanding natural language processing capabilities, contextual understanding, human-like response generation, widespread use across diverse domains, and immense potential to revolutionize information systems while enhancing user experiences.

The collaboration between grey literature and ChatGPT can yield excellent synergy. ChatGPT can enhance all phases and functions of information management, offering web scraping for pertinent publications, automatic tagging, and metadata creation. It augments user experiences with improved interfaces and valuable natural language dialogues.

The future of grey literature remains a shared responsibility. While acknowledging the need for further enhancements and developments in grey literature management, progress must be built upon the successes already attained. Advocacy for the significance of grey literature needs amplification alongside the development of standards and guidance materials. The potency of grey literature hinges on collective cooperation, necessitating innovative leadership. In summary, the future of grey literature is contingent upon our collective actions.

References

- ALA, 2003. 'The Dublin Core'. <https://urlis.net/nfww1kao>
- Akshay, K., 2023. 'Best Large Language Models for 2023 and How to Choose the Right One for Your Site'. <https://urlis.net/2pfb2t6p>
- Bastian, M. 2023. 'GPT-4 has more than a trillion parameters – Report'. <https://urlis.net/pjuvnfz8>
- Exeter, University of, 2023. 'Lib Guides: What is Grey Literature'. <https://urlis.net/kj1coc5m>
- GreyNet, 2004. <https://www.greynet.org/greysourceindex/documenttypes.html>
- Kinsta, 2023. 'What Is Web Scraping? How To Legally Extract Web Content'. <https://urlis.net/cff7uj3t>
- INIS, 2023. <https://www.iaea.org/inis>
- McKinsey & Company, 2023. 'What is generative AI?' <https://urlis.net/qzkuog2w>
- Nazarov, G. 2023. '18 Important Benefits of ChatGPT for Humanity'. <https://urlis.net/hno6jiuu>
- OpenAI, 2023. <https://openai.com/about>
- Savić, D., 2018. 'Rethinking the Role of Grey Literature in the Fourth Industrial Revolution', *TGJ (The Grey Journal)*, Special Winter Issue, vol. 14. <https://urlis.net/nkixfvqa>
- SocialTalent, 2023. "The Beginner's Guide to Boolean Search Terms". <https://urlis.net/03z76mj7>
- W3schools.com, 2023. JSON Introduction. <https://urlis.net/u73ueipo>

International Nuclear Information System – INIS

Organizing the world's nuclear information and making it universally accessible



International
Nuclear
Information
System
INIS

www.iaea.org/inis

All In the Mind - Adopting an Agile Mindset as the Prerequisite to Agile Transformation*

Alistair Reece, GeoScienceWorld

Abstract

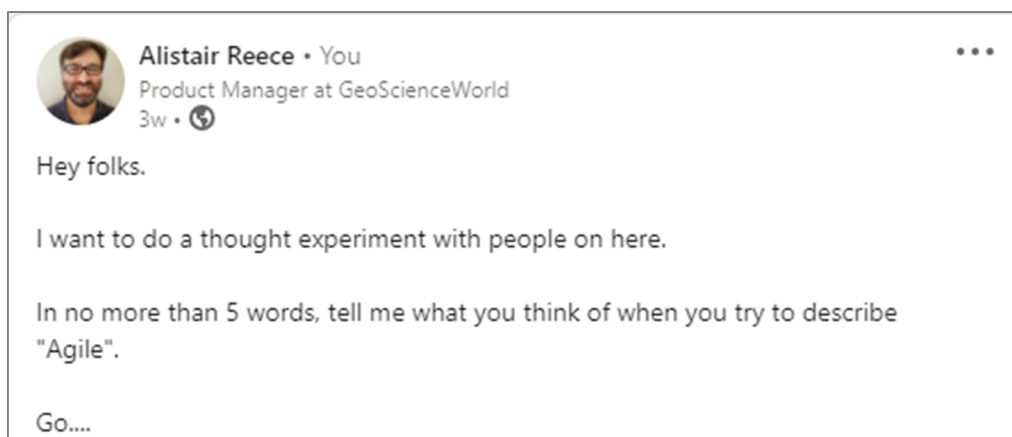
In today's rapidly changing world, the ability to adapt and thrive is crucial for success. To navigate the ever-changing needs of stakeholders and communities, many organizations seek to implement Agile methodologies. However, the true catalyst for meaningful transformation lies in fostering an Agile Mindset within these organizations.

This paper explores the indispensable role of an Agile Mindset as a prerequisite for successful Agile transformation. We will explore the core principles and values that shape the Agile Mindset, emphasizing how this way of thinking cultivates a culture of collaboration, adaptability, and continuous improvement. By embracing this mindset organizations enhance their impact, drive innovation, and effectively address the evolving needs of their communities.

Using GeoScienceWorld as an example of an organization undergoing Agile transformation and seeking to adopt an Agile Mindset, we will discuss how keeping the 4 values of Agile to the forefront of our thinking has impacted our internal, and external, business practices, paying particular attention to product development and prioritization.

What is Agile?

Regardless of industry or sector, we often hear the word "Agile" used to describe business processes, especially around project management. However, the use of the word is rarely, if ever, qualified by what is meant, exactly, by "Agile". In an attempt to gauge the various uses of the term among my own contacts, I presented the following challenge to my connections on LinkedIn:



The challenge provoked a diverse array of responses, including:

- A philosophy many don't understand
- Learning to work better, efficiently
- Pivoting
- Confirming what is most valuable
- Structure, ceremonies (sometimes too much)
- Outcomes through learning, not over-planning
- MVP, discovery, alpha, beta, kanban
- Empowered teams evolving the solution
- Fail fast then iterate; repeat

* First published in the GL25 Conference Proceedings, February 2024 <https://doi.org/10.26069/grey-net-2024-000.507-gg>

Each of the responses from the connections that took part is valid, and in many ways useful. Looking through the responses, I was able to group them into 4 general thematic buckets:

- Project management methodology
- Sprints
- Daily stand up
- Retrospectives

Those buckets all have value in and of themselves, however I am convinced that they actually miss the key point of what it means to be “Agile”.

There was one respondent, though, who understood fully the task that I had set, and that person gave me a simple, single word, answer:

- Mindset

In the rest of this paper, we will look at what it means to have an Agile mindset, and how that mindset impacts our work and business processes, both with colleagues internally and stakeholders externally.

The Four Values

The origins of Agile are in a meeting of leaders working in the software industry, who met in February 2001 in Utah in order to discuss how to improve working processes in software development.¹ Software projects prior to the adoption of Agile methods often failed to complete, and those that did usually exceeded their budgets. The ultimate aim of Agile, and the Agile Manifesto was to uncover “better ways of developing software”. As a result of this aim the attendees in Utah developed the Four Values.

The Four Values are value statements in which the Agile Manifesto notes that certain ideas are to be valued over other ideas. Although the Four Values have their origins in software development, they can be extrapolated and applied to every area of an organization.

The Four Values² are:

- **Individuals and interactions** over processes and tools
- **Impactful outcomes** over comprehensive documentation
- **Customer collaboration** over contract negotiation
- **Responding to change** over following a plan

The second of the Four Values in the original text says “Working Software over comprehensive documentation”. I replaced “working software” with “impactful outcomes” as I believe the Agile mindset should not be limited to just software development.

It is important to understand that while adopting an Agile mindset places more value on the clauses on the left side, in bold, of the statements above, it does not say that the clauses on the right have no value at all.

Mindset before Practice

Given that we have identified that the core of Agile is a mindset, how an individual or organization thinks and perceives their work, we need to address the concept of “Agile methodologies”.

There are several popular ways of working that are associated with Agile, including such well known methodologies as:

- Scrum³
- Kanban⁴
- Scaled Agile Framework⁵

These methodologies share common features, roles and ceremonies, including:

- Dividing work periods into “sprints”
- Having a daily standup meeting to discuss progress and blockers
- Performing retrospectives to learn what has gone well and what can be improved

Despite these common features, and the perception that these methodologies are inherently “Agile”, there is no guarantee that an organization is actually Agile, and lives up to the Four Values.

The Agile Manifesto doesn’t prescribe any particular methodology as being a definitive approach to “being Agile”, as such it is perfectly possible for an organization to implement an “Agile” methodology, such as Scrum, and yet remain resolutely not-Agile. When the business values process and tools, for example, over interactions and individuals, but practices Scrum, they are not Agile. When an organization ignores the reality of change in their situation and doggedly sticks to their detailed, laid out, plan but has adopted Scaled Agile Framework, they are still not an Agile organization.

Such organizations have put the cart before the horse, having adopted the practices of Agile methodologies without internalizing the values of the Agile mindset, and it is no surprise that in such a situation the phrase “Agile doesn’t work” becomes common.

Agile Mindset in Practice

Having discussed the attributes of an Agile Mindset, I now want to show how we at GeoScienceWorld have put it into practice within our own organization, in particular in the team that I lead, the Product Management Group.

The Product Management Group, PMG, in GeoScienceWorld is responsible for the creation and prioritization of our product backlog. PMG also oversees the development of new products and enhancements to existing products, such as our publishing platform.

In 2022, PMG spent a lot of time and resources working on plans to revitalize an existing tool on our publications platform called OpenGeoSci, which is a content search tool that has a map based interface to allow users to navigate through available content based on geography rather than traditional keyword search. When the tool was originally launched, it existed as a separate website from our publishing platform, however when we migrated to our current platform provider, OpenGeoSci was integrated into the main website.

As a result of the work that PMG had undertaken in 2022, we came into 2023 ready to start development work with our various software development partners. We had created wireframes for the user interface, the technical architecture had been defined and documented, and the tools required to meet the requirements had been identified. We had also applied for an Amazon Imagine grant to offset the cost of development to some extent.

PMG meets on a quarterly basis to discuss and plan our work in the upcoming months as well as create our roadmap for where we think we are likely to concentrate our efforts further out. When it came to prioritization though, we usually worked on whatever was most appealing to us at any given time, as such we weren’t necessarily providing value back to our various stakeholder groups.

Having been asked by our CEO how exactly we went about prioritizing our work, PMG set about creating a more data based approach, which resulted in our “Prioritization Matrix”. For each project that PMG needed to prioritize, we awarded points based on the following criteria:

- Number of target personas who would benefit
- Number of business metrics impacted
- Number of customer service issues reported in the previous 12 months
- Potential market value of the project
- Level of effort

The highest score possible using this matrix would be 14.

The image below shows the matrix after the first time PMG assigned points to each of the extant projects in our backlog as of March 2023.

Project	Category	Value Proposition	Target Personas	Business	Customer Satisfaction	Scale of Impact	Level of Effort	Score
Content Access and Communication Streamlining	Tech Debt	Seamless access, reducing frustration, and more communication around access and subscriptions.	4	2	3	0	0	9
Registered User Experience	Enhancement	TBD	3	3	1	1	1	9
Revised Checkout Process	Enhancement	Overhaul the ecommerce checkout experience so that users can easily purchase content and maintain their library of past purchases. Drive more revenue through ecommerce channel.	2	2	2	1	2	9
Deposits to Discovery Services	Tech Debt	Would encompass whole-book PPV and bulk PPV enhancements as well as other enhancements around the shopping cart and shop.geoscienceworld.org.	3	2	2	0	2	9
Institutional IDP Access	New Product Development	Improve discoverability through a streamlined deposit to major discovery services	2	3	0	1	2	8
Infoscience Technologies TDM Tool	New Product Development	Allow institutions to be set up in the database as IDPs so their employees can use SAML to authenticate.	3	3	0	1	0	7
Article Page UX Enhancement	Enhancement	Help corporate researchers find insights and data and seamlessly integrate into workflows	4	2	0	1	0	7
Deep Learning Q&A Tool	New Product Development	Increasing usability on article and book chapter pages by smoothing out the UX and integrating new features.	3	2	0	1	1	7
		Finding answers and insights from scholarly research publications to accelerate research acceleration						

Assigning points to all of our projects showed that despite the amount of work PMG had put into planning and creating the specifications for a new version of OpenGeoSci, the project scored incredibly low in the Prioritization Matrix. With this information, and with a commitment to working in an Agile manner, PMG responded to this change rather than blindly following the original plan that had been laid out. The Prioritization Matrix had shown PMG that:

- OpenGeoSci had limited value when compared to other projects in the backlog
- PMG needed to pivot to focus on the work that would have more impactful outcomes
- PMG's plan for 2023 needed to be re-configured

As mentioned above, GeoScienceWorld's Product Management Group meets in person once a quarter to review the work undertaken in the preceding few months and to re-prioritize our backlog, taking into consideration new information, changes in our industry, fresh opportunities, and how we can provide value back to our stakeholders.

Conclusions

From this very brief overview of the values that underpin a truly Agile organization it is possible to draw three conclusions for those organizations looking to adopt Agile ways of working.

Given that Agile is first and foremost a way of thinking rather than a way of doing, it is imperative that an organization understand that Agile is about culture. To be Agile is to place the customer, whether that be internal or external, at the very heart of everything we do. It is after all to the customer that organizations ultimately need to provide value.

Secondly, it is clear that Agile is not a one-size fits all approach, and that extends to within an organization. Some Agile teams will adopt a Scrum approach, while others will decide that Kanban is the right choice for them. Yet other teams will decide that none of the prescribed methodologies work for them in their sitz im leben, thus they will design and implement ways of working that are imbued with the Four Values but don't have any particular framework underpinning them. When organizations begin to value their Scrum or Kanban processes and tools over the individuals and interactions they encounter, that organization is no longer Agile.

Thirdly, and finally, adopting an Agile mindset requires constant reflection and the willingness to constantly refer back to the Four Values as our ultimate guides to how an organization works. As the Agile Manifesto itself says in its first sentence:

“We are uncovering better way of developing software by doing it and helping others do it.”

It is possible to replace the phrase “developing software” such that the goal of an Agile organization is that:

“We are uncovering better ways of working by doing it and helping others do it.”

The process of becoming Agile is ongoing and iterative, such that it requires an ever present willingness to change and adapt to the changing world in which we find ourselves working.

References

1. History: The Agile Manifesto [online]: 2001, The Agile Alliance [Accessed on 30th October 2023]. Available from: <https://agilemanifesto.org/history.html>
2. Agile Manifesto [online]: 2001, The Agile Alliance [Accessed on 30th October 2023]. Available from: <https://agilemanifesto.org/>
3. What is Scrum? [online]: Scrum.org [Accessed on 9th January 2024]. Available from: <https://www.scrum.org/resources/what-scrum-module>
4. What is Kanban? [online]: The Agile Alliance [Accessed on 9th January 2024]. Available from: <https://www.agilealliance.org/glossary/kanban/>
5. Scaled Agile Framework [online]: Scaled Agile, Inc. [Accessed on 9th January 2024]. Available from: <https://scaledagileframework.com/>

Grey Literature Supporting the Right to Knowledge*

Silvia Giannini, Stefania Lombardi, and Anna Molino,

Institute of Information Science and Technologies, ISTI-CNR, Italy

Abstract

One of the principal areas of interest of the Library of the CNR Area in Pisa is in authors' Rights Retention. Indeed, the staff regularly supports the personnel in the publication process, from choosing the publication venue to depositing their products in the institutional archive, finding that many researchers need to be made aware of their rights and how to retain them. For this reason, the library staff participates in the CLAKP and Right2Pub initiatives. CLAKP (Copyright Law and Access to Knowledge Policies Group) is a research group aiming to strengthen the right to knowledge as essential for education, innovation, and cultural access. Right2Pub (The Authors' Voice from the Italian Research Community) project aims to build an awareness of the importance of Secondary Publishing Rights and Rights Retention in the Italian Research Community.

In our work, we describe the two ongoing initiatives and the contribution of our library to them. We also illustrate the first results of a preliminary study on the role of Grey Literature on this topic and how some European countries approach it.

Keywords: Right to knowledge, Rights retention, Secondary Publishing Rights, CLAKP, Right2Pub, KR21

1. Rights Retention: the context

The human right to science is defined in some crucial norms of international law, specifically in Article 27 of the Universal Declaration of Human Rights and Article 15 of the International Covenant on Economic, Social and Cultural Rights. One idea emerges from both norms: the balance between intellectual property rights (exclusivities) and rights to access, exploit and develop scientific knowledge. Maintaining this balance is a fundamental aspect of fully democratic societies¹.

The Open Science movement upholds the principle that the entire process and all results of publicly funded research should be publicly available. It is based on the cooperation and sharing of all research outputs, from literature to data, software to protocols and technologies. *Open Access to scientific publications and Open Science are [therefore] integral parts of the human right to science².* The major cultural shift introduced by the Open Science movement significantly accelerated deep reflection on maintaining authors' rights to their works in scientific research carried out within universities and research institutions.

Scientists do not publish to receive compensation but to communicate the results of their research. To do so, researchers usually publish articles in scientific journals, often owned by major commercial publishers. Indeed, with the advent of the digital age, the editorial market has become oligopolistic because a few influential publishers primarily run it. In return for the service offered, these publishers make the authors sign a publishing contract that entrusts all economic rights to the publisher. In contrast, only the moral right of authorship remains to the author³.

One problem authors may face is that changing a publisher's standard contract could be difficult. If the authors are not lawyers (and, in some cases, it may be difficult for the lawyers themselves if they are not experienced in the subject matter), it may be challenging to know exactly what revisions to request. If successful, a scenario will likely show different situations between

* First published in the GL25 Conference Proceedings, February 2024 <https://doi.org/10.26069/grey-net-2024-000.506-gg>

¹ Binda F., Caso R. (2020). *Il diritto umano alla scienza aperta*. Trento Law and Technology Research Group. Research Paper n. 41, p.1. <https://zenodo.org/records/4053531> (the English translation is ours).

² *Ivi.*, p. 3 (the English translation is ours).

³ It is worth mentioning that Italian copyright splits the authors' rights into moral (or intellectual) and property rights.

authors who know how to negotiate and those who do not. As Peter Suber said⁴, the author's addendum was introduced around 2004 as the first solution to authors' Right Retention. It is a proposed amendment to the contract with the publisher. Lawyers write the addendum and, in this way, negotiation between the publisher and authors becomes unnecessary.

1.1. Rights retention: the Italian context

Before entering more details, we must make an initial consideration: the Italian law on copyright does not imply that authors must cede all their rights to the publisher. Therefore, we should ask ourselves why they agree to sign contracts that transfer all economic rights to a publisher, granting them complete control over their work.

First and foremost, scientists must publish to circulate their ideas in prestigious venues, i.e., journals with a high impact factor or labelled as "excellent". This action is essential to advance in their careers and meet the criteria used in research evaluation exercises. To assess the quality of research, the Evaluating Agencies rely on commercial bibliometric evaluation services. These services measure it through mathematical and statistical indices based on the number of citations received by an article or journal rather than on the actual relevance of that research and its spin-offs on science and society.

These evaluation criteria primarily increase the bargaining power of large oligopolistic publishers because they own the prestigious publishing venues to which authors turn.

A need for more awareness and attention and a lack of sensitivity to the problem compounds the first factor mentioned above. Indeed, it is not necessarily the case that authors, especially younger ones, know that by transferring commercial rights to the publisher, they implicitly authorize the publisher to make different uses of the manuscript without the author's permission, such as modifying it for commercial purposes, rearranging the content to publish it in another type of source, translating it into other languages. In most cases, the authors' institutions of affiliation do not have a role in the author-publisher contractual relationship, so they are unaware that their researchers are voluntarily transferring their copyrights at the expense of themselves, the institution, and the general public. Moreover, these same institutions must pay publishers expensive subscriptions to allow access to scientific results produced by their authors. Finally, the closure of science makes it inaccessible to society and other scholars who operate in less economically fortunate settings and who cannot afford to pay to learn about the work done by their peers.

In this context, it has become imperative to draw the attention of all actors to the issue of authors' retention of rights. It is crucial to retain the right to publish one's work in open access to further the principles promoted by open science.

Two prominent "actions" at the center of European and international debate are identified to achieve this goal: the Rights Retention Strategy and Secondary Publishing Rights.

Rights retention refers to applying strategies that allow authors to retain certain fundamental rights over their work, such as the right to reproduce, distribute, and reuse for noncommercial purposes, when they sign a publishing contract with a publisher. On the other hand, the term Secondary Publishing Rights implies action to change national intellectual property laws so that authors are guaranteed the right to re-publish their work, freely and free of charge, in open access repositories.

Universities and research institutions in Italy have long issued policies supporting open access. However, they are often not mandatory and specific policies on copyright retention are not detectable. To facilitate the transition to open access and protect authors' rights, Italian institutions have adopted the model of transformative contracts, which has spread throughout

⁴ More on: <https://erc.europa.eu/news-events/magazine/rights-retention-and-open-access>

Europe, i.e., agreements between libraries and publishers that include a fee for publishing in open access, in addition to the reading one.

Italy has published the National Plan for Open Science⁵ and participated in defining the European Agreement for the reform of research evaluation, which currently represents a significant obstacle to affirming the right to knowledge, as stated before. Important open access publishing initiatives have also been implemented as viable alternatives to the commercial publication of journals and series. These are no-profit publishing systems run by academic or research institutions, which take charge of the entire publication process. In such publishing systems, the rights remain with the author, and there are no costs to the authors or readers.

Regarding legislation on Secondary Publishing Rights, there is already a proposal for a law in Italy rooted in the 2016 proposal of the Italian Association for the Promotion of Open Science (AISA⁶). The proposal aims to amend Italian law on copyright by including a specific article that gives the author the unwaivable and inalienable right of republication in open access, following a regulatory model already adopted in other European countries.

The transitional nature of transformative agreements, the high costs they require, and which prevent institutions from totally covering their scientific production make it necessary to think about different forms of opening science, such as the implementation of strategies or norms that intervene in authors' rights and which, as we will see below, are still totally absent in the Italian landscape.

2. The Library of CNR in Pisa

2.1. The interest in Rights Retention: supporting researchers in the publication process

The Library of the CNR Area in Pisa collects the bibliographic and documentary resources of the Institutes located in the Area. It supports the informational needs of the scientific community. The principal tasks of the service focus on library automation, digital libraries, Open Science and Open Access, Grey Literature, and web-based information services⁷.

The library's main activities include managing scientific production, supporting the authors for publication, and depositing their works in the institutional archive.

In this respect, the library staff:

- provide authors information about the publication venues (e.g., metrics, APCs, etc.);
- guide authors in the deposit of their scientific production in the institutional archive;
- verify the compliance of the deposited versions with either funders' or publishers' policies on self-archiving;
- inform authors about the various strategies for green OA;
- inform authors about good practices for Open Science;
- support authors in the research evaluation exercises.

Such actions require us to be constantly updated about the evolution of publishers' policies and the strategies authors may adopt to retain their rights. Thus, over the years, we have developed a growing interest in the issues concerning authors' Rights Retention and the informational resources and strategies that may guide this difficult purpose.

2.2. The Italian approach to Rights Retention: the initiatives CLAKP and Right2Pub

Secondary Publishing Rights, Rights Retention and, more in general, fair access to knowledge are at the core of the international initiative Knowledge Rights 21 (KR21), which focuses on *bringing*

⁵ https://www.mur.gov.it/sites/default/files/2022-06/Piano_Nazionale_per_la_Scienza_Aperta.pdf

⁶ <https://aisa.sp.unipi.it/>

⁷ <https://library.isti.cnr.it/index.php/en/library>

*about changes in legislation and practice across Europe that will strengthen the right of all to knowledge*⁸.

The programme, sponsored by IFLA, IFLA Foundation, Arcadia, LIBER, and SPARC Europe, *aims to mobilise the potential of Europe's knowledge institutions, particularly libraries, to engage with others across the spectrum of the access to knowledge movement to build momentum towards long term copyright reform that benefits library users and researchers in the 21st century*⁹.

KR21 supports and finances national actions to improve public awareness on the issues of access to knowledge, publishing rights, and promoting substantial changes in law.

In Italy, two initiatives can be included in this framework: *CLAKP* and the project *Right2Pub - Balancing Publication Rights. The Authors' Voice from the Italian Research Community*.

CLAKP¹⁰ is a national research group created within IGSG-CNR to reinforce the right to knowledge as an essential component of education, innovation, and cultural participation. This is also implemented through the support for regulatory reform of copyright for the benefit of libraries, users, and researchers.

CLAKP's main areas of interest concern the retention of rights by authors of scientific content, open norms, Secondary Publishing Rights, e-books, and controlled digital lending.

The IGSG research group works within the KR21 initiative, supporting the national coordinator for Italy (Avv. Deborah De Angelis) in collaboration with the Creative Commons Italian Chapter and the Libraries of the CNR Research Areas of Pisa and Bologna.

The project Right2Pub¹¹ aims to build an awareness of the importance of Secondary Publishing Rights and Rights Retention among the Italian Research Community. Its primary objectives are:

- to strengthen advocacy for the formal recognition of Secondary Publishing Rights at the legislative level;
- to direct attention toward the inherent limitations of current national legislation, which does not explicitly confer Secondary Publishing Rights upon authors;
- to enhance awareness within the national research community regarding Rights Retention.

In the project, the role of the two libraries lies in supporting and advising researchers on how to exercise their rights as authors and accompany them during the publishing process.

2.3. The contribution of our Library to CLAKP and Right2Pub

In CLAKP, our principal interest is how strategies for rights retention are currently approached and how they may be implemented. Accordingly, our contribution focuses on collecting policies, strategies, and experiences adopted in the field of Rights Retention. We mainly rely on grey materials to understand how authors can protect their rights.

More into practice, a series of videos¹² on the main topics of CLAKP have been realised so far, as well as a preliminary study on how grey literature approaches the subject and how it is managed in some countries.

In Right2Pub, the two libraries involved in the project are expected to collect existing resources on Rights Retention and Secondary Publishing Rights and to produce informative materials useful for the authors when choosing the publication venue to guarantee their rights.

In addition, two training sessions, one in Pisa and one in Bologna, are planned to provide authors with an overview of these topics and practical information on how to maintain their rights and

⁸ <https://www.knowledgerights21.org/>

⁹ <https://www.knowledgerights21.org/about/>

¹⁰ <https://www.igsg.cnr.it/progetti-2/clakp/>

¹¹ <https://www.right2pub.eu/>

¹² https://www.youtube.com/playlist?list=PLmW_xhy00luZhOQP3Nm_Gn9BvIMkLeL36

make Open Access, e.g., depositing their materials in an open repository and being compliant with the publisher policy on Green OA.

As in CLAKP, we will count on grey materials (e.g., infographics, videos, reports, etc.) that have been realized to achieve our purposes.

3. The methodology

At the beginning of our analysis, we looked for any kind of material (both published and grey) concerning Rights Retention and collected them. We also examined how laws in some European countries act in that regard. In addition, we considered initiatives such as the *Retain* project sustained by SPARC Europe, which focuses on the topic, and assessed some of its grey outputs (e.g., reports and whitepapers).

We found grey materials at four levels: the legislative level, the institutional level, the funders' level, and the initiatives/projects level.

Finally, we reviewed a list of funders and institutional policies in different countries. We compared them in our analysis to understand how grey materials could support Rights Retention and the Right to Knowledge.

4. How Rights Retention is approached in (some) EU countries and how GL supports the Right to Knowledge

Letting authors¹³ to retain fundamental rights to their publications helps them and promotes Open Access because to make Open Access and re-use their publications, authors must remain owners of their rights. The policies of funders and universities can make maintaining rights automatic and much easier than it would be for a single author in a negotiation with a publisher.

The analysis of the materials listed in the previous paragraph led us to group the strategies and documentation supporting authors to retain their rights into four categories. Indeed, grey materials on Rights Retention may be addressed at the legislative, institutional, funder and initiative/project level.

In the following sections, we will describe each scenario in more detail and illustrate how grey materials are fundamental in building and disseminating such strategies. There are four manners - supported by grey materials - to help authors retain their rights: at a legislative level, through some international initiatives, through the intervention of funders, and through authors' institutions. Analyzing the different approaches to Rights Retention in various countries, we found examples of national laws and grey materials that may help authors retain their rights during the phases of the publication process.

4.1 The legislative level

The already cited AISA (Italian Association for the Promotion of Open Science) in paragraph 1, produced an analysis, at a legislative level, to search laws in some European countries¹⁴ regarding Rights Retention and provides also, in some cases, a translation in English and Italian. For example, European countries already have operational laws dealing with authors' Rights Retention:

- Germany¹⁵
- France¹⁶
- Belgium¹⁷
- The Netherlands.

¹³ More on: <https://erc.europa.eu/news-events/magazine/rights-retention-and-open-access>

¹⁴ <https://aisa.sp.unipi.it/attivita/diritto-di-ripubblicazione-in-ambito-scientifico/testi-di-riferimento/>

¹⁵ <https://www.gesetze-im-internet.de/urhg/>

¹⁶ <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000033202746>

¹⁷ http://www.ejustice.just.fgov.be/cgi/article.pl?urlimage=%2Fmopdf%2F2018%2F09%2F05_1.pdf%23Page81&caller=summary&language=fr&pub_date=2018-09-05&numac=2018031589

In Germany, "Copyright is not transferrable¹⁸" by law; Section 15 of the German law on Rights Retention, states that "the author has the exclusive right to exploit his or her work in material form; this right includes:

1. the right of reproduction (section 16),
2. the right of distribution (section 17),
3. the right of the exhibition (section 18)¹⁹.

First, the *Right of reproduction* stands for the right to produce copies of the work, whether on a temporary or permanent basis, regardless of the process or quantity in which they are made. Accordingly, transferring the work to devices for repeated communication of video and sound sequences (video and audio recordings) also constitutes reproduction, regardless of whether it is the recording of the communication of the work on a video or audio recording medium or the transfer of the work from one video or audio recording medium to another.

Instead, the *Right of distribution* means offering the original or copies of the work to the public or putting them into circulation. The German law states that if the original or copies of the work have been put into circulation by sale with the consent of the person authorized to distribute them in the territory of the European Union or another Contracting Party to the Agreement on the European Economic Area, their dissemination is permitted, except for rental. For German law, rental is defined as a transfer for a fixed period for use that serves directly or indirectly for profit. However, the rental does not include the transfer of originals or copies

1. of buildings or works of applied art or
2. used in the context of an employment or service relationship for the exclusive purpose of fulfilling obligations resulting from the employment or service relationship.

Right of exhibition means the right to publicly display the original or copies of an unpublished artistic work or an unpublished photographic work. By specifying each type of right, German law leaves no room for misunderstanding regarding preserving rights.

On the other hand, in France, article L. 533-4.-II-III-IV, it is stated that (II) data resulting from a research activity that is at least half-funded by grants from the state, local authorities, public institutes, subsidies from national funding agencies, or EU funds may be freely re-used as long as a specific right or regulation does not protect them and have been made public by the researcher, institute or research organization. (III) The publisher of a scientific publication may not restrict the re-use of research data made public as part of its publication. (IV) The provisions of this article are a matter of public policy, and any clause to the contrary is deemed unwritten²⁰.

The situation in Italy is different because copyright could be transferable. As anticipated in paragraph 1, the Italian Gallo Law has never been approved. The foreseen²¹ authors' Secondary Publishing Rights remain to them unless the publisher and authors have a different agreement.

Specifying every issue by law - or by a policy - could let people better understand authors' Rights Retention and may help authors raise their awareness. Authors' Rights Retention is concerned with how authors use repositories for self-archiving. We found several examples regarding grey materials on Rights Retention and Secondary Publishing Rights. Among them, we searched different types of documentation on authors' Rights Retention and Secondary Publishing Rights

¹⁸ Section 29. Transfer of copyright, in German Rights Retention Law: <https://www.gesetze-im-internet.de/urhg/>

¹⁹ *Ivi*.

²⁰ II.-Dès lors que les données issues d'une activité de recherche financée au moins pour moitié par des dotations de l'Etat, des collectivités territoriales, des établissements publics, des subventions d'agences de financement nationales ou par des fonds de l'Union européenne ne sont pas protégées par un droit spécifique ou une réglementation particulière et qu'elles ont été rendues publiques par le chercheur, l'établissement ou l'organisme de recherche, leur réutilisation est libre.

III.-L'éditeur d'un écrit scientifique mentionné au I ne peut limiter la réutilisation des données de la recherche rendues publiques dans le cadre de sa publication.

IV.-Les dispositions du présent article sont d'ordre public et toute clause contraire à celles-ci est réputée non écrite. In the already cited <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000033202746>

²¹ By the existing law (the above cited n. 633/1941 Law).

produced in some countries, also at an institutional level, intending to verify if and how the grey literature may support these topics.

4.2 The Institutional level and Policies

As this paper states in different sections, some examples of grey literature are policy documents or organizational reports. At a national level, in note 9, we have already mentioned several policies (by AISA) concerning Rights Retention strategies. Instead, at an institutional level and following the University of Harvard policy (the first IARPP: Institutional Author Rights Retention Policies²²), other universities²³ adopted the same approach. IARRPs (Institutional Author Rights Retention Policies) are an initiative that produces essential policy instruments to support researchers in the phases of the publication process. The Harvard Faculty of Arts and Sciences did the first university-level rights-retention OA policy. Other universities followed this model.

In addition, the *UK Research and Innovation* (UKRI)²⁴ produced an OA policy (August 2021), a rights-retention provision on the Plan S²⁵ model.

Also, in the UK, researchers are covered by different Open Access policies of funders and publish in journals with various OA policies, sometimes different depending on who is funding the research. This variety of policies is complex, causes confusion, and is difficult to manage. Researchers run the risk that their results will not be eligible for submission to the UK Research Excellence Framework post 2021 (REF2021)²⁶. In the UK, policy development and connection among institutions, funders, and publishers is overseen by a steering group of experts representing various aspects of Open Access publishing.

The Harvard model is different, as Peter Suber states:

On the Harvard model, faculty vote to grant a set of nonexclusive rights to the university, which uses the rights to authorize OA through its institutional repository. At the same time, it grants the same set of nonexclusive rights back to the faculty authors²⁷.

The Harvard model showed that institutional Rights Retention Policies are more effective than asking authors to retain rights independently. Indeed, institutions have more negotiating power than a single author in a contract with publishers. The Harvard-style Rights Retention policies represented a successful model for more than 80 universities or college units worldwide, which voted to adopt similar strategies. We also found that preserving a broader set of nonexclusive rights may be more useful than retaining only those necessary to comply with Open Access policies. In the *Good practices for university open-access policies*²⁸ some points are fixed:

- *The institution must have an institutional repository or participate in a consortial repository. Most schools launch a repository before adopting a policy to fill it, but some do it vice versa.*
- *Institutions with the kind of policy recommended here will want the grant of nonexclusive rights in the policy to prevail over a later publishing contract inconsistent with the policy. Adopting the policy may suffice to attain that goal. However, to be more certain, practically*

²² <https://osc.hul.harvard.edu/policies/fas/>

²³ https://cyber.harvard.edu/hoap/Additional_resources

²⁴ The *UK Research and Innovation* (UKRI) is a non-departmental public body of the UK government that directs research and innovation funding, financed through the science budget of the Department for Science, Innovation and Technology. Established on 1 April 2018 by the Higher Education and Research Act 2017, the UKRI merged nine (Arts and Humanities Research Council, Biotechnology and Biological Sciences Research Council, Engineering and Physical Sciences Research Council, Economic and Social Research Council, Medical Research Council, Natural Environment Research Council, Science and Technology Facilities Council, Innovate UK, Research England) organizations into a single body. The UKRI was created following a report by Sir Paul Nurse, President of the Royal Society, who recommended the merger in order to increase interdisciplinary integrative research. More on https://en.wikipedia.org/wiki/UK_Research_and_Innovation

²⁵ <https://www.coalition-s.org/>

²⁶ <https://results2021.ref.ac.uk/>

²⁷ Suber P. (2021) *Rights retention and open access*, European Research Council magazine, October 28, 2021: <https://erc.europa.eu/news-events/magazine/rights-retention-and-open-access>

²⁸ https://cyber.harvard.edu/hoap/Good_practices_for_university_open-access_policies

and legally, that the policy license survives any later transfer, US institutions should get authors to sign a “written instrument” affirming the policy.

- Here's why: Under US copyright law ([17 USC §205\(e\)](#)), a “nonexclusive license...prevails over a conflicting transfer of copyright ownership if the license is evidenced by a written instrument signed by the owner of the rights licensed or such owner's duly authorized agent.”
- This provision doesn't say that a written instrument is the only way to make a nonexclusive license prevail over a later contract inconsistent with the policy. The nonexclusive license in the policy may prevail in any case, especially if the university policy is sufficiently well known. But to be safe, it's best to get a written affirmation of the grant of rights (or license) as specified by 17 USC 205(e)²⁹.

This is the main difference between the Harvard model and the others. The Harvard model is centralized, and, above all, the nonexclusive licenses prevail over a conflicting transfer of copyright ownership if the license is evidenced by a written instrument signed by the owner of the rights licensed.

A report from the *Retain* project states³⁰:

Different factors have contributed to the rapid adoption and type of policies developed across Europe over the last 3 years. Providing support for researchers is a major (if not the major) element, but other aspects are also important. The context in which the policy is developed, and specifically the legal jurisdiction and publishing culture, are affecting the pace and nature of policies which are developed.

The same report contrasted Harvard-style Rights Retention Policies and those developing in Europe. In the Harvard model, there is a centralized system. The European model has different approaches based on every institution's culture, procedures, laws, and history. Analyzing some IARPP (Institutional Author Rights Retention Policies), the *Retain* project states:

European research institutions are exploring and increasingly implementing policies which retain rights over the outputs of research for researchers and the institutions themselves. They should continue to do so, working closely with their researchers to ensure policies have support and that the benefits to authors are clear.

There is no one size fits all approach - different policies are more appropriate and stronger in different contexts dependent on legislation, publishing culture, funding requirements and other factors. However, generally, policies are stronger where the institution itself retains and exerts certain rights for achieving more openness and not just the researcher if a clear legal basis for such a policy exists. According to legal advice received by institutions in the UK, British copyright law recognises earlier licences where prior knowledge of the licence can be demonstrated, and thus a carve out in contract law is applicable to publishing contracts.

Advice suggests that such a mechanism does not apply in continental legal jurisdictions, and so alternative mechanisms or legislative reform may be required to achieve the same effect, whether that is at national level or as part of broader EU consideration of copyright harmonisation³¹.

²⁹ https://cyber.harvard.edu/hoap/implementing_a_policy

³⁰ SPARC EUROPE, Opening Knowledge: Retaining Rights and Open Licensing in Europe in the RETAIN PROJECT, June 28, 2023: <https://zenodo.org/records/8084051>

³¹ *Ivi*, p. 2.

4.2.1 Institutional Policies List

As mentioned above, we found grey materials such as laws and institutional policies. The following table contains a list of institutional policies representing examples of IARPPs:

Nation	University	Policy	link	last visit
Germany	Germany, Leibniz University Hannover	Open Access Policy at Leibniz University Hannover	https://www.uni-hannover.de/en/universitaet/profil/leitbild-und-strategien/forschung/open-science/open-access/open-access-policy	January 18, 2024
Iceland	Bifröst University	Open Access Policy	https://www.bifrost.is/english/about-bifrost/policies-and-regulations/open-access-policy	January 18, 2024
	TU Dublin	Open Access Policy for Publications & Data for Technological University Dublin	https://arrow.tudublin.ie/open_access_policy.pdf	January 18, 2024
Norway	Tromsø, UiT, The Arctic University of Norway	Principles for open access to academic publications at UiT	https://uit.no/Content/762228/cache=1643633369000/PRINCIPLES%20FOR%20OPEN%20ACCESS%20TO%20ACADEMIC%20PUBLICATIONS%20AT%20UIT.pdf	January 18, 2024
	NTNU, Norwegian University of Science and Technology	Self-archiving and Rights Retention Strategy	https://i.ntnu.no/wiki/-/wiki/English/Self-archiving+and+Rights+Retention+Strategy	January 18, 2024
	The University of Bergen	The University of Bergen Policy for Open Science	https://www.uib.no/en/foremployees/142184/university-bergen-policy-open-science#open-access-to-research-publications-and-artistic-research	January 18, 2024

Nation	University	Policy	link	last visit
Sweden	Stockholm University	Open Science Policy	https://www.su.se/stafforganisation-governance/governing-documents-rules-and-regulations/research/open-science-policy-1.628566	January 18, 2024
	Chalmers University of Technology	Open Science Policy		
	Lund University	Open access policy for publications and artistic works	https://www.staff.lu.se/sites/staff.lu.se/files/2021-09/Open-access-policy-for-publications-and-artistic-works.pdf	January 18, 2024
	University of Skövde	Guidelines for open access and registration of publications in DiVA	https://www.his.se/globalassets/styrdokument/utbildning-forskarniva/riktlinjer-diva.pdf	January 18, 2024
UK	University of Edinburgh	Research Publications and Copyright Policy (2021)	https://www.ed.ac.uk/information-services/about/policies-and-regulations/research-publications	January 18, 2024
	University of Cambridge	Rights Retention Pilot / Self-Archiving Policy	https://www.openaccess.cam.ac.uk/publishing-open-access/self-archiving-policy-guidance	January 18, 2024
	Birkbeck University of London	Open Research Policy	https://www.bbk.ac.uk/about-us/policies/open-accessresearch	January 18, 2024
	Sheffield Hallam University	Open access and rights retention	https://libguides.shu.ac.uk/OpenAccess/rightsretention	January 18, 2024
	The University of Manchester	Intellectual Property ("IP") Policy	https://documents.manchester.ac.uk/display.aspx?DocID=24420	January 18, 2024
USA	Harvard University	A Model Open-Access Policy	https://osc.hul.harvard.edu/	January 18, 2024

Figure 1: a list of IARPP³²

4.3 The funders' level

At the funders' level, the cited *Retain* project report explains:

Having strong Open Access positions of national research funders and national policy - or lawmakers can both have a decisive influence on the national level³³.

The Horizon Europe funding program for 2021-2027 differs from Horizon 2020 in part by adding a rights retention requirement³⁴. Unlike the initiative cOAlition S, Horizon Europe does not require grantees to apply for an open license to their accepted manuscripts upon submission. Horizon Europe only encourages grantees to notify the publisher of their obligations under the grant agreement.

³² All the links of the institutional policies are also listed in the finale webliography.

³³ *Ivi*, p. 13.

³⁴ https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/aga_en.pdf#page=152, p. 278, in article 17.

4.4 The initiatives/projects level

Other initiatives/projects aimed at protecting authors' rights are:

- cOAlition S Rights Retention Strategy³⁵: cOAlition S has released its Rights Retention Strategy (RRS) to allow authors to retain their rights and to enable compliance with their funders' OA policy through dissemination in a repository. cOAlition S has developed a Rights Retention Strategy to give researchers - supported by a cOAlition S organization - the chance to submit their manuscripts for publication to journals of their choice, including subscription journals while remaining fully compliant with Plan S. As part of this strategy, cOAlition S organizations modified their grant conditions to ask the application of a Creative Commons Attribution (CC-BY³⁶) license to all Author Accepted Manuscripts (AAM) or Versions of the Record (VoR).
- Ouvrir la Science³⁷ (France); the rights retention strategy is part of France's Second National Plan for Open Science. The Plan, supported by the European Union, concludes with research evaluation and strategies to implement Open Science, favoring authors' Rights Retention, allowing them to comply with several funding agencies' mandates.
- The already cited - in paragraphs 3 and 4 - *Retain* project (a KR21 funding program project³⁸), led by SPARC Europe, intends to accelerate the uptake of Rights Retention and open licensing to enable researchers to share their work openly. It will do this by calling for publisher, institutional, and funder policy change and empowering authors to refuse to transfer their rights. They carried out research to provide a solid and informed basis for this change and then campaigned and supported a transformation in copyright policy that embraces OA amongst publishers, funders, and institutions.

The project Right2Pub and the CLAKP group have planned to produce grey materials to provide authors with powerful and practical instruments to inform on Rights Retention and Secondary Publishing Rights. Examples are toolkits, leaflets, infographics, reports on the results of surveys and Focus Groups, and more videos in the wake of those already published. For example, a recent survey about Rights Retention and Secondary Publishing Rights was administered to the CNR scientific community in November 2023. In December 2023, two Focus Groups were held in the CNR Research Areas of Pisa and Bologna. The data analysis is ongoing, and the results will be published on the project website³⁹.

5. Conclusions

Rights Retention is closely connected to Open Science as it favors more transparency, allowing the authors to share their research. Consequently, avoid expensive duplicates and accelerate scientific progress for a more inclusive society. On the other hand, Open Science represents a fundamental component of the right to education, an essential element of a democratic society, as highlighted by the UN 2030 Agenda⁴⁰ in the statement, *No one will be left behind*.

In paragraph 1, we already mentioned that when publishers hold fundamental rights, they decide on OA. On a practical level, the retention of rights by authors allows not only access to the literature but also guarantees the possibility of extracting and reusing content in different contexts and for different purposes. When authors want OA and hold their rights, they avoid the delays and efforts required⁴¹ to obtain permission. They also avoid the risk of a negative response.

Adopting institutional Rights Retention policies is more effective than asking, encouraging, or requiring authors to retain rights independently. In this way, authors benefit from greater

³⁵ <https://www.coalition-s.org/rights-retention-strategy/>

³⁶ <https://creativecommons.org/licenses/by/4.0/>

³⁷ <https://www.ouvrirlascience.fr/release-of-the-english-version-of-the-rights-retention-strategy-guide/>

³⁸ Retain Project and Right2Pub project are both funded by KR21 programme, sharing objectives and strategies.

³⁹ <https://www.right2pub.eu/>

⁴⁰ <https://sdgs.un.org/2030agenda>

⁴¹ Suber P. in <https://erc.europa.eu/news-events/magazine/rights-retention-and-open-access>

protection when negotiating with publishers to retain their rights, thus overcoming the restrictions imposed.

Adopting institutional Rights Retention policies is more effective than asking authors to retain rights by their own. In this way, authors benefit from more protection when negotiating with publishers to retain their rights, going beyond the restrictions imposed.

At a legislative level, grey materials are the stronger instruments supporting authors' Rights Retention. At an IARPP level, grey materials are stronger if they use a national law, too. Regarding this kind of instrument, every nation (and every IARPP) must follow its way according to its laws, procedures, and culture.

CLAKP and the Right2Pub project are important initiatives in Italy aiming to raise interest in the topic. Much grey materials have been produced on this topic, and much more will likely settle in the future. It would be worthwhile to collect and systematize it so that the international scientific community can easily reuse all the valuable outputs to support the right to knowledge. The use of grey material is the basis of the regulatory mechanisms for maintaining such a fundamental right as free access to knowledge.

Note: This paper's cited links were revised on January 18, 2024.

Bibliography

- Attanasio P. (2022). *Punti di vista sull'accesso aperto*, Giornale italiano di psicologia, Fascicolo 3, settembre 2022, <http://www.rivisteweb.it/doi/10.1421/105465>
- Bennett, E. A. (2021). *Open science from a qualitative, feminist perspective: Epistemological dogmas and a call for critical examination*. Psychology of Women Quarterly, 45(4), 448–456. <https://doi.org/10.1177/03616843211036460>
- Besançon L., Peiffer-Smadja N., Segalas C., Jiang H., Masuzzo P., Smout C., Billy E., Deforet M., Leyrat C. (2020). *Open Science Saves Lives: Lessons from the COVID-19 Pandemic*. <https://doi.org/10.1101/2020.08.13.249847>
- Besson S. (2023). *The 'Human Right to Science' qua right to participate in science. The participatory good of science and its human rights dimensions*, The International Journal of Human Rights, <https://doi.org/10.1080/13642987.2023.2251897>
- Binda, F., Caso R., (2020). *Il diritto umano alla scienza aperta*. <https://doi.org/10.5281/zenodo.4053531>
- Caso R. (2023). *Il diritto umano alla scienza e il diritto morale di aprire le pubblicazioni scientifiche. Open Access, "secondary publication right" ed eccezioni e limitazioni al diritto d'autore*. <https://doi.org/10.32091/RIID0099>
- Caso R. (2019), *La libertà accademica e il diritto di messa a disposizione del pubblico in Open Access*, <https://doi.org/10.5281/zenodo.3635771>
- Caso R. (2023). *La valutazione autoritaria e la privatizzazione della conoscenza contro la scienza aperta. In: Perché la valutazione ha fallito: per una nuova Università pubblica*. Italia: Morlacchi Editore, 2023, p. 17-39. <https://www.morlacchilibri.com/universitypress/index.php?content=scheda&id=1209>.
- Chiodetti A.G., Gasperini A., Locati M., Sala M. (2023). *Risultati del sondaggio Politiche e infrastrutture per l'Open Access per pubblicazioni e letteratura grigia*, <https://doi.org/10.15161/oar.it/77021>
- Della Sala S., Cubelli R. (2021). *La beffa e il danno delle nuove politiche dell'editoria scientifica*, Giornale italiano di psicologia, Fascicolo 3, settembre 2021, <https://doi.org/10.1421/102281>
- Ding Y. (2019). *Is Creative Commons a Panacea for Managing Digital Humanities Intellectual Property Rights?* Information Technology and libraries, <https://doi.org/10.6017/ital.v38i3.10714>
- DORA (Declaration or Research Assessment), SPARC-Europe and EUA (European University Association). *Reimagining academic assessment: stories of innovation and change*. https://eua.eu/downloads/publications/eua-dora-sparc_case%20study%20report.pdf
- FINAL STATEMENT (2023). *16th Berlin Open Access Conference*, <https://oa2020.org/b16-conference/final-statement/>
- Masuzzo P. (2020). *Open Science, "La scienza fatta bene"*, <https://doi.org/10.5281/zenodo.4106505>
- Pasari L. (2022). *From the Right to Science to the Right to Open Science: The European Approach to Scientific Research*. In: *European Yearbook on Human Rights*, Intersentia, 2022.
- Rossi G. (coordinator), Caso R., Castelli D., Giglia E. (2022). *Piano Nazionale per la Scienza Aperta*. https://www.mur.gov.it/sites/default/files/2022-06/Piano_Nazionale_per_la_Scienza_Aperta.pdf
- Rouah S., Bourdon R.D. (2019), *Access to Scientific Works, Exclusive Rights and Free Science*, in *Revue internationale du droit d'auteur*, <https://rida.ideesculture.fr/sites/default/files/2019-12/261-D2VA.pdf>

- Suber P. (2021). *Rights retention and open access*, European Research Council magazine, October 28, 2021: <https://erc.europa.eu/news-events/magazine/rights-retention-and-open-access>
- Tennant J. (2018). *Open Science: just Science done Right*. Link: <http://doi.org/10.5281/zenodo.1285575>
- UN (2015). *Transforming our world: the 2030 Agenda for Sustainable Development*, <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N15/291/89/PDF/N1529189.pdf?OpenElement>
- UNESCO (2021). UNESCO Recommendation on Open Science (pp. 1–36). UNESCO. Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000379949.locale=enGoogle Scholar>
- UNESCO, Canadian Commission for UNESCO (2022). *An introduction to the UNESCO Recommendation on Open Science*, <https://doi.org/10.54677/XOIR1696>
- Yon-Seng Khoo S. (2021). *The Plan S Rights Retention Strategy is not a solution*, Insights: the UKSG journal, <https://doi.org/10.1629/uksg.556>

Webliography

- <https://library.isti.cnr.it/index.php/en/library>
- <https://www.knowledgerights21.org/>
- <https://www.knowledgerights21.org/about/>
- <https://www.igsg.cnr.it/progetti-2/clakp/>
- <https://www.right2pub.eu/>
- https://www.youtube.com/playlist?list=PLmW_xhy00luZhOQP3Nm_Gn9BvIMkLeL36
- <https://aisa.sp.unipi.it/attivita/diritto-di-ripubblicazione-in-ambito-scientifico/testi-di-riferimento/>
- <https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000033202746>
- <https://www.gesetze-im-internet.de/urhg/>
- http://www.ejustice.just.fgov.be/cgi/article.pl?urlimage=%2Fmopdf%2F2018%2F09%2F05_1.pdf%23Page81&caller=summar y&language=fr&pub_date=2018-09-05&numac=2018031589
- <https://www.senato.it/leg/18/BGT/Schede/Ddliter/51466.htm>
- <https://pmg.org.za/bill/705/>
- <https://osc.hul.harvard.edu/policies/fas/>
- https://cyber.harvard.edu/hoap/Additional_resources
- <https://www.coalition-s.org/rights-retention-strategy/>
- <https://www.ouvirlascience.fr/release-of-the-english-version-of-the-rights-retention-strategy-guide/>
- <https://www.uni-hannover.de/en/universitaet/profil/leitbild-und-strategien/forschung/open-science/open-access/open-access-policy>
- <https://www.coalition-s.org/>
- <https://www.bifrost.is/english/about-bifrost/policies-and-regulations/open-access-policy>
- https://arrow.tudublin.ie/open_access_policy.pdf
- <https://uit.no/Content/762228/cache=1643633369000/PRINCIPLES%20FOR%20OPEN%20ACCESS%20TO%20ACADEMIC%20PUBLICATIONS%20AT%20UIT.pdf>
- <https://i.ntnu.no/wiki/-/wiki/English/Self-archiving+and+Rights+Retention+Strategy>
- <https://www.uib.no/en/foremployees/142184/university-bergen-policy-open-science#open-access-to-research-publications-and-artistic-research>
- <https://www.su.se/staff/organisation-governance/governing-documents-rules-and-regulations/research/open-science-policy-1.628566>
- <https://www.staff.lu.se/sites/staff.lu.se/files/2021-09/Open-access-policy-for-publications-and-artistic-works.pdf>
- <https://www.uib.no/en/foremployees/142184/university-bergen-policy-open-science#open-access-to-research-publications-and-artistic-research>
- <https://www.his.se/globalassets/styrdokument/utbildning-forskarniva/riktlinjer-diva.pdf>
- <https://www.ed.ac.uk/information-services/about/policies-and-regulations/research-publications>

- <https://www.openaccess.cam.ac.uk/publishing-open-access/self-archiving-policy-guidance>
- <https://www.bbk.ac.uk/about-us/policies/open-accessresearch>
- <https://libguides.shu.ac.uk/OpenAccess/rightsretention>
- <https://documents.manchester.ac.uk/display.aspx?DocID=24420>
- <https://osc.hul.harvard.edu/policies/>
- <https://osc.hul.harvard.edu/>
- <https://www.youtube.com/watch?v=xai5JhyWVqI&t=110s>
- <https://www.youtube.com/watch?v=9nWe7NHT2fY>
- <https://www.youtube.com/watch?v=Nnmrx1aPUTU&t=138s>
- <https://www.youtube.com/watch?v=Ck2gxo0RbtU&t=170s>
- <https://www.youtube.com/watch?v=BvwaC2jVjVo&t=306s>
- <https://www.anvur.it/en/activities/vqr/>
- <https://www.italiadomani.gov.it/content/sogei-ng/it/en/home.html>
- <https://www.coalition-s.org/blog/reviewing-the-rights-retention-strategy-a-pathway-to-wider-open-access/>
- <https://scholarlykitchen.sspnet.org/2021/02/17/rights-retention-strategy/>
- <https://www.openaire.eu/blogs/a-guide-on-rights-retention-strategy?tmpl=component&print=1&format=print>
- <https://www.wiley.com/en-us/network/publishing/societies/publishing-strategy/the-plan-s-rights-retention-strategy-how-should-we-respond>
- <https://www.coalition-s.org/blog/now-is-the-time-for-universal-benefi%20ts-of-the-blessings-of-knowledge/>
- <https://www.coalition-s.org/blog/how-the-norwegian-university-of-science-and-technology-takes-legal-responsibility-for-its-authors-copyrights-by-implementing-rights-retention/>
- <https://www.coalition-s.org/blog/how-to-make-it-right-a-rights-retention-pilot-by-the-university-of-cambridge-ahead-of-shaping-a-full-institutional-policy/>
- <https://ukscl.ac.uk/>
- <https://libguides.shu.ac.uk/OpenAccess/rightsretention>
- <https://libguides.shu.ac.uk/OpenAccess/rightsretention>
- <https://libraryblogs.is.ed.ac.uk/openscholarship/2022/10/14/rights-retention-policy-an-update-after-9-months/>
- <https://open-science.it/-/rrs-guide>
- <https://www.coalition-s.org/enabling-open-access-through-clarity-and-transparency-a-request-to-publishers/>
- <https://sparceurope.org/what-we-do/open-access/copyright/project-retain/>

Realizing the Potential of Grey Literature by Recognizing its Publishers: The PUBGREY Project and the Case of Climate Change*

Dominic Farace, GreyNet International, Netherlands
Stefania Biagioni and Carlo Carlesi, ISTI-CNR, Italy

Abstract

The way to confront climate change is by publishing the results of research dealing with the manifold and diverse topics associated with this complex entity. In response to this, GreyNet sets out to identify among its community of practice organizations that consider themselves publishers in grey literature. This is initiated by designing a standardized template. The acquisition of the data compiled via the online template harvested 25 records. The records captured in this phase of the project now comprise the PUBGREY registry openly accessible on GreyNet's website and via the GreyGuide, GreyNet's web access portal and repository. The organizations that appear in the PUBGREY registry are together seen as a consortium of publishers in grey literature. Together they demonstrate the supply-side of grey literature where its production, publication, and open access adhere to FAIR principles. Following this, a selection of records is made based on three criteria forming the population of this use case. These criteria include: open access compliance, each of the publishing bodies will have already been assigned a ROR ID, and an individual's email address is provided as the point of contact in the record. Ten of the 25 records in the PUBGREY registry adhere to the established criteria and form the population of our study. These are then asked to complete a brief online survey dealing with grey literature. The survey questions used in this study on climate change are the exact same as in a study three years earlier on circular economy. The reuse of the questionnaire was based on a recent [working paper](#) demonstrating how circular economy provides a strategy in achieving goals for climate change. Finally, via the search function on the ten websites of our survey population, a search of the terms: 'climate', 'climate change', and 'circular economy' are carried out. The results from both the survey and the searches from the websites are then analyzed and presented in summary.

Introduction

The way to confront climate change is by publishing the results of research dealing with its diverse and manifold topics associated with this complex entity. In order to demonstrate the role grey literature has in confronting climate change we first seek to identify the publishers of grey literature by compiling and publishing a registry in this field of information. We then seek to acquire the publishers' views on grey literature via a questionnaire. And finally, by means of the survey results, the use of the PUBGREY registry, and results from searches in the websites of the publishers are we then able to record and document our case on climate change. (See Appendix 1: PUBGREY Project Plan)

Step One – Identify the Publishers in Grey Literature

In order to identify the publishers in grey literature, an online template was designed and posted via GreyNet's distribution list and social media. The template consists of 10 fields with accompanying scope notes. It was posted in mid-February 2023 via GreyNet's distribution list and social media, namely Facebook and LinkedIn.

* First published in the GL25 Conference Proceedings, February 2024 <https://doi.org/10.26069/grey-net-2024-000.498-gg>

Field #	RECORD FIELD NAME	SCOPE NOTES
1.	Name of Publishing Body	<i>Complete Name and Acronym if applicable</i>
2.	Sector of Information	<i>Government, Academics, Business, Industry, Other</i>
3.	Document Types	<i>Reports, Proceedings, Theses, Datasets, Videos, etc.</i>
4.	Publication Formats	<i>Print, PDF, Datafile, Online, etc.</i>
5.	Main Coverage	<i>Disciplines, Topics, Subjects</i>
6.	Content Contributors	<i>Internal only, External also accepted</i>
7.	Open Access Compliant	<i>Yes, CC License if applicable</i>
8.	Homepage URL	<i>http, https</i>
9.	Identifiers	<i>Date founded, Awards, ROR ID, DOI, Social Media, etc.</i>
10.	Point of Contact	<i>Full Name, ORCID if applicable, Email address</i>

Table 1: PUBGREY Template



In the final week of March 2023, the records submitted until then were compiled, edited, and published on GreyNet's Web site and in the GreyGuide, GreyNet's Web Access Portal and Repository. This repository was designed and is managed by my two colleagues in this project. The PUBGREY registry¹ carries an ISBN as well as a DOI. The first edition contains 25 records of publishers in grey literature and is the primary resource that serves in the next phase in our project.

Figure 1 Cover PUBGREY Registry

Step Two – Acquire the Publishers’ Views on Grey Literature

Moving on to the second step in our project, we seek to acquire the publishers' views on grey literature separate from the views of a combined range of stakeholders that include authors, researchers, editors, sponsors, end-users, etc.

It is here that a selection of records is made based on three criteria: open access compliance, the publisher was assigned a ROR-ID², and the respondent who completed the template provided his/her contact details that could be used in a further line of questioning dealing with their views on grey literature and their response if any to search results acquired from their organization's website.

Of the twenty-five publishers in the PUBGREY registry 10 met these criteria and they are the population of our study on climate change. The population of the 2020 study on circular economy³ was open to all types of stakeholders in grey literature.

The questionnaire GreyNet designed in 2020 that was used in the study on circular economy was reintroduced in this study dealing with climate change. The decision to reuse the questionnaire was sparked by a working paper by Wang et al⁴ in 2022 entitled “Circular economy as a climate strategy”.

The reuse of the questionnaire is seen as warranted in that the survey questions while referring to grey literature do not mention the term circular economy and neither do they include the term climate change. The ten survey questions (See Appendix 2) both in 2020 and again in 2023 are identical; however, the survey populations differ. This allows for comparison and analysis of the results of both. This would also help to determine whether there is the same or a similar level of consensus among GreyNet's community of practice with the controlled sub-group of publishers dealing with their views on grey literature.

Survey Year	Survey Population	Survey Reach	Survey Questions	N° of Survey Respondents
2020	GreyNet's Distribution List and social media	Open/Random	10	72 (NA)
2023	PUBGREY Registry Publishers in Grey Literature	Controlled/ Criteria est.	10	10 (100%)

Table 2: Comparison of the 2020 and 2023 Survey Populations, Survey Reach, and Respondents

There is reason to consider that if a comparison of the results between the two survey populations were to uncover any significant differences, then this would allow us to identify the publishers' views dealing with grey literature juxtaposed to that of a varying range of stakeholders in the field of grey literature.

SURVEY RESPONSES*	
Strongly Agree 2020	Strongly Agree 2023
Q1 - Grey literature resources should be open access compliant 63%	90%
Q4 - The dated mindset regarding grey literature is as much a barrier as broken links 25%	40%
Q5 - Persistent identifiers maximize the use of grey literature resources 36%	60%
Q7 - More consideration should be given to the accessibility of grey literature in its early production and subsequent publication 61%	70%
Q9 - By drawing public awareness to grey literature, barriers facing it will have more prospect in being resolved 39%	20%
*Rounded to the nearest percent	

Table 3: Comparison of Five of the Survey Responses having the highest differential

Here we see a comparison of the results of 5 of the 10 questions in the two surveys exhibiting the highest differential. While four of the five responses compared show a significant increased percentage of strong agreement on the part of the publishers, one of the five responses compared shows a significant decreased percentage of agreement on the part of the publishers. A brief look at the 5 questions and the responses from the two surveys averages a near 19% disparity.

In the study on circular economy, grey literature is shown to be both a driver and a vehicle in research. As a driver, it is counted as one of the industries associated with circular economy namely the information industry alongside textile, agriculture, utilities, and other industries. As a vehicle, grey literature is seen as an important way of publishing by way of numerous document types, thereby communicating research results produced by other industries.

Circular Economy

- **Driver:** Grey Literature is part of the information Industry among other industries in the circular economy such as textile, agriculture, utilities, etc.
- **Vehicle:** Via grey literature's multiple and diverse document types, information produced in all industries in the circular economy is transferable and openly accessible.

Now, if the circular economy can be viewed as a strategy related to climate and climate change as purported by Wang et al, then grey literature may also be seen as a driver and vehicle for climate change.

Step Three – Employ the PUBGREY Registry in the case of Climate Change

Two of the record fields in the PUBGREY template enabled us to address climate change. I refer here to the field Main Coverage in the template in which the disciplines, topics, and subjects of the publishers are recorded and to the field Document Types in the template in which both textual and non-textual document types are recorded.

Grey Literature seen as a driver in climate change

If we look at the coverage of topics compiled from the PUBGREY registry we see that the term climate change is not found among the topics. However, if we look at the host of topics recorded, it is not questionable to assume that many of them are related to climate change e.g., agriculture, coastal management, environment, food security, health, natural resources, sustainable development, etc.

PUBGREY – Multidisciplinary coverage by Publishers in Grey Literature

Agriculture	Food Security	Nuclear Science
Archaeology	Geography	Nutrition
Caribbean Studies	Grey Literature	Pharmaceuticals
Coastal Management	Health	Policies
Communications	Health Care	Psychology
Development	Health Care Systems	Public Health
Dietetics	Heritage	Public Policy
Diseases	Humanities	Publishing
Drugs	Informatics	Radiation Physics
Economics	Library Science	Science
Economy	Marine Environmental Science	Social Science
Educational Science	Mathematics	Soil Remediation
Engineering	Medical Devices	Steel
Enterprise Architecture	Medical Diagnostics	Sustainable Development
Entomology	Medical Procedures	Technology
Environment	Natural Resources	Telematics
Family Studies	Nuclear Energy	Trade
Florida History	Nuclear Medicine	

Table 4: Overall coverage of topics extracted from the PUBGREY Registry

This is later supported by search results involving the terms: 'climate', 'climate change', and 'circular economy' retrieved via the websites of the ten publishing organizations in our sample.

Organization's Website	Country	Coverage	Climate	Climate Change	Circular Economy	CC & CE
INIS-IAEA	AT	Energy	75733	35335	791	385
UF	US	Multidisciplinary	+10000	+10000	128	80
IFPRI	US	Food Policy	4529	4142	108	40
APO	AU	Public Policy	3173	2675	91	17
SAARLAND	DE	Multidisciplinary	357	104	4	-
MTAK	HU	Multidisciplinary	198	49	-	-
ADS	UK	Archaeology	91	7	-	-
AHS	CA	Health	72	12	2	2
ESTIA	GR	Multidisciplinary	16	3	1	-
NII	JP	Informatics	5	4	-	-

Table 5: Website search results from the sample population (*accessed on 23 April 2023*)

The working paper by Wang et al in 2022 in which circular economy is seen as a strategy in climate change appears to some extent in our web searches. Results shown in the table indicate that all 10 of the publishers' websites contain records on climate and climate change. While 7 of the 10 publishers' websites to some degree include records on circular economy, only 5 include records on climate change and circular economy combined. Topics covered in those five websites deal with energy, food policy, public policy, health, as well as a multidisciplinary coverage of topics.

Grey Literature seen as a vehicle in climate change

When referring to grey literature as a vehicle in transferring information and knowledge dealing with climate change, we need only look at the number of document types in various publication formats that are listed in the PUBGREY registry that accounts for at least fifteen. If we rank them according to the number of times that they are recorded by our survey population, we find that two of the top five are non-textual - those being datasets and audiovisual materials - while the other three in the top five are the more traditional grey literature document types: reports, theses, and proceedings.

Grey Literature Document Types		
Top 5 ranked in order ↑ ↓		
Reports Theses Datasets Proceedings AVMs	Conference Papers Discussion Papers Grant Proposals Guidelines Legislative Material	Maps Policies Protocols Research Papers Standards

Table 6: Coverage of document types listed by the ten publishers in our sample population

Summary of our Findings on Climate Change

From an empirical standpoint, grey literature can be seen as both a driver and vehicle in the field of scientific and technical information. As a driver, grey literature is in the forefront of information produced on all levels of (non)government, academics, business and industry. As a vehicle, grey literature serves in publishing and disseminating that which is produced in diverse and multiple document types both in textual and non-textual formats.

Climate Change

- **Driver:** Grey Literature includes multidisciplinary coverage of topics associated with climate change. As such, it is integral to research in this field.
- **Vehicle:** Via grey literature's multiple and diverse document types, the results of research associated with climate change are published and openly accessible.

We also found through the PUBGREY project, that publishers show more of a degree of consensus on grey literature than a combined range of stakeholders.

Concluding Statement

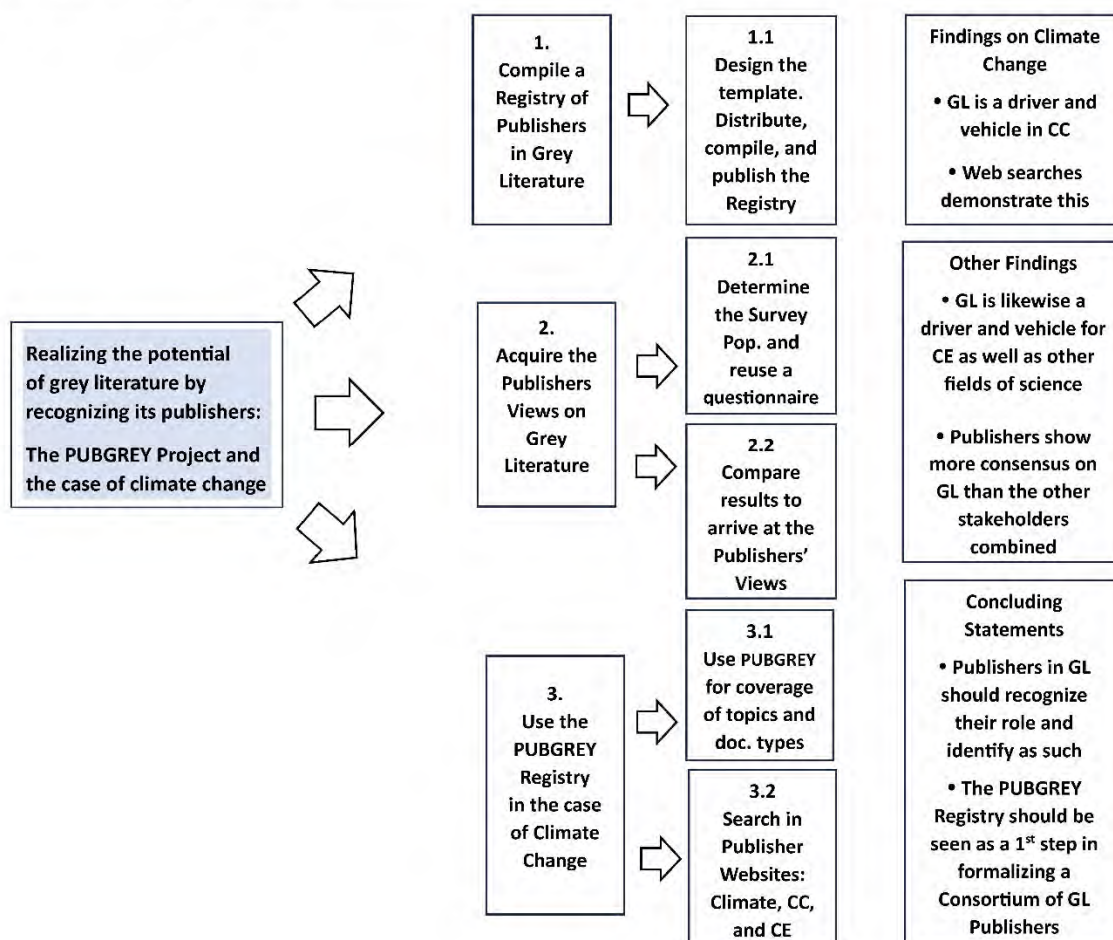
If we then establish that there is consensus among GreyNet's community of practice as to grey literature's role as both a vehicle and driver in research, what better way to draw awareness to this than through publishing. Hence, those organizations producing and publishing grey literature must publicly acknowledge their role as publishers. It is in this way that they can be seen as an integral factor in confronting climate change as well as other societal problems and issues, whose solutions can best be addressed by way of research and publication. In close, the PUBGREY Registry should be seen as a first step in formalizing a Consortium of Grey Literature Publishers.

References

- ¹ PUBGREY – Publishers in Grey Literature / compiled by D. Farace, GreyNet International TextRelease : Amsterdam, 2023. - 1st ed. – 15 p. - ISBN 978-90-77484-44-9 [Registry] https://www.greynet.org/images/PUBGREY_1st_ed.,_2023_.pdf
- ² ROR is a global, community-led registry of open persistent identifiers for research organizations <https://ror.org/>
- ³ Farace D., & Frantzen J, (2021). Grey Literature Resources generate and drive Awareness to a Circular Economy: An Explorative Research Project. In: Twentieth-Second International Conference on Grey Literature, National Research Council of Italy, - Online Conference 19 November 2020 vol. 22 pp. 26-30. <https://doi.org/10.26069/greynet-2021-000.456-gg>
- ⁴ Wang, K., M. Costanza-van den Belt, G. Heath, J. Walzberg, T. Curtis, J. Barrie, P. Schroder, L. Lazer, and J. C. Altamirano. 2022. "Circular economy as a climate strategy: current knowledge and calls-to-action." [Working Paper]. Washington, DC: World Resources Institute <https://pacecircular.org/sites/default/files/2022-11/Circular-Economy-as-a-Climate-Strategy-paper-11.22-PAE-WRI-CH-NREL.pdf>

APPENDIX 1:

PUBGREY Project Plan



The scheme above, provides an overview of the project plan. The three cells forming the left-hand column state the goals of the project. The cells in the middle column provide the method of approach and implementation. And, the cells forming the right-hand column discuss the project findings and concluding statements.

APPENDIX 2:

Survey Questions in 2020 and 2023

- Q1** Grey literature resources should be open access compliant
- Q2** Loss of Information is a waste and presents a problem especially for grey literature
- Q3** Information overload contributes to the underuse of valuable grey literature resources
- Q4** The dated mindset regarding grey literature is as much a barrier as broken links
- Q5** Persistent identifiers maximize the use of grey literature resources
- Q6** Knowledge transfer is the primary function of grey literature
- Q7** More consideration should be given to the accessibility of grey literature in its early production and subsequent publication
- Q8** With grey literature research, the reusability of data/sets is more important than their replicability
- Q9** By drawing public awareness to grey literature, barriers facing it will have more prospect in being resolved
- Q10** Optional: Please enter your name and email address, and any other comments or recommendations that would be of benefit for this survey. Thank You!

Data from “Realizing the potential of grey literature by recognizing its publishers: The PUBGREY project and the case of climate change”

<https://doi.org/10.17026/SS/GWIFFK>

Dominic Farace, GreyNet International, Netherlands

<https://orcid.org/0000-0003-2561-3631>

<https://ror.org/01pxfxi80>

Questionnaire / Text Writer

Stefania Biagioni, InfraScience; Institute of Information Science and Technologies, Italy

<https://orcid.org/0000-0001-9518-0267>

<https://ror.org/05kacka20>

Reviewer

Carlo Carlesi, InfraScience; Institute of Information Science and Technologies, Italy

<https://orcid.org/0000-0001-9808-6268>

<https://ror.org/05kacka20>

Reviewer

Abstract

A selection of records from the PUBGREY Registry¹ was made based on three criteria forming the population of this use case. These criteria include: open access compliance, each of the publishing bodies will have already been assigned a ROR ID², and an individual's email address is provided as the point of contact in the record. Ten of the 25 records that comprise the PUBGREY registry adhered to the established criteria and they were asked to complete a brief online survey dealing with grey literature. The survey questions used in the study on climate change are the exact same as in a study three years earlier on circular economy³. The reuse of the questionnaire was based on a recent working paper⁴ demonstrating how circular economy provides a strategy in achieving goals for climate change. Finally, via the search function on the ten websites of our survey population, a search of the terms: 'climate', 'climate change', and 'circular economy' were carried out. The results from both the survey and the searches from the websites were then analyzed and presented in summary.

Keywords

Grey literature; Climate Change; Circular Economy; Publishers; Survey Data

Subject Area

Library and Information Science (LIS); Publishing; Grey Resources

Methods Applied

• Steps

A ten-question online survey was implemented via SurveyMonkey⁵. Nine of the questions were closed-ended. The tenth question requested the respondent's contact details. The survey questions used in this study on climate change are the exact same as in a study three years earlier on circular economy. The reuse of the questionnaire was based on a recent working paper demonstrating how circular economy provides a strategy in achieving goals for climate change. Finally, via the search function on the ten websites of our survey population, a search of the terms: 'climate', 'climate change', and 'circular economy' were carried out.

• Sampling strategy

A selection of records from the PUBGREY registry was made based on three criteria forming the population of this use case. These criteria include: open access compliance, each of the publishing bodies will have already been assigned a ROR ID, and an individual's email address is provided as the point of contact in the

record. Ten of the 25 records that comprise the PUBGREY registry adhered to the established criteria and they were asked to complete a brief online survey dealing with grey literature.

Survey Year	Survey Population	Survey Reach	Survey Questions	N° of Survey Respondents
2023	 Publishers in Grey Literature PUBGREY Registry	Controlled	10	10

• Quality Control

Owing to the criteria used in the selection of the survey recipients and the response rate, we can ascertain that the processes implemented in the data collection were accurate, reliable, and consistent. The survey data remain preserved on the SurveyMonkey software platform and are archived in the Dutch national repository for research data.

Dataset Description

File name:	Survey Results Climate Change and Grey Literature
Formats:	PDF
Creation dates:	from 2023-05-24 to 2023-06-20
Language:	English
License:	CC0 Waiver - no rights reserved
Archive Name :	DANS EASY Archive
Publication date :	2024-01-12
DOI :	https://doi.org/10.17026/SS/GWIFFK

Potential Reuse of the Data

The potential for reuse of the data in this study on Climate Change and Grey Literature has already been demonstrated via the reuse of an online questionnaire in the study on Circular Economy and Grey Literature 3 years earlier. This allowed for a comparison of the survey results as shown in one of the files in the data record. Nevertheless, the data is limited by the number of respondents to the survey. It remains a fact that the number of respondents does not formally allow for the expression of results in percentages. The data however remain preserved in a national archive⁶, which carries the CoreTrustSeal⁷ and by way of this data paper demonstrates compliance with FAIR data principles⁸.

Linked References

¹ https://www.greynet.org/images/PUBGREY_1st_ed.,_2023_.pdf

² <https://ror.org/>

³ <https://doi.org/10.17026/dans-zhz-k3z>

⁴ <https://pacecircular.org/sites/default/files/2022-11/Circular-Economy-as-a-Climate-Strategy-paper-11.22-PACE-WRI-CH-NREL.pdf>

⁵ <https://nl.surveymonkey.com/>

⁶ <https://easy.dans.knaw.nl/ui/datasets/id/easy-dataset:68541>

⁷ <https://www.coretrustseal.org/wp-content/uploads/2018/04/DANS-Electronic-Archiving-SYstem-EASY-.pdf>

⁸ <https://www.force11.org/group/fairgroup/fairprinciples>

Slovak Centre of Scientific and Technical Information **SCSTI**

Achieve
your goals
with us



INFORMATION SUPPORT OF SLOVAK SCIENCE

SCIENTIFIC LIBRARY AND INFORMATION SERVICES

- technology and selected areas of natural and economic sciences
- electronic information sources and remote access
- depository library of OECD, EBRD and WIPO

SUPPORT IN MANAGEMENT AND EVALUATION OF SCIENCE

- Central Registry of Publication Activities
- Central Registry of Art Works and Performance
- Central Registry of Theses and Dissertations and Antiplagiarism system
- Central information portal for research, development and innovation - CIP RDI >>>
- Slovak Current Research Information System

SUPPORT OF TECHNOLOGY TRANSFER

- Technology Transfer Centre at SCSTI
- PATLIB centre

POPULARISATION OF SCIENCE AND TECHNOLOGY

- National Centre for Popularisation of Science and Technology in Society

IMPLEMENTATION OF PROJECTS

- National Information System Promoting Research and Development in Slovakia – Access to electronic information resources - NISPEZ
- Infrastructure for Research and Development - the Data Centre for Research and Development - DC VaV
- National Infrastructure for Supporting Technology Transfer in Slovakia - NITT SK
- Fostering Continuous Research and Technology Application - FORT
- Boosting innovation through capacity building and networking of science centres in the SEE region - SEE Science

Identifying Possibilities of Emerging Technology Adoption in the Fashion Industry: Levering Insights from Grey Literature

Arianne Muthia Zahra, Wawan Dhewanto, and Akbar Adhiutama

School of Business and Management, Bandung Institute of Technology, Bandung, Indonesia

Abstract

In this study, we aim to broaden the landscape of emerging technologies applicable to the fashion sector (ETF) through the use of grey literature. While overlooked, the grey literature has merit in providing a rich outlook from otherwise commercially published literature. To investigate this evidence, a total of 698 grey documents from the year 2012 to 2023 found in the Scopus database were screened and analyzed using VosViewer. The results of the bibliometric analysis are used to map potential trajectories of emerging technologies that can be used in the fashion industry. Stakeholders interested in adopting these emerging technologies can consider this article a reference for their technological transformation roadmap.

Keywords: emerging technologies, fashion industry, grey literature, technology adoption

1. Introduction

In a rapidly changing world, businesses in the fashion industry continually seek to meet the ever-evolving demands of consumers. Many increasingly turn to emerging technologies to pursue novelty and competitive advantage (Jin & Shin, 2021). However, these technologies can transform the fashion scene and are frequently hidden from academic and industrial debate. Their presence may not prominently come to the surface as they are kept in the “grey literature”.

Grey literature, encompassing a wide array of non-traditional and non-peer-reviewed sources, is often overlooked in mainstream scholarly analysis. Specifically, grey literature can be defined as any documents created in print and electronic media by academic institutions, businesses, governments, and industries not under commercial publishers' authority (Mahood, Van Eerd, & Irvin, 2013). These documents can include government or NGO reports, conference papers, theses, and dissertations found in grey literature databases, clinical trial registers, and conference proceedings. In these unconventional repositories, valuable insights and early indicators of technological advancements can be discovered (Paez, 2017). This paper aims to reveal the wealth of information in grey literature to provide a comprehensive overview of the role of emerging technologies in the fashion industry (ETF) from 2013 to 2023. Mainly, we seek to answer these questions: 1) Who are the leading authors, and what are the leading publications in grey literature regarding ETF? 2) What kind of technologies have been influential in the fashion industry in grey literature for the past decade?; 3) What are suggestions for future research regarding ETF?

While other researchers have approached this using the traditional methods of evaluations, such as structured literature review and meta-analysis, we attempt to track a wider breadth of literature using quantitative bibliometric methods as this approach can uncover patterns in a larger body of work (Zupic & Cater, 2015). Bibliometric reviews are often used to evaluate scientific publications and measure their impact on research (Belter et al., 2015). Aside from performance analysis, the bibliometric review is mainly used for science mapping. The latter provides researchers insight into a particular line of research dynamics.

We utilize VOSviewer software to create a network visualization of keywords extracted from many grey literature sources to achieve this purpose. This network visualization technique allows us to uncover the hidden connections and associations between various emerging technologies and their applications in the fashion sector.

Following Jin and Shin (2021), we seek to uncover how emerging technologies have shaped the fashion industry. Nevertheless, our research is poised to offer a unique perspective on emerging technologies, shedding light on trends typically disregarded in more traditional scholarly approaches. By harnessing the power of grey literature and network analysis, we hope

to contribute to understanding how fashion businesses can leverage these technologies for a competitive edge.

2. Literature Review

Emerging technology can alter the trajectory of the fashion industry (Eike & Bakhsian, 2018). Emerging technology denotes technologies that are still in their early stage of development and are rising to prominence (Mosweu & Chaterera-Zambuko, 2021). From the first industrial revolution to the third, technologies were introduced to solve problems in the mass production system. In this century, however, unmatched and inaccurate demands can push into excess inventory or oversupply. This problem may stem from the difficulty of predicting ever-changing demands (Dart & Lewis, 2017). The fourth industrial revolution in the 21st century has thus mainly paved the way to solve these inaccuracies.

Several emerging technologies synonymous with the fourth industrial revolution are big data and analytics, 3D printing or additive manufacturing, cloud, industrial internet of things (IoT), simulation, and autonomous robots. These new technologies are currently being applied to innovate the global fashion supply chain and involve diverse new actors, such as software providers, material science professionals, and engineers, in the scenery (Sun & Zhao, 2018). Similarly, fashion product development now requires a diverse understanding of tools relevant to the goal.

While numerous publications have surfaced regarding each of these innovations, few studies have been made to recap the applications in the fashion industry (i.e., Bertola & Teunissen, 2018; Braglia et al., 2020) while scant research has been found to integrate sources from grey literature.

3. Methodology

Data Collection

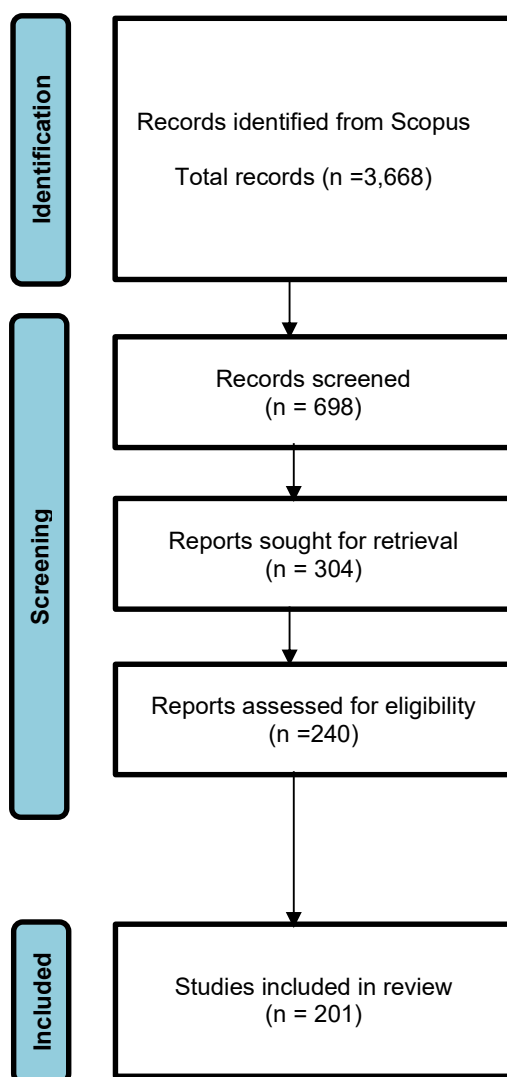
In this study, a comprehensive bibliometric review was conducted to explore the landscape of emerging technologies in the fashion industry. Bibliometric reviews are often used to evaluate scientific publications and measure their impact on research (Belter et al., 2015). To retain the validity of these sources, we purposely chose grey literature within the Scopus database and followed the steps for a comprehensive literature review. The search in Scopus was conducted to identify a decade of relevant sources spanning from 2013 to 2023.

A set of relevant keywords was carefully selected to construct a comprehensive dataset representing the various facets of emerging fashion technologies in the fashion sector. These keywords included terms such as "technology," "fashion", and "cloth". Specifically, the search string used in Scopus was: KEY(("fashion" OR "cloth*") AND ("technology" OR "Digital")). The aim of using the term 'technology' instead of 'emerging technology' is to encompass a more comprehensive array of technological advancements and trends pertinent to the fashion industry.

Data Pre-processing

The identified grey literature was subjected to rigorous data extraction and pre-processing. This involved capturing key metadata, including publication titles, abstracts, authors, publication dates, and the list of keywords associated with each document. Data pre-processing was performed to eliminate duplicates and ensure data consistency using the PRISMA 2020 approach. Additionally, the full texts of selected publications were scrutinized to extract supplementary information when necessary. Figure 1 shows the steps taken in data pre-processing.

Figure 1. PRISMA 2020 Flow Diagram



Using the Scopus database, 3,668 records were identified from the search string. The search was further refined to 1,364 records, including only conference papers and conference reviews, to represent the grey literature. Further limitations were imposed concerning the 2013-2023 publication year, totaling 937 documents. A total of 698 documents were then used for screening after excluding those irrelevant to the subject matter. Several examples are topics that concern astronomy, biochemistry, physics, math, earth, planetary, and arts.

Following the PRISMA 2020 chart, we screened the documents through title and abstract readings and successfully retrieved only 240 documents for lengthier assessment. In total, 201 studies were included in the review.

Data Analysis

To gain a deeper understanding of the intellectual landscape and connections between various keywords and emerging technologies, the VOSviewer software version 1.6.18 was employed. This software is a powerful tool for bibliometric analysis that aids in creating network visualizations based on the co-occurrence of keywords. Through such network visualization, the relationships between emerging technologies in the fashion industry were unveiled, revealing patterns and trends in research and innovation.

4. Results and Discussion

4.1 Leading publications, authors, sources, and countries in ETF

A publication's citation is a proxy for research impact (Farrukkh, et al., 2020). Table 1 shows ten of the most cited grey publications in a decade. Through 199 total citations (TC) in 2023, Bhatnagar et al. (2019) leads with their research on an innovative method to predict body shape and clothing through the Multi-Garment Network available in virtualhumans.mpi-inf.mpg.de/mgn. Research by Devendorf et al. (2016) follows closely in second with 157 TC. Their research probes into the experience of using Ebb, a novel textile display technology for personal dressing style. Other impactful research includes topics relating to digitalization of the fashion design phase (Leng et al., 2015), smart clothing (Scataglini, 2015 & Wu & Devendorf, 2020), IoT and blockchain technology for supply chain data management (Pal & Yassar, 2015), and wearable technologies (Berglund et al., 2016; Gioberto et al., 2013; Jones et al., 2020).

Table 1. The most cited publication

Rank	Author(s)	Title	Source	Year	TC
1	Bhatnagar, et al.	Multi-garment net: Learning to dress 3D people from images	IEEE International Conference on Computer Vision	2019	199
2	Devendorf, et al.	"I don't want to wear a screen": Probing perceptions of and possibilities for dynamic displays on clothing	Conference on Human Factors in Computing Systems	2016	157
3	Leng et al.	Online sketching hashing	IEEE Computer Society Conference on Computer Vision and Pattern Recognition	2015	101
4	Pal & Yasar	Internet of Things and Blockchain Technology in Apparel Manufacturing Supply Chain Data Management	Procedia Computer Science	2020	81
5	Berglund et al.	A survey of the historical scope and current trends of wearable technology applications	International Symposium on Wearable Computers	2016	59
6	Jones et al.	Wearable bits: Scaffolding creativity with a prototyping toolkit for wearable e-textiles	International Conference on Tangible, Embedded, and Embodied Interaction	2020	51
7	Lu et al.	Learning binary code for personalized fashion recommendation	IEEE Computer Society Conference on Computer Vision and Pattern Recognition	2019	44
8	Wu & Devendorf	Unfabricate: Designing Smart Textiles for Disassembly	Conference on Human Factors in Computing Systems	2020	38
9	Gioberto et al.	Detecting bends and fabric folds using stitched sensors	ACM International Symposium on Wearable Computers	2013	33
10	Scataglini et al.	A review of smart clothing in military	Workshop on Wearable Systems and Applications	2015	31

Aside from these impactful publications, we also discovered the most productive researchers on applying emerging technologies in the fashion industry. Table 2 summarizes the top four productive authors of the decade. We have decided to include only four authors in this list as the subsequent number of authors similarly contributed the same amount of research documents. Professor Lucy E. Dunne was found to have the most research published in grey literature and with the most citations compared to other authors. She is currently the program director of Apparel Design and Apparel Studies and the co-director of the wearable technology lab at the University of Minnesota. Interestingly, most of these top productive authors were affiliated with this university. The second most productive author on this research topic is

Professor Jonna Häkkinen, leader of the user experience research group LUX at the University of Lapland.

Table 2. The most productive authors

Author	University	Countries	Total Documents
Dunne L.E.	University of Minnesota	USA	15
Häkkinen, J.	University of Lapland	Finland	11
Compton C.	University of Minnesota	USA	5
Gioberto, G.	University of Minnesota	USA	4

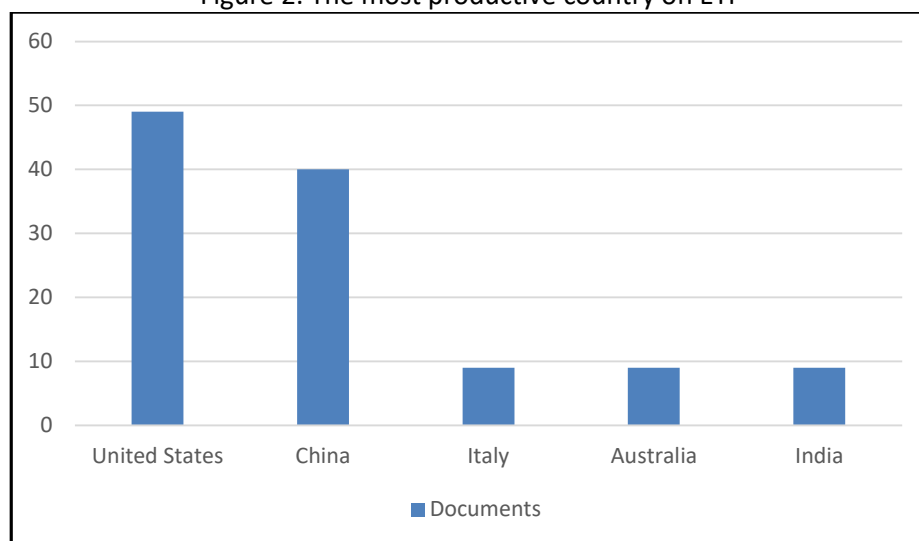
Table 3 depicts a list of conference sources published most regarding ETF. With a total of 37 and 15 documents, the ACM International Conference and the International Symposium on Wearable Computers were the most productive sources, respectively. They have also gained more citations than other conference sources. Meanwhile, other sources (Conference on Human Factors in Computing Systems, Smart Innovation, Systems, and Technologies, and Springer Proceedings in Business and Economics) had nine documents.

Table 3. The most productive grey sources

Sources	Total Documents	Total Citations
ACM International Conference	37	204
International Symposium on Wearable Computers	15	123
Conference on Human Factors in Computing Systems	9	250
Smart Innovation, Systems, and Technologies	9	15
Springer Proceedings in Business and Economics	9	15

Lastly, we analyze the most productive country in the area of ETF. The United States of America ranked first with a total number of 49 publications, and China ranked second with 40 publications. Italy, Australia, and India had each contributed nine documents in the area of ETF. Figure 2 shows that there is more research regarding ETFs from developed countries compared to developing countries.

Figure 2. The most productive country on ETF

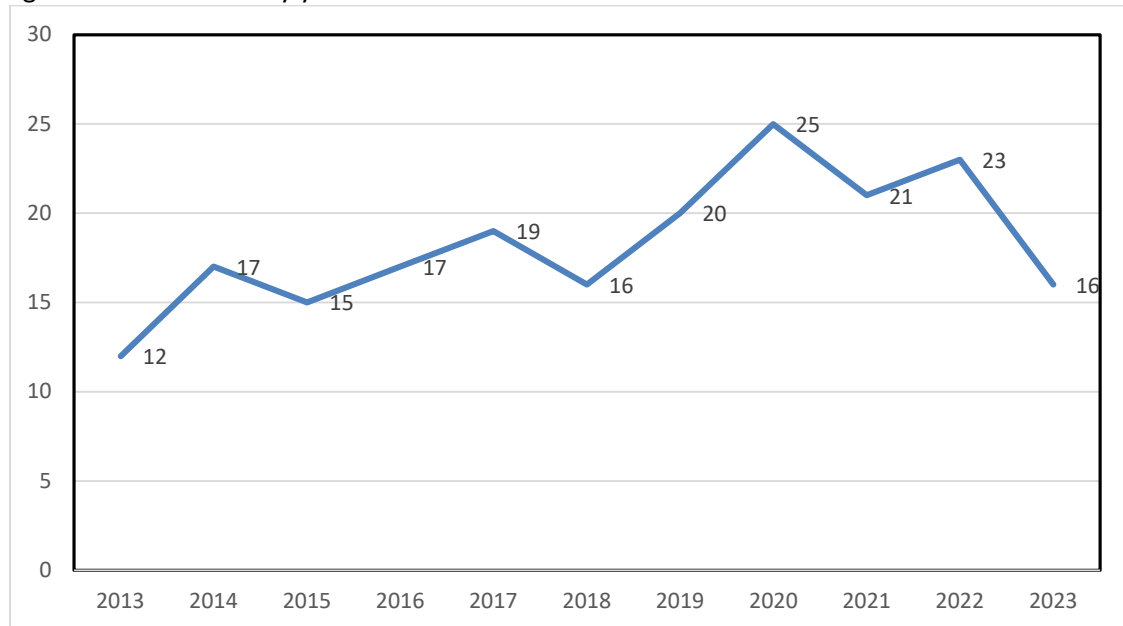


4.2 Publication Trend

Our sample of grey publications showed a fluctuating trend in research regarding emerging technology in the fashion industry, as depicted in Figure 3. The most significant number of publications was in 2020, with 25 publications, followed by 2022, with 23 publications. A lower

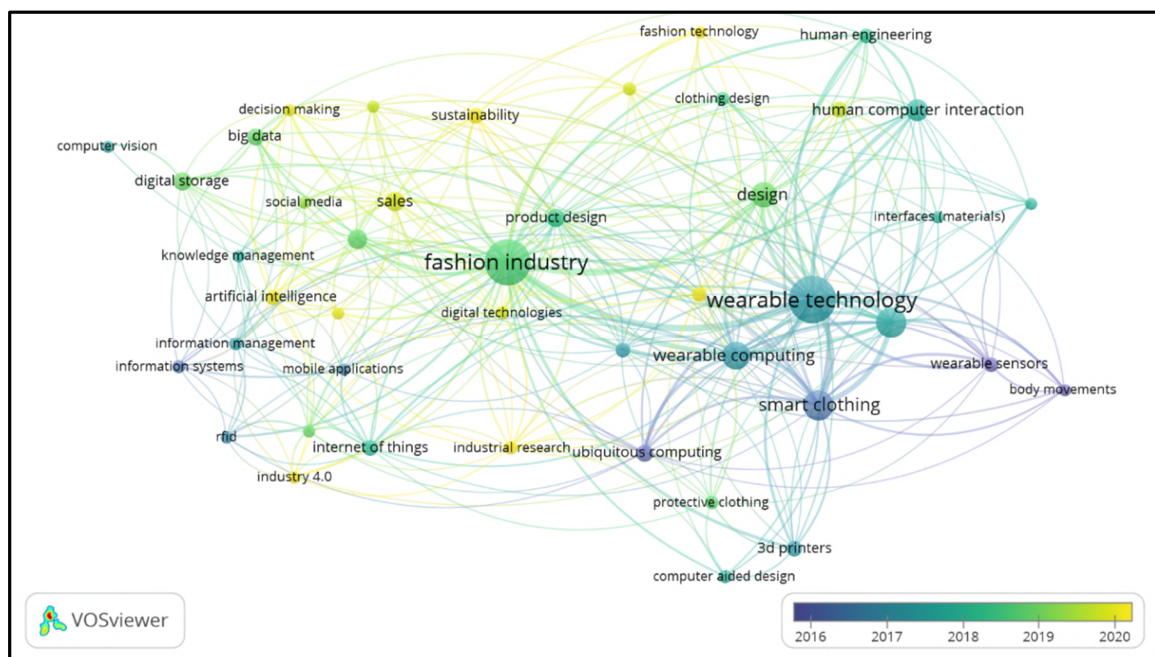
amount of publications was seen in 2023, which might be attributed to the cut-off date of data sampling, as this research has only included samples from January to September 2023.

Figure 3. Publications by year



To better identify ETF topics that were most published throughout the decade, the VosViewer software was used. Figure 4 shows an overlay visualization of publication with lighter colors used to signify earlier years of publication and darker colors for later years. Earlier research primarily focused on smart clothing, wearable technology, and information systems for the fashion industry. Meanwhile, later research focuses on the topic of Industry 4.0 technologies and various other technologies for boosting sustainability and sales in the fashion industry.

Figure 4. Overlay Visualization



Using the density analysis in VosViewer, we can also see visualizations of topics frequently published in the grey literature. Figure 5 shows that wearable technology was the

most common area, with complementing topics such as wearable computing and smart clothing showing a frequent but lesser amount of publications.

Figure 5. Density Visualization

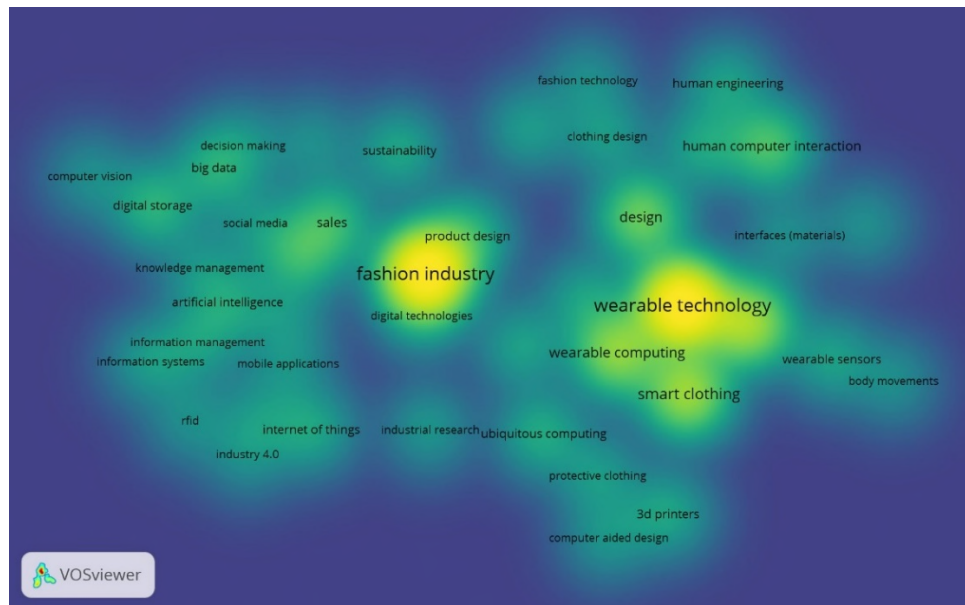
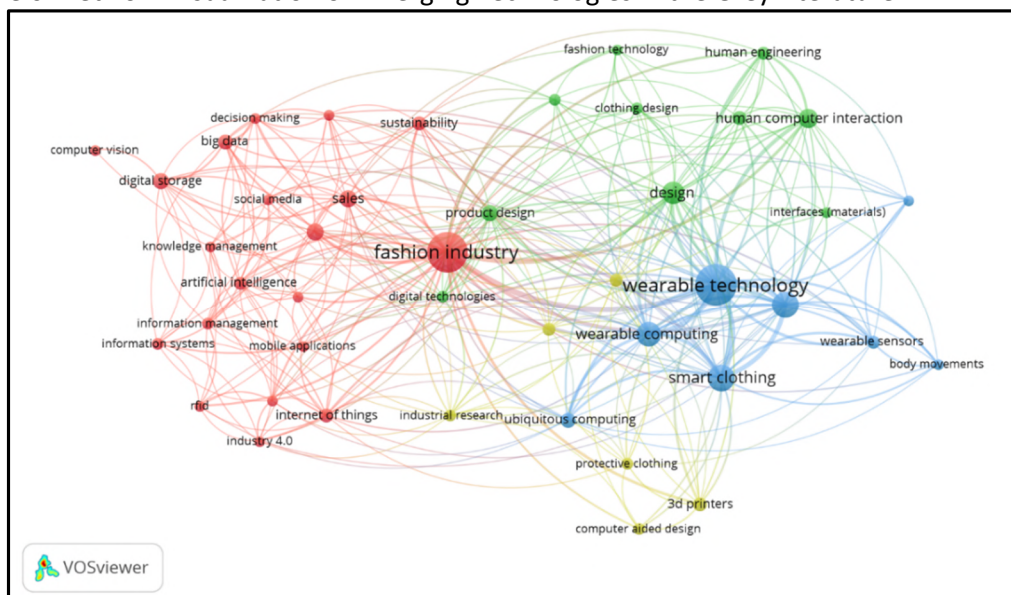


Figure 6 is a network visualization of author keywords that emerged within the decade. There are four main clusters relating to the fashion industry. The red cluster (Cluster 1) represents the most items. There are 20 connected keywords that discuss emerging technologies to boost the fashion industry, such as Industry 4.0 technologies, social media, electronic commerce, and information management. The next biggest cluster is the green cluster (Cluster 2), which has ten interconnecting keywords regarding design. The third cluster is the blue cluster (Cluster 3), which has six keywords relating to wearable technology. The yellow cluster (Cluster 4) contains the least number of interrelated keywords, covering applicable industrial research technologies such as 3D printers, virtual reality, and other computer-aided tools. However, upon inspection of individual publications, it can largely be combined with Cluster 3, which resolves around smart clothing. The researchers then decided to merge these two clusters.

Figure 6. Network Visualization of Emerging Technologies in the Grey Literature



Cluster 1: Emerging Technology Applications in the Fashion Industry

Through our review, the application of emerging technologies in the fashion industry can influence many areas within its value chain. New applications can be found through the advancement of Industry 4.0 technologies, especially in the grey literature. Radio Frequency Identification (RFID), for instance, is increasingly utilized to enhance productivity within the supply chain (Lee, 2018; Pal & Yasar, 2020). Through the grey literature, we found that there are other novel applications, such as Kantwaong's (2013) research, in which RFID can be used to command a cloth-dressing robot, and Kolstad et al.'s (2017) combination of machine learning, RFID, and IOT to produce a new approach in recommending fashion outfits.

A combination of Industry 4.0 technologies is also sought to capture better information systems in the operational environment. For instance, Pal & Yasar (2020) found that data silos between different parts of the fashion industry value chain can be reduced through the combination of blockchain-based architecture and IoT applications. The combination of machine learning and artificial intelligence can also be used to optimize the manufacturing process within the fashion industry, thus making way for leaner production (Xu et al., 2020). The blend of Big Data, AI, and NLP can also be structured to develop an intelligent fashion analytics support system (Ngai et al., 2018).

ETF also provides a unique purchasing experience to end customers. Through virtual reality, fashion buyers can ensure that each item is suitable. Fashion products can also be customized to fit into unique body dimensions through 3D body scanners (Srivathsar, 2023). Different research also found the use of digital media to engage customers (Al Rabaani & Said, 2021; Liu & Cantoni, 2023). Big data and data analytics can be utilized to reflect social sentiments towards fashion trends and products (Bertola, 2021).

The application of ETF can also be found in SMEs. The integration of ERP can be made to support SME's sales growth (Siswanto & Maulida, 2014). With the increasing adoption of ETF, it is also increasingly crucial for enterprises to prepare workers with the necessary digital skills (Kampakaki et al., 2022). Borisova et al. (2022) further recommend a business model transformation for these enterprises in light of digitalization.

Results of the scientific mapping also saw the recent occurrence of sustainability as a keyword, with publications diversely appearing on knowledge management, design, and production topics. For example, Chuang and Chiu (2017) recognize social media's power to promote sustainable knowledge sharing between fashion communities. Meanwhile, several other researchers (Alves et al., 2022; Riberio & Brito, 2022) proposed using blockchain technology to trace sustainable activities along the clothing value chain. Other instances of sustainability can be seen through attention to eco-design (Lee, 2018) and the use of computing technologies to help reuse textile materials for production (Wu & Devendorf, 2020).

Cluster 2: Application in Fashion Design

With the advent of emerging technologies in the fashion industry, disruption has also wrought its way into fashion design. The onset of smart garments also requires new methods and materials in fashion design. While this prompts the need to include technicians in the design team, Vahid et al. (2021) suggest other approaches, such as experimenting with ready-to-use smart materials for non-technically skilled fashion designers. However, Hu (2021) pointed to the disparity between demand and supply within the fashion industry, in which fashion designers should nevertheless be equipped with technical skills based on emerging technologies. Zhang et al. (2022) support this notion by introducing interactive technologies in the classroom to develop new skills for design students. The utilization of digital technology platforms in fashion design should also be explored to realize potential (Tu & Wang, 2018). Other researchers explored ways to assist fashion designers. Seyed et al. designed a prototyping system for wearable technologies.

Cluster 3: Wearable Technology

The rise of smart clothing research and application can be seen in this decade, with an array of innovative products and even raw materials, such as smart yarns (Dion, 2013) and smart textiles

(Du et al., 2018), that are becoming more versatile and useful to the user. As it involves electronic sensing components, this innovative clothing is designed and developed by traditional fashion designers, computer scientists, and electrical engineers.

The sensor systems are mainly implemented to monitor human conditions or surroundings and can also trigger user convenience or protection (Geißler et al., 2023; Petz, 2021). For example, Compton (2020) presents the development of a wearable robotic garment that can dynamically compress when detecting stressful situations and provides stress reduction. Similarly, Zhu's (2022) DynamicSkin explores aesthetic tech wearables that offer users thermal regulation benefits. Even more inadvertent is Kuusk's (2018) MagicLining to the linings of garments that sense physical activity and alter perception.

Other publications on wearable technology probe user experience with these wearable technologies (Dunne, 2019) or question variability in the positioning and sizing of implemented sensors (Gioberto et al., 2014; Yeqing, 2023). Notably, Han et al. (2014) consider not only the development of wearable technology but also the potential industrial market.

4.2 Future Direction

While numerous research studies have been conducted in smart clothing or wearable technologies, it is evident that this type of emerging technology application is still far from mature, and opportunities are wide open in research and development. Researchers interested in pursuing this topic can consider the viewpoint of users or customers. The progression of user experience and viewpoints will enhance wearability and increase the marketability of wearable technologies. Researchers can build upon Wu and Devenfong's (2020) exploration of reclaiming and reusing materials in intelligent textiles to create a sustainable possibility in the area.

As is, fashion sustainability becomes an apparent worthy topic to pursue for future research. Digital technology has increasingly aided in the green transformation of the fashion industry. However, progress in embracing this change has been slow (Ogunyemi et al., 2023). Further research is needed to understand how to promote sustainability within the fashion industry.

Another type of research pursuit can be made through the viewpoint of application in small and medium enterprises. While ETFs are evidently still in their onset of development, there are instances where they can be adopted by SMEs (Siswanto & Maulida, 2014). Future research can thus investigate barriers and ways they can be fruitfully utilized by SMEs to boost their business performance.

5. Conclusion

This research aims to provide a snapshot of opportunities in the fashion industry brought about by emerging technologies. While several researchers have attempted to review these technologies holistically, oversight has been made towards applications published in grey literature. While the possibilities of application are endless, it is essential to consider all sources of information, such as the grey literature. The key insights drawn from our analysis are hoped to offer valuable guidance for fashion businesses seeking to leverage these technologies for competitive advantage.

Our research mainly found relevant opportunities for the fashion industry through the intersection of Industry 4.0 technologies such as big data, artificial intelligence, and IoT. These applications support production, operations, and even sustainability within the supply chain. The advent of emerging technologies also made possible smart clothing and textiles whereby sensors are embedded within units to provide a myriad of opportunities, for example, in terms of performance, health, and safety. Understanding these emerging paradigms allows fashion entrepreneurs to adapt, innovate, and stay ahead of the curve.

However, it is imperative to acknowledge the limitations of our study. One such limitation lies in the scope and accessibility of grey literature. While our approach captures a wide array of unconventional sources, not all relevant information may be included, potentially leading to some gaps in the analysis. Additionally, the quality and credibility of grey literature can vary significantly. Nevertheless, we sought to instil a degree of reliability by including grey sources from Scopus. Other researchers can seek to combine traditionally published literature to

enhance our findings further. Another limitation pertains to the data collection period. Our study focused on the years 2013 to 2023, and while helpful in providing a snapshot within the decade, future research can be conducted to explore the developments beyond this timeframe.

In conclusion, our research offers a review of ETF using bibliometric analysis to explore the intersection of fashion and emerging technologies. Our findings hope to provide valuable insights and serve as a foundation for future fashion and technology management research.

References

- Alves, L., Cruz, E. F., & Rosado Da Cruz, A. M. (2022). Tracing Sustainability Indicators in the Textile and Clothing Value Chain using Blockchain Technology. *2022 17th Iberian Conference on Information Systems and Technologies (CISTI)*, 1–7. <https://doi.org/10.23919/CISTI54924.2022.9820241>
- Belter, C. W. (2015). Bibliometric indicators: opportunities and limits. *Journal of the Medical Library Association : JMLA*, 103(4), 219–221. <https://doi.org/10.3163/1536-5050.103.4.014>
- Bertola, P., & Teunissen, J. (2018). Fashion 4.0. Innovating fashion industry through digital transformation. *Research Journal of Textile and Apparel*, 22(4), 352–369. <https://doi.org/10.1108/RJTA-03-2018-0023>
- Bhatnagar, B., Tiwari, G., Theobalt, C., & Pons-Moll, G. (2019). Multi-Garment Net: Learning to Dress 3D People From Images. *2019 IEEE/CVF International Conference on Computer Vision (ICCV)*, 5419–5429. <https://doi.org/10.1109/ICCV.2019.00552>
- Braglia, M., Marrazzini, L., Padellini, L., & Rinaldi, R. (2021). Managerial and Industry 4.0 solutions for fashion supply chains. *Journal of Fashion Marketing and Management: An International Journal*, 25(1), 184–201. <https://doi.org/10.1108/JFMM-12-2019-0285>
- Chuang, L.-W., & Chiu, S.-P. (2017). Encouraging Knowledge Sharing Among Green Fashion Communities. *2017 International Conference on Green Informatics (ICGI)*, 141–144. <https://doi.org/10.1109/ICGI.2017.43>
- Compton, C., Woelfle, H., Dahunsi, B. O., Pettys-Baker, R., Subash, N., Priebe, M., & Holschuh, B. (2021). Dynamic, Discreet, Robotic Compression Garment for Real-Time Stress Assessment and Intervention. *2021 International Symposium on Wearable Computers*, 170–174. <https://doi.org/10.1145/3460421.3478837>
- Dan-Dan, T., & Zhi-Qiang, W. (2017a). Transformation and Innovation of Traditional Fashion Design Based on the Digital Technology Platform. *2017 International Conference on Information, Communication and Engineering (ICICE)*, 159–161. <https://doi.org/10.1109/ICICE.2017.8478984>
- Dan-Dan, T., & Zhi-Qiang, W. (2017b). Transformation and Innovation of Traditional Fashion Design Based on the Digital Technology Platform. *2017 International Conference on Information, Communication and Engineering (ICICE)*, 159–161. <https://doi.org/10.1109/ICICE.2017.8478984>
- Devendorf, L., Lo, J., Howell, N., Lee, J. L., Gong, N.-W., Karagozler, M. E., Fukuhara, S., Poupyrev, I., Paulos, E., & Ryokai, K. (2016). “I don’t Want to Wear a Screen”: Probing Perceptions of and Possibilities for Dynamic Displays on Clothing. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*, 6028–6039. <https://doi.org/10.1145/2858036.2858192>
- Dion, G. (2013). Garment Device: Challenges to Fabrication of Wearable Technology. *Proceedings of the 8th International Conference on Body Area Networks*. 8th International Conference on Body Area Networks, Boston, United States. <https://doi.org/10.4108/icst.bodynets.2013.253707>
- Du, J., Markopoulos, P., Wang, Q., Toeters, M., & Gong, T. (2018). ShapeTex: Implementing Shape-Changing Structures in Fabric for Wearable Actuation. *Proceedings of the Twelfth International Conference on Tangible, Embedded, and Embodied Interaction*, 166–176. <https://doi.org/10.1145/3173225.3173245>
- Dunne, L. E. (2019). Intro to the Human Body: Wearability and Human Factors of Wearable Systems. *Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems*, 1–3. <https://doi.org/10.1145/3290607.3298822>
- Eike, R. J., & Bakhshian, S. (2018). Review of Fashion, Technology and Health: Future Directions for the Apparel Industry. *Trends in Textile Engineering & Fashion Technology*, 4(3), 1–4. <https://crimsonpublishers.com/index.php>
- Farrukh, M., Meng, F., Wu, Y., & Nawaz, K. (2020). Twenty-eight years of business strategy and the environment research: A bibliometric analysis. *Business Strategy and the Environment*, 29(6), 2572–2582. <https://doi.org/10.1002/bse.2521>
- Geißler, D., Zahn, E. F., Bello, H., Ray, L. S. S., Woop, E., Zhou, B., Lukowicz, P., & Joost, G. (2023). MoCa’ Collection: Normalizing Dynamic Textile Geometry with Capacitive Sensing in Design Centric Wearables. *Adjunct Proceedings of the 2023 ACM International Joint Conference on Pervasive and Ubiquitous Computing & the 2023 ACM International Symposium on Wearable Computing*, 276–280. <https://doi.org/10.1145/3594739.3610779>
- Gioberto, G., Coughlin, J., Bibeau, K., & Dunne, L. E. (2013). Detecting bends and fabric folds using stitched sensors. *Proceedings of the 2013 International Symposium on Wearable Computers*, 53–56. <https://doi.org/10.1145/2493988.2494355>
- Han, S. C., Han, Y.-H., & Kim, H. S. (2014). Characteristics and perspectives of wearable smart devices and industrial ecosystem. *2014 20th IEEE International Conference on Parallel and Distributed Systems (ICPADS)*, 911–914. <https://doi.org/10.1109/PADSW.2014.7097907>

- Hu, N. (2021). Research on the Application of VR Technology in Clothing Design Teaching. *The Sixth International Conference on Information Management and Technology*, 1–5. <https://doi.org/10.1145/3465631.3465910>
- Jin, B. E., & Shin, D. C. (2021). The power of 4th industrial revolution in the fashion industry: what, why, and how has the industry changed? *Fashion and Textiles*, 8(1), 31. <https://doi.org/10.1186/s40691-021-00259-4>
- Jones, L., Nabil, S., McLeod, A., & Girouard, A. (2020). Wearable Bits: Scaffolding Creativity with a Prototyping Toolkit for Wearable E-textiles. *Proceedings of the Fourteenth International Conference on Tangible, Embedded, and Embodied Interaction*, 165–177. <https://doi.org/10.1145/3374920.3374954>
- Kuusk, K., Våljamäe, A., & Tajadura-Jiménez, A. (2018). Magic lining: an exploration of smart textiles altering people's self-perception. *Proceedings of the 5th International Conference on Movement and Computing*, 1–6. <https://doi.org/10.1145/3212721.3212893>
- Lee, J. K. (2018). Utilization of RFID Technology for Omni-channel Fulfillment in the See-Now-Buy-Now Business Model of Fashion. *Proceedings of the 2018 ACM International Joint Conference and 2018 International Symposium on Pervasive and Ubiquitous Computing and Wearable Computers*, 130–133. <https://doi.org/10.1145/3267305.3267630>
- Leng, C., Wu, J., Cheng, J., Bai, X., & Lu, H. (2015). Online sketching hashing. *2015 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2503–2511. <https://doi.org/10.1109/CVPR.2015.7298865>
- Mahood, Q., Van Eerd, D., & Irvin, E. (2014). Searching for grey literature for systematic reviews: challenges and benefits. *Research Synthesis Methods*, 5(3), 221–234. <https://doi.org/10.1002/jrsm.1106>
- Ogunyemi, A. A., Diyaolu, I. J., Awoyelu, I. O., Bakare, K. O., & Oluwatope, A. O. (2023). Digital Transformation of the Textile and Fashion Design Industry in the Global South: A Scoping Review. In R. A. Saeed, A. D. Bakari, & Y. H. Sheikh (Eds.), *Towards new e-Infrastructure and e-Services for Developing Countries* (Vol. 499, pp. 391–413). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-34896-9_24
- Paez, A. (2017). Gray literature: An important resource in systematic reviews. *Journal of Evidence-Based Medicine*, 10(3), 233–240. <https://doi.org/10.1111/jebm.12266>
- Pal, K., & Yasar, A.-U.-H. (2020). Internet of Things and Blockchain Technology in Apparel Manufacturing Supply Chain Data Management. *Procedia Computer Science*, 170, 450–457. <https://doi.org/10.1016/j.procs.2020.03.088>
- Petz, P., Eibensteiner, F., & Langer, J. (2021). Sensor Shirt as Universal Platform for Real-Time Monitoring of Posture and Movements for Occupational Health and Ergonomics. *Procedia Computer Science*, 180, 200–207. <https://doi.org/10.1016/j.procs.2021.01.157>
- Scataglini, S., Andreoni, G., & Gallant, J. (2015). A Review of Smart Clothing in Military. *Proceedings of the 2015 Workshop on Wearable Systems and Applications*, 53–54. <https://doi.org/10.1145/2753509.2753520>
- Siswanto, J., & Maulida, A. (2014). ERP module requirements for micro, small and medium enterprise fashion industry in Bandung. *2014 International Conference on Information Technology Systems and Innovation (ICITSI)*, 183–188. <https://doi.org/10.1109/ICITSI.2014.7048261>
- Srivathsan, K., Bharath, K., Kumaravel, R., Vishnu Prasad, V., & Malini, A. (2023). Customization of User Experience in Fashion Technology. *2023 3rd International Conference on Innovative Practices in Technology and Management (ICIPTM)*, 1–6. <https://doi.org/10.1109/ICIPTM57143.2023.10117970>
- Sun, L., & Zhao, L. (2018). Technology disruptions: exploring the changing roles of designers, makers, and users in the fashion industry. *International Journal of Fashion Design, Technology and Education*, 11(3), 362–374. <https://doi.org/10.1080/17543266.2018.1448462>
- Vahid, D. G., Jones, L., Girouard, A., & Frankel, L. (2021). Shape Changing Fabric Samples for Interactive Fashion Design. *Proceedings of the Fifteenth International Conference on Tangible, Embedded, and Embodied Interaction*, 1–7. <https://doi.org/10.1145/3430524.3440633>
- Wu, S., & Devendorf, L. (2020). Unfabricate: Designing Smart Textiles for Disassembly. *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, 1–14. <https://doi.org/10.1145/3313831.3376227>
- Yeqing, C., & Xiaoning, L. (2023). Middle School Student's Intelligent Uniform Design with Wearable Devices Based on Sustainability. *2023 8th International Conference on Cloud Computing and Big Data Analytics (ICCCBDA)*, 628–632. <https://doi.org/10.1109/ICCCBDA56900.2023.10154796>
- Zhang, L., Yang, H., Zhang, C., & Li, N. (2018). A New Way of Being Smart? Creative Computing and Its Applications in Tourism. *2018 IEEE 42nd Annual Computer Software and Applications Conference (COMPSAC)*, 45–50. <https://doi.org/10.1109/COMPSAC.2018.10201>
- Zhu, Y., Lee, A., Hu, Z., & Kao, H.-L. (Cindy). (2022). DynamicSkin: Bio-inspired Scaled Sleeve for Body Temperature Regulation and Dynamic Self-Expression. *Augmented Humans 2022*, 284–286. <https://doi.org/10.1145/3519391.3524173>

Strategic Design of Performance Management for Ministerial Organizations: A Comprehensive Literature Review in the Public Sector

Didi Kurniadi Halim, Dermawan Wibisono, and Nur Budi Mulyono

School of Business and Management, Bandung Institute of Technology, Bandung, Indonesia

Abstract

Currently, Indonesian ministries collectively score 71.30 in performance accountability, indicating a "BB" predicate. This suggests significant room for improvement within these ministries to meet world-class governance standards. However, a preliminary investigation reveals a lack of uniformity in the performance measurement frameworks employed by these ministries. Some ministries utilize the balanced scorecard (BSC), while others adopt a more straightforward mind map approach. This inconsistency in approaches may hinder Indonesia's journey towards world-class governance. This paper's objective is to conduct a comprehensive literature review on performance management in the public sector, with a specific focus on government organizations, especially ministries. The aim is to develop a tailored performance management framework suitable for Indonesian ministry organizations. This endeavour draws upon established frameworks used globally by public sector entities. A rigorous literature review encompassed keywords such as performance management, public sector organization, and ministry organizations. This resulted in a pool of 249 papers from Scopus-indexed journals, of which 93 were comprehensively evaluated, leading to the synthesis of 40 articles for insights. This study scrutinizes the unique characteristics of ministry organizations in Indonesia, proposing a performance management system in alignment with these distinctive features. It also highlights the prevailing non-uniformity in performance measurement methodologies across ministries and their inadequacies in addressing internal organizational challenges. This research serves as a catalyst for the evolution of performance management, aligning it with governmental objectives. It stands as one of the pioneering studies delving into performance management systems within ministerial organizations, offering valuable foundations for future research and initiatives to enhance ministerial performance management and governance.

Keywords: Indonesian Ministry Organization, New Public Management, Ministry Organization, Performance Management System, Public Sector Organization

Introduction

In administering the performance of public sector organizations, including the ministry organization, Indonesia adopted the approach proposed by Hood in 1991. According to Hood, effective management of public sector organizations entails the adoption of private sector management practices, which prioritize organizational outcomes through efficiency, effectiveness, and professional management. Beginning in 2010 and continuing through 2024, the Ministry of Administrative Reform and Bureaucratic Reformation (KemenPanRB) has devised a three-phase plan for bureaucratic reform. (SK PERMENPAN No. 25, 2020).

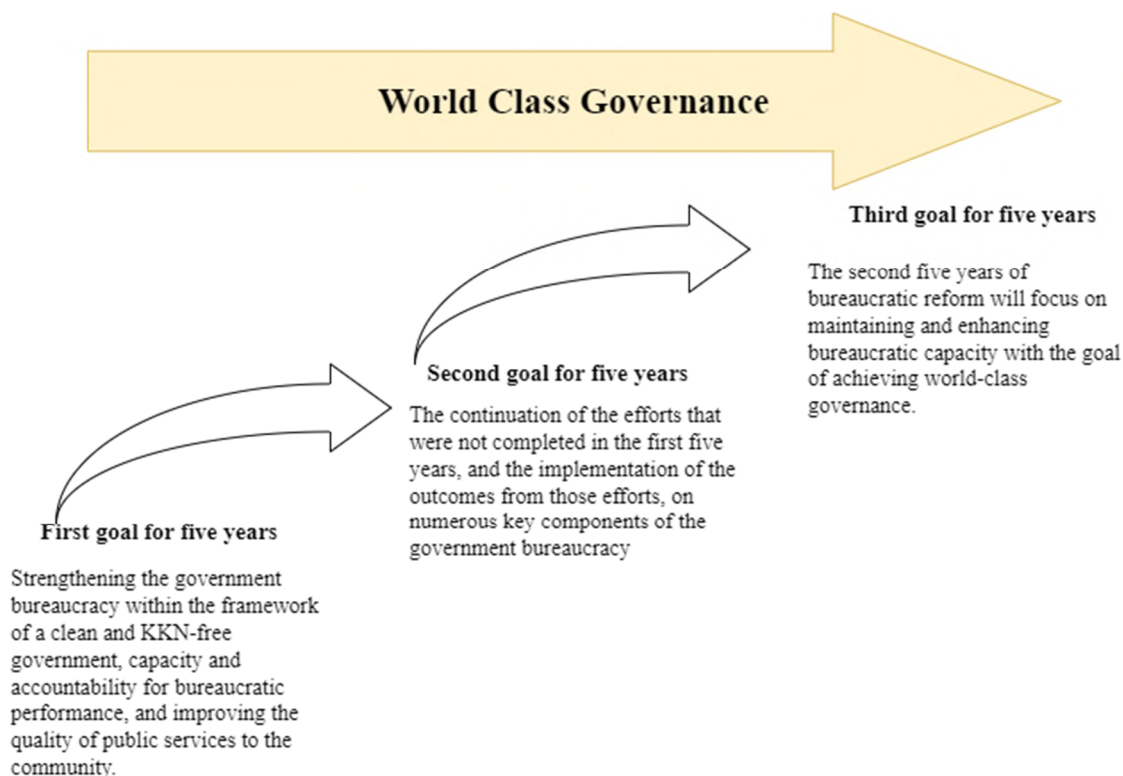


Figure 1 Indonesian Government Bureaucratic Reform Roadmap

Source: SK PERMENPAN No 25 Year 2020

In striving for world-class standards, the utilization of the Malcolm Baldrige National Quality Award (MBNQA) references is essential. MBNQA sets rigorous standards for organizational excellence, and achieving a score greater than 85 or an "A" predicate is the benchmark for excellence. However, it's important to note that when evaluating the performance of Indonesian ministries through the SAKIP (Sistem Akuntabilitas Kinerja Instansi Pemerintah) framework, there are unique considerations. Over the past five years, the maximum attainable score within the SAKIP framework for any ministry has been capped at 80, which corresponds to a "BB" predicate. This limitation reflects the specific context and criteria established by the Indonesian government to assess the performance of its ministries. The Malcolm Baldrige National Quality Award, on the other hand, sets a broader and more comprehensive set of criteria for organizational excellence, including leadership, strategic planning, customer focus, measurement, analysis and knowledge management, workforce focus, operations focus, and results. Organizations in the United States and other countries that use the MBNQA criteria aim to achieve scores above 85 to demonstrate exceptional performance in these areas. In summary, while the MBNQA serves as a valuable reference for world-class standards in organizational excellence, the SAKIP framework in Indonesia has its own context-specific criteria, with a maximum score of 80, reflecting the Indonesian government's standards for ministry performance evaluation.

Table 1 Average SAKIP Value 2019 - 2022

Year	Absolute Value	Predicate
2019	72.22	BB
2020	67.13	B
2021	70.75	BB
2022	72.22	BB

Source: Ministry of Administrative Reform and Bureaucratic Reformation (KemenPanRB)

According to Table 1 there is still room for improvement in government performance in order to achieve world-class governance. To achieve world-class governance by 2024, a strategy that is consistent with the nature of organizations in Indonesia is required. It is anticipated that the goal of achieving world-class governance will be achieved by employing the appropriate performance management and performance evaluation strategies.

The Indonesian government compiled the information in Figure 1. Roadmap for bureaucratic reform with the New Public Management (NPM) methodology in mind. NPM is an entirely new approach in public sector organizations; it emerged in the 1980s and was implemented in the United Kingdom (UK) and New Zealand for public sector reform. NPM emphasizes government policy output control, decentralization of management authority, introduction of markets and quasi-market mechanisms, and customer-focused services. (Hood, 1991).

Performance evaluation and management assist organizations manage their resources to achieve their goals (Jayaram and Vickery, 2000). Similarly, Lockamy suggest that an organization must have a comprehensive set of measures to evaluate its progress in achieving its goals, improving its fundamental processes, and aligning itself with customer (stakeholder) needs (Lockamy, Beal and Smith, 2000). A strong performance management system assists an organization in creating value by focusing effort where and when it will be most effective (Chang, 2005). In summary, a performance management system is meant to assist organizations, especially ministry organizations, in maintaining a balance across their objectives and the needs of their stakeholders and people in general.

Performance management in public sector organizations, specifically ministry organizations, has been the subject of research. There is a lack of uniformity in the performance management approach used by each ministry organization, so it is uncertain whether the approaches in use are suitable for the ministry organization. This is because performance management is a context-dependent process that is tailored to particular needs (Cuthbertson and Piotrowicz, 2011). Moreover, the formation of good governance in government is always associated with efficiency and cost cutting, which is being further suppressed; to achieve this, the government must modify its organization in accordance with the globalization agenda of corporations (Dewi and Sahputra, 2023). Therefore, the design of performance management for public sector organizations, particularly ministry organizations, must thoroughly investigate the complex interdependencies between contextual factors and the application of performance measures (Lye, 2004).

However, there are very few studies that examine the design of performance management systems in public sector organizations, particularly ministry organizations. Therefore, identifying a substantial corpus of work can be challenging. This paper presents a synthesis of a systematic literature review to develop an understanding of the main themes of the design of performance management systems to date. This review begins with a detailed description of the methodology used and then discusses the findings of the papers included in the review. The analysis assesses whether the available frameworks for performance management systems are suitable for the organizational contexts of ministries.

Research Methodology

SYSTEMATIC LITERATURE REVIEW PROCESS

In the development of performance management strategies for public sector entities, particularly ministries, a meticulous three-stage process is followed, aligning with the PRISMA guidelines for systematic literature reviews. The initial two stages are inherently interconnected, commencing with an in-depth exploration of foundational literature, followed by a bibliometric analysis to provide contextualization to the research. Subsequently, the study employs primary data collection methods to assess the current state of performance management implementation within ministries situated in Indonesia. The research methodology employed in

this article adopts a normative juridical research approach, utilizing a library-based method guided by regulations, books, literature, and relevant materials pertaining to the discussed issues. In this endeavour, Bakker's recommended systematic review method (Bakker, 2010) serves as a guiding framework.

The initial phase involves the formulation of search strings, combining keywords related to performance management and public sector organizations into two categories, labelled as A and B, as illustrated in Table 2:

Table 2 Search String

Category A	Category B
Performance Management System	Public Sector Organization
Performance Management	Ministry Organization
Performance Evaluation	Government Organization

This keyword combination results in nine search phrases (3 x 3), with the inclusion of wildcard symbols (*) to encompass various term variations. For instance, search strings like "Performance Management*" and "Ministry Organization*" were employed. The literature was gathered from academic databases, with Scopus serving as the primary academic database for this study.

The initial search yielded 249 documents, out of which 218 articles from journals and conference proceedings met the initial inclusion criteria listed as follows:

1. The paper presents a framework for performance management applicable to public sector organizations.
2. The framework contains components addressing challenges faced by public sector organizations.
3. The paper discusses characteristics of public sector agencies.

Based on these criteria, 93 papers progressed to the subsequent stage of the review process, involving a comprehensive assessment of the full papers. Here, performance attributes presented in these papers were meticulously analyzed using memo-writing techniques to discern each article's core values and ideas. Out of the 93 papers, 40 were deemed suitable for inclusion in this study. Figure 2 provides a visual representation of the literature selection process.

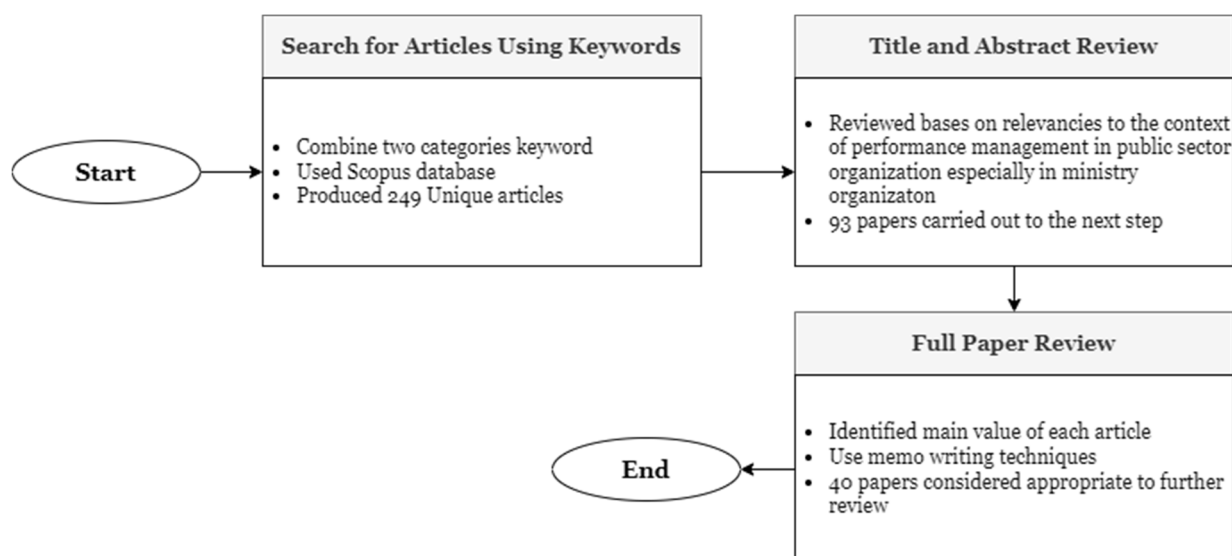


Figure 2 Flow Chart Article Selection Process

A comprehensive examination and evaluation will be conducted on the 40 sorted papers to ascertain a global perspective on the implementation of performance management systems in public sector organizations. This study proposes a potential approach for implementation in ministry organizations operating within the Indonesian context.

The examination of the documents revealed that the investigations can be categorized into four primary research inquiries, which have been utilized to organize the exposition of the literature synthesis.

1. How is the current framework used by public sector organizations especially ministry organization implement in the organization?
2. How is currently ministry organization implementing performance management for the organizations?
3. How to effectively implement performance management in ministry organization to give good quality service to society?

Validity and Reliability

To improve the quality of the Systematic Literature Review (SLR), an approach was taken in the form of semi-structured interviews. The interview technique is a tool that is often used in qualitative research to collect the necessary information. Interview Refers to a form of communication exchange in which questions are submitted with the aim of gathering information or data (Yates, Clarke, & Thurstan, 2019). There are various interview methods that can be used in data collection, including structured, semi-structured, and unstructured approaches, each of which has its own uses and advantages in the research context. The study will involve stakeholders in interviews, which may be individual, semi-structured, or focus group interviews. It is important to note that focus groups and in-depth interviews, although different in their approach, are equally effective in addressing certain research questions (Crabtree et al., 1993). In general, the interview process can be divided into three distinct stages: project planning, data collection, and data analysis (Young et al., 2018). Semi-structured methods involve the use of a series of predetermined questions by the researcher to collect data. Nonetheless, this method gives a signal to researchers to ask additional questions if there are interesting findings or new information that emerges during the interview process (Young et al., 2018). The ability to ask questions flexibly facilitates deeper discussion of the topic at hand.

Results

Characteristic of Performance Management in Ministry Organization.

Due to the limited availability of literature pertaining to ministry organizations, the organizational character that shall serve as a point of reference is that of the public sector. Public sector organizations play a crucial role in a government's development. (Van Der Kolk, 2022), Moreover, the New Public Management (NPM) approach is currently having a significant impact on performance management in organizations that are part of the public sector. (Lapsley and Wright, 2004). The NPM, is a decentralized system of management that incorporates private sector work practices, such as controlling and benchmarking, into the public sector. Its aim is to enhance the efficiency and effectiveness of local government performance, thereby promoting good governance and ultimately improving the welfare of citizens. (Hood, 1991). Australia is a country that has demonstrated notable success in the implementation of the NPM approach. It is noteworthy that Australia was the first country to introduce the NPM approach.

According to Hawke (2012) The public administration system in Australia is based on the Westminster style and is distinguished by a greater degree of ministerial authority in comparison to the more legalistic systems employed in other nations. The Australian system of

administration is characterized by a significant level of decentralized power and responsibility granted to upper-level executives, with only minimal legal restrictions that prioritize overarching principles over specific regulations (Hawke, 2012). Senior managers within the public sector are typically career civil servants who are appointed based on a comprehensive assessment of their qualifications and abilities, rather than their political affiliations. The administrative framework that ensues requires senior managers to execute the policies of any governing body with equal dedication and competence. Hawke's (2012) study on public sector organizations in Australia identifies four factors that exert an influence on performance management within the country.

External factors play a significant role as the first factor. Political factors are widely recognized as the most extensively documented external influence in the field of performance literature (Pandey and Moynihan, 2006). The rotation of political leadership to oversee government operations over a specified duration significantly influences the trajectory of public sector entity performance. The efficacy of the performance management framework implemented by the preceding government is increasingly being called into question by each political party, leading to frequent modifications whenever a major political party assumes power. (Curristine, 2009). The group encompasses additional components such as civil society, domestic and international economic impacts, and comparative advancements in other jurisdictions pertaining to performance management that could potentially impact the structure and nature of the system (Hawke, 2012). In summary, it can be posited that the performance of public sector entities, particularly ministries, is significantly impacted by external factors, namely stakeholders who intersect or have a direct or indirect involvement with the ministry's objectives.

Internal factors are equally significant as external factors in determining the success of an organization. Structural factors pertain to legal, regulatory, institutional, and organizational factors that hold distinct significance for each country. (Wanna, 2011). Managerial factors play a significant role in determining the implementation of the performance management system. These influences refer to the impact of leadership, change management, organizational alignment with policies, administration, and control. The effects of hierarchical relationships have a connection with structural, cultural, and behavioural factors, which are activated and applied through management (Kotter, 2007).

Performance management in public sector organizations is influenced by a range of internal factors, including technical, cultural, and behavioural factors. The technical factors pertain to the ability of government personnel to execute plans, as well as their success in ensuring high standards of measurement, upkeep of reporting mechanisms, and adherence to established procedures. The aforementioned factors encompass the impact of the guidance and instruction provided by individuals tasked with designing and collecting performance data, as well as those who receive and utilize said data. The majority of literature written by practitioners focuses on the technical components of managing performance. (Newcomer, Hatry and Wholey, 2015), (McDavid, 2019). In contrast to technical considerations, cultural and behavioural factors exhibit a distinct interdependence, with cultural factors exerting an influence on the manner in which performance management is implemented. (Moynihan, 2008). While behaviour pertains to individuals' reactions towards the outcomes of performance management, the most significant impact of behaviour on the efficacy of performance management lies in the utilization of budgets and performance targets. These factors possess a potent influence on individuals' actions, often resulting in distortion, as they strive to meet or evade the limitations imposed upon them by performance expectations. (Radnor, 2008).

The impact of these five factors plays a significant role in shaping the execution of performance management within public sector entities, particularly those operating as ministry organizations. The production of an optimal performance management implementation requires the establishment of a theorem that enables the harmonization of various factors.

Review of Existing Performance Management Framework

This paper conducts a review of various performance management system frameworks to determine their applicability in the context of managing the performance of a Ministry Organization.

1. PMS Model from US Central Government

This is a conventional framework for managing performance, which was initially formulated by the Office of Personnel Management in the United States. The framework outlines five essential phases of performance management, (1) Planning work and setting expectations, (2) Continually monitoring performance, (3) Developing the capacity to perform, (4) Periodically rating performance in a summary fashion, (5) Rewarding good performance (Zheng *et al.*, 2019). The utilization of a framework approach serves as the fundamental basis for implementing performance management. The aforementioned five phases are consistent with the four fundamental elements that are crucial for achieving success in the realm of public sector performance management, as introduced Smith dan Goddard, (1) Formulation of strategy, (2) Performance measurement instruments, (3) Analytic techniques, (4) Encouraging appropriate organisational responses (Smith and Goddard, 2002).

The implementation of PMS (Performance Management System) is a crucial process in organizations. The model exhibits potential for application as a performance management system framework. Its effectiveness depends on its emphasis on the formulation of a strategic plan to incentivize organizational growth. Nevertheless, scholarly articles that provide a more comprehensive analysis of its implementation are scarce.

2. Balanced Scorecard

The Balanced Scorecard (BSC), introduced by Kaplan and Norton in 1992, has transformed the framework by incorporating operational and strategic measures of performance in addition to financial measures. According to Kaplan and Norton, financial performance is classified as a trailing indicator that is contingent upon antecedent performance factors. BSC offers a comprehensive measurement system that encompasses four distinct perspectives, namely customer, financial, internal business process, and learning and innovation, in order to gauge performance. This approach is designed to provide a more thorough evaluation of organizational performance (Kaplan and Norton, 2008).

The main goal of public sector organizations, particularly those within the ministry, is not centered on financial gains. This is in line with Kaplan's assertion that the BSC is not applicable in situations where financial goals are deemed as the ultimate objective. (Kaplan and Norton, 2001). The accountability of the public sector should be based on their effectiveness in fulfilling societal needs, rather than their proficiency in generating revenue or managing expenditures.

Presently, a considerable number of public sector entities are embracing BSC as a performance management framework. However, the implementation of the BSC in these organizations necessitates preliminary modifications to the framework to render it suitable for use in the public sector. This is due to the BSC's inability to incorporate one of the performance management attributes that can be implemented in public sector organizations, namely stakeholder interests. The BSC scorecard is a viable implementation factor for public sector organizations, The utilization of a scorecard can serve as a tool to enhance organizational management.

3. Public Sector Scorecard

The Public Sector Scorecard (PSSC) is a framework for performance management that aims to enhance outcomes for service users and stakeholders in public and voluntary sector organizations, while keeping the overall cost constant. The adaptation and extension of the balanced scorecard is tailored to align with the cultural and ethical principles of the public and non-profit sectors. The Performance Support System prioritizes the establishment of a culture

of performance management that is centered on enhancing, innovating, and learning, as opposed to a hierarchical culture of fault-finding. The Performance Statistic System and the Balanced Scorecard exhibit differences in that the former does not necessitate organizations to delineate targets for every performance measure employed. Targets should only be employed if they pertain to outcomes or evidence-based drivers of outcomes, the measure's value surpasses its cost, the target is ambitious, yet feasible, and potential unintended consequences are identified and mitigated (Moullin, 2017).

The basic principles of design and organization that underlie the PSSC exhibit a marked resemblance to those of the BSC. The PSSC prioritized the examination of outcomes, the procedures that facilitate the attainment of those outcomes, and the capacity of the organization to effectively aid its personnel and procedures in the efficient realization of the pertinent outcomes. The implementation of PSSC within ministerial organizations may pose a challenge for the framework, as Moulin has asserted that PSSC's efficacy is limited to specific organizational types (Moullin, 2017).

- The organization is a public or voluntary sector organization.
- The organization is committed to improving outcomes for service users and stakeholders.
- The organization is willing to develop a performance management culture based on improvement, innovation, and learning.
- The organization is willing to involve service users and stakeholders in the development of performance measures.
- The organization is willing to develop measures of performance that help improve and assure quality, rather than just measuring activity or outputs.
- The organization is willing to align its performance measures with its strategy and to revise its strategy map as necessary.
- The organization is willing to use performance information to identify further service improvements and to develop better performance measures.

These seven criteria shown above, should be considered when implementing PSSC in ministerial organizations, especially in Indonesia.

4. The Balanced Stakeholder Model

Balanced Stakeholder Model (BSM), developed to balance the stakeholders interest (Zheng *et al.*, 2019). The BSM framework is intended to be utilized as a performance management tool with a focus on stakeholders, particularly in the public sector. The objective is to address two fundamental inquiries: (1) This inquiry pertains to the process of transforming intricate public objectives and environments into a set of feasible fundamental actions and stakeholder frameworks. (2) This study aims to explore strategies to assist public sector managers in determining the optimal combination of factors, including activities, stakeholders, and balanced interests, that are most likely to result in successful outcomes.

The primary responsibilities of the Balanced Scorecard Methodology (BSM) involve breaking down the strategic objectives of the enterprise into requisite actions across multiple tiers, recognizing both internal and external stakeholders, and reconciling their principal concerns (Wang *et al.*, 2019). However, Business Sustainability Management (BSM) in isolation is insufficient in revealing the primary concerns or contradictions of stakeholders. Typically, interests are ascertained via diverse forms of communication with stakeholders, including but not limited to questionnaires, interviews, formal and informal meetings, among others.

5. Performance Prism'

The Performance Prism framework, created by Neely (Neely, Adams and Crowe, 2001), incorporates a stakeholder perspective across five distinct facets: stakeholder satisfaction, stakeholder contribution, strategies, capabilities, and processes. The Performance Prism differs from the Balanced Scorecard in that it is not a perspective-based framework. According to (Shaik and Abdul-Kader, 2012). the performance management facet is the primary characteristic of the Performance Prism.

The Performance Prism incorporates strategy as an integral component of the performance management procedure. The formulation of strategy in this instance is aimed at meeting the expectations of stakeholders. In the case where this framework is implemented within public sector entities, there will be a multitude of stakeholder expectations that serve as the primary focus of satisfaction. The Performance Prism model lacks a causal link between the outcomes and the factors that influence them. Furthermore, the tool lacks the capability to replicate the effects of alterations in a single variable on the overall performance of the system. In addition, it should be noted that the Performance Prism lacks the ability to illustrate the potential trade-offs that may arise between conflicting performance indicators. The limitations imply that the Performance Prism framework is not suitable for direct utilization in performance management.

6. Knowledge Based Performance Management System

In 2003, Wibisono developed a framework that easy to use and addresses by proposing a methodology for the design of a realistic performance management system to balance short-term and long-term measures, internal and external measures, and financial and operational measures. Knowledge Based Performance Management System (KBPMS) nine important aspects that should be considered in designing PMS; including determining a PMS framework, identifying company environment, formulating company statements, analysing currently implemented PMS, determining performance variables, determining cause-effect amongst variables, determining performance standards, determining improvement priority, and formulating recommendations and model evaluation (Wibisono, 2016).

KBPMS presents three distinct perspectives that are applicable in the management of organizations and can be operationalized within public sector entities. The three key components under consideration are organizational output, internal process, and resource capability. (Wibisono, 2016). The framework exhibits a high degree of applicability within public sector entities, affording ease of implementation across a broad range of organizations. However, despite the numerous conveniences offered by KBPMS, it is imperative that due diligence be exercised in its deployment within public sector organizations, particularly those operating within the purview of ministerial bodies. The presence of stakeholder influence and budgetary policies as constraints in managing the performance of ministry organizations necessitates careful consideration prior to the implementation of KBPMS within such organizations.

Numerous frameworks are utilized by public sector organizations worldwide, with many of these frameworks being adaptations of pre-existing ones. Additionally, these frameworks share a similar concept in the realm of performance management. This paper will solely focus on potential frameworks that could be implemented in ministry organizations situated in Indonesia, with the exclusion of other frameworks. Subsequently, the forthcoming discourse will delve into the crucial factors that require contemplation when formulating the notion of performance management within ministry establishments.

Consideration for Ministry Organization Performance Management System

Public sector organizations differ from private organizations in that they have a multitude of stakeholders, including citizens, politicians, and other interest groups. The attainment of

stakeholder objectives is crucial for the optimal functioning of public sector entities. Failure to prioritize these goals may result in a decline in organizational performance (Speklé and Verbeeten, 2014). Like the ministerial organization, the ministerial organization serves as a presidential aide, facilitating the attainment of the president's objectives through coordination with each minister's arrangements. (Sekretariat Negara, 2019).

This paper discusses several phenomena that have been observed in various ministerial organizations in Indonesia. Firstly, the organizational structure of these ministries is unique in that it is dispersed throughout all provinces, with unclearly defined lines of coordination and responsibility. Secondly, there is a lack of uniformity in the frameworks used by each ministry organization. Thirdly, the distribution of performance indicators is not effectively developed. Lastly, the determination of indicator derivatives remains confusing for employees within these organizations.

The Indonesian government has adopted the New Public Management (NPM) approach, which prioritizes performance and has been shown to enhance efficiency and effectiveness in organizational management, the application of private sector management practices to public sector organizations is a characteristic feature of NPM. (Hood, 1991). The inception of NPM in Indonesia dates to 1999 when it was introduced via Presidential Instruction Number 7 of 1999, which aimed to enhance accountability for government performance. The influence of New Public Management (NPM) on Indonesia is evident in the formulation of the budget, which formerly adhered to a conventional budget model but has now transitioned to a budget that is based on performance (Indrawati, 2010). Performance-based budgeting refers to the process of formulating a budget that considers the correlation between funding and anticipated outcomes and achievements. This approach takes into account the effectiveness of attaining the desired results and outputs while ensuring efficiency (PP No 21, 2004).

Even though the adoption of NPM in Indonesia has resulted in improvements to the country's performance-based budgeting system, there are still barriers in the process of putting it into practice. The process through which performance metrics are agreed upon is the most significant challenge to the implementation of performance-based budgeting. If the output is the only thing that is assessed, then course it will be relatively simple, but measuring the intended results or outcomes will need more work. The first thing that must be done is to adapt the vision and mission of the president into the vision and mission of each ministry in accordance with the tasks and responsibilities of that ministry, Because of the current conditions, every ministerial organization is being requested to make the vision and mission of the president the vision and mission of the ministry's Institution. This causes uncertainty in measuring the extent to which an organization has been successful.

Performance Management Concept for Ministry Organization

The primary goal is to formulate performance management concepts that seamlessly align with the distinct attributes and needs of ministry organizations. These concepts are summarized in Table 3, which highlights key research aspects and the corresponding gaps that guide the evolution of our customized performance management framework. By synthesizing these research elements and identifying gaps, our objective is to create a performance management framework uniquely suited to the Indonesian ministry organizational context. This framework is envisioned to empower ministry organizations to enhance their performance and effectively achieve their mission and objectives.

Table 2 Performance Management Concept to be Develop for Ministry Organizations

Research Aspect	Research that has been done	Gaps to fill
Topic/Focus	PMS in public sector organization (public health, sport organization, university, etc)	PMS that suitable to Ministry organization in Indonesia
Design of PMS	PMS Model, PSS, BSM, BSC, CPA, Integrated Performance Assessment, Result Base Performance Management	KBPMS Approach
Organization Form	Flat or 2D Organization	All Organization/3D Organization
Level of Determination	General Overview	2 Level organization
Benchmarking process	Not provided	To be provided
Cascading method	Not provided	To be provided
KPI Determination	Not provided	To be provided
Linkage among organization	Not provided in detail	To be provided
Expert System	Not provided	To be provided

The research aspects outlined in Table 3 offer a broader perspective on the state of performance management studies across the public sector. Previous research has explored performance management in various domains, including public health, sports organizations, and academic institutions. This multifaceted landscape of research provides a valuable foundation for our study, allowing us to draw insights from these diverse sectors and apply them to the specific context of ministry organizations in Indonesia. It helps us recognize that while performance management is a well-studied subject, its application within ministry organizations requires a tailored approach to address their unique characteristics and operational intricacies.

Our research focus, as highlighted in the "Topic/Focus" aspect, narrows the lens to the distinct challenges and nuances encountered within ministry organizations in Indonesia. While existing research has delved into performance management systems within the broader public sector, our study recognizes the need for a finely tuned approach. This shift in focus reflects our commitment to constructing performance management concepts that resonate harmoniously with the specific demands of ministry organizations. It acknowledges that the one-size-fits-all approach may not suffice when dealing with these specialized entities within the public domain.

The introduction of the KBPMS (Kementerian Badan dan Pelayanan Umum Performance Management System) approach, as detailed under the "Design of PMS," illustrates our endeavour to build upon the wealth of performance management models developed in previous research. It signifies our dedication to meticulously fashioning a performance management framework that aligns with the intricate requirements and goals of ministry organizations. By drawing from existing models and adapting them to the unique context of ministry organizations, we aim to provide a tailored solution that can enhance their performance effectively.

Our approach to considering diverse organizational forms, as indicated in the "Organization Form" aspect, is informed by the realization that ministry organizations often operate within complex, three-dimensional structures. While existing research predominantly examines

performance management in flatter organizational settings, our study seeks to broaden the scope to encompass the full spectrum of organizational configurations. This recognizes the need to adapt performance management concepts to the intricate organizational dynamics encountered within ministry organizations.

The "Level of Determination" aspect underscores our focused approach to designing performance management concepts specifically attuned to the dual-tier organizational structure intrinsic to ministry organizations. This level of granularity acknowledges that ministry organizations have a unique hierarchy that requires a nuanced approach to performance management.

Lastly, our commitment to addressing the historical oversight of benchmarking processes in performance management research, as highlighted in the "Benchmarking Process" aspect, reflects our dedication to providing comprehensive insights. This acknowledges that benchmarking is a critical component of performance management and that tailoring benchmarking methodologies to the nuanced dynamics of ministry organizations is a valuable contribution to the field.

Propose Framework

The proposed performance management framework, which encompasses Vision and Mission, Strategy Organization, Key Success Factors (KSFs), Key Performance Indicators (KPIs), and Activity and Budget, serves as a robust structure guiding organizations toward their strategic objectives. This framework aligns seamlessly with the findings of the conducted systematic literature review (SLR), which underscored the paramount importance of aligning organizational endeavours with a well-defined vision and mission. The SLR uncovered a wealth of evidence indicating that organizations equipped with clear visions and missions tend to exhibit superior performance and a greater likelihood of success. By anchoring the performance management process in the organizational vision and mission, this framework ensures unwavering alignment with the overarching purpose of the organization.

Moreover, the SLR highlighted the strategic planning's pivotal role in performance management. The incorporation of the Strategy Organization component in this framework directly addresses this insight, serving as a practical application of strategic planning principles. It effectively translates the organization's vision and mission into tangible strategies and initiatives. Furthermore, the identification and integration of Key Success Factors (KSFs) aligns with the SLR's emphasis on the need to pinpoint critical elements that significantly impact organizational success. The framework not only identifies these KSFs but also integrates them into the performance management process, driving the achievement of strategic goals.

The alignment between the SLR findings and the proposed framework is most apparent in the inclusion of Key Performance Indicators (KPIs). The SLR consistently underscored the role of KPIs as essential metrics for measuring and monitoring progress toward strategic objectives. By placing KPIs at the core of the framework, it operationalizes this insight, offering organizations a systematic approach to monitor performance and make data-driven decisions.

Finally, the Activity and Budget component, integral to the proposed framework, bridges the crucial gap between strategy and execution. This step is in direct alignment with the SLR's recognition of the necessity for organizations to translate strategic plans into actionable activities while effectively allocating resources. By emphasizing this step, the framework ensures that strategies are not merely conceptual documents but are implemented with precise resource allocation, thereby increasing the likelihood of achieving the envisioned outcomes.

In essence, the proposed performance management framework intricately weaves together the SLR's findings, emphasizing the pivotal role of vision, mission, strategic planning, KPIs, and resource allocation in optimizing organizational performance. By embracing this framework,

organizations can harness these insights to elevate their performance management practices and more effectively align their efforts with their strategic objectives.

Furthermore, this study delves into a selection of scholarly works related to performance management within public sector entities and the applicability of various models within such organizations. It serves as a valuable reference point for determining the optimal framework to implement within ministry organizations, especially in the context of Indonesia.

The literature reveals that public sector organizations possess distinct characteristics setting them apart from their private sector counterparts. The primary distinction lies in their overarching objectives, where private sector entities prioritize financial goals, while public sector organizations have a broader set of objectives. In Indonesia, particularly within ministry organizations, the presence of numerous stakeholders with both political and non-political influences further distinguishes them. This multifaceted stakeholder landscape poses a significant challenge for performance management. Therefore, the chosen framework must align with the unique organizational character shaped by these dual influences.

Additionally, preliminary observations conducted across various ministry organizations in Indonesia unveil inconsistencies in the adoption of performance management frameworks. Moreover, the distribution of performance indicators is deemed ineffective due to the presence of repetitive indicators across different organizational levels, potentially leading to inaccurate performance assessments. Consequently, the adoption of an appropriate cascading indicator method becomes crucial for enhancing performance management within ministry organizations. These on-the-ground observations complement the existing literature review.

One notable revelation is the distinctive organizational structure of ministries in Indonesia, influenced by the country's archipelagic geography and decentralized governance system. This uniqueness can result in ambiguities in the delineation of responsibilities. When designing a performance management system, it is imperative to consider the comprehensive insights derived from this assessment as a fundamental aspect of the performance management development process. The performance management system intended for use in ministry organizations in Indonesia must satisfy the criteria, Figure 3.

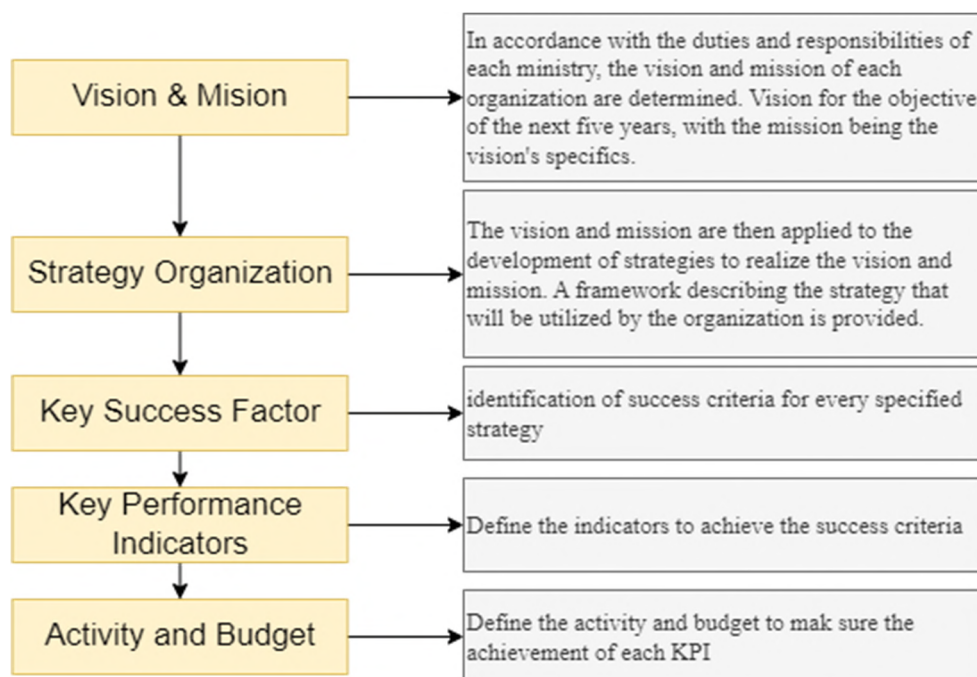


Figure 3 Conceptual to Develop Performance Management

The results of the investigation exhibit dissimilarities from various prior studies that have been carried out. Several scholarly investigations have analysed the distinctive attributes of public sector entities and the obstacles encountered by these organizations. As far as the researcher is aware, there has been no attempt to construct a comprehensive performance management framework that is appropriate for this context. Most extant research endeavours to implement and modify pre-existing frameworks for measuring performance, such as the Balanced Scorecard (BSC), Performance Prism, and comparable models. Given that existing frameworks do not entirely align with the unique features of public sector entities, it is imperative to develop a novel approach to designing performance management systems.

Conclusion and Future Research

In all of this research, it can be concluded that performance management plays a key role in increasing the efficiency and effectiveness of ministerial organizations in Indonesia. Findings from the literature and case studies confirm that organizations that have good performance management systems tend to achieve their strategic goals better. However, the complexity of the structure and the influence of multiple stakeholders within a ministry organization creates its own challenges that require a tailored approach to performance management.

The proposed performance management framework, which includes elements such as Vision and Mission, Strategic Organization, Key Success Factors, Key Performance Indicators, and Activities and Budgets, has been designed to reflect the unique characteristics of ministry organizations. By relating these findings to the organizational context of ministries in Indonesia, we have created a strong foundation for improving performance management practices in the future.

For future research, there are several areas that could be explored further. First, it is important to conduct further empirical studies to test the effectiveness of the proposed performance management framework in the context of ministerial organizations in Indonesia. In addition, there is a need for further research on the practical implementation of this framework and the challenges organizations may face in implementing it.

Furthermore, future research can explore issues such as cascading indicators, expert systems, and benchmarking that have been identified in this study. In addition, there is potential to compare existing performance management frameworks and identify the best elements that ministerial organizations can adopt. As such, this research provides a strong foundation for further research in an effort to continuously improve performance management in Indonesian ministerial organizations and perhaps also provide insights for similar organizations around the world.

References

- Bakker, R.M. (2010) 'Taking Stock of Temporary Organizational Forms: A Systematic Review and Research Agenda: Temporary Organizational Forms', *International Journal of Management Reviews*, 12(4), pp. 466–486. Available at: <https://doi.org/10.1111/j.1468-2370.2010.00281.x>.
- Chang, H.H. (2005) 'The influence of continuous improvement and performance factors in total quality organization', *Total Quality Management & Business Excellence*, 16(3), pp. 413–437. Available at: <https://doi.org/10.1080/14783360500053790>.
- Crabtree, B.F. et al. (1993) 'Selecting individual or group interviews.' Available at: <https://doi.org/10.4135/9781483349008.n9>.
- Currstine, T. (2009) 'Performance Budgeting (PB) in OECD Countries'.
- Cuthbertson, R. and Piotrowicz, W. (2011) 'Performance measurement systems in supply chains: A framework for contextual analysis', *International Journal of Productivity and Performance Management*, 60(6), pp. 583–602. Available at: <https://doi.org/10.1108/17410401111150760>.
- Dewi, H. and Sahputra, H. (2023) 'New Public Management: Is that for better public services?', *New Public Management* [Preprint], (6).

- Hawke, L. (2012) 'Australian public sector performance management: Success or stagnation?', *International Journal of Productivity and Performance Management*, 61(3), pp. 310–328. Available at: <https://doi.org/10.1108/17410401211205669>.
- Hood, C. (1991) 'A PUBLIC MANAGEMENT FOR ALL SEASONS?', *Public Administration*, 69(1), pp. 3–19. Available at: <https://doi.org/10.1111/j.1467-9299.1991.tb00779.x>.
- Indrawati, N. (2010) 'Penyusunan Anggaran Dalam Era New Public Management-Implementasinya di Indonesia', 10.
- Jayaram, J. and Vickery, S.K. (2000) 'The effects of information system infrastructure and process improvements on supply-chain time performance', *International Journal of Physical Distribution & Logistics Management*, 30(3/4), pp. 314–330. Available at: <https://doi.org/10.1108/09600030010326082>.
- Kaplan, R.S. and Norton, D.P. (2001) 'Transforming the Balanced Scorecard from Performance Measurement to Strategic Management: Part I', *Accounting Horizons*, 15(1), pp. 87–104. Available at: <https://doi.org/10.2308/acch.2001.15.1.87>.
- Kaplan, R.S. and Norton, D.P. (2008) 'LINKING STRATEGY TO OPERATIONS FOR COMPETITIVE ADVANTAGE', p. 323.
- Kotter, J.P. (2007) 'Leading change-why transformation efforts fail.pdf'.
- Lapsley, I. and Wright, E. (2004) 'The diffusion of management accounting innovations in the public sector: a research agenda', *Management Accounting Research*, 15(3), pp. 355–374. Available at: <https://doi.org/10.1016/j.mar.2003.12.007>.
- Lockamy, A., Beal, R.M. and Smith, W.I. (2000) 'Supply-Chain Excellence for Accelerated Improvement', *Interfaces*, 30(4), pp. 22–31. Available at: <https://doi.org/10.1287/inte.30.4.22.11646>.
- Lye (2004) 'Performance measurement in the public sector-a clarification and agenda for research.pdf'.
- McDavid, J. (2019) 'Program Evaluation and Performance Measurement'.
- Moullin, M. (2017) 'Improving and evaluating performance with the Public Sector Scorecard', *International Journal of Productivity and Performance Management*, 66(4), pp. 442–458. Available at: <https://doi.org/10.1108/IJPPM-06-2015-0092>.
- Moynihan, D.P. (2008) *The dynamics of performance management: constructing information and reform*. Washington, D.C: Georgetown University Press (Public management and change series).
- Neely, A., Adams, C. and Crowe, P. (2001) 'The performance prism in practice', *Measuring Business Excellence*, 5(2), pp. 6–13. Available at: <https://doi.org/10.1108/13683040110385142>.
- Newcomer, K.E., Hatry, H.P. and Wholey, J.S. (eds) (2015) *Handbook of practical program evaluation*. Fourth edition. San Francisco: Jossey-Bass & Pfeiffer Imprints, Wiley (Essential texts for nonprofit and public leadership and management).
- Pandey, S.K. and Moynihan, D.P. (2006) 'Bureaucratic Red Tape and Organizational Performance: Testing the Moderating Role of Culture and Political Support'.
- PP No 21 (2004) 'Peraturan Pemerintah No. 21 Tentang Penyusunan Rencana Kerja dan Anggaran Kementerian/Lembaga'.
- Radnor, Z. (2008) 'Hitting the Target full Conference Report.pdf'.
- Sekretariat Negara (2019) 'Peraturan Presiden Nomor 68 Tahun 2019'.
- Shaik, M. and Abdul-Kader, W. (2012) 'Performance measurement of reverse logistics enterprise: a comprehensive and integrated approach', *Measuring Business Excellence*, 16(2), pp. 23–34. Available at: <https://doi.org/10.1108/13683041211230294>.
- SK PERMENPAN No. 25 (2020) 'PERATURAN MENTERI PENDAYAGUNAAN APARATUR NEGARA DAN REFORMASI BIROKRASI REPUBLIK INDONESIA NOMOR 25 TAHUN 2020 TENTANG ROAD MAP REFORMASI BIROKRASI 2020-2024'.
- Smith, P.C. and Goddard, M. (2002) 'Performance Management and Operational Research: A Marriage Made in Heaven?', *The Journal of the Operational Research Society*, 53(3), pp. 247–255.
- Speklé, R.F. and Verbeeten, F.H.M. (2014) 'The use of performance measurement systems in the public sector: Effects on performance', *Management Accounting Research*, 25(2), pp. 131–146. Available at: <https://doi.org/10.1016/j.mar.2013.07.004>.
- Van Der Kolk, B. (2022) 'Performance measurement in the public sector: Mapping 20 years of survey research', *Financial Accountability & Management*, 38(4), pp. 703–729. Available at: <https://doi.org/10.1111/faam.12345>.
- Wang, M. et al. (2019) 'Contextualizing performance appraisal practices in Chinese public sector organizations: the importance of context and areas for future study', *International Journal of Human Resource Management*, 30(5), pp. 902–919. Available at: <https://doi.org/10.1080/09585192.2017.1292537>.
- Wanna, J. (2011) 'The Reality of Budget Reform in OECD Nations'.
- Wibisono, D. (2016) *How To Create World Class Company, Panduan Bagi Direktur dan Manajer*. 2nd Edition. ITB.
- Yates, K.L., Clarke, B. and Thurstan, R.H. (2019) 'Purpose vs performance: What does marine protected area success look like?', *Environmental Science & Policy*, 92, pp. 76–86. Available at: <https://doi.org/10.1016/j.envsci.2018.11.012>.
- Young, J.C. et al. (2018) 'A methodological guide to using and reporting on interviews in conservation science research', *Methods in Ecology and Evolution*, 9(1), pp. 10–19. Available at: <https://doi.org/10.1111/2041-210X.12828>.
- Zheng, Y. et al. (2019) 'A performance management framework for the public sector: The balanced stakeholder model', *Journal of the Operational Research Society*, 70(4), pp. 568–580. Available at: <https://doi.org/10.1080/01605682.2018.1448247>.

ISBN 978-90-77484-43-2

International Directory of Organizations in Grey Literature



idgl

4th Edition 2024

This revised and expanded edition of the International Directory of Organizations in Grey Literature, IDGL, includes a record of each organization's URL (Uniform Resource Locator) and ROR (Research Organization Registry) ID. The ROR-ID record further allows for the inclusion of other linked and persistent identifiers such as the organization's GeoName ID, GRID (Global Research Identifier), ISNI (International Standard Name Identifier), Funder ID, and Wikidata. Organizations are listed under the country in which they reside and appear in alphabetical order. Each organizational entry is assigned one of four sector codes: Academics - ACAD, Government - GOVT, Business - BUSN, or Other - OTHR. If the organization likewise appears in the Registry of Publishers in Grey Literature, a PUBGREY link is also assigned. An organization's entry in the directory indicates that one or more persons within that organization has contact with GreyNet International, that the organization has an assigned ROR ID, and that the organization is currently included on GreyNet's Distribution List. For further information, contact info@greynet.org.

GreyNet

www.textrelease.com

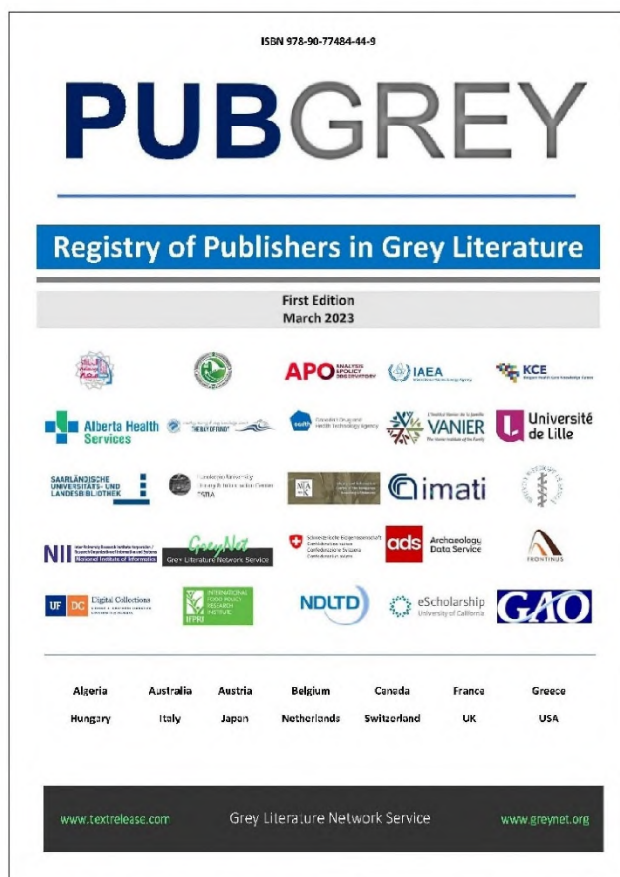
Grey Literature Network Service

www.greynet.org

Secure your Listing!
2nd Edition, Forthcoming 2024

PUBGREY

Registry of Publishers in Grey Literature



https://www.greynet.org/images/PUBGREY_1st_ed.,_2023_.pdf

GreyNet International maintains a registry of organizations that serve as publishers in the field of grey literature. The PUBGREY Registry is a unique information resource connecting both the supply and demand sides of grey literature.

Current List of Publishers in the PUBGREY Registry

Alberta Health Services (AHS)	Canada
Analysis & Policy Observatory (APO)	Australia
Archaeology Data Service (ADS)	United Kingdom
Bay of Fundy Ecosystem Partnership	Canada
Belgian Health Care Knowledge Centre (KCE)	Belgium
Canadian Agency for Drugs and Technologies in Health (CADTH)	Canada
Federal Office of Public Health (FOPH)	Switzerland
Frontinus Ltd.	United Kingdom
George A. Smathers Libraries; University of Florida (UF)	United States
Government Accountability Office (GAO)	United States
GreyNet International, Grey Literature Network Service	Netherlands
Hirokopia University, Library & Information Center	Greece
Institute for Mathematics and Information Technologies (IMATI)	Italy
International Food Policy Research Institute (IFPRI)	United States
International Nuclear Information System (INIS)	Austria
Instituto Superior de Sanitat (ISS)	Italy
Khemiya Milana University	Algeria
Library and Information Centre; Hungarian Academy of Sciences (MTAK)	Hungary
National Institute of Informatics (NII)	Japan
Networked Digital Library of Theses and Dissertations (NDLTD)	United States
Saarland University and State Library	Germany
University of California eScholarship Repository	United States
University of Constantine 2 - Abdelhamid Mehri	Algeria
University of Lille	France
University of Pisa; Dept. of Civilisations and Forms of Knowledge (MAPP)	Italy
Vanier Institute of the Family	Canada

www.textrelease.com Grey Literature Network Service www.greynet.org

Newest Record Entry

	UNIVERSITÀ DI PISA
Sector of Information	Academics
Document Types	Reports, Datasets
Publication Formats	PDF, Datafile
Main Coverage	Archaeology
Content Contributors	External also accepted
Open Access Compliant	Yes, CC-BY-SA
Homepage URL	https://digitalib.unipi.it/it/archivio/MOD-Mappa-Open-Data-archive/
Identifiers	DOI GRID grid.5395.a ISNI 0000 0004 1757 3729 Crossref Funder ID 501100007514 Wikidata Q645663 Pisa (GeoNames ID 3170647), Italy
Point of Contact	Gabriele Gattiglia, https://orcid.org/0000-0002-4245-8939 gabriele.gattiglia@unipi.it

Enter Your Record Here

RECORD FIELD NAME	SCOPE NOTES
Publishing Body	Complete Name and Acronym if applicable
Sector of Information	Government, Academics, Business, Industry, Other
Document Types	Reports, Proceedings, Theses, Datasets, Videos, etc.
Publication Formats	Print, PDF, Datafile, Online, etc.
Main Coverage	Disciplines, Topics, Subjects
Content Contributors	Internal only, External also accepted
Open Access Compliant	Yes, CC License if applicable
Homepage URL	http, https
Identifiers	Date founded, Awards, ROR ID, DOI, Social Media
Point of Contact	Full Name, ORCID if applicable, Email address

<https://www.surveymonkey.com/r/J8DJSF5>

<https://www.surveymonkey.com/r/J8DJSF5>

Author Information

Adhiutama, Akbar

Akbar Adhi Utama is an associate professor in the School of Business and Management, Institut Teknologi Bandung. He received his Ph.D in Management of Technology at Shibaura Institute of Technology in Japan. He holds both his master of engineering in Electrical Engineering and M.B.A in School of Business Management from Institut Teknologi Bandung. His research interests are in operations management, supply chain management and management of technology.

ROR_ID <https://ror.org/00apj8t60>

ORCID: <https://orcid.org/0000-0002-8625-038X>

Biagioni, Stefania

Stefania Biagioni graduated in Italian Language and Literature and specialized in Data Processing and DBMS at the University of Pisa. She is currently an associate member of the research staff at the Institute of Information Science and Technologies "Alessandro Faedo" (ISTI), an institute of the Italian National Research Council (CNR) located in Pisa. She is currently involved in the activities of the ISTI Infrastructures for Science Laboratory (InfraScience). She has been Head Librarian till August 2017. She was responsible of National and International Projects on Digital Libraries and Open Access Repositories looking at the DRIVER/OpenAIRE vision, such as ERCIM Technical Reference Digital Library (ETRD) and PUMA (PUBlication MANagement) & MetaPub Projects. She has coauthored a number of publications dealing with digital libraries and grey literature. Her research interest is focused on digital libraries, knowledge sharing and transfer in scientific area, scholarly communication infrastructures, data and documents management, Open Access and Open Science. She has been dealing with grey literature since the 90's. In 2013, she became involved in the GreyGuide Project, where she now serves as its Repository and Web Portal Manager. In 2018 together with GreyNet International, DOIs were minted and entered in the metadata fields of GreyGuide records. Stefania's involvement with persistent identifiers carried over to the AccessGrey Project in 2019. She is currently involved in the PID Project that includes the ORCID and ROR ID together with DOI persistent identifiers in metadata records housed in the GreyGuide Repository.

ROR_ID <https://ror.org/05kacka20>

ORCID iD <https://orcid.org/0000-0001-9518-0267>

Email: stefania.biagioni@isti.cnr.it

Carlesi, Carlo

Carlo Carlesi graduated in Computer Science and has worked since 1970 at the IEI (now ISTI) of the Italian National Research Council in Pisa. His interest has been concentrated in many software engineering fields such as: Data Base Systems, Software quality and testing, Administration and UNIX system management, Network security and management, Data Publication, Open Science, Digital Library [Management] Systems and Architectures. He was Head of the "Information Technology Security Service" of the Institute and has participated in many national and international projects, among the most recent: Italian Project for Research in the Antarctica - South Pole Project with the aim to create a Multidisciplinary Integrated Information System. Other of the projects in which he participated include: ERCIM Technical Reference Digital Library - ETRDL Project; PUMA (PUBlication MANagement) a software infrastructure for the management of the institutional/disciplinary archives of the published and grey literature of the CNR Institutes. He is currently a collaborator of the Infrastructures for Science Laboratory (InfraScience) of the CNR ISTI and is involved in the GreyGuide Repository and Portal to Good Practices and Resources in Grey Literature. He has co-authored a number of publications dealing with digital libraries and grey literature. In 2013, he became involved in the GreyGuide Project, where he now provides for the Technical Development and Support. In 2018 together with GreyNet International, DOIs were minted and entered in the metadata fields of GreyGuide records. Carlo's involvement with persistent identifiers carried over to the AccessGrey Project in 2019. He is currently involved in the PID Project that includes the ORCID and ROR ID together with DOI persistent identifiers in metadata records housed in the GreyGuide Repository.

ROR_ID <https://ror.org/05kacka20>

ORCID iD <https://orcid.org/0000-0001-9808-6268>

Email: carlo.carlesi@isti.cnr.it

Dhewanto, Wawan

Wawan Dhewanto is a Professor of Entrepreneurship at the School of Business and Management, Institut Teknologi Bandung. He was involved in developing the Bachelor Program on Entrepreneurship and became its Director in 2013. Prof. Wawan Dhewanto has also served as Head of Entrepreneurship Development Division of ITB Entrepreneurship and Innovation Development Institute (LPIK ITB). His research interests

Author Information *CONTINUED*

are on Entrepreneurship, Entrepreneurial Leadership, Management of Innovation and Technology, Digital Start-Ups, dan Small and Medium Enterprise (SME) Internationalisation. He is also the co-author of several entrepreneurship and technology management books.

ROR_ID <https://ror.org/00apj8t60>

ORCID: <https://orcid.org/0000-0002-6705-5191>

Farace, Dominic

Dominic Farace is Head of GreyNet International and Director of TextRelease, an independent information bureau specializing in grey literature and networked information. He holds degrees in sociology from Creighton University (BA) and the University of New Orleans (MA). His doctoral dissertation in social sciences is from the University of Utrecht, The Netherlands, where he has lived and worked since 1976. After six years heading the Department of Documentary Information at the Royal Netherlands Academy of Arts and Sciences (SWIDOC/KNAW), founded GreyNet in 1992. He has since been responsible for the International Conference Series on Grey Literature (1993-2013). In this capacity, he also serves as Program and Conference Director as well as managing editor of the Conference Proceedings. He is editor of The Grey Journal and provides workshops and training in the field of grey literature.

ROR_ID <https://ror.org/01pxfxj80>

ORCID_ID <https://orcid.org/0000-0003-2561-3631>

Email: info@greynet.org

Giannini, Silvia

Silvia Giannini graduated and specialized in library sciences. Since 1987 she has been working in Pisa at the Institute for the Science and Technologies of Information "A. Faedo" of the Italian National Council of Research (ISTI-CNR). Currently she is the head of the Library and Scientific Documentation Center of the CNR in Pisa. She is interested in library automation tools, digital libraries, data management and documents lifecycle, Open Access repositories of published and grey literature. ROR_ID <https://ror.org/05kacka20>
ORCID_ID <https://orcid.org/0000-0001-7323-3786>
Email: silvia.giannini@isti.cnr.it

Halim, Didi Kurniadi

He completed his bachelor's degree at Parahyangan University in 2004, then worked at many financial institutions before enrolling in the MBA program at the Bandung Institute of Technology with a focus on general management and graduating in 2010. Has

worked in a variety of consulting firms and has been heavily involved in the preparation of feasibility study documents and performance management systems for several Indonesian state-owned companies, including PT. Pertamina (Persero), Perum Perhutani, PT Pelita Air Services, PT. Pertamina Lubricants, and PT. PLN (Persero). ROR_ID <https://ror.org/00apj8t60>
ORCID: <https://orcid.org/0009-0008-2534-3145>

Lombardi, Stefania

Stefania Lombardi holds a PhD in Moral Philosophy, and is a librarian at ISTI-CNR.

ROR_ID <https://ror.org/05kacka20>

Email stefania.lombardi@cnr.it

ORCID_ID <https://orcid.org/0000-0003-3545-1170>

Molino, Anna

Anna Molino graduated in Linguistics at the University of Pisa in 2010. Since 2013, she works at ISTI-CNR ("Istituto di Scienza e Tecnologie dell'Informazione - A. Faedo"). She worked as project assistant and financial manager in various EU funded and national research projects for the Digital Libraries group of the NeMIS lab. Since 2018, she joined the Library staff of the CNR Area in Pisa. She is actively involved in all library duties as well as in the practice of Open Access and Open Science principles. She also contributes in the language revision and translation of the scientific production of the library. ROR_ID <https://ror.org/05kacka20>
ORCID_ID <https://orcid.org/0000-0002-4793-3727>
Email: anna.molino@isti.cnr.it

Mulyono, Nur Budi

Nur Budi Mulyono is an academic at the School of Business and Management, Institut Teknologi Bandung (SBM ITB). He received a bachelor's and master's degree in industrial engineering from Institut Teknologi Bandung in 2001 and 2005, respectively. He earned a doctorate in disaster operations management from Toyohashi University of Technology. During his studies, he actively participates in a local government project in Japan to establish a solid disaster prevention system. He is also involved in developing technology solutions for the local small and medium manufacturing industry in Toyohashi to improve efficiency and resilience to disruptions. His research interests include operations management, productivity management, relief supply chains, artificial intelligence, and resilient systems in the industrial and energy sectors.

ROR_ID <https://ror.org/00apj8t60>

ORCID: <https://orcid.org/0000-0001-6135-9357>

Author Information *CONTINUED*

Reece, Alistair

Alistair is the Product Manager Platform and Implementations at GeoScienceWorld, a leading content aggregator and journal publisher in the geosciences. Alistair has strategic responsibility for the GSW research platform, in particular ensuring that the platform's functionality meets the needs of the geoscience research community, as well as other stakeholder groups. Alistair was also a Business Analyst and Product Owner for one of the major scholarly content platform companies, with particular interest in XML, requirements gathering, and Agile ways of working.

ROR_ID <https://ror.org/00ez32163>

ORCID_ID <https://orcid.org/0000-0002-2002-5593>

E-mail: reece@geoscienceworld.org

Savić, Dobrica

Dr Dobrica Savić is an information and knowledge management consultant at the IAEA. He holds a Doctorate degree from Middlesex University in London, an MPhil degree in Library and Information Science from Loughborough University, UK, an MA in International Relations from the University of Belgrade, Serbia, as well as a Graduate Diploma in Public Administration, Concordia University, Montreal, Canada. He has extensive experience in the management and operations of web, library, information and knowledge management, as well as records management and archives services across various United Nations agencies, including UNV, UNESCO, World Bank, ICAO, and the IAEA. His main interests are digital transformation, creativity, innovation, and the use of IT for successful information and documentation services.

ROR_ID <https://ror.org/00gtfax65>

ORCID_ID <https://orcid.org/0000-0003-1123-9693>

Contact: www.linkedin.com/in/dobricasavic

Wibisono, Dermawan

Graduated as an Industrial Engineer from ITB in 1989, Master by Research from Royal Melbourne Institute of Technology in Australia with financial support from AusAid in 1999, and PhD from the University of Bradford in England with financial support from the Islamic Development Bank in Jeddah in 2003, before becoming a Professor at ITB in 2012. He specializes in corporate performance management, expert systems, and quality management. He has already published

several text books in various publishers such as Mengelola Kinerja Kementerian (ITB Publishing, Bandung, 2017), Gumam (ITB Publishing, Bandung, 2017), How to Create World Class Company, 2nd edition (ITB Publishing, Bandung, 2016), Mengelola Kinerja Kementerian dan Pemerintahan (BPFE Publishing, UGM, Jogjakarta, 2016), Active Learning with Case Methods (Andi Publishing, Jogjakarta, 2014), Knowledge Based Performance Measurement System (Lambert Academic Publishing, Germany, 2014), Panduan Penyusunan Skripsi, Tesis dan Disertasi (Andi Publishing, Jogjakarta, 2013), How to Create World Class Company: Panduan Bagi Manajer dan Direktur (Gramedia Publishing, Jakarta, 2012), Manajemen Kinerja: Korporasi dan Organisasi: Panduan Penentuan Indikator (Erlangga Publishing, Jakarta, 2011), Manajemen Kinerja: Konsep, Desain dan Teknik Meningkatkan Daya saing Perusahaan (Erlangga Publishing, Jakarta, 2006), Riset Bisnis: Panduan bagi Praktisi dan Akademisi (Gramedia Publishing, Jakarta, 2003). He also published many research in international journal (more than 20 papers) and international conference proceeding (more than 25 papers). Despite publishing academic reference and papers, he also writing novels of characters building that until now he has 6 novels that one of them has been transferred into a film nationally.

ROR_ID <https://ror.org/00api8t60>

ORCID: <https://orcid.org/0000-0001-5551-9414>

Zahra, Arianne Muthia

Arianne is a doctoral student in the School of Business and Management, Institut Teknologi Bandung. She finished her Masters degree in Creative and Cultural Entrepreneurship at SBM ITB and her undergraduate degree in psychology at the International Islamic University Malaysia. Apart from her research interest in technology adoption and SMEs, Arianne also has experience working as a research assistant in various educational institutions in Indonesia and Malaysia.

ROR_ID <https://ror.org/00api8t60>

ORCID: <https://orcid.org/0000-0002-7078-9911>

GreyNet International

A Publisher in Grey Literature

PiDfest 11-13 June 2024, NTK Prague

PID SERVICES:

DOI MINTING



REPOSITORY LANDING PAGES



COMMUNITY OF PRACTICE



"PIDS benefit the production and publication of grey literature: Supply-side compliance with FAIR Data Principles"

The role of grey literature publishers much like that of commercial publishers is to provide value added information to publications in advance of their dissemination. Today, this involves the inclusion of rich metadata and actionable persistent identifiers. Together they enhance both the generation and transfer of knowledge. Likewise, for grey literature to meet and benefit from compliance with FAIR data principles, publishers must be proactive in the inclusion of PIDS and their associated metadata.

This approach to enhanced publication further demonstrates the value of crosslinking in the publication trail. For example, by incorporating PIDS, **research data** associated with full-text can appear openly accessible in a data archive even prior to the publication of the manuscript. Likewise, **video recordings** of conference presentations can be published in an audio-visual portal prior to their publication as conference papers. Similarly, **conference papers** can appear published and openly accessible in a federated or institutional repository independent of their publication in the conference proceedings.

The more accessible a publication is upon its introduction in the information chain the greater the potential impact it can have. This is of course the significant benefit open access offers grey literature. When the publication further contains actionable persistent identifiers such as the DOI, ORCID, ROR, and Funder ID along with associated rich metadata the researcher and end-user stand to further gain. Today, the inclusion of PIDS is no longer seen as an added benefit but rather becomes a precondition.

Not only are grey literature publishers responsible for the inclusion of PIDS and metadata related to their publications but also the authors and researchers are invited, if not mandated to do so. When they are provided with standardized online templates accompanied by scope notes, this can both enhance the quality of the publication, while decreasing the time in which their work becomes findable, (openly) accessible, interoperable, and (re)useable.



Dominic Farace, GreyNet International
<https://orcid.org/0000-0003-2561-3631>
<https://ror.org/01pxfxj80>

Stefania Biagioni and Carlo Carlesi, InfraScience; ISTI-CNR
<https://orcid.org/0000-0001-9518-0267>
<https://orcid.org/0000-0001-9808-6268>
<https://ror.org/05kacka20>
<https://api.crossref.org/funders/501100014596>

GreyGuide Repository				GreyGuide Portal				
Proposals / Abstracts	Biographical Notes	Conference Papers	Data Papers	Conference Proceedings	Conference Slides	Conference Posters	Conference Videos	Published Datasets
GLA Collection	BIO Collection	GLP Collection	RGL Collection	Document Share	Document Share	Document Share	Repositories TIB AV Portal	Repositories DANS EASY Archive

Notes for Contributors

Non-Exclusive Rights Agreement

- I/We (the Author/s) hereby provide TextRelease (the Publisher) non-exclusive rights in print, digital, and electronic formats of the manuscript. In so doing,
- I/We allow TextRelease to act on my/our behalf to publish and distribute said work in whole or part provided all republications bear notice of its initial publication.
- I/We hereby state that this manuscript, including any tables, diagrams, or photographs does not infringe existing copyright agreements; and, thus indemnifies TextRelease against any such breach.
- I/We confer these rights without monetary compensation and with the understanding that TextRelease acts on behalf of the author/s.

Submission Requirements

Manuscripts should not exceed 25 double-spaced typed pages. The size of the page can be either A-4 or 8½x11 inches. Provide the title, author(s) and affiliation(s) followed by your abstract, suggested keywords, and a brief biographical note.

A printout or PDF of the full text of your manuscript should be forwarded to the office of TextRelease. A corresponding MS Word file should either accompany the printed copy or be sent as an attachment by email.

REFERENCE GUIDELINES

General

- All manuscripts should contain references
- Standardization should be maintained among the references provided
- The more complete and accurate a reference, the more guarantee of an article's content and subsequent review.

Specific

- Endnotes are preferred and should be numbered
- Hyperlinks need the accompanying name of resource; a simple URL is not acceptable
- If the citation is to a corporate author, the acronym takes precedence
- If the document type is known, it should be stated at the close of a citation.
- If a citation is revised and refers to an edited and/or abridged work, the original source should also be mentioned.

Examples

Youngen, G.W. (1998), Citation patterns to traditional and electronic preprints in the published literature. - In: College & Research Libraries, 59 (5) Sep 1998, pp. 448-456. - ISSN 0010-0870

Crowe, J., G. Hodge, and D. Redmond (2010), Grey Literature Repositories: Tools for NGOs involved in public health activities in developing countries. – In: Grey Literature in Library and Information Studies, Chapter 13, pp. 199-214. – ISBN 978-3-598-11793-0

DCMI, Dublin Core Metadata Initiative Home Page http://purl.oclc.org/metadata/dublin_core/

Review Process

The Journal Editor first reviews each manuscript submitted. If the content is suited for publication and the submission requirements and guidelines complete, then the manuscript is sent to one or more Associate Editors for further review and comment. If the manuscript was previously published and there is no copyright infringement, then the Journal Editor could direct the manuscript straight away to the Technical Editor.

Journal Publication and Article Deposit

Once the journal article has completed the review process, it is scheduled for publication in The Grey Journal. If the Author indicated on the signed Rights Agreement that a preprint of the article be made available in GreyNet's Archive, then browsing and document delivery are immediately provided. Otherwise, this functionality is only available after the article's formal publication in the journal.

Contents

'Harnessing, Adopting, and Supporting Grey Literature'

Harnessing the Power of AI for Managing Grey Literature	167
Dobrica Savić, IAEA Consultant in Nuclear Knowledge Management, Austria	
All in the Mind - Adopting an Agile Mindset as the Prerequisite to Agile Transformation	178
Alistair Reece, GeoScienceWorld, United States	
Grey Literature Supporting the Right to Knowledge	183
Silvia Giannini, Stefania Lombardi, and Anna Molino, Institute of Information Science and Technologies, ISTI-CNR, Italy	
Realizing the Potential of Grey Literature by Recognizing its Publishers: The PUBGREY Project and the Case of Climate Change	197
Dominic Farace, GreyNet International, Netherlands; Stefania Biagioni and Carlo Carlesi, ISTI-CNR, Italy	
Data from "Realizing the Potential of Grey Literature by Recognizing its Publishers: The PUBGREY Project and the Case of Climate Change"	204
Dominic Farace, GreyNet International, Netherlands; Stefania Biagioni and Carlo Carlesi, ISTI-CNR, Italy	
Identifying Possibilities of Emerging Technology Adoption in the Fashion Industry: Levering Insights from Grey Literature	207
Arianne Muthia Zahra, Wawan Dhewanto, and Akbar Adhiutama; School of Business and Management, Bandung Institute of Technology, Bandung, Indonesia	
Strategic Design of Performance Management for Ministerial Organizations: A Comprehensive Literature Review in the Public Sector	218
Didi Kurniadi Halim, Dermawan Wibisono, and Nur Budi Mulyono; School of Business and Management, Bandung Institute of Technology, Bandung, Indonesia	

Colophon.....	164
Editor's Note.....	166
On The News Front	
International Directory of Organizations Grey Literature 4th edition, March 2024 - ISBN 978-90-77484-43-2.....	233
PUBGREY, Registry of Publishers in Grey Literature First edition, 2023 https://greynet.org/pubgrey.html	234
Advertorials	
INIS, The International Nuclear Information System.....	177
CVTISR, Slovak Centre of Scientific and Technical Information	206
GreyNet International, A publisher in Grey Literature	238
Author information.....	235
Notes for Contributors.....	239