# Conference platform metadata and functions: existing platforms analysis and ontology-based approach

Yevhenii B. Shapovalov<sup>1,2</sup>, Viktor B. Shapovalov<sup>1,2</sup>

#### **Abstract**

The academic landscape is currently marred by the rise of predatory conferences, which are more concerned with profits than with promoting genuine scholarly discourse. These events often lack the stringent peer review processes necessary to ensure the dissemination of high-quality research. To address this issue, the academic community urgently requires robust conference management platforms capable of discerning and filtering out such dubious gatherings. These platforms should be designed not only to facilitate the search and participation in conferences but also to rigorously evaluate and ensure the quality of the conferences listed. Incorporating insights from various studies, it becomes evident that an ideal platform would merge the functionalities of advanced peer review, decision-making tools based on ethical considerations, and concrete quality metrics. By implementing these features, conference management platforms can become the bulwark against the dilution of research integrity and play a pivotal role in nurturing the value of scientific conferences. The literature underscores a shift towards focusing on the core issue of quality in conferences, suggesting that a multifaceted platform could successfully address both the problems of questionable conference quality and predatory nature.

#### **Keywords**

 $predatory\ conference\ platforms,\ ontology,\ metadata,\ automation$ 

#### 1. Introduction

The collective literature points to the growing concern of predatory conferences, which are characterized by their profit-driven motives and lack of rigorous peer review, leading to the dissemination of low-quality research. The term "questionable conference", as suggested by McCrostie [1], aligns with a more precise identification of these events based on specific red flags. This nomenclature shift directs the focus towards the quality problem rather than merely labeling the conferences as predatory.

Chartier's work underlines the rise of such conferences, hinting at the critical need for reliable platforms that ensure trusted selection and peer review processes [2]. Pecorari introduces a tool designed to assist researchers in making informed decisions about conference participation, thereby equipping them with the means to discern quality. This suggests that platforms could integrate such tools to facilitate ethical decision-making for prospective attendees [3].

CS&SE@SW 2023: 6th Workshop for Young Scientists in Computer Science & Software Engineering, February 2, 2024, Kryvvi Rih. Ukraine

- sjb@man.gov.ua (Y. B. Shapovalov); svb@man.gov.ua (V. B. Shapovalov)
- © 0000-0003-3732-9486 (Y. B. Shapovalov); 0000-0001-6315-649X (V. B. Shapovalov)

© 2024 Copyright for this paper by its authors. Use permitted under Creative Commons License Attribution 4.0 International (CC BY 4.0).

CEUR Workshop Proceedings (CEUR-WS.org)

<sup>&</sup>lt;sup>1</sup>Ukrainian Scientific Center for the Development of Information Technologies, 180 Antonovycha Str., Kyiv, 03150, Ukraine

<sup>&</sup>lt;sup>2</sup>National Center "Junior Academy of Science of Ukraine", 38-44 Dehtiarivska Str., Kyiv, 04119, Ukraine

Ibrahim's discussion on the adverse effects of predatory practices on scientific literature further substantiates the necessity for heightened awareness and educational resources within conference platforms to combat these issues [4].

Stevic's hybrid model provides a framework for evaluating conference quality through measurable aspects. By embedding such a model into conference platforms, it could systematically assess and ensure the quality of conferences listed or hosted on the platform [5].

Martins' proposition of new quality metrics tailored for conferences could be utilized by platforms to standardize quality assessment, moving beyond subjective perceptions to more concrete and comparative measures [6].

Laplante's emphasis on the importance of paper quality for the reputation of conferences suggests that platforms could enforce strict peer review guidelines and quality checks for paper submissions [7].

Berndtsson et al. [8], Hagemann-Wilholt et al. [9], Bentlage et al. [10], Iana et al. [11] explore various aspects of conference systems and platforms, from subjective quality assessment to the practicalities of online conference management and the development of recommendation systems. Integrating these insights could lead to the creation of multifaceted platforms that not only focus on quality control but also enhance the overall user experience through pervasive computing, metadata curation, and personalized recommendations.

By converging these diverse perspectives, the argument shifts from evaluating the quality of conferences to addressing the core issue of quality itself. This approach underscores the potential of conference platforms to serve as a solution to the problems of quality and the predatory nature of some conferences. Such platforms could incorporate advanced peer review processes, ethical decision-making tools, quality metrics, and pervasive computing to ensure the integrity and value of scientific conferences.

Currently, Ukrainian Research Information System (URIS) is being developing [12] and the system that will ensure accounting of the scientific data is developing as sub-system of it [13]. Therefore, to ensure consideration of existing experience during development of national platform of conferences, this study aims to analyze metadata and functions of existing conference platforms.

#### 2. Methods

#### 2.1. Data collection

We analyzed the 6 most well-known conference platforms. The platforms that being analyses included two groups of software: informational-oriented and process-oriented. The first group principle is just to provide information and structure. This group included ConfiDent (https://www.confident-conference.org/index.php/Main\_Page), Conference Index (https://conferenceindex.org/), OpenResearch (https://www.openresearch.org/wiki/Main\_Page) and WikiCFP (http://www.wikicfp.com/cfp/). In other hand, process-oriented systems provide whole cycle of processes that are being required to providing conferences. It could include processes of submission, reviewing and publishing. As examples we took Morressier and EasyChair.

#### 2.2. Data processing

We provided data aggregation using Pivot tables in MS Excel. To ensure correct structural data representation based on the type of data that we collected, we added colonum that describes the type of characteristics of data that we collected. This colonum included Presence of event class, Basic metadata of conferences, User fields, Identifiers, Functionality, Planned functionality, Organizational data, and Additional data. It is worth noting that we analyze web pages and scholar papers, but it ensures that we obtained full information about the systems due to some fields of functions may be not described or shown through the privacy settings. We have legginged in all systems where it was possible to avoid to, but there is still a possibility of it. That's why we each function or field in our analysis could be in the state "no data" for cases when we did not find the relative function /field or "yes" for cases when this field or fucntion was available. Those classes were used as filters in Pivot table and graphs were built for each such class separately.

#### 3. Results

#### 3.1. Description of the conference platform

## 3.1.1. Description of the informational-oriented systems

ConfIDent [9], Conference Index, OpenResearch [9], and WikiCFP [11] are four distinct platforms, each with its unique focus on academic and scientific events, albeit with some overlap in their offerings.

ConfiDent is a platform that aims to ensure the persistent accessibility of scientific events such as conferences in high quality. It appears to focus on the longevity and quality of the information regarding scientific meetings, ensuring that records of these events are maintained over time 1.

Conference Index categorizes and indexes conferences globally. It organizes information by category (such as engineering, physics, health science), by tag (like education, environment, medicine), and by country, highlighting the international span of its listings. The platform emphasizes its role in reaching potential participants through its indexing services 2.

OpenResearch seeks to make descriptive metadata on conferences and other scientific events permanently accessible, with high quality through automated processes and scientific data curation. It serves a broad audience including researchers, universities, specialized societies, and funding agencies. The platform provides information on thousands of events and event series, and allows browsing by fields of science, type of content, and region, thus facilitating a targeted search for scientific events and resources.

WikiCFP is a semantic wiki dedicated to Calls for Papers (CFPs) in the fields of science and technology. It hosts over 100,000 CFPs and is utilized by a large number of researchers monthly. The platform is essentially a repository and dissemination point for upcoming calls related to conferences, workshops, and journals, focusing on the early stages of conference participation and paper submission. This table provides a high-level overview of the platforms' purposes and services, although it does not capture all requested parameters due to limited information

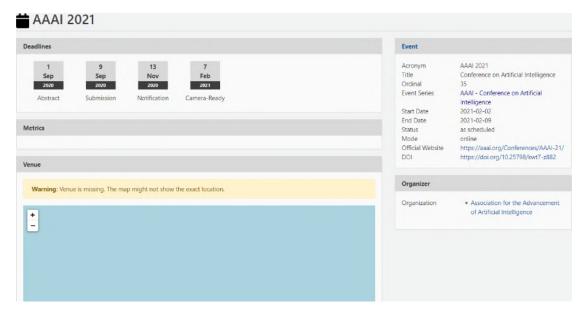


Figure 1: General view of ConflDent conference platform.

availability. For specific details such as the number of visitors or more precise ownership and location data, further in-depth research or direct inquiry with the platforms may be necessary. A general description of those systems is presented in table 1.

#### 3.1.2. Description of the process-oriented systems

Morressier and EasyChair are both platforms that cater to the needs of the academic and research communities, albeit with different approaches and services.

**Morressier** is designed to support the pre-publishing journey of scholarly communications. It provides an array of services that support the early stages of research dissemination, from managing hybrid and virtual conferences to facilitating journal submissions, peer-review workflows, and implementing AI-powered integrity checks. The platform's vision is to enhance efficiency and trust in the scientific communication process using technology.

**EasyChair** offers a comprehensive conference management system that supports the organization of scientific conferences, both virtually and in-person. It encompasses a virtual conference solution to facilitate scientific conferences of any size, a conference management system for handling everything from program committees to publishing proceedings, and a registration system that allows for the creation of complex registration forms and online payment processing in multiple currencies. EasyChair also includes 'Smart Slides', a feature that enables the publication and distribution of presentation slides, and 'Smart CFP', a tool for publishing conference calls for submissions. In addition, their publishing services offer a seamless submission-to-publication process for reviewed content in various scientific areas.

These platforms highlight the diverse technological tools available to modern researchers and conference organizers, aiming to streamline the scientific communication lifecycle from

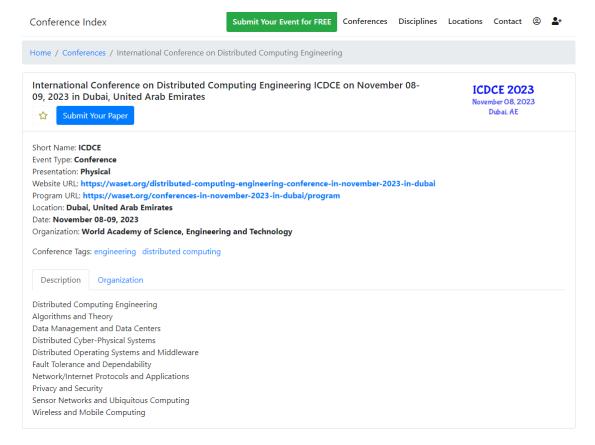


Figure 2: General view of Conference Index conference platform.

initial call for papers to post-conference publication and dissemination. A general description of those systems is presented in table 2.

#### 3.2. Frequency of fields usage

Fields such as 'Title', 'Type', 'Country', 'City' used in four systems, indicate that users often delineate conferences based on these categorical distinctions. These could serve as primary filters when searching for events relevant to an individual's location preference or subject matter

The fields that are used in 3 systems are 'Venue', 'The term of notification of assignment', 'The start date', 'The official website of the conference', 'Serial number (series of events)', 'Organizers', 'Final submission', 'Direction', 'Date of completion', 'Acronym', and 'A series of events' — reflect a middle tier of frequency in usage. Those fields underscore general aspects of conferences including the logistical aspects of conferences, including information on event timelines, locations, and organizational details, which are critical for planning and attendance. The inclusion of 'Final submission' indicates a focus on the deadlines for academic contributions, while 'Direction' may refer to the thematic or disciplinary orientation of the conference.

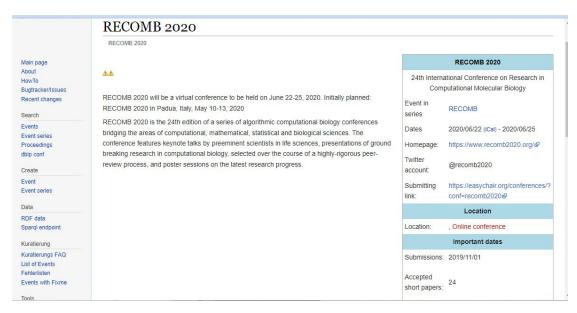


Figure 3: General view of OpenResearch conference platform.

**Table 1**A general description of informational-oriented conferences.

Platform	Aim	Short description
ConflDent (https://www. confident-conference. org/index.php/ Main_Page)	To make scientific events persistently accessible in high quality.	A platform for persistent access to high-quality scientific events.
Conference Index (https://conferenceindex.org/)	To help conference organizers reach potential participants easily.	An indexing platform for posting and finding conferences including details like organization and ticket price table.
OpenResearch (https://www. openresearch.org/ wiki/Main_Page)	Making descriptive metadata on conferences and other formats of scientific events permanently accessible through automated processes and scientific curating.	A service for researchers to search for and publish information on scientific events.
WikiCFP (http://www.wikicfp. com/cfp/)	To provide a platform for Calls For Papers (CFP) for international conferences, workshops, meetings, seminars, events, journals, and book chapters.	A Wiki website for Calls For Papers in various fields including computer science, engineering, and more.

Fields like 'Region', 'Reference to registration', 'Mode (form of conduct)', 'Hashtags', 'Address', and 'Academic sphere' with a using in two systems are used less frequently but suggest a nuanced



Figure 4: General view of WikiCFP conference platform.

approach to categorizing and promoting conferences. 'Mode (form of conduct)' could indicate whether the conference is virtual or in-person, an increasingly relevant distinction in the post-pandemic landscape.

Finally, 'Website', 'URL program', 'Status', 'Reference to external id', 'ID', 'Doi', 'Contact' is used least frequently. These may represent specific details that are occasionally sought after or are relevant only in certain contexts, such as scholarly communication or detailed inquiries.

The usage frequency of these fields can serve as an indicator of the priorities and behaviors of conference stakeholders. High-frequency fields are likely to be deemed essential for the discovery, selection, and participation in academic conferences, while lower-frequency fields may represent specialized interests or administrative concerns. This data informs platform developers and conference organizers about which features to emphasize or streamline for better user engagement and operational efficiency.

The fields 'Surname', 'Name', and 'Web Page' are used in 5 systems, emerge as the most commonly used. This suggests a strong emphasis on personal identification and online presence,



**Figure 5:** General view of Morressier platform.

**Table 2**General description of process-oriented conferences.

Platform	Aim	Short description	Number of events	Number of visitors
Morressier	To support the entire pre-publishing journey of scholarly communications.	Supports hybrid and virtual conferences, journal submissions, peer-review workflows, and Al-powered checks.	More than 200 profes- sional and scientific organizations use Mor- ressier	Not stated
EasyChair	To organize research paper submission and review for the scientific community.	A conference management system provides various services including a virtual conference solution.	111106 conferences (as of the page's last update)	4094277 users (as of the page's last update)

which are typically crucial for networking, identification, and accessibility purposes.

In contrast, fields with usage in only one system reflect a diverse array of individual and organizational attributes. 'Type of organization' could be indicative of the structure or sector (e.g., non-profit, corporate, academic) an individual is associated with. 'Profile type (open/closed)' might relate to the privacy settings of a user's profile within the organization's database or



# OPAL' 2024: 7th International Conference on Optics, Photonics and Lasers

Melia Palma Marina Hotel, Mallorca (Balearic Islands)

Palma de Mallorca, Spain, April 17-19, 2024

Conference website	https://opal-conference.com/
Submission link	https://easychair.org/conferences/?conf=opal2024
Abstract submission deadline	March 5, 2024
Abstract registration deadline	April 10, 2024
Submission deadline	April 15, 2024

### Topics: optics photonics lasers moems

#### **About the Event**

Similar to the previous OPAL conferences, the 7<sup>th</sup> International Conference on Optics, Photonics and Lasers (OPAL' 2024) will incorporate three symposiums covering a broaden range in optics, photonics and lasers, and provide an excellent opportunity to exchange ideas and present latest advancements in these areas. The OPAL 2024 will be organized by the IFSA - professional, non-profit association serving for industry and academy since 1999.

The purpose of OPAL' 2024 is bring together leading international researchers, engineers and practitioners interested on any of the optical related technologies. The conference will offer plenary and invited talks, contributed oral and poster presentations, special sessions, tutorials, and exhibitions of commercial products. Social and cultural events will also take place to foster networking among the participants in a friendly manner.

#### Submission Guidelines

All papers must be original and not simultaneously submitted to another journal or conference. The following paper categories are welcome:

Figure 6: General view of EasyChair platform.

Number of uses vs. Name of field

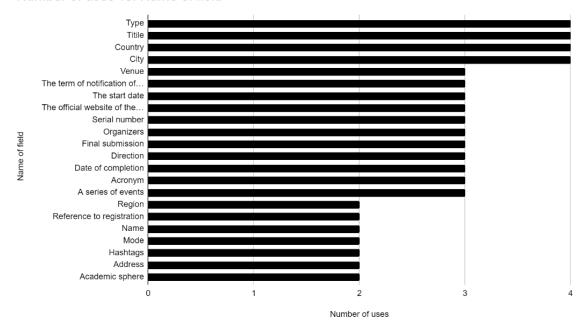


Figure 7: Number of uses of fields of basic metadata of the conferences in conference platforms.

network.

'Position until', 'Position since', and 'Position' fields are indicative of employment status and history. These would be key in understanding tenure, career progression, and current roles within the organization. 'Phone number' and 'Login' are used for communication or system entry purposes.

'Degree', 'Name of the organization', and 'Name of position' provide specific professional and educational details that are important for delineating qualifications and organizational hierarchy. 'Annual income of the organization' is a more specialized field that could be relevant for financial analysis, funding, or economic status reporting within the organization. Considering that annual income of the organization is used for this Morressier system, that is paid system, it seems that this parameter is using to analyze advertising strategies with specific organizations.

The low frequency of these latter fields could suggest that they are either less frequently accessed due to their specificity, or they are utilized in more targeted queries where detailed individual or organizational information is necessary. This distribution indicates a focus on essential identification and communication data over more detailed personal or organizational information in common use cases. Such an analysis can guide the design of information systems, ensuring that frequently used fields are more accessible, while less frequently used data can be structured in a way that is unobtrusive yet available when needed.

# Number of uses vs. Name of field

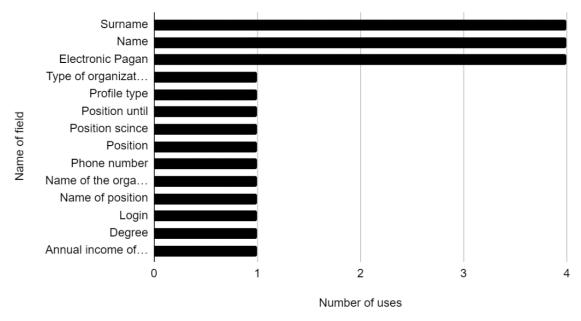


Figure 8: Number of uses of fields of basic metadata of the conferences in conference platforms.

Conference management platforms serve as pivotal tools in the orchestration of scholarly meetings, encompassing a wide array of functions tailored to enhance the academic conference lifecycle as well as only for providing information about specific events. An analysis of common features across such platforms reveals a hierarchy of functionalities, often reflected by their

implementation frequency or utility prominence.

The most prevalent function that is implemented in the 4 systems is the search capability. It allows for an intricate querying of conferences based on a multitude of criteria including geographic location (country and city), academic discipline, and specific conference titles. This omnipresent feature underscores the critical importance of discoverability and accessibility in academic conferencing, suggesting that users place significant value on the ease with which they can locate relevant events.

Peer reviewing and conference registration features implemented only in two systems that are process-oriented systems, indicative of their essential but secondary status in comparison to the search functionality. Peer reviewing is integral to the academic rigor of conference proceedings, enabling the evaluation and selection of scholarly works for presentation. Concurrently, the registration function encapsulates attendee management and may include financial transactions, emphasizing the operational backbone of the conference experience.

Similarly valued, the submission function is an essential one in the academic exchange, facilitating the contribution of research findings to the conference corpus. This is often paralleled by the feature for viewing the list of events, which is equally important for attendees to navigate the conference program effectively.

Publication of materials is in use in two systems, reflecting the necessity for a platform to act as a repository for conference outputs such as proceedings, abstracts, and papers. This feature is crucial for the dissemination of knowledge post-conference and for ensuring the academic contributions are recorded and made accessible.

Less prevalent, yet still integral to the suite of services offered by these platforms, is the capability to manage a series of events, as well as tools to aid in indexing conferences within recognized scientometric databases like Scopus. These functionalities are used only in one system and are suggestive of a more specialized but vital role in enhancing the conference's reach and academic credibility.

This tiered analysis of platform functionalities illustrates a direct correlation between the numerical values and the perceived utility of each feature. The popularity of these functions suggests a prioritization aligned with the primary needs of conference attendees and organizers, which includes finding and participating in relevant academic gatherings, ensuring the quality of content, and the broad dissemination of scholarly work.

'Internal ID' is used in all systems, suggests it is the primary means of identifying records within the system. This high usage underscores the necessity for a unique identifier within an organization's database, enabling efficient management and retrieval of records.

The 'Doi' (Digital Object Identifier) is used in two systems, and it is a widely recognized identifier for electronic documents, which indicates its significant role in the persistent referencing of research articles, datasets, and other academic materials.

'Wikicfp' used in two systems, pointing to their roles as important but less central compared to 'Internal ID' and 'Doi'. 'Wikicfp' might refer to a specific database or index for calls for papers in academic conferences.

The 'Wikidata id', 'ISBN', and 'Dblp' each used only in one system, denoting their specialized use cases. 'Wikidata id' could be a unique identifier for conference series or events within the organization. 'ISBN' (International Standard Book Number) is a familiar identifier for books and other standalone publications, indicating its relevance in academic material management.

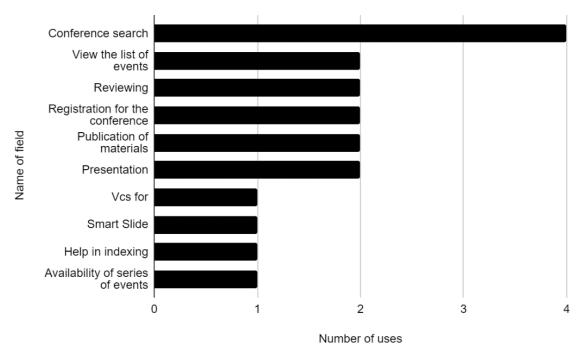


Figure 9: Number of uses of functions in conference platforms.

'Dblp' likely refers to the computer science bibliography, indicating a specific field-related indexing service that supports the citation and tracking of conference proceedings and journals in computing.

This data suggests a hierarchy where internal management and referencing systems (Internal ID), globally recognized identifiers (Doi), and subject-specific databases (Wikicfp, Dblp) play distinct roles in the cataloging, retrieval, and citation of academic work. The lesser frequency of 'ISSN' and 'Wikidata ID' may point to a more contextual application, while 'Doi' and 'ISBN' have broader applications across disciplines and publication types.

## 3.3. Ontologies as a tool to provide flexible data structures for conferences

Ontologies can ensure flexible data structure that gives an opportunity to both, modify it for each separate conference and modify approach in general when it will be required. CIT Polyhedron is one of the most promising ontology-generating systems that provides generation ontologies and visualization of graphs. Modern ontology systems can make an effective decision-making [14, 15]. It can be effectively used in the in the field of science [16, 17, 18]. It could provide structured view of graph 11 and processing view of table 11. The main advantages of it are the high speed of providing such a system, the possibility to use exchange fields to fill the ontology and interoperability between different knowledge fields.

An ontology-based approach for organizing conference data could counteract the proliferation of predatory and low-quality conferences. This is due to it will promote healthy competition among conference providers by mandating the completion of structured fields. Similar func-

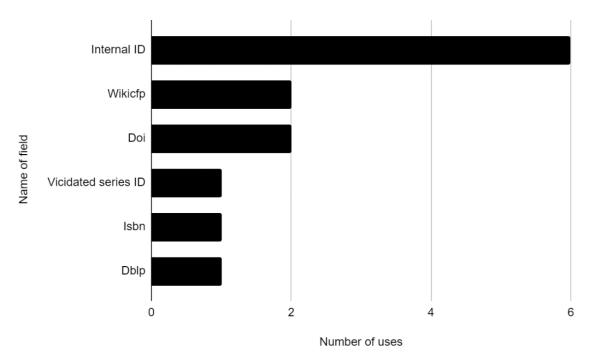


Figure 10: Number of uses of identifiers in conference platforms.

tionalities might be integrated into various systems, but ontology stands out due to its superior level of structuring. An ontology-based system leverages the full potential of consolidating informational resources within the CIT Polyhedron framework. This integration not only enhances data accessibility and organization but also contributes to the overall robustness and efficiency of the system.

#### 4. Conclusion

Conference management platforms are indispensable in the effective management and facilitation of academic conferences. These platforms embody a suite of features that cater to various stages of the conference lifecycle, from initial discovery to post-conference knowledge dissemination. An in-depth analysis of these functionalities reveals a tiered system of importance. At the forefront is the sophisticated search capability, deemed most critical for its role in enabling users to find relevant conferences easily. Subsequent features include peer reviewing and registration, which are crucial for maintaining academic rigor and managing conference operations, respectively. Additionally, the submission of research and the publication of conference materials are fundamental for the scholarly exchange of ideas. Emerging technologies such as VCS for presentation version control and Smart Slide for enhancing presentations are gaining importance. At the base of the hierarchy are internal management and referencing systems, which ensure efficient record management and retrieval. The use of globally recognized identifiers like DOI, along with subject-specific databases, supports the accurate cataloging and citation of academic work. The collective use of these features aims to not only meet the



**Figure 11:** The use of ontologies in form of graph to systemize conferences.

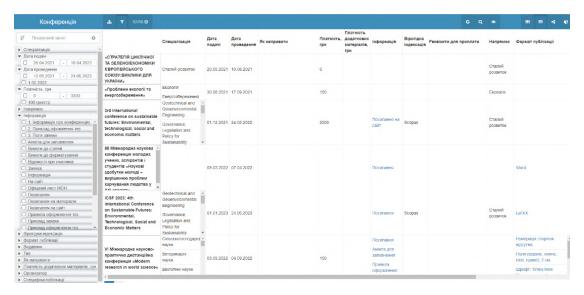


Figure 12: Representing of metadata of the conferences.

primary needs of conference attendees and organizers but also to extend the conference's reach and uphold its academic standing

# References

- [1] J. McCrostie, Predatory Conferences: A Case of Academic Cannibalism, International Higher Education (2018) 6–8. doi:10.6017/ihe.0.93.10425.
- [2] M. Chartier, The Alarming Rise of Predatory Conferences, Eos 103 (2022). doi:10.1029/2022E0220449.
- [3] D. Pecorari, Predatory Conferences: What Are the Signs?, Journal of Academic Ethics 19 (2021) 343–361. doi:10.1007/s10805-021-09406-4.
- [4] S. Ibrahim, A. Saw, The Perils of Predatory Journals and Conferences, Malaysian Orthopaedic Journal 14 (2020) 1–6. doi:10.5704/MOJ.2007.003.
- [5] Z. Stevic, I. Dalic, D. Pamucar, Z. Nunic, S. Veskovic, M. Vasiljevic, I. Tanackov, A new hybrid model for quality assessment of scientific conferences based on Rough BWM and SERVQUAL, Scientometrics 119 (2019) 1–30. doi:10.1007/s11192-019-03032-z.
- [6] W. S. Martins, M. A. Gonçalves, A. H. F. Laender, G. L. Pappa, Learning to assess the quality of scientific conferences: a case study in computer science, 2009, p. 193–202. doi:https://doi.org/10.1145/1555400.1555431.
- [7] P. Laplante, J. Rockne, P. Montuschi, T. Baldwin, M. Hinchey, L. Shafer, J. Voas, Quality in conference publishing, IEEE Transactions on Professional Communication 52 (2009) 183–196.
- [8] G. Berndtsson, M. Folkesson, V. Kulyk, Subjective quality assessment of video conferences and telemeetings, IEEE, 2012, pp. 25–30. doi:10.1109/PV.2012.6229740.

- [9] S. Hagemann-Wilholt, C. Hauschke, M. Plank, Confident An open platform for FAIR conference metadata, Grey Journal 16 (2020) 95–100.
- [10] E. Bentlage, L. Roekens, L. Bußmann, M. Brach, Planning and Conducting an Online Conference at the time of COVID-19: Lessons Learned from EGREPA 2021, BioRxiv (2021) 1–11. doi:10.1101/2021.09.19.460976.
- [11] A. Iana, S. Jung, P. Naeser, A. Birukou, S. Hertling, H. Paulheim, Building a Conference Recommender System Based on SciGraph and WikiCFP, in: M. Acosta, P. Cudré-Mauroux, M. Maleshkova, T. Pellegrini, H. Sack, Y. Sure-Vetter (Eds.), Semantic Systems. The Power of AI and Knowledge Graphs, Springer International Publishing, Cham, 2019, pp. 117–123. doi:10.1007/978-3-030-33220-4\_9.
- [12] S. Zharinov, The role of the library in the digital economy, Information Technology and Libraries 39 (2020). doi:10.6017/ITAL.V3914.12457.
- [13] Y. B. Shapovalov, V. B. Shapovalov, A. G. Zharinova, S. S. Zharinov, I. O. Tsybenko, O. S. Krasovskiy, An academic events sub-system of the URIS and its ontology representation to improve scientific usability and motivation of scientists in terms of European integration, CEUR Workshop Proceedings 3374 (2023) 130–140. URL: https://ceur-ws.org/Vol-3374/paper10.pdf.
- [14] O. Y. Stryzhak, V. Horborukov, V. Prychodniuk, O. Franchuk, R. Chepkov, Decision-making System Based on The Ontology of The Choice Problem, Journal of Physics: Conference Series 1828 (2021) 012007–0. doi:10.1088/1742-6596/1828/1/012007.
- [15] O. Stryzhak, V. Prykhodniuk, M. Popova, M. Nadutenko, S. Haiko, R. Chepkov, Development of an Oceanographic Databank Based on Ontological Interactive Documents, in: K. Arai (Ed.), Intelligent Computing, Springer International Publishing, Cham, 2021, pp. 97–114. doi:10.1007/978-3-030-80126-7\_8.
- [16] R. A. Tarasenko, S. A. Usenko, Y. B. Shapovalov, V. B. Shapovalov, A. Paschke, I. M. Savchenko, Ontology-based Learning Environment Model of Scientific Studies, CEUR Workshop Proceedings 3083 (2022) 43–58. URL: https://ceur-ws.org/Vol-3083/paper278.pdf.
- [17] Y. B. Shapovalov, V. B. Shapovalov, A Taxonomic Representation of Scientific Studies, CEUR Workshop Proceedings 3013 (2021) 353–360. URL: https://ceur-ws.org/Vol-3013/ 20210353.pdf.
- [18] L. Globa, R. Novogrudskaya, B. Zadoienko, O. Y. Stryzhak, Ontological Model for Scientific Institutions Information Representation, IEEE, 2020, pp. 255–258. doi:10.1109/PICST51311.2020.9467984.