

ETLTC & THE ACM CHAPTER ON ELEARNING AND
TECHNICAL COMMUNICATION PRESENTS



THE ACM BOOK OF ABSTRACTS & POSTERS

Based on:

*The 3rd International Conference on Careers in
Applied Sciences (CAS'23)*

in conjunction with

*THE 1st International Symposium on International
Program in Information Management (IPIM'23)*

**The University of Aizu - 2023
Volume 5**



EDITED BY DEBOPRIYO ROY

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MESSAGE FROM THE EDITOR

CAS'2023 was hosted in a hybrid mode at the picturesque University of Aizu campus at Aizuwakamatsu city on May 20-27, 2023. The event was highly successful, was a closely knit affair, and was attended by over 50 participants, and many students from partner universities and industries in Europe and Japan, discussing trendy topics in the different domains of AI and information management. The event this year showcased many exciting presentations on different domains of information management, led by Prof. Wolfgang Ziegler from the Karlsruhe University of Applied Sciences, Germany. The discussion centered on the following key fields within information management in the technical communication industry.

1. **Content Management:** Content management involves the creation, organization, storage, retrieval, and maintenance of digital content. It encompasses strategies, processes, and tools to manage documentation, technical manuals, user guides, knowledge bases, and other forms of technical information.
2. **Information Architecture:** Information architecture focuses on designing and structuring information systems and content to enhance usability and findability. It involves the organization of information elements, such as taxonomy development, metadata creation, and navigation design, to enable users to locate and understand information quickly and effectively.
3. **Knowledge Management:** Knowledge management aims to capture, store, organize, and distribute knowledge within an organization. It involves processes and strategies to identify, capture, and share tacit and explicit knowledge to enhance productivity, foster innovation, and support decision-making.
4. **Data Management:** Data management focuses on the collection, organization, storage, and governance of data within an organization. It involves establishing data standards, ensuring data quality, implementing data security measures, and leveraging data analytics for informed decision-making. In the technical communication industry, data management plays a crucial role in managing technical specifications, product data, user data, and other forms of structured and unstructured data.
5. **Localization and Translation:** Localization and translation involve adapting content for different languages, cultures, and regions to ensure effective communication across global markets. This field encompasses linguistic and cultural adaptation, as well as the technical aspects of translating and localizing software interfaces, documentation, and multimedia content.
6. **Information Retrieval and Search:** Information retrieval focuses on developing efficient search and retrieval systems to help users find relevant information quickly. It involves techniques such as search engine optimization (SEO), information indexing, query optimization, and user interface design to improve search experiences and increase discoverability.

The idea of this meeting was to explore, foster collaboration, and prepare our students with a basic understanding of these fields of information management in the technical communication industry, and understand how they work together to ensure the effective creation, organization, storage, retrieval, and dissemination of information. The attendees gained an understanding of how by leveraging various strategies, processes, and technologies, professionals in these fields play a vital role in facilitating clear and concise communication between technical experts and end-users, enhancing user experiences, and supporting efficient knowledge transfer within organizations.

Due to the emergence of AI in the different domains of information management, we would like to focus exclusively on these areas of study, so will come back with a new look in 2024 by starting a new series of conferences titled the *International Conference on Artificial Intelligence and Information Management*. We will look forward to your support as we embark on a new journey in 2024.

Thank You and Best Regards.

Debopriyo Roy

Chair - ETLTC-ICETM & AIIM Conference Series

Chair - ACM Chapter on eLearning and Technical Communication

Professor, University of Aizu, JAPAN

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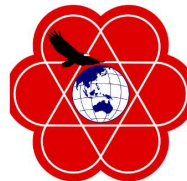


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ETLTC & ACM CHAPTER PRESENTS

**THE 3RD INTERNATIONAL CONFERENCE ON
CAREERS IN APPLIED SCIENCES (CAS'23)**

IN CONJUNCTION WITH

**THE 1ST INTERNATIONAL SYMPOSIUM ON THE
INTERNATIONAL PROGRAM ON INFORMATION
MANAGEMENT (IPIIM'23)**

20-27 MAY 2023

THE UNIVERSITY OF AIZU, JAPAN



ETLTC



EDITORS: DEBOPRIYO ROY & GEORGE FRAGULIS

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KARLSRUHE UNIVERSITY OF APPLIED SCIENCES, GERMANY

Digital Information Services - An Introduction to Content Management, Content Delivery, and Semantics in Technical Communication

BY PROFESSOR DR. WOLFGANG. ZIEGLER

The seminar provides an overview of basic concepts in Technical Communication required for the development of Digital Information Services. Recent data on market studies in Germany will show requirements and initiatives from the industry. Topics cover content management methodologies such as reuse and variant management as well as content delivery use cases for adaptive and intelligent content provisioning. Semantics will be introduced as the technology for introducing model-based concepts for content creation, linking and search also known as digital (information) twin.

Selected Questions from the Audience:

- What do you think are some of the challenges companies are facing when using AR for content delivery? And how might that be impeding its mass adoption?
- Do you know why there are low adoption rates for smaller companies compared to larger companies? What can be done to improve the rates?
- For the companies that use Content Management Systems, is there any way/ statistics that tell if they are using it effectively?
- I've understood that CMS is really useful for information creation for new products, but what about older products? Do companies need to "translate" documents from legacy manuals? What if some of those documents do not follow the standards used in CMS?
- Analytics/statistics by these services were mentioned a lot. What are the most important statistics generated by these services for the companies using them and what impact do they have?
- I believe CMS has been there for a while, so why is it becoming increasingly important just now? What changes in the environment/market make companies start to care about it now?
- Could you please give us a use case example of organizing ontology first and importing it to CMS?
- I think ontology models are very suitable for looking at relationships. However, when it comes to containing too much information, it will be difficult to handle, what do you think?
- I've understood CMS is important for companies. But, many small and medium-sized enterprises company in Japan don't introduce it. Do you think the important thing to introduce it in these companies? Also, are there any disadvantages to introducing it?

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Selected Questions from the Audience:

- How can Natural Language Processing benefit CMS or CDP? Are there any existing systems implementing machine learning techniques?
- What are the biggest challenges and considerations facing current CMSs from the perspectives of developers and users?
- I can understand that augmented intelligence is achieved by using CMS and ontologies. In your example you used content data and blueprints, can this technique be used to deepen the understanding of the study or studying? If you can come up with an example, please show me.
- How high a priority does CMS have for companies? It seems that Japanese companies want to spend their money on increasing their sales especially. I could understand the importance of this field but, the advantages of CMS don't connect to the demand of companies directly in some cases. Thus, I have a question about how to promote these technologies like CMS.
- I have found that using a CMS is very useful. However, I think that the risk of cyberattacks such as unauthorized access is not zero because I go through the Internet. Are there any security issues with using the CMS?
- What types of systems use machine learning techniques?
- What type of AI neural networks are used in CMS and CDP?
- How to evaluate the usability of CMS? I think it is important for companies to consider usability to compare similar systems.
- What benefit can we take using AI in auto-classification? Is the new system faster and more accurate in processes than the old one?

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KARLSRUHE UNIVERSITY OF APPLIED SCIENCES, GERMANY

Semantic Modelling and Ontologies in Technical Communication

BY JULIAN STÄHLE & PROFESSOR DR. WOLFGANG. ZIEGLER

This workshop covers the basics of semantic models (ontologies) in Technical Communication, including knowledge graphs. Participants will learn the basics of ontologies and why they are useful in Technical Communication such as Content Management. Common use cases are presented, which are based on relations, e.g. between metadata and functionalities. On this basis, the use of Semantic Correlation Rules is illustrated. Queries are implemented and explained using SPARQL. Additionally, participants will gain an understanding of the representation of ontologies using the standardized language formats XML, RDF, and OWL. By the end of the workshop, attendees will have an insight into semantic models and be able to deepen their knowledge for their own projects.

Selected Questions from the Audience:

- In your opinion, what size companies would be most likely to benefit from the use of ontologies? During what stage of the company's evolution would it be beneficial to begin working with ontologies?
- Are there scenarios where major refactors of the ontology model are needed? Are there guidelines to avoid or minimize these? How many relations and classes are too much or too little?
- Aside from manual checking, are there any verification processes or tools to ensure that the models are well-formed?
- How are recent advances in technology evolving semantic models? What are some future directions for the semantic web?
- How can the benefits of working with ontologies be measured?
- This is related to my scenario question. Rather than scenarios, it may be better to ask about the pitfalls of designing ontologies to generalize more, so what pitfalls are there in ontology model design?
- How do you think data collection using ontology models will progress in the future?
- What is the method of deciding which concepts to include in ontology design for the domain and what do you keep in mind when making that decision?
- I think defining the attributes of each class is very difficult. If you have any suggestions to help do that, I want to know.

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KARLSRUHE UNIVERSITY OF APPLIED SCIENCES, GERMANY

Semantic Modelling and Ontologies in Technical Communication

BY JULIAN STÄHLE & PROFESSOR DR. WOLFGANG. ZIEGLER

Selected Questions from the Audience:

- What are the limitations of ontologies? especially for businesses?
- How capable would be of future AI systems to dig into relevant use cases and using SCRs in a systematic way?
- Can the combination of ontology and AI improve the accuracy or quality of AI? If it's true, how does ontology improve it?
- What would you recommend for determining the categories needed to create an ontology?
- If we create a detailed ontology, we would enter extra information. That is difficult for humans to see. But is entering more information good for the computer?
- Are there any challenges in using ontology models in the technical communication field currently? What do you think could solve the issue (e.g. new technology etc)?
- Through the slides, I felt that there is a relationship between ontology and the natural language processing I am learning. What do you think about the relationship between ontology and natural language processing?
- How does RDF differ from traditional database models in terms of representing and linking data?
- When there are so many objects(e.g. more than 1 million objects), how to ensure all of the objects are in the right order and solve the potential conflicts in their relationships?
- Have there been experiments implementing a graph database using ontologies as a schema of sorts, as a hybrid between relational databases like SQL and current graph databases like Neo4j?
- In a big project, if there are a lot of classes and relations between classes, It needs cost much time to create ontology and it is difficult to define relations between all classes. So, Are there any solutions for it?
- Ontology description languages and RDF were unfamiliar to me. What are the situations where such tools are used?

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KARLSRUHE UNIVERSITY OF APPLIED SCIENCES, GERMANY

Transformation and Visualization of Content Management Data Towards Semantics

BY LEON BRECHT, MARIELLE DERWAND & PROFESSOR DR. WOLFGANG.
ZIEGLER

This workshop focuses on the role of XML and the corresponding transformation language XSLT in the field of information and component content management (CCMS). It covers data transformation scenarios from CCMS to knowledge graphs as a logical and visualization layer. Additional special use cases will be considered, e.g. linking in CMS, brought by data transformations to the graph technology level. This will also help to understand why ontologies are, in recent industry scenarios, part of the data governance concepts. A preview of CCMS analytics using XML technologies will close the workshop.

Selected Questions from the Audience:

- What benefits are there to using XSLT instead of any other general programming language + XML libraries?
- In your opinion, what are the biggest disadvantages of XML since it has been around for quite some time?
- Are there any good ways to reduce the size/compress the XML/XSLT files? Are there ever any issues when a single file gets too large?
- Have there been any instances where you had to process XML from sources that you cannot inherently trust, such as user input? if so, how do you protect against XML vulnerabilities such as billion laughs or external entity expansion?
- Why not use some other markup language which is easy to write and read by humans?
- How is XML used in businesses? What advantages does it bring to companies?
- What are the limitations of Document Type Definitions (DTD)?
- What is the biggest advantage of using XML that you feel when you are using it?
- XML is a highly flexible format that can represent various types of data. However, have you ever encountered difficulties managing interoperability and schema between different applications due to the high extensibility of XML?
- What are the most common errors you make when writing XML and XSLT files?
- Is OWL the only way to convert XML into graph format? Are there other tools out there to expand XML's borders?

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NATIONAL & KAPODISTRIAN UNIVERSITY OF ATHENS, GREECE

Trends in Industrial Automation

BY FOTIS KOUMBOULIS, NIKOLAOS KOUVAKAS, JOHN SIGALAS, TATIANA
CHRYSOULA DROSOU, ANTONIOS MENEXIS

The directions of Industry 4.0, require ongoing automation based on advanced and complex control procedures. Design and programming skills related to these procedures, for both decentralized and lamped control units, are necessary. The familiarization with the current developments in the field is accomplished, through the presentation of the respective engineering trends and technological solutions regarding three highly increasing sectoral applications:

Perspectives in Automation of Mesh Welding Machines:

Procurement through websites, e-shops, and mobile applications. Mesh automated design. Design through control software packages using Artificial Intelligence and Machine Learning tools. Quality improvement. Reduction of energy consumption and waste. The exploitation of the acquired data. Industrial controllers (PLCs) and networks (profinet, ethercat). Robotic systems, remotely controlled through SCADA, Robotic UGVs for product transfer and distribution.

New skills in Automatic Control of UGVs:

Kinematic and dynamic modeling aspects (wheels, frame, motor dynamics, slip conditions), Controller design (position, velocity, and orientation control), Influence of uncertainties (mass, inertia, friction, electrical parameters), Networked control of UGVs (protocols, signal transmission, and reconstruction, influence of the performance), MATLAB simulation and low-level computer platforms, Multiphysics software and digital twins, Robotic swarms and robotic games, Teaching Automatic control through UGVs in High Schools and Universities.

Trends and applications in Systematic Industrial Control:

Systematic control design through DES (models, implementability, real applications), Software tools (PLCs, functionality of a programming suite in automation systems, remote maintenance solutions), Interconnection of control units (industrial communication protocols, status, and trends), Application examples (Ballast water treatment solution), Teaching perspectives (Greece).

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NATIONAL & KAPODISTRIAN UNIVERSITY OF ATHENS, GREECE

Trends in Industrial Automation

BY FOTIS KOUMBOULIS, NIKOLAOS KOUVAKAS, JOHN SIGALAS, TATIANA
CHRYSOULA DROSOU, ANTONIOS MENEXIS

Selected Questions from the Audience:

- Are there any alternative products to replace PLCs used in welding machines? Do you think open source software of PLC is popular in robotics?
- Is there an area where autonomous UGVs are already the standard?
- I understand the benefits of accuracy of work and reduction of work time. What should I be aware of when using it? For example, machine runaway, control errors, etc.
- Has self-driving technology bolstered the research of autonomous UGVs in any sense?
- Which technologies are used to ensure crash avoidance?
- I understand that there are various models, but are they used in combination? And how to decide which model to use?
- Are current UGV systems capable of collaborative tasks where UGVs must work together to accomplish a task?
- You mentioned that some parameters are intentionally dropped out of consideration to avoid complexity. How do you decide on those parameters? Is there a rule for those kinds of decision-making?
- How can network latencies be managed for network-controlled UGVs considering that they cannot be reduced to zero?
- Are there any measures taken to manage the worst-case scenario for network-based controllers? in which the network is completely disconnected?
- What advantages or unique features does MATLAB has compared to other systems?
- Do robotic swarms apply any concepts to avoid the byzantine problem, in which some robots may be unreliable or even malicious?
- Comment: MATLAB is suitable for large-scale differential models as well as hybrid systems. For symbolic manipulations we prefer Mathematica.
- I am very interested in Swarm Robotics. Where is the specific application of this robot? As with WiFi, can it be used only indoors?
- With AI technology evolving rapidly, how will it affect UGV development?
- What are the most exciting things about your study(ies)?
- I could understand the importance and possibility of automation technologies. However, there are people who are afraid of being replaced by automation technologies with them. How can we make progress and harmony between humans and such technologies?

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NATIONAL & KAPODISTRIAN UNIVERSITY OF ATHENS, GREECE

Trends in Industrial Automation

BY FOTIS KOUMBOULIS, NIKOLAOS KOUVAKAS, JOHN SIGALAS, TATIANA
CHRYSOULA DROSOU, ANTONIOS MENEXIS

Selected Questions from the Audience:

- Why is it that you prefer Mathematica for symbolic manipulations?
- Are UGVs ever used to fight wars, conflicts, etc.? If they are ever used, can they be counteracted?
- What algorithms are used in production right now?
- Can a large number of UGVs be moved at once? If it is possible it could be used for war, what do you think? Also, if the UGVs get out of control, is there any way to stop them? Heavy-duty vehicles can cause harm to those around them. And what should we be careful about when using them?
- Comment: We have tested UGVs coordinated through networked control systems in outdoor workspaces (hills, etc)
- What fields are you particularly looking forward to seeing the UGVs play in the future?
- I am not sure what you mean by protocols being better than a 4 to 20-milliamp wire. I thought that wires are at a different layer to communication protocols. Can you clarify what you mean?
- What are the main differences between the simulation software used for learning and real-life situation? What do simulations typically fail to model?

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ACROLINX, GERMANY

Acrolinx Workshop with Undergraduate Students from the University of Aizu

BY

NOBUTOSHI MURATA, ACROLINX, JAPAN (ONSITE)

MICHAEL KLEMME, ACROLINX, GERMANY (ONLINE)

Acrolinx is an AI-powered software that improves the quality and performance of enterprise content to impact business outcomes. Benefits are Efficiency, Risk Reduction, better Performance of your content, and better Customer Experience. While Acrolinx helps all content creators in the enterprise, Technical Documentation has seen the need first and has been implementing Content Governance solutions already for a long time.

In the workshop, we will discuss

- how to integrate Content Governance solutions into the overall process
- the different goals/dimensions that can be controlled
- the integration with other processes in your world.

The session ended with a demo. We had a lot of time for questions!

Selected Questions from the Audience:

- Could you please elaborate on your business in Japan?
- Are there any new features in development and if yes which ones?
- How does Acrolinx help with talent acquisition and training?
- How does Acrolinx manage different cultures in the processing or translation of these texts?
- So, then how much of your business is translation management?
- Could Acrolinx be used to perform quality checks on AI-generated text from, for example, a ChatGPT-like product information assistant?
- Is Acrolinx exploring any ai solutions for checking texts?
- What are the advantages of Acrolinx NLP technology compared to competitors in the field? What information has Acrolinx released about its future outlook and strategy?
- Are there any restrictions on text forms or usage environment?

ACM BOOK OF ABSTRACTS & POSTERS

ACROLINX, GERMANY

Acrolinx Workshop

BY
NOBUTOSHI MURATA, ACROLINX, JAPAN (ONSITE)
MICHAEL KLEMME, ACROLINX, GERMANY (ONLINE)

Selected Questions from the Audience:

- What do you think are the areas where NLP will be most needed in the future?
- What current challenges is Acrolinx facing?
- In one of the previous slides, I saw that “source terminology” and “content creation” were forming a feedback loop. Which part of Acrolinx you just showed us takes care of that process?
- I’ve understood that Acrolinx is used by big companies. But, are small companies introducing it? I think the small company costs a lot of money. Is the benefit worth the cost?
- Do you hire linguists extensively?
- Are there any languages that are difficult to check for grammatical accuracy in Acrolinx?
- I saw in a part of the demo about the measurements on clarity and etc (not the score, but a specific metric). which specific metrics are these?
- In recent days, the combination of ai and content management systems widely continues to spread in the world. In comparison to other companies software, I want to know the advantages of using Acrolinx.
- What is the impact of the service integrated with ChatGPT API on Acrolinx?

Reference: <https://www.youtube.com/@acrolinxIQ>

ACM BOOK OF ABSTRACTS & POSTERS

UNIVERSITY OF WESTERN MACEDONIA, GREECE

Blockchain Applications in the Healthcare Industry: Prospects and Challenges

BY

IOANNIS ANTONIADIS AND DELIAS ANTONIS

Blockchain is one of the main technologies of Industry 4.0, which will transform the way organizations, both in the public and private sectors, operate and provide services to their internal and external customers and the way they interact with their stakeholders. Even though most people are intrigued and attracted by the cryptocurrencies and NFTs craze, blockchain technology provides significant opportunities for disruption in various organizational issues.

Academic research has identified numerous applications of blockchain technology that can disrupt the modus operandi of almost every industry because its characteristics provide solutions to several issues concerning fairness, transparency, resilience, security, and trust. Apart from the obvious financial applications that are the most popular, supply chain management, entertainment, gamification, e-government and public record-keeping, energy, healthcare, and even military and defense are some of the industries that are currently at the epicenter of practitioners.

In this short workshop, we are going to discuss the applications of blockchain in the healthcare industry. Blockchain can revolutionize several operational aspects of the way healthcare is provided. One example is the manner in which patients' medical records are handled. Health systems typically require patients to gather and transmit medical information with medical professionals, either in paper form or electronically on storage devices. This technique for sharing medical records is inefficient as it lacks interoperability characteristics, and it is "provider-centric" rather than "patient-centric".

Blockchain technology may help resolve these problems by offering better and safer (in terms of data privacy) services to patients. With the use of blockchain technology, patient medical data will be shared with appropriate permissions via smart contracts through the appropriate governance framework, regulating and automating actions, such as the modification of viewing privileges or the creation of new records.

In this workshop we are going to present the applications of blockchain in healthcare and present case studies, and proof of concepts of solutions that can be applied in the industry. These applications will provide opportunities for prospective practitioners, academics, and policymakers worthy of investigation that can potentially be of interest to both undergraduate and postgraduate students who wish to pursue a career in the healthcare industry or even create their own startups.

ACM BOOK OF ABSTRACTS & POSTERS

UNIVERSITY OF WESTERN MACEDONIA, GREECE

Blockchain Applications in the Healthcare Industry: Prospects and Challenges

BY

IOANNIS ANTONIADIS AND DELIAS ANTONIS (UNIVERSITY OF WESTERN
MACEDONIA, GREECE)

Selected References:

- Abid Haleem, Mohd Javaid, Ravi Pratap Singh, Rajiv Suman, Shanay Rab, (2021) Blockchain technology applications in healthcare: An overview, *International Journal of Intelligent Networks*, Volume 2, Pages 130-139, ISSN 2666-6030, doi: [10.1016/j.ijin.2021.100001](#).
- Bell, L., & Buchanan, W. J., Cameron, J., & Lo, O. (2018). Applications of Blockchain Within Healthcare. *Blockchain in healthcare today*.
- Hasselgren, A., Krlevska, K., Gligoroski, D., Pedersen, S. A., & Faxvaag, A. (2020). Blockchain in healthcare and health sciences—A scoping review. *International Journal of Medical Informatics*, 134, 104040.
- Krichen, M., Ammi, M., Mihoub, A., & Almutiq, M. (2022). Blockchain for modern applications: A survey. *Sensors*, 22(14), 5274.
- McGhin, T., Choo, K. K. R., Liu, C. Z., & He, D. (2019). Blockchain in healthcare applications: Research challenges and opportunities. *Journal of Network and Computer Applications*, 135, 62-75.
- Yaqoob, I., Salah, K., Jayaraman, R., & Al-Hammadi, Y. (2021). Blockchain for healthcare data management: Opportunities, challenges, and future recommendations. *Neural Computing and Applications*, 1-16.

ACM BOOK OF ABSTRACTS & POSTERS

UNIVERSITY OF WESTERN MACEDONIA, GREECE

Blockchain Applications in the Healthcare Industry: Prospects and Challenges

BY

IOANNIS ANTONIADIS AND DELIAS ANTONIS (UNIVERSITY OF WESTERN MACEDONIA, GREECE)

Selected Questions from the Audience:

- How long can someone hold on to Bitcoin to retain value?
- What are your ideas/ what would your approach be to increase the overall trust in blockchain?
- Can you explain the HODL strategy in the crypto world?
- How is anonymity still ensured when traceability is possible?
- Do you think cryptocurrencies can be easily migrated from proof-of-work to other forms like proof-of-stake? If not, why?
- I believe scalability is a problem because of proof of work, no?
- Are blockchains resistant to attack by quantum computers?
- Are POW blockchains prone to a denial of service?
- Are blockchain solutions in the healthcare sector successfully in use?
- How can the decentralized feature of blockchain benefit the healthcare sector?
- How do you think blockchain and semantic web technologies can work together in the healthcare ecosystems, making data management and delivery more efficient?
- In part 1 I learned that it's difficult to correct data (block?) once it is in the chain. What can healthcare providers do if they make mistakes while making a health record of a patient?
- Can you discard an existing block from the record when a new block is written?
- Are there real-world examples of blockchains in hospitals already?
- You mentioned that there are many challenges in blockchain technology, what do you currently find the most challenging?

References:

<https://andersbrownworth.com/blockchain/blockchain>

<https://www.coindesk.com/learn/what-is-a-51-attack/>

<https://www2.deloitte.com/nl/nl/pages/innovatie/artikelen/quantum-computers-and-the-bitcoin-blockchain.html>

ACM BOOK OF ABSTRACTS & POSTERS

BEIJING UNIVERSITY, CHINA



Exploring the Application of GPT in Technical Writing

BY DR. ZHIJUN GAO, BEIJING UNIVERSITY

This talk will share some pilot studies of using GPT technology in the field of technical writing at Peking University.

Three cases will be shared:

1. Terminology extraction. Achieving high-accuracy monolingual and bilingual terminology extraction, with the ability to export as Excel or TBX.
2. Technical document updates. Using R&D documents and change lists, among other information, to automatically update the original documents.
3. Technical document rewriting. Automatically rewriting technical documents not originally written in Information Mapping/DITA into the required structured documents.

Based on the current experiments, the results are very promising. Some approaches have already been applied in practical enterprise projects.

ACM BOOK OF ABSTRACTS & POSTERS

FLUID TOPICS, FRANCE



Modern Content Delivery for Digital Information Services

BY FABRICE LACROIX, FLUID TOPICS, FRANCE (ONLINE)

By changing the way it is delivered, technical information has become a first-class citizen and a strategic asset for many companies. Indeed, by moving away from static documents (PDF or HTML pages) and by switching to dynamic delivery, technical content not only becomes more findable and readable, but also becomes the foundation for powering transformative user experiences and business cases. In this presentation, Fabrice Lacroix will present real-life examples of innovative digital information services and highlight the key requirements that enable such transformation.

ACM BOOK OF ABSTRACTS & POSTERS

FLUID TOPICS, FRANCE

Market Requirements and Approaches to Digital Information Services in Automotive Supplier & Childcare Industry

BY JULIAN STÄHLE, BRITAX ROEMER, GERMANY

The purpose of this presentation is to provide insights into the pivotal role that Britax Römer has played in driving the evolution of user manuals in the context of child safety. As a leading manufacturer of child safety products, Britax Römer has been at the forefront of driving the legal change toward digital information provision. Over the past several years, Britax Römer has been focused on transforming the way that user manuals are created and delivered to consumers. Rather than relying on monolithic printed manuals, the company is working to deliver digital, customer-, product-, and situation-specific information to consumers in a more efficient and effective manner.

To achieve this goal, the company has introduced a Component Content Management System and a Delivery System, which work together to deliver customized content to consumers. This change has been essential to Britax Römer's ability to meet the evolving needs of its consumers and the market.

In addition, Britax Römer is exploring exciting use cases to provide interactive and engaging information services. These innovations have the potential to revolutionize the way that end users interact with child safety products, and to create a safer world for children.

At the core of these initiatives is the focus on semantic modeling, which will enable Britax Römer to deliver information services that are more intuitive and easier to use. By breaking down complex information into manageable and understandable pieces, the company wants a more accessible and effective way of delivering safety information to its consumers. Overall, this presentation will provide valuable insights into the ways that Britax Römer is driving innovation in the field of child safety products. We will explore the company's strategies for delivering more effective and customer-centric information services and the exciting possibilities that lie ahead in this field.

ACM BOOK OF ABSTRACTS & POSTERS

FLUID TOPICS, FRANCE

Market Requirements and Content Strategies in E-Mobility Industry

MARCUS BARTEL, SCHUNK TRANSIT, AUSTRIA

The market of e-mobility imposes time pressure on customers, i.e. short development times of standardized products aligned with frequent product changes. Product development is accompanied by normative requirements as well as increasing amounts and quality of demanded information. So, information provisioning meeting all these requirements has to be realized by future digital information services. This means also combining existing information in order to make the appropriate information available on demand at any time on all requested devices. So, the company needs a new type of smart information management as a digitalization strategy for digital services and aftersales. This goal is tackled at the moment by several projects including the following.

The creation and management of technical product information have become difficult without system support. Time and cost pressures as well as the increasing variety of products require modular documentation, variant and language management.

One of the tasks is therefore efficient information management through a component-based content management system (CCMS). Content should be situational and selective, i.e. modular with semantic structures and metadata. Metadata determines the "intelligence" of content and thus the possible use cases. With this structured information, we can meet the requirements in an automated way via a CDP (Content Delivery Portal) and create added value for our customers to open up new business areas. This will also change the job description of the technical content providers by new tasks of information architecture and smart delivery where a manifold of concepts from computer science will be included.

ACM BOOK OF ABSTRACTS & POSTERS

DMG MORI, JAPAN

Content Management by Utilizing Meta Data

UENO YUKIKO, DMG MORI, JAPAN

The talk will focus on the recent situation and outlook on future activities in the content area:

DMG MORI started to use a CMS in 2007 in Germany. Japanese and Italian technical writers of DMG MORI started to use the CMS in 2017 and are still exploring the full set of functionalities of the CMS yet, especially, metadata. German technical writers were already using metadata such as the document type, module type, and component cascade.

However, the categories of metadata have to be optimized because groups of technical writers were located at different places, and there was so far no data governance of metadata.

When technical writers in Japan started to use the CMS, there was a need for reorganizing and adjusting metadata to the local requirements matching the content and the manuals created in Japan.

To use the CMS efficiently in the entire company, we are now trying to have well-organized and harmonized categories in the metadata so that all the technical writers in Japan, Germany, and Italy can categorize all the modules and documents by following the common rules. We regularly have meetings, discuss which categories are necessary as metadata based on our documents, and organize the contents, e.g., if there are a variety of modules for the same content, we determine which one to use and which ones to get rid of. Organizing the content takes time and we are still not sure if the ways we organize and categorize the content are correct, but we believe our work will help us organize and efficiently search for the content. Furthermore, we want to find future ways of using metadata than just searching for content.

ACM BOOK OF ABSTRACTS & POSTERS

JAPAN ADVANCED INSTITUTE OF SCIENCE &
TECHNOLOGY AND MITSUBISHI HEAVY INDUSTRIES,
LTD. R&I CENTER, JAPAN

Formal intellectualization and structuring of expert knowledge

RESEARCH ASSISTANT PROFESSOR DR. KOKI IJUIN 1

PROFESSOR DR. TAKUICHI NISHIMURA 1

MANAGING EXPERT DR. MASATOMO KAMADA 2

1: JAPAN ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY

2: MITSUBISHI HEAVY INDUSTRIES, LTD. R&I CENTER

The need of acquiring knowledge in the manufacturing industry is growing due to the aging society the experts are retiring from employment.

This presentation talks about the method of collecting and articulating that knowledge through interviews between experts and mid-level workers.

This method was aimed to assist the midlevel workers to interview from the perspective of how the professional workshop facilitators make questions in order to grasp the tacit knowledge. The experimental trials were held in order to verify the capability of the proposed method for ten different works related to Inspection. The results showed that the proposed method was able to collect some knowledge that was not written in existing instructions.

The results also showed that the proposed method was able to shorten the amount of time in order to gather experts' knowledge, compared to the previous research which required a professional facilitator.

ACM BOOK OF ABSTRACTS & POSTERS

DATEV, GERMANY

Creating Customer Value by Evolving Legal Content into Legal Knowledge

BJOERN BODER, DATEV, GERMANY

Knowledge is an essential success factor for tax consultants in Germany, and we aim to make our knowledge systems for tax consultants more comprehensive, integrated, and intelligent. Simultaneously, we currently face numerous technical debts along the entire value chain.

As a result, we plan an extensive modernization of our editorial system and content delivery process. Moreover, we want to create a basis for the context-related integration of knowledge in DATEV applications. Contextual information will be standardized and semantically structured in a centralized system. Utilizing a Semantic Information Model (SIM), content can be assigned to semantic nodes, transforming isolated content into interconnected knowledge.

Currently, we are exploring these approaches in a Proof of Concept (PoC) to get insights and make decisions for a future system architecture for evolving legal content into legal knowledge. In our presentation, we will look at the steps taken to modernize our knowledge systems, discuss the current status and venture an outlook for the future.

ACM BOOK OF ABSTRACTS & POSTERS

Britax Roemer, Germany

Market Requirements and Approaches to Digital Information Services in Automotive Supplier & Childcare Industry

JULIAN STÄHLE, BRITAX ROEMER, GERMANY

The purpose of this presentation is to provide insights into the pivotal role that Britax Römer has played in driving the evolution of user manuals in the context of child safety. As a leading manufacturer of child safety products, Britax Römer has been at the forefront of driving the legal change toward digital information provision. Over the past several years, Britax Römer has been focused on transforming the way that user manuals are created and delivered to consumers. Rather than relying on monolithic printed manuals, the company is working to deliver digital, customer-, product-, and situation-specific information to consumers in a more efficient and effective manner.

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ACM BOOK OF ABSTRACTS & POSTERS

Schunk Transit, Austria

Market Requirements and Content Strategies in E-Mobility Industry

MARCUS BARTEL, SCHUNK TRANSIT, AUSTRIA

The market of e-mobility imposes time pressure on customers, i.e. short development times of standardized products aligned with frequent product changes. Product development is accompanied by normative requirements as well as increasing amounts and quality of demanded information. So, information provisioning meeting all these requirements has to be realized by future digital information services. This means also combining existing information in order to make the appropriate information available on demand at any time on all requested devices. So, the company needs a new type of smart information management as a digitalization strategy for digital services and aftersales. This goal is tackled at the moment by several projects including the following.

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ACM BOOK OF ABSTRACTS & POSTERS

JAIST, Japan

Bottom-up knowledge and ontology linked to top-down them in clinical practice

CHIAKI OSHIYAMA & TAKUICHI NISHIMURA
JAIST, JAPAN

In clinical practice, there are many different subjects and different situations. So far, clinical-related knowledge has been organized as an ontology in Top Down. However, there are many cases where field-specific knowledge cannot be connected to them. Various intervention methods have been taken to address individual problem-solving in clinical practice. These intervention methods have been accumulated through case studies. By sharing these between workers and supporters, it is easier to gain a common understanding of how to deal with the problems that arise. We are researching knowledge structuring that visualizes implicit and inherent knowledge in clinical practice. From the methods of coping with problems that have been accumulated so far, actions taken in the process are extracted as “knowledge”, the purpose is clarified, and the relationship between them is visualized. In one of our studies, we also developed a method of utilizing knowledge in combination with BPSD predictions calculated by AI from environmental data. That study clearly showed what to do to prevent BPSD. By clarifying the purpose of the action, we can understand the precautions to be taken and the rationale for them. This can lead to a more consistent delivery of care and the person may feel more comfortable receiving care. This time, I will provide a topic about this research and the knowledge structuring of cognitive behavioral therapy.

ACM BOOK OF ABSTRACTS & POSTERS

JAIST, Japan

Collaborative abduction for exploration of new or tacit knowledge - Can Humans and AI co-evolve with data, knowledge, and feelings?

TAKUICHI NISHIMURA, KOKI IJUIN, CHIAKI OSHIYAMA, MIHOKO OTAKE-MATSUURA, TOSHIHISA TANAKA, SHOGO OKADA, & NAOSHI UCHIHIRA
CENTER FOR ADVANCED INTELLIGENCE PROJECT, RIKEN, CHUO-KU, JAPAN;
TOKYO UNIVERSITY OF AGRICULTURE AND TECHNOLOGY; JAPAN ADVANCED
INSTITUTE OF SCIENCE AND TECHNOLOGY

In the future, AI robots are expected to absorb many people's jobs, and many people will not be able to find work. In such a society, people will be unable to find their dreams, and crime and suicide will increase.

Therefore, we would like to develop a personal robot AI that seeks out the user's dreams and goals based on the user's preferences and circumstances and assists the user in progressively growing toward those dreams. The robot AI will use wearable sensors worn by the user and sensors embedded in the real world to understand the user's activities, situations, and features. Then, by interacting with the user, it will seek directions to solve problems and set up dreams and goals. It accompanies and supports the user in realizing his/her dreams throughout his/her life.

AI can process data and knowledge in frames much faster than humans. However, to solve a user's problem or realize a user's dream, knowledge outside the frame may be necessary. In such cases, it is necessary to find an expert who is knowledgeable about the knowledge and acquire knowledge outside the frame of that expert. In this case, the skills to expand the frame interactively with people, consistent with the knowledge within the frame, are required.

Furthermore, it is conceivable that even experts may not have useful knowledge appropriate to the user's situation. In such cases, we would like to develop an AI with the abduction capability to explore new knowledge. Naturally, since the knowledge is outside the frame, even if the AI generates a hypothesis by itself, it is impossible for the AI to evaluate the hypothesis by itself. Therefore, we seek a collaborative abduction technique that generates effective hypotheses by mutually asking philosophical questions to users and experts and verifying the hypotheses together with the parties involved. This position paper provides directions for building the AI which drives the co-evolution of humans and AI.

ACM BOOK OF ABSTRACTS & POSTERS

Metaphacts, Germany

Semantic Technologies and Knowledge Graphs in Healthcare and Industrial Environments

SEBASTIAN SCHMIDT, METAPHACTS, GERMANY

Knowledge workers in enterprises, government, and anywhere else have to take more decisions at a rapid rate, while at the same time complexity of these decisions increases as well. This ranges from a diagnosis and optimal treatment decision in healthcare to the selection of the right materials and parts in manufacturing to decisions on which product to develop and launch next. Most, if not all of these decisions should be data-driven and it is not surprising that especially technology unsavvy users are looking towards machine learning and artificial intelligence to get the right data, or better knowledge, presented to make these decisions. The presentation will focus on the element of explicit knowledge modeling and how this allows for the involvement of subject matter experts in the knowledge management process, while at the same time creating a much-needed layer of trust for machine learning and artificial intelligence. The presentation will cover the basic approach and highlight examples from healthcare, pharma, industry, and more.

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Siemens Healthineers, Germany

Model-Based Content Development and Delivery in Healthcare Industry

CHRISTIAN DESCHNER, SIEMENS HEALTHINEERS, GERMANY

In Healthcare Industry as well as in the machinery industry, systems engineering becomes increasingly challenging. The complexity of systems and the variety of the systems portfolio is increasing. This is where the traditional, document-centric approach reaches its limits. With a parts-centric, model-based systems engineering approach, every system-related artifact created during the entire system lifecycle is treated as part of the system and hence part of the systems model. Every single part interacts with other parts from the same or different engineering domains and needs to be replaceable and combined as needed. To ensure this interoperability, the parts need to be black-boxed and context agnostic. In such setups, each part must provide a well-defined set of guaranteed qualities. The context of the parts usage itself defines the requested qualities which must be fulfilled. Based on the alignment of required and guaranteed qualities, the best-fitting part can be selected. Since user and service documentation content also deals with the systems, it is also part of the model of the entire system and hence must provide guaranteed qualities. These required qualities can be seen as intrinsic metadata of content objects. The content objects extrinsic metadata are then the result of the alignment of the intrinsic metadata and the required (content) qualities from the system. Based on well-defined required and guaranteed qualities, appropriate, existing content modules – and not-yet-existing modules, as well - can be identified systematically and dynamically for each system and its context all over the entire content lifecycle.

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SKAN Switzerland

Knowledge and Service Management in Machinery and Pharmaceutical Industry

DANA BARO, SKAN, SWITZERLAND

In today's fast-paced business environment, knowledge is a critical asset for companies, especially those that are rapidly growing. In addition, with increasing product variance, development progresses, and customer-specific projects, the need to preserve product and experiential knowledge increases. Knowledge management deals not only with the development of approaches to capture, store, share, and utilize intellectual assets effectively. It could also provide a framework for creating, organizing, and sharing knowledge across the organization. Especially for field engineers who regularly work on a wide variety of plant types, information search is crucial. If these are explicitly available, they are not infrequently found in different systems, which provide search mechanisms of varying quality. In addition, even a lack of knowledge about where documents and specific information are stored or whom to ask for help can prevent information needs from being met and consequently jeopardize the success of the task. The implementation of a knowledge portal for the externalization of tacit knowledge sets an important milestone. By using an ontological metadata model, its contents can not only be classified but also linked. Moreover, by using an API and mapping metadata from other systems, system boundaries can be overcome without implementing active interfaces. The modeling of use-case-specific information needs, therefore, represents a major contribution to knowledge management by supporting the process of information search as well as the collection of relevant content. However, this can only be implemented if the content is classified. Only through holistic classification in the product and information space content can be considered in the context of semantic correlations. With the implementation of a stable and comprehensive metadata construct exists, new content can find its way into the knowledge portal during knowledge management, such as expert landscapes that facilitate the search for subject-specific contacts. In addition, by using rules to examine if the content from CCMS or other systems needs to be created or provided based on specified events or data, for example, maintenance intervals or error codes, service operations can be optimized due to the supported content delivery process.

ACM BOOK OF ABSTRACTS & POSTERS

LIEBHERR, Germany

Semantics, Content Correlations, and Data Governance in Heavy Machinery Industry

FRANK MUELLER, LIEBHERR, GERMANY

The engineering industry struggles often with inconsistent data and metadata stored in multiple data silos. This is a challenge, especially for a data-driven use case that requires a continuous information supply chain. Customer service processes rely on well-connected information and data to keep machine availability high. Identifying a fault quickly and clearly and fixing it without having to return to the site several times is crucial. Persons and systems involved in service processes use a wide range of information in a variety of systems and applications. However, significant time and information are often lost because the information is not found quickly enough or not found at all. The challenge is to provide the service organization with the best possible information and to connect it in a meaningful way. Based on known and critical use cases, relevant information should be provided proactively. This presentation describes a holistic approach to address these challenges using semantic technologies such as knowledge graphs, semantic modeling methods, and microservice-based infrastructure. The presentation includes the concept, implementations, a discussion of experiences and preconditions according to data governance, as well as results.

ACM BOOK OF ABSTRACTS & POSTERS

GovSolutions, Germany

eGovernment in Germany: Digital Transformation and the Online Access Act

HEIKE BERUMEN, GOVSOLUTIONS, GERMANY

In 2017, the Online Access Act (OZG) became effective in Germany. 575 OZG service bundles that contained 6000 compiled administrative services were to be digitized at federal, state, and municipal levels by December 31, 2022. Out of the 575 service bundles, 115 are attributed to the federal government, 90 services fall under the regulatory and enforcement powers of the states and municipalities, and 370 services are to be regulated by the federal government and executed by the states and municipalities. However, by the deadline, only a few dozen administrative services had been digitized, and government, politics, and the public are now discussing the failure of the project and a new possible direction. The presentation will first examine Germany's federal organization. Key figures from current research results will be presented, and the possible reasons for the project's failure will be examined in more detail. In the public discourse, the following reasons are often cited: the lack of a centrally organized project management, unclear responsibilities, a lack of process understanding (providing applications online vs. considering processes end-to-end), risk-averse organizational structures, a lack of interest from politicians, legal framework conditions, a lack of digital competence, acute shortage of skilled personnel, unsuitable infrastructure, the use of countless IT systems and software solutions that do not allow for seamless data exchange - or could it be a combination of all of these factors? The focus will then shift to the outlook, as digital transformation has now reached the smallest government offices and is advancing relentlessly. Finally, the presentation will explore how a visit to the city hall can be designed as a user journey for citizens while relieving staff.

ACM BOOK OF ABSTRACTS & POSTERS

Acrolinx, Germany

Modern Language Management for Digital Information Services

CHRISTOPHER RUMMEL, ACROLINX, GERMANY

Nearly every enterprise is either using generative Artificial Intelligence (AI) or strategizing about how to use it. We know generative AI can streamline content creation and increase content velocity. But it's not without major risks. Incorrect information, off-brand messaging, and even downright offensive content. These aren't small inconveniences. They're major legal, financial, and compliance risks that have the potential to cause real business problems. A safeguard against generative AI risk is content governance. Content governance is a systematic approach to capturing and digitizing your company's content strategy. It measures your current content status and actively guides content creation to achieve your defined goals. This means your content is maintained over time and can also be improved by incorporating performance metrics. Ultimately, content governance takes the key elements of your content strategy — your goals, priorities, and guidelines — and turns them into actionable content creation workflows, content processes, and metrics.

ACM BOOK OF ABSTRACTS & POSTERS

Fukushima Medical University, Japan

A Survey of Fukushima Prefecture Students' Attitudes Towards Discharging APLS Treated Water into the Ocean

RYOMA YOSHIDA, FUKUSHIMA MEDICAL UNIVERSITY

Twelve years have passed since the Great East Japan Earthquake and the Fukushima Daiichi Nuclear Power Plant accident. However, the ALPS (Advanced Liquid Processing System)-treated water stored at the power plant has raised a new controversy recently. ALPS removes radioactive substances harmful to humans from contaminated groundwater. Unlike cesium 137, removing tritium from contaminated groundwater is difficult, so treated water has been stored in tanks on the premises of the nuclear power plant. These tanks are projected to be full by the autumn of 2023. Therefore, the Japanese government has decided to release the treated water into the ocean. Experts say the treated water is scientifically safe. However, some people are against releasing the water into the sea, even though they understand the scientific safety of doing so, as there is a risk of reputational damage to Fukushima's fisheries and tourism industry. This study will investigate the attitudes of students in Fukushima prefecture toward releasing treated water into the ocean by examining if factors such as knowledge about radiation and mass media affect them. Furthermore, the author will propose methods to disseminate scientifically correct information and prevent harmful rumors.

ACM BOOK OF ABSTRACTS & POSTERS

University of Aizu, Japan

Health Informatics and the Importance of Visualization and Storytelling with Numbers: A Review of the Literature

DUSS YANNIK TIMO, KIMMIG VIKTORIA, WU YIFAN, ANDO YUKI, KIKUCHI YUTO
AND SAKAI YOSHIKI, UNIVERSITY OF AIZU

As big data and machine learning technologies gain their significance in a wide variety of fields, the domain of health care is no exception. The Data Science approach has enabled doctors to process large amounts of medical data and to make data-driven decisions with increased efficiency.

The presentation “Medical Visualization and Data Science” is a part of the undergraduate course “Visualization and Storytelling in Data Science” at the University of Aizu and is about the relationship between Health Informatics and Data Science. It mainly focuses on the visualization aspect of Health Informatics and its significance, and provides several examples. Furthermore, it explains the importance of the connection between Health Informatics and Data Science, discusses possible applications in Japanese medical institutions, and gives an outlook into the future of Medical Visualization.

ACM BOOK OF ABSTRACTS & POSTERS

University of Aizu, Japan

XML in Health Information Management: A Review of the Literature

TAKAHIRO YOKOI, KOEI IZUMI & SEIKURO KONNO
UNIVERSITY OF AIZU, JAPAN

We will present how to use XML in the Health care field. We analyzed common points, different points, and important points based on information that each member considers in each chosen report. Especially, each member reported about used XML e-health records, frameworks, services, and the systems used in hospitals.

ACM BOOK OF ABSTRACTS & POSTERS

University of Aizu, Japan

Ontologies for Health Information Management: a Review of the Literature

HAYASHI JURI, KIKKAWA DAIKI, EISHIN ISHIDA & ABE MASAYA
UNIVERSITY OF AIZU, JAPAN

With the purpose of collecting and providing health information using different application programs, a health information search engine based on metadata and ontology has been developed and that will be discussed during the presentation. It is capable of providing reliable health information to information sources and information consumers. We describe this health information search engine and the ontology that is the cornerstone of the health search engine.

ACM BOOK OF ABSTRACTS & POSTERS

Fukushima Medical University, Japan

Advantages and Disadvantages of online international exchange for healthcare students

KURUMI NAYA
FUKUSHIMA MEDICAL UNIVERSITY

Introduction:

The COVID-19 pandemic has interrupted international student exchange programs. In response, online alternatives have emerged. The aim of this study is to identify the advantages and disadvantages of online international exchanges for healthcare students in comparison with traditional on-site international exchanges.

Methods:

A PubMed literature search used “(online OR distance) AND covid AND (“international exchange” OR “overseas study” OR “overseas education” OR “education abroad” OR “international education” OR “international exchange”)” to identify relevant articles. Only those reported within the last 5 years were included.

Results and Discussion:

Of 83 articles identified, 21 were related to online international exchange for healthcare students. Many online distance-learning programs were held during and after the imposition of pandemic-related travel restrictions. Based on the advantages and disadvantages of various healthcare-related programs, we developed a decision tool for prospective exchange participants and believe that it may be useful for students in other fields who are interested in international exchange..

ACM BOOK OF ABSTRACTS & POSTERS

Fukushima Medical University, Japan

Awareness of pregnancy, childbirth, childcare, and related factors among Japanese high school students: A cross-sectional study at a high school in Fukushima Prefecture

AOI WATANABE
FUKUSHIMA MEDICAL UNIVERSITY

Background and aim: Adolescence is a transitional period to adulthood, during which more attention is needed on matters of reproductive health. Adolescents need life-planning education to improve their knowledge acquisition and planning for pregnancy and childbirth. This study assessed levels of awareness about pregnancy, childbirth, childcare, and related factors among high school students.

Methods: A questionnaire survey was incorporated into a high school reproductive health class on March 14, 2019, among 210 students at a high school in Fukushima Prefecture. Using data collected from the survey before the class, we analyzed associations among three awareness indicators (confidence in planning pregnancy, confidence in childbirth, and looking forward to childcare) and their association with student characteristics (mental health, subjective health, and satisfaction with school life) using the chi-square test and multiple logistic regression analysis. Analyses were stratified by students' self-reported gender.

Results: Female students' levels of awareness of pregnancy, childbirth, and childcare were associated with each other ($p < 0.001$), whereas male students lacked an association between pregnancy and childcare ($p = 0.11$). Among female students, subjective health was associated with awareness of pregnancy ($p = 0.02$), childbirth ($p < 0.001$), and childcare ($p = 0.01$). In addition, satisfaction with school life was associated with awareness toward childbirth ($p = 0.01$) and childcare ($p = 0.047$). In contrast, no statistically significant factors were associated with the three awareness indicators among male students.

Conclusions: Our results suggest a need for gender-specific approaches in life-planning education. Among female students, enhancing subjective health and satisfaction with school life would lead to increased confidence in future pregnancies, childbirth, and the enjoyment of childcare. Awareness raising might be needed among male students to facilitate their consideration of pregnancy, birth, and childrearing as their own life-planning issues. This survey employed a traditional questionnaire format, but in future research, the application of a digital tool that students can use on their own to visualize their reproductive awareness levels could facilitate discussion among peers and teachers in a life-planning class.

ACM BOOK OF ABSTRACTS & POSTERS

University of Aizu, Japan

Healthcare Website Design & Health Information Systems: A Review of the Literature

MAEDA TEPPEI, SAOTOME MAKOTO & HAGIHARA SHUN
UNIVERSITY OF AIZU, JAPAN

Companies that want to achieve maximum success in their industry need to have their own online services. Hospitals are also part of them. Medical Web resources play an important role, in influencing a clinic's reputation and the effectiveness of its treatment. So we talk about why a good website is necessary and what features are required of a hospital website.

ACM BOOK OF ABSTRACTS & POSTERS

STANFORD ONLINE HIGH SCHOOL, USA

Establishing a Computational Screening Framework to Identify Environmental Exposures Using Untargeted GC-HRMS

JUNI KIM

STANFORD ONLINE HIGH SCHOOL, USA

The human exposome, which includes chemical exposures over the lifetime and their effects, is now recognized as an important measure for understanding human health; however, the complexity of the data makes the identification of environmental chemicals challenging. The goal of our project was to establish a computational workflow for the improved identification of environmental pollutants containing chlorine or bromine. Using the “pattern. search” function available in the R package NonTarget, we wrote a multifunctional script that searches mass spectral clusters from untargeted gas- chromatography high-resolution mass spectrometry (GC-HRMS) for the presence of spectra consistent with chlorine and bromine-containing organic compounds. The “pattern. search” function was incorporated into a new function that allows the evaluation of clusters containing multiple analyte fragments, has multi-core support, and provides a simplified output identifying listing compounds containing chlorine and/or bromine. The new function was able to process 46,000 spectral clusters in under 8 seconds and identified over 150 potential halogenated spectra. We next applied our function to a deidentified dataset from patients diagnosed with primary biliary cholangitis (PBC), primary sclerosing cholangitis (PSC), and healthy controls. Twenty-two spectra corresponded to potential halogenated compounds in the PSC and PBC dataset, including six significantly different in PBC patients, while four differed in PSC patients. More details on using the function for the analysis of GC-HRMS data can be found at <https://hrmsfilterscript.netlify.app/>. We have developed an improved algorithm for detecting halogenated compounds in GC-HRMS data, providing a strategy for prioritizing exposures in the study of human disease.

ACM BOOK OF ABSTRACTS & POSTERS

University of Aizu, Japan

Analysis of a Healthcare Ecosystem in Japan: A Hypothetical Model Based on the Silicon Valley Approach to Ecosystem Design

FLAHERTY ATSUMI JEAN, RAMOS JUSTIN KYLE NODORA, TESHIROGI KOTA,
SUGIMOTO REN, MATSUMOTO MOTOHIRO, YANAGIDA SARIMU, TANAKA YURI,
HAGA SHUICHIRO, AND ABE SHINGO
UNIVERSITY OF AIZU

This presentation explores the design and evolution of modern healthcare ecosystems, focusing on digital transformations and platform-enabled business models. We'll dissect the current healthcare ecosystem, considering key stakeholders, interactions, and challenges. We'll then delve into the digital healthcare sphere, highlighting the roles of IoT, telehealth, and AI, and examining the implications of big data and privacy concerns. We'll scrutinize platform-enabled ecosystems, identifying their key elements and successful real-world examples. Finally, we'll discuss strategies for organizations to adapt and thrive in this evolving landscape, underpinned by health tech investments and innovation.

ACM BOOK OF ABSTRACTS & POSTERS

Fukushima Medical University, Japan

Dietary intake methods for improving immunity to protect people against COVID-19 based on a nurse's perspective

MIYU ENDO, SATOMI ABE, AYAKA KATAGAI, AND MIYUU KONNO
FUKUSHIMA MEDICAL UNIVERSITY

On March 13, 2023, Japan formally implemented the relaxation of infection control of COVID-19 and determined to abolish the requirement to wear face masks. However, we have to continue to care even more about preventing COVID-19.

Our immune system influences the prevention of infectious diseases, and our daily diet provides an opportunity to consume nutrients that are the components of maintaining and improving our immune system. The Japanese diet is recognized worldwide as one of the ideal diets and provides the five macronutrients in a single meal, with the basic format of one staple, one main dish, two side dishes, and soup.

We discussed the nutrients that should be incorporated into our diets regularly to improve our immune system and prevent COVID-19 and the dietary content that can provide these nutrients based on some studies and textbooks. We also discussed the metabolic processes of nutrients that promote recovery in people infected with COVID-19 and those that may impede recovery. Then, we examined the dietary contents that contain sufficient nutrients to be consumed depending on the symptoms and physical condition of the person, including how to consume these nutrients easily. This presentation presents our findings based on a nurse's perspective and proposes the possible usage of a digital tool to promote health behavioral change.

Enhancing Immunity and Coronavirus Disease 2019 Protection: Dietary Intake Methods from a Nurse's Perspective

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ABSTRACT

Japan formally implemented relaxed infection control measures for coronavirus disease 2019 (COVID-19), including eliminating the mandatory face mask requirement. However, we must continue to focus on COVID-19 prevention. Our immune system influences the prevention of infectious diseases, and our daily diet provides an opportunity to consume nutrients that maintain and improve the immune system. The Japanese diet is recognized worldwide as ideal and provides five macronutrients in a single meal in the basic format of one staple, one main dish, two side dishes, and soup. We discussed the nutrients that should be regularly incorporated into our diets to improve our immune system and prevent COVID-19 and the dietary content that can provide these nutrients based on some studies and textbooks. We also discuss the metabolic processes of nutrients that promote recovery in people infected with COVID-19 and those that may impede recovery. We then examined the dietary contents that contained sufficient nutrients to be consumed depending on the symptoms and physical condition of the person, including how to consume these nutrients easily. This paper presents our findings based on a nurse's perspective and proposes using a digital tool to promote behavioral health change, including how to consume these nutrients easily. This presentation presents our findings based on a nurse's perspective and proposes using a digital tool to promote behavioral health change.

KEYWORDS

COVID-19, Nutrients, Nursing

ACM Reference format:

Satomi Abe, Miyu Endo, Ayaka Katagai, Miyuu Konno. 2023. Enhancing Immunity and Coronavirus Disease 2019 Protection: Dietary Intake Methods from a Nurse's Perspective.

1 Background

On March 13, 2023, Japan officially implemented coronavirus disease 2019 (COVID-19) infection control mitigation measures to, eliminate the need to wear facemasks. In response, the Ministry of Health, Labor, and Welfare stated, "The implementation of COVID-19 infection control measures will no longer require a uniform response by the government and will be based on the

judgment of individuals and businesses."^[10] It stated that "the government will no longer require a uniform response, but will be based on the judgment of individuals and businesses. This has led to efforts to prevent COVID-19 transmission. Therefore, we focused on diet as an easy and convenient way to incorporate self-infection control into one's lifestyle and the relationship between COVID-19 and nutrients.

2 Objective

The objectives of this study were to review and make recommendations from a nursing perspective for a diet that can be easily prepared and consumed to prevent COVID-19 infection or promote recovery after the disease using a literature review and questionnaire survey.

3 Methods

1. Literature review

1) Literature selection method: ① Google Scholar was used for the keywords "COVID-19," "prevention," and "diet" from March 18 to 25, 2023; ② Internet searches were conducted from April 12 to 23, and if the site was not a public institution, the authenticity of the content was confirmed in text. If the site was not a public organization site, the authenticity of the content was confirmed using text.

2) Literature review: The relationship between immunity and nutrients was examined regarding the nutrients necessary for improving human immunity, metabolic processes of nutrients related to immunity, and foods containing nutrients.

2. Questionnaire Survey

1) Survey period: April 25–27, 2023

2) Participants: A total of 169 second and third-year students at the School of Nursing, University A

3) Survey method: Google Form was utilized, with no names entered.

4) Question items: "Whether you had had COVID-19," "The most painful symptoms when you had COVID-19," "What you ate when you had COVID-19," and "What you wanted to eat when you had COVID-19" were selected, and "What you had difficulty in preparing meals when you had COVID-19" was written in a description format.

5) Analysis method: Responses to the choice-type questions were tabulated; for the descriptive-type questions, the descriptions were read, and similarities were summarized in the items.

3. review of recommendations

Based on the results of a literature review and questionnaire survey, the recommended diet for patients with COVID-19 was examined from the perspective of nurses.

4 Results

1. Literature review

The following nutrients are required to maintain and improve immunocompetence:

1) Vitamin A has immunomodulatory effects, regulates immune responses, and maintains immunocompetence. Vitamin A sufficiency reduces the risk of viral infection via nonspecific immunomodulatory effects. Bioinformatics analysis of the pharmacological effects of vitamin A suggested immunomodulation, suppression of inflammatory reactions, and action on reactive oxygen species as the mechanisms of action. Foods containing vitamin A include carrots, spinach, and liver.^{[1][3]}

Foods containing vitamin A include carrots, spinach, and liver.^{[1][3]}

2) Vitamin D has immunomodulatory effects and regulates the innate immune system against viral respiratory infections. Recent studies have shown that vitamin D deficiency increases the risk of contracting viral respiratory infections. In addition, a correlation between blood vitamin D levels and the risk of mortality from COVID-19 has been reported. Furthermore, vitamin D deficiency, other factors that increase risk of COVID-19 morbidity and mortality, such as cardiovascular disease, chronic respiratory disease, diabetes, hypertension, and obesity, were listed as one of the factors that increase the risk of COVID-19 morbidity and mortality.^[1] Foods that contain vitamin D include shimeji mushrooms and eggs.^[3]

3) Proteins: Some proteins, such as enzymes and hormones, regulate metabolisms. Some involve material transport, and some function in biological defense, such as antibodies. Amino acids, which are proteins, are precursors for producing neurotransmitters, vitamins, and other important bioactive substances. Moreover, they are used as energy sources when oxidized.^[8] Protein-containing foods include pork, mackerel, eggs, and soybeans.^[1]

4) Zinc: It was essential for intracellular signal transduction in innate and acquired immunity. As a mechanism of antiviral action, it also acted to inhibit viral invasion by stabilizing cell membranes and inhibiting viral replication and had a preventive effect on respiratory tract infections.^[1] Foods containing zinc include spinach, rice, and beans.^[3]

2. Questionnaire survey

1) The number of respondents was 16 out of 169), and the response rate was 0.08%.

2) The results of each question were as follows:

① The results of each question were as follows: "What was the most difficult symptom when you were ill with COVID-19?"

37.50% of the respondents answered "fever" and "cough," while 18.80% answered "sore throat" and 6.25% answered "headache.

② "What did you eat when you were ill? 25.00% of the respondents selected "Jelly" and "Porridge," 18.75% selected "Sports drink," 12.50% selected "Usual meal" and "Udon," and 6.25% selected "Instant food."

③ "What did you want to eat when you were ill?" 50.00% of the respondents selected "Jelly," 12.5% selected "Udon," "Instant food," and "Ice cream," and 6.25% selected "Throat lozenges" and "Fruits.

④ When asked, "What was difficult about preparing meals when you had COVID-19?" 50.00% answered "Lack of energy to prepare meals," 18.75% answered "Not being able to go shopping," 12.50% answered "Going shopping for ingredients" and "Lack of energy to prepare meals," and 6.25% answered "My family cooked meals for me, but I think it was difficult to think of a menu and to prepare meals.

5 Discussion

Based on the literature review results, we discuss the combination of nutrients that improve immunity and the Japanese diet of one soup and three vegetables for the prevention of COVID-19 infection. For example, white rice is a staple meal providing zinc and energy. For the main dish, salmon grilled with salt was incorporated to provide protein and vitamin D. For the two side dishes, soaked spinach, and Chikuzen-ni were included in the menu. Spinach contains vitamin A, and soaked spinach is a familiar dish among Japanese people. Chikuzen-ni also contains carrots, lotus root, and chicken, providing vitamins, proteins, multiple other nutrients, and dietary fiber mentioned in the results. A nimono is a dish that allows many ingredients to be prepared simultaneously and balances a meal. By incorporating nameko mushroom and daikon radish into miso soup, one can consume abundant nutrients such as carbohydrates, fats, vitamins, minerals, and dietary fiber, in addition to the nine essential amino acids contained in miso, which can be added.

Next, based on the questionnaire survey results, we discussed the diet for each symptom.

According to the results of the questionnaire, most of those affected by COVID-19 ate "udon" and "porridge. The main nutrients in "udon" and "rice porridge" are carbohydrates, and carbohydrates are a source of energy for the body to fight the virus when it is sick with the virus. In addition, carbohydrates have a short retention time in the stomach, which reduces their burden on the digestive system.^[4] "Rice porridge" was able to replenish water due to the cooking method of adding a lot of water, and eating it warm also increased the body temperature, thereby promoting circulation.

Udon" can also maintain a good balance per the basic format of one soup and three dishes of Japanese cuisine by adding toppings. Using udon soup (broth), meat, or eggs rich in protein (main dish), spinach for vitamin A, enokitake mushrooms for vitamin D, and wakame seaweed for minerals (side dish), a dish that is nutritionally balanced, easy to eat, and less stressful to the digestive system can be created.



Figure 1: Example of a good balance per the basic format of one soup and three dishes of Japanese cuisine by adding toppings

Subsequently, the diet of patients with each COVID-19 symptom was examined. The most severe symptom was "fever. An oral rehydration solution is recommended during fever because sweating can easily lead to dehydration. [5] This solution consists of water and electrolytes and is generally used to prevent dehydration. [6] Fruits have also been identified as food sources providing water and energy. Fruits are rich in potassium, which exerts antipyretic effects by promoting excretion. [7] Among fruits, bananas are gentle to the stomach and easy to eat, and pears, which have high water content, are particularly effective during fever.

Next, when symptoms of "cough" are strong, radish and honey are mentioned as recommended foods. The pungent component of radish has an anti-inflammatory effect, thus soothing throat inflammation, and the multiple digestive enzymes in radish also help the gastrointestinal tract, which COVID-19 weakens. Honey has been shown to reduce airway inflammation. However, it is inappropriate for children under 1 year of age.

Additionally, for a "sore throat," a diet that minimizes throat irritation is desirable. Specifically, the following were mentioned: ① choose foods that are soft and easy to slurp, ② use a blender or cook them well to make them easier to swallow, and ③ use nutritional supplements in liquid or jelly form. Suitable foods and dishes include porridge, steamed egg custard, tofu, bananas, soups, and smoothies. Smoothies can be made by combining vegetables, fruits, dairy products, and other ingredients available in the refrigerator and providing multiple nutrients. This is recommended when a person has no appetite due to a sore throat or other symptoms, and foods include jellies and puddings.

Other factors considered vital when considering meals during COVID-19 were that they ought to have been quick and easy to prepare, as many respondents stated that they did not have the strength or energy to prepare meals.

Finally, although the specific menus we have examined thus far are considered suitable as hypotheses, we have not yet confirmed their effectiveness. Therefore, we believe our future task will be to incorporate them into our lives, starting from familiar places, and confirm their effectiveness. Additionally, the proposed menu lacks variety since three meals a day are required. Since COVID-19 occurred on a pandemic scale, it is necessary to consider

Japanese food and menus that explore cooking methods and ingredients from various countries. Suppose these considerations and information sharing can be promoted among nursing professionals and infected individuals active in Japan and other countries. In that case, it will be possible to respond to any new infection outbreak in the future.

6 Conclusion

The following three points were obtained from the study on a diet to prevent COVID-19 infection or promote recovery from COVID-19 infection from the perspective of nurses.

1. Knowledge of the relationship between immunity and nutrients can be used to identify the value of consumed foods to prevent infection and promote recovery from infection.
2. Combining foods containing the nutrients necessary to improve immunity with familiar dishes and cooking methods that suit an individual's condition is important.
3. The use of digital tools facilitates the selection of ingredients, their quantities, and cooking methods and promotes the sharing of information and the accumulation of data with many people.

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REFERENCES

- [1] Seika Kamohara(2021): Clinical evidence of functional food ingredients for prophylaxis of COVID-19: Update 2021, Functional Food Research, Vol.17,75-90
- [2] Shusuke Takahashi,Kouki Ono,Mitsuyo Hori(2021):Relationship between nutrients and COVID-19 infection in Japan,The journal of the Japan association for the integrated study of dietary habits, Vol.32,131-136
- [3] Takashi Higashiguti, Masaya Sasaki, Syouhei Iijima etc. The Japanese Society of Clinical Nutrition and Metabolism Project Team for COVID-19(2022): Nutritional recommendations for the treatment and prevention of novel coronavirus infection (COVID-19), JSREN, Vol.2,84-94
- [4] Seishiro Murata(2004):Ganong's Review of Medical Physiology,21st edition,Maruzen company,509,511
- [5] Kimiko Kitagawa(2018):Systematic Nursing Specialty Gerontological Nursing,9th edition,IGAKU-SHOIN Ltd,226-229
- [6] https://www.otsukakj.jp/med_nutrition/mf/menu/000073.php (2023.05.27)
- [7] Akio Kagawa(2017):Nanatei Food 80 Kilocalorie Mini-Guide, Kagawa Nutrition University Press,130,134,158
- [8] Teiji Nakamura(2020):Systematic Nursing, Specialty Basic Fields, Nutrition, Structure and Function of the Human Body 3,13th edition, IGAKU-SHOIN Ltd,24,35
- [9] city.fukushima.fukushima.jp(2023.05.27)
- [10] <https://www.mhlw.go.jp/stf/corona5rui.html> (2023.05.27)

A Survey of Fukushima Prefecture Students' Attitudes Toward Discharging ALPS Treated Water into the Ocean

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Abstract. This study conducted a survey to investigate how radiation education affected university students' attitudes toward ALPS treated water. The contents of the questionnaire used in the survey concerned the Fukushima Daiichi Nuclear Power Plant accident, interest in ALPS-treated water, fear of water containing tritium, the biological effects and reputational damage associated with the release of ALPS-treated water into the ocean, the pros and cons of discharging treated water into the ocean, and purchasing behavior after discharge. Owing to an insufficient number of responses to the survey, no firm conclusions could be drawn. However, some tendencies in the questionnaire values between the experimental and control groups were found, which may suggest how radiation education affects awareness of ALPS-treated water.

Introduction

The reactor buildings of the Fukushima Daiichi Nuclear Power Plant were severely damaged by a strong earthquake and hydrogen explosion in March 2011. The accident melted the nuclear fuel and released radioactive substances into the environment. Currently, the reactor buildings are inundated with groundwater. Groundwater is contaminated by melted nuclear fuel and contains myriad radioactive substances that are harmful to the human body. To prevent contaminated water from leaking into the soil and ocean, it was first pumped from the wells. Thereafter, radioactive materials, except tritium, were removed using Advanced Liquid Processing System (ALPS). Tritium cannot be easily removed from water, because it closely resembles regular water molecules. Water containing tritium is called ALPS-treated water and is stored in tanks at the Fukushima Daiichi Nuclear Power Plant. The most significant issue with ALPS-treated water is the shortage of storage locations. According to the Tokyo Electric Power Company (2023), 97% of the total capacity is used and tanks that store treated water are expected to be full by 2024. Other facilities already occupy the premises of the power plant and surrounding areas; thus, it is unrealistic to further increase capacity. Treated water must be discharged into the Pacific Ocean, as it is impossible to store it permanently. However, local governments and fishery cooperatives are opposed to its release because of concerns about reputational damage (Tokyo Shinbun, 2020). These people are worried about ALPS-treated water; nevertheless, the Japanese government states that it is not harmful to the human body. This study hypothesizes that those who are worried about treated water do not make scientific decisions but emotional ones. This study examines whether knowledge of radiation helps people make scientific judgments by exploring the relevance between knowledge of radiation and attitude toward ALPS-treated water.

RESEARCH

We surveyed the students of the School of Health Sciences, Fukushima Medical University. Google Forms was used to correct answers. This survey aimed to understand student awareness of the discharge of treated water into the ocean. In total, 117 valid responses were obtained. The questions and choices were as follows.

1. How interested are you in the Fukushima Daiichi Nuclear Power Plant accident and ALPS-treated water?
(Very interested:4, Somewhat interested:3, Not very interested:2, Not interested at all:1)
2. How scared are you of water containing tritium?
(Very scared:4, Somewhat scared:3, Not very scared:2, Not scared at all:1)
3. What do you believe is the possibility of adverse effects on people's health if treated water is discharged into the ocean?
(Very high:4, High:3, Low:2, Very low:1)
4. If treated water is discharged into the ocean, what do you believe is the possibility of reputational damage to Fukushima Prefecture's fisheries and tourism industries?
(Very high:4, High:3, Low:2, Very low:1)
5. Please select whether you are for or against the release of treated water stored at the Fukushima Daiichi Nuclear Power Plant into the sea off the coast of Fukushima Prefecture.
(For, Against, No opinion or interest)
6. If treated water is safely discharged off the coast of Fukushima Prefecture in the future, would you consume seafood from Fukushima Prefecture?
(Yes, No, No idea)

Additionally, participants were asked the reasons for their answers to Questions 5 and 6.

RESULTS AND DISCUSSIONS

We focused on differences in specialized radiation education at universities. Therefore, the study population was divided into two Groups. Group 1 (n=16), the experiment group, comprised students who had attended lectures on environment and radiation. The remaining students belonged to Group 2 (n=101), the control group. For Questions 5 and 6, the participants who answered “no opinion” were excluded from the valid responses. The survey results are as follows:

1. The average score of Group 1 is 2.50 (SD=7.07) and Group 2 is 2.77 (SD=0.643).
The score of Group 2 is higher than Group 1.
2. The average score of Group 1 is 2.31 (SD=0.583), and Group 2 is 2.59 (SD=0.706).
The score of Group 2 is higher than Group 1.
3. The average score of Group 1 is 1.68 (SD=0.768), and Group 2 is 1.95 (SD=0.776).
The score of Group 2 is higher than Group 1.
4. The average score of Group 1 is 2.64 (SD=1.05), and Group 2 is 3.04 (SD=0.716).
The score of Group 2 is higher than Group 1.
5. In Group 1, the number of valid responses was 10. Seven responded with “For” and three with “Against.”
In Group 2, the number of valid responses was 70; 39 responded with “For” and 31 with “Against.” The reasons for these responses are presented in **TABLE 1**.

TABLE 1: The reasons for responses to Question 5

Reason(Group 1)		Reason(Group 2)	
Pros	Cons	Pros	Cons
<ul style="list-style-type: none"> The concentration of tritium will be diluted with a large amount of seawater. ALPS treated water has been processed to the extent that it does not harm the ecology. There is no place to keep ALPS treated water. Other countries are releasing the water containing tritium. It is scientifically known that there are no adverse effects. 	<ul style="list-style-type: none"> It's not good for your body and marine life. Bioaccumulation may occur. 	<ul style="list-style-type: none"> The concentration of tritium will be diluted with a large amount of seawater. Other countries are releasing tritium. There is no place to keep ALPS treated water. Other countries are releasing the water containing tritium. It is impossible to store it permanently. It is more risky to leave the treated water on the ground. Governments, experts and the media say it's safe. The amount of tritium contained in the treated water meets the standards and is very small. 	<ul style="list-style-type: none"> It's not good for your body and marine life. ALPS Treated water should be discharged in other prefectures instead of Fukushima prefecture. Water exceeding the standard value may be released out of sight. There is a risk of reputational damage. Anxiety about safety. If it is harmful, it will develop into an international problem.
<p>No opinion or interest</p> <ul style="list-style-type: none"> It is not possible to judge. It is difficult to understand. 		<p>No opinion or interest</p> <ul style="list-style-type: none"> It is difficult to understand the merits and demerits of ocean release. Not a citizen of Fukushima Prefecture If it's safe, it doesn't matter where it is released. 	

6. In Group 1, 14 valid responses were obtained. Thirteen of them responded with “Yes” and one responded with “No.” In Group 2, 76 valid responses were obtained; 69 of them responded with “Yes” and 7 responded with “No.” The reasons for these responses are presented in **TABLE 2**.

TABLE 2: The reasons for responses to Question 6

Reason(Group 1)		Reason(Group 2)	
Yes	No	Yes	No
<ul style="list-style-type: none"> • It is safe even if the ALPS treated water is released into ocean. • Fish from Fukushima Prefecture are tested for radioactivity. • Fish is delicious. 	<ul style="list-style-type: none"> • Concerns about bioaccumulation. 	<ul style="list-style-type: none"> • It is safe even if the ALPS treated water is released into ocean. • There is no difference in safety with products from other prefectures. • It is a local product. • The seafood from Fukushima are fresher than ones from other prefectures. • There is no particular reason to refrain from purchasing. • Others said it is safe. 	<ul style="list-style-type: none"> • It seems to contain harmful substances. • I don't like to eat it because I think about vague risks even when it's safe.
	<p style="text-align: center;">No idea</p> <ul style="list-style-type: none"> • If it's not 100% safe, I'm a little worried. 		<p style="text-align: center;">No idea</p> <ul style="list-style-type: none"> • I won't eat it aggressively. • If you have proof that it is safe, I will eat. • Even if the government says it's safe, it's not absolute. • I think it's scary in the beginning of discharge. • I wonder if there is some health hazard. • If the price and quality are the same, don't go out of your way to choose Fukushima products.

CONCLUSIONS

It was not possible to obtain data from a sufficient number of radiation-educated populations; therefore, it was not possible to quantify the effects of radiation education. To obtain more reliable results, it is necessary to increase the sample size and improve the questionnaire. The results of this study did not reveal significant differences owing to the lack of data, therefore, it is not possible to assert the influence of radiation education on awareness of treated water. However, Group 1 appeared to be less interested in the Fukushima Daiichi Nuclear Power Plant accident and ALPS-treated water, less fearful, and less concerned about both biological and reputational damage; and more people in Group 1 agreed to discharge ALPS-treated water than Group 2. We aim to determine whether these tendencies are significant in a better research design.

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REFERENCES

1. Current ALPS Treated Water, etc. Conditions(n.d.). Retrieved May 24, 2023, from <https://www.tepco.co.jp/en/decommission/progress/watertreatment/alps01/index-e.html#amount>
2. Osensyorisui no Umi eno Hosityutsu “Hantai” Fukushima-ken no Shityousongikai de Ikensyo Aitsugu (Opposition to the release of treated contaminated water into the sea Fukushima Prefecture Municipal Assembly Receives Statements of Opinion) (2020. July 31). Tokyo Shinbun. <https://www.tokyo-np.co.jp/article/46023>

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