INFORMATION MANAGEMENT IN SOCIAL RESEARCH: FROM DATA, INFORMATION, AND DIGITAL CONTENT COLLECTION TO STORAGE OR DISPOSAL

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Abstract

Information, its possession, the ability to manage it, to apply it for various purposes have always been important both at the personal level and at the level of the organization, institution. These abilities were especially actualized when, together with new information and communication technologies, the amount of data, information, and later various digital content increased significantly, and its transmission time, in contrary, decreased significantly. On the one hand, it greatly facilitated all information, data, etc. search and transfer processes, but at the same time began to raise other challenges - related to the management, storage, transmission, dissemination of accumulated information. At the same time the need of new competences also raised. It's obvious, that by that reason, into The Digital Competence Framework for Citizens (Dig Comp 2.2) one of the first groups of competencies is information and data literacy which consists from such main competences: browsing, searching and filtering as well as evaluating and managing data, information and digital content.

Those skills and competences are important not only in personal and professional life of all of us, but also in sciences and research work, especially in social Sciences where personal data (such as gender, age, social, marital status and etc.) is very important for better understanding the analysed results. In majority of social research those criteria enable deeper understanding of the essence of different phenomenon in social life, to distinguish differences and identify similarities, to make more on the evidence based and more proper conclusions and recommendations. But according to the new regulation of the data in Lithuania „Due to the provisions of the guidelines for assessing compliance with scientific research ethics" those processes should become much more controlled than it was earlier. In the Regulation the main principles of manage the research data are presented. According to the Regulation the procedures for keeping, storing and accumulating data collected during social research have been heavily regulated, which not only makes it very difficult to conduct relevant research, but also could encourage at all not to collect relevant data or even to avoid certain research methods, especially those, during which personal data is required.

Keywords: Information management, social research, digital content collection, storage of information and digital content, disposal of information and digital content.

1 INTRODUCTION

Information Management skills such as knowledge about content management, ability to analyze and synthesize information, analytical ability to combine and organize complex information, problem-solving ability and etc. are very important not only in permanently changing world, labor market as well as preparing to active participation in them. Information, its possession, the ability to manage it, to apply it for various purposes have always been important both at the personal level and at the level of the organization, institution. These abilities were especially actualized when, together with new information and communication technologies, the amount of data, information, and later various digital content increased significantly, and its transmission time, in contrary, decreased significantly. On the one hand, it greatly facilitated all information, data, etc. search and transfer processes, but at the same time began to raise other challenges - related to the management, storage, transmission, dissemination of accumulated information. At the same time the need of new competences also raised. It's obvious, that by that reason, into The Digital Competence Framework for Citizens (Dig Comp 2.2) one of the first groups of competencies is information and data literacy which consists from such main competences: browsing, searching and filtering as well as evaluating and managing data, information and digital content.

2 METODOLOGY

An analysis of the theoretical and practical discourse was carried out in order to clarify the essential aspects of information management in social research (from the collection of data, information and digital content to storage and destruction) and their regulation, as well as the principles and challenges of implementing the essential theoretical provisions.

3 RESULTS

3.1 Information, Data and Digital Content Management in the Labor Market

“The digital transformation in the manufacturing sector is rapidly accelerating and countries around the world are already talking not only about Industry 4.0, but also about the upcoming fifth and sixth industrial revolutions. Digitalization is changing the way products are designed, manufactured, used and maintained. Digitalization is also changing the way how supply chains operate and allows companies to reduce their negative impact on the environment. All of this is ultimately linked to increased business competitiveness, productivity, innovation and rising wages.” (Aggregate Industry Digitization Index 2022: Study of Science, 2022)

Lithuania was one of the first EU countries to develop its own Industry Digitalization Roadmap 2020-2030, which outlines the country’s industrial development trends and objectives. The need to monitor the country’s digital transformation is high; however, there are currently no coherent initiatives to monitor the digitization of industry. Responding to this need, the Aggregate Manufacturing Digitalization Index 2022 was initiated. The index is based on two different components (Aggregate Industry Digitization Index 2022: Study of Science, 2022):

1) Manufacturing Digitization Index (lagging indicator) reflects Lithuania’s actual position compared to EU countries in the context of digital industrial transformation;

2) Manufacturing Digitization Confidence Index (leading indicator), which reflects the expectations of Lithuanian manufacturing companies in the context of business digitization and short-term development trends.

According to available data, Lithuania is currently lagging behind the EU in technological areas such as big data analytics, 3D printing and robotics. In the latter category Lithuania ranks particularly low, this is due to the low level of industrial robotics use: the country’s industry ranks only 20-22 among the 27 EU countries. Despite this, Lithuanian manufacturing sector scored more in technological areas such as cloud computing, IT and artificial intelligence, compared to the average of the EU.

Table 1

The overall scores of the Industrial Digitization Index and the different indicators constituting categories

Position	Lagging indicator Maximum 100 points		An enabling environment Maximum 40 points		Usage of Technologies Maximum 60 points	
1	Finland	69,4	Finland	27,5	Denmark	43,3
2	Denmark	67,6	Denmark	24,3	Finland	41,9
3	The Netherlands	57,8	Germany	23,4	The Netherlands	36,8
4	Sweden	56,9	Austria	22,7	Sweden	34,8
5	Austria	54,5	Luxembourg	22,2	Austria	31,8
6	Ireland	50,9	Sweden	22,1	Malta	31,1
7	Luxembourg	49,8	Ireland	21,9	Ireland	29
8	Belgium	48,1	The Netherlands	21,1	Belgium	27,8
9	Germany	45,1	Belgium	20,3	Luxembourg	27,5
10	Malta	41,7	Cyprus	14,7	Slovenia	24,2

11	Slovenia	36,7	Estonia	13,6	Italy	23,3
12	Italy	36,7	France	13,5	Czech Republic	22,4
13	Czech Republic	34,5	Italy	13,3	Germany	21,7
14	France	32,8	Slovenia	12,5	**Lithuania**	**21**
15	Portugal	32,4	Czech Republic	12,1	Portugal	20,9
16	**Lithuania**	**31,8**	Spain	11,9	France	19,2
17	Spain	30,8	Portugal	11,5	Spain	18,9
18	Slovakia	27,4	Greece	11,1	Slovakia	16,5
19	Estonia	25,8	Slovakia	10,9	Croatia	15,2
20	Hungary	25,5	Hungary	10,9	Hungary	14,6
21	Cyprus	23,7	**Lithuania**	**10,7**	Poland	13,1
22	Croatia	23,6	Malta	10,6	Estonia	12,2
23	Poland	20,4	Croatia	8,4	Latvia	10,8
24	Latvia	18,1	Bulgaria	7,4	Cyprus	8,9
25	Greece	16,4	Poland	7,3	Bulgaria	7,2
26	Bulgaria	14,6	Latvia	7,3	Greece	5,3
27	Romania	9,8	Romania	6,5	Romania	3,2
	EU	**36,8**	**EU**	**14,8**	**EU**	**22**

In the Lithuanian context, the most digitized sectors are those in the engineering industry, while in the EU context the best performers are traditional manufacturing sectors such as food, textiles, wood or paper. (Aggregate Industry Digitization Index 2022: Study of Science, 2022)

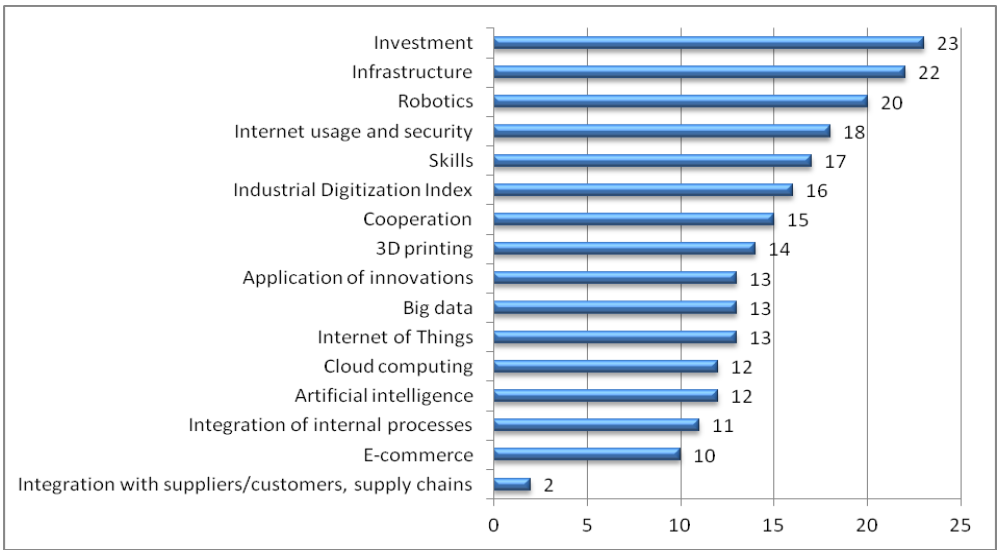

Figure 1. Lithuania's position according to individual Lagging Indicator sub-categories

Based on the results of the study, the document presented recommendations for public interventions in the fields such as human capital, public digitization support and digital infrastructure.

During the conduction of analysis (Bickauske and etc., 2020), it was found out that there were these major challenges deterring the Lithuanian manufacturing industry enterprises to take forward steps towards higher level of industrial digitalization:

1. Employee resistance and the lack of knowledge how to manage the essential changes – newly installed digitalization tools often change the order of work, methods of work, security requirements; a need for employee re-qualification process arises;

2. The lack of financial resources and slow return of investments – SMEs do not tend invest into industrial digitalization because the profits from the latter come over a long period of time and it is slow in general; smaller turnovers of SMEs also make an impact on their decisions whether to invest into the digitalization.

3. The lack of knowledge when choosing the solutions for digitalization – enterprises often have different technologies installed into separate fields of operations, however, they lack knowledge of how to unify all of them with an efficient digitization tool which could synchronize different tools and manage all the operations centrally.

4. Constant shortage of qualified specialists – companies tend to think often that every new digitization tool they are going to install will additionally require skilful specialists who could work with them and, as a result, it will cost the company extra.

5. Lack of specialists - companies often believe that the implementation of new digital tools will require the employment of new professionals who are able to work with these digital technologies, which will require additional costs from companies.

The direction of intervention is the development of human capital where one of the most important means is to develop and improve consulting services related to digital competences increase in companies, to promote the supply and quality of training programs necessary for the formation of digital competences, to review the content of the measures implementing the policy of employee training, qualification raising and retraining, giving priority to initiatives that form the competences required for the application, implementation and use of digital technologies, even to create new study programs / adapt existing ones to better suit the industry needs in the context of digitization of processes; to raise the competences of lecturers and teachers and update the infrastructure necessary for the teaching process in study institutions, taking into account continuous digital technological progress. (Aggregate Industry Digitization Index 2022: Study of Science, 2022)

The direction of intervention is public support for digitization of business processes pays more attention to promoting the supply of digital technologies, demand for digital technologies by increasing financial support measures availability and efficiency, to reducing the administrative burden of using digitalization-related public support measures burden, to increasing integration into international value creation chains built on digital technologies development and/or application of, to promoting the involvement of Lithuanian industrial companies in international initiatives, clusters, R&D programs promoting the development, implementation and application of digital technologies and etc. Also no less important is to strengthen the readiness of Lithuanian industrial companies in the field of cyber security, by introducing companies to the challenges of cyber security and promoting the implementation of cyber security measures in business. (Aggregate Industry Digitization Index 2022: Study of Science, 2022)

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3.2 Information, Data and Digital Content Management in Social Science and Research

Regarding the guidelines for the assessment of the ethical compliance of scientific research, in addition to other aspects of the organization of research in social sciences, such as general and special (according to research directions) principles of compliance with research ethics, information for research subjects, data collection, including alternative methods, risk assessment, all types avoiding harm (psychological, financial, social, etc.), as well as paying close attention to confidentiality and data protection.

Those skills and competences are important not only in personal and professional life of all of us, but also in sciences and research work, especially in social Sciences where personal data (such as gender, age, social, marital status and etc.) is very important for better understanding the analysed results. In majority of social research those criteria enable deeper understanding of the essence of different phenomenon in social life, to distinguish differences and identify similarities, to make more on the evidence based and more proper conclusions and recommendations. But according to the new regulation of the data in Lithuania „Due to the provisions of the guidelines for assessing compliance with scientific research ethics" (2022) those processes should become much more controlled than it was earlier. In the Regulation the main principles of manage the research data are presented. According to the Regulation the procedures for keeping, storing and accumulating data collected during social research have been heavily regulated, which not only makes it very difficult to conduct relevant research, but also could encourage at all not to collect relevant data or even to avoid certain research methods, especially those, during which personal data is required.

According to the document, "data protection is the most important area of privacy protection in the collection and management of research data and the publication of results." (Šiaulių valstybinės kolegijos atitikties mokslinių tyrimų etikai vertinimo tvarkos aprašas. 2022).

For this reason, it is important to ensure:

1) Protection of scientific research data and confidentiality;

2) Storage and management of scientific research data;

3) The quality of scientific publications.

The goal of data protection is to be able to open research data and results while preserving the confidentiality of subjects. In order to properly ensure data protection in scientific research (research data), researchers are recommended to prepare a research data management plan, which, in addition to general information about researchers, their research and subject competencies and responsibilities, the relevance of the research, goals, research sample, research data collection and detailed presentation of analysis methods to the scientific and public community, great attention is also paid to research metadata. Before conducting the research, the holder or their group must provide detailed information about what metadata will be prepared and documented, what metadata standards (DDI, TEI, EML, MARC, CMDI, etc.) different metadata standards will be used, how these standards are compatible with the requirements of the data repository where research data is planned to be stored, where and in what format they will be recorded, stored or disposed of, whether they will be publicly available, etc.

The document mentioned in no less detail is still before the investigation research data management plan, in which, in addition to general information about the researchers, their research and subject competences and responsibilities, the relevance and goals of the research being conducted, a detailed presentation of the research sample, research data collection and analysis methods to the scientific and public community, great attention is also paid to the research metadata. Before conducting the research, the holder or their group must provide detailed information about what metadata will be prepared and documented, what metadata standards (DDI, TEI, EML, MARC, CMDI, etc.) different metadata standards will be used, how these standards are compatible with the requirements of the data repository where research data is planned to be stored, where and in what format they will be recorded, stored or disposed of, whether they will be publicly available, etc. (Šiaulių valstybinės kolegijos atitikties mokslinių tyrimų etikai vertinimo tvarkos aprašas, 2022, On approval of guidelines for assessing compliance with research ethics, 2020).

The aforementioned document obliges the researcher or their team to clearly know how the research data will be stored, how backup copies will be made, where they will be stored, how the research data will be restored in the event of an incident, etc., even before the start of the investigation. Also, the

Research Data Management Plan must provide for how the data will be managed after the end of the research. One of the more important aspects here is to foresee how long, where and what data will be stored, even for what purposes it would be stored (e.g. legal, historical, cultural, contractual, etc.). Also, when and what research data will be compromised, who will make this decision, etc. (Šiaulių valstybinės kolegijos atitikties mokslinių tyrimų etikai vertinimo tvarkos aprašas, 2022, On approval of guidelines for assessing compliance with research ethics, 2020).

All these provisions are very significant and necessary, but the process of their implementation in practice so far raises more questions than answers. Such a situation, in turn, encourages interest in and sharing of international experience, joint efforts to search for optimal solutions to this problem, because digitization enables both good and bad ways to cross the borders of states and institutions, which, in turn, facilitates and speeds up communication, information gathering, search and retrieval and dissemination, etc., but also poses other challenges related to information management.

4 CONCLUSIONS

The review and analysis of the theoretical and practical discourse allows us to state that although a number of strategic documents and programs related to digital competences, their need and development, search, management, storage and destruction of information, data, digital content have been created in Lithuania, a number of existing situation studies, there is still a lack of more specific methodologies and tactics for developing digital competencies related to information, data, digital content management, and digital literacy in general for future and existing professionals in various fields. Including social science researchers.

In addition, the existing situation is usually analyzed instead of constructive and specific recommendations for the implementation of various strategies and programs as well as scientific research, especially in the aspects of metadata creation, management and storage/deletion.

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