

## NEXT – Digital Transformations for Supporting Next-Generation Labour

### Deliverable 2.3

# Report on the ‘Digital’ Employee’s Needs

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## Document History

Version	Date	Author Name	Partner	Description
0.1	10/01/2024	Oleksandr Blazhko	OPNU	Initial draft
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0.7	26/01/2024	Mykhailo Lebid	OPNU	Second improved version
0.8	29/01/2024	Yevgeniya Sulema	ISKPI	Version ready for review
0.9	30/01/2024	Irina Tal	DCU	Reviewed version
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# 1 Introduction

This document provides the analysis of the stakeholders' responses to two questionnaires, Questionnaire 1 - focused on digital jobs market trends - and Questionnaire 2 - focused on relevant soft skills in the context of digital skills. These questionnaires were part of a two-stage survey. The general description of the survey and its questionnaires is provided by the deliverable D2.2 which is logically connected to this deliverable, D2.3.

For each questionnaire, the responses normalisation, the quantitative metrics analysis, and the qualitative analysis of the responses have been performed.

The normalisation is a preliminary step in the responses analysis; it is needed for transforming the responses in the convenient form for further quantitative metrics analysis and qualitative analysis.

The quantitative metrics analysis of the stakeholders' responses serves for proving the representativeness and appropriateness of the responses. It is the second step in the response analysis.

The qualitative analysis of stakeholders' responses was aimed at the clarification of the list of topics and subtopics to be covered in the learning materials for each subject proposed in the project application. The qualitative analysis allowed us to identify trends and patterns in stakeholder responses. This helped uncover prevalent opinions, preferences, or concerns among stakeholders, providing a clear picture of the overall sentiment. As a result, we can quantify trends and patterns and verify the initial assumptions on the essential topics to be covered by the learning materials to be developed as a part of WP3 tasks.

The rest of the document is organized as follows. The second chapter aims to present the analysis of the stakeholders' responses to the questionnaire on the digital job market trends (Questionnaire 1). The third chapter aims to present the analysis of the stakeholders' responses on soft skills required by the digital jobs market (Questionnaire 2). The fourth chapter summarizes the findings.

## 2 Analysis on the digital job market trends

### 2.1 Questionnaire 1: General analysis of the responses

As it was indicated in the deliverable D2.2, the purpose of the Questionnaire 1 was to discover the opinion of the experts working in IT companies on the newest trends in digital transformation of the job market in order to confirm the topics previously selected for further development of learning materials as part of the WP3.

Questionnaire 1 consists of three introductory questions (name, affiliation, duration of the work in ICT) and five main questions. The main questions are as follows.

1. *Are you familiar with the advances in **Artificial Intelligence**? If yes, please share your opinion on how it can influence the digital transformation of the job market. Which new jobs can appear on the job market and which new skills can be requested by the employers with the relation to wider application of this technology? Please give examples to illustrate your answer.*
2. *Are you familiar with the immersive technologies including **Extended Reality (XR)**, **Augmented Reality (AR)**, **3D Visualization**? If yes, please share your opinion on how it can influence the digital transformation of the job market. Which new jobs can appear on*

the job market and which new skills can be requested by the employers with the relation to wider application of these technologies? Please give examples to illustrate your answer.

3. Are you familiar with the concept of **Metaverse**? If yes, please share your opinion on how it can influence the digital transformation of the job market. Which new jobs can appear on the job market with the relation to this new technology? Please give examples to illustrate your answer.
4. Are you familiar with **Blockchain** and instruments for **information security**? If yes, please share your opinion on how it can influence the digital transformation of the job market. Which new jobs can appear on the job market and which new skills can be requested by the employers with the relation to wider application of these technological tools? Please give examples to illustrate your answer.
5. Which **other technologies** would you consider as game-changers for the next-generation digital job market? Please give examples on new digital jobs and new digital skills to be requested by employers with the relation to these technologies.

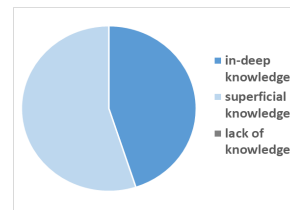
We received 20 responses. The analysis of these responses shows that the **Questionnaire 1** provides data on the awareness of IT specialists in the following areas:

- Artificial Intelligence;
- Augmented and extended reality;
- Metaverses;
- Blockchain technology.

Based on the collected data, it is possible to determine the share of respondents who have in-depth knowledge, superficial knowledge, and lack of knowledge in all categories.

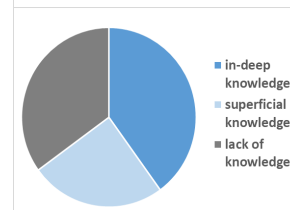
**In the area of Artificial Intelligence:**

in-depth knowledge:	45%
superficial knowledge:	55%
lack of knowledge:	0%



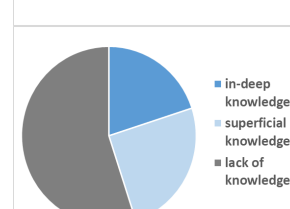
**In the area of Augmented and Extended Reality:**

in-depth knowledge:	40%
superficial knowledge:	25%
lack of knowledge:	35%



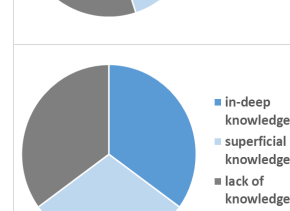
**In the area of Metaverses:**

in-depth knowledge:	20%
superficial knowledge:	25%
lack of knowledge:	55%



**In the area of Blockchain technology:**

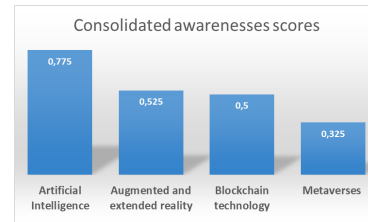
in-depth knowledge:	35%
superficial knowledge:	30%
lack of knowledge:	35%



The metric CAS (consolidated awareness score) in the area of knowledge can be defined as the ratio of the value of the maximum possible knowledge in the area to the consolidated score of the sample.

In this way is possible to determine the CAS metric for each of the areas:

- Artificial Intelligence CAS - 0,775
- Augmented and extended reality CAS - 0,525
- Blockchain technology CAS - 0,5
- Metaverses CAS - 0,325



This diagram shows that the respondents' best awareness is in the area of artificial intelligence. In the majority of answers, respondents indicated that they have proper understanding and general knowledge in the areas of blockchain technologies, augmented and extended reality, awareness is average. The least awareness in the area of Metaverse.

The answers to Questionnaire 1 were manually converted into a normalised form suitable for further analysis. The normalised Questionnaire 1 is available as Google Documents [1].

## 2.2 Questionnaire 1: Quantitative analysis

The quantitative analysis was conducted in relation to five general topics:

1. Artificial Intelligence;
2. Extended Reality (XR), Augmented Reality (AR), 3D Visualization;
3. Metaverse;
4. Blockchain and instruments for information security;
5. Other technologies relevant to the next-generation digital job market.

The results for the quantitative metrics analysis for each of these topics are presented in Table 1, Table 2, Table 3, Table 4 and Table 5 accordingly.

Table 1 - Quantitative metrics analysis for questions related to Artificial Intelligence

Subquestion	Quantitative metrics analysis
Are you familiar with the advances in Artificial Intelligence?	Yes - 95%, Yes (no experience) - 5%
Share your opinion on how it can influence the digital transformation of the job market.	It's shared an influence - 85%
Which new jobs can appear on the job market can be requested by the employers with the relation to wider application of this technology?	It's shared the list of jobs - 40% It's expressed a doubt - 10%
Which new skills can be requested by the employers with the relation to wider application of these technologies?	It's shared the list of skills - 80%

Table 2 - Quantitative analysis for questions related to Extended Reality (XR), Augmented Reality (AR), 3D Visualization

Subquestion	Quantitative metrics analysis
Are you familiar with the advances in Extended Reality (XR), Augmented Reality (AR), 3D Visualization?	Yes - 40%, Yes (no experience) - 10% No - 50%
Share your opinion on how it can influence the digital transformation of the job market.	It's shared an influence - 30%
Which new jobs can appear on the job market can be requested by the employers with the relation to wider application of this technology?	It's shared the list of jobs - 25%
Which new skills can be requested by the employers with the relation to wider application of these technologies?	It's shared the list of skills - 20%

Table 3 - Quantitative analysis for questions related to Metaverse

Subquestion	Quantitative metrics analysis
Are you familiar with the advances in Metaverse?	Yes - 40%, No - 60%
Share your opinion on how it can influence the digital transformation of the job market.	It's shared an influence - 30%
Which new jobs can appear on the job market can be requested by the employers with the relation to wider application of this technology?	It's shared the list of jobs - 20%

Table 4 - Quantitative analysis for sub questions related to Blockchain and instruments for information security

Subquestion	Quantitative metrics analysis
Are you familiar with the advances in Blockchain and instruments for information security?	Yes - 60%, Yes (no experience) - 5%, No - 35%
Share your opinion on how it can influence the digital transformation of the job market.	It's shared an influence - 25%
Which new jobs can appear on the job market can be requested by the employers with the relation to wider application of this technology?	It's shared the list of jobs - 25%

Which new jobs can appear on the job market can be requested by the employers with the relation to wider application of this technology?	It's shared the list of jobs - 15%
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Table 5 - Quantitative analysis for questions related to other technologies as game-changers for the next-generation digital job market

Subquestion	Quantitative metrics analysis
<i>Which other technologies would you consider as game-changers for the next-generation digital job market?</i>	The answer is presented - 60%
<i>Please give examples on new digital jobs to be requested by employers with the relation to these technologies</i>	It's shared the list of jobs - 35%
<i>Please give examples on new digital skills to be requested by employers with the relation to these technologies</i>	It's shared the list of jobs - 15%

Thus, the provided responses to Questionnaire 1 are fully representative for further qualitative analysis.

## 2.3 Questionnaire 1: Qualitative analysis

The qualitative analysis of the data collected through Questionnaire 1 was also conducted in relation to the five aforementioned topics:

Artificial Intelligence;  
 Extended Reality (XR), Augmented Reality (AR), 3D Visualization;  
 Metaverse;  
 Blockchain and instruments for information security;  
 Other technologies relevant to the next-generation digital job market.

The purpose of the qualitative analysis is to form a list of possible digital jobs for each topic and discover the requested skills needed for these jobs.

The list of **jobs** in **Artificial Intelligence** is as follows (here and below – if the occurrence of the item in the experts’ responses is more than one, it is given in brackets):

- Data Scientist (3)
- Data Analyst (3)
- AI-Ethicist (3)
- AI-Optimizer (2)
- AI-Trainer (2)
- LLM AI-Engineer
- Engineer for Automating
- AI Blockchain Architect
- AI-Supporter
- AI-Engineers
- Machine learning specialist
- AI algorithm bias mitigators
- AI-generated content creators
- AI-driven virtual experience designers



- AR/VR content architects, and immersive storytellers who use generative AI
- Specialist in protection of "implemented in life"
- AI for management systems in state authorities
- Developer of AI-systems

The list of **general skills** requested for jobs based on **Artificial Intelligence**:

- AI assisted tasks
- AI assisted services
- AI-Ethics-skills
- Understanding of AI
- Knowledge of AI-structure
- AI-augmentation of skills
- Strong foundation in data science
- Using the machine learning
- Ability to interpret AI-answers
- Ability to collaborate with AI systems
- Consulting by using AI
- Development and integration of AI
- Understanding how to use, interpret, and leverage AI
- Using the AI-systems

The list of **special skills** in Artificial Intelligence:

- AI-monitoring and forecasting the state of the IT market.
- AI-supporting of HR employees in searching and hiring employees.
- AI-promoting of IT companies in the IT market
- AI-detection Web-contents for trends forecast
- AI-support to help customer support handle clients requests
- AI-support to help with Image editing
- AI-support to generating content
- AI-support to answering questions
- AI-support to engaging in conversations
- AI-support to providing explanations
- Using the ChatGPT
- Using the AWS AI services
- Using the TensorFlow and PyTorch
- Skills in programming language Python
- Skills in programming language R
- Usage of ChatGPT
- Usage of Copilot

The list of **jobs** in **Extended Reality (XR), Augmented Reality (AR), 3D Visualization**:

- 3D Graphic Designer (3)
- XR/AR/VR Designer (2)
- Developer of VR Media Composer
- Hardware Developer of VR headset/sensory wear
- Software Developer for VR headset/sensory wear
- XR Content Creators
- AR Application Developer
- XR Security Designer
- XR/AR/VR Developer
- XR/AR/VR Project Manager
- UX/UI Designer

The list of **general skills** in **Extended Reality (XR), Augmented Reality (AR), 3D Visualization**:

- Computational design
- 3D modelling
- Hardware and optics engineering
- Computer vision
- Image processing

The list of **special skills** in **Extended Reality (XR), Augmented Reality (AR), 3D Visualization**:

- Developer of AR Education Systems
- VR in healthcare for therapists
- AR Maintenance Technicians
- Software Developer for Microsoft HoloLens

The list of **jobs** in **Metaverse**:

- Metaverse Business Consultant
- Metaverse Architect
- Consultant on the Metaverse Reputation of Clients
- Expert in the Metaverse communication
- Metaverse Journalist
- Metaverse Immersive experiences Designer
- 3D Designer
- Virtual World Developer
- Virtual Fashion Designer
- Virtual Real Estate Developer
- Virtual Product Marketer
- Programming skills for Metaverse-applications Developing
- XR/AR skills for Training/Learning

The list of jobs in **Blockchain** and instruments for **Information Security**:

- Blockchain Developer
- Cybersecurity Architect of Blockchain projects
- Developer of Blockchain games
- Consultant on implementation of Blockchain systems
- Specialist in Blockchain auditing and compliance
- Solidity Engineer
- Blockchain Solution Architect
- Blockchain Quality Engineer
- Cybersecurity specialist with expertise in Blockchain
- Specialist in certification and auditing of Blockchain systems
- Specialist in security audits of data storage and data processes
- Remote Backup Protection Analyst
- Crypto Analyst
- Information Security Analyst
- Cryptography programming Developer

The list of **general skills** in **Blockchain** and instruments for **Information Security**:

- Cryptography Skills (2)
- Cybersecurity Skills (2)
- Understanding Blockchain technology
- Understanding Blockchain Platforms

- Understanding Smart Contract Design
- Coding Skills
- Cloud Security Skills
- Knowledge of Compliance Laws

The list of **jobs** related to **other technologies** relevant for the next-generation digital job market:

- Quantum computing Specialist (4)
- AI integration in the SaaS
- 5G Technology Specialist
- Edge computing Specialist
- Biotechnology Specialist
- Social Media Specialist
- Specialist in Digital VR-business/Marketing
- Manager in Business Innovation/Automation/Digitalisation
- Manager for Remote/Digital work spaces
- IoT Data Analyst/Scientist
- IoT Healthcare Specialist
- IoT Agriculture Specialist
- IoT Manufacturing Specialist
- Automated Machine Learning Specialist
- Robotics Process Automation Developer
- Personal AI Doctor
- Edge Computing Specialist
- Wireless Technologies Specialist
- Sustainability Technologies Specialist

The list of **skills** related to **other technologies** relevant for the next-generation digital job market:

- AI in programming process
- Data analytics
- Machine Learning
- Cybersecurity

Thus, as the findings we obtained from the qualitative analysis of the Questionnaire 1, we have the list of digital jobs and the list of required skills which we must address in the learning materials to be prepared within WP3.

## 3 Analysis on soft skills required for digital jobs

### 3.1 Questionnaire 2: General analysis of the responses

Questionnaire 2 consists of three introductory questions (name, affiliation, duration of the work in ICT) and four main questions.

The main questions are open-ended questions to invite experts to disclose answers in the “Storytelling” format . These are as follows:

*What is your opinion regarding the possible impact of ‘digital’ jobs on employee’s **mental health**? Which soft skills an employee should have to minimize this impact?*

*What is your opinion regarding potential **ethics issues** in ‘digital’ communication and collaboration? Which soft skills an employee should have to minimize the impact of such issues?*

*What is your opinion regarding **personal data protection** and security risks in ‘digital’ environments? Which soft skills an employee should have to feel secure on this matter? Do you have any **other suggestions on the soft skills** of the next-generation employees which can help them to feel comfortable and secure while working fully ‘digitally’?*

Answers to Questionnaire 2 in a normalised form are available as Google Documents [2].

### 3.2 Questionnaire 2: Quantitative analysis

The quantitative analysis was conducted in relation to four general topics:

1. Mental Health issues;
2. Ethics issues;
3. Personal Data Protection and Security risks.
4. Other issues relevant to the next-generation digital job market.

The results of this analysis for each of these topics are presented in Table 6, Table 7, and Table 8, respectively.

Table 6 - Quantitative analysis for questions related to Mental Health

Subquestion	Quantitative metrics
What is your opinion regarding the possible impact of ‘digital’ jobs on employee’s mental health?	It's presented an opinion - 55%
Which soft skills an employee should have to minimize this impact?	It's presented the list of skills - 95%

Table 7 - Quantitative analysis for questions related to potential Ethics issues

Subquestion	Quantitative metrics
What is your opinion regarding potential ethics issues in ‘digital’ communication and collaboration?	It's presented an opinion - 70%
Which soft skills an employee should have to minimize the impact of such issues?	It's presented the list of skills - 100%

Table 8 - Quantitative analysis for questions related to Personal Data Protection and Security risks

Subquestion	Quantitative metrics
What is your opinion regarding personal data protection and security risks in ‘digital’ environments?	It's presented an opinion - 65%
Which soft skills an employee should have to feel secure on this matter?	It's presented the list of skills - 85%

The last question “Do you have any other suggestions on the soft skills of the next-generation employees which can help them to feel comfortable and secure while working fully ‘digitally?’” received 60% answers.

Thus, the provided responses to Questionnaire 2 are fully representative for further qualitative analysis.

### 3.3 Questionnaire 2: Qualitative analysis

The qualitative analysis of the data collected through Questionnaire 2 was also conducted in relation to the aforementioned four general topics:

1. Mental Health issues;
2. Ethics issues;
3. Personal Data Protection and Security risks.
4. Other issues relevant to the next-generation digital job market.

The purpose of the qualitative analysis is to discover the requested soft skills needed for improving the readiness of employees to face issues related to digital jobs.

The list of **soft skills** in **Mental Health** is as follows (here and below – if the occurrence of the item in the experts’ responses is more than one, it is given in brackets):

- Communication Skills (9)
- Time Management (8)
- Collaboration (3)
- Empathy (3)
- Emotional Intelligence (3)
- Team Work (2)
- Social Skills (2)
- Critical Thinking (2)
- Resilience (2)
- Adaptability (2)
- Able To Relax In Free Time
- Active Listening
- Approachability
- Attention
- Burnout Prevention
- Common Sense
- Compassion
- Coping Mechanisms
- Creativity
- Focusing
- Grit
- Healthy Work Life Balance Knowledge
- Honesty
- Identify
- Motivation
- Negotiation
- Nonverbal Social Skills
- Physical Activity
- Planning
- Prioritize Tasks
- Problem-Solving Skills
- Respect
- Responsibility

- Self Awareness
- Social Intellect
- Stress Management
- The Ability To Get Along With People And Negotiate
- Training Of Skills
- Virtual Team Work
- Work-Life Balance Strategies
- Working As Expected Without Overtimes

The list of **soft skills** needed for overcoming **Ethics** issues:

- Communication (6)
- Adaptability (4)
- Empathy (4)
- Critical thinking (3)
- Work ethics (3)
- Honesty (3)
- Understandable (2)
- Awareness (2)
- Cultural awareness (2)
- Cultural sensitivity (2)
- Flexibility (2)
- Active listening
- Appropriate use of language and tone
- Balancing digital and face-to-face interaction
- Collaboration
- Courage to oppose unethical practices
- Cultural competence
- Cybersecurity awareness
- Dependability
- Emotional intelligence
- Ethical awareness
- Ethical decision-making
- Etiquette
- Integrity
- Keeping attention during communication
- Leadership
- Negotiation
- Openness
- Respect for confidentiality
- Respecting privacy in digital communication
- Self-awareness
- Tolerant
- Transparency

The list of **soft skills** needed for improving the level of **Personal Data Protection** and minimizing **Security** risks:

- Cybersecurity awareness (7)
- Communication (5)
- Critical thinking (4)
- Understanding privacy settings (4)
- Adaptability (2)
- Analytical thinking
- Attention to details

- Aware of the ethics impact
- Continual learning
- Cooperation
- Courage to oppose unethical practices
- Creativity
- Curiosity
- Empathy
- Legal and Ethical Awareness
- Problem solving
- Skepticity
- Team work
- Transparency

The list of **soft skills** based on **other suggestions** for the next-generation employees which can help them to feel comfortable and secure while working fully 'digitally':

- Communication (6)
- Flexibility (4)
- Adaptability (3)
- Collaboration (3)
- Critical Thinking (2)
- Digital Literacy (2)
- Empathy (2)
- Resilience (2)
- Self-Management (2)
- Team work (2)
- Ability to adapt to situations, stress, workload, and pressure
- AI usage skills
- Citations
- Continuous learning adaptability
- Cooperation
- Creative Problem-Solving
- Cultural Awareness and Inclusivity
- Cyber security
- Delegation
- Effective Communication
- Emotional Intelligence
- Fluency in English
- Grit
- Humorous
- Keep learning approach
- Leadership
- Licencing
- Management
- Mindfulness and Stress Management
- Multi disciplinary perspective
- Negotiation
- Openness
- Optimism
- Organization
- Patience
- Prioritisation and planning
- Problem-Solving Skills
- Remote collaboration proficiency

- Strong sense of self-motivation
- Time management
- Tolerant
- Work ethics

Thus, based on the qualitative analysis of the data collected through Questionnaire 2, we formed the list of required soft skills which we plan to address in the learning materials to be prepared within WP3.

## 4 Conclusions

This document presented the findings obtained as the result of a two-stage survey described in D2.2. Based on the quantitative analysis conducted for both stages (Questionnaire 1 and Questionnaire 2) we confirmed that the survey is representative, and so, the conclusions based on it can be considered as trustful.

The qualitative analysis of the responses obtained through Questionnaire 1 allowed us to create (1) the list of digital jobs and (2) the list of skills required for these jobs for five general topics: Artificial Intelligence; Extended Reality , Augmented Reality , 3D Visualization; Metaverse; Blockchain and instruments for information security; and Other technologies relevant to the next-generation digital job market as identified by the respondents. The qualitative analysis of the responses obtained through Questionnaire 2 allowed us to create the list of soft skills needed to help employees working on digital jobs to overcome possible issues related to: Mental Health; Ethics; Personal Data Protection and Security risks; and Other issues relevant to the next-generation digital job market as identified by the respondents

These findings will be used while preparing the learning materials within the WP3.

## 5 References

- [1] NEXT Project – Questionnaire 1 responses in a normalised form, [https://docs.google.com/spreadsheets/d/1F2J-3DpeUDJoWnE6\\_xSZg5DaQIsHK6CvCHZmJdUIMuQ](https://docs.google.com/spreadsheets/d/1F2J-3DpeUDJoWnE6_xSZg5DaQIsHK6CvCHZmJdUIMuQ)
- [2] NEXT Project – Questionnaire 2 responses in a normalised form, [https://docs.google.com/spreadsheets/d/1\\_ikFPildjsxm\\_nv4yLtA6LFCtFe7ZoojDQWTtcn02HQ/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1_ikFPildjsxm_nv4yLtA6LFCtFe7ZoojDQWTtcn02HQ/edit?usp=sharing)



# NEXT

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