TS4NFDI Requirements Analysis Report

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1. Introduction

Terminologies and terminology services are widely used inside the NFDI landscape and beyond. To get an overview of the usage of terminologies and their corresponding terminology services a requirement analysis report is needed.

a. Background information and goal of the survey

Terminology Services 4 NFDI (TS4NFDI) aims to standardize and harmonize collaborative terminology management within the NFDI. It provides a way to integrate and converge individual solutions into a standardized, interoperable, sustainable Terminology Service embedded in a long-term NFDI infrastructure, thereby improving the overall efficiency and effectiveness of terminology management and use, as well as cross-domain collaboration within the NFDI community. The Requirement Analysis Report is designed to capture the requirements of consortia and identify potential use cases to support them to integrate terminology services into their applications.

b. What is TS4NFDI?

TS4NFDI is a cross-domain basic service of the consortia Base4NFDI for the provision, curation, development, harmonization and mapping of terminologies. TS4NFDI is currently in the initialization phase. By the end of this phase (end of Q4/2024), TS4NFDI will provide a centralized and harmonized API Gateway along with a Terminology Service Suite (TSS). The TSS will feature JavaScript-based Graphical User Interface (GUI) widgets that provide direct access to at least three different terminology service software stacks: Ontoportal, Skosmos, and Ontology Lookup

Service. These software stacks, available across multiple instances, will be integrated into a unified terminology service access point for web services.

c. Target Groups of the survey

The target groups of this requirement analysis are developers and managers of web services. We are also interested in users who work with terminologies or ontologies.

2. Questionnaire

The following section presents a questionnaire divided into eight subsections 2a-h) for ease of reference. The [first](#) and the [last](#) subsections of this section contain questions for all participants. The result of question 5 in subsection 2a) is an indicator of whether a participant has encountered terminologies in their work environment prior to this survey. If this is not the case, the survey participant will proceed to the questions in subsection [2b)](#). The questions in subsection 2b) have been included in order to identify potential new users of terminology services. Section [2c)](#) contains questions about the occurrence of terminological encounters in the course of the survey participant's current or previous activities. The response to question 14 in subsection 2c) determines which of the three potential branches the participant is selecting. The three possible branches are: 1) Developer, 2) Manager, and 3) User/Other. The questions for the Developer Branch can be found in subsection [2d)](#). The questions for the Manager Branch can be found in subsection [2e)](#). The subsection [2f)](#) contains questions for users of terminologies and/or terminology services. Subsection [2g)](#) contains common questions for all participants who answered yes to question 5 of subsection 2a). Required questions are marked with a red "*" at the end of the question. Help texts and the design of the answers are marked in blue. The phrase "If yes in xx" is utilized to indicate that the question is a follow-up related to the initial question, "xx."

a. General Questions for all Participants

1. Name of your institutional organization? *

   Free Text

2. Which NFDI consortium are you connected to? *

   Dropdown menu including Other (Multiple Choice)

       a. Base4NFDI

       b. BERD@NFDI

       c. DAPHNE4NFDI

       d. DataPLANT

       e. FAIRagro

       f. FAIRmat

       g. GHGA

       h. KonsortSWD

       i. MaRDI

       j. NFDI4Biodiversity

       k. NFDI4BIOIMAGE

       l. NFDI4Cat

       m. NFDI4Chem

       n. NFDI4Culture

       o. NFDI4DataScience

       p. NFDI4Earth

       q. NFDI4Energy

       r. NFDI4Health

       s. NFDI4Immuno

       t. NFDI4Ing

       u. NFDI-MatWerk

       v. NFDI4Memory

       w. NFDI4Microbiota

       x. NFDI4Objects

       y. NFDIxCS

       z. PUNCH4NFDI

       aa. Text+

       bb. Other: Free Text

3. Describe your role(s) in the NFDI consortia: *

Free Text

4. Are you responsible for the operation/management of an infrastructure and/or service within the NFDI consortia? *

List (Radio) + Help text: In this context, the term "service" is used to describe a (Web) application that offers a benefit to the user, such as data discovery or data annotation. In contrast, the term "infrastructure" is used to describe the system of hardware, software, facilities, and service components that support the delivery of business systems and IT-enabled processes.

   a. Yes, I'm responsible for at least one infrastructure and one service.
   b. Yes, I'm responsible for at least one infrastructure.
   c. Yes, I'm responsible for at least one service.
   d. No

5. Have you encountered terminologies in your work environment before this survey? *

List (Radio)

   a. Yes.
   b. No.

b. Questions for potential new Users

1. Do you query your own data? *
(Multiple Choice) + Help text: In this context the term "query" describes a question or request to an information source. A query itself can be executed in different ways.
   a. Yes, with a query language (e.g. SQL, SPARQL, Cipher).
   b. Yes, with a GUI search bar.
   c. Yes, via an API (e.g. via curl, Python, Java).
   d. No.

2. If yes in 1b: Is the GUI search bar web based (e.g. accessible in a web browser)?
   List (Radio)
      a. Yes.
      b. No.

3. If yes in 2: What is the web address for the tool which provides the search bar? Feel free to add multiple web addresses if needed.
   (Free Text)

4. Do you annotate your own data?
   List (Radio)
      a. Yes.
      b. No.

5. If yes in 4: Are you using a web tool for this?
   List (Radio)
      a. Yes.
      b. No.

6. If yes in 5: What is the web address for the annotation tool? Feel free to add multiple web addresses if needed.
   (Free Text)

7. Do you have structured data?
   List (Radio) + Help text:Structured data is highly organized, standardized and easily accessible for machines. The data itself is typically saved in a database (e.g. relational database or graph database). In contrast unstructured data is often saved in a native format (e.g. freetext). Unstructured data could also have an internal structure. However it doesn't have a predefined data model.
      a. Yes.
      b. No.

8. If yes in 7: Could you explain very briefly how your data is structured?
   (Free Text)

c. **Continue General Questions for Users who encountered terminologies in your work environment before this survey**

6. Are you using terminologies? *

(Multiple Choice w comments) + Help text about Terminologies

    a. Yes, I'm using them for data annotation.
    b. Yes, I'm using them to provide a search engine.
    c. Yes, I'm using them to increase usability.
    d. Yes, I'm using it in the following context: (Free Text) Internal Note – single free-text field only possible with Javascript enabling in LS. otherwise use multiple choice fields with comments for all options.
    e. No.

7. Have you encountered terminology services in your work environment before this survey? *

List (Radio) + Help text about Terminology Services

    a. Yes

    b. No

8. Do you develop, or curate terminologies for your community? *
List (Radio)

    a. Yes
    b. No

9. Do you need mappings between terms? *
List (Radio) + Help text about Term Mappings

    a. Yes , Please specify in the comment field on the right.(Free Text)
    b. No
    c. I could not say

10. Do you have tasks where you need to use data across disciplines? *
List (Radio)

    a. Yes, terminologies play a role in these tasks
    b. Yes, but terminologies don't play a role in these tasks
    c. No

11. If yes in 10 a or b: Could you give an example for this task?
(Free Text)

12. What support do you expect from TS4NFDI, or what are your expectations from a cross-consortium work of TS4NFDI? (Select all that apply) *
(Multiple Choice)
    a. Guidance on best practices for Terminology Service management.
    b. Technical support and resources.
    c. Training sessions and workshops on Terminology Service management.
    d. Facilitation of cross-consortium collaborations.
    e. Other (Please specify): (Free Text)

13. After the first questions of this survey could you describe very briefly in your own words where, and how you are using terminologies? *
Free Text

14. Select the appropriate branch that describes your activity. The scope and content of the other questions depend on this selection. If you would say you fit for more than one option please decide on one option. Please only select "Other" if no other fits as well. *
List (Radio)
    a. Management
    b. Developer
    c. User
    d. Other: (Free Text)

d. Developer Branch

1. What software and tools are you using in your daily work? *
(Free Text)

2. Are you providing or using terminologies in your applications? *
(List ratio)
    a. Yes, I'm providing and using terminologies.
    b. Yes, I'm providing terminologies.
    c. Yes, I'm using terminologies.

      d. No.

3. Do you offer a terminology service? *

    (List ratio)

      a. Yes.

      b. No.

4. If yes in 3: Which features does your terminology service offer? *

    (Multiple Choice)

      a. Access via API

      b. Access via Graphical User Interface (GUI)

      c. Term Search

      d. Graph View

      e. Mapping Information

      f. Other: (Free Text)

5. How do you access terminologies? *

    (Multiple Choice)

      a. Via a SPARQL endpoint

      b. Via a RESTful APIs

      c. Via a Graphical User Interface (GUI)

      d. From a local database

      e. Other: (Free Text)

6. What exchange formats do you use for terminologies? *

    (Multiple Choice)

      a. RDF/XML; Turtle; JSON-LD

      b. SKOS

      c. HL7 FHIR

      d. JSON

      e. XML

      f. OBO

g. Other: (Free Text)

7. Do you use terminology terms in your application(s)? *

   (List ratio)

   a. Yes.
   b. No.

8. If yes in 7: Do you check if a term has become obsolete/deprecated? *

   (List ratio)

   a. Yes, please specify in the comment field: (Free Text)
   b. No.

9. If yes in 7: Is versioning of terms important for your application? *

   (List ratio)

   a. Yes, it is essential for the application.
   b. I'm not sure.
   c. No.

10. Do you offer annotation tools (e.g. ELNs)? *

    (List ratio) + Help text about Annotations

    a. Yes.
    b. No.

11. If yes in 10: Are you using a web tool for this?

    List (Radio)

    a. Yes.
    b. No.

12. If yes in 11: What is the web address for the annotation tool? Feel free to add multiple web addresses if needed.

    (Free Text)

13. Do you offer or do you plan to offer a semantic search engine? *

    (List ratio)

    a. Yes, we already offer at least one semantic search engine. It is/They are called:(please specify in the comment field) (Free Text)

    b. Yes, we plan to offer at least one semantic search engine. It is/They are called:(please specify in the comment field) (Free Text)

    c. No.

14. Do you offer or do you plan to offer a knowledge graph (for your domain)? *

    (List ratio)

    a. Yes, we already offer at least one knowledge graph. It is/They are called: (please specify in the comment field)(Free Text)

    b. Yes, we plan to offer at least one knowledge graph. Details could be find here: (please specify in the comment field) (Free Text)

    c. No.

e. Manager Branch

1. What is your vision of a terminology service and how do you expect it to support you? Please outline your ideas very briefly.*
   (Free Text)

2. Do you use or plan to use terminologies to harmonize data in your domain.*
   (List ratio)
   a. Yes, we are actually using terminologies to harmonize data.
   b. Yes, we are planning to use terminologies to harmonize data in the future.
   c. No, we don't have any plans for this.

3. Are you using tools to annotate data? *
   (List ratio) + Help text about Annotations
   a. Yes.

b. No.

4. If yes in 3: Do you use terminologies to annotate data? *
    (List ratio)
    a. Yes. I use the following terminologies: (Free Text)
    b. No. I use: (Free Text)

5. If yes in 3: Which tools do you use to annotate data? *
    (Free Text)

6. Do you have dedicated partners working with terminologies, developing,
    or curating them? *
    (List ratio)
    a. Yes, the following institution and/or person is responsible: (Free
        Text)
    b. No.
    c. I don't know.

7. Play terminologies a role in your metadata schema(s)? *
    (List ratio)
    a. Yes.
    b. No.
    c. I don't know.

8. Are you using spreadsheets in your work? *
    (List ratio)
    a. Yes, it helps me in my daily work.
    b. Yes, since I have to.
    c. No.

9. Do you have or plan to create a knowledge graph for your domain? *
    (List ratio)
    a. Yes, we are actually using knowledge graphs.
    b. Yes, we are planning to use knowledge graphs in the future.
    c. No, we don't have any plans for this.

10. Do you think a terminology service should support term requests for a
    missing term? *
    (List ratio)
    a. Yes.
    b. No.

11. For which terminology tasks do you lack software tools for? *
    (Free Text)

f. User/Other Branch

1. What software and tools are you using in your daily work? *
   (Free Text)

2. Which web services (e.g. search engines, ELNs) are you using in your daily work? *
   (Free Text)

3. Are you using spreadsheets in your work? *
   (List ratio)
   a. Yes, it helps me in my daily work.
   b. Yes, since I have to.
   c. No.

4. Are you using tools to annotate data? *
   (List ratio) + Help text about Annotations
   a. Yes.
   b. No.

5. If yes in 4: Do you use terminologies to annotate data? *
   (List ratio)
   a. Yes. I use the following terminologies: (Free Text)
   b. No. I use: (Free Text)

6. If yes in 4: Which tools do you use to annotate data? *
   (Free Text)

7. Do you know what a graph view for terms is? *
   (List ratio)
   a. Yes.
   b. No.

8. If yes in 7: How would you explain what a graph view should contain? *
   (Free Text)

9. If yes in 7: Do you think a terminology service should support a graph view for terms? *
(List ratio)
   a. Yes.
   b. No.

10. If yes in 9: Is there a service which already fits your requirements?
(Free Text)

11. Do you think a terminology service should support term requests? *
(List ratio)
   a. Yes.
   b. No.

12. For which of your daily tasks, in relation to terminologies, are software tools missing? *
(Free Text)

g. **Last General Questions for Users who encountered terminologies in your work environment before this survey**

15. Select the appropriate branch that describes your activity. The scope and content of the other questions depend on this selection. If you would say you fit for more than one option please decide on one option. Please only select "Other" if no other fits as well.*

16. Do you wish to create/use your own custom collection/subset of terminologies?
(List ratio)
   a. Yes.
   b. I don't know.
   c. No.

17. In the context of terminologies does multilingualism play a role in your domain/workflows?
(List ratio)
   a. Yes.

      b. No.

18. Do you wish to create/use your own custom subset of terms?

(List ratio)

      a. Yes, I want to select a subset of terms from one terminology.

      b. Yes, I want to select terms from multiple terminologies.

      c. No.

      d. I don't know.

19. For which of the following tasks do you need the support of a basic terminology service? *

Dropdown menu including Other (Multiple Choice)

      a. Terminology services e.g. BioPortal, Ontology Lookup Service, SKOSMOS

      b. Terminology management e.g. GitHub, GitLab, WebODF

      c. Terminology development e.g. Protégé, ROBOT, OWL API, RDFLib

      d. Terminology curation e.g. VocBench, ROBOT, Protégé

      e. Terminology versioning e.g. Protégé, Git

      f. Term mapping e.g. SSSOM, Cocoda Mapping Tool, OpenRefine, OxO

      g. Annotation e.g. ELNs, Annotation Workbench

      h. Terminology accessibility e.g. TS4NFDI Widgets

20. If one item checked in 19: Which of the services in 19 do you already use?

(Free Text)

21. Can you think of new terminology service features that would improve your system/workflows? (Free Text)

h. Last General Questions for all Participants

22. Could we contact you for further questions?

(List ratio)

      a. Yes.

b. No.

23. If yes in 22: What is your first name?
(Free Text)

24. If yes in 22: What is your last name?
(Free Text)

25. If yes in 22: What is your email address?
(Free Text)

26. If yes in 22: Would you be willing to participate in a user study?
By participating in a user study, you will be asked to use a tool developed for the terminology services and provide you feedback on how you like the functionality, how easy it is to use, what can be improved upon etc.
(List ratio)
a. Yes.
b. No.

3. Results

A total of 69 participants completed the survey. The survey was open between 06. May 2024 and 14. June 2024. The results of the survey are presented in four subsections: (a) General Answers, (b) Developer Branch Answers, (c) Manager Branch Answers and (d) User/Other Branch Answers. As only two participants completed the branch entitled **"Questions for potential new Users"** (see questions in 2b)), no results section for this branch is available.

a. General Answers

Are you responsible for the operation/management of an infrastructure and/or service within the NFDI consortia?

A total of 69 survey participants were included in the analysis of the question results. Of these, 28 were responsible for at least one service, 2 for at least one infrastructure, 22 for at least one infrastructure and one service, and 17 were not responsible for a service or infrastructure. The results for this question are also presented in Table 1 and Figure 1.

Are you responsible for the operation/management of an infrastructure and/or service within the NFDI consortia?	absolute	relative
Yes, I'm responsible for at least one service.	28	40,58 %
Yes, I'm responsible for at least one infrastructure.	2	2,90 %
Yes, I'm responsible for at least one infrastructure and one service.	22	31,88 %
No.	17	24,64 %
n	69	

Table 1. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

Are you responsible for the operation/management of an infrastructure and/or service within the NFDI consortia?
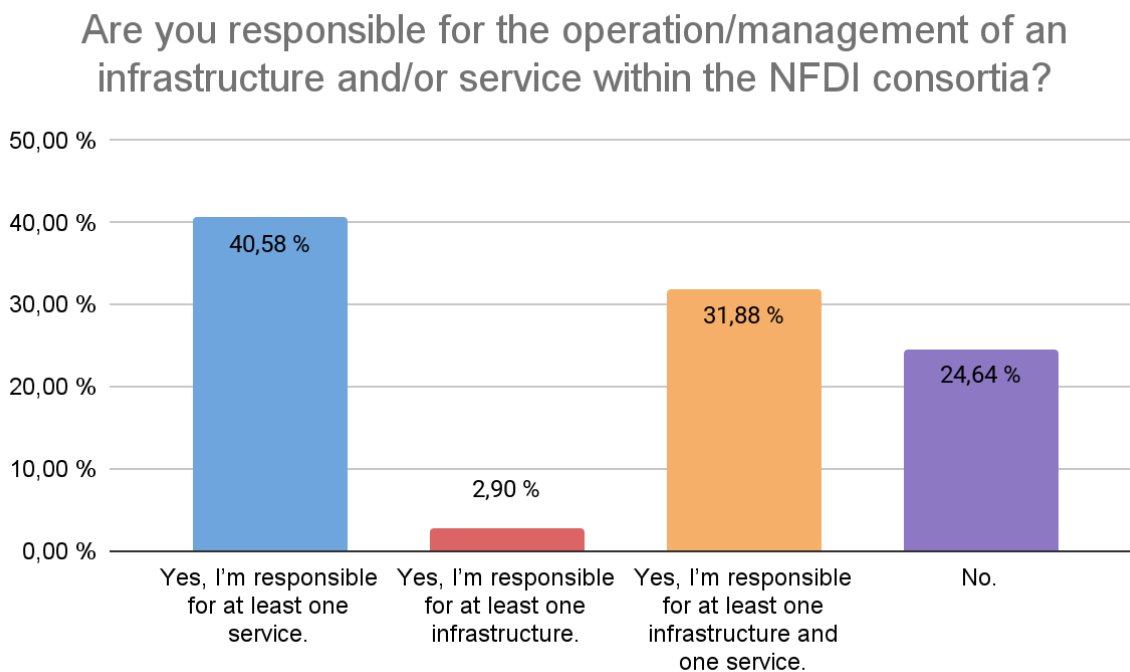
Fig. 1. The figure presents four distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes, I'm responsible for at least one service.", the red bar represents the answer "Yes, I'm responsible for at least one infrastructure.", the orange bar represents the answer "Yes, I'm responsible for at least one infrastructure and one service.", and the purple bar represents the answer "No."

Have you encountered terminologies in your work environment before this survey?

A total of 69 survey participants were included in the analysis of the question results. Of these, 67 answered in the "Yes." option, while two participants selected the "No." option. The results for this question are also presented in Table 2 and Figure 2.

Have you encountered terminologies in your work environment before this survey?	absolute	relative
Yes.	67	97,10 %
No.	2	2,90 %
n	69	

Table 2. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
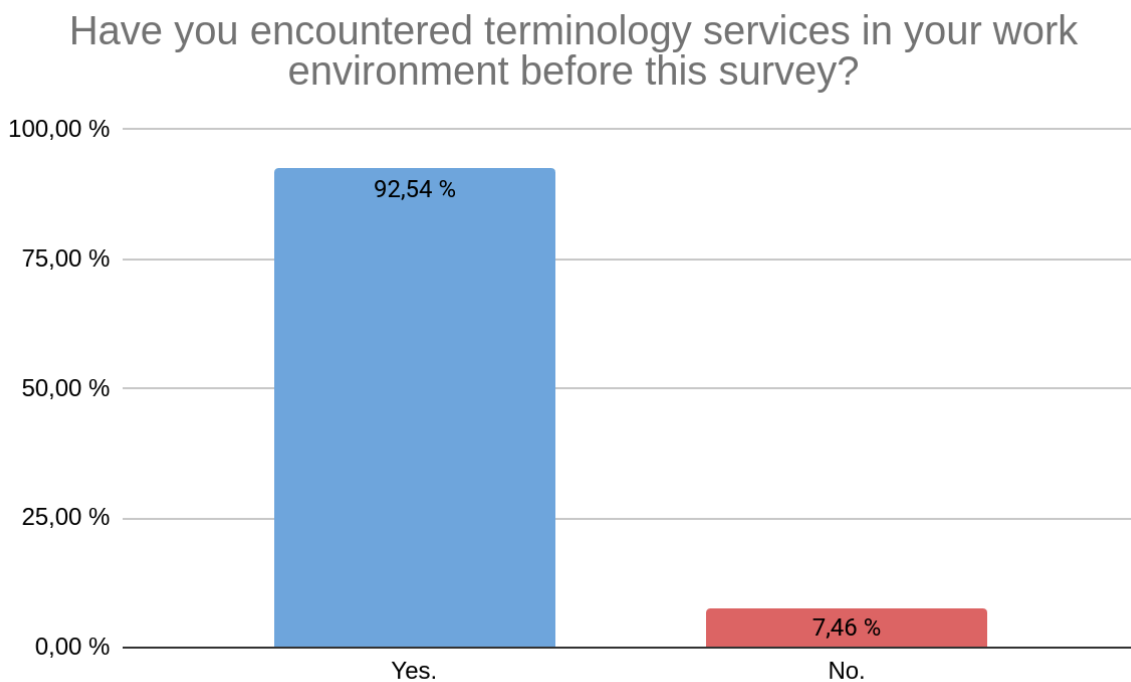

Have you encountered terminologies in your work environment before this survey?
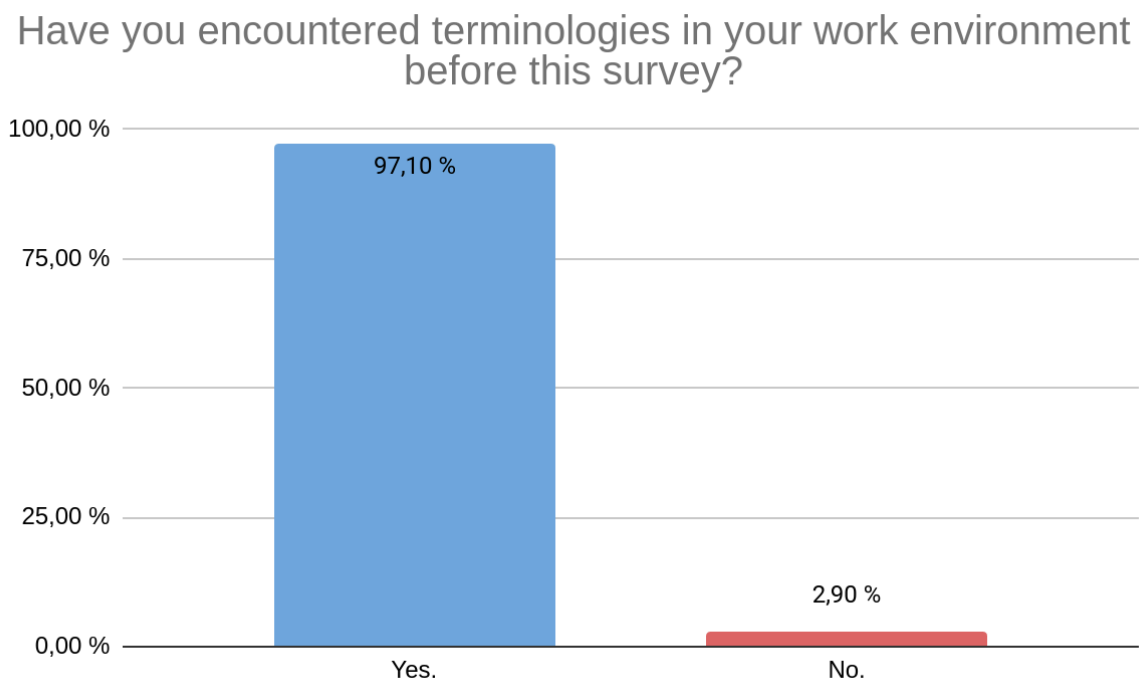
Fig. 2. The figure presents two distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", and the red bar represents the answer "No."

Have you encountered terminology services in your work environment before this survey?

A total of 67 survey participants were included in the analysis of the question results. Of these, 62 have encountered terminology services in their work environment and 5 have not. The results for this question are also presented in Table 3 and Figure 3.

Have you encountered terminology services in your work environment before this survey?	absolute	relative
Yes.	62	92,54 %
No.	5	7,46 %
n	67	

Table 3. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
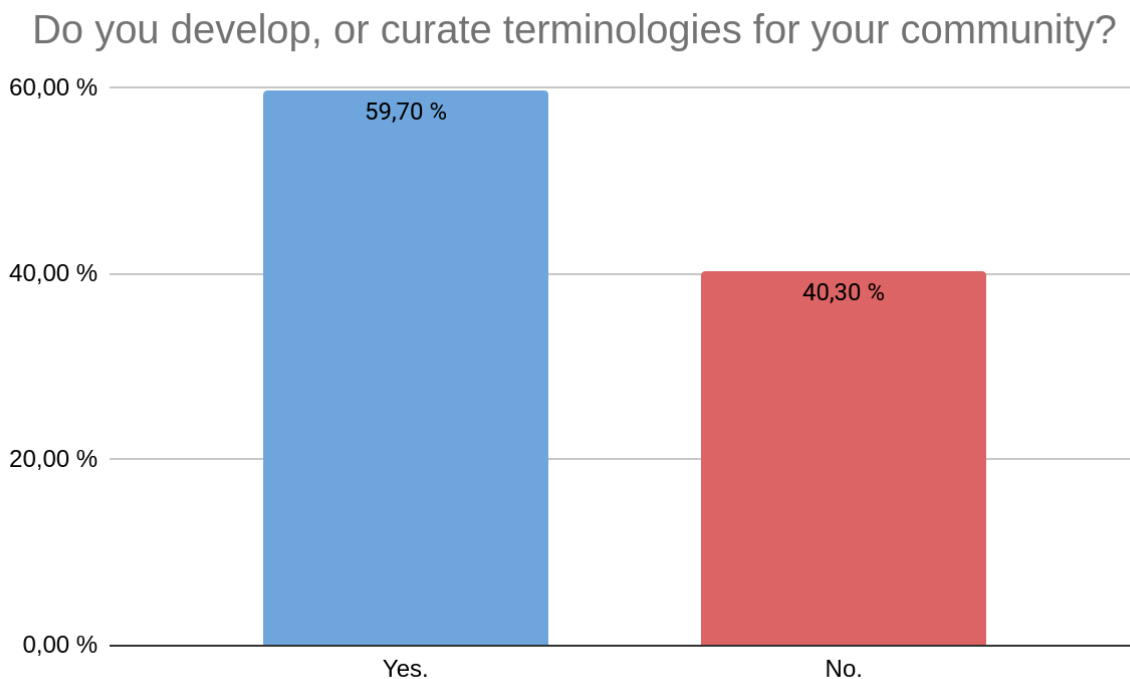

Fig. 3. The figure presents two distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", and the red bar represents the answer "No."

Do you develop, or curate terminologies for your community?

A total of 67 survey participants were included in the analysis of the question results. Of these, 40 have developed or curated terminologies for their community and 27 have not. The results for this question are also presented in Table 4 and Figure 4.

Do you develop, or curate terminologies for your community?	absolute	relative
Yes.	40	59,70 %
No.	27	40,30 %
n	67	

Table 4. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
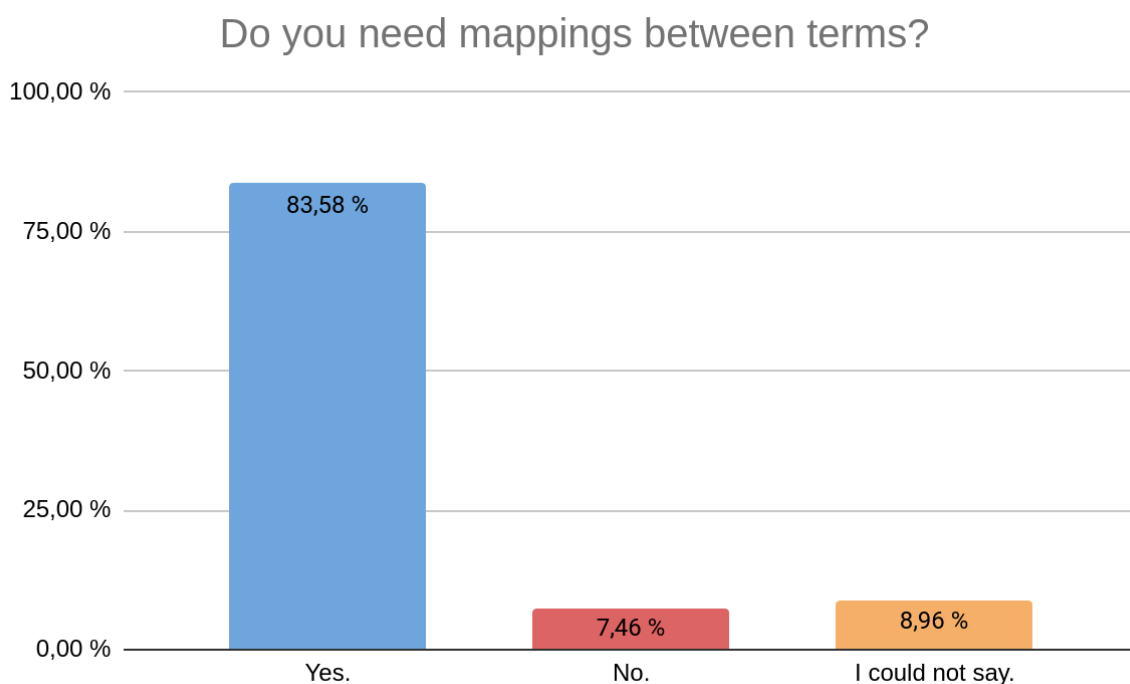

Fig. 4. The figure presents two distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", and the red bar represents the answer "No."

Do you need mappings between terms?

A total of 67 survey participants were included in the analysis of the question results. Of these, 56 needed mappings between terms, 5 said not needed, and 6 could

not say whether they needed or not. The results for this question are also presented in Table 5 and Figure 5.

Do you need mappings between terms?	absolute	relative
Yes.	56	83,58 %
No.	5	7,46 %
I could not say.	6	8,96 %
n	67	

Table 5. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
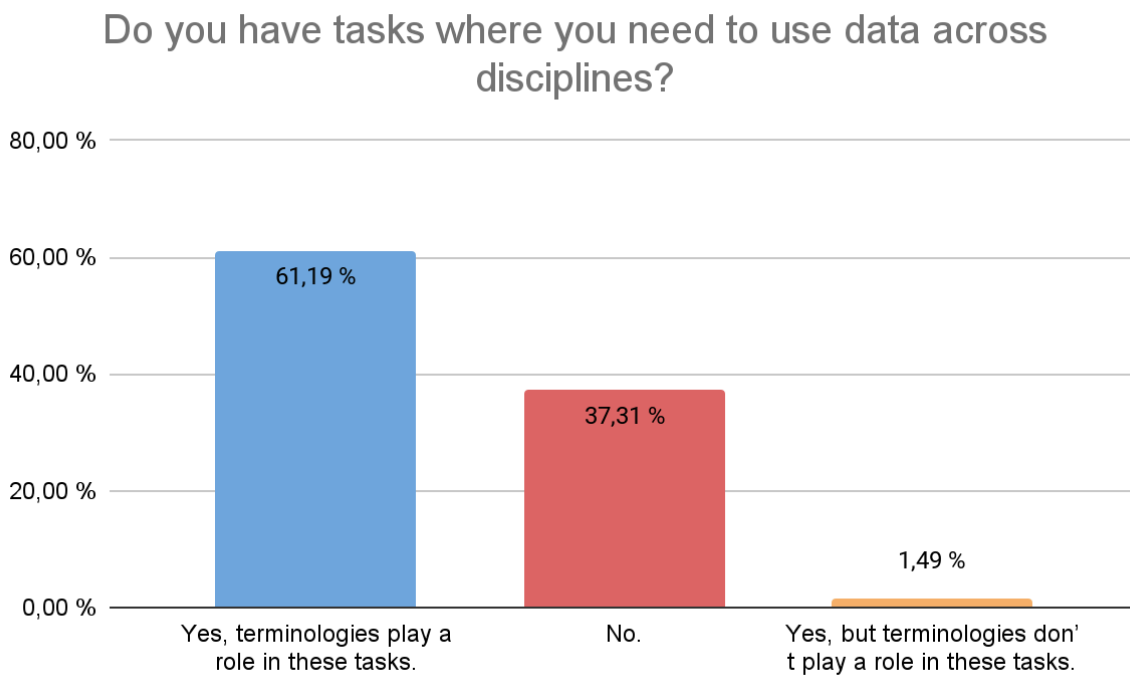
Do you need mappings between terms?

Fig. 5. The figure presents three distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", the red bar represents the answer "No.", and the orange bar represents the answer "I could not say."

Do you have tasks where you need to use data across disciplines?

A total of 67 survey participants were included in the analysis of the question results. Of these, 41 have tasks that require the data across disciplines, 1 requires but without the need for terminologies, and 25 do not have this need at all. The results for this question are also presented in Table 6 and Figure 6.

Do you have tasks where you need to use data across disciplines?	absolute	relative
Yes, terminologies play a role in these tasks.	41	61,19 %
No.	25	37,31 %
Yes, but terminologies don't play a role in these tasks.	1	1,49 %
n	67	

Table 6. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.


Fig. 6. The figure presents three distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes, terminologies play a role in these tasks.", the red bar represents the answer "No.", and the orange bar represents the answer "Yes, but terminologies don't play a role in these tasks."

Are you using terminologies? (Consortia coverage)

These results were calculated from the original answers of question 6 from Continue General Questions for Users. A response of "Yes." in Table 7 and Figure 7 indicates that at least one survey participant from a particular consortium selected at least one of three possible "Yes." responses a-c to question 6. A total of 27 survey participants were included in the analysis of the question results. Of these, 25 are using terminologies in their tasks and 2 are not. The results for this question are also

presented in Table 7 and Figure 7.

Are you using terminologies?	absolute	relative
Yes.	25	92,59 %
No.	2	7,41 %
n	27	

Table 7. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
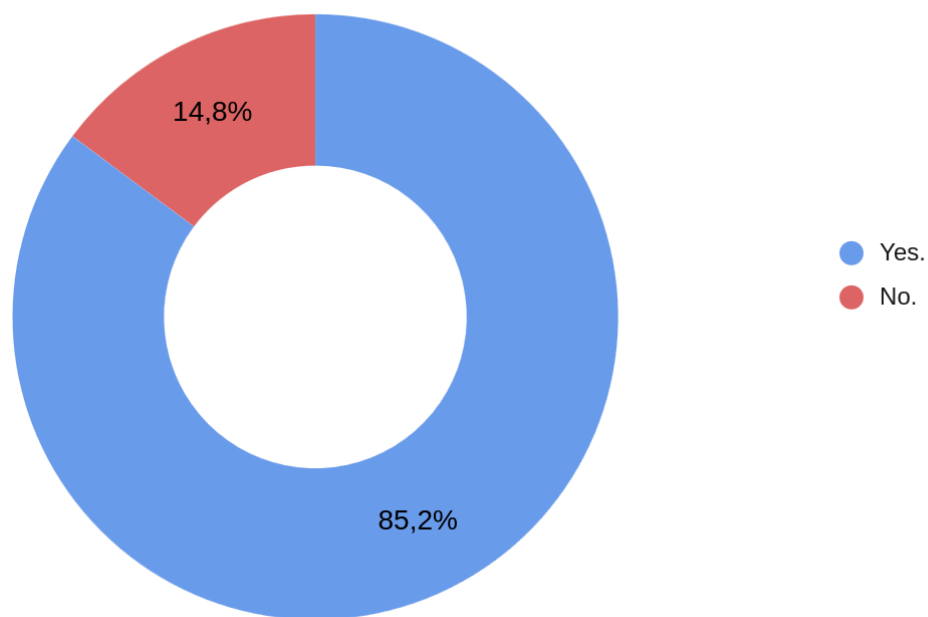
Are you using terminologies?
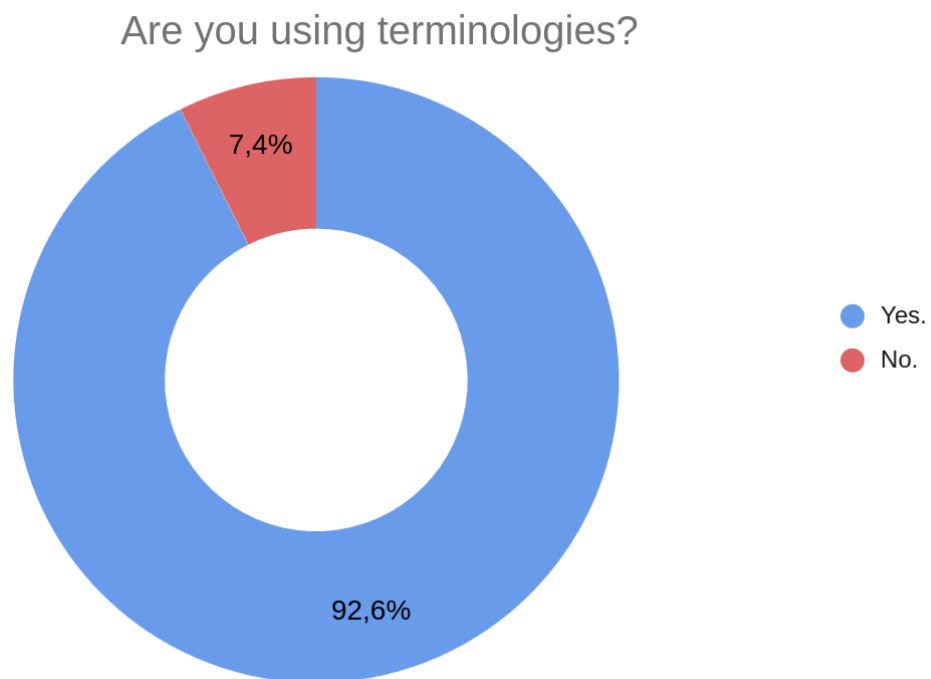
Fig. 7. The "Yes." answers are marked in blue. The "No." answers are marked in red. There are a total of 27 survey participants.

Are you using terminologies for data annotation? (Consortia coverage)

These results were calculated from the original answers of question 6 from Continue General Questions for Users. A response of "Yes." in Table 8 and Figure 8 indicates that at least one survey participant from a particular consortium selected the possible answer "Yes, I'm using them for data annotation." to question 6. A total of 27 survey participants were included in the analysis of the question results. Of these, 23 are using terminologies for data annotation and 4 are not. The results for this question are also presented in Table 8 and Figure 8.

Are you using terminologies for data annotation?	absolute	relative
Yes.	23	85,19 %
No.	4	14,81 %
n	27	

Table 8. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

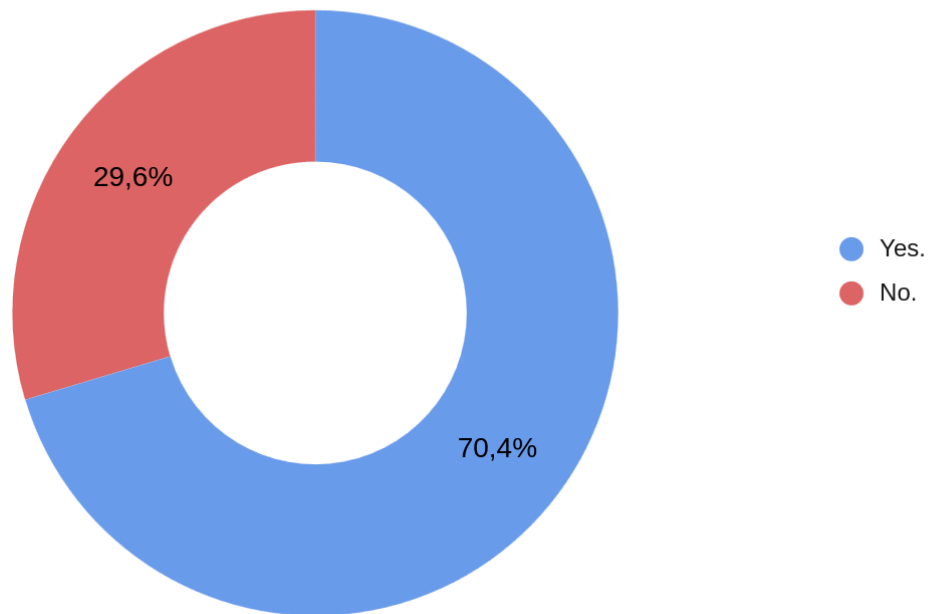## Are you using terminologies for data annotation?

Fig. 8. The "Yes." answers are marked in blue. The "No." answers are marked in red. There are a total of 27 survey participants.

Are you using terminologies to provide a search engine? (Consortia coverage)

These results were calculated from the original answers of question 6 from Continue General Questions for Users. A response of "Yes" in Table 9 and Figure 9 indicates that at least one survey participant from a particular consortium selected the possible answer "Yes, I'm using them to provide a search engine." to question 6. A total of 27 survey participants were included in the analysis of the question results. Of these, 19 are using terminologies to provide search engines and 8 are not. The results for this question are also presented in Table 9 and Figure 9.

Are you using terminologies to provide a search engine?	absolute	relative
Yes.	19	70,37 %
No.	8	29,63 %
n	27	

Table 9. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

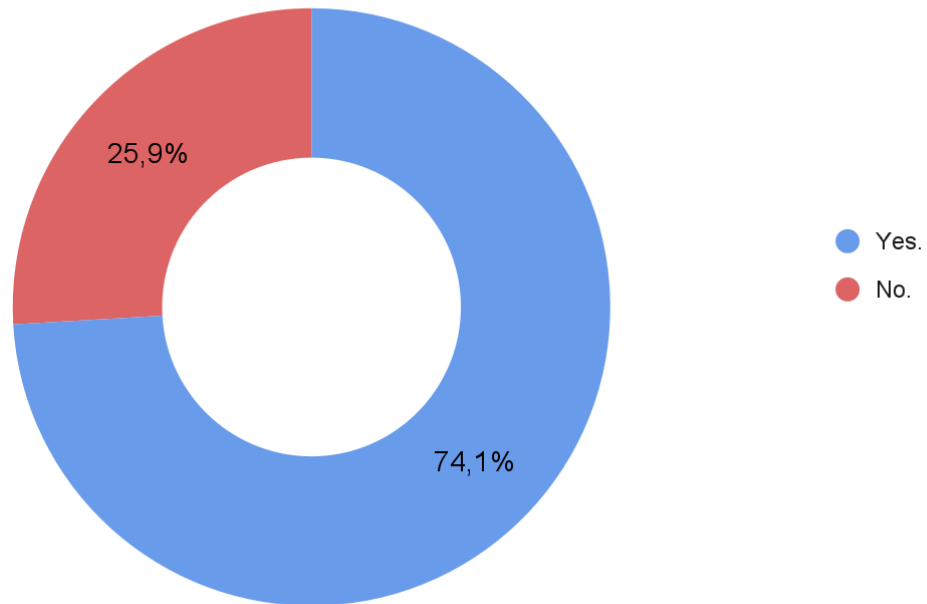## Are you using terminologies to provide a search engine?

Fig. 9. The "Yes." answers are marked in blue. The "No." answers are marked in red. There are a total of 27 survey participants.

Are you using terminologies to increase usability? (Consortia coverage)

These results were calculated from the original answers of question 6 from Continue General Questions for Users. A response of "Yes" in Table 10 and Figure 10 indicates that at least one survey participant from a particular consortium selected the possible answer "Yes, I'm using them to increase usability." to question 6. A total of 27 survey participants were included in the analysis of the question results. Of these, 20 are using terminologies to increase usability and 7 are not. The results for this question are also presented in Table 10 and Figure 10.

Are you using terminologies to increase usability?	absolute	relative
Yes.	20	74,07 %
No.	7	25,93 %
n	27	

Table 10. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

Are you using terminologies to increase usability?

Fig. 10. The "Yes." answers are marked in blue. The "No." answers are marked in red. There are a total of 27 survey participants.

Are you using terminologies?

A total of 67 survey participants were included in the analysis of the question results. A participant could select multiple consortia. Members of all 27 consortia participated in the survey. A total of 88 responses were submitted. This means that some participants belong to more than just one consortium. There is a range of 1 to 7 participants per consortium that completed the survey.

Consortium	Number of participants
Base4NFDI	2
BERD@NFDI	4
DAPHNE4NFDI	2
DataPLANT	4
FAIRagro	2
FAIRmat	1
GHGA	1
KonsortSWD	6
MaRDI	1
NFDI4Biodiversity	6
NFDI4BIOIMAGE	1
NFDI4Cat	4
NFDI4Chem	4
NFDI4Culture	7
NFDI4DataScience	3
NFDI4Earth	7
NFDI4Energy	3
NFDI4Health	3
NFDI4Immuno	1
NFDI4Ing	4
NFDI-MatWerk	1
NFDI4Memory	6
NFDI4Microbiota	4
NFDI4Objects	4
NFDIxCS	1
PUNCH4NFDI	1
Text+	5
n	88

Table 11. The table is divided into two columns. The first column on the left side presents the possible answers, and the right column presents the absolute numbers for each answer. The first row contains the table headers, and the last row lists the total number of answers for this question.
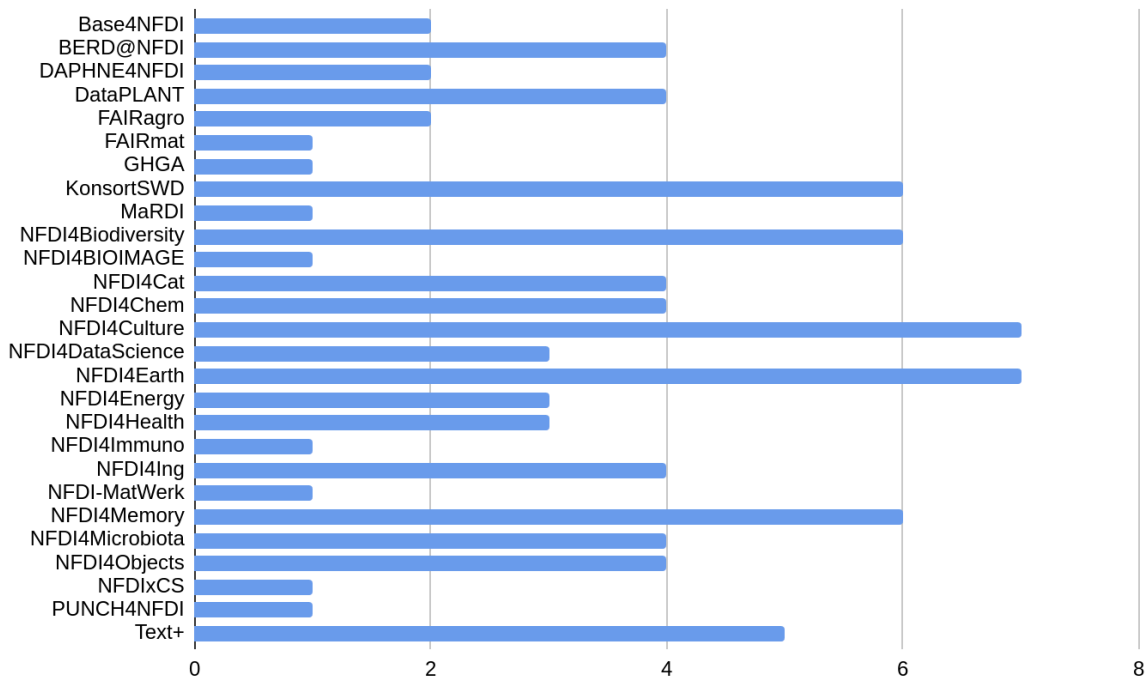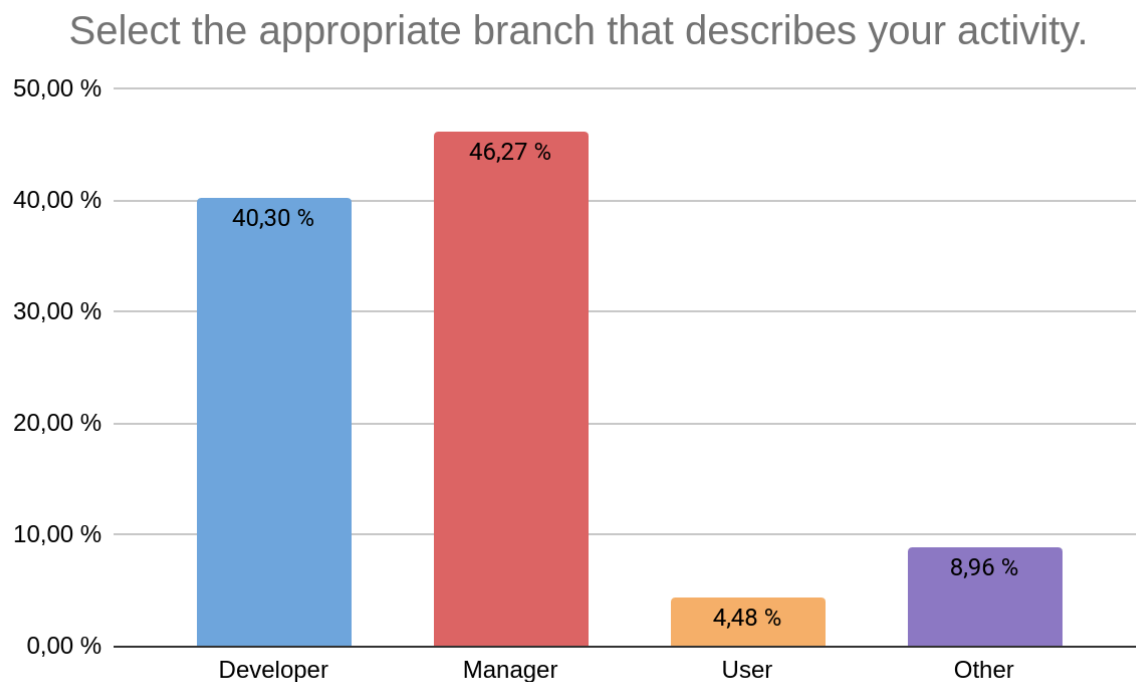
Fig. 11. The figure presents 27 potential responses for the y-axis, while the x-axis depicts the corresponding absolute values. Each blue bar represents the number of participants of a specific NFDI consortium.

Select the appropriate branch that describes your activity.

A total of 67 survey participants were included in the analysis of the question results. Of these, 27 selected the answer "Developer", 31 selected the answer "Manager", 3 selected the answer "User", and 3 selected the answer "Other". The fourth answer possibility "Other" of question 14 in subsection was added to identify potential other use cases for terminology services next to "Developer", "Manager" or "User". The free text responses of 5 participants who selected "Other" included the following terms: "Coordinator", "Advisor", "Dev + Manager", "Infrastructure developer/provider", and "Training users on existing ontologies". This indicates that one user did not select either the Developer or Manager branch. The participants who describe themselves as "Coordinator" and "Consultant" are related to a manager. The participant who describes himself as an "infrastructure developer/provider" is a specialized developer. The participant who describes himself as a trainer "Training users on existing ontologies". The last participant who selected "Other" didn't fill out the corresponding free text field. The results for this question are also presented in Table 12 and Figure 12.

Select the appropriate branch that describes your activity.	absolute	relative
Developer	27	40,30 %
Manager	31	46,27 %
User	3	4,48 %
Other	6	8,96 %
n	67	

Table 12. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
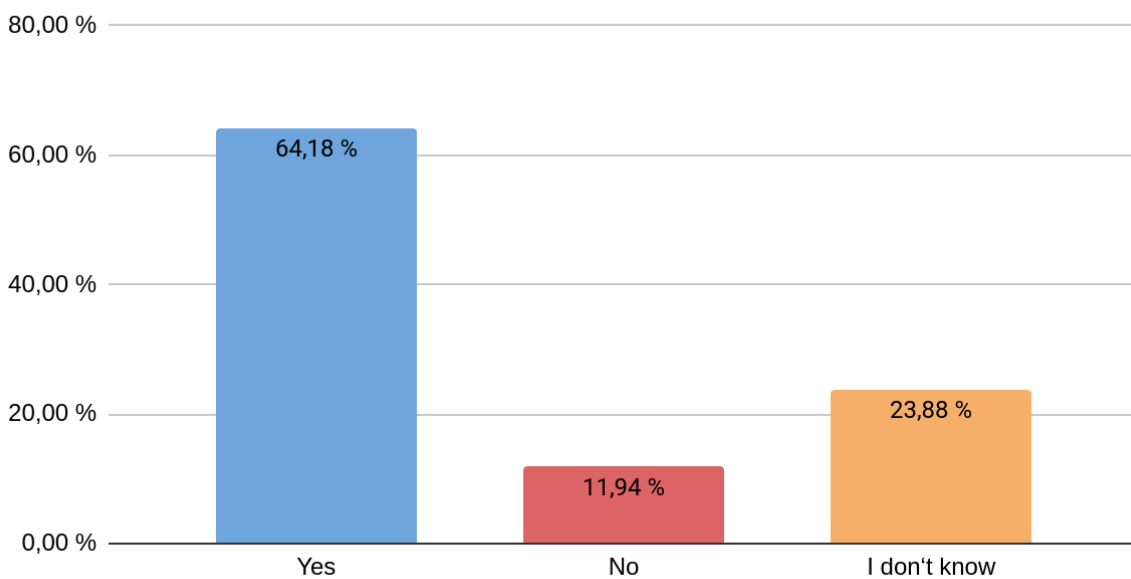

Fig. 12. The figure presents four distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Developer", the red bar represents the answer "Manager", the orange bar represents the answer "User", and the purple bar represents the answer "Other"

Do you wish to create/use your own custom collection/subset of terminologies?

A total of 67 survey participants were included in the analysis of the question results. Of these, 43 wish to create/use custom collections/subsets of terminologies, 8 do not, and 16 have stated they don't know. The results for this question are also presented in Table 13 and Figure 13.

Do you wish to create/use your own custom collection/subset of terminologies?	absolute	relative
Yes	43	64,18 %
No	8	11,94 %
I don't know	16	23,88 %
n	67	

Table 13. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
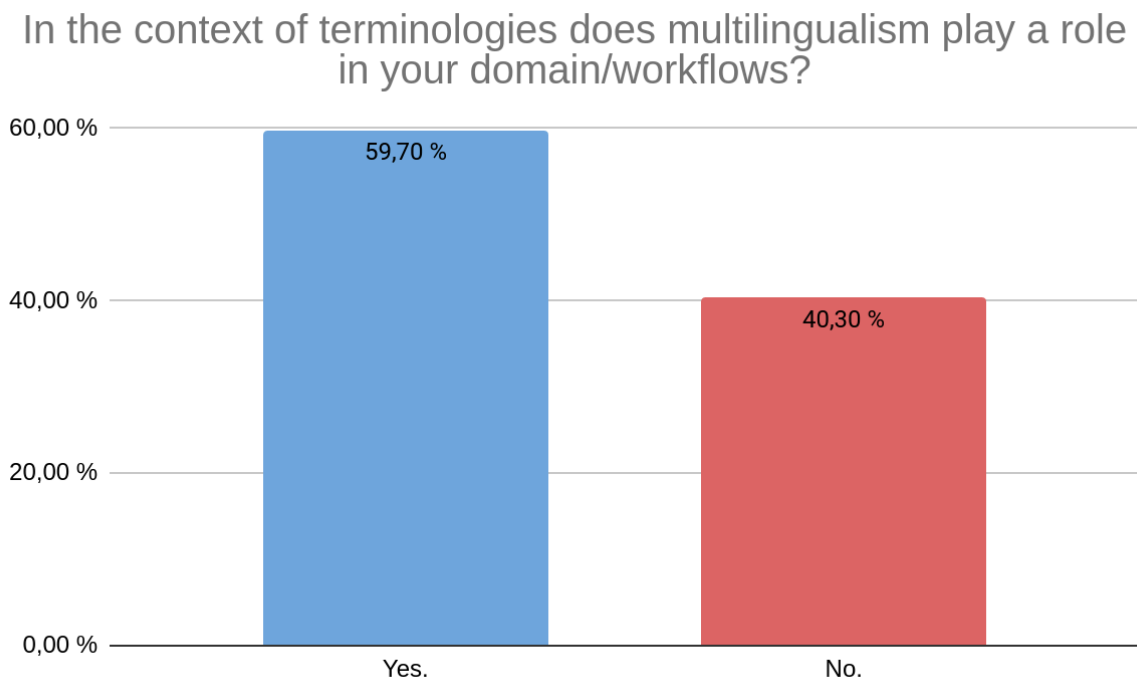

Fig. 13. The figure presents three distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes", the red bar represents the answer "No", and the orange bar represents the answer "I don't know"

In the context of terminologies does multilingualism play a role in your domain/workflows?

A total of 67 survey participants were included in the analysis of the question results. Of these, 40 mentioned that multilingualism plays a role in their domain in the context of terminologies and 27 said it plays no role. The results for this question are also presented in Table 14 and Figure 14.

In the context of terminologies does multilingualism play a role in your domain/workflows?	absolute	relative
Yes.	40	59,70 %
No.	27	40,30 %
n	67	

Table 14. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
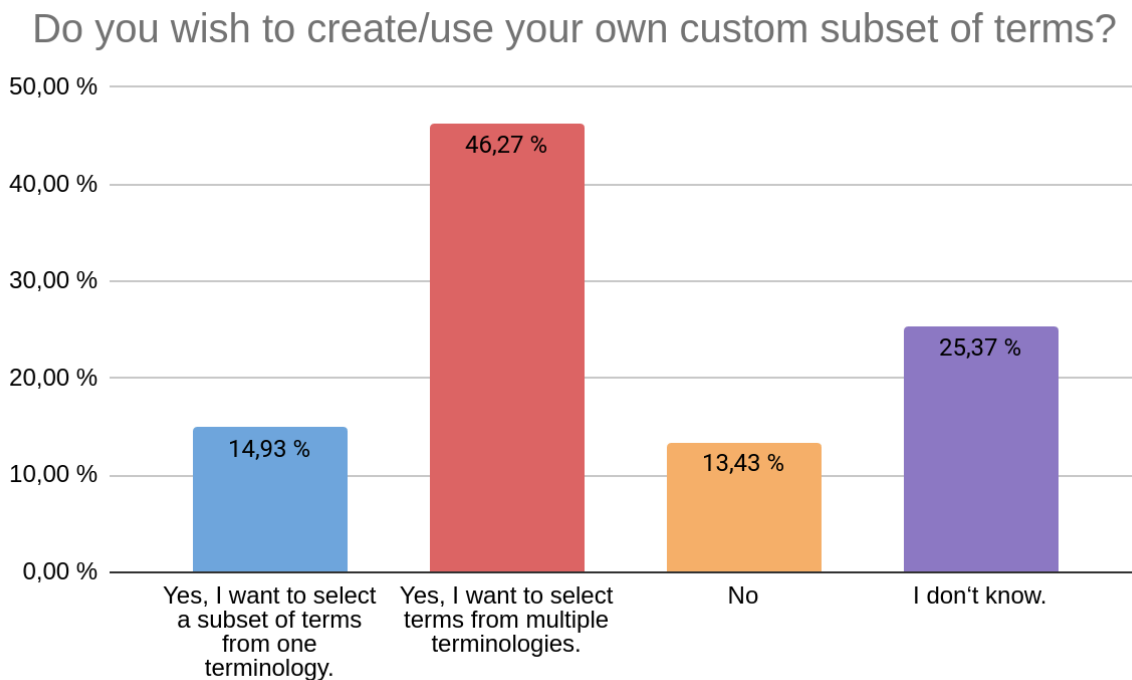

Fig. 14. The figure presents three distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", and the red bar represents the answer "No."

Do you wish to create/use your own custom subset of terms?

A total of 67 survey participants were included in the analysis of the question results. Of these, 10 have stated that they want to define a subset of terms from one terminology, 31 want to define subsets from multiple terminologies, 9 said they do not need a subset of terms, and 17 said they don't know. The results for this question are also presented in Table 15 and Figure 15.

Do you wish to create/use your own custom subset of terms?	absolute	relative
Yes, I want to select a subset of terms from one terminology.	10	14,93 %
Yes, I want to select terms from multiple terminologies.	31	46,27 %
No	9	13,43 %
I don't know.	17	25,37 %
n	67	

Table 15. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

Fig. 15. The figure presents four distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes, I want to select a subset of terms from one terminology.", the red bar represents the answer "Yes, I want to select terms from multiple terminologies.", the orange bar represents the answer "No", and the purple bar represents the answer "I don't know."

What support do you expect from TS4NFDI, or what are your expectations from a cross-consortium work of TS4NFDI?

A total of 67 survey participants were included in the analysis of the question results. Of these, 46 expect guidance from TS4NFDI on best practices for terminology service management, 45 demand technical support and resources, 33 expect training sessions and workshops on terminology management, and 38 require facilitation of

cross-consortium collaborations. The results for this question are also presented in Table 16 and Figure 16.

What support do you expect from TS4NFDI, or what are your expectations from a cross-consortium work of TS4NFDI?	absolute	relative
Guidance on best practices for Terminology Service management.	46	68,66 %
Technical support and resources.	45	67,16 %
Training sessions and workshops on Terminology Service management.	33	49,25 %
Facilitation of cross-consortium collaborations.	38	56,72 %
n	67	

Table 16. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
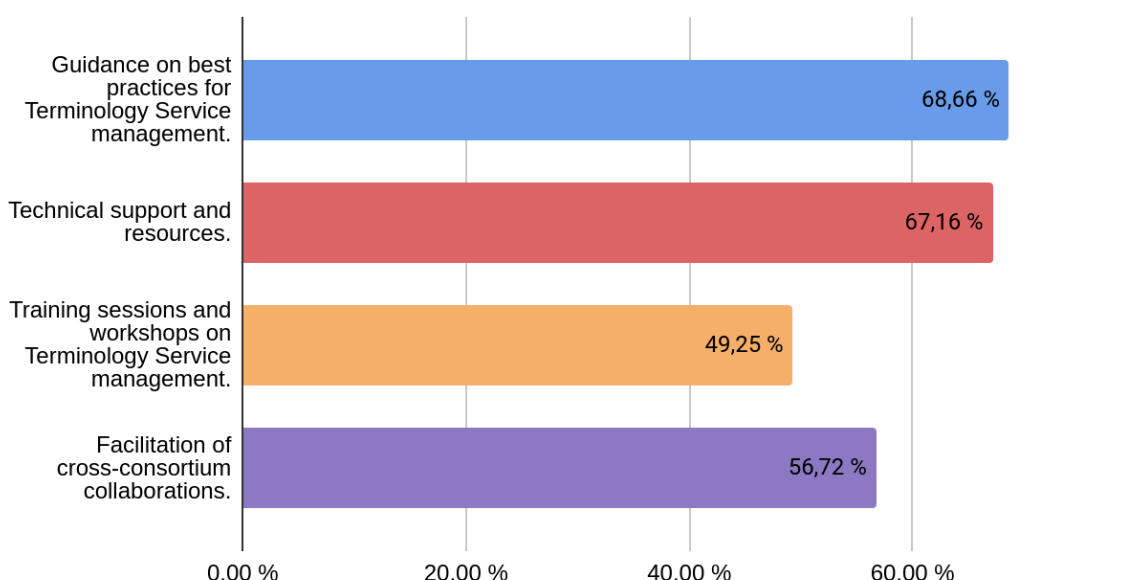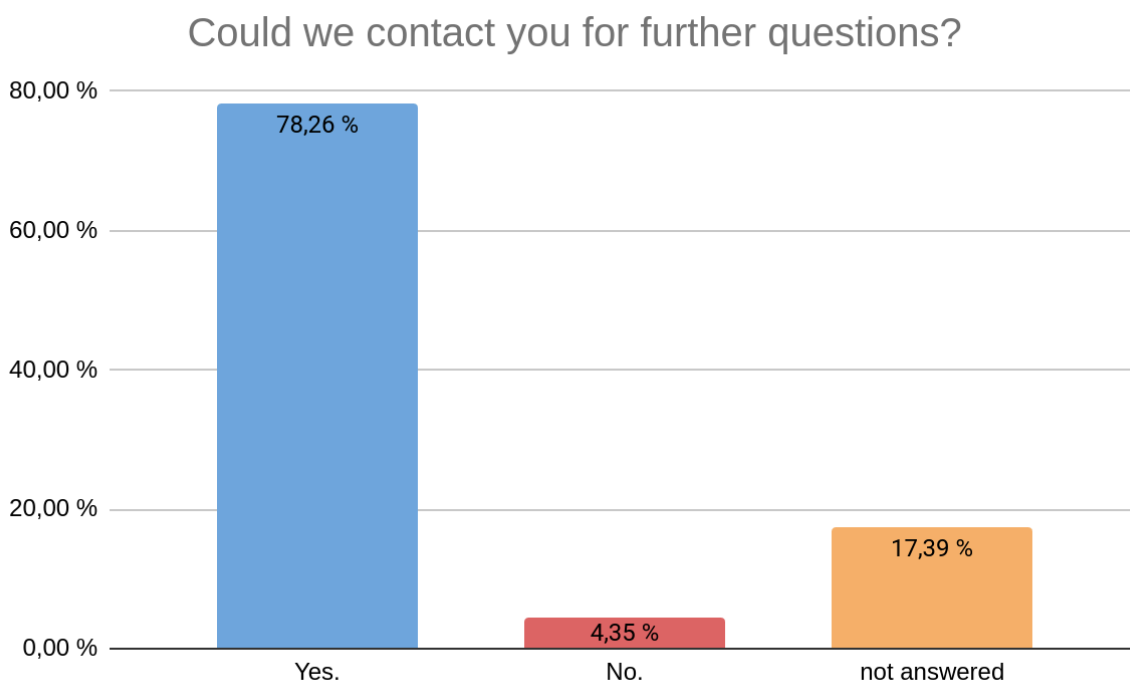

Fig. 16. The figure presents four distinct potential responses for the y-axis, while the x-axis depicts the corresponding percentage values. The blue bar represents the answer "Guidance on best practices for Terminology Service management.", the red bar represents the answer "Technical support and resources.", the orange bar represents the answer "Training sessions and workshops on Terminology Service management.", and the purple bar represents the answer "Facilitation of cross-consortium collaborations."

Could we contact you for further questions?

A total of 69 survey participants were included in the analysis of the question results. Of these, 54 have agreed to get contacted by TS4NFDI team for further

questions, 3 said no, and 12 preferred not to answer. The results for this question are also presented in Table 17 and Figure 17.

Could we contact you for further questions?	absolute	relative
Yes.	54	78,26 %
No.	3	4,35 %
not answered	12	17,39 %
n	69	

Table 17. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
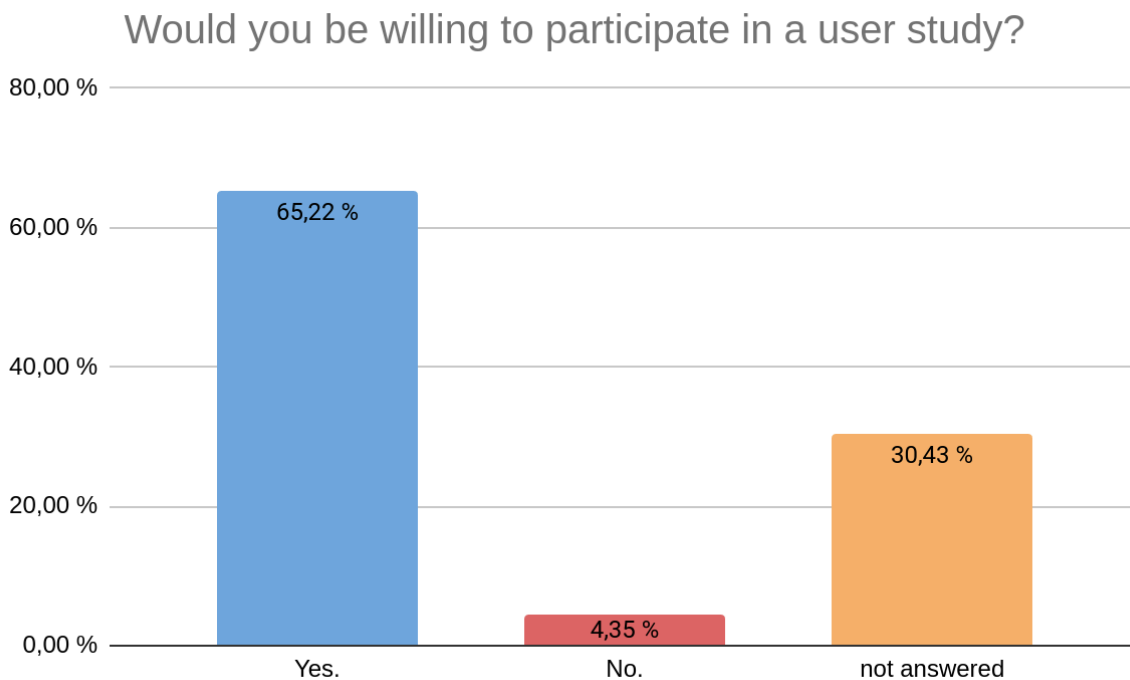

Fig. 17. The figure presents three distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", the red bar represents the answer "No.", and the orange bar represents the answer "not answered".

Would you be willing to participate in a user study?

A total of 69 survey participants were included in the analysis of the question results. Of these, 45 have agreed to participate in a user study, 3 said no, and 21 preferred not to answer. The results for this question are also presented in Table 18 and Figure 18.

Would you be willing to participate in a user study?	absolute	relative
Yes.	45	65,22 %
No.	3	4,35 %
not answered	21	30,43 %
n	69	

Table 18. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
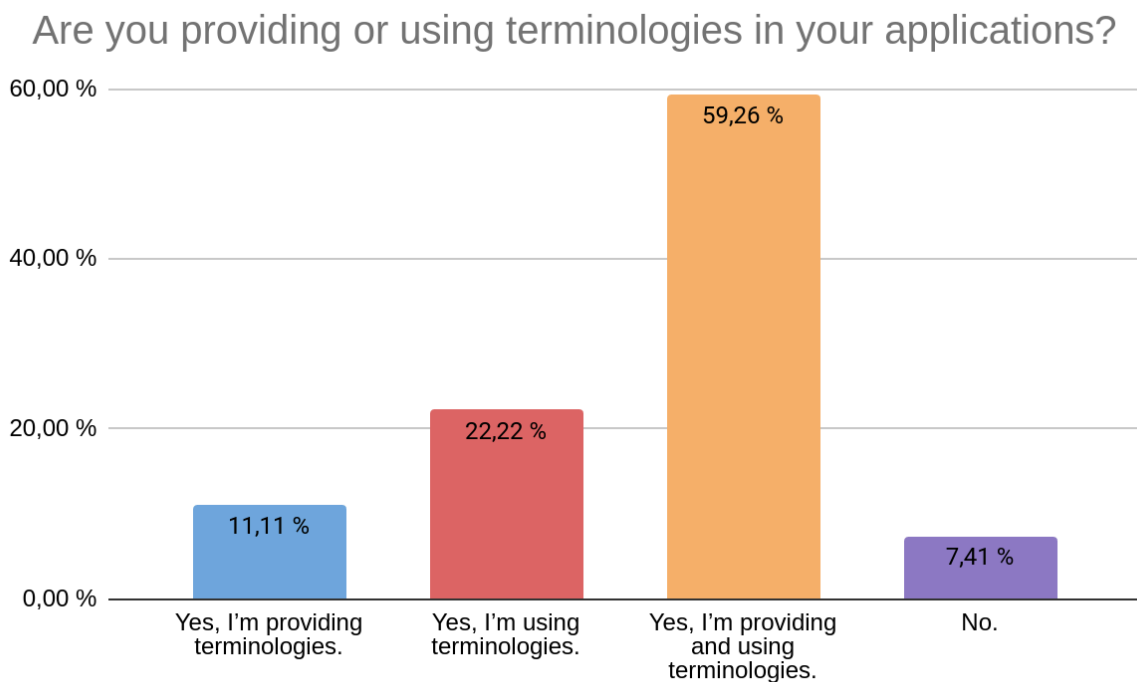

Fig. 18. The figure presents three distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", the red bar represents the answer "No.", and the orange bar represents the answer "not answered".

b. Developer Branch Answers

Are you providing or using terminologies in your applications?

A total of 27 survey participants were included in the analysis of the question results. Of these, 3 provide terminologies in their applications, 6 use terminologies in their applications, 16 use and provide terminologies, and 2 neither use nor provide terminologies in their applications. The results for this question are also presented in Table 19 and Figure 19.

Are you providing or using terminologies in your applications?	absolute	relative
Yes, I'm providing terminologies.	3	11,11 %
Yes, I'm using terminologies.	6	22,22 %
Yes, I'm providing and using terminologies.	16	59,26 %
No.	2	7,41 %
n	27	

Table 19. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
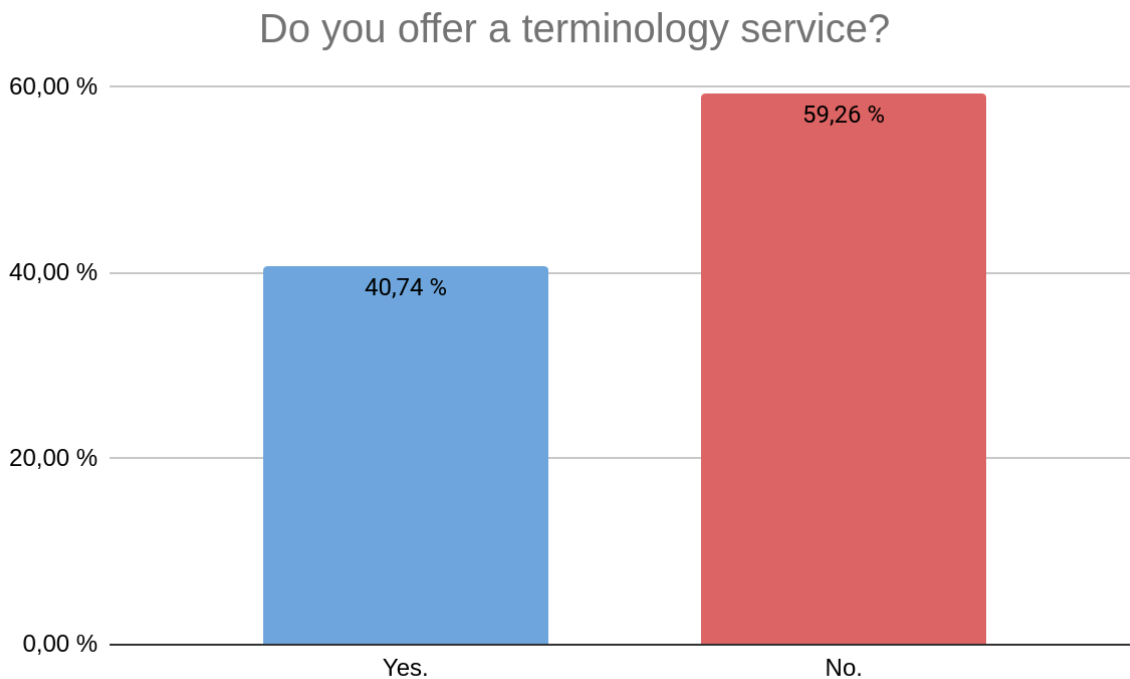

Fig. 19. The figure presents four distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes, I'm providing terminologies.", the red bar represents the answer "Yes, I'm using terminologies.", the orange bar represents the answer "Yes, I'm providing and using terminologies.", and the purple bar represents the answer "No."

Do you offer a terminology service?

A total of 27 survey participants were included in the analysis of the question results. Of these, 11 offer a terminology service and 16 do not. The results for this question are also presented in Table 20 and Figure 20.

Do you offer a terminology service?		absolute	relative
	Yes.	11	40,74 %
	No.	16	59,26 %
	n	27	

Table 20. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

Fig. 20. The figure presents two distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", and the red bar represents the answer "No."

Which features does your terminology service offer?

A total of 11 survey participants were included in the analysis of the question results. Of these, 10 stated that their terminology service offers "Access via API", 10 offer "Access via a Graphical User Interface (GUI)", 9 provide a "Term Search", 5 provide a "Graph View", and 3 offer "Mapping Information". The results for this question are also presented in Table 21 and Figure 21.

Which features does your terminology service offer?		
Access via API	**absolute**	**relative**
Yes	10	90,91 %
No	1	9,09 %
Access via GUI	**absolute**	**relative**
Yes	10	90,91 %
No	1	9,09 %
Term Search	**absolute**	**relative**
Yes	9	81,82 %
No	2	18,18 %
Graph View	**absolute**	**relative**
Yes	5	45,45 %
No	6	54,55 %
Mapping Information	**absolute**	**relative**
Yes	3	27,27 %
No	8	72,73 %
n	11	

Table 21. The table is divided into three columns. The unformatted content of the first column on the left side presents the possible answers, the unformatted content of the column in the middle presents the absolute numbers, and the unformatted content of the last column presents the relative numbers. The first row contains the survey question, the first cell of the second, fifth, eighth, eleventh, and fourteenth row contains the possible answers, and the last row lists the total number of survey participants.
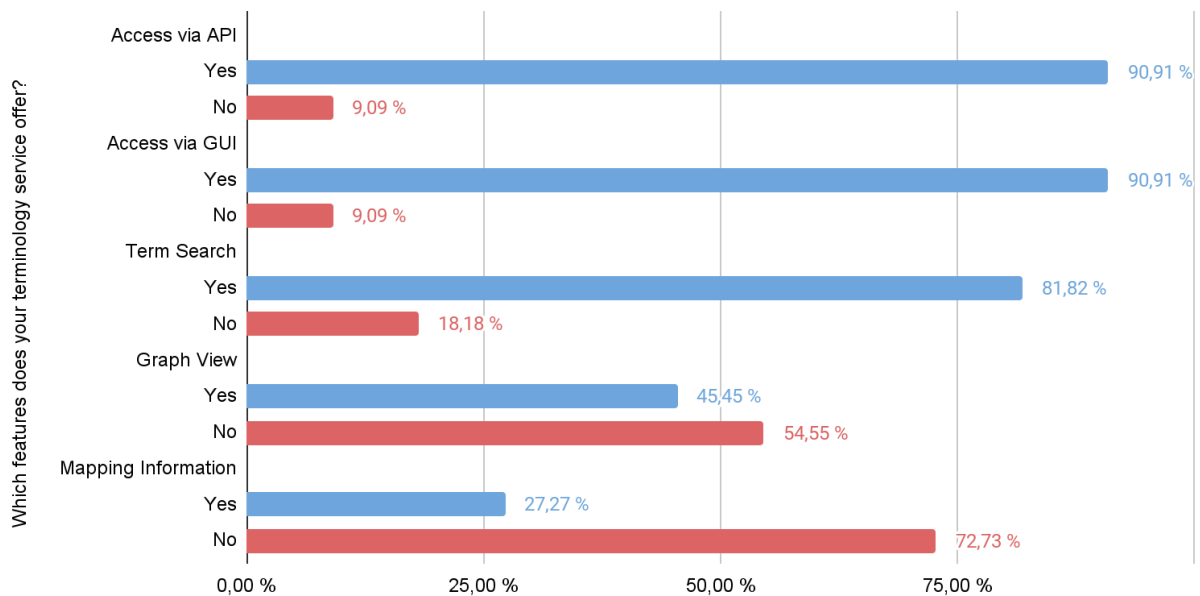

Fig. 21. The figure shows five possible answers on the y-axis and the corresponding percentages on the x-axis. Each of the blue bars represents a 'yes' answer and each of the red bars represents a 'no' answer for one of the five possible answers.

How do you access terminologies?

A total of 27 survey participants were included in the analysis of the question results. Of these, 8 access terminologies "Via a SPARQL endpoint", 16 access "Via RESTful APIs", 19 "Via a Graphical User Interface (GUI)", and 6 "From a local database". The results for this question are also presented in Table 22 and Figure 22.

How do you access terminologies?		
Via a SPARQL endpoint	**absolute**	**relative**
Yes	8	29,63 %
No	19	70,37 %
Via RESTful APIs	**absolute**	**relative**
Yes	16	59,26 %
No	11	40,74 %
Via a Graphical User Interface (GUI)	**absolute**	**relative**
Yes	19	70,37 %
No	8	29,63 %
From a local database	**absolute**	**relative**
Yes	6	22,22 %
No	21	77,78 %
n	27	

Table 22. The table is divided into three columns. The unformatted content of the first column on the left side presents the possible answers, the unformatted content of the column in the middle presents the absolute numbers, and the unformatted content of the last column presents the relative numbers. The first row contains the survey question, the first cell of the second, fifth, eighth, and eleventh row contains the possible answers, and the last row lists the total number of survey participants.
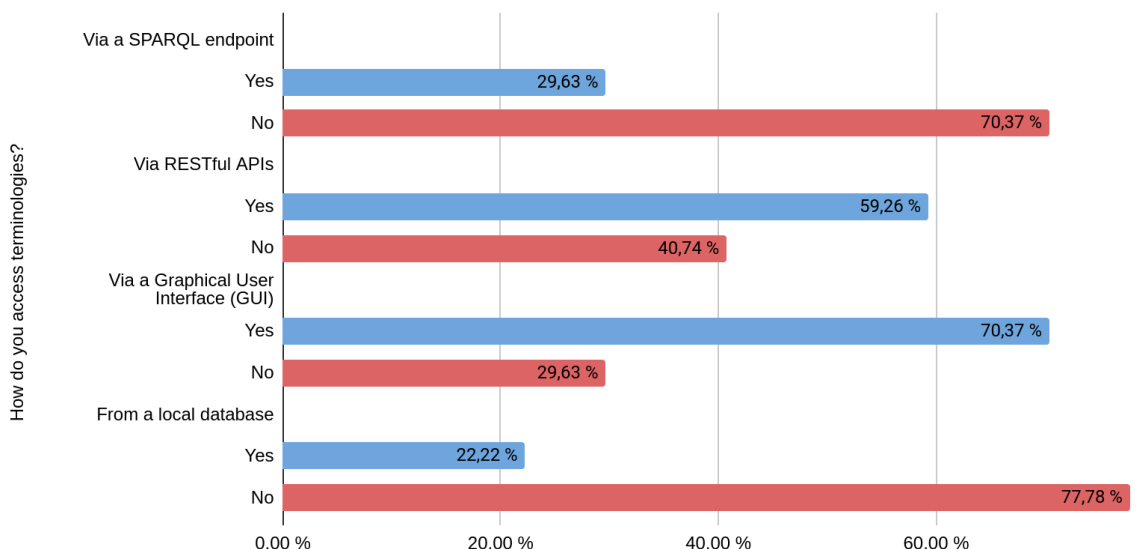

Fig. 22. The figure shows four possible answers on the y-axis and the corresponding percentages on the x-axis. Each of the blue bars represents a 'yes' answer and each of the red bars represents a 'no' answer for one of the four possible answers.

What exchange formats do you use for terminologies?

A total of 27 survey participants were included in the analysis of the question results. Of these, 21 use "RDF/XML; Turtle; JSON-LD" as the terminology exchange format, 11 use "SKOS", none use "HL7 FHIR", 13 use "JSON", 5 use "XML", and 4 use "OBO". The results for this question are also presented in Table 23 and Figure 23.

What exchange formats do you use for terminologies?		
RDF/XML; Turtle; JSON-LD	**absolute**	**relative**
Yes	21	77,78 %
No	6	22,22 %
SKOS	**absolute**	**relative**
Yes	11	40,74 %
No	16	59,26 %
HL7 FHIR	**absolute**	**relative**
Yes	0	0,00 %
No	27	100,00 %
JSON	**absolute**	**relative**
Yes	13	48,15 %
No	14	51,85 %
XML	**absolute**	**relative**
Yes	5	18,52 %
No	22	81,48 %
OBO	**absolute**	**relative**
Yes	4	14,81 %
No	23	85,19 %
n	27	

Table 23. The table is divided into three columns. The unformatted content of the first column on the left side presents the possible answers, the unformatted content of the column in the middle presents the absolute numbers, and the unformatted content of the last column presents the relative numbers. The first row contains the survey question, the first cell of the second, fifth, eighth, eleventh, fourteenth, and seventeenth row contains the possible answers, and the last row lists the total number of survey participants.
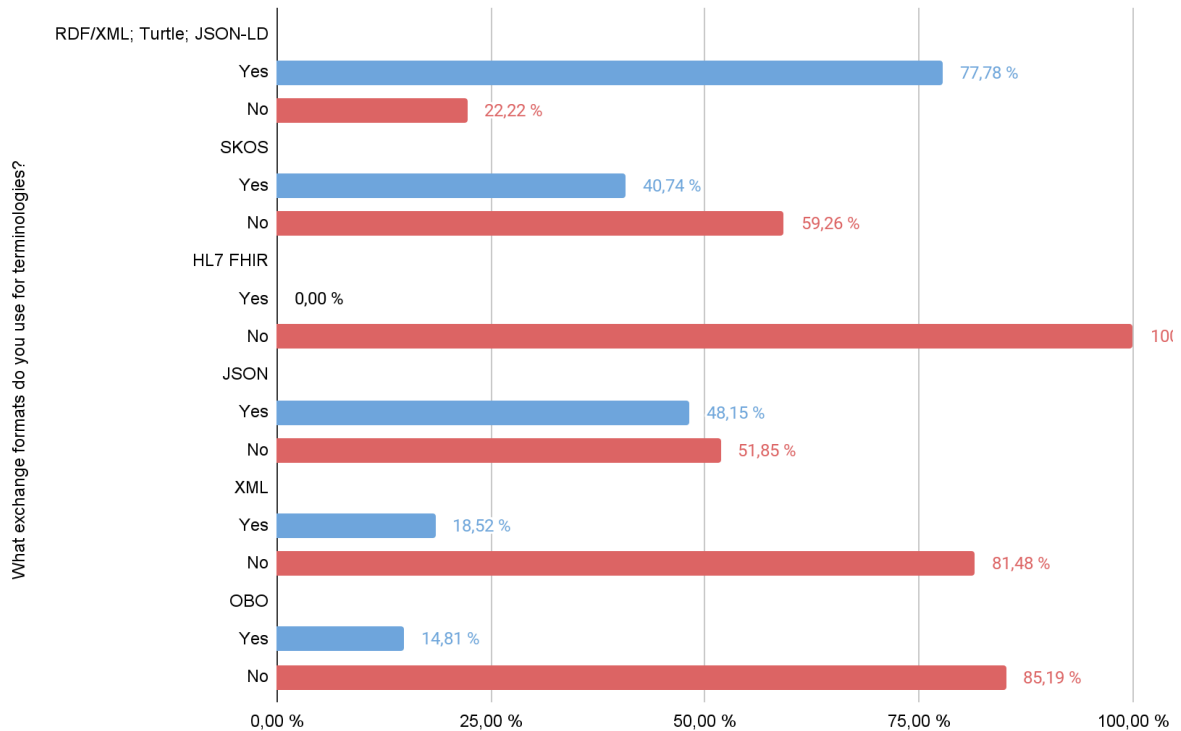
Fig. 23. The figure shows six possible answers on the y-axis and the corresponding percentages on the x-axis. Each of the blue bars represents a 'yes' answer and each of the red bars represents a 'no' answer for one of the six possible answers.

Do you use terminology terms in your application(s)?

A total of 27 survey participants were included in the analysis of the question results. Of these, 24 use terminology terms in their applications, and 3 do not. The results for this question are also presented in Table 24 and Figure 24.

Do you use terminology terms in your application(s)?	absolute	relative
Yes.	24	88,89 %
No.	3	11,11 %
n	27	

Table 24. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

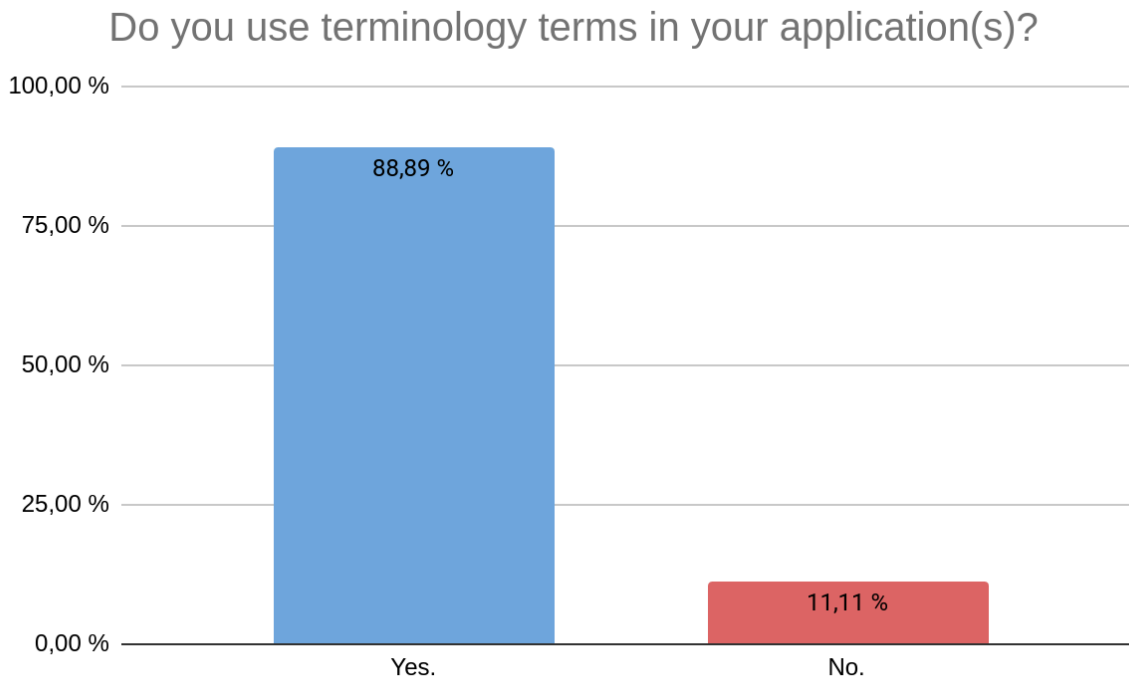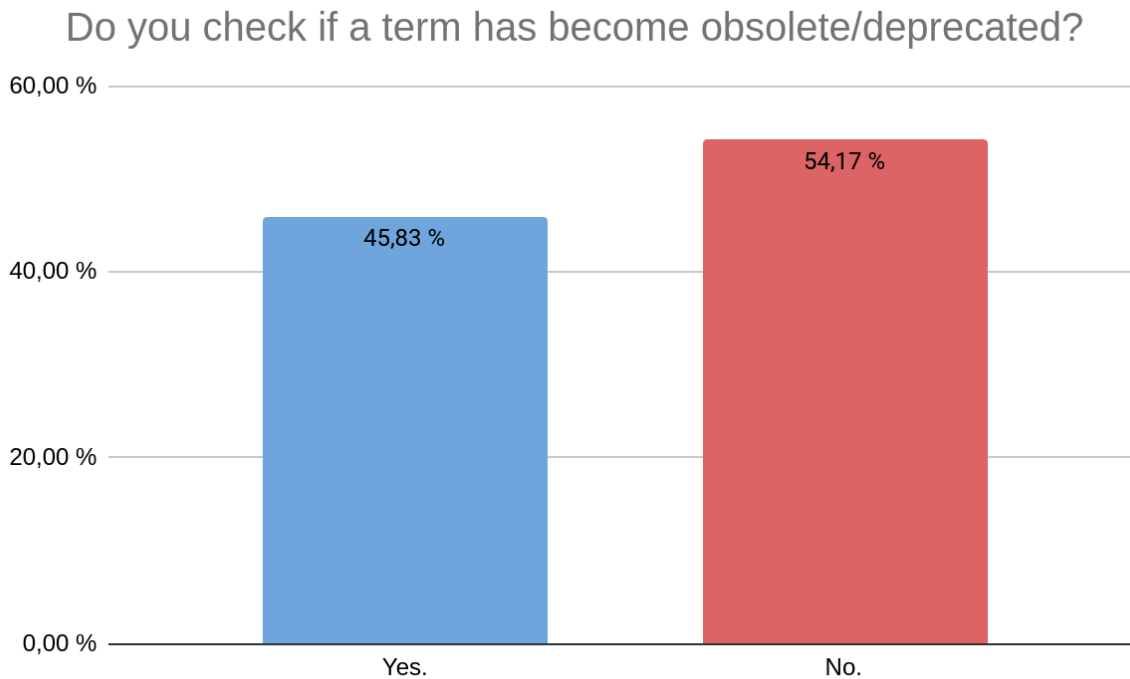## Do you use terminology terms in your application(s)?

Fig. 24. The figure presents two distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", and the red bar represents the answer "No."

Do you check if a term has become obsolete/deprecated?

A total of 24 survey participants were included in the analysis of the question results. Of these, 11 check whether terms became obsolete or deprecated and 13 do not. The results for this question are also presented in Table 25 and Figure 25.

Do you check if a term has become obsolete/deprecated?	absolute	relative
Yes.	11	45,83 %
No.	13	54,17 %
n	24	

Table 25. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
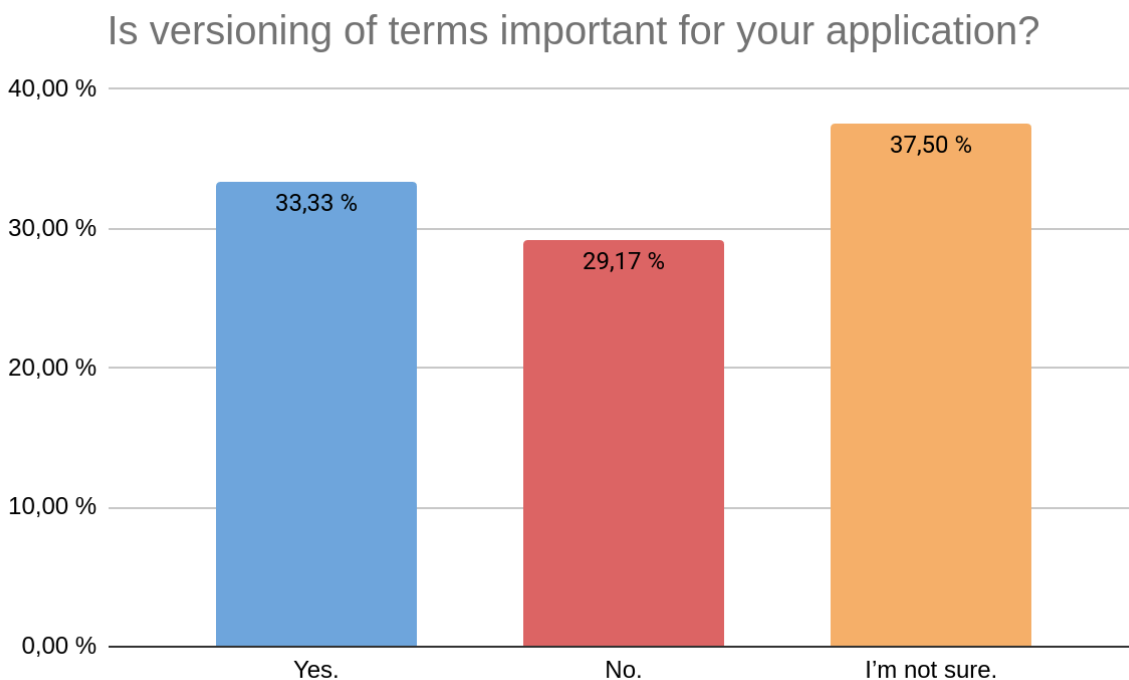
Do you check if a term has become obsolete/deprecated?

Fig. 25. The figure presents two distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", and the red bar represents the answer "No."

Is versioning of terms important for your application?

A total of 24 survey participants were included in the analysis of the question results. Of these, 8 stated that term versioning is important for them, 7 said it is not, and 9 mentioned that they are not certain about it. The results for this question are also presented in Table 26 and Figure 26.

Is versioning of terms important for your application?	absolute	relative
Yes.	8	33,33 %
No.	7	29,17 %
I'm not sure.	9	37,50 %
n	24	

Table 26. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

Is versioning of terms important for your application?

Fig. 26. The figure presents three distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", the red bar represents the answer "No.", and the orange bar represents the answer "I'm not sure.".

Do you offer annotation tools (e.g. Electronic Lab Notebooks)?

A total of 27 survey participants were included in the analysis of the question results. Of these, 9 offer an annotation tool such as ELN, and 18 do not. The results for this question are also presented in Table 27 and Figure 27.

Do you offer annotation tools (e.g. Electronic Lab Notebooks)?	absolute	relative
Yes.	9	33,33 %
No.	18	66,67 %
n	27	

Table 27. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

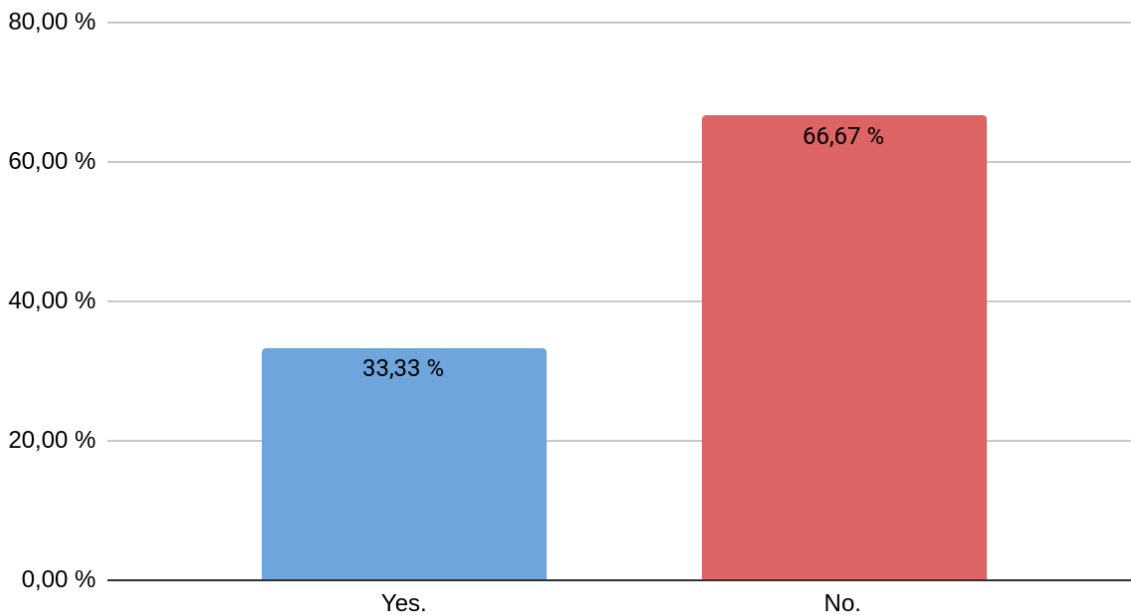## Do you offer annotation tools (e.g. Electronic Lab Notebooks)?

Fig. 27. The figure presents two distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", and the red bar represents the answer "No."

Are you using a web tool for this?

A total of 9 survey participants were included in the analysis of the question results. Of these, 5 are using a web tool for annotation and 4 are not. The results for this question are also presented in Table 28 and Figure 28.

Are you using a web tool for this?	absolute	relative
Yes.	5	55,56 %
No.	4	44,44 %
n	9	

Table 28. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
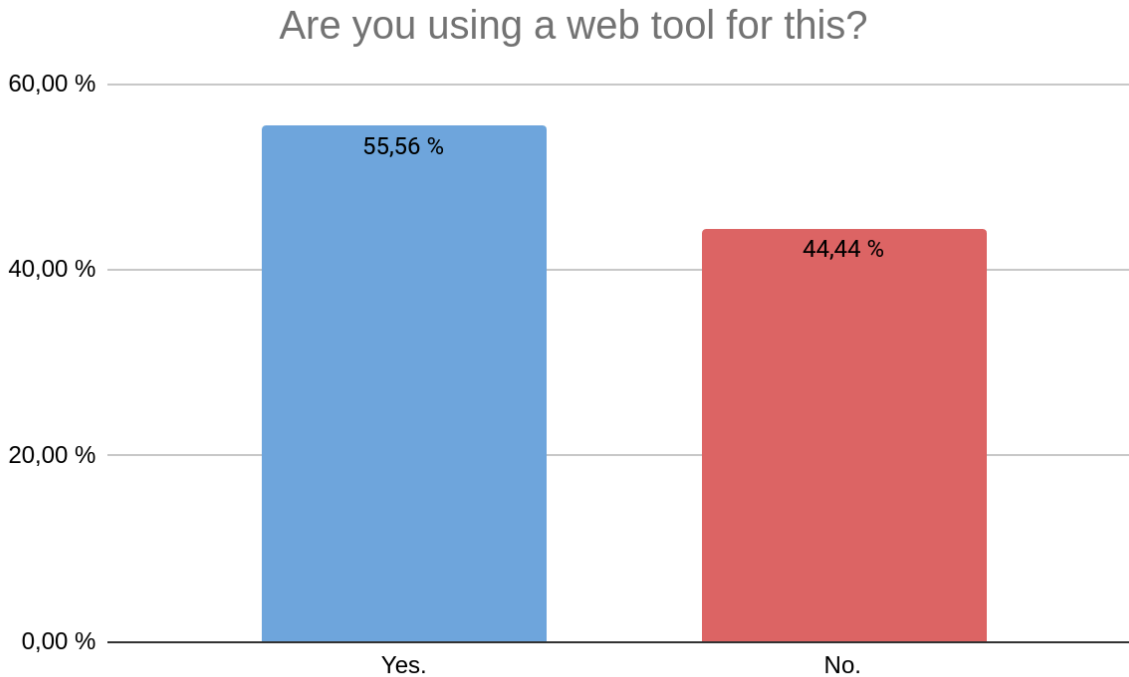
Are you using a web tool for this?

Fig. 28. The figure presents two distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", and the red bar represents the answer "No."

Do you offer or do you plan to offer a semantic search engine?

A total of 27 survey participants were included in the analysis of the question results. Of these, 12 plan to offer at least one semantic search engine to the users, 13 do not, and 2 are already offering one. The results for this question are also presented in Table 29 and Figure 29.

Do you offer or do you plan to offer a semantic search engine?	absolute	relative
Yes, we plan to offer at least one semantic search engine.	12	44,44 %
No.	13	48,15 %
Yes, we already offer at least one semantic search engine.	2	7,41 %
n	27	

Table 29. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

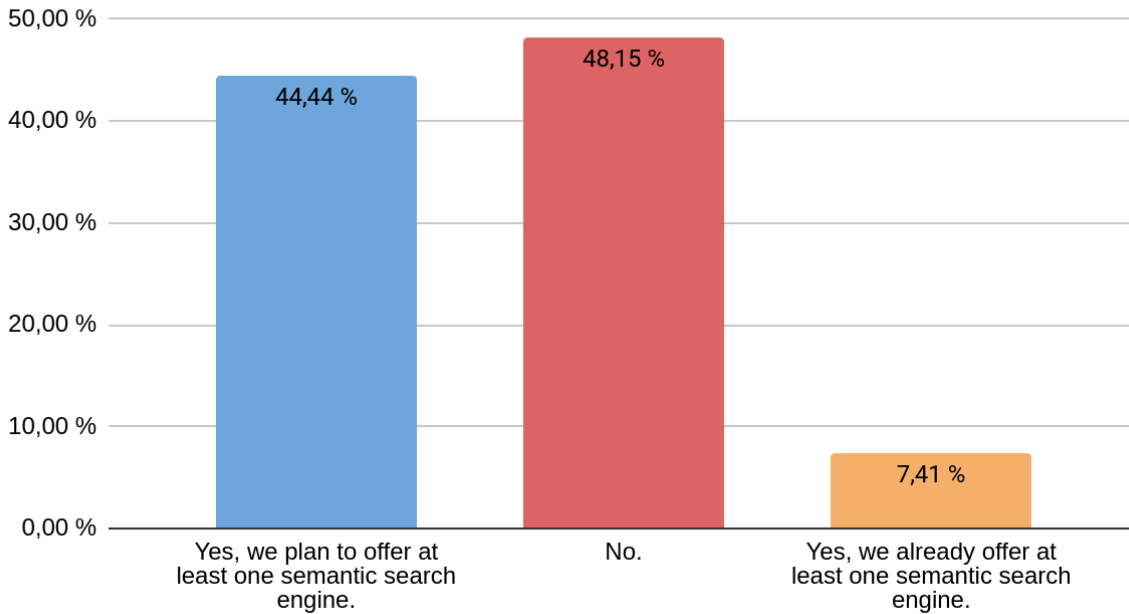## Do you offer or do you plan to offer a semantic search engine?

Fig. 29. The figure presents three distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes, we plan to offer at least one semantic search engine.", the red bar represents the answer "No.", and the orange bar represents the answer "Yes, we already offer at least one semantic search engine.".

Do you offer or do you plan to offer a knowledge graph (for your domain)?

A total of 27 survey participants were included in the analysis of the question results. Of these, 12 plan to offer a knowledge graph for their domain, 12 do not, and 3 are already providing one for their domain. The results for this question are also presented in Table 30 and Figure 30.

Do you offer or do you plan to offer a knowledge graph (for your domain)?	absolute	relative
Yes, we plan to offer at least one knowledge graph.	12	44,44 %
No.	12	44,44 %
Yes, we already offer at least one knowledge graph.	3	11,11 %
n	27	

Table 30. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

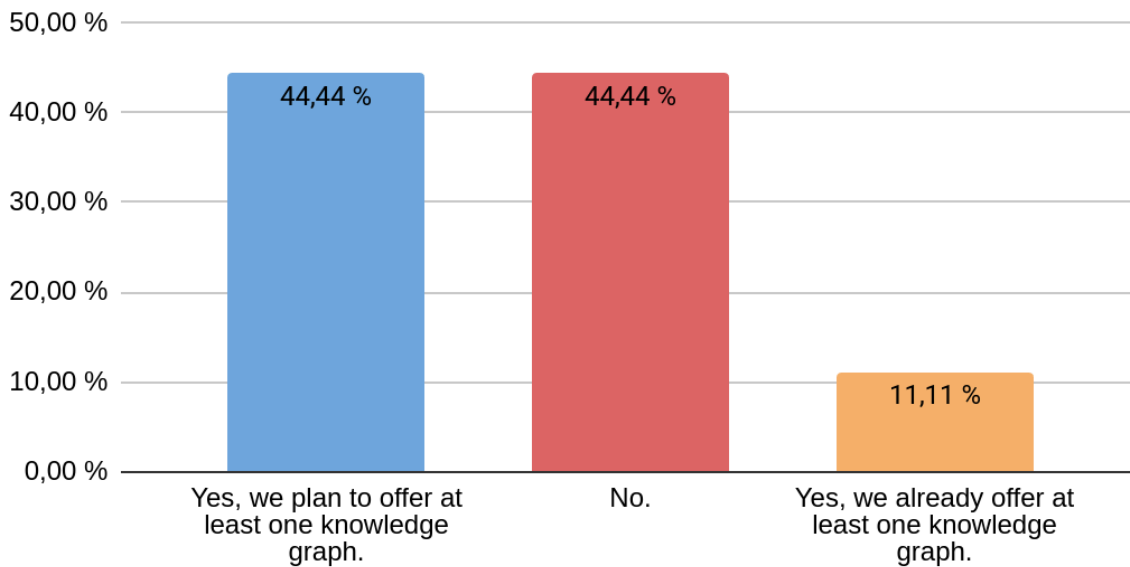## Do you offer or do you plan to offer a knowledge graph (for your domain)?

Fig. 30. The figure presents three distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes, we plan to offer at least one knowledge graph.", the red bar represents the answer "No.", and the orange bar represents the answer "Yes, we already offer at least one knowledge graph."

c. Manager Branch Answers

Do you use or plan to use terminologies to harmonize data in your domain?

A total of 31 survey participants were included in the analysis of the question results. Of these, 18 are already using terminologies to harmonize the data in their domain, 10 plan to do it in the future, and 3 have neither plan nor usage. The results for this question are also presented in Table 31 and Figure 31.

Do you use or plan to use terminologies to harmonize data in your domain?	absolute	relative
Yes, we are actually using terminologies to harmonize data.	18	58,06 %
Yes, we are planning to use terminologies to harmonize data in the future.	10	32,26 %
No, we don't have any plans for this.	3	9,68 %
n	31	

Table 31. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

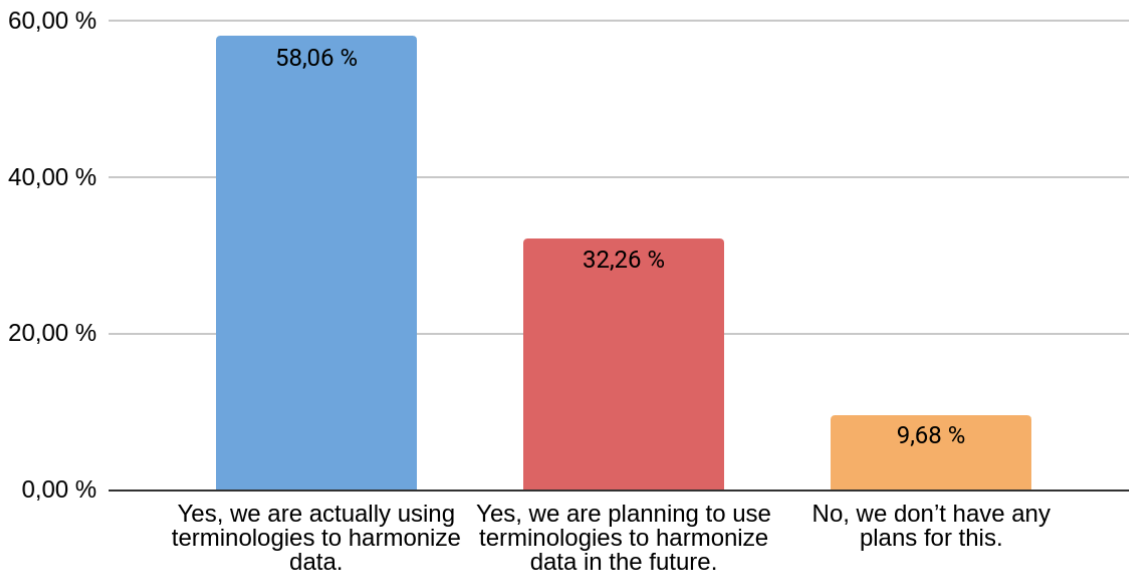## Do you use or plan to use terminologies to harmonize data in your domain?

Fig. 31. The figure presents three distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes, we are actually using terminologies to harmonize data.", the red bar represents the answer "Yes, we are planning to use terminologies to harmonize data in the future.", and the orange bar represents the answer No, we don't have any plans for this."

Are you using tools to annotate data?

A total of 31 survey participants were included in the analysis of the question results. Of these, 21 are using tools for data annotation and 10 are not. The results for this question are also presented in Table 32 and Figure 32.

Are you using tools to annotate data?	absolute	relative
Yes.	21	67,74 %
No.	10	32,26 %
n	31	

Table 32. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
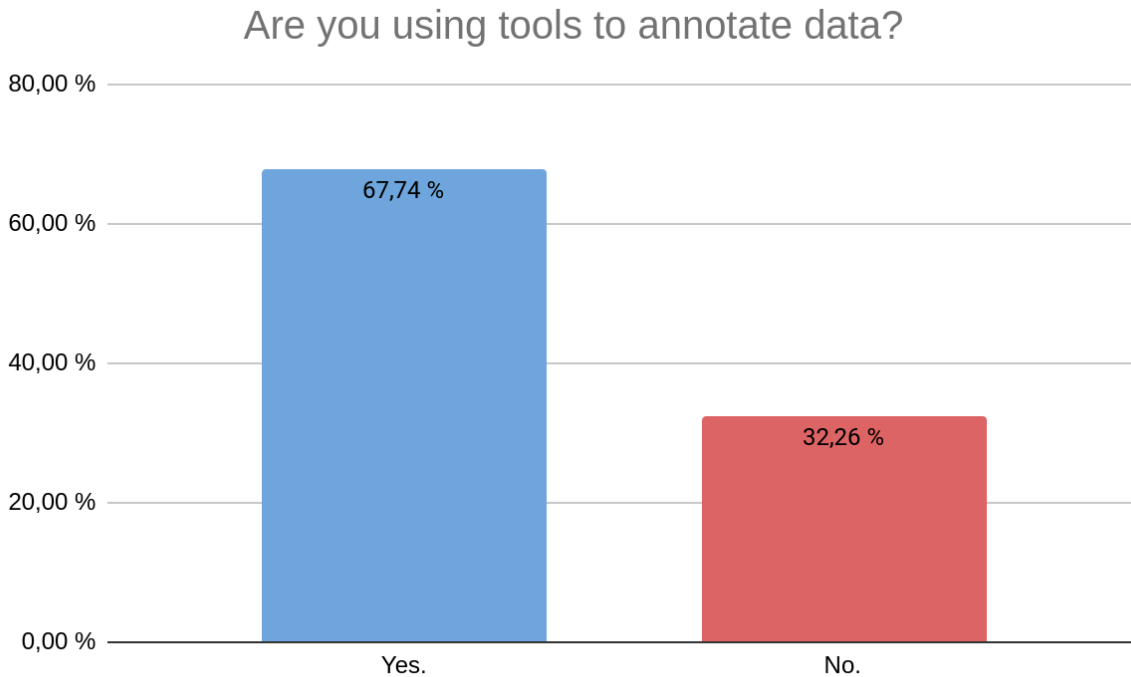
Are you using tools to annotate data?

Fig. 32. The figure presents two distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", and the red bar represents the answer "No."

Do you use terminologies to annotate data?

A total of 21 survey participants were included in the analysis of the question results. Of these, 19 are using terminologies for data annotation and 2 are not. The results for this question are also presented in Table 33 and Figure 33.

Do you use terminologies to annotate data?	absolute	relative
Yes.	19	90,48 %
No.	2	9,52 %
n	21	

Table 33. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

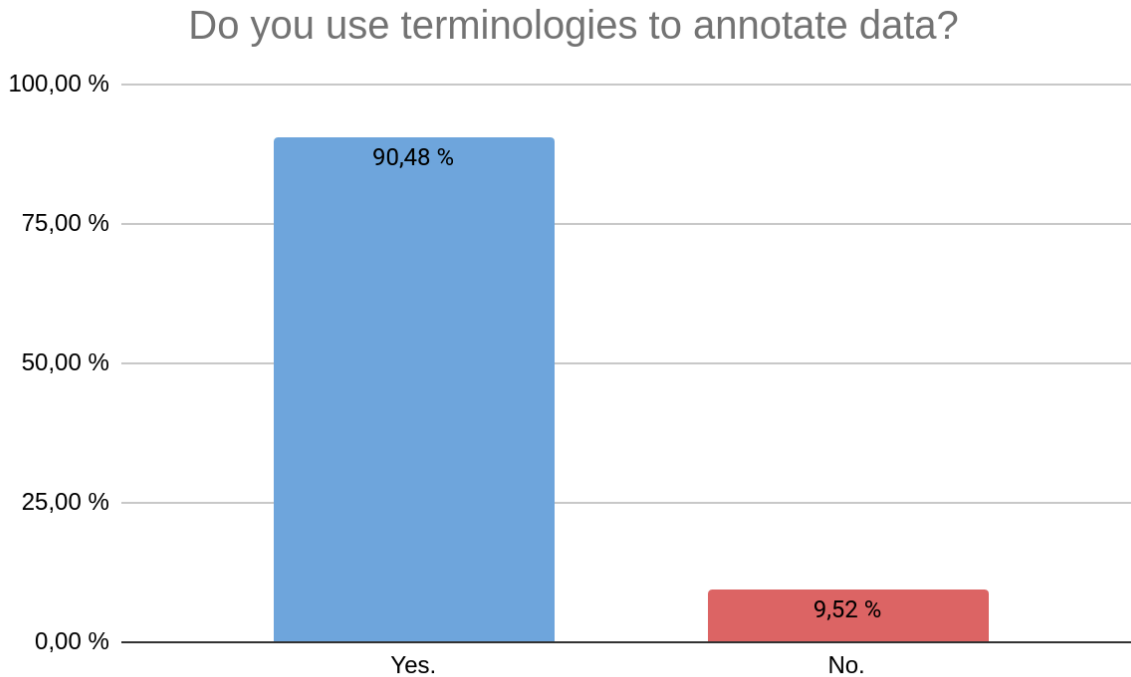## Do you use terminologies to annotate data?

Fig. 33. The figure presents two distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", and the red bar represents the answer "No."

Do you have dedicated partners working with terminologies, developing, or curating them?

A total of 31 survey participants were included in the analysis of the question results. Of these, 15 have dedicated partners who are involved in developing/curating/working with terminologies, 10 have not, and 6 are not sure about the matter. The results for this question are also presented in Table 34 and Figure 34.

Do you have dedicated partners working with terminologies, developing, or curating them?	absolute	relative
Yes.	15	48,39 %
No.	10	32,26 %
I don't know.	6	19,35 %
n	31	

Table 34. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

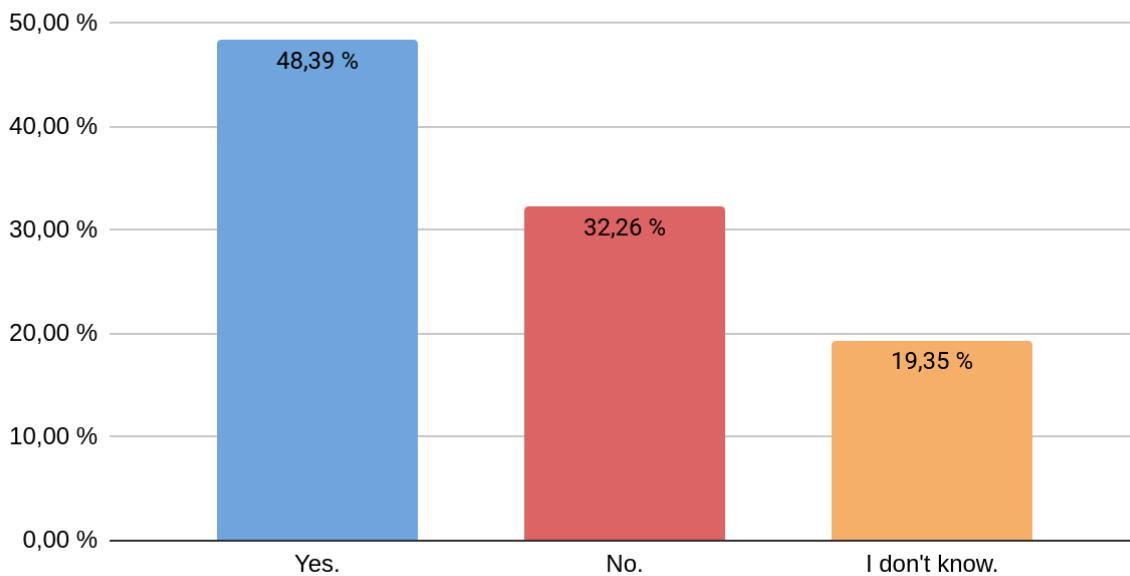## Do you have dedicated partners working with terminologies, developing, or curating them?

Fig. 34. The figure presents three distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", the red bar represents the answer "No.", and the orange bar represents the answer "I don't know."

Play terminologies a role in your metadata schema(s)?

A total of 31 survey participants were included in the analysis of the question results. Of these, 28 mentioned that terminologies play a role in their metadata schema(s), 1 stated that they do not, and 2 indicated that they were unsure. The results for this question are also presented in Table 35 and Figure 35.

Play terminologies a role in your metadata schema(s)?	absolute	relative
Yes.	28	90,32 %
No.	1	3,23 %
I don't know.	2	6,45 %
n	31	

Table 35. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

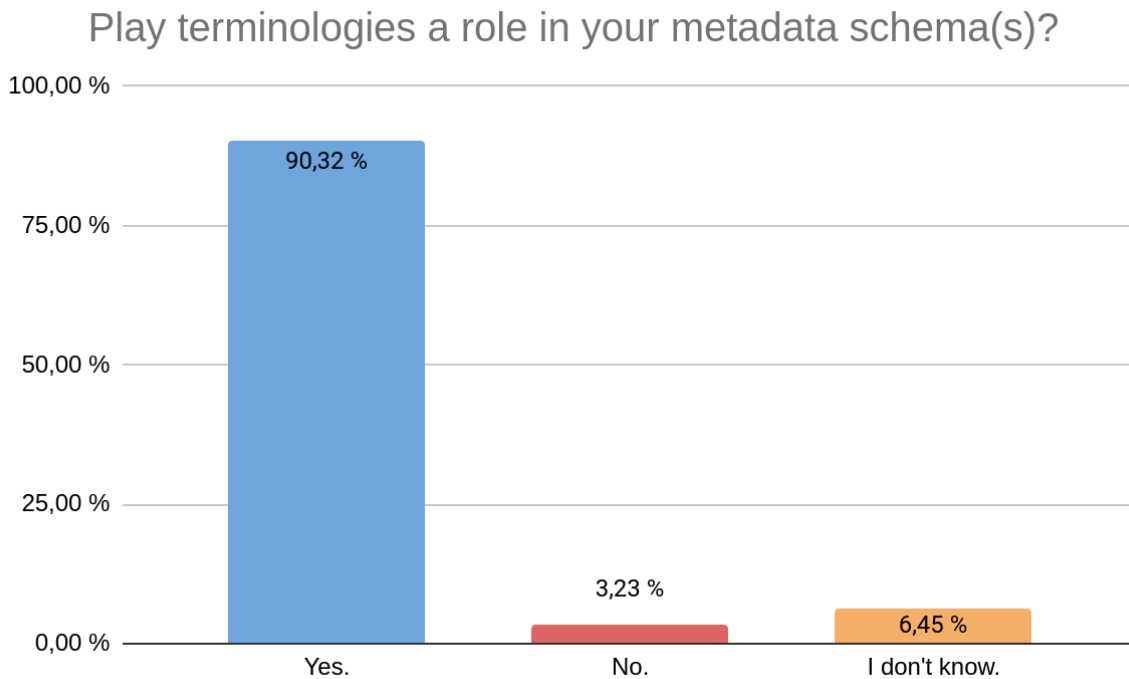## Play terminologies a role in your metadata schema(s)?

Fig. 35. The figure presents three distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", the red bar represents the answer "No.", and the orange bar represents the answer "I don't know."

Are you using spreadsheets in your work?

A total of 31 survey participants were included in the analysis of the question results. Of these, 18 are using spreadsheets in their daily work since it helps them, 6 are using it because they have to, and 7 do not use it at all. The results for this question are also presented in Table 36 and Figure 36.

Are you using spreadsheets in your work?	absolute	relative
Yes, it helps me in my daily work.	18	58,06 %
Yes, since I have to.	6	19,35 %
No.	7	22,58 %
n	31	

Table 36. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
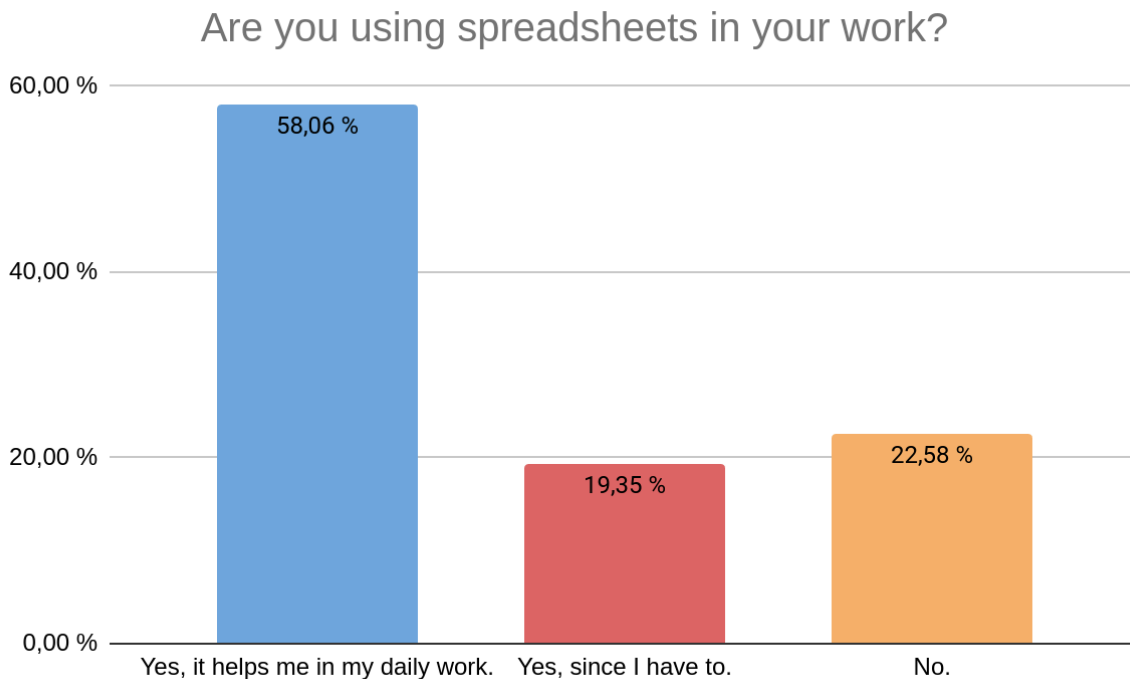
Are you using spreadsheets in your work?

Fig. 36.The figure presents three distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes, it helps me in my daily work.", the red bar represents the answer "Yes, since I have to.", and the orange bar represents the answer "No."

Do you have or plan to create a knowledge graph for your domain?

A total of 31 survey participants were included in the analysis of the question results. Of these, 17 plan to have a knowledge graph for their domain in the future, 6 have no plan, and 8 are already using a knowledge graph. The results for this question are also presented in Table 37 and Figure 37.

Do you have or plan to create a knowledge graph for your domain?	absolute	relative
Yes, we are planning to use knowledge graphs in the future.	17	54,84 %
No.	6	19,35 %
Yes, we are actually using knowledge graphs.	8	25,81 %
n	31	

Table 37. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

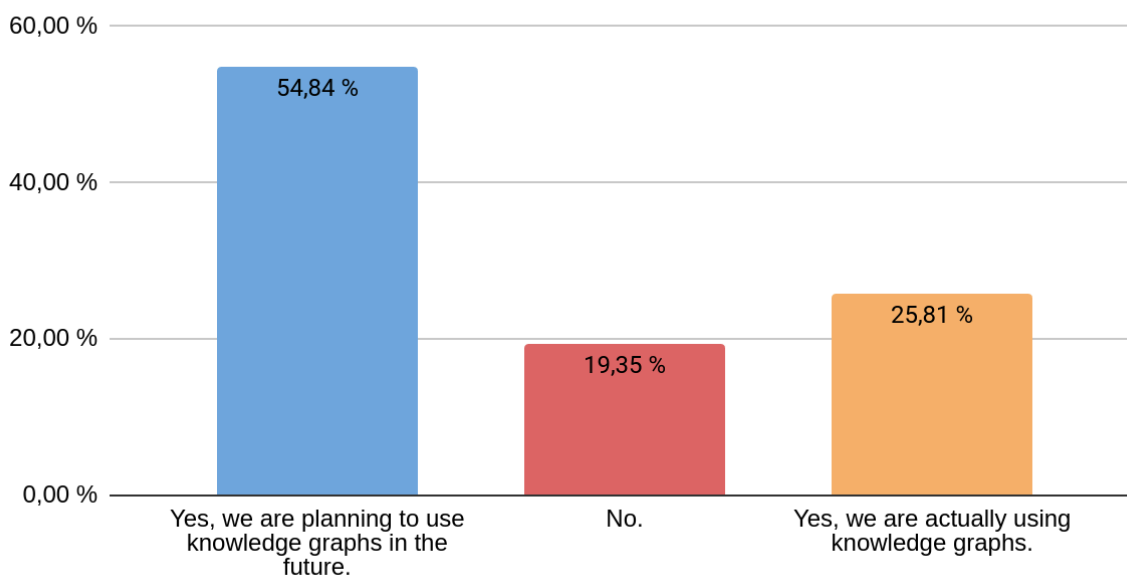## Do you have or plan to create a knowledge graph for your domain?

Fig. 37. The figure presents three distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes, we are planning to use knowledge graphs in the future.", the red bar represents the answer "No.", and the orange bar represents the answer "Yes, we are actually using knowledge graphs."

Do you think a terminology service should support term requests for a missing term?

A total of 31 survey participants were included in the analysis of the question results. Of these, 29 think that a terminology service should support a term request feature for the missing terms, and 2 mentioned that it is not desired. The results for this question are also presented in Table 38 and Figure 38.

Do you think a terminology service should support term requests for a missing term?	absolute	relative
Yes.	29	93,55 %
No.	2	6,45 %
n	31	

Table 38. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

Do you think a terminology service should support term requests for a missing term?
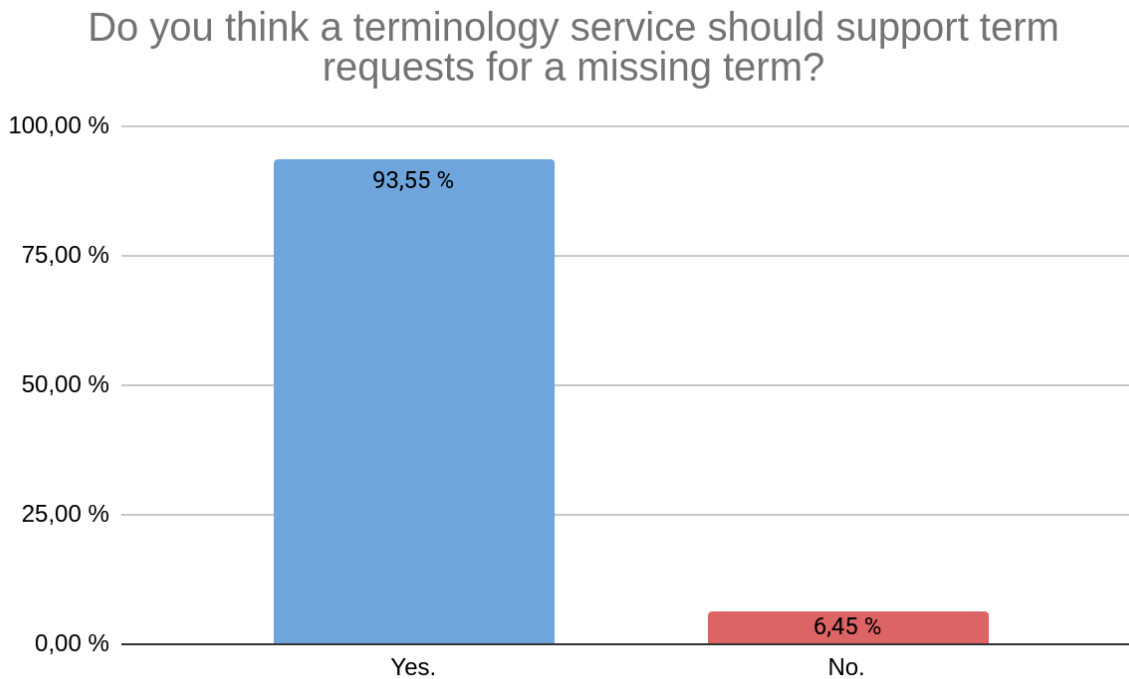
Fig. 38. The figure presents two distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", and the red bar represents the answer "No."

d. User/Other Branch Answers

Are you using spreadsheets in your work?

A total of 9 survey participants were included in the analysis of the question results. Of these, 5 are using spreadsheets in their daily work since it helps them, 2 are using them since they have to, and 2 are not using spreadsheets. The results for this question are also presented in Table 39 and Figure 39.

Are you using spreadsheets in your work?	absolute	relative
Yes, it helps me in my daily work.	5	55,56 %
Yes, since I have to.	2	22,22 %
No.	2	22,22 %
n	9	

Table 39. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

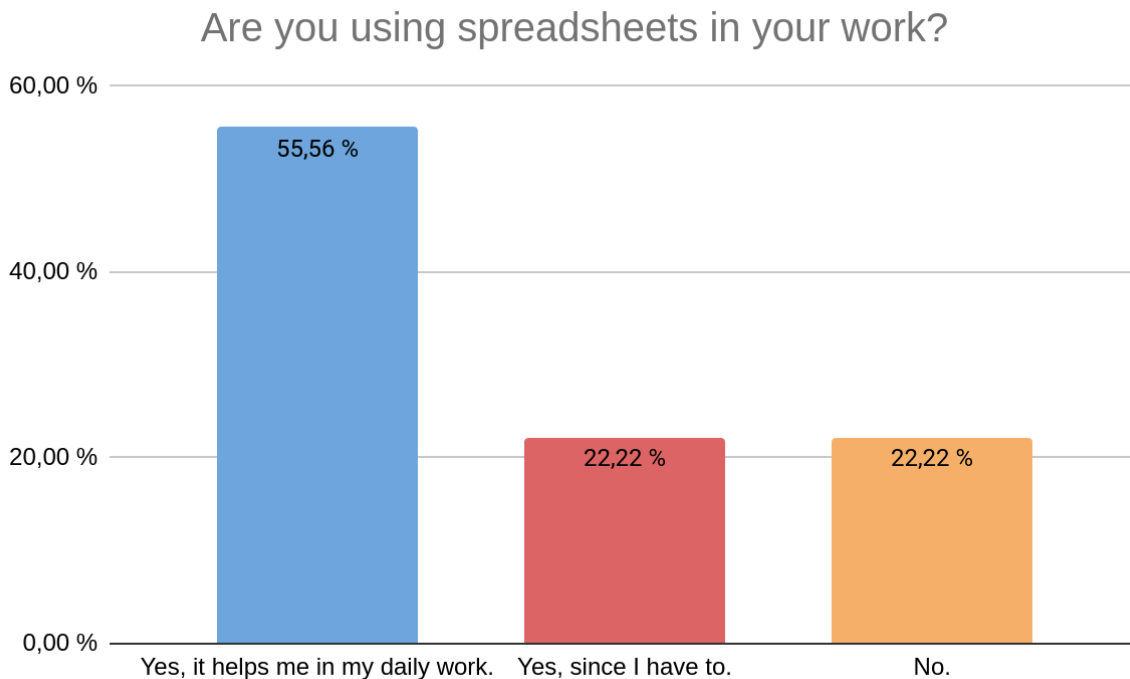## Are you using spreadsheets in your work?

Fig. 39. The figure presents three distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes, it helps me in my daily work.", the red bar represents the answer "Yes, since I have to.", and the orange bar represents the answer "No."

Are you using tools to annotate data?

A total of 9 survey participants were included in the analysis of the question results. Of these, 6 are using tools to annotate data and 3 do not. The results for this question are also presented in Table 40 and Figure 40.

Are you using tools to annotate data?	absolute	relative
Yes.	6	66,67 %
No.	3	33,33 %
n	9	

Table 40. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

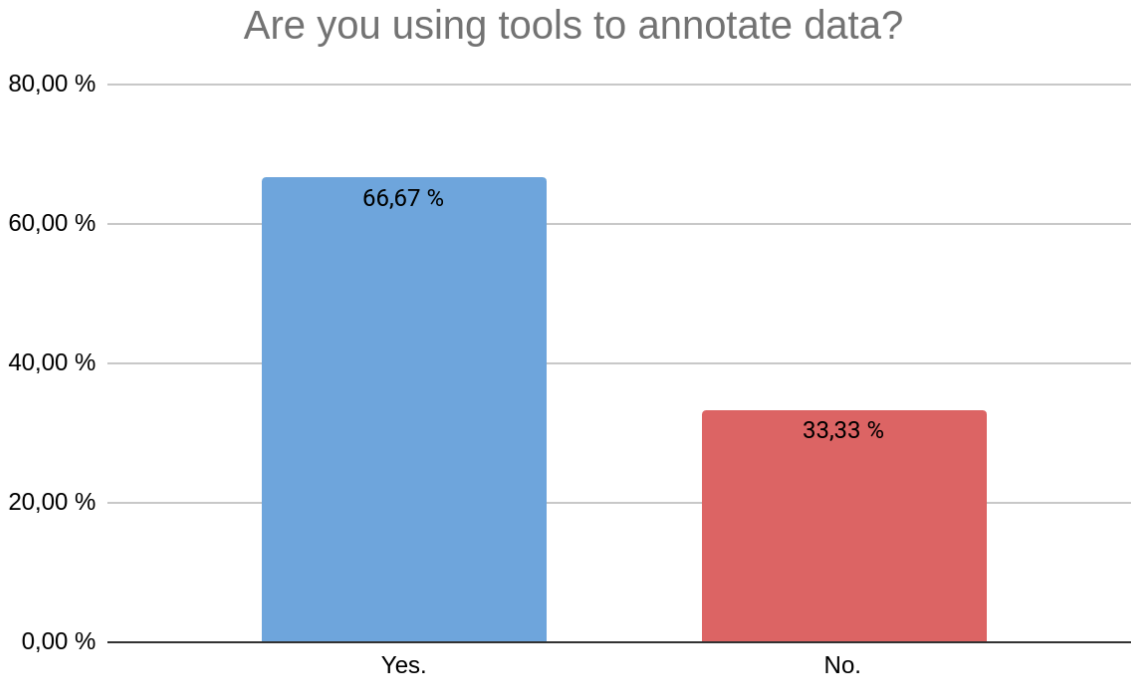## Are you using tools to annotate data?

Fig. 40. The figure presents two distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", and the red bar represents the answer "No."

Do you use terminologies to annotate data?

A total of 6 survey participants were included in the analysis of the question results. Of these, 5 use terminologies to annotate their data and 1 does not. The results for this question are also presented in Table 41 and Figure 41.

Do you use terminologies to annotate data?	absolute	relative
Yes.	5	83,33 %
No.	1	16,67 %
n	6	

Table 41. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
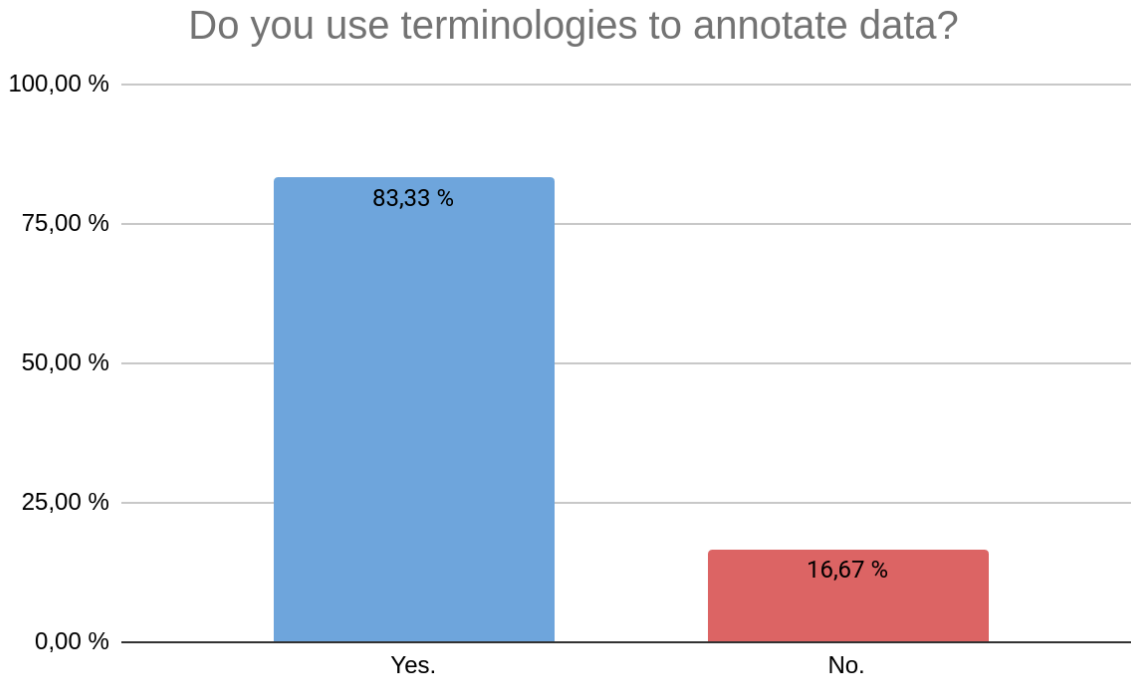
Do you use terminologies to annotate data?

Fig. 41. The figure presents two distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", and the red bar represents the answer "No."

Do you know what a graph view for terms is?

A total of 9 survey participants were included in the analysis of the question results. Of these, 6 know what a graph view for terms is and 3 do not. The results for this question are also presented in Table 42 and Figure 42.

Do you know what a graph view for terms is?	absolute	relative
Yes.	6	66,67 %
No.	3	33,33 %
n	9	

Table 42. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

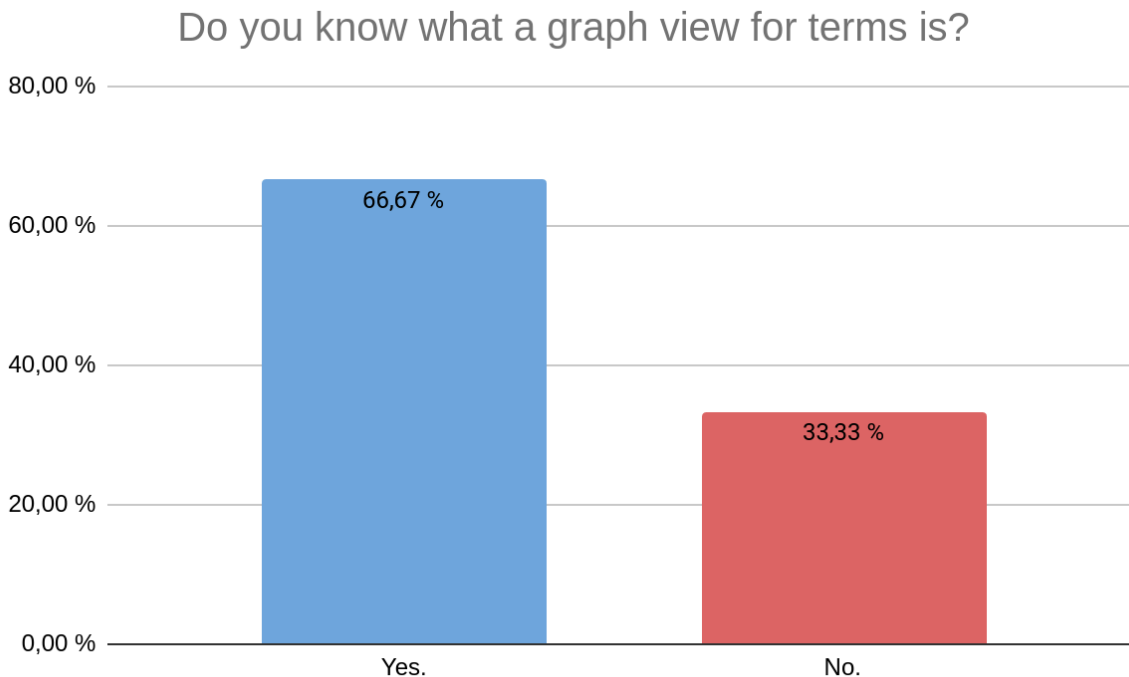## Do you know what a graph view for terms is?

Fig. 42. The figure presents two distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", and the red bar represents the answer "No."

Do you think a terminology service should support a graph view for terms?

A total of 6 survey participants were included in the analysis of the question results. Of these, 5 think that a terminology service should support a graph view for terms and 1 does not. The results for this question are also presented in Table 43 and Figure 43.

Do you think a terminology service should support a graph view for terms?	absolute	relative
Yes.	5	83,33 %
No.	1	16,67 %
n	6	

Table 43. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.

Do you think a terminology service should support a graph view for terms?
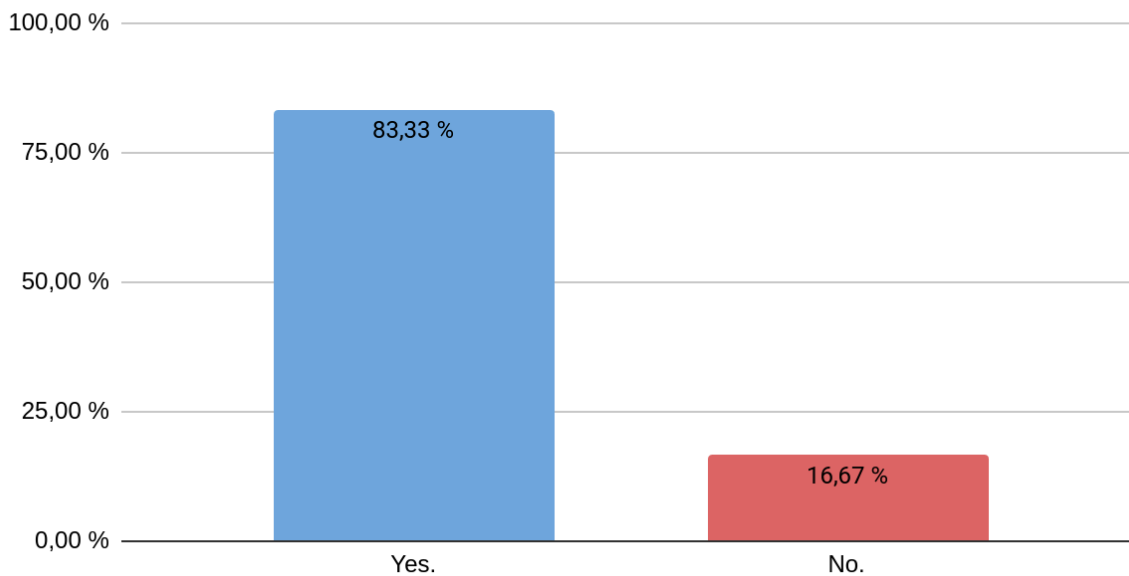

Fig. 43. The figure presents two distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", and the red bar represents the answer "No."

Do you think a terminology service should support term requests?

A total of 9 survey participants were included in the analysis of the question results. Of these, 8 think that a terminology service should support term requests and 1 does not. The results for this question are also presented in Table 44 and Figure 44.

Do you think a terminology service should support term requests?	absolute	relative
Yes.	8	88,89 %
No.	1	11,11 %
n	9	

Table 44. The table is divided into three columns. The first column on the left side presents the possible answers, the column in the middle presents the absolute numbers, and the last column presents the relative numbers. The first row contains the table headers, and the last row lists the total number of survey participants.
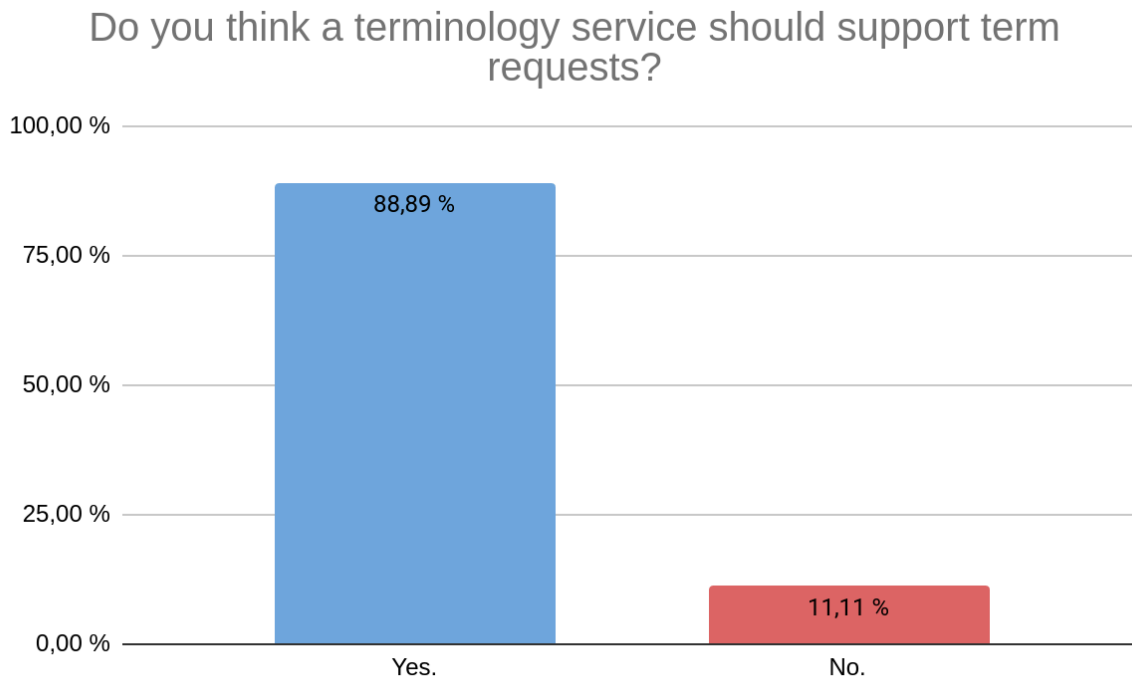
Fig. 44. The figure presents two distinct potential responses for the x-axis, while the y-axis depicts the corresponding percentage values. The blue bar represents the answer "Yes.", and the red bar represents the answer "No."