User Evaluation Report

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Editors(s):	**Eric Karstens, Liliana Bounegru (EJC)**
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History

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Authors List

Organisation	Name
EJC	Liliana Bounegru (author)
EJC	Eric Karstens (author and internal reviewer)

Executive summary

This document is the final version of the second user evaluation report that was due end of June 2011, two months after the planned release date of the intermediate SYNC3 prototype at the end of April 2011. On grounds of the delay in the development of the intermediate SYNC3 prototype and its release at the end of May 2011, the release of the final version of this report was shifted by about one month to the end of July 2011. The aim the User Evaluation Report is to document the evaluation process and its results as a way to enable dissemination of the data collected during the user evaluation rounds and offer the developers the opportunity to properly analyse the user feedback data and use it as documentation for the ongoing improvement of functionality and usability aspects of the SYNC3 system and for identifying bugs in the system.

This report outlines the plan for the first two cycles of user evaluation of the SYNC3 system and describes the concrete steps taken during the user evaluation process. To this end, it establishes the background of the methodology applied for the first two rounds of user evaluation of the SYNC3 system. It includes the overview and conclusions of the focus group on the user interface organized at the EJC together with L3S on 30 March 2010, the complete results of the four rounds of user evaluations of the first SYNC3 prototype, and the complete results of the three rounds of user evaluations of the intermediate SYNC3 prototype. It will be extended into a third user evaluation report as soon as testing of the final prototype will have taken place. The third prototype is planned to be released in M31, October 2011.

User feedback was very rich in detail. A number of 48 issues concerning usability, functionality aspects and errors were registered. The majority of the comments collected concerned usability issues. No major functionality requests were registered, which could be interpreted as the users being content with what the system offers at this point in its development. A series of functionalities: relevance and ranking of the generated results to the user query, the Overview and the Workspace (News Story Creator), which were indicated by the test users as needing improvement in the testing of the first prototype, have been reworked and their new versions have been well received by the users that tested the intermediate prototype. The areas most often appreciated by the users were the grouping of news articles and blog posts around news events and the faceted browsing. The areas that were most often indicated as needing improvement were the Map View in terms of functionality, and the user interface in terms of attractiveness and usability.

Table of Contents

List of Figures

List of Tables

1. Introduction

1.1. Goals and objectives of WP7, task 7.4

The project DoW describes the general intention of the SYNC3 user evaluation activities in section B1.3.1.VII WP7 as follows:

> This task will deal with the planning and coordination as well as with the actual process of user evaluation of all system prototypes. Three prototypes are foreseen in the duration of the project, so three cycles of user evaluation are definitely foreseen, although more evaluation workshops may be organised upon demand of the WP leaders in order to receive feedback from users on specific aspects of the SYNC3 tool (e.g. interface 'look and feel', etc.). EJC will be responsible for the evaluation of the prototypes, coordinate the whole process and will provide users for the testing.

1.2. Task 7.4 description and responsible contributors

The three prototypes are foreseen in the duration of the project in M18 (September 2010), M25 (April 2011), and M31 (October 2011). EJC will be responsible for organising all the evaluation workshops and gathering the necessary professional users who will test the system prototypes. EJC will be responsible for the definition of the evaluation scenario of the system prototypes, i.e. the process the users will go through and the means of recording their reactions and comments.

The three integrated prototypes of SYNC3, as foreseen in the DoW, will thus go through validation and testing. Where necessary and sensible for the process of development, intermediate integrated prototypes or user interface prototypes will be submitted to user testing as well. Results of the validation will be fed into subsequent development cycles.

The work is to be carried out in an iterative way, based on proven methodologies to be selected at the start of task 7.4. It will follow the "design - validate - redesign - validate & redesign" model. The process of validation will be performed using standard validation techniques that conform to industrial practice.

Following this model, a first focus group on the user interface was already organized by EJC and L3S on March 30, 2010. Its outcome and conclusions were communicated to the SYNC3 Consortium in an internal report[i]. WP6 leader L3S took corresponding actions to address the results of the validation in the following development cycles of the user interface. A second focus group on the user interface is planned for mid October.

Seven types of users are being called upon to test and validate the system, representing the target groups of SYNC3:

- Professional journalists and editors, both freelance and permanently employed, interested in getting an overview of news items from traditional media and following how they were received in the blogosphere;
- Citizen journalists and bloggers (non-professional journalists) who play an active role in the process of collecting, analysing and disseminating news;
- Communication, Marketing, and PR professionals within corporations and communication agencies, interested in brand monitoring and product perception in online news sources and blogs;
- Policy makers as well as influence groups, such as lobby groups, interested in following the public debate on current issues in the news and blogosphere;

- Media monitoring/media intelligence professionals, a subcategory of PR professionals specialized particularly in documentation and analysis of media content;
- Academic researchers specializing in comparative media studies interested in comparative analysis of content in traditional media and new media (blogs);
- General public (media consumers).

1.3. Task 7.4 testing and validation stages

User evaluation depends on the technical SYNC3 partners delivering the two preliminary prototypes (basic and intermediate) and the final prototype, which are foreseen for month 18 (September 2010), month 25 (April 2011), and month 31 (October 2011), respectively. The actual validation sessions must be scheduled as soon as possible after the prototype releases, since user evaluation reports are due within two months following each prototype release, specifically in month 20 (November 2010), month 27 (June 2011), and month 33 (December 2011), respectively. Insights from these reports are expected to help developers refine the different modules as well as to gain additional insights into user needs and requirements.

On grounds of the delay in the development of the first prototype, it was necessary to shift the release of its corresponding user evaluation report by about two months to the end of January 2011 (M22). While the delay did not entail time constrains in performing the planned evaluation sessions and no quality concessions in the collection of user feedback, it did cause a partial overlap of the evaluation period with the winter holidays season, which led to several weeks of inactivity in terms of organizing evaluation sessions, in the middle of the evaluation period.

The procedure in the three evaluation cycles is essentially similar: to validate the SYNC3 system, groups of users from each of the seven target groups are presented with the integrated prototypes by way of the graphical user interface (GUI) in order to collect information on usability, functionality and stability of the SYNC3 system from the user perspective. This includes (contingent on respective prototype functionality) factors such as search capabilities (e.g., search facilities, search/retrieval performance, proportion and quality of sources coverage, 'freshness' of listed results, meaningfulness/relevance and precision of retrieved records, response time, user effort, e.g. in designing queries to obtain satisfactory results), output form (e.g., quality/value/relevance of displayed content from extracted records), as well as user interface and documentation (e.g., user friendliness, intuitiveness, user effort in learning and using the interface, comprehensiveness, quality, usefulness of documentation).

Collecting this external view is supposed to create a flow of valuable, independent and non-blinkered insights into how to optimally tailor the single modules into a working system and how to optimise the user interface.

1.4. Specific objectives of task 7.4

In tune with the overall SYNC3 vision, and based on the general objectives above, the specific goals of task 7.4 can be described as follows:

- Develop a detailed and appropriate testing strategy based on current research and best practices to provide the SYNC3 project with a professional validation plan;
- Develop a plan to validate the SYNC3 product with users from each target group and implement this plan;
- Establish a proactive identification of possible problems, e.g. a "fail fast" indicator in order to avoid follow-up problems in the case of usability and functionality issues of a single module or inadmissible user interaction with the system as a whole;

- Provide insights from validation and testing to help developers create an innovative system, to steer the project as whole, and ensure the high quality of the final product;
- Create a validation and testing process that is pragmatic, yet simple and effective;
- Ensure high visibility of the testing results in order to provide developers with insights for the finalisation of single modules as well as for overall system configuration;
- Quickly disseminate evaluation results in order to make testing meaningful and timely for developers;
- Document the results of the validation process for future reference and as a basis for user training;
- Establish a proper basis for initiating the next phase of the development cycle;
- Ensure that the completed end product complies with established software and system requirements;
- Satisfy non-technical standards, policies, practices, procedures, and conventions, where applicable;
- Help create a usable and useful final product.

1.5. Relationship between user evaluation and other WPs

The task of user evaluation is closely intertwined with other activities of the SYNC3 project. In general, it is assumed that the findings from these WPs and the documented status of the different WPs are stable and remain basically unchanged. Every member of the project able to identify significant changes that are relevant to testing and validation is asked to immediately notify EJC in the case of wrong or outdated assumptions in this test and validation document.

The most important basis for task 7.4 is the User Requirements and Specifications Report (D7.1), which has laid down the relevant framework for the SYNC3 system that was agreed upon within the Consortium, in particular:

- Potential user groups, i.e., professional journalists, citizen journalists and bloggers (non-professional journalists), communication professionals, policy makers, and the broader public (media consumers). Two other potential user groups were later identified, i.e., media monitoring professionals and academic researchers specializing in comparative media studies;
- Scenarios of use for each user group, including basic description of planned functions, aiming to provide potential users with a good understanding of the intention, functionality and use of SYNC3;
- User requirements overview, collected via user surveys (questionnaires), focus groups (interviewing), monitoring of existing systems and example scenarios (use cases).

Furthermore, all WPs related to technical development, namely WP3 (*News clustering and excerpt extraction*), WP4 (*Blog processing*), and WP5 (*News event labelling and relations*), WP6 (*System architecture, interfaces and integration*), as well as WP8 (*System architecture and integration*), have foreseen their own evaluation metrics as part of a self-assessment plan.

The assessment plan outlines the performance measures and evaluation metrics for each technical WP. The evaluations in WPs 3-5 are supposed to make sure that their respective system components are fully functional, both in terms of technology and programming, and as far as the respective processing of content is concerned.

WP8 will carry out systematic evaluations to measure the overall system performance. The coordination of the testing activities to ensure that the integration meets the documented requirements is established as phase three in this WP.

1.6. Scope of user evaluation

The scope of this user evaluation plan is to ensure functionality and usability from a user perspective. To reach this goal, validation must be combined with verification to some extent. Validation is not a method to identify software defects or bug tracking. This is a practice generally described as verification. This verification will be executed as part of the individual development practices.

The abovementioned evaluation tasks must consequently be considered separately from the user evaluation efforts discussed in the present document. They are of a purely technological nature and must be carried out by engineers and software developers, whereas the user evaluation will be performed by journalistic organizations with limited engineering expertise, yet a clear understanding of the practical benefits to be reaped from SYNC3 in the context of everyday workflow.

However, the successful completion of the technical testing is a prerequisite for any kind of user evaluation. If user interaction with the prototypes founders on error messages, poor performance and system stops or breakdowns which are not caused by the human interaction itself, test users will become frustrated early on in the process, confidence in the SYNC3 tool as a whole will be undermined, and scarce or not even any meaningful user feedback will be elicited. Therefore, even the basic prototype must be as technically robust as possible.

Also, the technical partners should be on standby at the time of user testing to resolve technical issues quickly and to assist with questions arising on usability and operation of the system. EJC will coordinate the testing dates with the technology partners and organize telecommunications (such as Skype) to make sure that timely assistance can be provided when needed.

2. Principles of validation

This section provides an overview of why and how testing in software development is necessary, as well as of which procedures create value, ensure quality and enhance visibility of progress towards the final product.

Questions to be answered are:

- What is the benefit of testing and validation in software development?
- Which best practices can be identified?
- How can the findings be applied to test and validate the SYNC3 system?

Current research reviewed in this section shows that a number of insights can help significantly if applied to this particular project. The following pages therefore provide an overview of the factors relevant to the software development process in general and particularly for testing and validation.

At the end of each sub-section the relevant insights for SYNC3 are highlighted, in order to provide an overview of the practices that have been applied in developing the actual validation plan for SYNC3, which is described in Section 4.

2.1. Definition of user validation

Validation: assuring that a software system meets the user's needs

This statement is a short and easy to remember definition of validation. A clear understanding of the term is important, otherwise assumptions what it means could lead to some confusion regarding the specific scope of testing and validation.

For example, the following definition from a technical standpoint is too narrow as it describes validation as "the process of evaluating software at the end of the software development process to ensure compliance to software requirements". Starting to validate once the project nears completion would be too late to uncover flaws, usability issues and integration issues. Therefore the following paragraphs will discuss the meaning of validation from different angles.

Broader definitions and meanings of the term "validation":

"In general, validation is the process of checking if something satisfies a certain criterion. Examples would be: checking if a statement is true (validity); if an appliance works as intended; if a computer system is secure, or if computer data are compliant with an open standard. Validation implies one is able to testify that a solution or process is correct or compliant with set standards or rules."[ii]

A technical definition of the term "validation":

"In Computer Programming Terminology, validation refers to the process of controlling that data inserted into an application satisfies predetermined formats or complies with stated length and character requirements and other defined input criteria. (Verification usually requires human judgement)." [iii]

The definition used in the course of the SYNC3 project:

The definition that we use to describe and understand the scope, the desired outcome of the testing and validation process is the one below, differentiating between the objectives from two points of view:

> **Validation: "Are we building the right product?"**
> e.g., is the software usable for the end users?

Verification: "Are we building the product right?"
e.g., are there defects or bugs in the code?

As for the difference between "validation" and "verification", it is important to note that verification is a related, yet very different concept and requires specific procedures to be applied properly. Verification essentially means to ensure that the software has no serious defects or flaws, such as software bugs.

It should be noted that tracking and resolving defects is not in the scope of the particular task discussed in this document. As mentioned above, the user validation tests will be used to look at the modules from a user perspective. Ensuring that the modules work from a technical view will be a task of their respective technical developers.

However, should any bugs be uncovered during the validation process, they will be immediately communicated to all stakeholders affected.

2.2. Relevant validation standards

As a formalized process, standards defined by either IEEE or ISO describe processes to ensure quality standards. Proper validation is a tool in the development process in order to reach both a level of confidence that the product fulfils the user needs, as well as meets so-called "minimal" criteria of quality standards.

The most relevant standard is IEEE 1012 (Software Validation & Verification Plan, SVVP), which provides an outline covering relevant aspects of validation. This standard is part of a whole system of standards applied to software development from different perspectives and at different stages of development.

Table 1: IEEE Standards overview

Acronym	Full name	Identification
SQAP	Software Quality Assurance Plan	IEEE 730
SCMP	Software Configuration Management Plan	IEEE 828
STD	Software Test Documentation	IEEE 829
SRS	Software Requirements Specification	IEEE 830
SVVP	**Software Validation & Verification Plan**	**IEEE 1012**
SDD	Software Design Description	IEEE 1016
SPMP	Software Project Management Plan	IEEE 1058

2.3. The role and relevance of validation

Software development is an area of knowledge still gaining importance. The reason for this is dependency of businesses, consumers and public services on software-based services working without major flaws. Another driver is the need to ensure quality of ever more complex software systems. As a result, any knowledge that supports the development of innovative, productive and easy to use software is becoming an important differentiator in competitive economic environments as well as public services.

Against this background it is easier to understand why the software creation process has been the target of many studies and research projects that tried to gather knowledge of how to achieve desired project outcomes. Statistically, many software projects run into trouble - the

number of failed or challenged software projects runs up to 70%. There are numerous reasons for this, the main issue being complexity.

The most complete set of data tracking the success of software projects was supplied by the Standish Group, a US research firm that focuses on mission-critical projects, that has conducted extensive research in order to determine success rates of small or large software projects.

Since 1994 the Group publishes an annual report called the CHAOS study, which is based on statistical data from over 30,000 software projects tested. The key question was how many projects succeeded or failed. From this extensive set of data the Standish Group developed general recommendations to ensure software development success.

The Standish Group study categorizes projects into three resolution types:

Table 2: Success or failure of software projects

Category	Description
Successful	The project is completed on time and on budget, with all features and functions originally specified.
Challenged	The project is completed and operational, but over budget, late, and/or with fewer features and functions than initially specified.
Failed	The project is cancelled before completion, or never implemented.

Source: Standish Group, 2001

The good news is that in recent years success rates are up across the board, while cost and schedule overruns are declining. The CHAOS research timeline provides evidence of steady improvement in IT project management. Quote: "In 1994, only 16% of application development projects met the criteria for success/completed on time, on budget, and with all features/ functions originally specified. In 2000, 28% of all projects were in the successful column."[iv]

Figure 1: Projects show steady improvement[v]

"Tracking U.S. project outcomes showed that in 1994, 28,000 projects were successful. In the year 2000, that number increased to 78,000 – almost a threefold climb. Conversely, failed projects amounted to 54,000 in the 1994 study vs. 65,000 in the 2000 study. This constituted an 18% increase, while overall project growth exceeded 60%. Challenged projects grew at a rate of 62%, to equal 137,000 over the 1994 number of 93,000."

Success factors in software development

The first so-called CHAOS study, conducted in 1994, identified 10 success factors, called the "CHAOS 10". This list provides an overview of which factors have a high positive or negative impact on software projects. Used proactively, these factors can be viewed as early indicators to avoid failure and as a means to define priorities early on.

Based on new data from the annual studies, the Standish Group has updated the CHAOS 10 and published a new ranking of the factors in the year 2000. Although no project requires all 10 factors to be successful, the more factors present in the project strategy, the higher the confidence level.

User involvement, which is the key task of validation, is ranking high on the list. It is the second most important factor to ensure successful software development and has been the most important factor in past studies.

Table 3: Recipe for Success: CHAOS 10

Recipe for Success: CHAOS 10 Each factor was weighted according to its influence on project success. The more points achieved, the lower the project risk.		**Success factor**
1	Executive support	18
2	User involvement	16
3	Experienced project manager	14
4	Clear business objectives	12
5	Minimized scope	10
6	Standard software infrastructure	8
7	Firm basic requirements	6
8	Formal methodology	6
9	Reliable estimates	5
10	Other criteria	5

Source: The Standish Group, 2001[vi]

The following list is an excerpt from a 2001 article in *Softwaremag* and describes the role of individual factors in more detail. It is important to understand that no single factor is the key to success. Rather, an appropriate balance considering all factors must be found for a given project.

Executive support

Traditionally, executive support occupied the No. 2 spot; however, it is now the No. 1 factor in project failure. Executive support influences a project's process and progress. Lack of executive input can jeopardize a project.

User involvement

Lack of user involvement traditionally has been the No. 1 reason for project failure. Conversely, it has been the leading contributor to project success. Even when delivered on time and on budget, a project can fail if it doesn't meet user needs or expectations. However, this year user involvement has moved to the No. 2 position. Despite how this may sound,

user involvement hasn't decreased in importance; it's just that IT professionals have, in effect, addressed this major problem.

Experienced project manager

Ninety-seven percent of successful projects have an experienced project manager at the helm.

Clear business objectives

This factor has moved down one spot because evidence shows that experienced project managers increase success rates.

Minimized scope

Wrapping up the top five is minimized scope. Time is the enemy of all projects, and since scope affects time, or project duration, they are linked. Clearly then, minimizing scope increases a project's chances of success. Minimized scope has replaced small milestones. While these two factors are similar, the act of minimizing scope leads to greater success than does creating small milestones. Concentrating on the top five will result in 70 success points.

Standard software infrastructure

Requirements are in a state of constant flux, but infrastructure needs stability. The Standish Group research shows that 70% of application code is infrastructure. Some of this code is unique to the application; nonetheless, much of this code could be purchased from an infrastructure vendor. By using standard infrastructure, the application development team can concentrate on business rules rather than on technology. Many application development projects fail not in standalone application development, but in existing application integration. Standard infrastructures can shortcut application integration.

Firm basic requirements

The word “basic” refers to base-level requirements. Creating minimal, obtainable base requirements and then developing those features will reduce the effect of change. Delivering minimal features allows users and executive sponsors to see quick results. As a result, project managers are better prepared to articulate the needs and priorities of the next project phase.

Formal methodology

This provides a realistic picture of the project and resources committed to it. And it results in steps and procedures the team can reproduce and reuse. It also enables the team to maximize consistency. And it incorporates lessons learned into active projects. The process encourages a go or no-go decision checkpoint. It also helps the project team proceed with a higher level of confidence, or halt or alter steps to fit changing requirements. CHAOS research shows that 46% of successful projects use a formal project management methodology, compared with 30% of challenged and failed projects. So, this factor should increase success rates by about 16%.

Reliable estimates

Systematic project estimating must be approached realistically, because estimating is just plainly hard. Then add to that the difficulty of developing, purchasing, and integrating components into existing and packaged applications, and outside services. IT managers must use all their collective knowledge and experience to come up with estimates that reflect the true effort required.

Other criteria

In last place is a collection of other factors. These factors include small milestones, proper planning, competent staff, and ownership. In the past, each of these factors was given its own category.[vii]

Relevant finding for the SYNC3 user validation plan:

The study confirms the paramount importance of user involvement in the software development process. Well-implemented rounds of user evaluation will therefore not only serve to assist the engineers in optimising software functionality and usability, but also enhance the no less crucial end-user acceptance of the eventual product.

2.4. Planning of the validation process

There are many different ways in which validation tests can be planned and applied. A short overview helps to identify the testing process best applicable to SYNC3.

2.4.1. Requirements validation

Designing a system test forces a development team to deeply understand the requirements. The better these requirements are visible, the earlier incompleteness, ambiguity, and inconsistency can be identified. Correcting such problems early will speed up development and reduce the number of late requirements changes.

There are three basic methods of evaluation:

Ad-hoc testing

- "Just see if you can break it"
- Make up test cases "on the fly"
- Human interpretation of requirements

Systematic testing

- Driven by explicit quality assurance goals
- Tests designed for comprehensive coverage
- Tests specify expected output as a benchmark

Automated testing

- Driven by explicit quality assurance goals
- Test-suite designed for comprehensive coverage
- Scripts need no human judgment

Relevant finding for the SYNC3 test and validation plan:

Requirements validation has been covered mostly in earlier stages of the SYNC3 project. Still, as this is an ongoing concern, this topic will be part of the validation process as well. Also, using a systematic testing approach is needed given the innovative character of SYNC3 with a focus on the integration of innovative modules such as sentiment analysis. Automated testing will not work with SYNC3, because the entire system usability and benefits hinge on user interaction.

2.4.2. Validation and verification

There is a strong dependency between validation and verification. Only a full static and dynamic verification plus a structured validation process will provide full coverage at the end.

Verification must be performed regularly to identify and eliminate flaws and defects of the software. This task is usually very complicated when a large project is partitioned into different modules that need to be integrated later in the process.

Validation can identify whether a user can execute a task with or without training. It can answer the question whether the graphical user interface (GUI) is intuitive or needs detailed and sophisticated help documentation. For example, a test can verify whether a user is able to perform a search and retrieve the news event that he is interested in, and use the various options that the system provides for exploring a news event: exploring relations between events, getting on overview of the specific items referring to them from traditional media sources and blogs, exploring the news event based on time, location, causal relations, or sentiment of the authors of blog entries that discuss the news event of interest, use the Workspace feature to select news events or news items, create relations between them and add own comments and opinions on them and use the sharing and collaboration features to create their own profiles, groups of friends and themed groups, and sign up for updates.

Validation therefore is not the tool to create user-friendly interfaces only. Complex tasks might require complex software with many features that are not necessarily intuitive and self-explanatory. Validation is also a very effective way to learn which training and documentation is needed in order to gain acceptance.

Verification, on the other hand, is needed to ensure that the software runs without major defects, e.g. that a video starts when a button is pressed, that large files can be processed without stalling the system, or that stored data is secure and can be reliably found when a search is initiated. Verification can be executed as a static or a dynamic process. Static verification usually refers to a software inspection or a code analysis. Dynamic verification is executed with test data to check how the system is working under load.

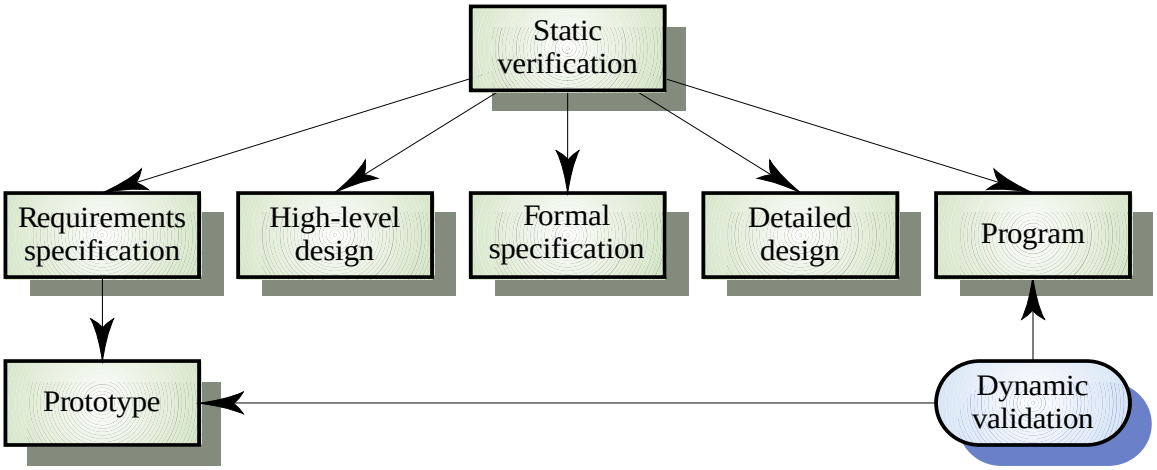


Figure 2: Static software verification[viii]

Relevant finding for the SYNC3 test and validation plan:

The dependency between validation and verification is an issue that must be covered in the test plan. Validation and verification are two sides of the same coin. Verification must be completed to a high degree before each round of validation, while validation will provide feedback for modifications which will require verification in turn before user testing.

2.4.3. Level of confidence

The "level of confidence" describes a status when many foreseeable factors are under control. This relates to different aspects such as functionality, integration, time, budget, etc. The term is also helpful to keep development confined to the key features and avoid the uncertainty that is caused by too many changes.

Finishing a project when it is "good enough"

Verification and validation (V&V) establish confidence that the software is fit for its purpose. This term applies strictly to a particular version or release of software in the development lifecycle. Therefore, this process will normally not result in software free of defects or include every conceivable feature. More to the point, the goal is to be able to finish a project and get to a product that is "good enough". This level of quality is usually the goal of standards such as IEEE or ISO which describe the minimum level of quality that is needed.

Releasing a system when it is "fit for purpose"

The required level of confidence can differ from system to system. High security software needs a higher level, while broadly used systems must ensure that, e.g., user data or stored content cannot be altered. Therefore it is important to define a set of criteria that describe what to test during a validation and verification process. The specification usually referred to in addition to "good enough" is usually to test whether a system is "fit for purpose".

Both terms are important to ascertain a certain level of flexibility in the development process, and they open productive ways to turn ideas into features from release to release.

Relevant finding for the SYNC3 test and validation plan:

The goal of creating a system that is "good enough" and "fit for purpose" is important for user evaluation as well. These concepts are actually a warning not to use testing to search for features that could be included. This would create the risk that the project becomes open-ended. In order to avoid this, a "wish list" will be one of the tools to collect possible features for future releases of SYNC3 without compromising the ongoing development.

2.4.4. Test early and often

The CHAOS 10 identifies "user involvement" as a key success factor. It does not define how it is supposed to be initiated, planned, and managed. What can be done to really uncover user requirements while they shift or change, particularly in the field of annotation of multimedia?

The point is that the only way to get to a level of certainty is to involve users in different stages of development and to use a set of tools to ensure that the needs of these users are understood in the best possible way. This still is an iterative process. Results from interviews, use cases and use models can result in surprises and new directions, which can shift the demands regarding development. The less momentous these new insights are, the easier it is to finish a project in time and on budget.

Validation and verification therefore must be applied in each stage of the development process. Simply testing an end product at a late stage will statistically often result in major rework demands.

Relevant finding for the SYNC3 test and validation plan:

Constant user involvement is the key, testing early and often can create additional benefits. The test plan should answer the question how many tests are to be planned and how often and at what stage of development tests can be performed.

2.4.5. How many tests?

How many users must take part in tests in order to create a system that is "fit for purpose"?

Usability expert Steve Krug[ix] presents compelling data and findings that testing does not need to be overly complex in order to get results which are helpful for the development process and the programmers.

His recommendations plus suggestions from other authors such as Jacob Nielsen are helpful as they provide background information on how the test process can be set up and how many users must be tested to get trustable results. Additionally, simplifying testing as much as possible helps to reach the goal of testing "early and often", which – as discussed above – is pretty important to ensure project success. Krug's book, however, is about usability, not validation. Although validation goes further and is more formal than usability testing there are still many relations relevant to both disciplines.

A distinction to be made is that validation judges interface design based on formal requirements as well as from a functional perspective, not from a marketing point of view, where, for instance, an optimum of usability is highly important for eCommerce. Nonetheless, the recommendations from the usability experts are highly useful in this context.

The following excerpts from *Don't make me think* provide relevant information on which aspects need to be considered:

> **The importance of recruiting representative users is overrated**
>
> It's good to do testing with people who are like the people who will use the site (or software), but it's much more important to test early and often. The motto is: "Recruit loosely and grade on a curve". The point of testing is not to prove or disprove something. Instead it's to inform the judgement of everyone involved with development. Quote: "People like to think that they can use testing to prove whether navigation system A is better than navigation system B but you can't. No one has the resources to set up a controlled experiment you'd need. What testing can do is provide you with invaluable input, which, taken together with your experience, professional judgement, and common sense, will make it easier to choose wisely – and with greater confidence – between A and B."
>
> **Testing is an iterative process**
>
> Testing isn't something you can do once. You make something, test it, fix it and test it again.
>
> **Nothing beats a live audience reaction**
>
> Testing slightly different versions of a software results in gaining even more insight on what might be the best solution to a given task.
>
> **Simple test set-up**
>
> In the beginning, usability testing was a very expensive proposition. You had to have a usability lab with an observation room behind a one-way mirror, and at least two video cameras so you could record the users' reactions and the thing they were using. You had to recruit a lot of people so you could get results that where statistically significant. It was science. It cost $20,000 to $50,000 a shot. It didn't happen very often. But in 1989, Jakob Nielsen wrote a paper titled "Usability Engineering at a Discount"[x] and pointed out that it didn't have to be that way. You didn't need a usability lab, and you could achieve the same results with much fewer users.

Table 4: Traditional vs. simple testing

	Traditional testing	Simple testing
Number of users per test	Usually eight or more to justify set-up costs	Three to four
Recruiting effort	Select carefully to match target audience	Grab some people. Almost anybody who uses the Web (or a computer) will do
Where to test	A usability lab, with an observation room and a one-way mirror.	Any office or conference room
Who does the testing	An experienced usability (or validation) professional	Any reasonably patient human being
Advance planning	Tests have to be scheduled weeks in advance to reserve the usability lab and allow time for recruiting	Tests can be done almost any time, with little advance scheduling
Preparation	Draft, discuss, and revise a test protocol	Decide what you're going to show
What/when to test	Unless there is a huge budget, put all your eggs in one basket and test once when the site is nearly complete	Run small tests continuously throughout the development process
Cost	€5.000 to €15.000 (or more)	About €300
What happens afterwards	A 20-page written report appears a week later, then the development team meets to decide what changes to make	Each observer writes one page of notes for the day of test. The development team can debrief the same day.

Source: Steve Krug[xi]

Number of users

Steve Krug suggests the ideal number to be three or four users for each round of testing. The first three users are very likely to encounter the most significant problems. [xii] Statistically there is proof that 3-4 users will discover 85% of a software or site's usability problems, and there are diminishing returns for testing additional users.[xiii]

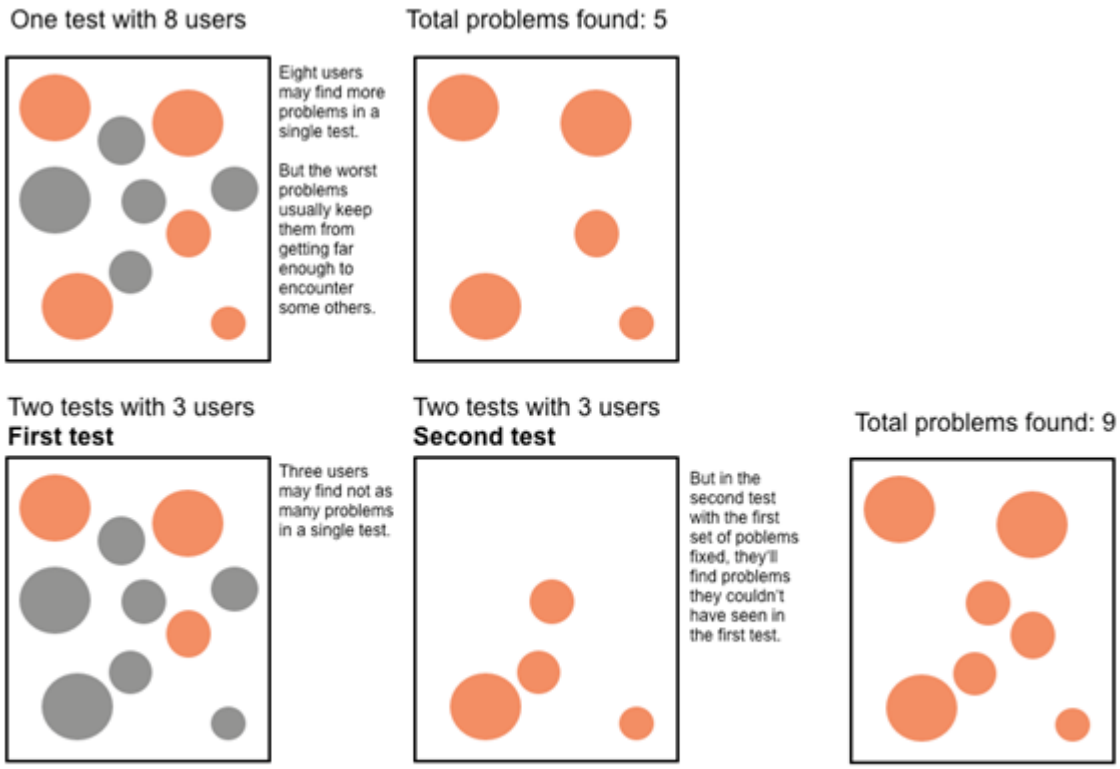


Figure 3: Three users will discover 85% of an application's usability problems

Many discussions have taken place about the sample sizes for usability evaluation since the studies of Steve Krug and Jacob Nielsen. The most popular rule in the usability evaluation field at the present moment is the "4±1"or "magic number five" rule.[xiv] Nielsen and Molich studied the issue of sample size for usability testing in the case of the heuristic evaluation method (HE), in which a small number of evaluators inspect the user interface design of a system in order to detect usability problems in comparison with known usability principles (heuristics). By means of empirical studies and mathematical methods the authors demonstrated that 2/3 of usability problems are detected by five evaluators and that tests with additional evaluators are not likely to expose new problems.[xv] Similar findings were indicated by Virzi in the case of determining the optimal sample size for usability testing using the TA (think aloud) method. He demonstrates that 80% of usability problems are detected by four or five users.[xvi] These findings have been challenged by several subsequent studies.[xvii] A meta-analysis of sample size issues in usability evaluation conducted in 102 usability evaluation experiments extracted from online academic databases, including the ACM Digital Library, IEEE Xplore, and ScienceDirect, and offline sources since 1990 indicated that in order to obtain reliable/optimal results using the TA method the size of the user sample must be nine in order to detect 80% of the usability problems. In spite of this, the "4±1"or "magic number five" rule maintains itself as the most frequently invoked rule in determining sample sizes in usability evaluation.

Relevant finding for the SYNC3 test and validation plan:

Wherever possible and appropriate we will apply the recommendations provided above to simplify the test process. The main reason is that this will result in more testing within a shorter time period and test results that can be used quickly by all developers. A complicated test process with high user numbers and a formal test report would also not fit the dynamic nature of this particular, journalist- and news-driven project.

2.4.6. Identifying future problems

The SYNC3 project aims to combine innovative modules to deliver the final product. Therefore the issue of system integration will gain importance from step to step. Starting with the first prototype, the task of integrating all system components must be considered in every step forward. Otherwise, testing and validation might not be able to identify problems that can arise once the modules have to work with each other to provide functionality.

Traditional "V-models"[xviii] of software development assume that testing can be done as build-up process: Once a phase is finished, every module that passed the tests is supposed to work on the next level as well. However, this is often not the case in real environments.

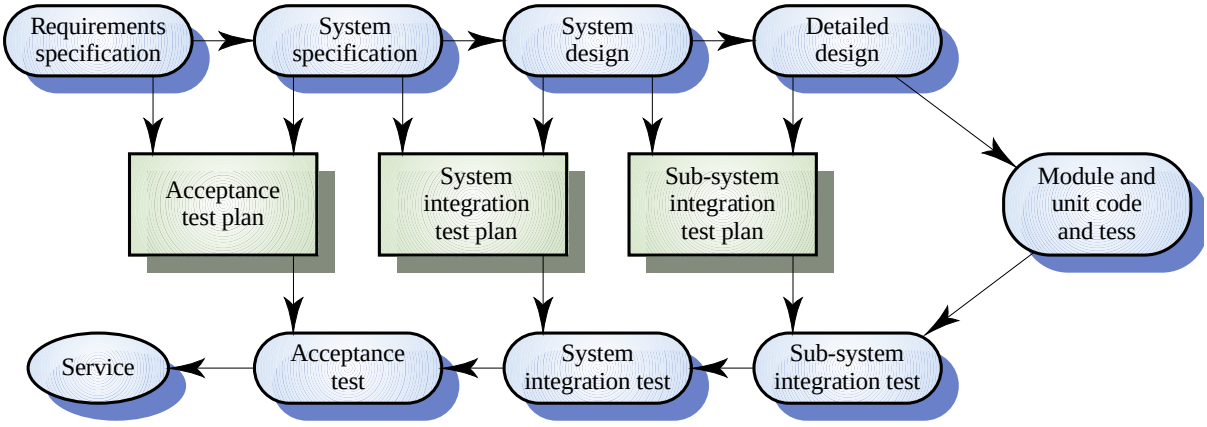


Figure 4: The V-model of development[xix]

Critics of the V-model point out that the testing is often done too late and not often enough in the process. The main reason is the assumption that at the end of each step fully functional modules will be available. But once the integration starts, problems or bugs surface that lead to reworks. Such late changes in a project are often both complex and time consuming. And they are difficult and harder to solve because subsystems must be changed and reconfigured as well.

"The V-model fails because it divides system development into phases with firm boundaries between them. It discourages people from carrying testing information across those boundaries. Some tests are executed earlier than makes economic sense. Others are executed later than makes sense. Moreover, it discourages you from combining information from different levels of system description. For example, organizations sometimes develop a fixation on 'signing off' on test designs. The specification leads to the system test design. That's reviewed and signed off. From that point on, it's done. It's not revised unless the specification is. If information relevant to those tests is uncovered later – if, for example, the architectural design reveals that some tests are redundant – well, that's too bad. Or, if the detailed design reveals an internal boundary that could easily be incorporated into existing system tests, that's tough: separate unit tests need to be written."[xx]

The suggested solution is to utilize an integrated evaluation approach, thus overcoming barriers between development processes as well as different modules. The earlier insights are gained on whether integration, functions and sub-systems successfully work together, the easier it will be to achieve good results. Even market research and new competition should be partly included in order to advance a project to the best level achievable.

3. SYNC3 user evaluation methodology

The SYNC3 user evaluation plan presented here is a systematic approach to ensure that the requirements of SYNC3 are met in the final product and that the modules released will have been validated.

Based on goals and best practices identified to be useful, this plan and report are designed to become a tool for the next phases of this project. Key points are a good understanding of the requirements as well as a detailed workflow. The outline used in this part is based on the IEEE 829 format.

3.1. SYNC3 objectives to be evaluated

As per the DoW, the goal of SYNC3 is "to create a framework for **structuring, rendering more accessible and enabling collaborative creation** of the extensive user-provided content that is located in personal blogs and refers to running news issues. The main obstacle for blogosphere content exploitation has been the **difficulty to structure** the disparate and vast information found in blog posts."

Structuring that portion of the blogosphere that discusses the running news is the main objective of SYNC3. To achieve this goal SYNC3 follows the logical but unexplored path of deriving the thematology from the news articles and then applying it to the blogosphere domain. This method is based on the fact that news articles and comments on blog posts that refer to news articles share the same thematology. The novelty of SYNC3 lies in using the news event as the fundamental element around which the thematology is formulated. The news event in SYNC3 is defined as "something that takes place at a particular time and at a particular location". To identify news events, SYNC3 is using an innovative algorithm combining statistical and language processing.

The SYNC3 system aims to also enable the creation of more user generated content either by authoring new material or re-organising the links structured by SYNC3 into user generated storylines.

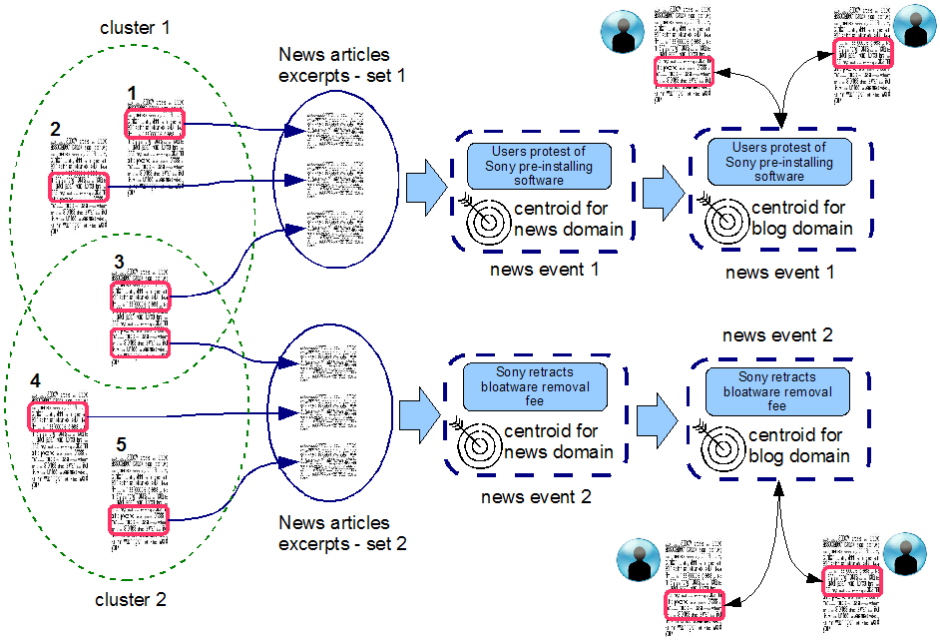


Figure 5: The SYNC3 approach

Evaluation-related deliverables

This is the list of deliverables related to validation tasks in the SYNC3 project:

Table 5: Evaluation-related deliverables

Deliverable	Title	Responsible
D7.4.1	User evaluation report	EJC
D7.4.2	User evaluation report	EJC
D7.4.3	User evaluation report	EJC

Scope of testing

The entire SYNC3 user feedback activities are designed to enable a broad range of validation procedures, including tests of basic material such as layouts, rough sketches of user interfaces or functional modules, simulations as well as the prototypes of the complete system. This flexibility is needed to respond to the needs of the developers. The perspective is that any interaction with users can produce new insights how to build the final system.

However, in terms of validation the tests naturally become more meaningful as the system completion and especially integration progresses. Otherwise the risk of testing incomplete material might result in not detecting defects.

As discussed above, the validation aims to ensure that "the right product will be built" from a user perspective. In case that the modules do not perform the desired tasks in a test situation for technical reasons, the test result will be labelled as "failed", and a note will be sent to developers asking for verification of the code.

3.2. Prototypes and evaluation scenarios

What will be evaluated in particular? This section provides a description of the suggested test and validation scenarios, for the first and second prototype of SYNC3.

The first prototype, the delivery of which was originally planned for month 18 (September 2010) has been released in month 20 (November 2010). As planned, the first prototype

> Provide[s] limited functionality compared to the next versions. Its aim is to prove the feasibility of the approach and pave the way for the next version.[xxi]

The intermediate prototype was planned to be delivered in month 25 (April 2011) and was released in month 26 (May 2011). Per the DOW, in the intermediate prototype

> All the main functionalities will be implemented. The performance of the overall system will be evaluated and changes towards the final prototype will be decided. Specific issues with each functionality will be tracked and scheduled for correction in the final prototype.[xxii]

The final prototype is planned to be delivered in month 31 (October 2011):

> This will be a fully developed prototype with all the functionalities implemented and optimized as well as with integration of changes and additions from the evaluation of the intermediate version. Extensive technical and user evaluation will be performed after the delivery of the final version of the prototype.[xxiii]

Obviously, the three main rounds of user evaluation need to take the different stages of completion into account. The first prototype has been checked primarily for basic functionality and general user understanding of the SYNC3 practical purpose and usability. In the second and third rounds, testing must dig as comprehensively as possible into the functional requirements and validate them with the different targeted user groups.

The following use cases were implemented in the first and second prototype and served as basis for formulating the tasks by means of which the participants tested the SYNC3 prototype.

Table 6: Correlation of SYNC3 use cases with the first and second integrated prototypes[xxiv]

ID	Use Case Title	Supported in the first Prototype	Supported in the intermediate Prototype
UC1	Perform keyword search	☑	☑
UC2	Perform advanced search	☑	☑
UC3	View search results	☑	☑
UC4	View today's news and blogs	☒	☒
UC5	Analyse event	☑	☑
UC6	Analyse blog	☑	☑
UC7	Analyse blog (advanced)	☒	☒
UC8	Monitor blogs	☒	☑
UC9	Create event relations	☑	☑
UC10	Associate events with blogs and news	☑	☑
UC11	Create groups	☒	☒
UC12	Export news stories	☒	☒
UC13	Manage Workspace	☒	☑
UC14	Receive newsletter	☒	☒

3.3. User evaluation methodology

In the course of the SYNC3 user evaluation, we employ tried-and-tested techniques to elicit useful feedback from the test persons. To this end, and different from the focus group brainstorming sessions during the user requirements analysis[1], user evaluation is usually conducted in face-to-face sessions with a maximum of four persons present:

- The test leaders (from EJC), asking questions, giving instructions and assignments, debriefing, observing and taking minutes;
- The primary test user, performing the evaluation and subsequently teaching the secondary test user;
- The secondary test user, to be instructed about the system by the primary user.

Where two test leaders are available, one of them could stay in the room with the test user currently carrying out the evaluation while the other one asks the concluding questions to a previous test user (debriefing). Under time pressure, this achieves the best possible time economy, while under more relaxed circumstances, one test leader is sufficient.

We use three main techniques to collect user feedback during practical testing, all complemented with audio documentation for backup and notes made by the test leader:

1. Thinking aloud and observation

This technique means that the test users are given assignments they have to perform with SYNC3. The test leader encourages the users to permanently talk about his/her impressions and actions during the evaluation process. In such a way, the mental models by which users address a task or try to achieve a goal can be detected and analysed. All the while, the test leader observes carefully the subjects' behaviour in order to try and detect even semi-conscious interactions with the system or barriers which are not expressly addressed by the user. Test participants are allowed to digress from the test scenario and perform unplanned tasks. Complementing the controlled interaction with the prototype with unplanned actions provides information about how potential users would use the system in natural settings and may lead to the identification of issues unanticipated in the evaluation script. The benefit of this approach is the fact that user behaviour and user satisfaction become immediately transparent. The need for modifications – if any – will become apparent, as will the possible need for specific training or introduction to the SYNC3 tool. At the same time, the professional users will express to what extent SYNC3 actually caters to their everyday work requirements.

2. Constructive interaction (teaching back)

This technique consists of two stages. In the first step, one test user gets the opportunity to try out and become familiar with SYNC3. In the second step, the same user explains the functionality of the system to the next user in line. The success rate of this direct user-to-user training is directly related to the mutual understanding of the system.

The particular benefit of this approach is that the first user is required to expressly verbalise his/her comprehension of how the system is working and how it is intended to be used. This task therefore triggers a reflection process and prompts the first user to explain SYNC3 in a systematic fashion. This reveals how deep the actual understanding has become at this point and highlights features which remain unclear or hard to grasp. In case this "Chinese whispers" test works well, the system has a very clear and easy usability; if not, any misapprehensions highlight urgent action points.

However, this approach can only be used in situations when test users have some extra time on their hands and are not anxious to rush back to their regular tasks. It is also of limited use with the user interface simulation and the first prototype, as user interaction with the system requires concise stewardship through the available processes which users cannot know at this stage.

3. Collection of express feedback

Immediately after finishing their hands-on experience with SYNC3, the test users are asked for their personal evaluation of the system. They are asked to fill in a standardised questionnaire and are also given the opportunity to independently express their opinion and possible suggestions.

The benefits of this technique are obvious, since it allows the collection of conscious cognitive reactions and recommendations. While such information alone, without the abovementioned first two steps would run the risk of misrepresenting the user experience – e.g., since people tend to rationalise or to respond according to pre-existing prejudices – in this case it constitutes a useful supplement to the observations made during the practical work with SYNC3.

However, all user evaluations must take into account that users frequently tend to react adversely and insecure to new, unaccustomed software. This is particularly true for those professional users who have long-term experience with other software solutions in the particular field of SYNC3. However, since the particular field of SYNC3 is rather recent, this reaction should not occur. Furthermore, the phenomenon that assessments made in surveys frequently turn out more negative than is warranted by the actual subject of enquiry will most probably come up during the SYNC3 user evaluation as well. The situation of being asked for opinion statements as such often leads to a particularly critical point of view.

3.4. Survey of exploitation opportunities

Having actual potential users try the SYNC3 system offers one of the best conceivable Having actual potential users try the SYNC3 system offers one of the best conceivable opportunities to find out about the practical application prospects in the media business sector for the eventual product. While participants of the user evaluation efforts will be primarily everyday users and not high-ranking decision makers, it is the assessment of exactly this kind of users that will influence the evaluation process in media companies to a great extent.

If the test users realize the gains in time and convenience and do not show adverse reactions to the SYNC3 system, they will become SYNC3 “ambassadors” in their respective organisations. Under the assumption that the participants in the user evaluation are representative of their peers in similar parts of the sector, their statements can also be used as a supporting measure in the eventual SYNC3 sales development.

In a separate effort, the final prototype will be presented to a number of executives at management level, who will be asked to assess the tool from the point of view of integration into existing work flows in their respective organisations and of the perceived balance between potential investment and efficiency gains.

4. SYNC3 user evaluation by use case

4.1. First prototype

It should be noted that the following use cases were designed with the SYNC3 end product in mind. Quite obviously, they have different priority levels and pertain to very different situations and environments. Some will only be required by the time the system is released into commercial usage, while others speak to the core qualities of the envisioned tool.

Table 7: Summary of SYNC3 use cases and implementation status in the first prototype[xxv]

ID	User Group	Use Case Title	Use Case Description	Status
UC1	All	Perform keyword search	All users may perform queries to the system by using a free text search engine.	☑
UC2	All	Perform advanced search	All users may perform queries using facets provided by the system like author name, source, time, etc.	☑
UC3	All	View search results	All users may navigate within the search results, which may be presented in different ways, according to the needs of the user.	☑
UC4	All	View today's news and blogs	All users will be presented with an overview of the most important news articles and blog posts.	☒
UC5	All	Analyse event	Every user may view all metadata information and analysis of an event. This includes news sources, relevant blogs, sentiment analysis (for blog posts), and temporal/causal/location relations (among events).	☑
UC6	All	Analyse blog	All related events and corresponding sentiment analysis of the blog are identified by the system.	☑ (partly)
UC7	All	Analyse blog (advanced)	The blogger's profile is displayed and a ranking system is available to the users.	☒
UC8	Professional journalist	Monitor blogs	Particular blogs of interest are monitored for their sentiment and relations with traditional news sources regarding an event.	☒
UC9	All	Create event relations	All users may use a personal space to create new relations between events of their interest and save this information.	☑

ID	User Group	Use Case Title	Use Case Description	Status
UC10	All	Associate events with blogs and news	The users will suggest blogs or news items associated with an event, which were not identified by the system or were linked in a different way.	☑
UC11	All	Create groups	All users may create groups which will share personally created news stories.	☒
UC12	All	Export news stories	User created news stories may be exported to other social community platforms.	☒
UC13	All	Manage Workspace	The SYNC3 users define the set of news portals and blog sources from which they collect content.	☒
UC14	All	Receive newsletter	All users are offered a newsletter of events of their interest.	☒

A series of tasks to be performed by the test users during evaluation sessions has been produced to enable evaluation by means of the think aloud protocol. The tasks have been formulated to cover the use cases described in the table above, which correspond to the functions implemented in the first prototype. According to D8.2: "First Integrated Prototype", which documents the first integrated prototype, the implemented functions are: news processing and analysis which enables the identification and analysis of news events, blog processing and analysis which enables the association of blog posts with news events, news events labelling and relation extraction which enables the creation of relations between news events, user interface which provides the environment through which the users interact with the system, search for news events and visualizes the generated results, and integration, consisting of integration of all these other functions.[xxvi]

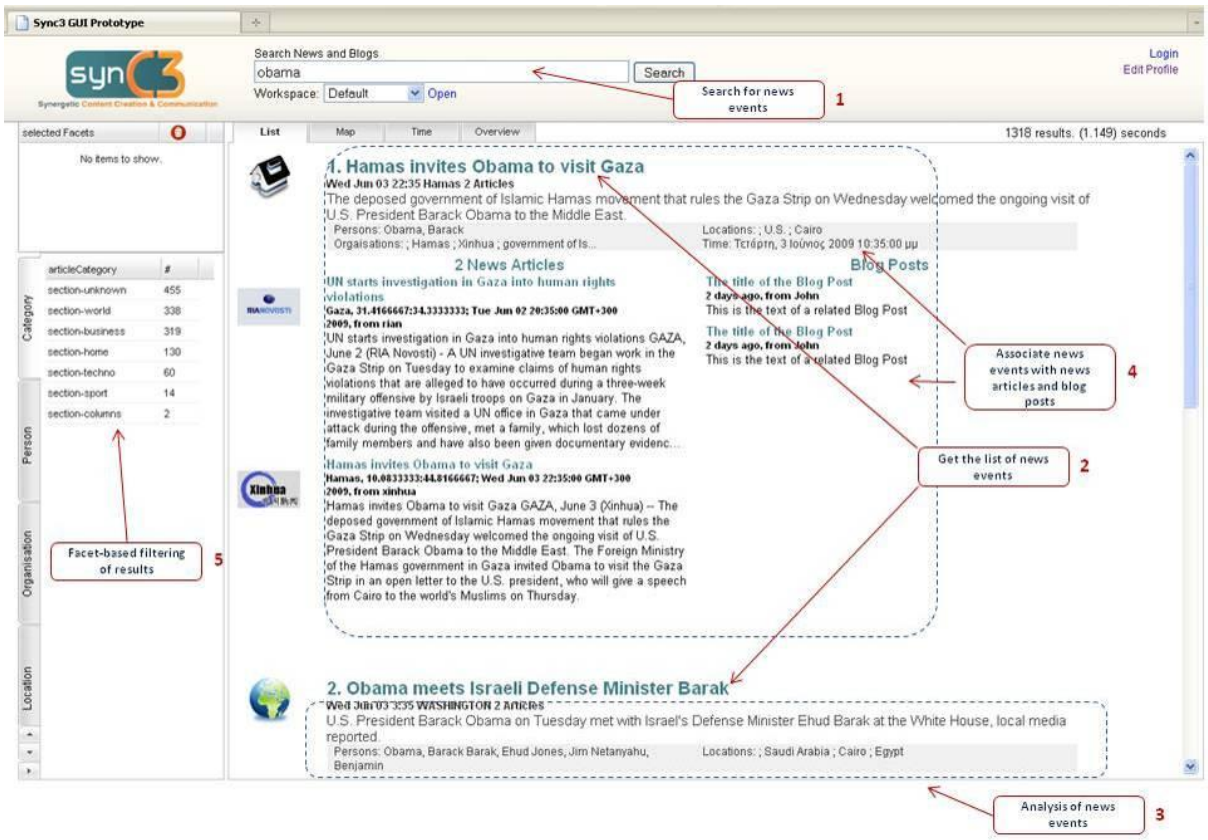


Figure 6: Visual representation of SYNC3 use cases related to the search function[xxvii]

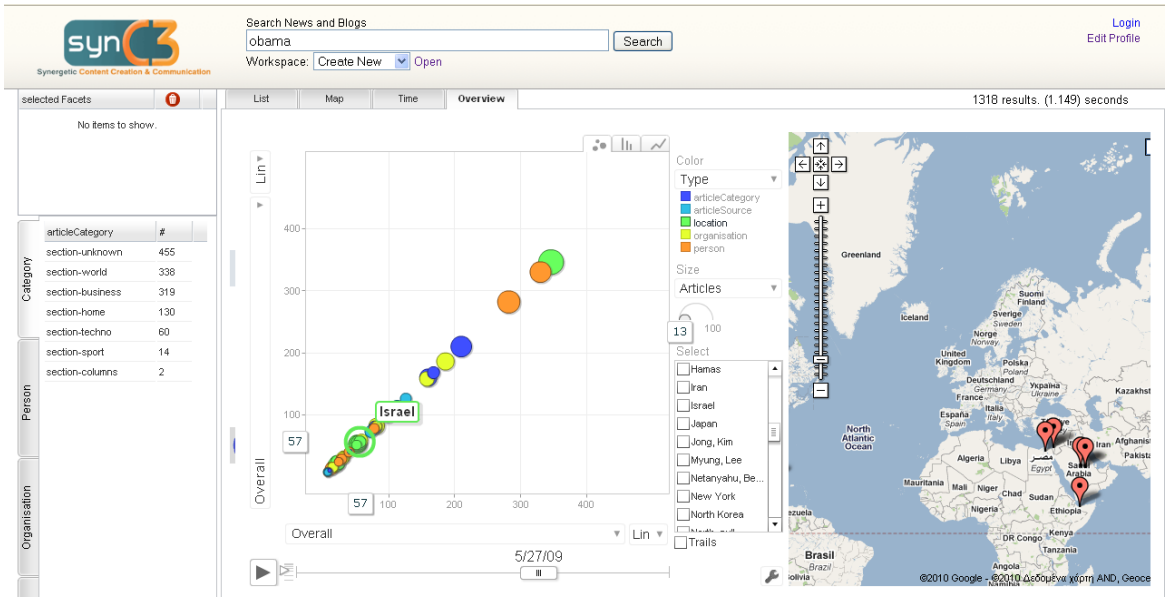


Figure 7: Visual representation of SYNC3 use cases related to search results visualization[xxviii]

The following tasks have been formulated to evaluate the use cases that were implemented in the first SYNC3 prototype. Each task is accompanied by questions which the test leader can ask in order to stimulate the participant to make observations on aspects of the SYNC3 system which require user validation:

1. [UC1 + UC5] Search for news about the BP oil spill by using the SYNC3 search function. Explore the generated news events. Are the results satisfactorily matching the query? Are the event titles meaningful/clear or not? Do you find it useful or not to have persons, organizations, locations involved in the event extracted and displayed?
2. [UC3 + UC6] Select one of the generated news events and explore the news articles and blog posts that discuss it. How would you comment on the listed news sources? Are the listed blog posts relevant to the selected news event? Are you satisfied with the range of news sources listed? Are there sources that you would have expected to be listed and have not been?
3. [UC10] Type the same query: "BP oil spill" in the Google News search engine and limit the results to the period January-September 2010 by using the "Custom Range" function. Look at the listed results and their sources. How would you compare them with the results you get from the same query in the SYNC3 prototype? Are there any sources that report on this topic that you consider essential for the SYNC3 prototype to list?
4. [UC2] By using the SYNC3 advanced search function, filter the generated results by one or more of the following: 'person', 'organization', 'location', or 'source'. Do you find this filtering function useful in your work? Why? Why not? Are the SYNC3 search capabilities satisfactory? What other kinds of search capabilities would be useful to have? Would you be interested for example to be able to search by keywords + positive/negative sentiment?
5. [UC3] Explore the generated results with the Overview having the X axis set to 'time' and the 'y' axis set to 'article' to see how the number of articles corresponding to your query changes over time. Select an entity whose evolution to follow over time from the following categories: news source, person, organization or location. Set the Y axis to 'overall' to see the overall number of articles referring to a particular entity from the categories: news source, person, organization, location, until the date that you selected. Does the graph help improve your understanding of the generated results? Does it bring a different perspective on the generated news? Do you find such visualizations useful in your work or not? Which of the modes of visualizing results is the most meaningful to you? Which of the visualizations would be most useful in your work?
6. [UC9] Select two or more news events from the search interface that you consider are related in some way and add them to the Workspace.
7. [UC9] Place them in a Group Canvas and name your Group Canvas. Do you find the function of grouping news items by means of the Group Canvas useful in your work?
8. [UC9] Draw connections between the news events by using arrows and make notes on the relations between them. Pay attention to the type of relations the subject is creating. Do you want to freely add relations between news items or do you want to have standard options for making relations between news items? If so, what type of relations would you like/need to establish between events?
9. [UC6] Annotate one of the news events by using the rating scale. When blog posts will be transferable to the Workspace, sentiment can be annotated as well. What would you relate the sentiment to? Would you be interested more generally in the sentiment of the entire blog post or in sentiment towards certain mentioned entities?
10. [UC9] Move some news items from the Group Canvas to the Group List. Are the offered possibilities to comment on the news items satisfactory? Do they enable the type of analysis that you usually perform on media content? What type of activity would you want to perform with the Workspace?

Additionally, and depending on available time, some questions were formulated to gather user feedback on UC11-14, based on a User Profiling Infrastructure simulation provided by L3S and available at: http://sync3.atc.gr/de.l3s.sync3.gui/groups/.

- Would it be useful in your work to have the functionality of creating groups and joining groups?

- How would you like to get recommendations: based on keywords that you can fill into your profile or based on your queries?

At the request of the Consortium partners the following questions were included in the evaluation sessions' script.

- Explain the participant that in the case of related news events a news article can be part of two news event clusters. What would you prefer: to have the same article listed twice in two news events or to have it just once in the most recent event? I.e.: To miss information or to have redundant information? Also, some articles listed under a news event are "near" duplicates in the sense that the only thing that distinguishes them is the URL. Would you be interested in having them all displayed or just one of them?

Each session is concluded by answering any remaining questions of the test participant and asking for an overall impression.

Integration issues (from the user perspective):

Do users perceive any flaws in the interplay between SYNC3 components?

How much time is consumed, and do participants feel that they increase efficiency with SYNC3?

Inherent Risks:

Overwhelming the user by an abundance of settings or difficult to understand options; scarcity of options. During actual evaluations, cutting the usage scenarios into smaller pieces so as to better accommodate the different prototypes might turn out useful, especially since the first two prototypes will most likely not cover the entire functionality of the SYNC3 final product.

4.2. Second prototype

The table below lists the use cases planned for the SYNC3 end product and the status of their implementation in the second integrated prototype.

Table 8: Summary of SYNC3 use cases and implementation status in intermediate prototype[xxix]

ID	User Group	Use Case Title	Use Case Description	Status
UC1	All	Perform key-word search	All users may perform queries to the system by using a free text search engine.	☑
UC2	All	Perform advanced search	All users may perform queries using facets provided by the system like author name, source, time, etc.	☑
UC3	All	View search results	All users may navigate search results, which may be presented in different ways, according to the needs of the user.	☑
UC4	All	View today's news and blogs	All users will be presented with an overview of the most important news articles and blog posts.	☑
UC5	All	Analyse event	Every user may view all event metadata information and analysis. This includes news sources, relevant blogs, sentiment analysis (for blog posts), and temporal/ causal/location relations (among events).	☑

ID	User Group	Use Case Title	Use Case Description	Status
UC6	All	Analyse blog	All related events and corresponding sentiment analysis of the blog post are identified by the system.	☑
UC7	All	Analyse blog (advanced)	The blogger's profile is displayed and a ranking system is available to the users.	☒
UC8	Professional journalist	Monitor blogs	Particular blogs of interest are monitored for sentiment and relations with traditional news sources regarding an event.	☑
UC9	All	Create event relations	All users may use a personal space to create new relations between events of their interest and save this information.	☑
UC10	All	Associate events with blogs and news	The users will suggest blogs or news items associated with an event, which were not identified by the system or were linked in a different way.	☒
UC11	All	Create groups	All users may create groups which will share personally created news stories.	☑
UC12	All	Export news stories	User created news stories may be exported to other social community platforms.	☑
UC13	All	Manage Workspace	The SYNC3 users define the set of news portals and blog sources from which they collect content.	☑
UC14	All	Receive newsletter	All users are offered a newsletter of events of their interest.	☒

A series of tasks to be performed by the test users during evaluation sessions has been produced to enable evaluation of both usability and functionality aspects by means of the Think Aloud protocol. The tasks have been formulated to cover the use cases described in the table above, which correspond to the functionalities implemented in the second prototype.[2]

Each task is accompanied by questions which the test leader can ask in order to stimulate the participant to make observations on aspects of the SYNC3 system which require user validation. According to the script below, each test participant is first introduced to the purpose of the evaluation session, then asked to perform a task that provides information about the user's news information searching patterns, briefly introduced to the scope of the SYNC3 system and then asked to perform a series of tasks via the user interface of the second prototype. The script is given below:

[2] For a more detailed description of the implemented use cases refer to D8.3: "Intermediate Integrated Prototype", pp. 13-18.

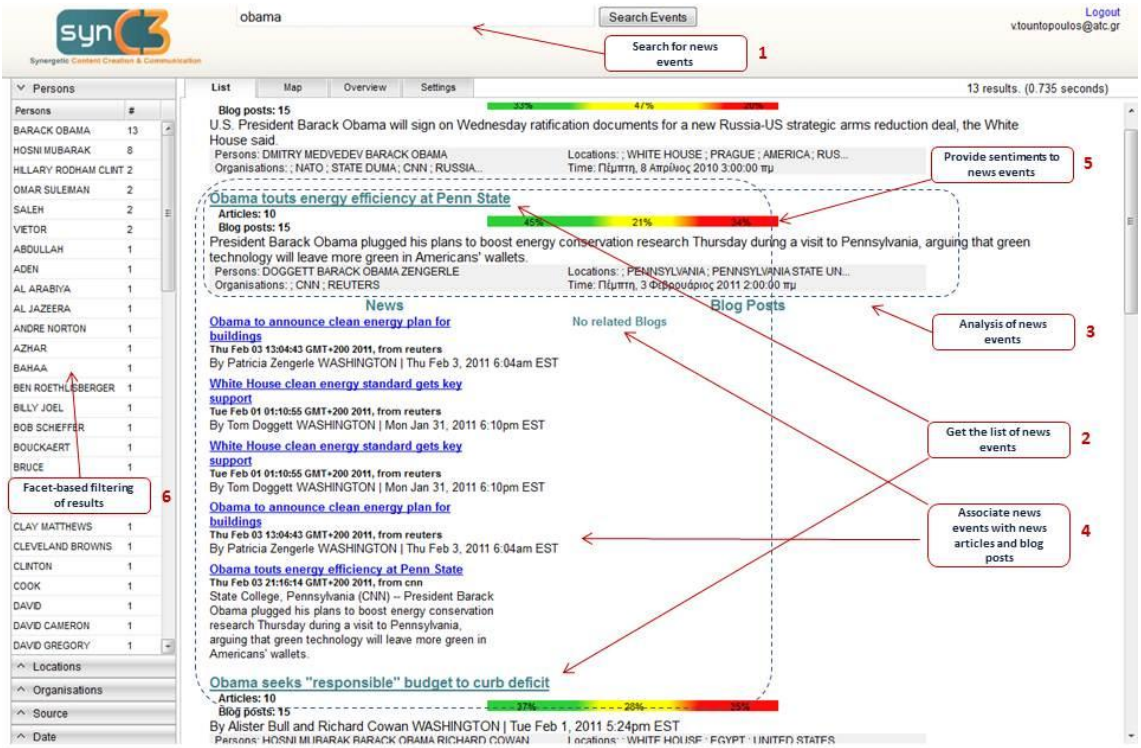


Figure 8: Visual representation of SYNC3 use cases related to the search function[xxx]

Figure 9: Visual representation of SYNC3 use cases related to search results visualization[xxxi]

Figure 10: Map view[xxxii]

1. Explanation of the purpose of the user evaluations by the test leader:
   The purpose of the user evaluations is to get feedback on usability and functionality aspects of the SYNC3 system. This feedback will help the developers to continuously improve the usability and functionality of the system and ensure that it responds to actual needs of users (we are testing the application, not the user). I will ask you to perform a series of simple tasks with the SYNC3 system. I would like you to comment on the interface design and functionality of the prototype during this session. After each task I will ask you a series of questions about different aspects of the prototype.
2. **Task 1** (test participant): Search for information about the Egypt unrest the way you normally do. (3 mins.)
3. General introduction to SYNC3 by the test leader:
   The aim of SYNC3 is to structure the blogosphere around news events extracted from traditional media and allow users to map and track the sentiments of bloggers and citizen journalists pertaining to particular news events as way to shed light on the formation of public opinions; its Workspace function enables users to create stories by connecting news events and commenting on news collaboratively or individually.
4. Explanation of the session structure by the test leader:
   First I will briefly explain the interface and major shortcomings of the prototype, second I will ask you to try the prototype by performing a series of tasks, and third to fill in the questionnaire on user satisfaction with the system.
5. Brief explanation and demonstration of the interface and its functions by the test leader:
   - Perform search by keyword "Google art".
   - The prototype is integrated with data starting February 2nd 2011 until the end of March 2011 (around 70.000 news articles and 80.000 blogs).
   - The result of the free-text search is a list of news events.
   - Explain what the user interface shows:
     i. News clustering into events
     ii. Blog classification around news events
     iii. Sentiment bar (mockup)
     iv. Event label and event description
   - For each event, show the available metadata information (number of associated news articles, list of named entities, date and location of the event).

- Expand the event "Google Art, Uffizi launch virtual tours" to show associated news articles and blog posts (explain that search words are highlighted in the text of the article).
- Open a news article to navigate to the actual source.
- Open a blog post to navigate to the actual source.
- Filter the results by means of the faceted browsing function.
- Switch to the Map view and explain that this view shows the locations of news events related to the current query on a map.
- Switch to the Overview page and briefly explain its function:
  Using the timeline view, the user can quickly see how the number of articles related to a search term has changed over time. The timeline view offers the user the possibility to zoom in and out or to select a certain time period using the slider at the bottom of the view. This view will also be able to be used in the future to display how the number of mentions of a certain entity has changed over time.
- Log into the system using a Gmail account.
- Switch to the Settings tab:
  i. Add notification with the following settings: Location=Brussels, Source= Reuters, keyword=environmental change
  ii. Update views

6. Explanation of the major shortcomings of current prototype by the test leader:
   - Sentiment analysis is a mock-up.
   - There is no categorization of news.
   - Workspace is not present.
   - Causal relations between news events are not identified.
7. Ask the participant if there are any questions.
8. Ask the test participant to perform the following tasks with the SYNC3 prototype:
   Task 2
   - [UC1] [UC3] [UC5] [UC6] Search for information about Egypt unrest and explore the results (3 min.)
   - [UC2] [UC3] Look at what US media writes about Egypt unrest this month.
   - [UC2] Identify in which events Mubarak is mentioned in relation to Egypt unrest.
   - [UC3] Return to the initial list of results.

   Questions:
   - How would you comment on the relevance of results to your query?
   - How would you comment on the search and browsing capabilities?
   - What do you think about the collapsed view of articles and blog posts?
   - How would you comment on the meaningfulness/clarity of the event titles/ labels? (Are they suitable in describing the news events?)
   - How would you comment on the lists of persons, organizations, time and location displayed under the event title in terms of presentation, usefulness?
   - Would you want top or recent events on the search interface or do you want the page blank?
   - Do you want to see words that you select through faceted search highlighted in the article fragment?

   Task 3: [UC3] Identify which region of the world is most commonly associated with Egypt unrest/the geographical distribution of this event. (Suggest the Map view if the user does not know which function to use).
   - How would you comment on this mode of showing locations related to events associated to a query?

   Task 4: [UC3] Identify the event which received the highest coverage about Egypt unrest/Explore how the coverage for this query changed in the past month and identify

the peak in media coverage. (if the user does not know how to do this then suggest the Overview).

- How would you comment on the capacity of the overview to show changes in coverage over time?
- Would you be interested in having a more refined timeline where events would be listed on a timeline according to relatedness (sort of like in a story)?

Task 5 [UC8]: Set notifications to get updates about Egypt unrest from American sources that mention Mumbarak.

- How would you comment on the usability and functionality of the notifications system?

Upon completion of all tasks the test participant is asked the following additional question to obtain a short testimonial that can be published on the SYNC3 website: *What is the thing that you liked most about SYNC3?*

Each session is concluded by answering any remaining questions of the test participant and asking for an overall impression.

Integration issues (from the user perspective):

Do users perceive any flaws in the interplay between SYNC3 components?

How much time is consumed, and do participants feel that they increase efficiency with SYNC3?

Inherent Risks:

Overwhelming the user by an abundance of settings or difficult to understand options; scarcity of options. During actual evaluations, cutting the usage scenarios into smaller pieces so as to better accommodate the different prototypes might turn out useful, especially since the first two prototypes will most likely not cover the entire functionality of the SYNC3 final product.

5. The user evaluation process

The user evaluation looks at the integrated system via the user interface only, not at individual modules. Therefore, the tests are best organised not by module or by function, but according to the use cases as described and listed above.

5.1. Recruiting user evaluators

EJC as a task leader is responsible for the recruitment of user evaluators. RIAN is responsible for the recruitment of user evaluators for the evaluation at the RIAN headquarters in Moscow. The focus is on users coming from the target groups as described in Section 1.2. In order to receive a valid and balanced feedback from users pertinent to the SYNC3 domain, yet with different work specialisations as well as cultural backgrounds, the following test groups and test locations are chosen:

5.1.1. First prototype user evaluations

(1) Bucharest, Romania

Location: Bortun-Olteanu PR Agency

Date: 19 January 2011

Target group: communication professionals, PR professionals.

Recruiting method: EJC affiliates

(2) Moscow, Russia

Location: RIA Novosti headquarters (SYNC3 Consortium member).

Date: 20-21 January 2011

Target group: News agency journalists and editors.

Recruiting method: Internally at RIAN (staff members and freelancers); selected participants of the original user requirements focus groups may be invited as well.

(3) Maastricht, the Netherlands

Location: EJC head office

Date: 25 November 2010

Target group: journalists, editors, bloggers

Recruiting method: Internally at EJC and EJC networks in the Netherlands and Belgium.

(4) London, UK

Location: Report International

Date: 16 December 2010

Target group: media monitoring specialists

Recruiting method: EJC affiliates

5.1.2. Second prototype user evaluations

The test participants in the user evaluation of the first SYNC3 prototype were predominantly media analysts. For this reason the recruitment of test participants for the user evaluation of the intermediate prototype focused on the user group comprising of journalists and editors.

(1) Deutsche Welle

Location: Bonn, Germany

Date: 10 June 2011

Target group: journalists

Recruiting method: EJC affiliates

(2) European Journalism Centre

Location: Maastricht, the Netherlands

Date: 15 June 2011

Target group: journalists, editors, bloggers

Recruiting method: Internally at the EJC

(3) RIA Novosti

Location: Moscow, Russia

Date: 17 June 2011

Target group: journalists and editors

Recruiting method: Internally at RIAN

5.2. Expected number of tests

The expected total number of user evaluations depends on how well the integrated prototypes pass the tests, because in the case of system failure or crashes, tests are to be repeated in order to validate any fixes or changes. Also, the developing partners may ask for intermediate user evaluation to support their work before or between deliveries of the two set prototypes.

The number of users broadly ranges between:

- 20-25 individual test users for the first prototype
- 12-15 individual test users for the intermediate prototype
- 30-40 individual test users for the final prototype [planned].

A smaller number of participants suffices for the second cycle of user evaluations as the intermediate prototype presents relatively small developments. To enhance consistency of the user evaluations and to ensure that the progress between the three prototypes is better measurable, the test users from the first round have been asked to take part in the second evaluation as well. For the user evaluation of the final prototype, more participants will however be added since the full functionality requires more intensive testing. Furthermore, the SYNC3 product will be closer to marketability and the Consortium should benefit from a broader base of user assessments to be integrated into the exploitation and business plan.

5.3. Qualification of the user evaluators

In order to obtain meaningful insights from the tests, basically any traditional and new media consumer or content creator would be qualified for a test of the SYNC3 system. However, to support the exploitation prospects of the SYNC3 system, it is business users who are able to validate the user requirements to the full extent and assess the eventual usefulness of the system. Moreover, if demanding professional users develop an aversion or resistance to the usability of the SYNC3 user interface or dismiss the eventual annotation results, this must be detected at the earliest possible stage so as to not jeopardise the system's exploitation prospects.

Experts in the field of testing advise to be wary of users who claim high levels of technical skills and programmers that claim to fully understand the business process. These types of individuals can cause more harm than good if they do not have the skills they believe they possess or may come with pre-defined concepts which SYNC3 is then likely to frustrate.

Any individual who matches the target user profile is invited cordially to participate. There is no particular incentive to take part in the tests other than a small present of minor value for external subjects. A single test is estimated to take between 30 minutes and a maximum of one hour.

Generally, any advance discussion of the system or its content should be avoided so as to guarantee a fresh and open approach of the evaluators. That however does not preclude a general introduction to SYNC3 and its user interface, or educating participants beforehand to the specific limitations of the prototype at hand so as not to frustrate their expectations for no reason.

5.4. Test environment and technical prerequisites

The user evaluations require any conference room or secluded office space, equipped with a computer with loudspeakers, a browser and a broadband Internet connection, as the system runs live on the technical partners' servers. With permission of the subjects, audio recordings are made of the testing sessions. The introduction and the questions asked follow a fixed script. This ensures that the test environment is basically the same for different users.

5.5. Managing user evaluation risks

The insights and information gathered through testing can be helpful to identify risks and contingencies that relate to the SYNC3 project. Risks include the delivery dates of modules and integrated prototypes, new and reworked items, and the ability of users to understand the tools provided by the software.

Overall risks to the project with an emphasis on the testing process are:

- Lack of qualified test participants;
- Lack of availability of required hardware, software, test data or tools;
- Late delivery of the software, hardware or tools;
- Delays in training on the application;
- Changes to the original requirements or designs;
- Complexities involved in testing the applications.

In more general terms, there are three more sets of risks relevant to SYNC3:

Inherent risks

There are some risk issues due to complexity and innovative functions that must be monitored as part of testing. Examples are safety (e.g. user data, content alteration), multiple devices used, settings of preferences, server load, and software clients, but also the fact that users may not be acquainted with and thus irritated by novel functionality.

Requirements risks

Vague or unclear requirements or false assumptions result in additional risks. Based on testing insights these must be documented and communicated in order to decide whether they pose a threat to project success or can be shifted to later lifecycle versions of SYNC3.

6. Intermediate conclusion

This validation plan aims to assist the SYNC3 system development with a flexible as well as comprehensive and effective means to steer further development. The detailed set-up and the definition of criteria are designed to make sure that objectives and goals set upon inception of the project will be met.

The user evaluation plan and methodology is however a dynamic document, based on feedback from Consortium partners and project needs. The number of tests, the scope and questions asked will thus differ from phase to phase. The basic process though will proceed as described. Therefore, close monitoring of the entire validation process will be one ongoing task for EJC.

Testing and validation can be a source of many enhancements as well as a means to control risks inherent with every software project. Based on results from the first test cycle, appropriate alterations of the plan must be developed for the follow-up phases such as bug fixing, fine-tuning and optimising the final product.

7. Results of the first user interface focus group

The focus group was organized at the EJC Maastricht office on Tuesday 30th March 2010. As it was a first focus group on the user interface, it was agreed that only close EJC contacts will participate (EJC employees and freelancers).

The focus group was moderated by the EJC (Mirek Hazer), while the user interface presentation and discussion was delivered by the L3S (Christian Kohlschutter and Dimitris Skoutas).

7.1. Set-up

7.1.1. Agenda

In order to allow quality discussion between participants based in Maastricht and L3S in Hannover, Skype videoconferencing and the screen sharing feature connected to the EJC's conference room were used. The focus group agenda was as follows:

1. Purpose of the focus group (EJC)
2. Overview of the SYNC3 project (EJC)
3. User interface presentation (L3S)
4. Feedback and discussion (L3S and EJC)
5. Wrap up (L3S and EJC)

The focus group was originally planned for one hour, but at the end it took almost 90 minutes because of good discussion and interest coming from the participants.

7.1.2. Participants

There was a set of 13 people associated with the EJC Maastricht office attending the focus group. It was of great benefit that these presented a real mix of media related potential users: professional journalists, bloggers and new media specialists coming from different background and countries, bringing in different expectations.

SYNC3 focus group organizers

- **EJC:** Miroslav Hazer (focus group moderator), Eric Karstens (WP7 Leader)
- **L3S:** Christian Kohlschutter (delivering UI presentation), Dimitris Skoutas (WP6 Leader) (both connected via Skype videoconference), Patrick Siehndel

EJC participants

1. Wilfried Ruetten – director
2. Ivan Picart – IT manager
3. Arne Grauls – web manager
4. Raymond Frenken – freelancer, professional business journalist
5. Sueli Brodin – freelancer, blogger, news editor
6. Rebecca Gehrer – project assistant
7. Liliana Bounegru – editor, new media specialist
8. Biba Klomp – project manager
9. Howard Hudson - editor

10. Adrianna Miara – associate editor, multimedia editor
11. Diana Lungu – associate editor
12. Daniel Paone – freelancer, new media specialist
13. Rina Tsubaki – project manager

7.2. Outcome of the focus group

The User Interface presentation was divided into three logical parts following an expected user scenario: 1) starting with search function, 2) going to the Workspace, and 3) adding the personalization and recommendation features.

There was a discussion followed by the presentation of each of the three parts. The key comments and recommendations made by the participants are included in the following sections.

7.2.1. Search function

- How do you see if you're searching news events, news articles or blog posts? It should be visible which results come from news and which from the blogosphere. Suggestion made: divide the search results into more columns – separate search facets for news articles and blog posts.
- Does the information on the right side show the most referred to entities? Participants did not understand fully where the information on the right side comes from/how it is generated.
- How do you distinguish between news event sources and how is the order in which they are listed in the search results being decided upon? Are the most popular and read sources included as the first ones in the search result? Participants did not understand fully how the listed order is generated. "We need to understand why we see certain news event or news item as the first, or the second one in the search. It is also important to know where the results that we see are coming from and how they were generated." *(It was explained that the order is based on the algorithm result.)*
- Where does the news event label and description come from? Is it taken from some of the news items or generated by the system? *(It was explained that both the news event label and description comes from the most representative news articles based on the statistical results.)*
- When a news item comes from a journalist at BBC, does it count as a news article or blog post? *(It was explained that in this case it will be listed among blog posts, because it is a news item bringing the opinion and sentiment of the author. E.g. http:// www.bbc.co.uk/blogs/.)*
- Where do we see the sentiments/opinion? *(There will be a search facet for the sentiment analysis on the right side column, similar to the existing facets for geography, etc.)*
- **Observation:** The system is not unique. You could copy already some other existing systems and add only some features, such as sentiment analysis. **Suggestion:** the added value of the system is in answering the question: where and how do you find the sentiment? It would be of a great value to generate a cloud of keywords (together with sentiment analysis) that appeared in the news items (including comparison of keywords used in news articles vs. blog posts).
- There should be a possibility in the search field to go back to previous queries without having to delete added search terms.
- It should be possible to see a number of news items next to the news event label and description and see the list of news items divided into news articles and blog posts.

- The system should allow visualization of sentiment according to location.
- It is also important to know the location of the person who creates the Workspace.

7.2.2. Workspace function

- How do you determine sentiment? How do you decide what is negative and positive? You should also consider different levels of positive and negative sentiment. Sentiment analysis is the most interesting feature, but it needs to be explained to the users somewhere. *(SYNC3 provides sentiment analysis only on blog posts in relation to the news event. Sentiment analysis is based on lists of positive, neutral and negative words, a standard approach in the sentiment analysis literature.)*
- How do you distinguish between a negative topic and the author negative sentiment towards the news event? Which one does the system take into account? *(The author sentiment determines the sentiment analysis result.)*
- Can you imagine a situation when you will be using the Workspace tool? (moderator question)
    - It can be useful for press officers working on media monitoring and analysis.
    - For journalists it is time consuming but if it's shared within a team then it's ok.
    - It can be useful in a newsroom, in case journalists want to see the difference in how the news event is covered in news articles and blog posts.
    - The tool could be of use to media research and academic groups who have more time for lengthy analyses and are interested in media content analysis and relations between types of media.
- Can the Workspace graph be generated by the system itself? *(Not at this moment, this feature is not planned to be implemented.)*
- Is there a way to draw more than arrows and arrange articles in the Workspace, like creating lengthier notes and giving titles? *(Yes. L3S presented all the possibilities which seemed to satisfy the participants.)*
- It would be useful if in the Workspace you could have highlighted in the news items the elements which the system extracted in the search page (such as location, persons, organizations and maybe indicators of sentiment). This type of simple visualization of key elements in the news item according to the system would make analysis and connecting news items in the Workspace easier.

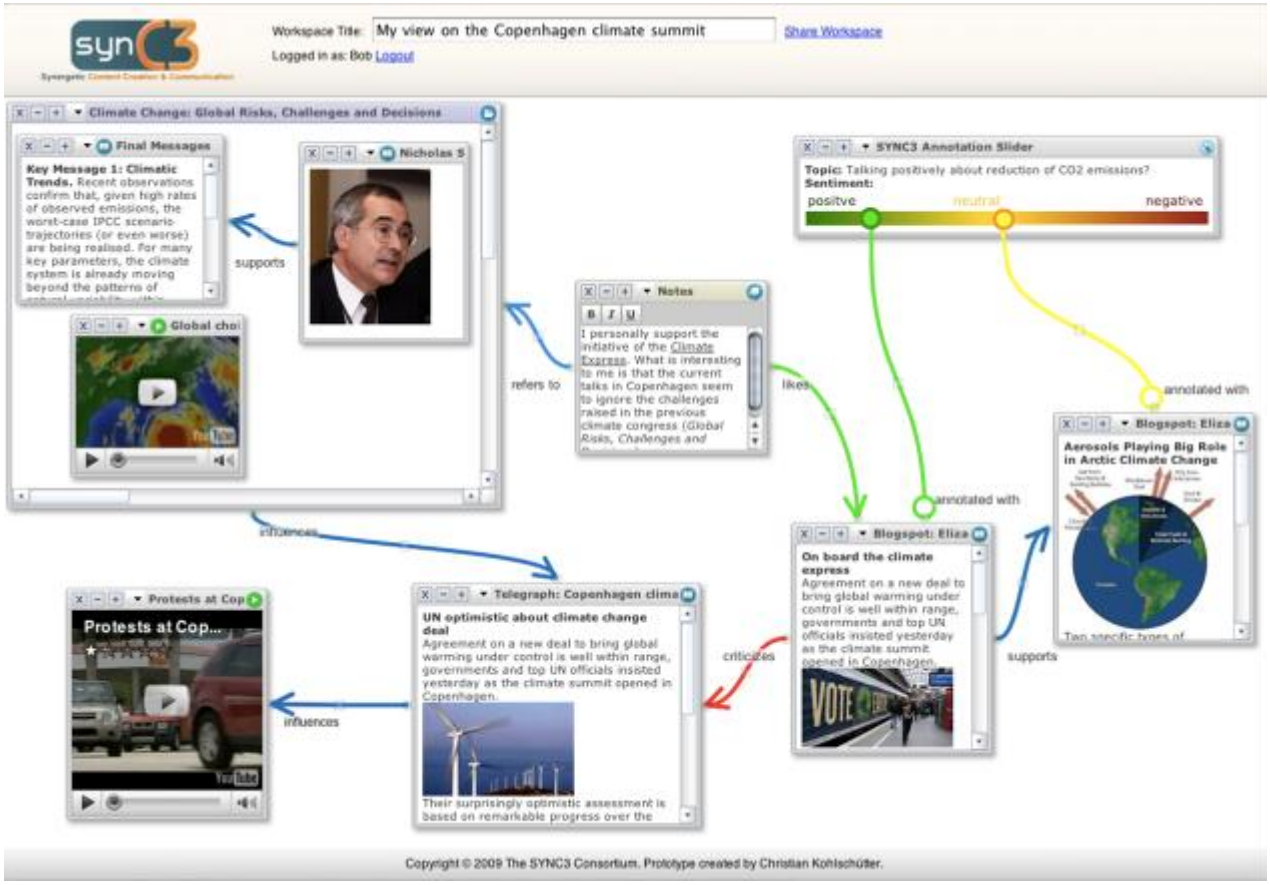


Figure 11: Screenshot of the SYNC3 Workspace

7.2.3. Workspace personalization and recommendations

- Would you like to use the Workspace in closed or public opened groups? (asked by L3S)
    - It should allow both closed and public groups depending on the users' profile. Bloggers would be more into sharing it, but communication professionals would perhaps work more on company confidential analysis shared only within their team.
- How should the user receive recommendations? (asked by L3S)
    - The user should have to choose how often to receive recommendations – to have the possibility to individualize the periodicity and also determine keywords that users are interested in. Even the weekly updates as sent from LinkedIn groups are seen sometimes as a spam because there is too much of not relevant content in them.
- Comments
    - Is there a bookmarking system for both the Workspace and the news events and items which are listed in search results?
    - There should be a word cloud in the Workspace and also a widget for persons that are part of the news event.

7.2.4. General comments

- Can the Workspace be embedded in a blog post? People would like to take the Workspace once created with them to use it for their blog posts, presentations, etc. *(Yes, it is possible, because each Workspace has its own individual URL.)*
- Is it worth to provide the possibility to include comments on the whole Workspace and how should be these comments displayed? (asked by L3S)
    - Is there a possibility to embed the Workspace into a blog post or Facebook page?
- The language issue – using only English language is viewed as a restriction. *(The core lists of news items sources are picked up manually and they come from different geographies covering all continents.)*
- Maybe you could offer a premium version as a paid product to companies (media analysis and opinion mining service).
- What function lacks entirely from the system? (asked by L3S)
    - A follow up function: What do you do with the Workspace? Is there a way to visualize Workspaces on a certain topic? To search through them, etc? *(L3S reacted that this is a good suggestion.)*

7.3. Outcome from individual testing

The participants of the focus group got 24 hours of access to the SYNC3 UI interface (under the non-disclosure agreement) hosted on the L3S server to be able to try it by themselves and provide more in-depth comments.

The following comments were gathered after the individual testing:

- The system works with AJAX requests on the background. This is a bad choice as:
    - searches are not bookmarkable;
    - the back button does not work (or you have to hack it to make it work).
- Ideally, the URL/SEARCH in the address-bar is user-friendly for power-users, like as in Delicious, for example:
    - http://delicious.com/popular/coding
    - http://delicious.com/tag/earth
- Ideally, every search result is immediately subscribable through RSS too (just like Delicious).
- "I don't like the "iframe" feeling of the scrollbars at all. Why not just adopt a fullpage layout?"
- The right column should have a title that better explains the function, such as "Further-Filter Results"
- The right-hand column items, could have a collapse/expand toggle function (especially when there will be more options available).
- When navigating a search result with 2300 items, the system loads new results while scrolling down. Most people are used to (Google) pagination and will prefer this over AJAX loading.

- Regarding Workspaces, there is Yahoo Pipes (http://pipes.yahoo.com) which has some similar features. One element there that could be taken into consideration is the "union" item.

7.4. Conclusions of the focus group on user interface

These conclusions are viewed as a suggested list of TODOs, which the Consortium (mainly L3S) will prioritize and try to address as much as possible, so in the future it is possible to revisit this document to see what actions have been taken and which issues have been addressed and how.

Based on the feedback from the participants, the following key fields should be further discussed and considered:

- Users do not understand fully how the search results are generated and what they stand for (how the system created the news event label and description, why is a certain news event on the first place in the search result, etc.).
- To be really able to map and analyze the blogosphere, the users need to better understand and see what search results come from news articles and which ones come from blog posts (it was not clear enough that the news event is generated from news articles and sentiment analysis from blog posts – the potential users would first need a quite detailed explanation of how the system works to be able to understand the displayed results).
- Users view sentiment analysis as one of the key features but are not fully familiar on how to really distinguish between positive and negative sentiment and what the sentiment really refers to.
- The Workspace is viewed as a useful tool but it will be used differently by different audiences. Because it is seen as something that can be very time consuming, it needs to be really user friendly and fast to understand on what one can do with the user interface (some gallery of examples can be helpful). It is needed to also provide the possibility to search through already created Workspaces and enhance the bookmarking and sharing possibilities.

The conclusions of the first focus group on the user interface were communicated to the Consortium and particularly to L3S. An improved version of the user interface was tested during the first prototype user evaluations, which are the object of the next section.

8. Results of user evaluations of the prototypes

The results of the SYNC3 user evaluations will be consolidated into three main parts, one for the evaluation round of the first prototype, one for the evaluation round of the second prototype and another one summarizing results related to the final prototype. Additionally, supplementary user evaluations will be described as well, such as several informal ad-hoc test runs with the user interface.

8.1. Results of the first prototype user evaluations

The first user evaluation report, D7.4.1, presented the results of the first prototype evaluation resulting from the four rounds of evaluation which took place at the EJC headquarters in Maastricht, the Report International headquarters in London, the Bortun-Olteanu PR Agency in Bucharest, and the RIA Novosti headquarters in Moscow. Two individual tests were performed with an EJC staff member with journalistic background and a media researcher at the University of Amsterdam, the results of which are included below.

The following table provides an overview of user evaluation dates and locations related to the first prototype.

Table 9: Dates and locations of user evaluation sessions for the first prototype

Location	Date(s)	Number of subjects
EJC headquarters, Maastricht	25 November 2010	5
Report International headquarters, London	16 December 2010	4
Bortun-Olteanu PR Agency headquarters, Bucharest	19 January 2011	4
RIA Novosti headquarters, Moscow	20-21 January 2011	8
Total	**Four sessions**	**21**

8.1.1. Evaluation framework

Demographics

A total of five news media professionals and media researchers took part in the user evaluations at the European Journalism Centre (EJC) in Maastricht on 25 November 2010. The diversity of the EJC environment was reflected by a variety of language proficiencies: French, Italian, Spanish, Moldovan, and Dutch. All participants were fluent in English. In terms of computer languages and technologies, they all felt comfortable to use in their daily work Microsoft Office applications. Two of them were experienced in HTML and CMS coding. In terms of distribution of subjects, all participants were junior or mid-level staffers aged between 25 and 35, with one below 25. Three women and two men evaluated the system, all of them actively working in the news media field either as journalists, editors, project assistants, or media researchers. Their daily jobs involved production, monitoring and analysis of news media content (including multimedia content), as well as following developments in media and journalism and organizing training, research, and communication projects to cover EU developments, foster media pluralism and media innovation, and improve journalism skills. All participants from the EJC had prior knowledge of SYNC3, as they had taken part in the earlier focus group on the user interface, worked on the project, or received internal updates on the development of the project.

At the Report International headquarters in London (a media monitoring and analysis agency which tracks and collects media coverage, analyzes it qualitatively and quantitatively and reports on it to their clients, with offices in around 45 countries and covering 39 languages), a

total of four senior professionals (the managing director, the client service director, the solutions strategy manager and an account director) participated in user evaluations on 16 December 2010. All were proficient in English. With several years of experience in media research, in their daily work they are involved in media content monitoring and analysis at macro-level, focusing on outlining, scrutinizing, assessing, and monitoring various strategies, policies, methods, and instruments for media analysis. Their expertise was visible in the valuable comments they made on the SYNC3 prototype which touched not only upon functionality and usability aspects but also upon product and business strategies. One out of the four participants was a woman. The dominant age group was 35-50, with one participant aged between 25 and 35.[3] None of the members of the group had been in touch with earlier versions of the SYNC3 system, nor had they heard about the project before having been approached by the SYNC3 Consortium.

At Bortun-Olteanu in Bucharest, a PR agency belonging to the Millenium Communications group, a total of four junior and mid-level PR and communication professionals participated in the SYNC3 user evaluations on 19 January 2011. All test participants were proficient in English and had Romanian as their mother tongue. They were all accustomed to using the Internet in their daily work, particularly social media. Their daily activities ranged from management of PR accounts in terms of budgets, strategies and communication plans, to implementation of online communication strategies by means of monitoring online mentions and managing online reputation for several brands, events coverage, and competition monitoring. All participants of this round were women, two of which were aged between 18 and 25 and the other two between 25 and 35. None of the test participants had any prior knowledge of the SYNC3 system.

At the RIA Novosti news agency in Moscow, a total of eight mid-level and senior staffers (editors, journalists, translators, project managers, and media monitoring and analytics professionals) participated in the SYNC3 user evaluations over a period of two days, on 20 and 21 January 2011. All test participants were proficient in English and typically had Russian as their mother tongue, as well as knowledge of several other foreign languages such as Spanish, Portuguese, German, Japanese, and French. They were accustomed to using the Internet in their daily work, and a small number of them were proficient in Google Analytics tools as well. All RIA Novosti questionnaire respondents were male. The dominant group age was 25-35 with the exception of one participant aged 35-50.[4] Their daily activities involved coordinating the monitoring of foreign media, coordinating foreign-language news production, media research, analysis and reporting (including international news and opinion trends).

Half of the overall number of respondents held a MA/MSc degree and 40% a BA/College degree.

Evaluation set-up and sequence

Typically, the evaluation sessions were conducted one subject at a time, with a time limit of one hour per session. Exceptions were one session in which two subjects tested the prototype at the same time, and the RIA Novosti evaluation round. Due to the large number of test participants, at RIA Novosti user evaluations were held in groups over a period of two days. A few of the sessions, the ones conducted with senior professionals ran a little over time and one had to be cut short due to the expiration of time over which the testing space was available. Participants

[3] Two out of the four Report International participants filled in the evaluation questionnaire to date, so the current analysis is based on data gathered from these two questionnaires and from the evaluation sessions.

[4] Six out of the eight RIA Novosti participants filled in the evaluation questionnaire to date, so the current analysis is based on data gathered from these six questionnaires and from the evaluation sessions.

were first briefly introduced to the SYNC3 project and to the structure of the session ahead. The limitations of the current prototype compared to the end SYNC3 product were further briefly listed and the participants were invited to ask any questions they may have before starting the actual test.

The live prototype was made available by ATC online at: http://sync3.atc.gr/de.l3s.sync3.gui/ and covered the functions: Exploration and Browsing Interface and the News Story Creator. In order to gather feedback on the User Profiling Infrastructure, a simulation was provided by L3S at: http://sync3.atc.gr/de.l3s.sync3.gui/groups/. Overall, the system functioned without flaws with the exception of several cases in the user evaluations round in Bucharest as well as in the two individual tests, when the Overview visualization as well as the News Story Creator were unavailable for testing. In these cases the test participants were presented with a screenshot of the News Story Creator and explained the concept behind it to collect user feedback. Since the focus of the evaluation were the use cases implemented in the live prototype, the User Profiling Infrastructure simulation had a lower priority and was presented to the test participants only when time was left after testing the live prototype. Less than half of the total number of participants was presented with the User Profiling Infrastructure simulation. Participants from all evaluation rounds were presented with a version of the prototype with nearly the same functionalities. One functionality that was not available in the first evaluation round at the EJC was made available for testing to the participants of the rest of the evaluation rounds, namely the Map View.[xxxiii]

Live prototype and simulation testing

The testing of the live prototype and the User Profiling Infrastructure simulation followed a script detailing the tasks to be performed by the test users, in accordance to the use cases implemented in the early prototype. The test was divided into three parts according to the three main modules of the UI: Exploration and Browsing Interface, the News Story Creator, and, whenever time permitted it, the User Profiling Infrastructure simulation. Each task was accompanied by questions which the test leader could ask in order to stimulate the participant to make observations.
In testing the Exploration and Browsing Interface, for the sake of consistency, all participants with the same professional profile were suggested to run the same query. Journalists and media researchers were suggested to query “BP oil spill”. Whenever the participants had particular information interests they were allowed to run any other query of interest, to enable comparative assessment of the information they got on a topic of interest from the SYNC3 prototype to information they got from other news and blog search engines. In the case of media monitoring and analysis professionals they were asked to search for information about a brand or product they are monitoring in their daily work. Some of the keywords used for search were: “Nokia CEO”, “Gillette”, and “Unicef”. The participants were asked to explore the generated results with the list view, map view and the overview. Further, they were asked to filter the results by using the advanced faceted search. During the entire task performance process participants were invited to make observations on search functionality and usability: simple and advanced search facilities, search/retrieval performance, proportion and quality of sources coverage, meaningfulness/relevance and precision of retrieved records, response time, usefulness of the alternative map view and overview in understanding the generated results, etc. To facilitate commentary the test leader prepared specific questions for the participants: *Are the results satisfactorily matching the query? Are the event titles meaningful/clear or not? Do you find it useful or not to have persons, organizations, locations involved in the event extracted and displayed? Do you find this filtering function useful in your work? Why? Why not? Are the SYNC3 search capabilities satisfactory? What other kinds of search capabilities would be useful to have? Would you be interested for example to be able to search by keywords + positive/negative sentiment?*, etc. Typically this part of the session lasted around 20 minutes, also fuelled by the interest of the participants in the search interface and the more general questions about how the system works which this function prompted.

In testing the News Story Creator usability and functionality the participants were asked to perform a series of tasks such as: to select two or more news events from the search interface that they consider related in some way and add them to the Workspace; to place them in a group canvas and name the group canvas; to draw connections between the news events and annotate one of the news events by means of rating and to make observations on functionality and usability guided by questions such as: *Do you find the function of grouping news items by means of the 'group canvas' useful in your work? Are the offered possibilities to comment on the news items satisfactory? Do they enable the type of analysis that you usually perform on media content? What type of activity would you want to perform with the Workspace?* Typically this part of the session lasted around 10-15 minutes.
For the User Profiling Infrastructure simulation the participants were explained what it is planned to do and were demonstrated some of its function with the provided simulation. Next they were asked for their opinion on the functionalities that are planned to be implemented with particular emphasis on receiving recommendations at the request of L3S. According to the remaining time, this part of the session lasted between 5 to 10 minutes.
At the request of the Consortium partners to collect some user feedback on specific issues, the participants were asked the following questions: *What would the user prefer: to have the same article listed twice in two news events or to have it just once in the most recent event? I.e.: To miss information or to have redundant information? Some articles listed under a news event are "near" duplicates in the sense that the only thing that distinguishes them is the URL. Would you be interested in having them all displayed or just one of them?*
Besides the qualitative input provided by the users, behavioural data on the interaction between user and system was also collected, such as user effort in learning and using the interface. The complete series of tasks and accompanying questions was presented in Section 4 of this report.

Supplementary exercises

The test participants were asked to also fill in on their own a summarizing questionnaire that was emailed in the course of the day. The questionnaire aimed to gather qualitative data about user attitudes towards various components of the SYNC3 system in a format that can be quantitatively processed. The questionnaire contained four sections and referred only to the live prototype. Section one enquired demographic details of the participants (age, gender, education), as well as their job title and a list of programming languages and technologies that he/she feels comfortable working with on a daily basis. Sections two and three aimed to measure user appreciation of system usability and functionality. Section four enquired a general rating of the prototype. Section five enquired basic business exploitation opportunities and was adapted to the participants' professional profile as well as the current state of the prototype. The questionnaire is available at: http://www.surveymonkey.com/s/sync3questionnaire. A total of eighteen test participants filled in and returned the questionnaire to date, although participants did not necessarily respond to all questions.

Restrictions and limitations

Before discussing the results, two caveats must be raised. First, as a little over half of subjects were recruited from the ranks of SYNC3 partners, the system was met by a friendly crowd. User evaluations carried out with completely independent third-party subjects might result in slightly more critical or sceptical reactions. Second, the prototype tested at the EJC and Report International had known functional limitations as follows:

- Sentiment analysis was absent.
- The prototype was integrated with a limited portion of the repository (month of July for the EJC evaluation and January to mid September 2010 for the Report International evaluation).
- The user could log into the Workspace with his Gmail account but could not save his work, could not create groups or export news stories created in the Workspace or register to receive newsletters.

- News articles and blog posts could not be transferred to the Workspace.
- Causal relations between news events were not identified by the system.
- The map view was not implemented by the time of the first evaluation session; it was implemented by the time of the second evaluation session.

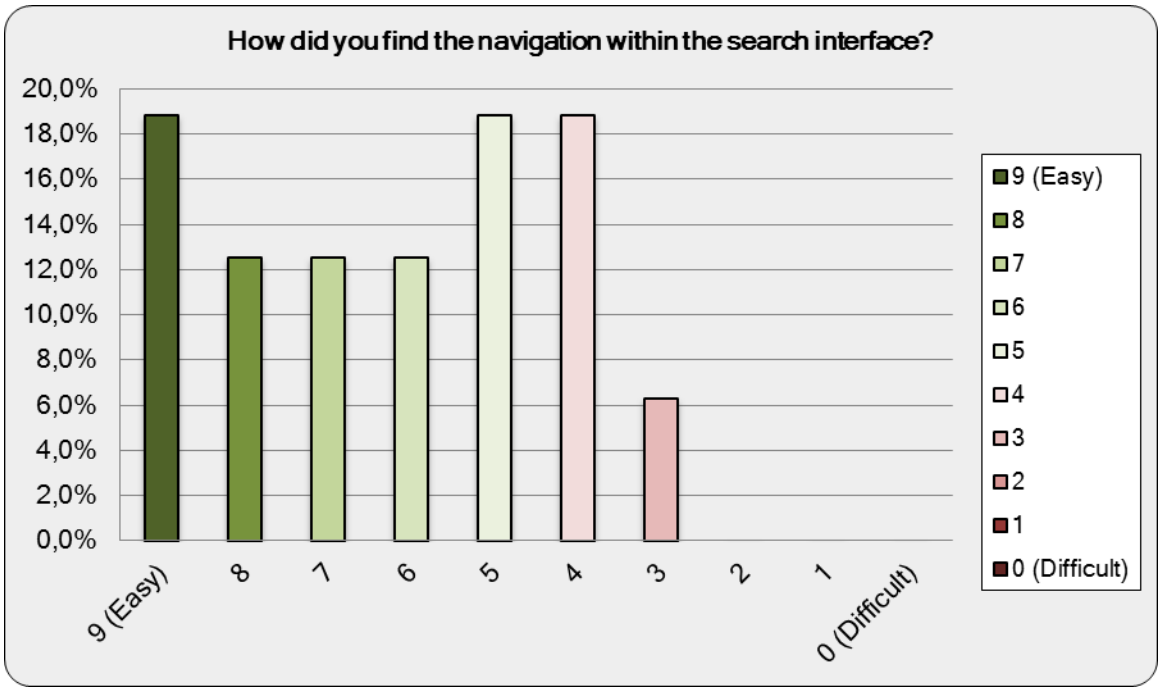
8.1.2. Questionnaire results

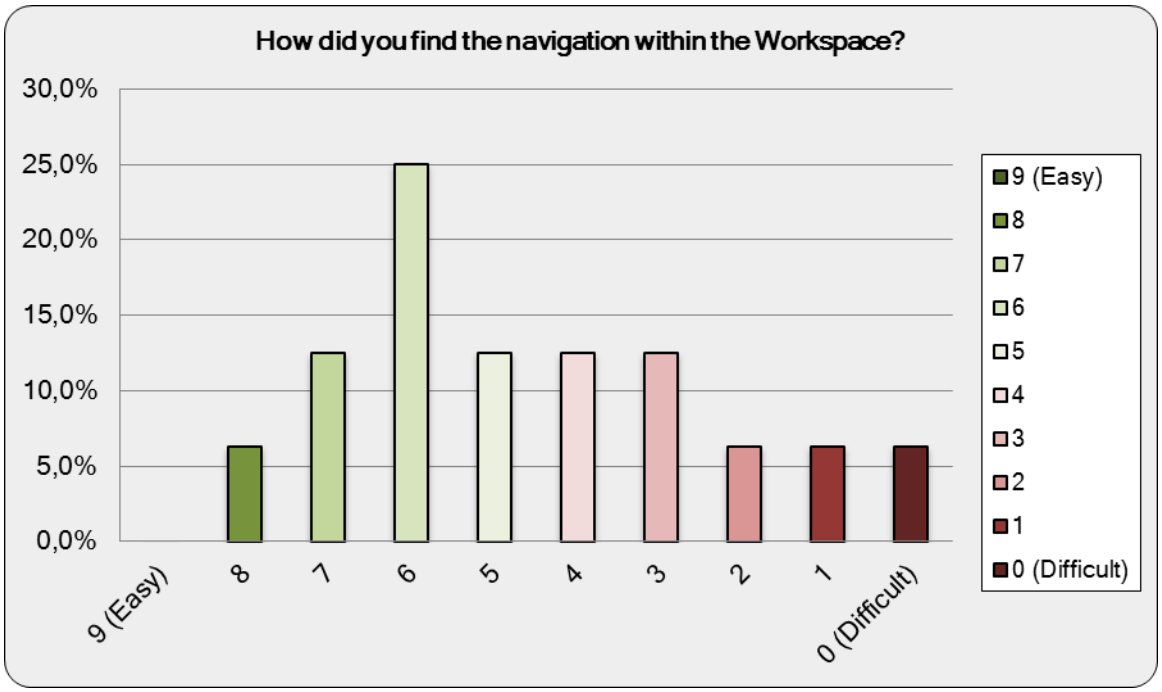
The questionnaire contained a combination of multiple choice questions and open questions requiring free-text input aimed to measure the user's subjective satisfaction with the system and to gather business and market information. The multiple choice questions allowed subjects to rate on two scales:

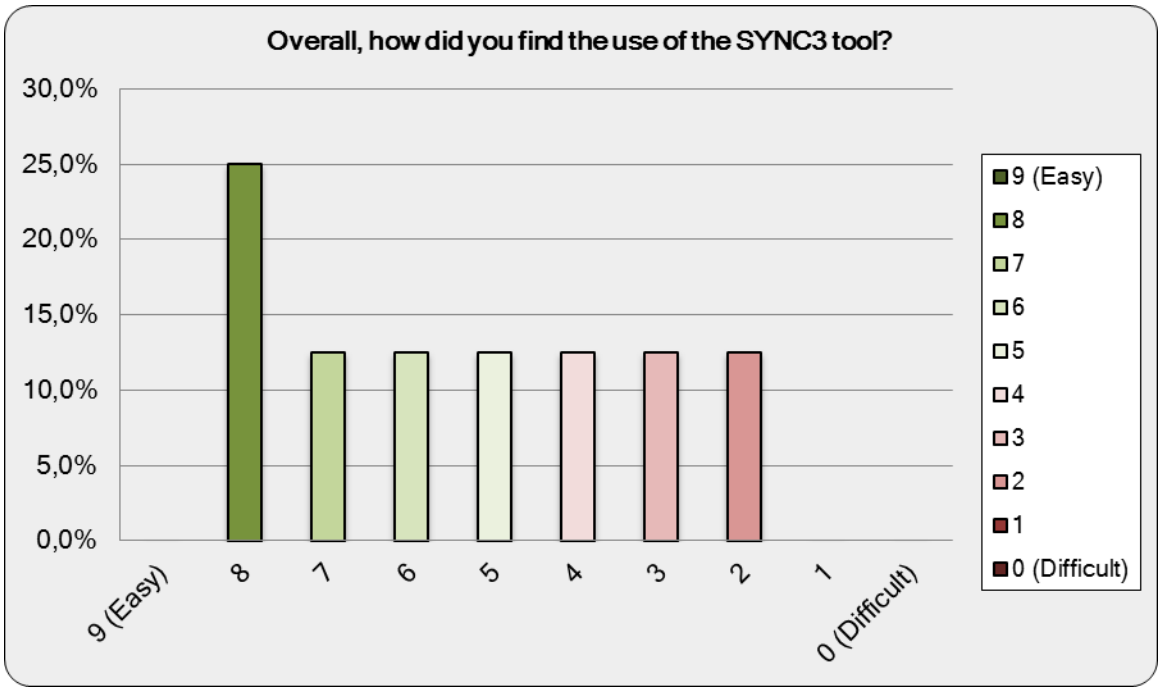
- a comparative rating scale, in which the participants were asked to rate various usability and functionality aspects of the SYNC3 prototype along a well-defined, evenly spaced continuum (a scale of five from very positive over neutral to very negative). This scale is aimed to measure the intensity of their attitude towards the prototype based on the experience of using it during the test session.
- a semantic differential scale, whereby the participants were asked to rate various usability and functionality aspects of the SYNC3 prototype based on a ten-point rating scale that had two bi-polar adjectives at each end, such as "easy-difficult", "very clear-confusing." The advantage of using this scale is that compels the participant to choose to a certain extent one or the other qualifying attribute.

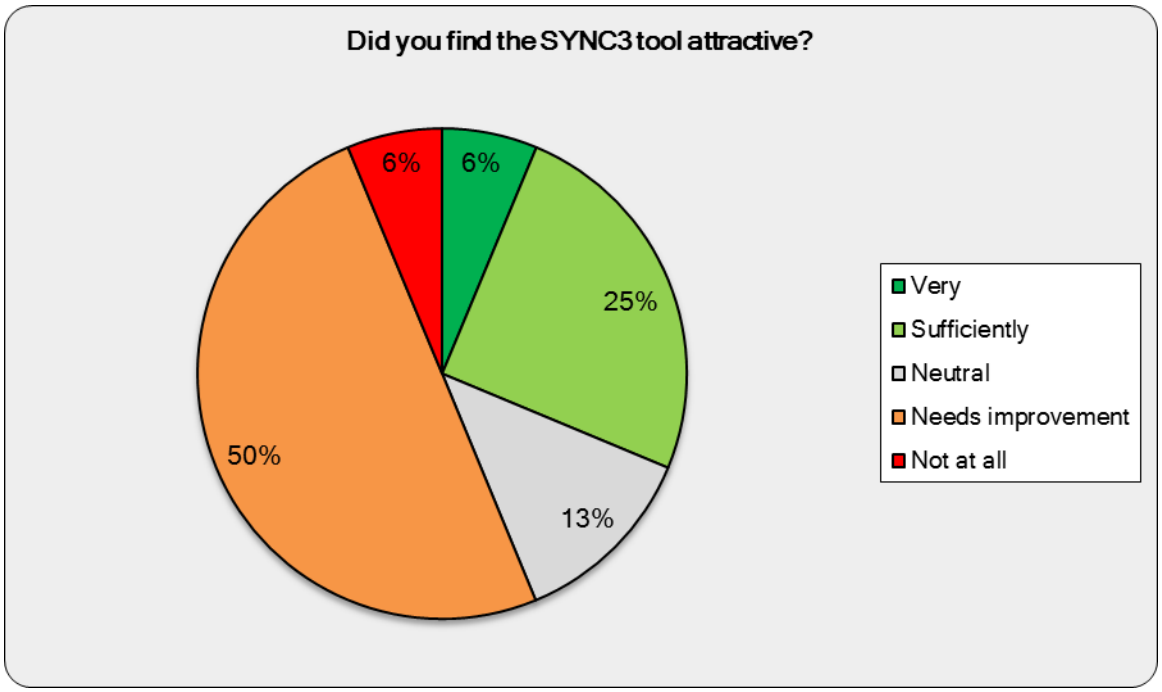
Below are the results of the multiple choice questions for usability and functionality information.

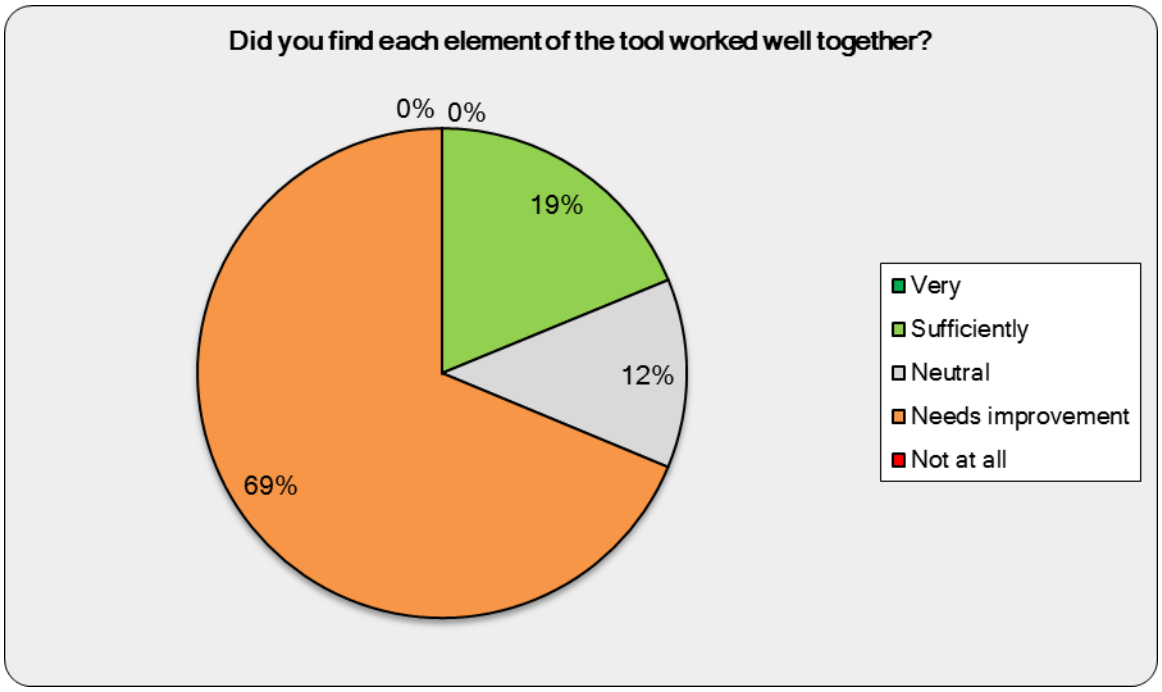
Usability information

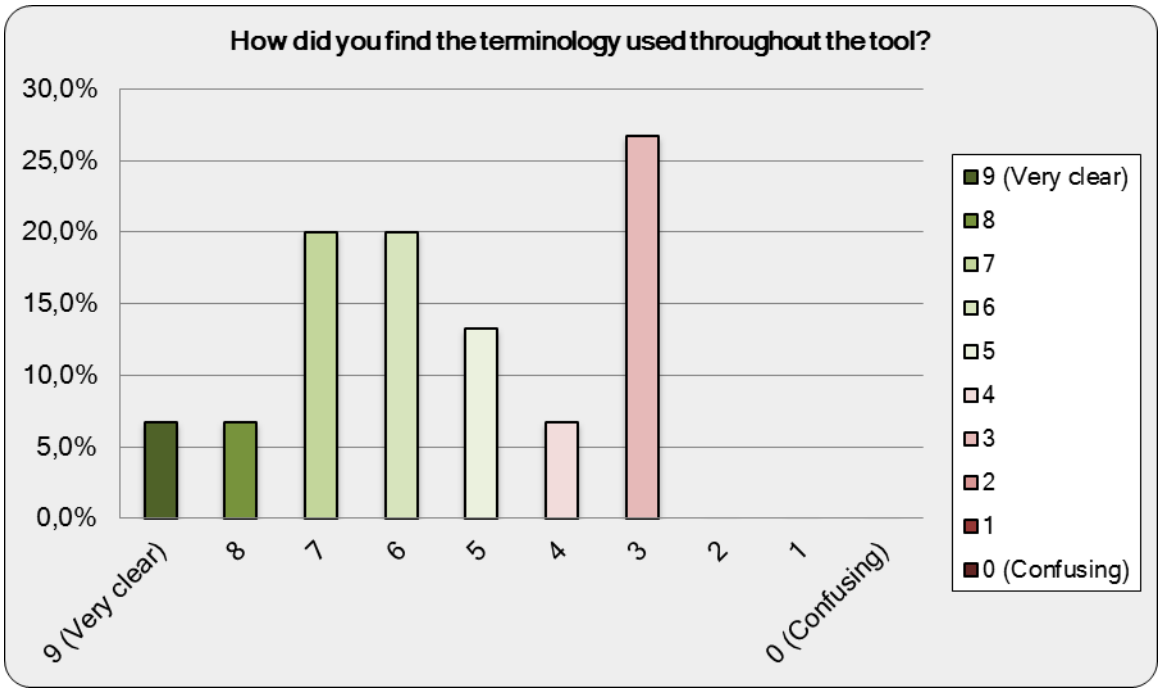


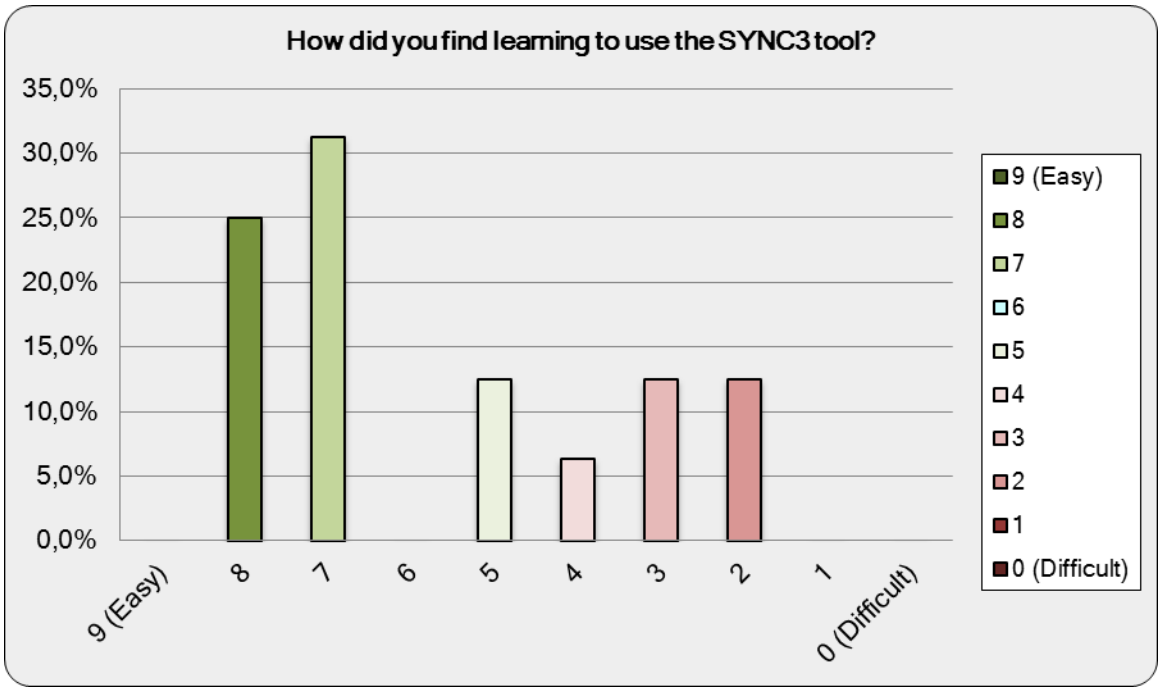

How did you find the navigation within the Workspace?
30,0%
25,0%
20,0%
15,0%
10,0%
5,0%
0,0%
9 (Easy)
8
7
6
5
4
3
2
1
0 (Difficult)


Overall, how did you find the use of the SYNC3 tool?
30,0%
25,0%
20,0%
15,0%
10,0%
5,0%
0,0%
9 (Easy)
8
7
6
5
4
3
2
1
0 (Difficult)

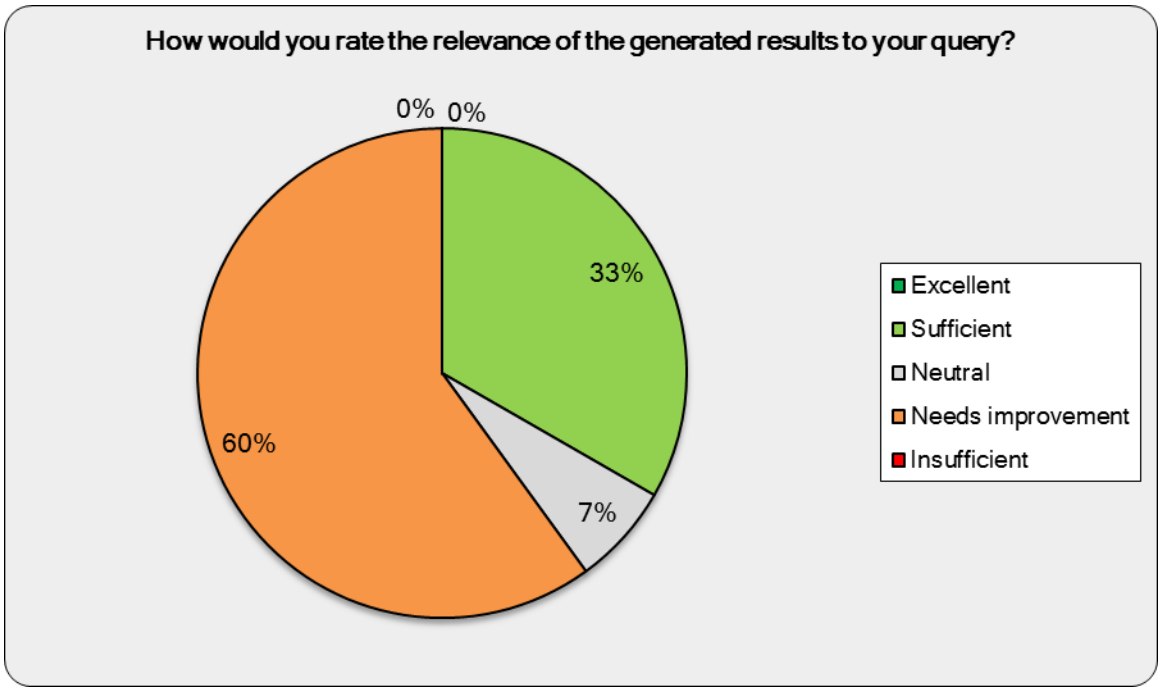

Did you find the SYNC3 tool attractive?
6%
6%
25%
50%
13%
Very
Sufficiently
Neutral
Needs improvement
Not at all

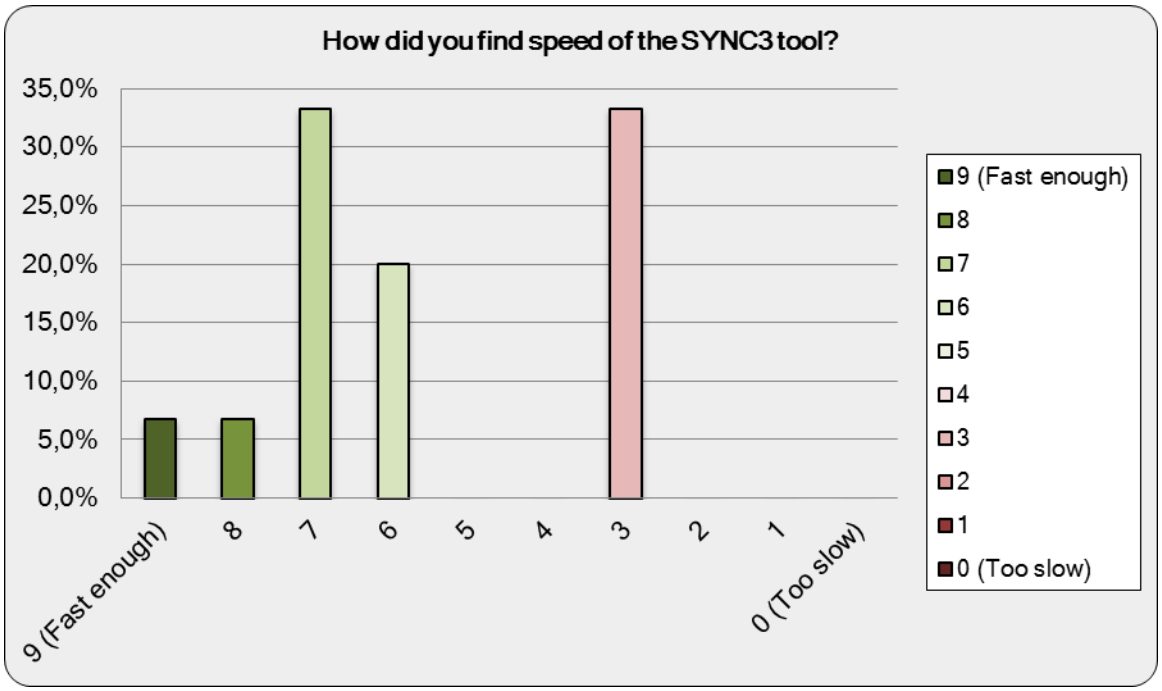

Did you find each element of the tool worked well together?
0%
0%
19%
12%
69%
Very
Sufficiently
Neutral
Needs improvement
Not at all

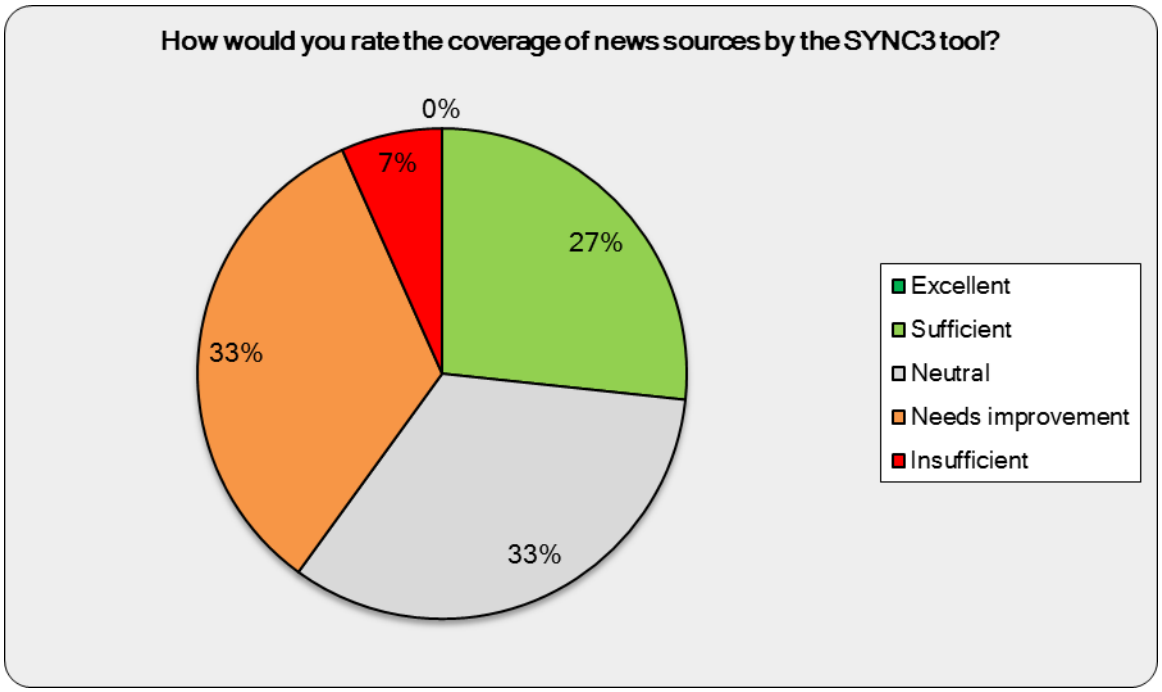

How did you find the terminology used throughout the tool?
30,0%
25,0%
20,0%
15,0%
10,0%
5,0%
0,0%
9 (Very clear)
8
7
6
5
4
3
2
1
0 (Confusing)

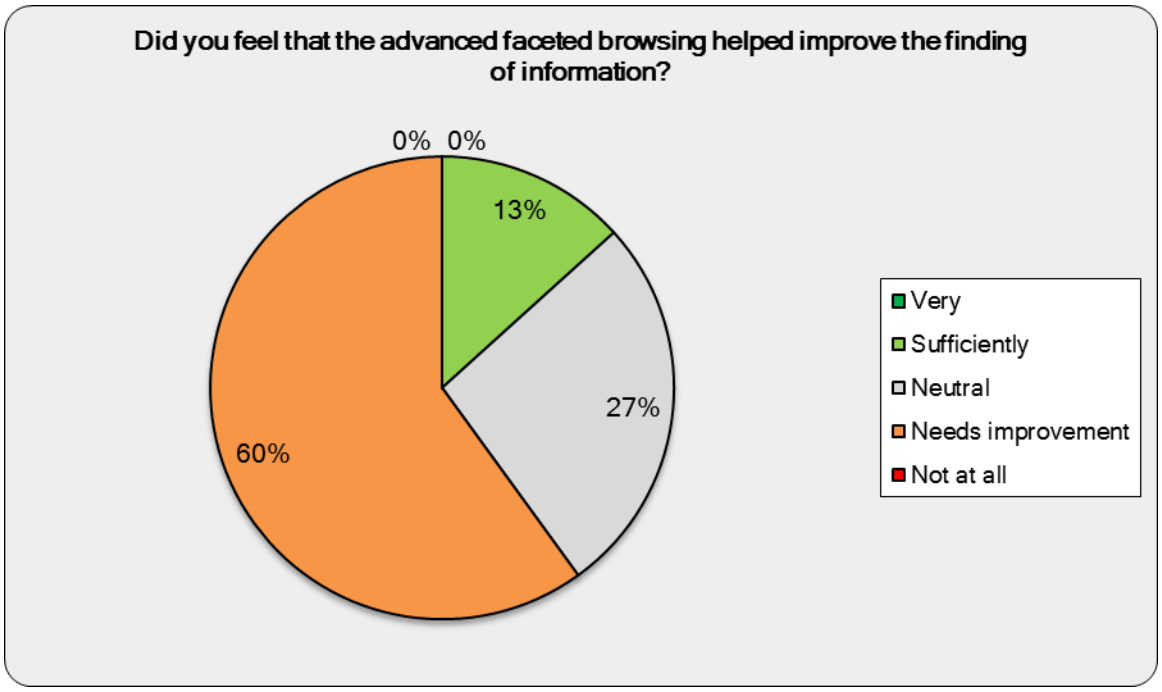

How did you find learning to use the SYNC3 tool?
35,0%
30,0%
25,0%
20,0%
15,0%
10,0%
5,0%
0,0%
9 (Easy)
8
7
6
5
4
3
2
1
0 (Difficult)

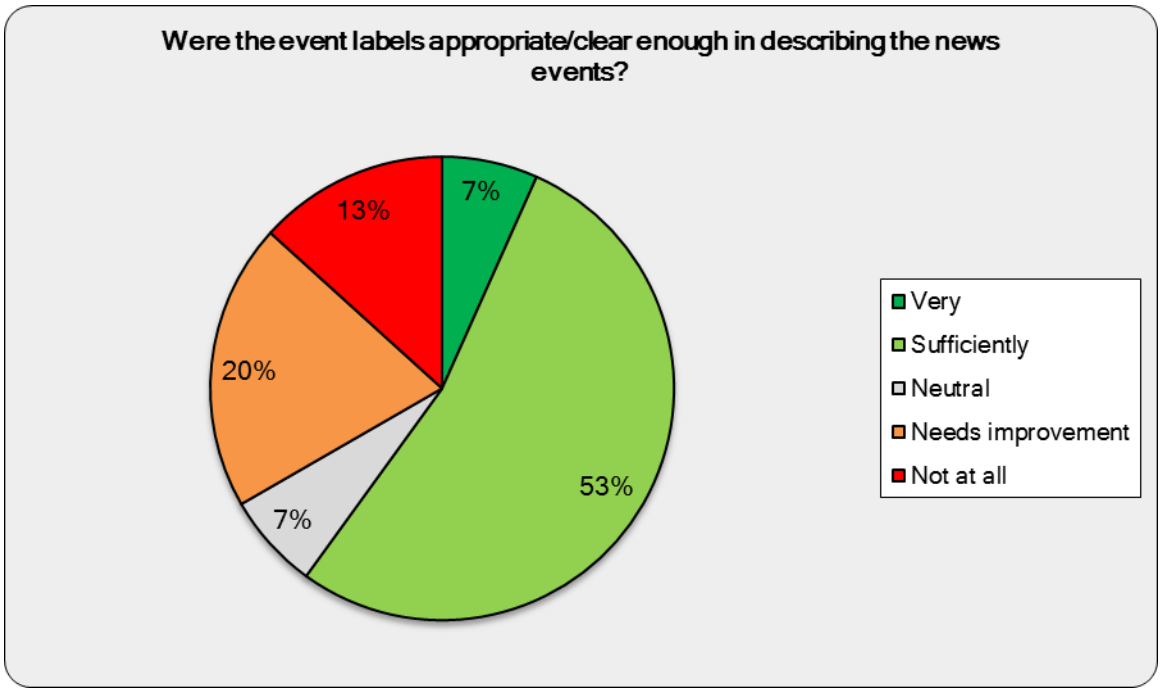
Functionality information

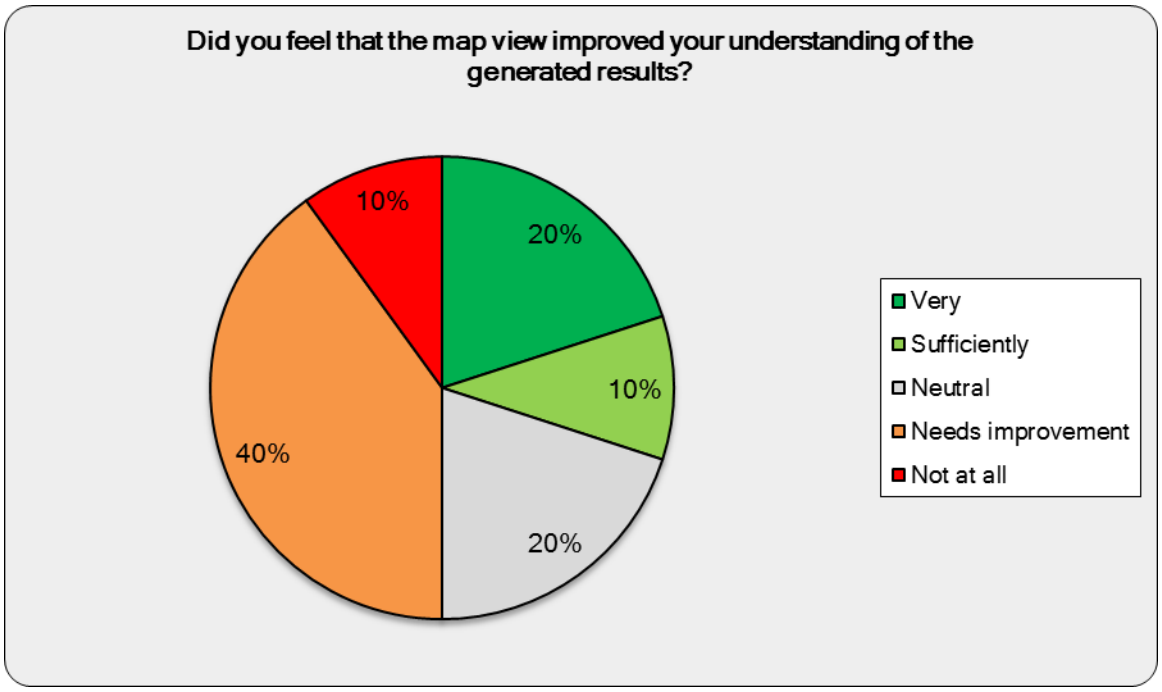


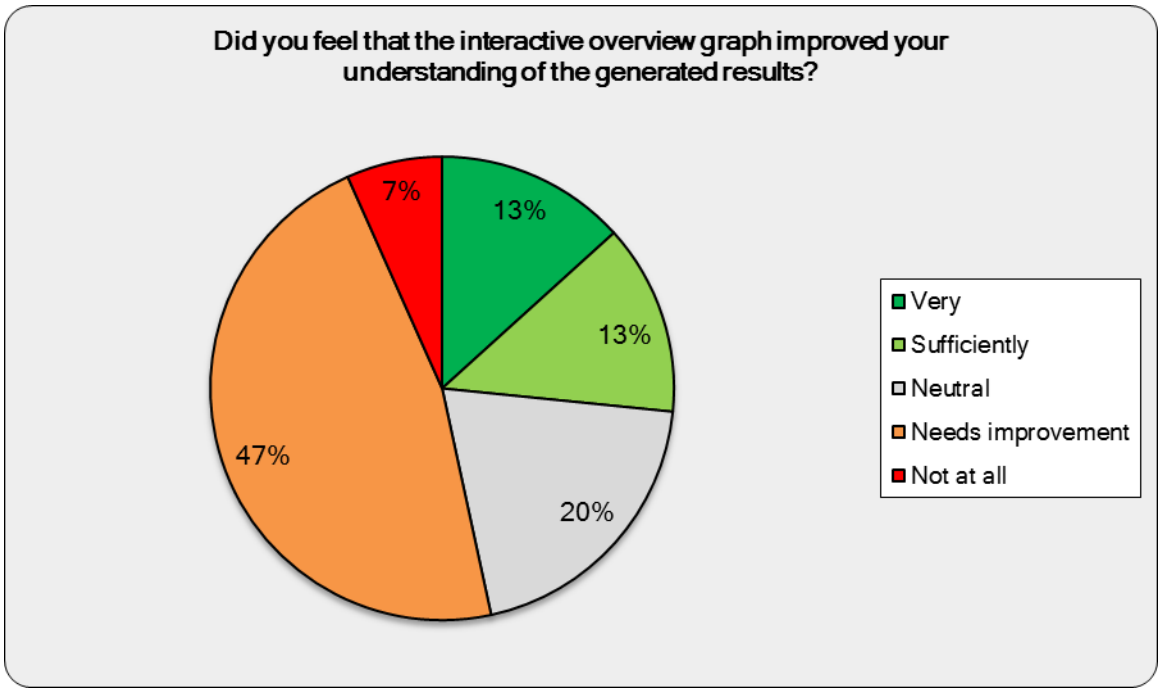


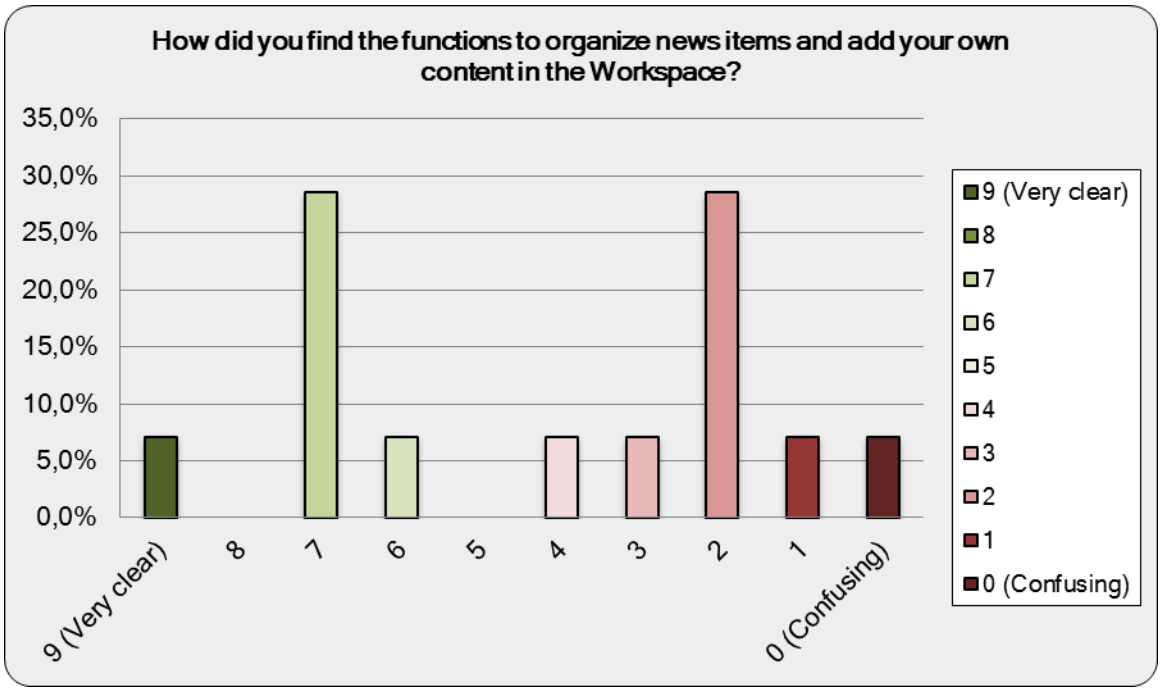

How would you rate the coverage of news sources by the SYNC3 tool?
0%
7%
27%
33%
33%
Excellent
Sufficient
Neutral
Needs improvement
Insufficient

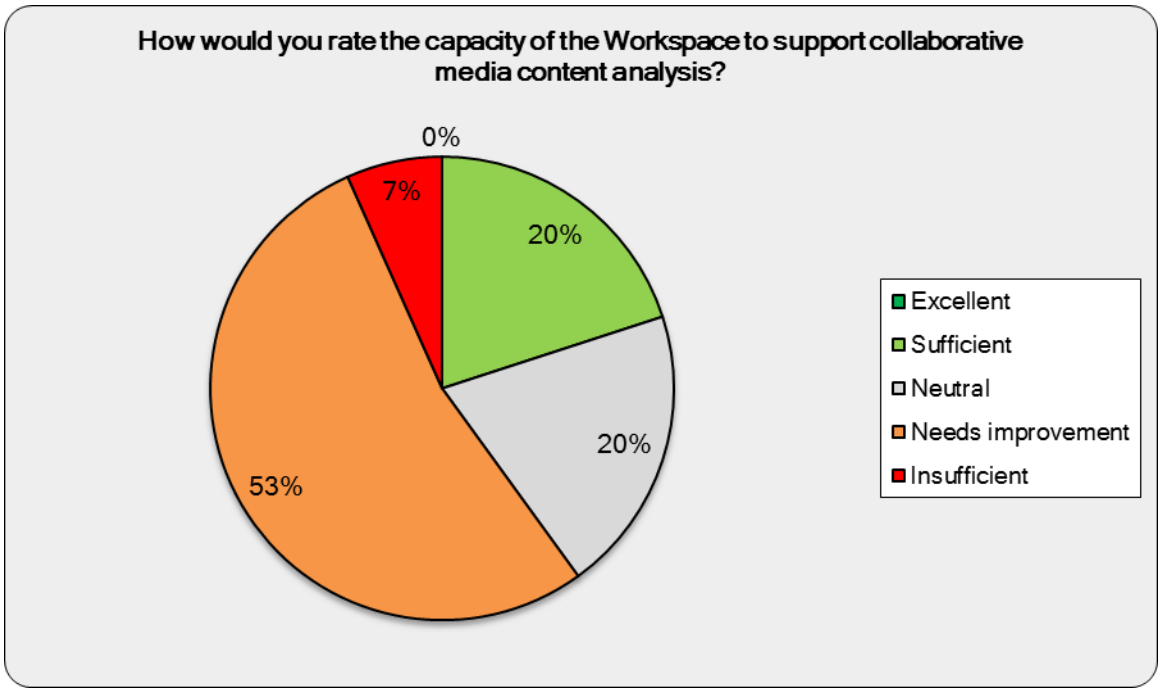

Did you feel that the advanced faceted browsing helped improve the finding of information?
0%
0%
13%
27%
60%
Very
Sufficiently
Neutral
Needs improvement
Not at all

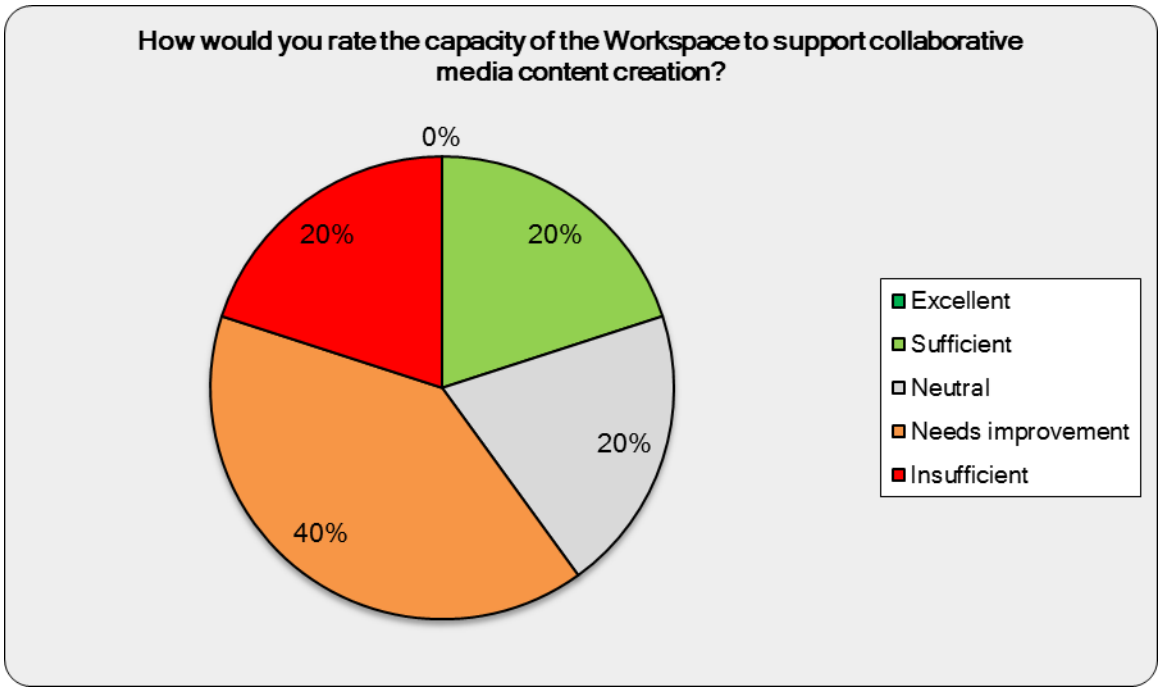

Were the event labels appropriate/clear enough in describing the news events?
7%
53%
7%
20%
13%
Very
Sufficiently
Neutral
Needs improvement
Not at all


Did you feel that the map view improved your understanding of the generated results?
20%
10%
20%
40%
10%
Very
Sufficiently
Neutral
Needs improvement
Not at all


Did you feel that the interactive overview graph improved your understanding of the generated results?
7%
13%
13%
47%
20%
Very
Sufficiently
Neutral
Needs improvement
Not at all


How did you find the functions to organize news items and add your own content in the Workspace?
35,0%
30,0%
25,0%
20,0%
15,0%
10,0%
5,0%
0,0%
9 (Very clear)
8
7
6
5
4
3
2
1
0 (Confusing)


How would you rate the capacity of the Workspace to support collaborative media content analysis?
0%
7%
20%
20%
53%
Excellent
Sufficient
Neutral
Needs improvement
Insufficient


How would you rate the capacity of the Workspace to support collaborative media content creation?
0%
20%
20%
20%
40%
Excellent
Sufficient
Neutral
Needs improvement
Insufficient

From these results collected through the dedicated questionnaires, the following conclusions can be drawn:

(1) Questions pertaining to usability have generally received positive ratings as they have been answered by points 9 to 5 pertaining to the positive side of choices on the scale, meaning that there was no major frustration regarding interaction with the system and interface layout. Exceptions were questions referring to navigation within the Workspace. About 40% of the respondents rated the navigation within the Workspace with values ranging from 0 to 4, with 0 representing "difficult".

(2) In terms of functionality, the results of the questionnaire were more critical than the evaluation of the same aspects during testing. About half of the respondents considered that the tool needs improvement in terms of relevance and ranking of generated results to the query, news sources coverage, advanced faceted browsing, map view, interactive overview graph, and capacity of the Workspace to support collaborative media content creation and analysis. The rating of the system as "needing improvement" suggests that the concept behind the SYNC3 system has been met with the approval of the test participants, which was one of the main objectives of the first prototype user evaluations, and reflects the naturally "raw" status of a system in its first prototype stage.

(3) Two thirds of the respondents favourably rated the accuracy of the event labels in describing the news events and over half of the respondents favourably rated the speed of the SYNC3 tool.

As could be expected, free-text responses given were rather varied in depth, and several respondents answered to selected ones only or to none at all. The feedback can be summarized as follows:

Usability

The SYNC3 concept and intention was met with the approval of the respondents who envisaged that its usability, applicability, and usefulness will increase with the size of the data set available. To exploit the potential of SYNC3 to the fullest, it was also suggested that effort should be directed towards connecting SYNC3 with a variety of social media platforms. Respondents praised SYNC3 for its capacity to enable better understanding of the dynamics between traditional and social media by linking together news articles with blogs that relate to them and thus syncing together two conversations and meshing their information into one. SYNC3 was deemed a useful tool for journalists and media researchers. Particularly interesting and perhaps unique was considered the breakdown of big events into smaller events that is at the core of the SYNC3 concept, by means of its definition of a news event at a very granular level.

Although well-received at conceptual level, the area most often indicated by the test users as requiring further development and improvement in order to become a usable tool was the Workspace. Besides the envisioned uses, the Workspace was seen as particularly useful in facilitating media archiving. Half of the respondents found that the Workspace needs to be made easier to use and improved to make its commercial utility more obvious. To increase its usefulness, the Workspace must be made possible to integrate with existing user workflows and material belonging to them, by for example opening up the Workspace and allowing material from outside the SYNC3 tool such as videos, photos, links etc. to be imported and analyzed. One respondent indicated that the Overview graph, a useful analysis instrument should also be made possible to transfer to the Workspace.

Another element that was indicated as needing further improvement was the Overview, the presentation of which needs to be made clearer. Respondents indicated that tutorials are a way to make clearer the way tools such as the Workspace and Overview work and what they do. In terms of search capabilities, respondents indicated that advanced search options by publication date and numeric range would increase the usefulness of the tool. In addition to the planned

functionalities, the respondents suggested that it would be useful if SYNC3 also included statistical overviews and visualizations to show connections and relationships between extracted entities. In terms of sentiment analysis, it was suggested that the influence of the bloggers needs to be taken into account when measuring sentiment. [*Test leader's note: a way to further exploit the list of blog source credibility criteria is to somehow include in the listing of blog results a value corresponding to the credibility of the blog or rank them according to credibility.*]

Functionality

This section of the questionnaire received far lesser and less extensive responses than the usability section. Some observations, such as the necessity to make the Workspace simpler and easier to use have been reiterated, while other respondents invoked the comments made during the testing on these issues (see Section 8.3).

Business and market information

Comments in this section were connected to the professional profile of the respondents. Four respondents with a communication/PR professional or media analyst profile, one professional journalist, one media researcher, and one blogger provided their opinions on business and market opportunities of SYNC3. While acknowledging the limited functionality of the current prototype, the four respondents with a communication/PR professional or media analyst profile positively appreciated the capacity of SYNC3 to become a useful tool for the media monitoring market, provided the tool is integrated with a much larger dataset and more user testing is conducted to gather documentation in order to make it more functional and easy to operate. To become a competitive tool, it was suggested that the Workspace should allow import of different media, such as videos and photos, and provide more statistical means of analyzing them along with an archiving option.

In terms of comparison with existing competitors, respondents indicated that there are more advanced commercial solutions on the market for web crawling and suggested that a niche focus would give a competitive advantage to SYNC3: focusing perhaps on political/public sector/NGO themes? The respondent with a professional journalist profile indicated as competitors: Google News, Icerocket, Manymoon, and Yahoo Pipes, all of which are being monitored by the SYNC3 Consortium. Additional competitors mentioned during the evaluation sessions were Radient 6, moreover.com, analytics.com, and Factiva. The concept behind SYNC3 met with the approval of the respondents with a blogger profile as well, who indicated that SYNC3 would be a useful tool for the blogging community as it enables bloggers to have their voices heard in a more timely fashion.

General conclusions

Far lesser respondents provided responses to this section of the questionnaire and their answers were brief. Besides emphasizing the above-mentioned perceived advantages and drawbacks of SYNC3 (enabling better understanding of the dynamics between traditional and social media, breaking down big events into smaller granularity events, that the Workspace and Overview have to become more user friendly, and to enable import of materials from outside the SYNC3 system), respondents indicated that while understanding that handpicked sources help keeping the data clean – with regard to comprehensiveness of source coverage, this is a drawback. This observation meets the agreement of the Consortium, as the limited set of sources is designed for the developing stages of the system, while the end product will freely roam the Internet. In addition, the search and browsing functions were positively appreciated. Limiting coverage to English language sources and excluding other types of social media such as micro-blogging services were also indicated as drawbacks of the system. An indicator of blog post opinion in the list of generated results was also deemed useful. Some of the main overall drawbacks indicated by respondents were: lack of sentiment [*Test leader's note: the absence of sentiment analysis is a planned fact given the early stage of development of the system*], and difficulty to use the Workspace. As overall improvements it was suggested that the set of news

and blog sources be expanded [*Test leader's note: the expansion of the set of sources is planned in the development of the project*]. A business strategy suggestion that was made is that the system specializes on a particular theme or sector and uses sector-specific intelligent libraries for NLP and automated sentiment).

8.1.3. Evaluation session results

Exploration and Browsing Interface

Observation of uninitiated users interacting with the SYNC3 Exploration and Browsing Interface yielded the overall impression that they quickly grasped its purpose and main functions. Overall, the responses to the Exploration and Browsing Interface were very favourable. Users appreciated that the tool was clean and clear visually, as well as its speed. One user indicated that the search bar should be larger and have a more central position on the page (at eye level).

Clustering of articles around news events and having results from news and blog sources listed on the same page in separate columns was unanimously appreciated. In terms of volume of results, it was remarked a couple of times that more results from news as well as blog sources were expected to be listed, particularly for news events that include emotional words in the case of blog posts. Expanding the source dataset towards having the system freely roam the Internet in its final version is on the agenda of the Consortium. As solution to this issue one senior participant suggested that a way to automatically pull blogs should be examined by potentially checking which blogs link to news sources most often. While junior professionals were sometimes disoriented as to which results represent news articles, blog posts, and news events, senior professionals recognized these three types immediately. Interest was shown towards indicating in a more telling way where news coverage triggers blog activity.

In terms of search capabilities, it was remarked that misspellings in queries are not recognized and corrected. It was indicated that searching by date or date range should be enabled as well. Most of the users indicated that the searched keywords should be highlighted in the generated results as visual aid for quick finding of the searched information. The relationship between the searched words and the listed news event labels was not immediately clear to all participants. To make the relationship more clear, perhaps the searched keywords should be highlighted in the news event label. Media monitoring professionals were particularly interested in selecting the pool of sources in which the search is being done. An archive of searches was suggested to be posted on the search page along with a list of news categories (politics, culture, sports, etc.).

In terms of generated results, about half of the test participants indicated that not all generated results were relevant to their query. For example, in the case of the query "oil spill Gulf of Mexico," one of the highly ranked listed results was an event referring to an oil spill in China, where Gulf of Mexico was only incidentally mentioned at the end of one of the articles. For the query "Haiti earthquake" the generated results refer to Haiti elections and not to the earthquake. Participants found it disorienting that in the top listed news events the searched words were absent from the news event label. The participants expected that in the (top) listed results the searched terms would be part of the main reported event and not part of a secondary event. In some cases not all of the searched terms could be identified in the text of the news article or blog post but in other sections on the article page. For the query "Gillette" most of the top listed results do not refer to the razors' brand but to an individual whose name is George Gillett. [*Test leader's note: This is due perhaps to the fact that the current ranking algorithm ranks based on a formula which calculates the frequency of the queried words in the retrieved results. In ranking the results the algorithm needs to be tweaked to take into account whether the queried words are part of the main event reported on in the news article or if they are incidentally mentioned in the article.*] It was remarked that not all generated blog posts were related to the events they were linked to either. Local events, such as events related to Dutch politicians, proved not to be covered. The latter issue is expected given the limited set of major news sources that the system is working with in the early stages of development. The connection between the number of

results displayed in the top right corner and the number of listed news events was not immediately clear to some of the participants. The pleasing appearance of the news agency logos which accompanies each news article was appreciated. One user indicated that in ranking results fresh results should be ranked higher when they have the same level of relevance to the query. In comparing the results generated by the SYNC3 prototype with the results generated by Google News Search for the same query, the participants remarked that Google News Search returns a much larger number of relevant articles. [*Test leader's note: Whereas the quantitative difference was anticipated and can be explained by the limited set of news sources indexed in this phase of development of the SYNC3 system, the limited number of relevant results for rather general queries indicates an issue that requests further work.*] It was indicated that the number of items (news articles and blog posts) clustered for which news event should be indicated at the news event label before the user clicks on it to see the news articles and blog posts. One user indicated that there should be an option to allow the user to select what they want to see: results from blog posts or results from news articles.

On a macro-level, one senior participant wondered whether such refined event granularity is necessary at a practical level. To increase the utility of the tool, the very refined granularity of events was suggested to be complemented by grouping events into a big cluster. Perhaps the navigation of information should start with a visualization of large amounts of information in big patterns and then break into granularity by means of the list view. The user wants granularity, but also wants to see the whole picture. This can be achieved by adding a meta-level where the fine-grained events are sorted under overarching events defined by selected parameters.

The test participants welcomed the idea of having metadata (named entities and dates) extracted and displayed but indicated that more work needs to be done on the way they are being displayed to make the difference between the categories of extracted entities more visible maybe by means of colours. It was however remarked that the metadata extracted from news articles, namely persons, organizations, locations, dates, is not always accurate. For example, the name of a hurricane is listed under persons and the name of a person under organizations. Names are not always displayed in full. Near duplicates (for example: name + surname vs. surname) are not always recognized and are displayed twice as separate entities instead of a unique entity. The various categories of metadata were not of equal importance to all participants. [*Test leader's note: give the user the option to have displayed the categories of metadata that he/she is interested in to avoid information overload*]. On the other hand, other categories have been indicated as potentially even more useful to be extracted than persons for example (the user already has an idea about what persons to expect to be involved in an event when searching for information on it), namely topics, products, issues. This observation belonged to a media analyst working in a for-profit media monitoring company. The participant gave the example of commercial applications which extract agenda topics or issues that are setting the debate on a particular theme. To bring the analysis enabled by the system a step further, it was suggested by one of the participants that extracted entities be aggregated by means of drawing connections between them.

The issue of having an indicator of influence of bloggers displayed along with the generated results from blog sources came up in the evaluation session as well. While SYNC3 took credibility as a criterion for selecting the blog sources that are crawled, the test participants with a media monitoring profile indicated that reach or readership of the blog is an important criterion for identifying influencers and should be included in the list of SYNC3 criteria for selecting blog sources to crawl. [*Test leader's note: a way to further exploit the list of blog source credibility criteria is to somehow include in the listing of blog results a value corresponding to the credibility of the blog or rank them according to credibility.*]

It was not immediately clear to the participants who tested the Map View which locations are being displayed on the map. The title of the tab "Map" was also indicated as unclear. The positioning of the "Map" as second tab in the search interface does not match its relevance. The Overview tab could be listed before it. They remarked with surprise that a smaller number of locations than the ones identified in the list view are being represented on the map. Participants

whose work takes place within national borders remarked that it would be useful to be able to select and zoom into a region on a map, i.e. a country, and have more specific locations, i.e. cities, displayed for the particular selection. Participants appreciated positively the fact that a snapshot of the article was displayed when moving the mouse over a location on the map.
Sentiment analysis was an issue towards which participants generally showed great interest. As reaction to the description of the SYNC3 mode of sentiment analysis, it was suggested that sentiment analysis be expanded from the blog post level to the blog source level. The blog post must be considered in its environment, the blog as a whole, when identifying sentiment. A larger context than a blog post should be taken into account when attempting to identify sentiment, namely the type of publication as well. Not all opinions expressed in the blogosphere weigh equally, so the degree of influence of the blog in the blogosphere should be taken into account when identifying sentiment.

Advanced keyword search

The idea behind the advanced search function was welcomed by all users, and its necessity was even anticipated by some. Some suggestions for its improvement were made as follows:

- Instead of having a separate menu for selected facets, selected entities should be highlighted in the list of facets.
- To simply the interface, only categories of entities (i.e.: location, organization, person, source) should be initially displayed and the entities themselves should be displayed by clicking on corresponding categories.
- There was a sense of disorientation when, after selecting more entities in the advanced search, the page went blank for a second.
- The trash icon used for de-selection creates confusion as it connotes deletion, not de-selection.
- Most users expected that selected facets would automatically get deselected when doing another search, although some preferred that selections are maintained for future queries as well.
- Bug: the top trash icon/ “deselect all” button does not work.
- The vertical listing of facets is difficult to read and makes it difficult for users to differentiate between the extracted entities. It was not immediately clear to some participants that clicking on the arrows in the vertical list of facets would display more facets. Listing the facets horizontally was suggested instead.

Overview

This dynamic way of visualization of generated news and blog results was met with great interest although it produced some confusion as to what it represents. Generally participants did not grasp quickly what the Overview visualization shows and remarked that it was not the most straightforward way of showing information. To maximize its utility it was remarked that it should be made to show the rhythm of a news story, to enable the pulse check of a story and its volume, as well as to enable comparisons in coverage between blogs and news. Below is a list of user and test leader comments on the Overview and the interaction between the user and the Overview:

- To be made more user-friendly, a tutorial was suggested to be made available to understand the Overview. The tutorial should contain more detailed information on menus and a general explanation on how it works (maybe even a video).
- More attention needs to be paid to the presentation and spelling. Some users were disoriented as to why some entities are capitalized and others are not.
- To make the visualization clearer it was suggested that when one entity is selected to be explored with the Overview, the bubbles representing the unselected entities should be more transparent or even better not represented at all.
- When clicking on a bubble the user expected to be sent to the text of the corresponding article(s).

- There was a sense of disorientation as to why the animation is flowing backwards sometimes when the X axis is set to time.
- An option to manually edit the visualization should be made available. Some users, following the model of more commercial products such as Analytica, expected more types of visualizations and statistical analysis to be available.
- The entities displayed for selection in the menu should also be categorized to simplify display.
- Some users wondered whether for a larger time span the Overview would still be clear enough to bring meaningful information.
- Bug: The timeline works with only a limited time range (a week in July).
- A "select all" button would be useful.
- It was not immediately obvious for some participants that the tag describing a bubble can be dragged outside the visualization when wanting to have a better view of the visualization.
- For comparative media analysis or competition analysis it would be useful to be able to dynamically visualize the evolution of coverage of two search terms in parallel.
- It was noticed that when pressing the pause button you are sometimes being brought to start and suggested that the visualized narration should always start from the point where it was paused.
- Generally the "bubbles" visualization was considered a more clear way of visually representing information than the other two available types of visualization, although some media monitoring professionals accustomed to line charts preferred the alternative lines visualization.
- It was suggested that the Overview should include the option to visualize topics in relation to sentiment and the blog activity plotted around them.
- One user drew attention to one downside of animations: they cannot be included in printed reports. An option for exporting the overview visualization to be included in reports should be made available.
- Test participants with PR and media monitoring background were mostly interested in visualizing results per news source or location.
- The explanation of colour coding is not as important for the user as to be placed so close to the top of the page. The list of categories by means of which to filter the results displayed in the dynamic graph was considered to need a more prominent place on the page than the explanation of colour coding.

News Story Creator

Generally, the test participants remarked that working with the News Story Creator is time-consuming and fiddly. Test users had difficulties in moving items around and making connections between them. To be accepted by the users, it has to be made easier and less time-consuming to use. A tutorial should be made available for this function. A suggestion made to make it easier to use was to enable making connections between items by clicking on the connection end-point instead of drawing arrows. Few found it difficult to understand what it does on a practical level, which is natural given that this function was not envisioned to be used by all the targeted user groups that tested the prototype.
The strong point of the News Story Creator was indicated as the capacity of easily transferring news items in a space where they can be analyzed and archived. While, as expected, not very useful for journalists, it was indicated that it could be useful for teaching journalism, because people can edit others' work. For the media monitoring and analysis market, the Workspace might be used for brainstorming as a starting point in preparing reports, if not cumbersome and time consuming. With further development, it could also be used as dashboard to be shared with clients to draw attention to issues. Participants with PR and media monitoring background indicated that the Workspace would be useful in illustrating case studies of media coverage and

cross-media influence in the case of crisis communication for example, or in following the results of a communication campaign in the media.
Below is a list of user and test leader comments on the Workspace and the interaction between the user and the Workspace:

- Bug: right clicking to transfer items to the Workspace did not always work.
- Users expected to have news articles exported to the Workspace as well when adding news events to the Workspace.
- Most users indicated that the widgets should be displayed at all times at the top left corner.
- In order to be used for content creation, all Word application capabilities should be made available for Notes.
- Icons such as the folder icon created confusion as they made the users want to click on them to have something opened.
- Potential bug: when the arrow gets off screen it cannot be manipulated anymore.
- Users showed interest towards importing items from outside the tool (videos or pictures) into the Workspace.

User profiling infrastructure

In terms of receiving recommendations, the participants indicated that they prefer to be asked if they want more information before being recommended items. One user remarked that the recommendations page has the MySpace logo.

Specific issues requesting user feedback

In the case of near duplicates, would you prefer to have all duplicates listed or just one?

All users responded just one, but one responded that near duplicates should be listed if they are updates. Another user indicated that the response to this question depends on the type of use that the tool is being put to. In content analysis, frequency does not matter, but in coverage analysis, any instance is relevant. [*Test leader's note: From the point of view of news distribution research it is important to see all the instances in which a story was published – Google News did so until Sept. 2007. Now it offers showing duplicates as an option. One possible option is to give the user the option to choose between having duplicates listed or not.*]

Is it helpful to have the same articles listed in different events?

The responses to this question varied. One user confirmed and suggested to have them prioritized and list at the bottom the ones that have been listed under other events as well. Another user however remarked that even then you get the impression that they are duplicates.

What other search capabilities would you want to have? Would search by keywords and sentiment be useful or not?

Users unanimously welcomed the idea of having the possibility to search by keywords and sentiment.

Business and market information

The idea behind the SYNC3 project was met with great interest and enthusiasm by most of the senior Report International test participants. The managing director particularly showed great confidence in the potential of SYNC3 and expressed interest towards being kept updated on the developments of the project and potentially collaborating at the level of research or of the end product exploitation. The expertise of these senior professionals materialized in suggestions at the level of business strategy as well. It was suggested that SYNC3 would gain a competitive advantage if it focused on a topical niche such as the European public sector or European politics.

8.1.4. Table of issues raised by users

In addition to the descriptive summary above, this table provides an overview of the issues raised by users during evaluations and of the wishes expressed. The list will be discussed by the Consortium and serve to prioritize actions to be taken during further development. In bold are the top ten issues proposed to be addressed by the Consortium from a user's perspective. It should be noted that the table does not include favourable aspects expressed by users or observed by the test leaders, as these are no cause for further action. Therefore, the following list must not be taken as an overall assessment of the quality of the first SYNC3 prototype.

Table 10: Issues raised by the users in the first user evaluation cycle

No.	Area	Issue	Comment
1	Functionality	**Improve relevance of generated results to queries.**	In ranking the results the algorithm needs to be tweaked to take into account whether the queried words are part of the main event or are incidentally mentioned in the article.
2	UI	**Make Overview chart more clear, simple and user-friendly.**	
3	Functionality/UI	Make influence of blogger visible in the UI in the list of results and take it into account when calculating sentiment.	
4	Functionality/UI	Set up tutorial to explain the Overview and the Workspace.	
5	Functionality	Open up Workspace to materials from outside the SYNC3 tool.	Allow import of pictures, videos and also the Overview visualization into the Workspace.
6	Business strategy	**As there are already on the market advanced solutions for web crawling, the best way to go for SYNC3 might be niche focus such as: political/public sector/ NGO themes.**	
7	Functionality	**Have the system recognize and correct misspellings in queries in order to enable it to generate results for queries with misspellings.**	
8	UI	**Highlight searched keywords in the generated results.**	
9	UI	More accurately display the extracted meta-data on persons, locations, organizations, etc.	Sometimes a word is not displayed in full.
10	Functionality	**Improve accuracy and eliminate duplicates from extracted entities.**	Duplicates: name + surname vs. surname, person sometimes

No.	Area	Issue	Comment
			thought of as organization.
11	Functionality	Map connections between extracted entities.	
12	Functionality	Extract additional categories such as topics, issues.	
13	Functionality	Make representation of location on the Map View comprehensive.	Not all extracted locations are represented on the map.
14	Functionality	**Cluster fine-grained events under an overarching event (story).**	
15	Functionality	Move sentiment analysis from blog post level to blog level.	Consider the blog post in its environment, in context, to decide whether sentiment is positive or negative – you need to take into account the context, the type of publication to decide on sentiment; sentiment should be defined by the influence of the blog.
16	UI	Highlight selected entities in the list of facets instead of having a separate menu for selected facets.	
17	UI	Eliminate the page going blank for a second, after selecting more entities in the advanced search.	
18	UI	Replace the trash icon with an icon that connotes de-selection instead of deletion.	
19	Bug	The selected facets are not automatically deselected when doing another query.	
20	Bug	The top de-selection icon meant to undo all selections at once does not work.	
21	UI	When one entity is selected to be explored with the Overview, the bubbles representing the deselected entities should be even more transparent or not represented at all.	
22	UI	Presentation in the UI and spelling require more attention.	For example, when are some entities capitalized and when are they not.
23	UI	Enable navigation to articles from Overview.	
24	UI	Add option to manually edit the Overview visualization.	

No.	Area	Issue	Comment
25	Bug	Animation with time view is sometimes going backwards.	
26	UI	Categorize entities available for selection in the Overview in locations, persons, organizations, etc., as well.	
27	Bug	Timeline works with only a limited time range (a week in July).	
28	UI	Add "select all" option to Overview.	
29	UI	**Design the Overview to enable comparisons in coverage between blogs and news or between different search terms.**	
30	UI	When pausing the Overview, the animation should not be brought to start, but continue from the point where it was paused.	
31	UI	Add sentiment visualization to Overview.	
32	UI	**Make moving widgets around and making connections between items in the Workspace less cumbersome and time-consuming.**	By making connection between items by clicking on the connection end-point instead of drawing arrows perhaps.
33	Bug	Right-clicking to transfer items to Workspace does not always work.	
34	UI	Have widgets displayed at all times in the top left corner in the Workspace.	Prezi is an example of neat display of widgets.
36	Functionality/UI	Make more Word application capabilities available for Notes.	
37	UI	Have icons visually represent functionalities or widgets in a non-ambiguous way.	i.e.: the trash icon connotes deletion not de-selection, the folder icon for the event widget makes the user click on it to open something, the User Profiling Infrastructure uses the MySpace logo.
38	Bug	When arrows get off-screen they cannot be manipulated anymore.	
39	UI	Near duplicates being essential information or not depends on the use of the tool: for content analysis or distribution analysis. Perhaps add option for the user to choose whether he/she wants to have near duplicates displayed or not.	

No.	Area	Issue	Comment
40	UI	In the case of the same article being listed under different events have the unique ones prioritized over the repeated ones.	
41	UI/Functionality	Enable search by keywords and sentiment.	
42	Functionality	Expand news sources coverage to include local sources as well.	
43	Functionality	Expand blog sources coverage.	
44	Functionality	Enable search by date/date range.	
45	UI/Functionality	Provide context by sending user to article(s) when placing mouse over a bubble in the Overview.	
46	UI	Make more immediately obvious that the tag describing a bubble can be dragged outside the visualization when wanting to have a better view of the visualization.	
47	Functionality/UI	**Provide more types of statistical overviews and visualizations.**	
48	Functionality	Eliminate listing of duplicate blog posts which link to blog post comments.	
49	Functionality/UI	Offer the possibility to select the visualization date range for the Overview.	

8.1.5. Conclusions from the first prototype user evaluations

To date, the objectives of user evaluation of the first prototype of the SYNC3 system were successfully achieved. No technical issues showed up in three of the four planned rounds of user evaluations, and user interaction was not disturbed by system crashes. As a result, test subjects could concentrate on functionality as well as usability of the system.

The scope of participating subjects to date was good, as all relevant target groups were represented (though with media analysts as a centre of gravity), and several nationalities and mother tongues were present. A mix of early-career, mid-level, and senior test participants took part. Testing of the first SYNC3 prototype benefitted from the feedback of several high-level test participants belonging to the executive/decision-making level, although most of the test participants were entry and mid-level professionals, which enabled feedback to span both system functionality and usability aspects as well as business strategy for the final application.

User feedback was very rich in detail. As anticipated in the methodology, the vast majority of subjects commented on a limited number of similar issues; unique issues or observations were the executive-level strategic remarks that only indirectly referred to the qualities of the actual prototype.

As per the DoW, the first prototype was supposed to "prove the feasibility of the approach and pave the way for the first version,"[xxxiv] by enabling the gathering of user feedback on functionality and usability to help guide the remaining development process. Both these objectives were fully achieved. The SYNC3 concept and intention was met with the approval of the test participants. Particularly well-received was the capacity to enable better understanding of the dynamics between traditional and social media by linking together news articles with

blogs that relate to them. The alternative ways of visualization of generated news and blog results, the Overview and the Map View, were met with great interest, although the Overview particularly produced some confusion as to what it represents. A series of suggestions to increase their user-friendliness has been collected during the evaluations. Although well-received at conceptual level, the areas most often indicated by the test users as requiring further development and improvement in order for SYNC3 to become a usable tool were: the relevance and ranking of the generated results to the user query, the Overview, and the Workspace.

In the coming months, it is paramount that the required further improvements particularly with regard to relevance and ranking of the generated results, the Overview, and the News Story Creator be implemented, and that the scope of the SYNC3 prototype be extended to include sentiment analysis which is one of most user awaited functionalities of the system.

The most important issues and comments collected during the user evaluations of the first prototype have been addressed by the responsible partners. The improvements based on user feedback can be seen in the intermediate prototype. The changes made in the Exploration and Browsing Interface based on the user evaluation are described in Section 2: Addressing user feedback of D6.1.2: "Exploration and Browsing Interface".[xxxv]

8.2. Results of the second prototype user evaluations

The second user evaluation report presents and analyses the results of the intermediate prototype user evaluation. The results were collected during three rounds of evaluation, which took place at the EJC headquarters in Maastricht, the Deutsche Welle headquarters in Bonn and the RIA Novosti headquarters in Moscow.

The following table provides an overview of user evaluation dates and locations related to the intermediate prototype.

Table 11: Overview of dates and locations of second prototype evaluation sessions

Organization/ Location	Profile	Date	Subjects
EJC headquarters, Maastricht, Netherlands	Journalism organization	15 June 2011	4
Deutsche Welle headquarters, Bonn, Germany	International broadcaster	10 June 2011	4
RIA Novosti headquarters, Moscow, Russia	News agency	17 June 2011	7
Total	**Four sessions**		**15**

8.2.1. Evaluation framework

Three of the core SYNC3 user groups were represented in the user evaluations of the intermediate SYNC3 prototype as shown in the chart below:

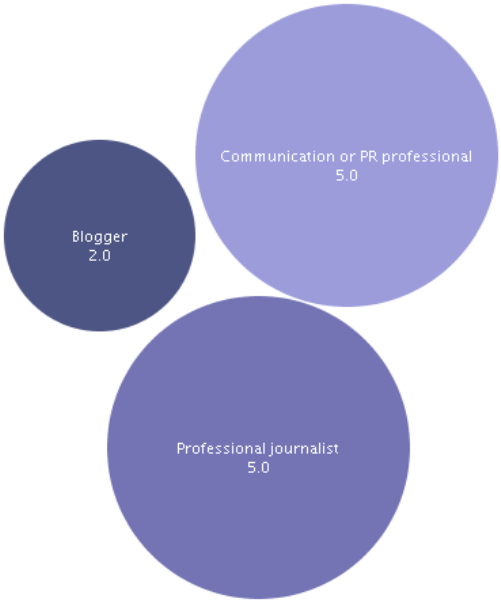
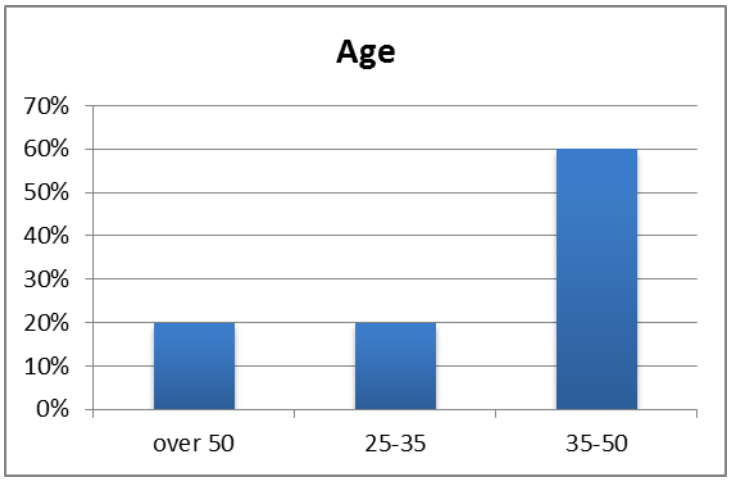


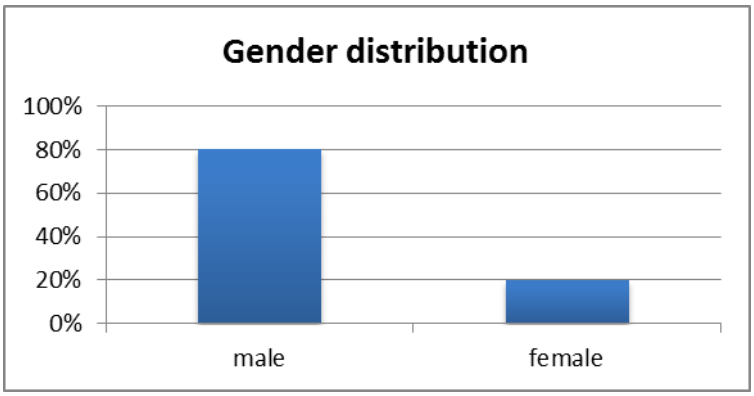
Figure 12: Representation of user groups in user evaluations

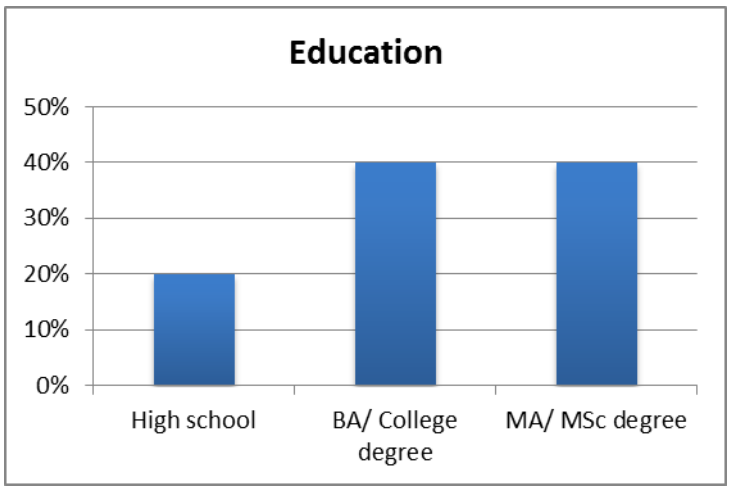
Demographics

1. User group: professional journalists

A total of five test participants identified themselves as professional journalists. Three of them work as news agency journalists in Russia, one as journalist and trainer in a German international broadcast agency, and one in the management of a German international broadcast agency. In terms of language proficiencies, the following languages were represented in this group: English, French, German, and Spanish. In terms of computer languages and technologies, skills varied from Microsoft Office applications and Internet search, to programming languages such as PHP and Python. The following three tables present the distribution of subjects in terms of age, gender, and education.

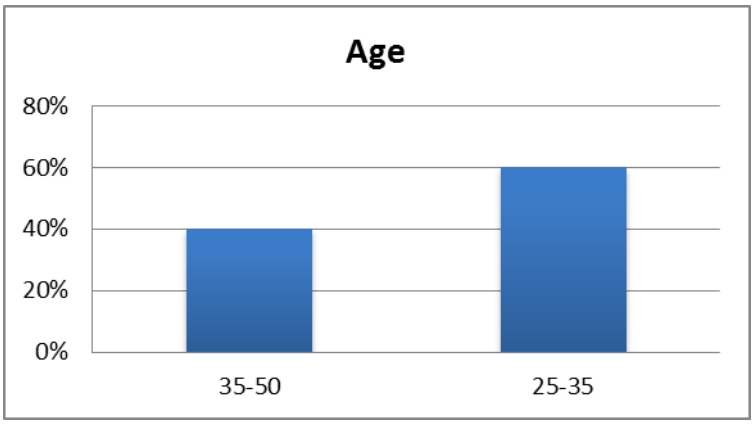


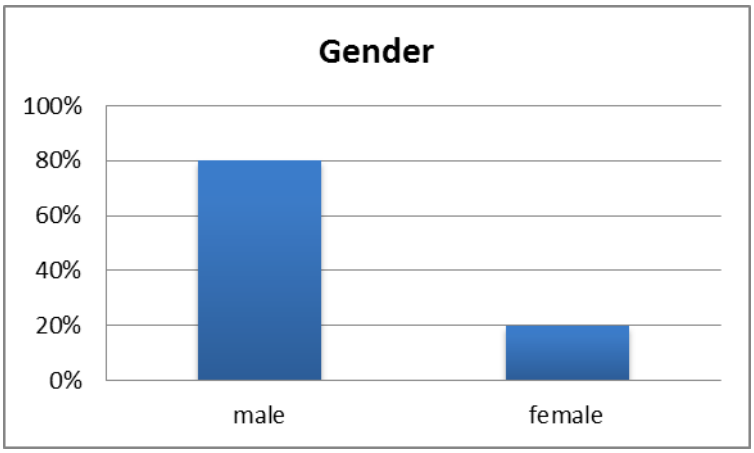


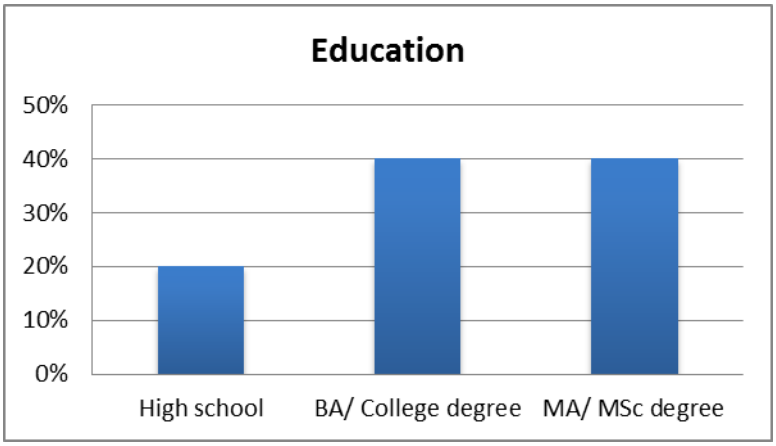


2. User group: Communication or PR professionals

A total of five test participants identified themselves as Communication or PR professionals. Two of them are part of the management of a Russian news agency; one of them is a news agency analyst in Russia, one works as a project coordinator for a journalism organization in the Netherlands, and one as researcher for a German broadcaster. In terms of language proficiencies, the following languages were represented in this group: English, German, and Russian. In terms of computer languages and technologies, skills varied from Microsoft Office applications and Internet search to Twitter, Google Refine, Google Fusion Table, Final Cut, Photoshop, Illustrator, and programming languages such as HTML, XML, JSON, CSS. The tables below show the distribution of subjects in terms of age, gender, and education:







3. User group: Bloggers

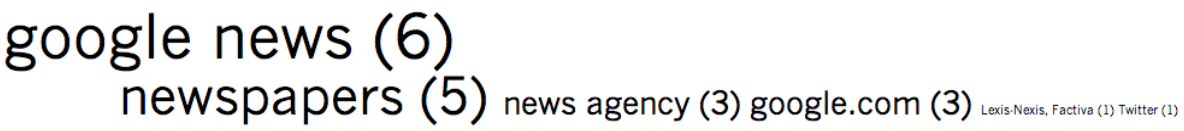
Two participants identified themselves as bloggers, one working as web project manager and the other as editor and online community manager in the Netherlands. In terms of language proficiencies, the following languages were represented in this group: English and Dutch. In terms of computer languages and technologies, skills varied from Microsoft Office applications, to social media tools and Internet search, to programming languages such as HTML, XML, JSON, and CSS. In terms of distribution of subjects, the participants were aged between 18-25 and 25-35, both holding a BA/College degree. Whereas this group is too small to be statistically representative, the observations collected during the evaluation sessions were valuable usability and functionality improvement suggestions.

Almost half of the participants had prior knowledge of SYNC3, as they had taken part in the evaluation of the first prototype. The selection was aimed at having as many of the users that tested the first prototype test the intermediate one as well in order to enable comparative assessment of progress from the first to the intermediate prototype.

The analysis of demographics above is based on the data collected through the questionnaire that was emailed to the test participants at the end of the evaluation session. Three of the test participants did not fill in the questionnaire.

News consumption habits of respondents

The one-to-one evaluation sessions started with *T1: Search for information about the Egypt unrest the way you normally do*. This task was meant to provide some insight into the news searching habits of the respondents. The top sources that they use to search for news are:



Evaluation set-up and structure of evaluation sessions

The evaluation sessions were conducted one subject at a time, with a time limit of one hour per session. Each session started with a brief explanation of the purpose of the evaluation session. Before being introduced to the SYNC3 project, information was collected about the regular news information seeking behaviour of the test participants. The structure of the session ahead and the limitations of the current prototype compared to the end SYNC3 product were further briefly listed, and the participants were invited to ask any questions they may have before starting the actual test.

The following components were made available via the user interface developed by L3S: the Exploration and Browsing Interface with its List view, Map view, Overview and Faceted Browsing, and the notifications settings. Overall, the system functioned without flaws. Rather long system response times were registered during the user evaluations at Deusche Welle due to the weak wireless Internet signal.

The testing of the prototype followed a script detailing the tasks to be performed by the participants, in accordance to the use cases implemented in the intermediate prototype. Each task was accompanied by questions that the test leader asked in order to collect feedback on specific usability and functionality issues.

In testing the Exploration and Browsing Interface, for the sake of consistency, all participants were asked to run the same query, "Egypt unrest". Whenever the participants had particular information interests they were allowed to run any other query of interest, to enable comparative assessment of the information they received on a topic of interest from the SYNC3 prototype to information they received from other news and blog search engines. Moreover, test participants who digressed from the evaluation script and interacted with the system in an uncontrolled manner were encouraged to do so because this sort of non-guided interaction with the system provides information about the interaction of the user with the system in natural uncontrolled conditions and can lead to the discovery of issues that were not foreseen by the evaluation script. The participants were asked to explore the generated results with the List view, Map view and the Overview. Further, they were asked to filter the results by using the advanced faceted search. During the entire task performance process, participants were invited to make observations on search functionality and usability: simple and advanced search facilities, search/retrieval performance, proportion and quality of sources coverage, meaningfulness/relevance and precision of retrieved records, response time, usefulness of the alternative Map view and Overview in understanding the generated results, etc. To facilitate commentary the test leader prepared specific questions for the participants. The questions were formulated as neutrally as possible, so as not to influences user responses: *How would you comment on the relevance of results to your query? How would you comment on the search and browsing capabilities? What do you think about the collapsed view of articles and blog posts? How would you comment on the meaningfulness/clarity of the event titles/labels? (Are they suitable in describing the news events?) How would you comment on the lists of persons, organizations, time and location displayed under the event title in terms of presentation and usefulness? How would you comment on the capacity of the Overview to show you changes in coverage over time?*

Typically this part of the session lasted around 20-30 minutes, also fuelled by the interest of the participants in the search interface and the more general questions about how the system works which this function prompted.

The testing of the system for setting notifications took lesser time (around 5-10 minutes). The test participants were asked to set notifications to get updates about Egypt unrest from American sources that mention Mubarak, and were invited to comment on the usability and functionality of the notifications system.

At the request of the Consortium partners, user feedback on specific issues was collected by asking the following questions: Would you want top or recent events on the search interface, or do you want the page blank? Do you want to see words that you select through faceted search highlighted in the article fragment? Would you be interested in having a more refined timeline where events would be listed on a timeline according to relatedness (sort of in a story)?

Besides the qualitative input provided by the users, behavioural data on the interaction between user and system was also collected, such as user effort in learning and using the interface. The complete series of tasks and accompanying questions is included in Section 6.2 of this report.

Supplementary exercises

The test participants were asked to also fill in on their own a summarizing questionnaire that was emailed in the course of the day. To enable evaluation of progress in user satisfaction in comparison with the results of the user evaluations of the first prototype, the questions included in the second questionnaire were almost identical to the ones included in the questionnaire emailed to the first prototype test participants. A more extensive set of questions was added to the Business and Market Information section. A description of the questionnaire can be found in the beginning of the Section 10.1.2: Questionnaire results. The questionnaire aimed to gather qualitative data about user attitudes towards various components of the SYNC3 system in a format that can be quantitatively processed. The questionnaire contained four sections. Sections one and two aimed to measure user appreciation of system usability and functionality. Section three enquired basic business exploitation opportunities and was adapted to the participants' professional profile as well as the state of the intermediate prototype. Section four enquired a general rating of the prototype. Section five enquired demographic details of the participants (age, gender, education), as well as their job title and a list of programming languages and technologies that he/she feels comfortable working with on a daily basis. The questionnaire is available at: http://www.surveymonkey.com/s/sync3_prototype2. Only 12 out of the 15 test participants filled in and returned the questionnaire. Not all respondents provided answers to all questions.

Restrictions and limitations

Before discussing the results, two caveats must be raised. First, as two thirds of subjects were recruited from the ranks of SYNC3 partners, the system was met by a friendly crowd. User evaluations carried out with completely independent third-party subjects might result in slightly more critical or sceptical reactions. Second, the tested prototype had known functional limitations as follows:

- Sentiment analysis was a mock-up.
- Categorization of news was absent.
- The New Story Creator was absent.
- Causal relations between news events were not identified by the system.

8.2.2. Questionnaire and evaluation session analysis: results and discussion

The different user groups of SYNC3 are envisioned to use the system in different ways. Where considered relevant, the results of the questionnaire and of the evaluation session were analysed per user group in order to show the level of satisfaction with the system of each user group and in order to better understand the needs of each type of user. Given that the bloggers user group had only two participants, the results of the questionnaire will not be analysed at group level for

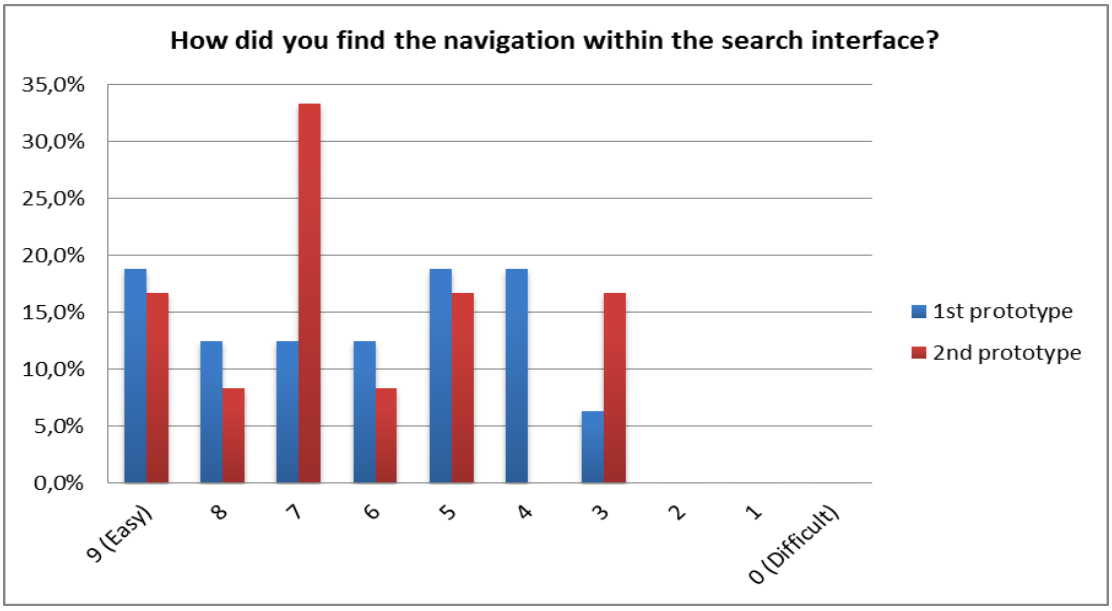
this group. In terms of level of confidence in the provided responses, over 90% of respondents were very confident or confident in the feedback they provided.

The results of each question included in the questionnaire are presented and discussed. The questionnaire results are complemented with the more extensive observations collected during the one-to-one evaluation sessions.

Below are the results of the multiple choice questions for usability and functionality information of the intermediate prototype.

Exploration and Browsing Interface – usability and functionality information

Navigation within the search interface



About 75% of the first prototype questionnaire respondents rated the navigation within the search interface with positive values on the responses scale (9 to 5, with 9 corresponding to easy). Most of the indicated usability issues of the search interface concerned the advanced faceted browsing function. Based on user feedback, improvements were brought to the usability of the search interface (see Section 5, "Faceted Browsing" of D6.1.2: Exploration and Browsing Interface). The percentage of positive ratings increased to 80% for the navigation within the search interface of the intermediate prototype.

Collapsed view of news articles and blog posts

During the evaluation session the test participants were asked to specifically comment on the collapsed view of articles and blog posts. Users appreciated the collapsed view because it is an organized way of presenting information and it avoids an overload of information on the first page. Users appreciated that they were not brought to a new window or tab when clicking on the event labels. It was however not clear enough for all users that they had to click on label to compress the results again. They suggested a few ways to indicate what actions are needed to expand and to compress the list of blog posts and news articles associated with an event. One way would be to have hover behaviour for titles, i.e. have the click turn into hand and have the colour of the title change when the user hovers over it.

Extracted metadata

During the evaluation session the test participants were asked to comment on the lists of persons, organizations, time, and location displayed under the event title in terms of presentation and usefulness.

Users viewed it useful to extract entities. In terms of usability they preferred that small capitals be used for metadata and that they should be colour coded as in Open Calais (blue is location, orange is company, etc.) to avoid a dull interface. It was thought that the sentiment analysis bar gets all the attention and that it should be displayed in the expanded view when blogs are loaded. One user considered it useful to click on the entities and add them to the search.

Homepage design

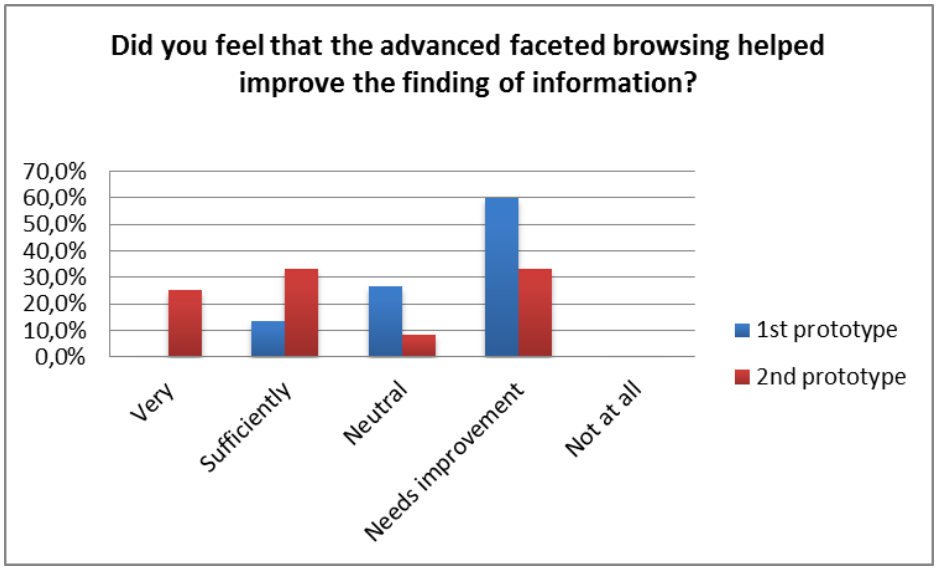
When asked if they want top or recent events in the search interface or if they want the page blank, users unanimously preferred the search interface to not be blank as SYNC3 is more than a search engine, so it should provide more than blank search page. Users considered that it should have a sort of editing function by providing mash-ups for example, to encourage users to return. There were several suggestions as to what can be placed on the home page:

- Tag cloud with the events of the last 48 hours
- Personalized information according to user history
- Information about the application (what it does, screen cast to show what can be done on the page) + recent searches and recommended searches

Other issues identified in relation to the search interface were:

- Searched words must be highlighted in blogs as well
- The number of articles and blog posts should be the real one even if only a maximum of ten are being displayed
- Sentiment bar should be changed to circles of same size but the percentage can be displayed in colours
- The complete blog title must be displayed.
- It was not clear for the user how to get back to initial blank screen
- There should be an option to share sentiment analysis, save this search and share timeline
- The system should work with user friendly URLs that allow the user to navigate the site by adding words to the URL
- The interface mimics frames. There should be full page scroll (frozen frames were considered old-fashioned in terms of design)

Advanced faceted browsing



The percentage of repondents who considered that the advanced faceted browsing very much or sufficiently helped improve the finding of information increased from 13% in the user evaluations of the first prototype to almost 60% in the user evaluations of the intermediate prototype. Users liked this function and appreciated that they could search by source and date. They also appreciated improvements made in usability such as the fact that the filters can be deleted by pressing the "x" icon. More detailed feedback on this feature was collected during the actual testing session. The collected feedback consisted of usability issues, functionality requests, and reported errors.

Usability issues

- Possibility to search through the entities listed in the advanced facets and to sort results while the user types in search terms (i.e. if the user types in the first letter of the searched word the facets should be filtered by that letter)
- It was not clear how to return to the full list of results after filtering by date
- Function "Order by date" should not be linked to search by date because it is not a matter of filtering but a matter of ranking; it should be made more prominent by placing it right under the search box
- Possibility to size faceted search
- Selected filters should be grouped by category
- When facets are very long and cannot be entirely displayed, by hovering over you can see the whole word but you still cannot see the number of results
- There are too many entities listed in categories in faceted browsing. A top "x" number of entities should be listed and the rest should be placed under a "more" button.
- The name "faceted browsing" does not make the function clear for the user. It should be changed to "filters" or "narrow your choices"
- Keywords from facets should be highlighted in the text, preferably not with colour but in bold letters to ease copying
- Selected facets should be highlighted in the faceted browsing navigation (in different colour maybe)

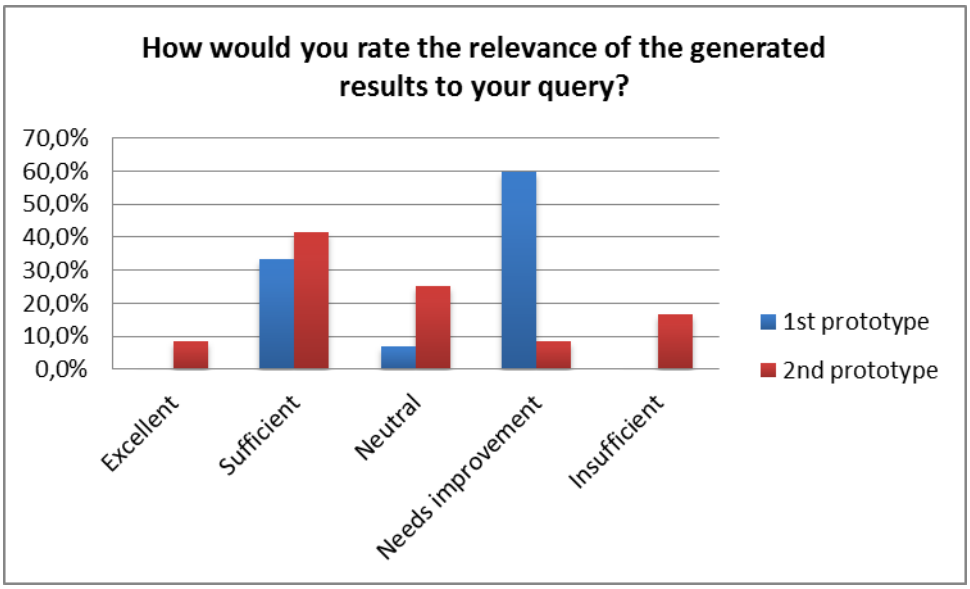
Functionality requests

- When filtering by source "BBC" the user expected to have displayed in the list of results only results from BBC sources
- Possibility to search by type of source: news or blogs
- Possibility to save filters for future queries
- When selecting certain facets, users expected that the entities that they select would be central to the top listed events
- There should be an opportunity to perform "OR" commands with the facets

Errors

- Entity recognition is not accurate, especially in the case of organizations. For the query "Google art" in faceted browsing, "Ministry of Science" is mentioned as location. "Al Jazeera" is mentioned as "person".
- If you click a facet multiple times it is being listed under the search bar as many times as you click on it – the system should recognize this erroneous behaviour and should list the entity just once no matter how many times the user clicks on it. Another option is for the facet to get deselected on the second click.

Relevance of results to query



60% of respondents that took part in the evaluation of the first prototype rated the relevance of the generated results to queries as needing improvement. Following the improvement of the ranking algorithm based on user feedback, the relevance of results to queries for the second prototype was rated as excellent or sufficient by 50% of respondents.

More detailed feedback on the relevance of results to queries was collected during the one-to-one evaluation sessions. The comments made concerned mainly errors, personal assessment of relevance, and functionality requests.

About half of the test participants indicated that not all generated results were relevant to their query in the first cycle of user evaluations. The user comments on the relevance of results to query for the second prototype were much more positive. Comments ranged from remarks such as "the relevance is good" to remarks on the improvement of relevance from users who participated in the first round of user evaluations as well: "The relevance is much better now. You can quickly see that even from the list of events while before you couldn't". A user with a communication and PR background appreciated the fact that results refer to a variety of subtopics related to the search, which makes it interesting whereas if you would type the same query in Google Search you would not get the same variety of results. On the other hand, the same user remarked, if one is looking for more general information about an event, one would not be able to get that overview from SYNC3 results.

More specific assessments of relevance were performed by a user with a journalistic profile. The judgements were based on the demonstration query, "Google art" and the query that the participants were asked to run, "Egypt unrest". For the query "Egypt unrest", one participant assessed that 90% of the results were relevant (except of the event titled "David Cameron outlines his vision for public services"), and that for the query "Google art" only the top of the four results was relevant to the query.

The test participants assessed the relevance of results in terms of relevance of news events to the query and relevance of articles to the event. For the event "Security is a movable feast," some users would have expected all articles to refer to Egypt and Tunisia whereas only 80% of them referred to Egypt and Tunisia.

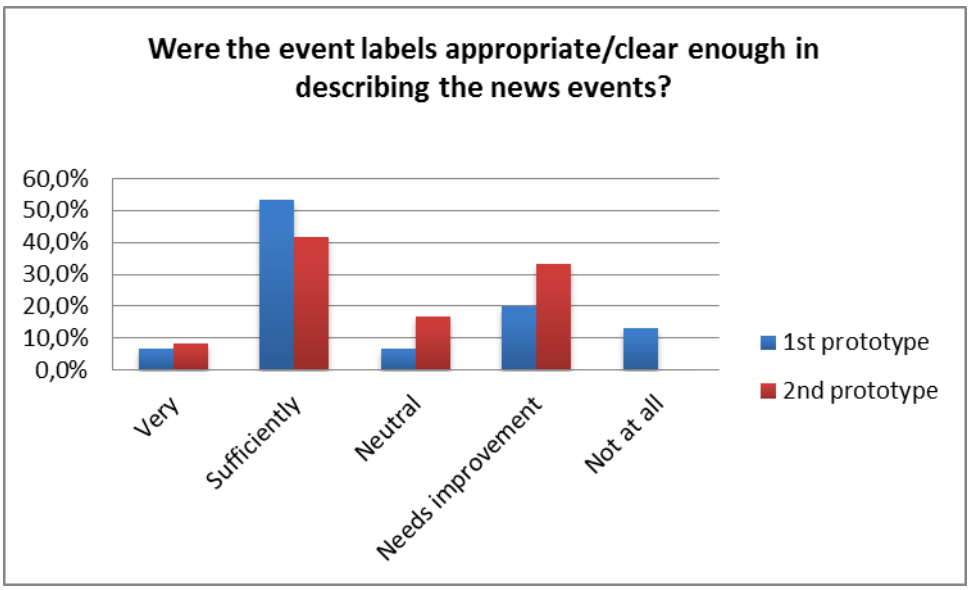
Functionality requests

- An option to sort the events in the list by the number of articles or sentiment

- An option to have the searched word(s) deleted with one click (the sort of functionality that Google.com offers by having an "X" icon in the search box). The listed results must be automatically deleted when the searched words are deleted.
- Popularity data (blog comments, tweets, likes, etc.) must be taken into account in the ranking of events.
- News clustering: follow-ups on an initial event must be shown in the same cluster as the initial event and instead of an event date the time span of the event must be displayed.

Errors

- Sometimes news articles are displayed in the list of blog posts. [*Test leader's note: this may be due to the fact that some of the blogs in the list of crawled blog URLs are sections of larger websites and when feeds are being automatically fetched for them, the specific section might not have a feed but the more general website might.*]
- When one searches for symbols such as "!#@#%$#@%^@$^@" the system does not respond. The system should indicate that no matching documents were found.

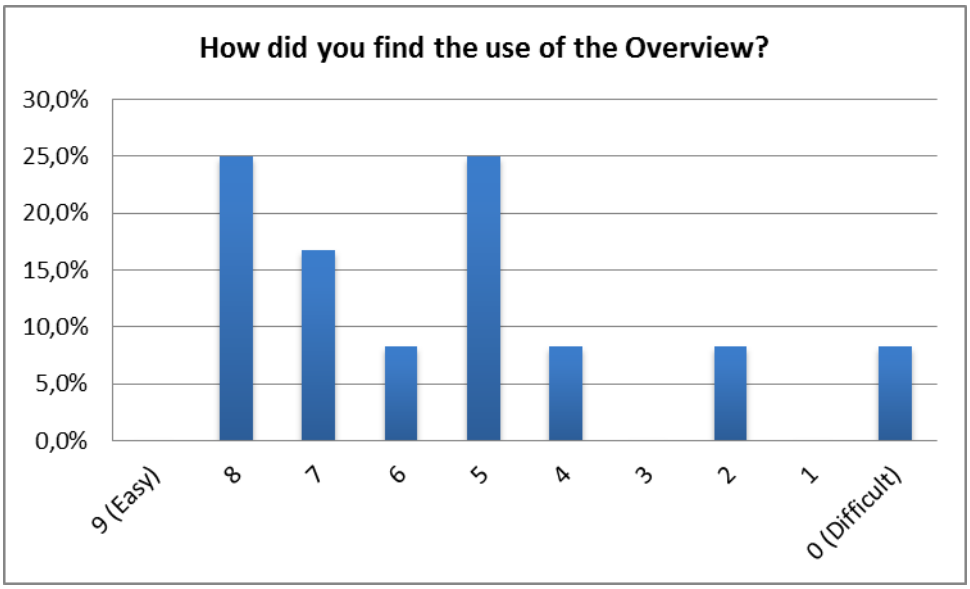


Clarity of event labels received the highest positive rating in the testing of the first prototype (60%). This percentage dropped to 50% in the testing of the intermediate prototype. Given the visible improvement of several functions in the second prototype, such as relevance of results to the query, this result might be interpreted as an increase in the expectations of the users, which made them more critical. The feedback received during the actual evaluation sessions gives more background understanding into this result. The assessment of label quality as generally needing improvement does not seem to be a general one, but seems to result from a few cases that were identified in which labels did not appropriately describe the events. These cases were:

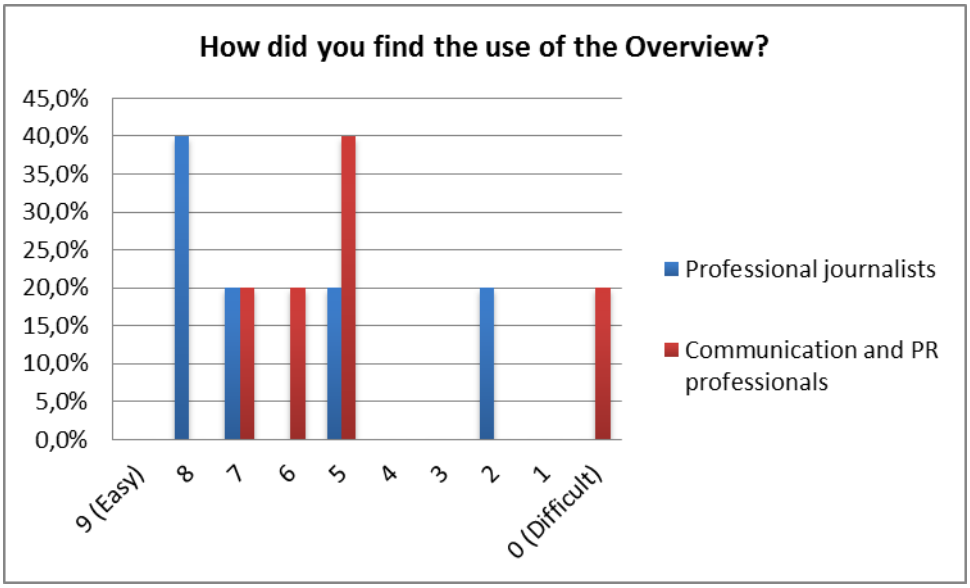
- query "Egypt unrest", event "security is a movable feast" – the result is about Egypt but the title is not the most relevant description of the event.
- query "arab wave" – the relevance to the query cannot always be seen from the titles

The users appreciate it when the labels contain the searched keywords, as well we the brevity of the labels. The description of the event was also considered useful.

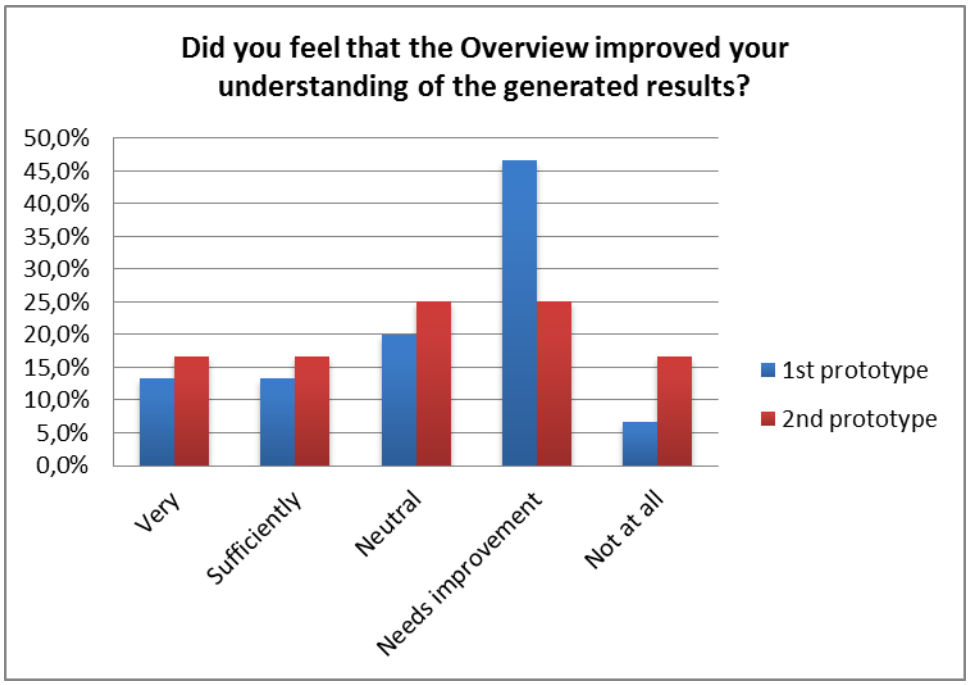
Overview



The aim of the Overview is to enable the user to explore the evolution of the number of related articles, blog posts, or mentioned entities) for a specific query over time. This concept was met with great interest but its realization in the first prototype was considered too complex and difficult to grasp by the test participants. The entirely new version integrated in the second prototype was better received by the test participants and the intermediate prototype and was found easy to use by 75% of the questionnaire respondents.



80% of both professional journalists and communication and PR professionals rated the use of the overview with values belonging to the positive side of the scale (9 to 5 with 9=easy).



Over 45% of test participants rated the Overview in the first prototype as needing improvement. The entirely reworked version of the Overview integrated in the intermediate prototype was better received by the test participants. Only 25% of respondents in the second evaluation cycle considered that the Overview needs improvement.

The observations made during the one-to-one evaluation sessions gave more insight into the results of the questionnaire. The comments usually concerned bugs or errors, functionality requests and issues regarding the usability of the interface.

The new Overview was well received. Its improvement compared to the version integrated in the first prototype was acknowledged by users. One of the test participants who took part in the evaluation of the first prototype remarked: "It's much better compared to the first version." Communication and PR professionals found it a useful feature as "it shows right away what was most written about". One of the bloggers indicated that the Overview would save time and research if you are looking for a specific date or date range.

Functionality requests

Two of the five communication professionals or media analysts indicated that it was not clear how to interpret the results. Asked to elaborate on this observation, one of them replied: "Neither of us could understand the relationship between the main list of events and the Overview. I think it would be more useful to use the Overview as tool for time-distribution of news events, containing news items. Like, each event would be displayed as a graph with horizontal time axis and vertical axis of number of news items for that news event on a given date". The user thus was interested to explore the evolution of the coverage of a news event over time.

Only two of the eight test participants with a journalistic profile indicated that this feature would not help journalists in their daily work. They explained that journalists need to search for stories in real-time. This observation indicates that in order to maximize its utility for journalists, SYNC3 would need to provide aggregate information in real-time. The journalists did acknowledge however that the feature would be useful for analysts and infographics experts. To enhance the value provided by using a system like SYNC3, another journalist indicated that the information delivered by the timeline, showing what happened in the past, could be analysed and used to predict future similar events.

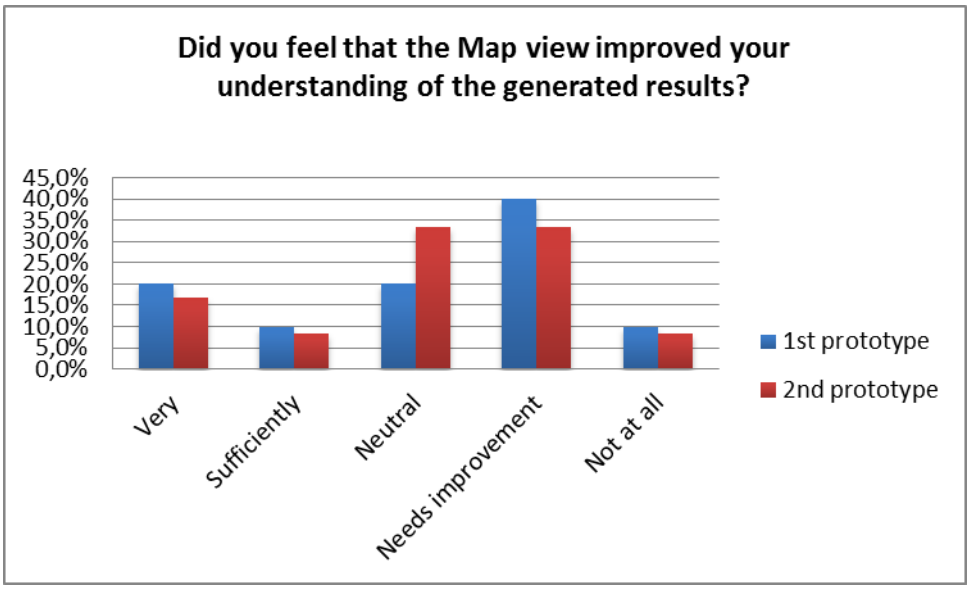
Errors

Through the Overview, a news analysis error became evident: for the query "Egypt unrest" the result: "Kyodo photo advisory…" is spam. The result is generated from the source Kyodo but this agency does not offer content for free.

Usability issues

Whereas test participants belonging to different groups had slightly different views on the concept and had different functionality requests corresponding to their professional needs, they all indicated the same set of issues to be improved in terms of usability. Below is a list of suggestions made to improve the usability (and functionality) of the Overview:

- The title "Overview" does not indicate the timeline type of chart. The title should indicate that the user is presented with a timeline.
- There has to be a clearer way to show that the slider can be used to zoom in and out (maybe through a blurb like: "drag to change timeline"). A test participant remarked: "If you do not hover over it you cannot see that you can move it."
- Use colours to make the interface more appealing and provide a short blurb explaining what it shows and what can be done with it.
- Timeline must be full screen.
- It is not clear what the axes represent with just the numbers displayed. Titles must be displayed for the axes.
- The selected event should be highlighted in a colour that draws more attention than grey.
- Filter search must be made smarter. It should also display derived words in results. Error: when filter by word + space the results do not always show up (example: filter by "Yemen")
- It is not clear what "1d", "2m" represent.



The usefulness of the Map view in improving the understanding of the generated results received more negative than positive ratings in both the version integrated in the first prototype and the version integrated in the intermediate prototype. More details were collected during the actual user evaluation session.

The task associated with this function was *T3: Identify which region of the world is most commonly associated with Egypt unrest/the geographical distribution of this event (suggest the Map view if the user can't figure it out)*. Several test participants used the locations filter in advanced faceted browsing to complete this task. Two of the users considered that the map is pretty common, and that it does not bring valuable information. The locations facet was considered much more useful than the Map view.

Functionality requests

One user also suggested that a real-time map would be more innovative. Such a map could be used by local journalists to discover sources of stories. The journalist suggested to look at Trends Map or Wolfram as examples. Another suggestion to make the map provide valuable information that would not be as easy to grasp in a different format, was to make the Map view more flexible in allowing the user to choose which geography to have mapped: the one of the news sources or news events.

Whereas the Map view appears not to provide new information or improve the understanding of an event, other user comments suggest that the usefulness of the map could result from its mode of presenting information and the possibilities to embed it in other websites. The map could be used to present and showcase locations by doing a screenshot or embedding it in an article. The users interested in embedding the map were also interested in having the possibility to do annotations on that location.

Error

- When selecting one facet when on Map view you are brought back to the list of results

Usability issues

- Instead of multiple pins for a location you could have the number of occurrences on a pin and the colour could correspond to the largest percentage of sentiment
- On the map you could show on click all extracted metadata + the full fragment describing the event as the user does not want to leave the page
- Some users were not sure what the pins showed: when the articles are published or what they are about, and suggested that this information should be provided on the page.

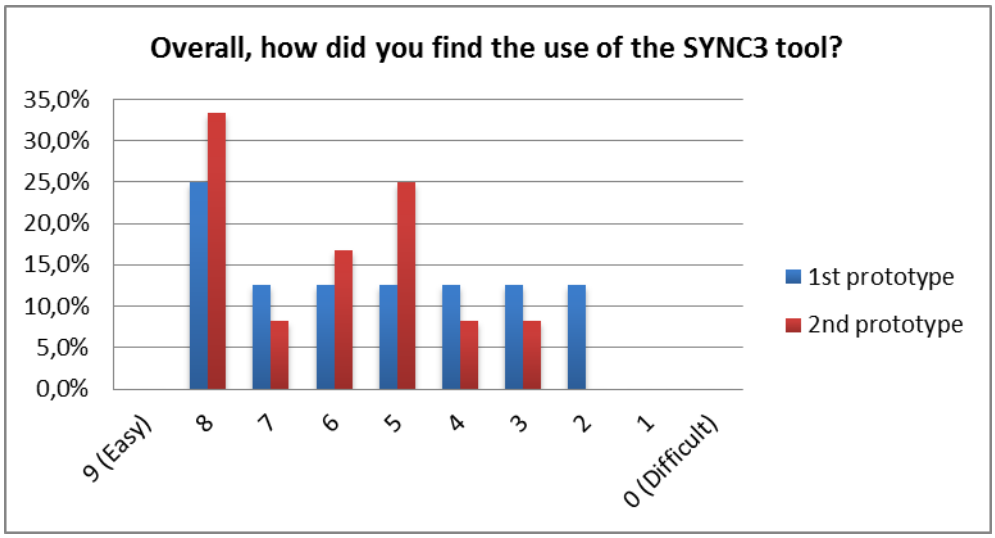
Notifications system

Five of the twelve test participants considered that they would not use the notifications function in this current stage. Some indicated that integrating it with an RSS feed instead of receiving notifications by email would be more useful.

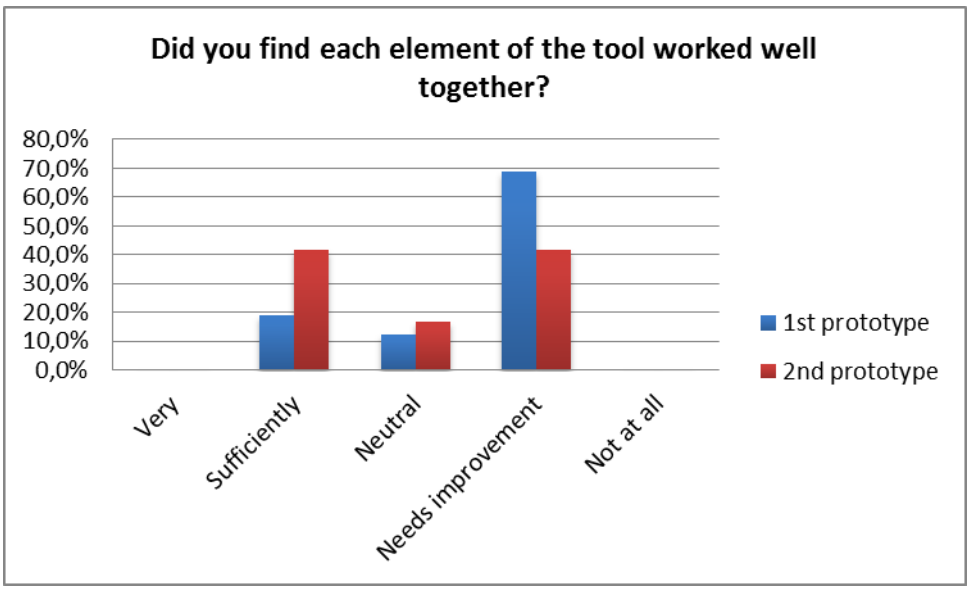
Usability issues

- When you click on the document under the folder icon the “add rules” button should show
- It would be useful if the system would suggest sources like DW, if it knows DW has written about the specific topic
- User friendliness of the Settings needs improvement. The feature needs to be made clearer. The name of the category needs to be made clearer also.
- There should be an option to get content only per type of media (news or blogs)

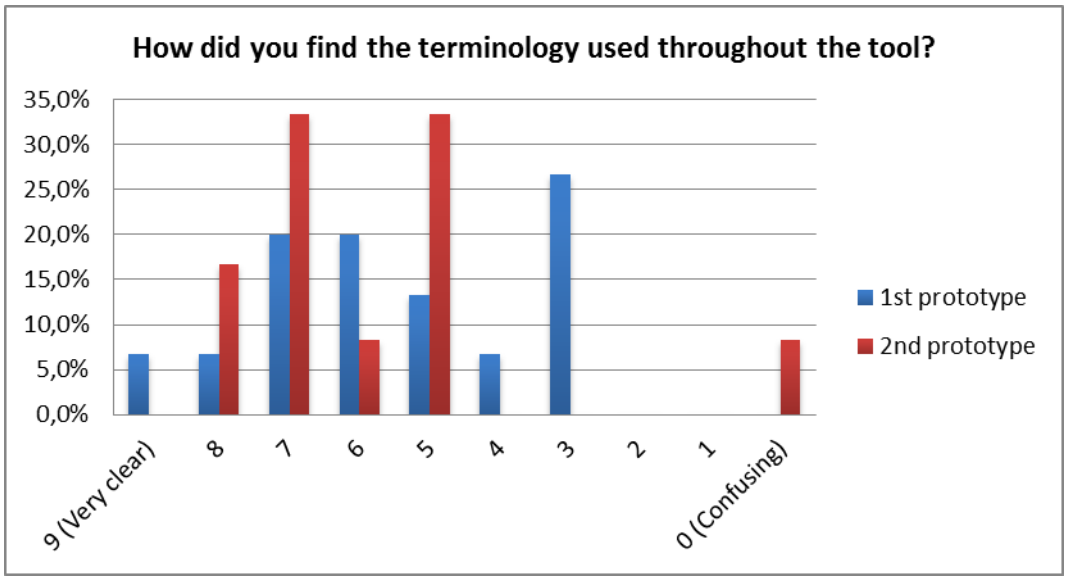
General issues



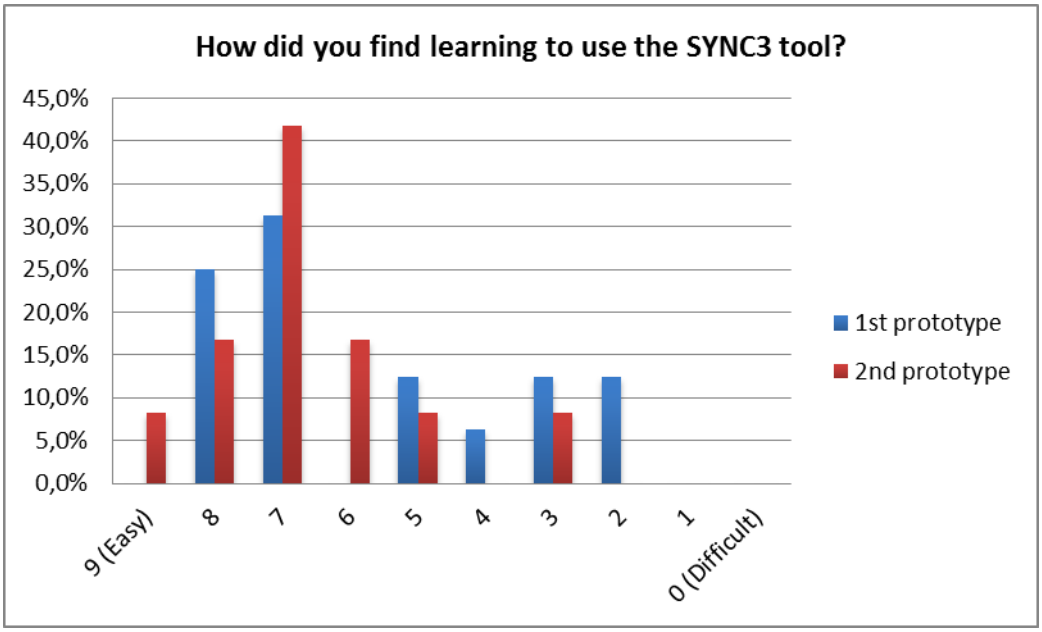
Whereas over 60% of the respondents that participated in the testing of the first prototype rated positively the overall use of the SYNC3 tool, the positive rating increased to over 80% for the intermediate prototype.



The users registered improvements as far as the integration of all features of the tool is concerned as well. Whereas almost 70% indicated that integration of the first prototype needs improvement, only about 40% of respondents that tested the intermediate prototype indicated that integration needs improvement and over 40% of them that each element of the tool works sufficiently well together. It is to be noted that "sufficiently" is the option right after the highest positive value, "very". It is to be noted also that one of the limitations of the comparison with the results of the evaluation of the first prototype is that the comparison is done on populations of different sizes and with different profiles and characteristics.

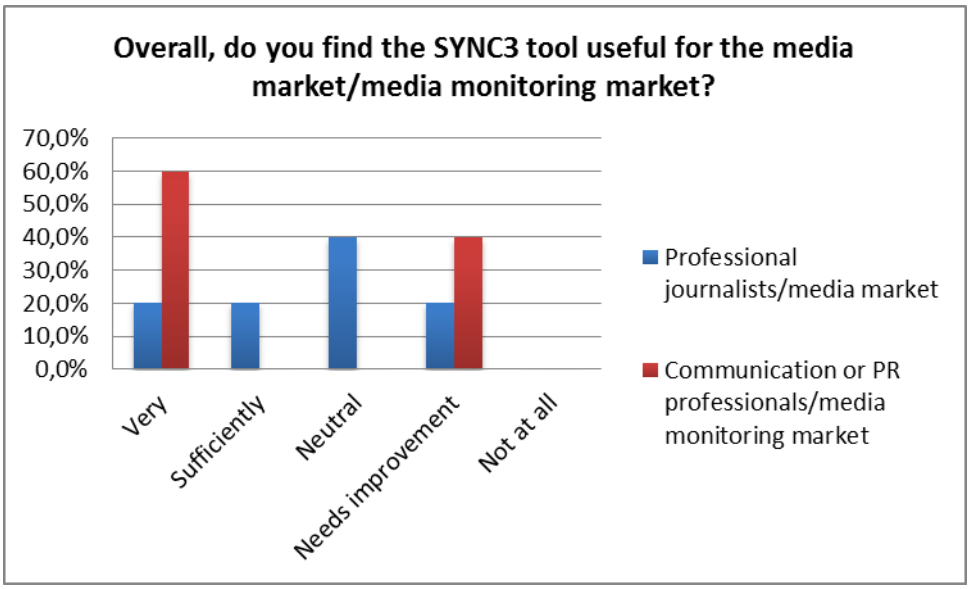


The rating of the user evaluation of this aspect of the SYNC3 system has improved as well, from over 65% of test participants rating the terminology used in the first prototype positively to over 90% of the test participants for the second prototype. Given that no major changes in terminology have been made, this increase could indicate the acceptance of the system terminology by the users or the familiarity with the terminology of the users who participated in the evaluation of the first prototype as well.



Over 90% of the repondents who tested the intermediate SYNC3 prototype rated learning to use the SYNC3 tool with positive values, compared to only about 70% in the case of the first prototype.

Business and market information



Communication/PR Professionals

This question was open-ended in the evaluation of the first prototype. While acknowledging the limited functionality of the current prototype, the four respondents with a communication/PR professional or media analyst profile positively appreciated the capacity of the SYNC3 to become a useful tool for the media monitoring market.

60% of participants in the evaluation of the second prototype responded that they find the SYNC3 tool very useful for the media monitoring market and that they would use it for media monitoring. 80% of them would suggest it for their own company and 60% of them for another company.

Journalists

40% of respondents with a journalism background considered that the SYNC3 tool would be useful for the media market, 80% will surely or maybe use it to get an overview of how an event was covered in traditional media and how it was received in the blogosphere. 60% of them would suggest it for their own company. SYNC3 thus appears to be considered more useful for the media monitoring market than for journalists at this stage of development.

Bloggers

The two bloggers that filled in the questionnaire considered that the SYNC3 tool would be very or sufficiently useful for the blogging community and that they would use it to get an overview of how an event was covered in traditional media and how it was received in the blogosphere. Both responded that they would suggest it to another blogger.

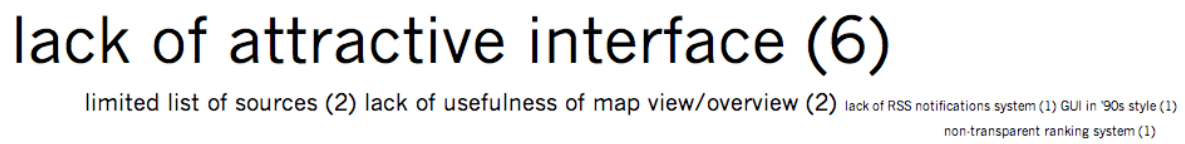
How would you compare SYNC3 with existing competitors?

Six answers were registered to this question. The participants listed the following competitors: Factiva, Lexis-Nexis, Nikkei, Google News and Yandex News, Newsexplorer, Google Insights, Google trends, Wolfram Alpha, Google Squared, and Silobreaker. Google News was considered to have better coverage in comparison with SYNC3, but it does not offer the ability to narrow your original search without doing a new one, which was considered to be an advantage of SYNC3. A journalist suggested that SYNC3 might be a great support system for aggregation tools like Storify or Bundlr. New trends or topics would be found in SYNC3, then imported into other platforms such as Storify, Wordpress or content management systems of media companies.

SYNC3 strengths

Overall, in terms of usability and functionality together, respondents considered that the following aspects will give SYNC3 an advantage:

SYNC3 weaknesses



The following areas were suggested for improvement: GUI, RSS for notifications instead of email. One user suggested thinking about opening the system by means of an API: "SYNC3 is a good system that enables identifying trends and it would be useful to think how to build a system for the future, a system that can adapt to changes".

8.2.3. Table of issues raised by users

In addition to the descriptive summary above, this table provides an overview of the issues raised by users during evaluations and of the wishes expressed. The list will be discussed by the Consortium and serve to prioritize actions to be taken during further development. In bold are the top ten issues proposed to be addressed by the Consortium from a user's perspective. It should be noted that the table does not include favourable aspects expressed by users or observed by the test leaders, as these are no cause for further action. Therefore, the following list must not be taken as an overall assessment of the quality of the first SYNC3 prototype.

Table 12: Issues raised by the users in the second user evaluation cycle

No.	Area	Issue
1	U	Indicate how to expand or compress the list of blog posts and news articles associated with an event by hover behaviour for titles, i.e. have the click turn into hand and have the colour of the title change when the user hovers over it
2	U	Use small capitals for extracted metadata and colour code it as in Open Calais
3	U	Display sentiment bar in the expanded view
4	U	Possibility to click on metadata and add it to the search box
5	U/F	Populate homepage with: ▪ tag cloud with the events of the last 48 hours; ▪ personalized information according to the user history ▪ information about the application (screen cast about what can be done on the page) + recent searches and recommended searches
6	U	Display the complete blog post title
7	U	Display the real number of articles and blog posts even if only a maximum of

No.	Area	Issue
		ten are being displayed
8	U	Option to share sentiment analysis, save this search and share timeline
9	U	Have user friendly URLs that allow to navigate the site by adding words to the URL
10	U	Remove frozen frames to enable the full page to scroll
11	U	Possibility to search through the entities listed in the advanced faceted browsing and to sort results while the user types in search terms (i.e. if the user types in the first letter of the searched word the facets should be sorted by that letter)
12	U	Provide way to return to the full list of results after filtering by date
13	U	Function "Order by date" should be placed under the search box
14	U	Provide possibility to size faceted search
15	U	Group selected filters by category
16	U	A top "x" number of entities should be listed in categories in faceted browsing and the rest should be placed under a "more" button.
17	U	Change name "faceted browsing" to "filters" or "narrow your choices"
18	U	Highlighted selected facets in the faceted browsing navigation
19	U	Possibility to search through the entities listed in the advanced facets and to sort results while the user types in search terms (i.e. if the user types in the first letter of the searched word the facets should be sorted by that letter)
20	F	Improve accuracy of entity recognition
21	U	If you click a facet multiple times it is being listed under search bar as many times as you click on it – the system should recognize this erroneous behaviour and should list the entity just once no matter how many times the user clicks on it. Another option is for the facet to get deselected on the second click
22	U	When filter by source is active display only results from the selected source
23	U	Possibility to search by type of source: news or blogs
24	U	Possibility to save filters for future queries
25	U	There should be an opportunity to perform "OR" commands with the facets
26	U	Introduce option to sort the listed events by number of articles or sentiment
27	U	Possibility to have the searched word(s) deleted with one click (by having an "X" icon in the search box)
28	U	The listed results must be automatically deleted when the searched words are deleted
29	F	Take into account popularity data (blog comments, tweets, likes, etc.) in ranking of events
30	F	News clustering: follow-ups on an initial event must be shown in the same cluster as the initial event and instead of an event date the time span of the event must be displayed

No.	Area	Issue
31	F	When one searches for symbols such as "!#@#%$#@%^@$^@" the system does not respond. The system should indicate that no matching documents were found
32	F	Provide aggregate information in real-time
33	F	Improve blogs recognition to avoid news articles being displayed in the list of blog posts
34	U	The title "Overview" should indicate that the user is presented with a timeline
35	U	Have a more clear way to show that the slider can be used to zoom in and out (maybe through a blurb like: "drag to change timeline")
36	U	Use colours to make the Overview interface more appealing and provide a short blurb explaining what it shows and what can be done with it
37	U	Make the timeline full screen
38	U	Display axes titles for Overview
39	U	Highlighted the selected event in a colour that draws more attention than grey in Overview
40	F	Make filter search smarter to also display derived words in results
41	F	Real-time map
42	U/F	Possibility for the user to choose which geography to have mapped: the one of the news sources or news events
43	bug	When selecting one facet when on Map view you are brought back to the list of results
44	U	Instead of multiple pins for a location have the number of occurrences on a pin and the colour could correspond to the largest percentage of sentiment
45	U	On the map show on click all extracted metadata + the full fragment describing the event
47	F	RSS feed instead of receiving notifications by email
48	U	Have the "add rules" button show up when you click on the document under the folder icon

8.2.4. Conclusions from intermediate prototype user evaluations

To date, the objectives of the user evaluation of the SYNC3 intermediate prototype were successfully achieved. No technical issues showed up in the three rounds of user evaluations and user interaction was not disturbed by system crashes. As a result, test subjects could concentrate on assessing the functionality as well as usability of the system.

The scope of participating subjects to date was good, as all core target groups were represented, namely journalists, media analysts, and bloggers. Several nationalities and mother tongues were present. A mix of early-career, mid-level, and senior test participants took part. The testing of the SYNC3 prototype benefitted from the feedback of several high-level test participants belonging to the executive/decision-making level in international broadcasters and news agencies, although most of the test participants were entry and mid-level professionals, which enabled feedback to span both system functionality and usability aspects.

User feedback was very rich in detail. A number of 48 issues concerning primarily the usability of the prototype were registered. As anticipated in the methodology, the vast majority of subjects commented on a limited number of similar issues; unique issues or observations were the executive-level strategic remarks that only indirectly referred to the qualities of the actual prototype.

As per the DoW, the intermediate prototype was planned to have "All the main functionalities […] implemented. The performance of the overall system will be evaluated and changes towards the final prototype will be decided. Specific issues with each functionality will be tracked and scheduled for correction in the final prototype."[xxxvi]

The majority of the comments collected concern usability issues. No major functionality requests were registered, which could be interpreted as the users being content with what the system offers at this point in its development. The functionality requests registered concern real-time aggregation of information, a real-time map, prediction of future events, and integration of ranking algorithm with popularity data. The requested functionalities have not been foreseen in the DoW.

A series of functionalities, namely relevance and ranking of the generated results to the user query, the Overview, and the Workspace, were indicated by the test users as needing improvement in the testing of the first prototype. These areas have been reworked and entirely new versions of the ranking algorithm and of the Overview have been provided (the Workspace is under development and will be made available in the final prototype). The changes have been well received by the users that tested the intermediate prototype. Whereas 60% of respondents that took part in the evaluation of the first prototype rated the relevance of the generated results to queries as needing improvement, the relevance of results to queries for the second prototype was rated as excellent or sufficient by 50% of respondents. As a concept the Overview was met with great interest but its realization in the first prototype was considered too complex and difficult to grasp by the test participants. The entirely new version integrated in the second prototype was better received. 75% of the questionnaire respondents found it easy to use.

The areas most often appreciated by the users were the grouping of news articles and blog posts around news events and the advanced faceted browsing. The areas that were most often indicated as needing improvement were the Map view in terms of functionality and the user interface in terms of attractiveness and usability. In the coming months work needs to be done to address these comments and increase the usability of the system.

Subsequent to the recommendation received in the second review meeting, namely that technical and user evaluations should be a main focus during the final year of the project, the Consortium is exploring further options to expand the user evaluation effort and at the same time focus it on validating a few very good components of the SYNC3 system, while putting less effort into the not yet entirely developed aspects.

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[ix] Krug, Steve: *Don't make me think*, 2nd Edition, p. 12.

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[xxviii] Ibidem.

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[xxxi] Ibid. p. 16

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[xxxv] Siehndel, Patrick, Dimitris Skoutas and Eelco Herder (L3S). Section 2: Addressing user feedback. D6.1.2: Exploration and Browsing Interface. pp. 8-11

[xxxvi] DoW p. 23