# Annual Report

## 2021 – 2022

ODISSEI

# 1 Message from the Director

Last year we set out to engage a broader community with ODISSEI endeavours and this has proved to be hugely successful. There was the launch of the ODISSEI Summer School and Benchmarking Challenge which allowed us to provide intensive training to 19 early career researchers. The summer school not only gave participants hands-on experience and accredited training, but also allowed us to see up close, the integrated infrastructure in action. Working closely with the researchers who use the infrastructure helps us quickly and clearly identify the next round of innovations and developments that are required for research. It's a virtuous and highly rewarding circle.

In the autumn however, our community truly bloomed into life with the first conference which included an open call for submissions. 400 people registered for the conference and it was particularly exciting to see so many graduate students and early career researchers presenting interesting new projects they were conducting using the infrastructure. The conference was a huge success not just because it showed what researchers were doing with the infrastructure but also what they aspired to do. This is a crucial question for ODISSEI and the team that is busy building and maintaining the infrastructure. All of us need to continue to develop new tools and services that enable researchers to answer questions previously out of reach. It's difficult to host a conference that presents both results and ideas side by side, but our Community Managers did a fantastic job in this respect. Several attendees told me the autumn conference was the best they had been to in years!

From both the summer school and the conference we took away many ideas on how we can further improve the infrastructure but demand was noticeably high for two innovations in particular, the ODISSEI Portal and the Secure ANalysis Environment (SANE). The Portal was launched in the autumn, with new iterations to be released periodically throughout next year. This is crucial for FAIR implementation, particularly of administrative data which is crucial for developing a collaborative and innovative research community. For example, from January researchers using Statistics Netherlands data will be able to properly cite data files, making their work more transparent and reproducible.

Demand is also very high for our Secure ANalysis Environment and this will move towards production over the next 12 months. This innovation should bring whole new ranges of data within the scope of researchers, allowing them to address complex and multi-layered issues and explore new linkages. Leveraging such technical innovations for high quality, FAIR, and open science is exactly what ODISSEI aims to be delivering over the next year.

Pearl Dykstra
Scientific director, ODISSEI

# 2 The Structure of ODISSEI

The ODISSEI acronym stands for Open Data Infrastructure for Social Science and Economic Innovations. At present, ODISSEI is made up of 44 member organisations that financially contribute to its development. These member organisations include Social Science Faculties, Economics Faculties, Research Institutes, Public Research Agencies, Statistics Netherlands, and E-Infrastructure providers. The 44 organisations in ODISSEI represent more than 5,000 social science researchers and ODISSEI aims to support their research by providing world class data infrastructure services that increase their access to data, computing tools, expertise, and financial resources.


The Supervisory Board is elected by the member organisations to represent their interests and oversee the development of ODISSEI. In turn the Supervisory Board appoints the Management Board of ODISSEI with overseeing ODISSEI's programme of work. This programme of work was set out in the ODISSEI Roadmap application which has a budget of € 13.9 million and runs through to the end of 2024. Reviewers described the project as *'the envy of social scientists everywhere*' and *'world leading*'. The implementation of the work programme is the responsibility of 16 partners, all of whom are ODISSEI member organisations. These 16 partners are coordinated by the Coordination Team at Erasmus University Rotterdam as the host participant of ODISSEI.

The programme of work is subdivided into four work streams which represent four separate ways in which ODISSEI serves the research community. First, the **Data Facility** ensures that researchers can find, access, and link the data that they need. At the centre of this work is the ODISSEI Secure Supercomputer

which allows researchers to analyse complex and rich data from Statistics Netherlands and other ODISSEI data providers in a secure, yet computationally powerful environment. ODISSEI also provides grants and support to access this data to facilitate new research.

The **Observatory** supports and maintains key long-standing data collection efforts and participation in the international social science data collections to which the Ministry of Education and Culture has committed itself (via so-called ERICs, European Research Infrastructure Consortiums). These include such studies as the European Social Survey, the Survey of Health, Ageing and Retirement in Europe and the Generations and Gender Programme. It also covers the Dutch Election Study which has been collecting data since 1971. This work stream is focused on providing a consistent, stable, and reliable stream of data for social scientists that could then be utilised across the infrastructure.

The **Laboratory** is where researchers can conduct their own experiments, primarily through the LISS panel, operated by Centerdata. ODISSEI provides financing for the core LISS panel but also provides access to researchers from ODISSEI member organisations to field their own questions to the LISS panel's representative and high-quality sample of over 4,500 households. The Laboratory is also where future ODISSEI upgrades and enhancements are developed and prototyped.

Finally, the **Hub** is where researchers are provided with support, expertise, and guidance in the use of ODISSEI services and facilities. It includes an educational programme, community events, remote access grants, LISS data collection grants, data stewardship, as well as a Social Data Analytics Team at Utrecht University who can provide high quality and intensive support to researchers looking to deploy computational and data science methods within ODISSEI.

As a community, ODISSEI not only delivers services but also develops and promotes standards and best practices for social science research. ODISSEI not only promotes the FAIR principles through the delivery of new search and access services, but also by requiring adherence to FAIR from ODISSEI users. ODISSEI requires its users to act in accordance with the **principles of responsible data science**: Fair, Accurate, Confidential and Transparent (FACT). ODISSEI also supports open science by facilitating inclusion, sharing, and equity through its work. These principles are set out in the ODISSEI User Policy which was launched in spring 2021.

# 3 Activities

In 2021-2022, ODISSEI conducted activities across the four work streams as defined in the ODISSEI Roadmap proposal. This section details those activities and the work that has been conducted at the time of reporting.

## 3.1 The Data Facility

### 3.1.1 Statistics Netherlands Microdata Access

ODISSEI stimulates the use of the rich microdata at Statistics Netherlands, particularly amongst early career researchers and first-time users. These pseudonymised microdata are available at the level of individuals, companies, and addresses. The data are made available to researchers in the secure Statistics Netherlands environment under strict conditions for statistical research, and can be combined with researchers' own datasets. However, the costs for obtaining access to these data can be prohibitive, especially for early-career researchers.

In early 2022, ODISSEI launched its annual call to facilitate access to microdata from Statistics Netherlands free of charge for researchers at ODISSEI member organisations (so-called **Microdata Access Grants**, MAG). The submission deadline was 10 May 2022. There were 29 applications to this call, which is an 11% increase on the year before. In June, seven projects of ODISSEI member organisations were awarded an ODISSEI Microdata Access Grant (Table 1). The amounts awarded are small at approximately €7,500 per project, but the impact of access is large as they bring a new generation of researchers into contact with complex and sensitive administrative data and these projects would not have been possible without them.

The proposals were assessed by an independent, interdisciplinary committee consisting of Jennifer Holland (Erasmus University Rotterdam), Erik-Jan van Kesteren (Utrecht University), Christiaan Monden (University of Oxford), Paul Muller (VU Amsterdam), and Bram Wouterse (Erasmus University Rotterdam). Committee members were excluded from evaluating proposals with which they expressed to have some kind of connection. Each proposal was evaluated by three committee members. The committee then approved the final ranking of proposals.

ODISSEI also continued the **Microdata Access Discount** (MAD) in collaboration with Statistics Netherlands. From July 2020 to June 2021, ODISSEI provided a discount of up to 50% to 158 Statistics Netherlands microdata projects from ODISSEI member organisations. The topics are immensely diverse, covering crime, health sciences, demography, environmental issues, and genetics to name a few. The total value of these discounts was **€ 275,000**. A full list of projects to have received the discount is available on the ODISSEI website. Member organisations are however prohibited from claiming more than their annual contributions. Statistics Netherlands and ODISSEI are also investigating how the discount might more efficiently improve access and innovation in microdata access.

*Table 1 - Microdata Access Grant Awardees 2021-2022*

| Applicant | Affiliation | Project Title |
|---|---|---|
| Mery Ferrando | TiSEM | Female entrepreneurs: life cycle trajectories and the effect of maternity leave |
| Deni Mazrekaj | UU-FSW | Mental health of children with same-sex parents |
| Jordy Meekes | UL-Law | The impact of peers on fathers' labour supply |
| K. Maeve Powlick | VU-FSW | Understanding educational pathways of undocumented children in the Netherlands |
| Eduard Suari-Andreu | UL-Law | The impact of health shocks on inter-vivos transfers: Implications for taxes and public transfers |
| Oskar Veerhoek | RU-FSW | Rising through the ranks: Firms and social mobility |
| Jonas Wogh | MU-SBE | Understanding price spreads in the housing market |

*Coordination Team Contact: Kasia Karpinska (kasia@odissei-data.nl)*

### 3.1.2 ODISSEI Use Cases

The Coordination Team cultivates a range of data products that are available for reuse within the Statistics Netherlands remote access environment and in the ODISSEI Secure Supercomputer. Several projects have produced results that form the basis of further results including geo-spatial maps of the Netherlands which provide rich contextual information to individual records and network files which represent pseudonymised individuals as embedded within their networks. For example, since August 2020 Statistics Netherlands and the ODISSEI Coordination Team have been working on the development and documentation of a whole population network file that is now available to authorised users within the Statistics Netherlands secure remote access environment and as of 2023 will include longitudinal data for 2010-2020. Further data products will be added to the environment through the course of the project. The Coordination team has also launched an ODISSEI User Policy designed at making all outputs from ODISSEI projects FAIR, including those from the secure environments at Statistics Netherlands and the OSSC. These efforts are currently being extended, by providing specific workflows and platforms to deposit code.

*Coordination Team Contact: Kasia Karpinska (kasia@odissei-data.nl)*

## ODISSEI SHOWCASE #1

### Mental Health of Children with Same-Sex Parents

***Deni Mazrekaj (Utrecht University), Mark Verhagen (University of Oxford)***

Same-sex parents are likely to face unique stressors, such as negative feedback from family and friends, and a hostile social and legal environment. This added stress of same-sex parents may in turn translate to reduced mental health of their children. Previous literature that compared mental health outcomes of children with same-sex versus different-sex parents relied on small selective samples or cross-sectional parent surveys prone to misreporting, social desirability bias and the inability to separate children who were born in same-sex families from children in previous different-sex relationships. In this project which is financed through an ODISSEI Microdata Access Grant, the authors address these issues using longitudinal population data. Using novel quasi-experimental methods, the authors compare more than 1,000 children with same-sex parents with over 500,000 children with different-sex parents on the use of antidepressants and mental health care between the ages of 16 and 20. The results will inform policy makers throughout the world whether children of same-sex parents are doing well in a relatively tolerant country towards gender and sexual minorities, or whether policy measures are necessary to improve their wellbeing.

### 3.1.3 ODISSEI Secure Supercomputer

Statistics Netherlands and SURF delivered an operational version of the **ODISSEI Secure Supercomputer** (OSSC) in September 2020. This facility is a global first enabling the analysis of highly sensitive administrative data that is linked to data from social surveys and other sources in a secure high performance computer environment. In spring 2022, the ODISSEI Secure Supercomputer was migrated to the new national supercomputer named Snellius. The ODISSEI Secure Supercomputer provides the fastest computing capacity in the Netherlands via the national supercomputer of SURF and obeys the highest standards for data protection both legally and technically, imposed by both Statistics Netherlands Law and Europe's General Data Protection Regulation (GDPR). It provides Statistics Netherlands' secure remote-access environment that can incorporate datasets and advanced analytics tools. Datasets include pseudonymised administrative microdata on persons, households, companies etc. from Statistics Netherlands as well as research data collected by ODISSEI members. Analysis of these highly secured datasets is possible due to the system's architecture: SURF acts as Trusted Third Party between the data provider and the researcher, and the analysis environment is strictly **controlled and protected**.

Development of the OSSC cost **€ 279,000** in 2021-2022 which was conducted by SURF and Statistics Netherlands. This included adaptations to ensure the OSSC can be effectively used on Snellius, including a new penetration test, and that practical issues such as data storage can be overcome. In 2021-22, ODISSEI has supported 8 researchers in using the facility. Interest in the OSSC has been broad and for a diverse range of uses. Through 2023 the number of projects will be further increased and supported in their implementation and usage of OSSC with the Coordination Team monitoring progress.

*Coordination Team Contact: Kasia Karpinska (kasia@odissei-data.nl)*

## ODISSEI SHOWCASE #2

## Using the OSSC to generate synthetic data

***Chang Sun (Maastricht University)***

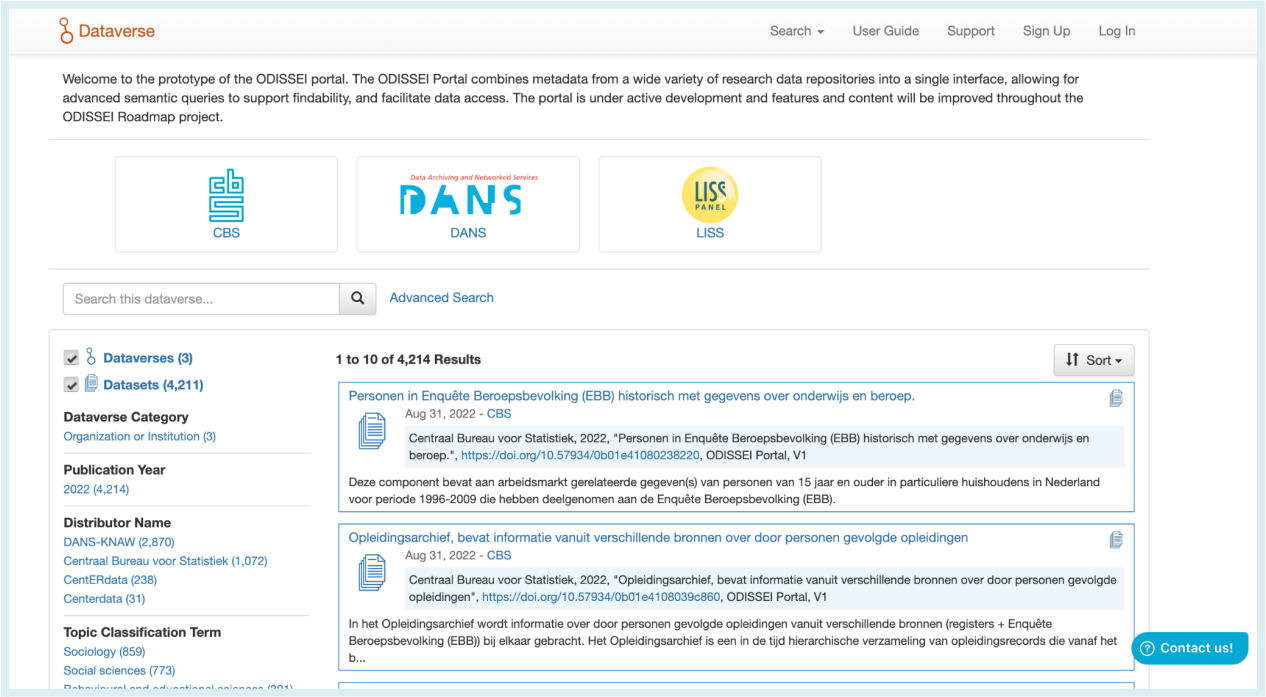
In this project, Chang Sun (Maastricht University) and her colleagues are creating a synthetic version of the microdata held by CBS using the ODISSEI Secure Supercomputer (OSSC). This complex project includes an application of artificial intelligence technologies to create synthetic data, while also taking into account ethical and legal perspectives and the trade-offs between data privacy and the potential utilization of synthetic data.

To achieve project goals, the researchers will generate synthetic data using a fully data-driven method (Generative Adversarial Networks). The data on cognitive scores achieved by Dutch primary school pupils, which are available at Statistics Netherlands, is used as a baseline for the analysis of the properties of the newly created synthetic data. To conduct such computationally expensive experiments, the researchers use a Graphics Processing Unit (GPU) node from the ODISSEI Secure Supercomputer (OSSC), which provides a secure environment for an efficient application of the deep learning-based generators on large-size sensitive data.

Upon its completion, the project aims to answer the following pressing questions about using synthetic data for social scientific inquiry: 1) what is the quality of synthetically generated data in relation to real-world data as a function of privacy cost?; 2) can complex, multi-faceted relations observed in the real data be well preserved when the synthetic data is being created? And finally, 3) what is the utility of synthetic data for different types of social science research?

### 3.1.4 ODISSEI Portal

The **ODISSEI Portal** promotes the reuse of existing datasets by making them Findable, Accessible, Interoperable and Reusable (FAIR). Reusing existing datasets, rather than creating new ones, can result in lower costs (because data collection is not needed), a better data quality (because professional panels or register data carefully curate their data) and richer data (because professional panels and register data are inherently rich). By combining and linking datasets, new research questions can be addressed.




To facilitate FAIR use of data, the Portal will provide a variable level, searchable catalogue of data within ODISSEI member organisations. The Portal working group has been established and consists of representatives from DANS, VU, SURF and the ODISSEI Coordination team. The budget for this work in 2021-2022 was **€ 422,000**. In the past year, the team has deployed a first iteration of the Portal which includes metadata from DANS, Centerdata and Statistics Netherlands. The incorporation of metadata from Statistics Netherlands is a significant milestone for ODISSEI and will ensure that Statistics Netherlands data becomes FAIR and citable by researchers. This will help researchers who are applying to use LISS or Statistics Netherlands microdata through ODISSEI grants and access discounts in navigating the pre-existing data collections and rapidly identifying possible linkages and synergies between the data sources. In 2022-23, further data sources within the ODISSEI ecosystem will be added to extend the coverage and functionality of the Portal.

*Coordination Team Contact: Lucas van der Meer (lucas@odissei-data.nl)*

## 3.2 The Observatory

### 3.2.1 ODISSEI Data Collection Committee

ODISSEI finances Dutch participation in ERIC surveys and surveys of key strategic importance. In 2021-2022, ODISSEI provided financing for Wave 9 of the Survey of Health, Ageing and Retirement in Europe **(SHARE - € 145,027)** and the Coordination of the European Social Survey **(ESS - € 45,000)**. ODISSEI also paid the Dutch contribution for 2021 of the Luxembourg Income Study (**LIS - € 36,300**). To ensure that all fieldwork efforts within ODISSEI are efficient and that the resulting data can be fully integrated within ODISSEI, a **Data Collection Committee** is in place and includes four members: Marike Knoef (Leiden University, Chair), Gerbert Kraaykamp (Radboud University Nijmegen), Ineke Stoop (formerly at the Social and Cultural Planning Bureau), and Bella Struminskaya (Utrecht University). In 2023 the committee will be overseeing the Generations and Gender Survey and Round 11 of the European Social Survey. In addition to the data collection committee Marike Knoef supervises data scouts at Leiden University who are responsible for identifying new datasets for use by ODISSEI member organisations and ensuring that they are FAIR. The data scouts have been working intensively with the portal and SANE teams to ensure that data from sources including municipalities and private companies can be documented and made accessible for research.

*Coordination Team Contact: Tom Emery (tom@odissei-data.nl)*

### 3.2.2 Media Content Analysis Lab

The Media Content Analysis Lab (MCAL) offers systematic analysis of large corpora of digital media content, where copyright and GDPR restrictions make it very hard to share media content data. A workbench is being developed for researchers where they can share data and analyses with strict rights management, without the need to read or export the data themselves. Currently, several Dutch initiatives exist that facilitate retrieval, storage, and analysis of media content (i.e. the infrastructure for content analysis [INCA] at the University of Amsterdam and the Amsterdam Content Analysis Toolkit [AMCaT] at VU Amsterdam). Their use, however, requires considerable programming skills and existing initiatives are currently tailored to a limited set of applications. Through the Media Content Analysis Lab, the large amount of longitudinal media content data (i.e., online news data; social media data) currently available within the Amsterdam School of Communication Research (ASCoR) at the University of Amsterdam will be made available to researchers at ODISSEI member organisations. It will also be possible to deposit new data, or to use specific tools on data stored elsewhere. In 2022 the Media Content Analysis Lab was moved to Wageningen University & Research under the direction of Rens Vliegenthart. In 2022-2023 the task will convert its data, tool, and project inventory into a linked open data model integrated within ODISSEI and communication science workflows will be deployed within the SANE environment.

*Coordination Team Contact: Tom Emery (tom@odissei-data.nl)*

### 3.2.3 Historical Sample of the Netherlands

The Historical Sample of the Netherlands (HSN) has linked the historical data file with the population registers held by Statistics Netherlands and enabled links to be made between the birth cohorts of 1900-1922 and the administrative data held by Statistics Netherlands. The linkage has been completed, with 84% of the HSN being matched with records at Statistics Netherlands using secure, pseudonymized linkage. This file will be made available for research purposes in the coming months through the remote access environment at Statistics Netherlands. The work is conducted by a team at the International Institute for Social History (IISG) and Statistics Netherlands. This work forms a key bridge to the work conducted in CLARIAH that features in the 2022 Social Sciences and Humanities Open Cloud for the Netherlands (SSHOC-NL) Roadmap application.

*Coordination Team Contact: Suze Zijlstra (suze@odissei-data.nl)*

### 3.2.4 Netherlands Twin Register

The Netherlands Twin Register (NTR) focuses on linking biomedical and cognitive data with the wider ODISSEI infrastructure through proof-of-concept projects within the ODISSEI Secure Supercomputer and integrating the diverse metadata of NTR in the ODISSEI Portal. Work began in August 2021 and will form a key bridge to the work conducted in the Consortium on Individual Development (CID) and BBMRI (Netherlands Biobank Research Facility). Over the course of 2021-2022, the NTR team has been developing a generic methodology for the Trusted Third Party linkage conducted during their ODISSEI pilot and that has been adapted to the new Snellius deployment of the OSSC. The task also curates a standard and FAIR pedigree form dataset using data from within Statistics Netherlands. This file will be of wider use within Statistics Netherlands and will be extended using data from the HSN and other sources.

*Coordination Team Contact: Tom Emery (tom@odissei-data.nl)*

## ODISSEI SHOWCASE #3

### The European Social Survey in the Netherlands

***Aat Liefbroer (NIDI, RUG, VU)***

The European Social Survey (ESS) is an academically driven cross-national survey that has been conducted across Europe since its establishment in 2001. Every two years, face-to-face interviews are conducted with newly selected, cross-sectional samples. The survey measures the attitudes, beliefs and behaviour patterns of diverse populations in more than thirty nations. The ESS data is available free of charge for non-commercial use and can be downloaded from the ESS Data Portal.

The European Social Survey has over 100,000 users worldwide and is widely used in teaching and research. In the Netherlands there are 12,409 registered users of the European Social Survey making it by far the widest used social survey in the Netherlands. The Netherlands has participated in every round of the European Social Survey and as of Round 11 the data collection in the Netherlands is financed via ODISSEI. The national coordinator of ESS in the Netherlands is Professor Aat Liefbroer (NIDI).

Over the next few rounds of data collection the European Social Survey will be transitioning to a more flexible, multi-mode design allowing for online data collection. Over this period, ODISSEI will ensure that the European Social Survey in the Netherlands will contribute high quality data that is efficiently and effectively collected to the highest possible standards.

## 3.3 The Laboratory

### 3.3.1 Distributed Analytics

The Distributed Analytics task is based around a primary use case involving the analysis of primary school students with special educational needs and is being developed in collaboration with Rolf van der Velden (Maastricht University). The aim is to develop an approach that allows the linkage of personal data in a secure and GDPR compliant manner. The initial plan involved a distributed analytics system, developed by Michel Dumontier (also at Maastricht University) that allows researchers to run analysis on highly sensitive data without having access to such data. It does so by bringing the analysis to the data rather than the data to the analysis. This approach is similar in design to the Personal Health Train and would greatly expand the type of data which could be included within ODISSEI. However, in the course of 2021-22, legal consultations on the application of the system deemed that it was not within the scope of GDPR. This work was conducted by the team at Maastricht University **(€ 82,000)**. Given this setback, alternative methods need to be explored and through 2022-23 the task will attempt to create a linked datafile usable for research through a synthetic data approach. Again, the primary hurdle is the legal compliance and the extent to which the synthetic datasets can be considered as non-personal data.

*Coordination Team Contact: Tom Emery (tom@odissei-data.nl)*

### 3.3.2 Automated Metadata Enrichment

Automated Metadata Enrichment is being led by Jacco van Ossenbruggen (VU). The social data within ODISSEI is highly structured and persistent identifiers and standardised codes are used pervasively. However, the degree of automated linkage is restricted by the lack of infrastructure that exists for such linkage. Computer science techniques are advancing using deep learning methods which help identify and link more opaque constructs within data that are less well defined and structured such as families, social networks, neighbourhoods, or even cultural groups. The potential of such techniques in the social sciences is considerable but these approaches require high levels of expertise. In this subtask, these high risk/high reward approaches are explored and examined to see if they can complement the more functional and established manual and semi-automated linkages which will be made in the development of the ODISSEI Portal. In 2021-2022 the team worked on a model for the standardisation of data access licencing and access that was applicable across a wide range of data **(€ 97,000).**

*Coordination Team Contact: Lucas van der Meer (lucas@odissei-data.nl)*

### 3.3.3 The LISS panel

The LISS panel, managed by Centerdata, consists of some 7,500 individuals from approximately 5,000 households. The panel is a representative sample of the adult population aged 16 and older in the Netherlands. In June 2022, ODISSEI launched the fifth round of the LISS Grant. This was the second time that applicants were also able to simultaneously apply for microdata access alongside their LISS data collection, allowing for the linkage of LISS data with the administrative data at Statistics Netherlands in a

single project. The call for proposals closed on 23 September 2022. 39 proposals were submitted, a 44% increase compared to 2021. Proposals are now being assessed by a committee of reviewers and successful applicants will be informed in Mid-December. The projects will commence from January 2023. The LISS Grants in the fifth round cost **€ 95,000**.

In addition to LISS Grants, the LISS panel spent **€ 125,000** on its maintenance in 2021-2022. Yearly fixed costs include personnel costs for panel management, subscription of broadband connection for panel members with initially no internet access, maintenance of hardware on loan to panel members, server and software licence costs, and incentive costs for updating background variables and activation of 'sleeping' panel members (as to avoid attrition). Costs for the core study mainly consist of incentives for panel members, but also personnel costs for programming, testing, data cleaning and data dissemination. As a recognition to ODISSEI of the provided subsidy, Centerdata provided a 20% discount for using the LISS panel to projects from ODISSEI member organisations. Finally, in 2021-2022 the LISS panel executed a round of refreshment to ensure that the panel remains representative and sustainable (**€ 240,000**)

*Coordination Team Contact: Kasia Karpinska (kasia@odissei-data.nl)*

## ODISSEI SHOWCASE #4

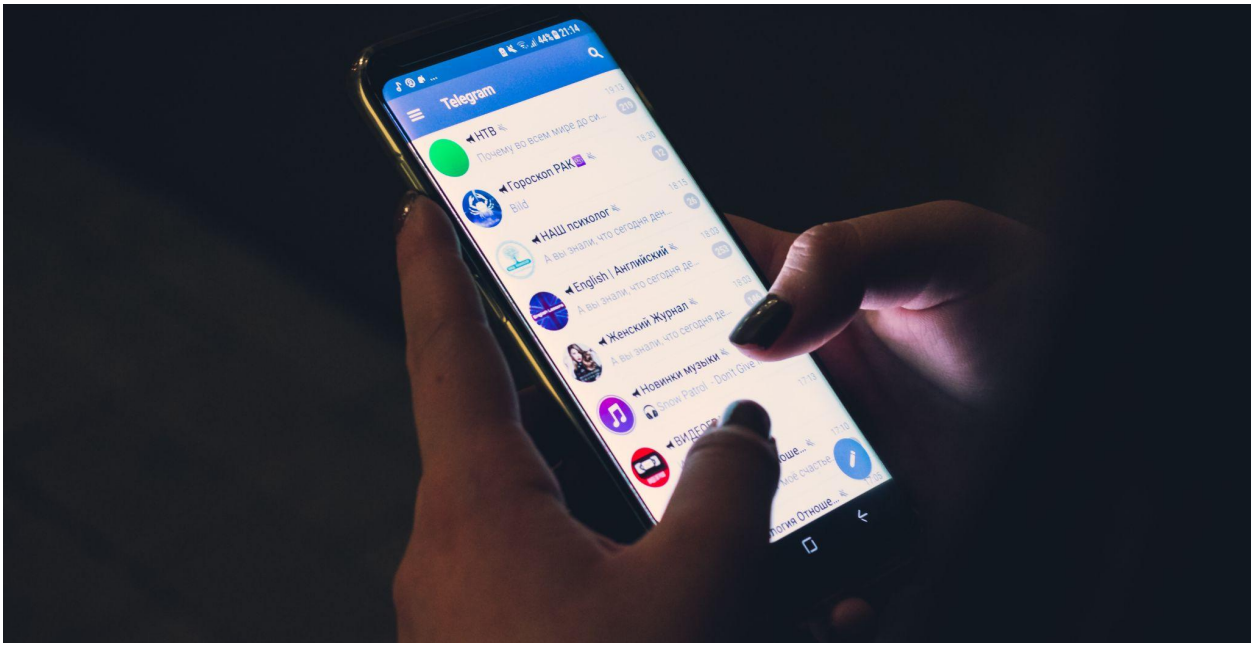
## Assessing Mobile Instant Messenger Networks with Donated Data

***Rense Corten and Laura Boeschoten (Utrecht University)***

Rense Corten and Laura Boeschoten were awarded a 2021 LISS panel grant for their innovative project that aims to study political participation using mobile instant messenger network data donated by the participants in the panel. Although Mobile Instant Messenger Services (MIMS), such as **WhatsApp**, play an increasingly important role in social and political participation of citizens and the spreading of information, there is relatively little knowledge about what these networks look like or how they operate. Most research on social media focuses on "traditional" social media platforms such as Twitter and Facebook, because in contrast to MIMSs, data from these platforms are relatively accessible to research. MIMSs generally operate from users' mobile devices, hidden from view or the data are typically proprietary and not available for research.

This project utilises an innovative method of data donation to collect information on the WhatsApp network in the Netherlands, by asking LISS respondents to donate their own WhatsApp user data in a way that is both user-friendly and respects their privacy. Given the scarcity of empirical knowledge on the structure and usage of MIMS networks, the initial focus of this project is on describing core features of the network topology, the group structure, and individual usage patterns. Moreover, the researchers also take advantage of the data already available on LISS respondents to study how MIMS usage relates to socio-economic differences and their political participation.

The data set that will become available in the LISS panel archive after the completion of the data collection will be one of the first datasets on WhatsApp usage that is collected from a high-quality sample and will offer promising novel insights on mobile utilisation, participation, and (mis)information.



### 3.3.4 Mass Experiments

The Mass Experiment Online Lab facilitates experiments in which large numbers of participants simultaneously interact under controlled conditions. These population-level experiments cannot be conducted in the traditional laboratory as they require scale in which network structure is systematically varied across multiple large-sized experimental populations. The Mass Experiment Online Lab overcomes (1) the significant infrastructural and logistic challenges associated with simultaneous networked participation of many participants and (2) removes barriers-to-entry by providing methodological and organisational research facilities to interested but otherwise ill-equipped domain experts through a series of open calls. In 2021-2022 the Lab was further piloted using the OTree software **(€ 58,104)**. The development work has resulted in an extensive feasibility study which was positively evaluated by the Management Board in autumn 2022 and has been used as the basis for further funding applications. It has also resulted in an eScience proposal, a task within the SSHOC-NL proposal, and the design of a further pilot which aims to deploy a Mass Online Experiment within the LISS panel.

*Coordination Team Contact: Kasia Karpinska (kasia@odissei-data.nl)*

### 3.3.5 Citizen Science

The ODISSEI Citizen Science Platform improves data quality in citizen science by applying existing expertise from the field of social science methodology. Citizen science projects include those which rely on ordinary citizens to collect scientific data at a large scale on for example air pollution, the backyard bird count, or the history of marriage. Underestimated aspects of data collection through citizen science are issues of selectivity and measurement error. A Citizen Science platform aims to perform three functions: (1) trusted and convenient data collection interface for fast development of Citizen Science applications through a web-based and mobile app platform to facilitate data collection; (2) link to spatial and demographic information from Statistics Netherlands to allow post-stratification to adjust for selectivity of the citizen scientist population and investigate the sensitivity of the conclusions; (3) double-coding and validation so researchers can estimate and correct for classification errors. The Citizen Science task is led by Peter Lugtig at Utrecht University. Through 2021-2022 the Citizen Science team collaborated with the Social Data Analytics Team to create a range of tools to support citizen science, provide an inventory of citizen science projects in the Netherlands and develop a proposal for future funding to extend and develop the work **(€ 77,000)**.

*Coordination Team Contact: Kasia Karpinska (kasia@odissei-data.nl)*

## 3.4 The Hub

### 3.4.1 Community Management

The ODISSEI Annual Conference in 2022 was held at Jaarbeurs in Utrecht on Thursday 3rd November 2022. There were 400 registrations for the conference, a 300% increase on the previous year. The newsletter is currently being sent out to 1,004 individuals in either Dutch or English. The number of subscribers has increased by 52% and 41% open and read the email, which is very high for a newsletter of this kind. The community managers have conducted a large number of ODISSEI showcase events over the year to increase the visibility and engagement of ODISSEI amongst practising researchers within member organisations. They explain all aspects of using ODISSEI to researchers. The community managers also run a wide range of events to engage the ODISSEI Community including task insight meetings for all people that are building ODISSEI, lunch lectures, and workshops (for a full overview, see the ODISSEI site[1]. They operate the ODISSEI website and social media presence and contribute to the development of the E-data magazine.

The costs in this task also include the support for researchers using the ODISSEI infrastructure including the administration of all grant programs and assistance in using the range of facilities within ODISSEI. In autumn 2021, Angelica Maineri was appointed as a data manager to support researchers in the implementation of complex data management plans that are dependent on ODISSEI infrastructure and subject to the ODISSEI user policy. Community Management also entails the strategic development of ODISSEI through new grant applications, collaborations with other research infrastructures, and the secretarial functions in supporting the Supervisory Board, the Management Board, and all task leaders in the execution of their duties.

The Community Management costs were **€ 362,000** and included the costs of operating the entire Coordination Team.

*Coordination Team Contact: Suze Zijlstra (suze@odissei-data.nl)*

[1] https://odissei-data.nl/calendar/

## ODISSEI SHOWCASE #5

## ODISSEI Conference for Social Science in the Netherlands 2022

***Jaarbeurs, 3 November 2022***


ODISSEI's annual conference on 3 November 2022 aimed to bring together data infrastructure builders and users, and expand ODISSEI's overall reach. To achieve this, **two well known keynote speakers** in the field of computational social science were engaged (**Frauke Kreuter**, University of Maryland and University of Munich, and **Matthew Salganik**, Princeton University). Their names accompanied a **Call for Papers** that was circulated in May. This was the first ODISSEI conference for which such a CfP was distributed. It yielded high interest, with **over 70 submissions** from researchers and research support staff from all career stages. This enabled us to organise a programme with an opening keynote, four parallel session time slots with five sessions each, a lunch with poster presentations, and a closing keynote. Topics of sessions ranged from data linking, innovations in data infrastructure, and FAIR data, to the COVID pandemic, inequalities and families, and genetics in social science. The conference was held at the Media Plaza of Jaarbeurs Utrecht.

With **over 300 participants**, we have witnessed a significant increase in attendance compared to last year (when we had 100 participants). Participants hailed from all parts of the country, including **Dutch universities** where we have member organisations, but also **partner organisations** such as Statistics Netherlands, the Netherlands eScience Center, SURF, Centerdata and DANS. Furthermore, participants from **Planning Agencies** (PBL, SCP) and from a few **government organisations and ministries** attended. By emailing Graduate Schools with an invitation specifically for their students, we ensured that we also reached a new generation of scholars, who participated in large numbers.

Participants were very enthusiastic about the conference. The 81 participants who filled in the evaluation form, rated the conference with a **4.6 out of 5** on average. They remarked favourably on the location, being close to the station and providing very good food. They were overall highly positive about the organisation and communications regarding practical conference matters. The content of the programme was also greatly valued. One participant remarked: '**I have heard from several attendees that this was the best conference they had ever attended (or had attended in years)**.' Points to consider for next year is that participants indicated that they would have liked longer breaks in between sessions to socialise with other participants, and that there were '**too many parallel sessions, I had serious fear of missing out.**'

### 3.4.2 Educational Programme

In 2021-22 the educational program in ODISSEI accelerated rapidly. In autumn 2021, ODISSEI planned to organize a computational social science summer school in collaboration with the Summer Institute for Computational Social Science (SICSS) which is coordinated by Duke University. The summer school was hosted by Erasmus University Rotterdam in June 2022 and was implemented in collaboration with the Social Data Analytics Team, the ODISSEI Benchmarking task, Enhance Your Research Alliance (EYRA), Statistics Netherlands, the eScience Center, and Centerdata. The summer school was attended by 19 early career researchers who were given training in network analysis, machine learning, and benchmarking. The feedback received from the participants was overwhelmingly positive despite the normal challenges that are common when implementing a curriculum for the first time. With the support of the Erasmus Graduate School of Social Sciences and the Humanities, the summer school was also accredited with all participants receiving 5 ECTS for participating.

The summer school focused on computational methods and approaches which are not extensively covered within standard graduate programs and emphasised hands-on-training with elements of ODISSEI infrastructure. Specifically, the participants were granted access to CBS microdata as part of a benchmarking research challenge. This access is exceptionally uncommon in training programs and was very popular amongst the participants. Due to the positive feedback and the overall success of the summer school, a further instalment is planned for June 2023.

*Coordination Team Contact: Suze Zijlstra (suze@odissei-data.nl)*

### 3.4.3 ODISSEI Social Data Science Team

The ODISSEI Social Data Science Team (SoDa) was established in September 2020 and now contains seven team members including Daniel Oberski (lead), Erik-Jan van Kesteren, Jonathan de Bruin, Parisa Zahedi, Shiva Nadi, Peter Gerbrands, and Javier Garcia-Bernardo. The costs in this task are all associated with staffing the team **(€ 118,000)**. The ODISSEI Social Data Science team exists to support social scientists in their research projects. A full list of projects that SoDa has worked on is available on the SoDa website. Researchers from ODISSEI member organisations can propose research projects for which computational, statistical, and research engineering skills will help answer questions which would otherwise remain unanswered. SoDa hosts a monthly Data Drop-in where researchers can ask all their questions surrounding data in social science and in their own research. Furthermore, SoDa cooperates with ASReview to support researchers who want to conduct systematic literature review with this tool. Projects supported by SoDa result not only in 'traditional' publications, but also in open-source reusable code that can be used for teaching purposes or as a starting point for other projects. The team has also supported many researchers in using other components of the infrastructure such as the OSSC, Microdata or LISS and coordinates with the eScience Center and the larger grants that they provide.

*Coordination Team Contact: Kasia Karpinska (kasia@odissei-data.nl)*

### 3.4.4 Computational Social Science Grants

The Computational Social Science Grants are administered by the Netherlands eScience Center. The grants provide hours from eScience Research Engineers employed at the NLeSC to collaborate with social scientists to enhance their research, by exploiting digital technology. The grants are made available via an annual open call that is assessed by experts in the field of computational social science. The call for 2022 was opened in spring 2022 and closed on 14 October 2022. A total of 8 applications were received and of these 5 were funded (Results to be formally announced at the end of November 2022). As the awards were not made until the 4th quarter of 2022, the costs for 2021-2022 refer to the costs associated with the first call **(€ 145,000)**. In 2022-2023, the eScience Center intends to increase the visibility of the call and increase the number of applications received.

*Coordination Team Contact: Kasia Karpinska (kasia@odissei-data.nl)*

## ODISSEI SHOWCASE #6

### The robot or the brain? Building a classifier for visual news frames of Artificial Intelligence

*Irina Lock (University of Amsterdam)*

In 2021 Irina Lock was awarded an **eScience-ODISSEI grant** to build a tool to study how digital technologies, such as machine learning applications, are portrayed in news media. Such technological advances are usually put in a specific light by online communication environments. However, analyses of this framing focus predominantly on a story's text only, neglecting the accompanying images. As opposed to text, images evoke vivid associations to the real world, are more saliently processed, and more profoundly imprinted in recipients' memory and emotions. This project bridges this critical gap in our understanding of how the AI technologies are being framed.

To enable the analysis of visual online content, Lock and data scientists of the Netherlands **eScience Center** have developed a machine learning classifier that automatically categorises online images in different predefined frames of AI. Thematically, this project is the first study to automatically analyse visual frames of this timely and relevant topic at a large scale. This project is methodologically at the forefront in communication science and contributes to the growing community of computational communication scientists interested in analysing images. It illustrates how computational methods can be used to detect and classify theoretically relevant concepts (i.e., frames) in images, but it also provides clear and tangible guidelines for how other researchers can apply these methods in their own work.

### 3.4.5 Benchmarking

In computational sciences, researchers often must choose between different computational approaches. Benchmarking uses standard datasets and parameters to systematically compare computational approaches and establish best practices in the community. Since translating research problems into benchmark studies is a novel concept in social sciences, it was decided in the autumn of 2021 to embed the benchmarking task within the context of the ODISSEI Summer School for Computational Social Science. This will eventually allow ODISSEI to monitor state-of-the-art algorithms for a specific task on the Enhance Your Research Alliance Benchmark Platform developed by the eScience Center and SURF, and implemented by EYRA.

In June 2022 the benchmarking challenge was implemented for the first time using administrative data from Statistics Netherlands. The analysis of administrative data is very promising for benchmark challenges but also poses many logistical challenges given the security protocols in place when accessing the data. During the summer school participants were given one week to estimate the employment outcomes using data only from 10 years prior. Whilst the participants did an excellent job during the summer school there were evident infrastructural constraints in identifying data, linking data, accessing data and assessing the benchmark challenge itself.

For the summer school in 2023, the benchmark task is collaborating closely with ODISSEI partners as well as Gert Stulp (University of Groningen) and Matthew Salganik (Princeton University) to ensure that the next iteration better leverages the advantages of a benchmark challenge in the context of a secure access environment. In 2022, the task moved from VU Amsterdam to Utrecht University with Paulina Pankowska, task leader.

*Coordination Team Contact: Tom Emery (tom@odissei-data.nl)*

# 4 Governance

ODISSEI now consists of **44 member organisations**. Almost all member organisations committed their financial contribution to ODISSEI until 2024, the end of the Roadmap project.

The **Supervisory Board** now consists of Pieter Hooimeijer (Deans of Social Sciences, chair), Carlo Schuengel (Deans of Social Sciences), Henk van der Kolk (Deans of Social Sciences), Viola Angelini (Deans of Economics and Business Administration), Hanneke Imbens (Statistics Netherlands), Helga de Valk (KNAW/NWO institutes and E-infrastructures), and Paulette Flore (public research institutes).

The **Management Board** now consists of nine members: Pearl Dykstra (EUR, Chair and Director), Tom Emery (EUR, Deputy Director), Dorret Boomsma (VU), Jessica Piotrowski, Marcel Das (Centerdata), Ran van den Boom (Statistics Netherlands), Annette Langedijk (SURF), Anja Smit (DANS), Rob van Nieuwpoort (NLeSC), and Jacco van Ossenbruggen (VU). The Management Board meets monthly to discuss and evaluate the program of work.

**The Coordination Team** consists of seven individuals: Tom Emery (Deputy Director), Lucas van der Meer (Operational Manager), Sofia den Haan (Project Management Officer), Kasia Karpinska (Scientific Manager), Angelica Maineri (Data Manager), Suze Zijlstra (Community Manager), and Thomas Groen (Community Manager). It is led by Pearl Dykstra.

As part of the Roadmap Project, an **Advisory Board** has been established including Ron Dekker (formerly CESSDA), Julia Lane (NYU), Melinda Mills (University of Oxford), Sally Wyatt (Maastricht University), and Amy O'Hara (Georgetown University). A virtual meeting is scheduled to take place in autumn 2022.

The 16 partners that execute the Roadmap project are Statistics Netherlands, Erasmus University Rotterdam, DANS, SURF, VU Amsterdam-Faculty of Science, NIDI, Leiden University-Faculty of Law, University of Amsterdam-Faculty of Social and Behavioural Sciences, International Institute of Social History (IISG), Maastricht University-Faculty of Science and Engineering, Centerdata, Utrecht University-Faculty of Social Sciences, Netherlands eScience Center (NLeSC), VU Amsterdam-Faculty of Social Sciences, and Wageningen University & Research-Social Science Group (WUR-SSG).

Key performance indicators for the infrastructure have been set out by the Coordination Team in consultation with all levels of management in the project.

*Table 1 - Key Performance Indicators*

| *Indicator* | *Target* | *Current* |
|---|---|---|
| Development | | |
| *Participation of all social science and economics faculties* | *All social science and economics faculties to be full ODISSEI members by 2025* | *All social science faculties are members. 6 of 15 Economics faculties still have to join* |
| *Participation in European projects* | *Active participation in at least two European Level projects by 2025* | *ODISSEI is now a partner in SoBigData Europe and investigating further projects.* |
| *International infrastructure collaborations* | *Formal collaboration with similar initiatives in UK, US, FR, and DE by 2024* | *Initial contact has been made with discussion of formalisation with a white paper delivered in spring 2023* |
| Data Access & Analysis | | |
| *Percentage of researchers at ODISSEI member organisations submitting a proposal* | *Receive project proposals from 10% of researchers at ODISSEI member organisations* | *Currently approximately 8% of all researchers have submitted* |
| *Percentage of researchers at ODISSEI member organisations being granted a project* | *Provide access to 5% of researchers at ODISSEI member organisations by 2025* | *Currently 2% of all researchers have received a grant* |
| *Number of unique visitors to the ODISSEI Portal* | *No current target set (To be set in 2023)* | *FIrst reporting in June 2023* |
| *Number of OSSC Projects per year* | *7 per year for 2022, 2023 and 2024* | *8 in 2022* |
| *Number of projects spanning more than 2 service providers* | *5 per year by 2025* | *4 projects in 2021* |
| Financial | | |
| *Further successful funding applications* | *Participation in a successful 2022 Roadmap Application for SSH* | *PDI-SSH SANE & FIP granted. 2022 Roadmap proposal and SSO proposal submitted* |
| *Total amount committed by member organisations* | *By 2025, to receive continuation of existing commitments to 2029 as a minimum* | *Current contributions are perpetual but no commitments until 2029* |

| | | |
|---|---|---|
| **Training & Education** | | |
| *Number of attendees at training, events and workshops* | *600 unique attendees at events per year* | *530 for 2021* |
| *Number of projects supported by Social Data Analytics Team (SoDa)* | *15 projects completed before end of 2024* | *12 projects acquired up to November 2022* |
| **Science & Technology** | | |
| *Number of scientific papers describing the infrastructure* | *3 per year by 2025* | *4 in 2022* |
| *Number of peer-reviewed publications derived from ODISSEI supported research projects* | *30 per year by 2025* | *30 in 2021-2022* |
| *Number of citations received for publications derived from ODISSEI supported research projects* | *2,000 citations since 2018 by 2025* | *571 since 2018* |
| **Social and Economic Impact** | | |
| *Number of datasets contributed by non-academic organisations* | *5 datasets from non-academic organisations accessible by 2025* | *2* |
| *Number of government agencies participating as member organisations* | *7 by 2025* | *6 with enquiries ongoing* |
| *Number of website visits* | *50,000 per year by 2025* | *15,521 in 2021-2022* |
| *Mentions in key policy documents* | *3 per year* | *Monitoring as of January 2023* |
| *Press mentions of ODISSEI related research in the Netherlands* | *10 per year* | *Monitoring as of January 2023* |
| **Communication** | | |
| *Number of social media (e.g. Twitter, LinkedIn) subscribers* | *5,000 by 2025* | *1,265 (50% growth per year, projected at 4,250 by 2025)* |
| *Number of newsletter subscribers* | *Total of 1,000 by 2025* | *1,004* |
| **Attracting New Talent** | | |
| *Number of international scientists recruited by ODISSEI* | *20 by the end of 2024* | *TBC* |
| *Number of major grants using ODISSEI (e.g. NWO talent, MCSA, ERC etc)* | *5 per year* | *3 in 2022* |

# 5 Roadmap Budget

In the financial years 2020-2021 through 2023-2024, ODISSEI will execute the Roadmap project with the budget as earlier approved by the Supervisory Board and NWO. A full breakdown and justification of this budget is available in the ODISSEI Roadmap proposal which is available on the ODISSEI website. An overview is given in Table 4.

The NWO Roadmap grant is **€ 9,300,000**. The other funding streams are earlier, yet unspent, NWO grants (**€ 1,100,000**), member contributions (**€ 3,180,000**) and ODISSEI's own cash reserve (**€ 362,000**). This adds up to the budget for the entire project of **€ 13,942,000**, which is spent evenly over the four financial years.

*Table 3 – Agreed upon Roadmap Budget for 2020-2024*

| *(in k€)* | 2020-2021 | 2021-2022 | 2022-2023 | 2023-2024[2] | Total Roadmap |
|---|---|---|---|---|---|
| Data Facility | 1.191 | 1.317 | 1.029 | 1.478 | **5.015** |
| 1.1 Microdata | 394 | 360 | 444 | 690 | **1.888** |
| 1.2 Use cases | 40 | 45 | 62 | 87 | **234** |
| 1.3 ODISSEI Secure Supercomputer | 615 | 638 | 246 | 279 | **1.779** |
| 1.4 Portal | 142 | 274 | 276 | 422 | **1.114** |
| Observatory | 455 | 1.264 | 925 | 223 | **2.867** |
| 2.1 Data collection | 323 | 1.059 | 698 | 45 | **2.125** |
| 2.2 Media Content Analysis Lab | 60 | 62 | 63 | 86 | **270** |
| 2.3 Historical Sample of NL | 71 | 72 | 92 | - | **236** |
| 2.4 Netherlands Twin Register | - | 71 | 72 | 92 | **236** |
| Laboratory | 493 | 739 | 294 | 841 | **2.367** |
| 3.1 Distributed Analytics | 66 | 89 | - | - | **155** |
| 3.2 Automatic Metadata | 71 | 72 | 74 | 101 | **318** |
| 3.3 LISS | 260 | 520 | 220 | 740 | **1.740** |
| 3.4 Mass Experiments | 19 | 58 | - | - | **77** |
| 3.5 Citizen Science | 77 | - | - | - | **77** |
| Hub | 503 | 935 | 873 | 1.380 | **3.692** |
| 4.1 Community Management | 230 | 455 | 451 | 941 | **2.078** |
| 4.2 Education | 10 | 40 | 41 | 85 | **176** |
| 4.3 SoDa | 97 | 224 | 168 | 319 | **808** |
| 4.4 Pathfinder grants | 166 | 192 | 192 | - | **550** |
| 4.5 Benchmarks | - | 23 | 22 | 35 | **80** |
| Total | 2.642 | 4.256 | 3.121 | 3.922 | 13.942 |

[2] This period of the Roadmap project covers 1.5 year.

# 6 Financial Results 2021-2022

An overview of the financial results for 2021-2022 is given in Table 4.

ODISSEI is on a firm financial footing. In the financial year 2021-2022, NWO transferred the second tranche (**€ 2,685,000**) of the € 9,300,000 Roadmap grant. 42 member organisations and one observer member contributed a total of **€ 725,000**. Almost all have reaffirmed their commitment until 2024 at least and for the financial year 2022-2023 ODISSEI has 44 member organisations.

In addition, **NWO** has provided **€ 550,000** for ODISSEI's **core budget**. This was the last time this contribution was to be made.

ODISSEI started the financial year with a **cash reserve** of € 2,274,000, which increased to **€ 3,060,000.** All but €395,000 of the cash reserves will be spent over the course of the Roadmap project and are currently allocated to specific tasks. The cash reserve is a consequence of both front loading of NWO payments and member contributions and back loading of task expenditures and deferments within several tasks due to COVID-19.

The final column in Table 4 indicates the discrepancy between the expenditures in each task for the period running from 1st July 2020 to 30th June 2022 (i.e. the first two years of the project) and the budget for this period as specified in the initial roadmap budget as of 1st July 2020. A positive value indicates that a task has underspent for the period and a negative value indicates that they have overspent.

In the past year, there has been a significant and rapid acceleration in many tasks. As a result, expenses grew from € 1.9 million in the previous year to € 3.3 million. This is still less than the budgeted € 4.3 million, but this is largely due to the delay in survey fieldwork that was initially scheduled to take place in the 2021-22 financial year. Due to COVID-19, this fieldwork is being executed in late 2022 which represents expenditures of € 967,000 which will now be included in the 2022-23 financial year

The reporting of expenditures is based on the date of invoicing rather than the point of execution which leads to a reporting lag for tasks with high material expenditures including the OSSC, Data Collection and Education tasks. Task specific reporting of financial figures are provided in section 3 of this report but the Management Board is confident that all tasks will deliver as anticipated to the budget initially set out. The deferment in funding does not reflect an issue with project implementation and there are no onward contingencies which are affected.

*Table 4 - Income and Expenditure 2016-2017 to 2021-2022*

| | 16-17 | 17-18 | 18-19 | 19-20 | 20-21 | 21-22 |
|---|---|---|---|---|---|---|
| Income | 525 | 1,040 | 1,587 | 1,175 | 3,754 | 4,103 |
| NWO contribution | 400 | 550 | 550 | 550 | 550 | 550 |
| NWO Bridge grant | | | 487 | | | |
| NWO Roadmap grant | | | | | 2,524 | 2,685 |
| Member organisations | 125 | 490 | 550 | 625 | 680 | 725 |
| Fieldwork contributions | | | | | | 143 |
| Expenses | 287 | 852 | 1,372 | 1,393 | 1,903 | 3,317 |
| Data Facility | | 35 | 603 | 464 | 753 | 1,286 |
| 1.1 Microdata | | 35 | 278 | 296 | 330 | 343 |
| 1.2 Use cases | | | | | 0 | 32 |
| 1.3 ODISSEI Secure Supercomputer | | | 325 | 85 | 216 | 692 |
| 1.4 Portal | | | | 83 | 207 | 219 |
| Observatory | 280 | 799 | 30 | 81 | 365 | 610 |
| 2.1 Data collection | 280 | 799 | 30 | 81 | 334 | 324 |
| 2.2 Media Content Analysis Lab | | | | | 10 | 70 |
| 2.3 Historical Sample of NL | | | | | 21 | 153 |
| 2.4 Netherlands Twin Register | | | | | 0 | 63 |
| Laboratory | 0 | 0 | 640 | 660 | 319 | 780 |
| 3.1 Distributed Analytics | | | | | 74 | 82 |
| 3.2 Automatic Metadata | | | | | 34 | 97 |
| 3.3 LISS | 0 | 0 | 640 | 660 | 203 | 460 |
| 3.4 Mass Experiments | | | | | 9 | 64 |
| 3.5 Citizen Science | | | | | 0 | 77 |
| Hub | 7 | 18 | 99 | 188 | 466 | 641 |
| 4.1 Community Management | 7 | 18 | 99 | 188 | 304 | 362 |
| 4.2 Education | | | | 0 | 0 | |
| 4.3 SoDa | | | | | 161 | 118 |
| 4.4 Pathfinder grants | | | | | 2 | 145 |
| 4.5 Benchmarks | | | | | 0 | 16 |
| Result (income minus expenses) | 238 | 188 | 215 | -218 | 1,851 | 786 |
| Cash reserve (accumulated result) | 238 | 426 | 641 | 423 | 2,274 | 3,060 |

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