Utrecht Data School. An Entrepreneurial Platform for Teaching and Applied Research Investigating Datafication[1]

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1. Introduction

Countless everyday activities and many aspects of social interaction are automatically recorded and stored in databases (Kitchin 2014). This *datafication* does not only constitute an exponentially growing supply of data, 'big data' in popular parlance, but also allows the further use of the data for (automated) analytical processes in many areas, such as economics, public administration, media and others (Mayer-Schönfelder & Cukier 2013). The traditional fields of research in the humanities have also been affected. Computer-assisted methods, access to new data stocks and digitized archives open up countless new opportunities for research in the humanities (Schäfer & Van Es 2017). But there are also those focused on the social consequences of new data practices and technological innovations (e.g. Elmer, Langlois, Redden 2015). Against the background of these transformations in 2013, at Utrecht University in the Netherlands, the Utrecht Data School (UDS) was initiated. It is a platform for teaching data analysis and digital methods, and simultaneously, exploring practices and processes of datafication by carrying out applied research projects.

1.1. Towards entrepreneurial research

Over the last ten years, universities have undergone dramatic changes (Brandt 2011; Colloni 2012). Cost-cutting measures have affected not only the funds for basic research but also for teaching. As a result, competition for smaller funding pools among national and European funding bodies has increased sharply and there is increasing pressure on individual researchers to raise third-party funds. In this climate, Mirko Tobias Schäfer, one of the authors of this article and University lecturer, and Thomas

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Boeschoten, an MA student New Media & Digital Culture at the time who was disgruntled about the lack of data analysis in his program, sought to introduce a course on digital methods. They approached external partners (public administration organizations, companies, and non-governmental organizations) to finance this course through applied research assignments. And so the Utrecht Data School was born. This cooperation with external partners is not about funding alone, but establishes direct collaboration between employees of the partner organizations and the students. Direct cooperation and integration of students and researchers in the specific context of external partners provides privileged access to empirical reality and facilitates valuable insight into the transforming effect of datafication. The practical cooperation, however, goes much further than mere observation. UDS consistently develops 'services' and 'products' around the topic of datafication. The aim is not to exploit research results commercially but to develop services and products that enable students and researchers to access the areas of their research interest. We called this method entrepreneurial research. The term 'entrepreneurial research' originally described research into entrepreneurial activities (e.g. Ucbasaran, Westhead, & Wright 2001; Grant & Perren 2002; Perren & Ram 2004, Landström & Lohrke 2010). However, we understand this to mean methodical access, in which entrepreneurial activities are essential not only to finance research, but more importantly, to provide access to the research object. In contrast to the spin-offs of universities, the consulting carried out by academics, or the exploitation of research results through patenting, licensing, or sale, our 'entrepreneurial research' is characterized by the exploitation of a commercial offer of services and products for research. These commercial services serve as 'methodological vehicles'. By solving practical tasks and offering expert knowledge, the researchers are better integrated into the environment. Both our entrepreneurial research and research into entrepreneurship should not be confused with academic enterprise or academic entrepreneurship (e.g. Shane 2004; Wright 2007; Pattnaik & Pandey 2014). This describes the commercial exploitation of research findings and activities. Henry Etzkowitz speaks in this context of research groups as “quasi-firms” (Etzkowitz 2003).

2 Structure of UDS

Officially, UDS is merely a project within the administrative structure of the Department for Media and Culture Studies at Utrecht University. This makes UDS part of the Faculty of Humanities. However, classes are offered to students from all faculties. UDS is integrated into the university focus area *Applied Data Science*. UDS team members are involved in teaching at various departments, such as the Faculty of Law, Computer Science, and Philosophy.

The project is led by one of the two founders, who is responsible for the teaching program, the research projects, the management of the research group, as well as for the budget and financing. As project leader he reports to the management team of the Department for Media and Culture Studies and to the director of the Faculty of Humanities at Utrecht University. The budget is controlled by the faculty's accounting department. In addition to the project leader, a project manager, a lecturer for the practicum, two PhD students, two data ethicists and a data management specialist are on the payroll. However, UDS excels on the many students and colleagues that invest their own (research) time to propel projects forward.[2]

In the first two years of its existence, UDS operated rather informally. As university lecturer, Mirko Tobias Schäfer dedicated a seminar group from his teaching load to UDS and the applied research projects. Thomas Boeschoten supervised the students and taught them the necessary knowledge in digital methods and data analysis. However, to finance Thomas as student assistant, a position not budgeted by the department, funds needed to be acquired from external partners. Major challenges in this initial phase were the development of the curriculum and, above all, the selection of external partners. Importantly, although our students conduct applied research projects, Utrecht Data School seeks to foster critical thinking about datafication and data practices. We raise questions and concerns about data analysis and algorithmic processes, and reflect on the limitations of our methods.

Over time awareness and interest for the course offered by Utrecht Data School grew both among students and external partners. Utrecht Data School was assigned as a

[2] The team of the Utrecht Data School: < https://dataschool.nl/about-uds/team/?lang=en>

practicum of the new media program and was now able to offer an official teaching programme. The course centred on practical skills in dealing with digital methods and data analysis. Practical skills are taught at the Utrecht University in so-called “practica”, which are offered as elective courses aimed at improving practical skills. Here students have the opportunity to develop knowledge about theatre, film and video, or the creation of websites and communication campaigns. Henceforth UDS constituted a partition of activities into teaching, fundraising, and research.

2.1 Financing

Research projects in the Netherlands can be financed from the so-called first revenue stream, the university itself, the second revenue stream, the national funding bodies (most NWO, which corresponds to the DFG in Germany) or the European ones, such as the European Research Council (ERC), and from the third revenue stream. The latter refers to third-party funds from companies, NGOs and foundations and government organizations. As mentioned, Utrecht Data School is largely financed from these funds, which are raised on a project basis and intended for conducting applied research projects (see Figure 1). These applied projects are carried out by students in cooperation with external partners after receiving a ten-week education on digital methods and analysis. The university provides the office, infrastructure (information technology, data storage, administration, etc.), but it is only able to partially cover the costs of teaching. The course far exceeds the traditional hours allocated to teaching (which explains the need for additional funding).

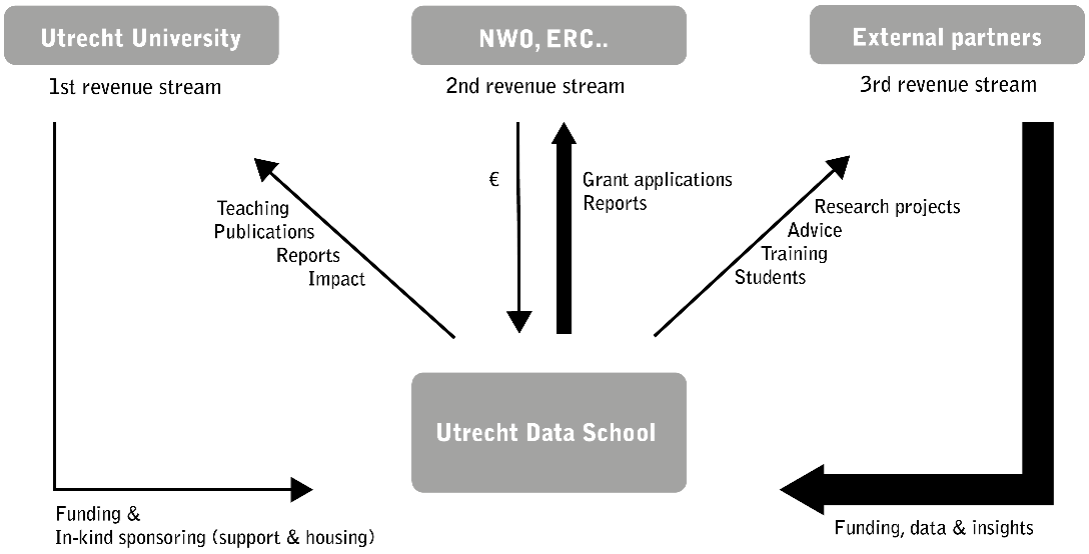

Figure 1: Financing UDS

We are cost covering and not for profit. The work at UDS is largely project-oriented, with terms of three to six months, long-term planning is only possible to a very limited extent. Moreover, third-revenue funding requires the management team to invest a significant amount of time in the selection of external partners and the coordination of the various projects. Nonetheless this type of funding also has several advantages. It allows for flexible budgeting; the funds can be used for research purposes as required and are not tied to fixed cost items. Instead of extensive research applications, cost estimates and project descriptions are prepared; standardized contracts are drawn up by the university who regulates the legal basis for cooperation. Third-party funds allow for a certain degree of autonomy, making it possible to hire employees independently, release employees from teaching duties and engage them in research projects, to finance further training or team development, or to reimburse team members for travel to conferences and Open Access fees outside the limited funds of a department.

2.2 Project types and services, and their implementation

Courses and Programmes

At the core, UDS combines applied research with teaching. However, starting out as a practicum UDS has grown to offer numerous programmes and services. Over the past two years, data science, digital humanities and critical data studies have also gained importance within Utrecht University (Bloothoofd et al. 2017); accordingly, UDS developed a whole series of new courses that are also offered in various departments and at various faculties. The practicum is still at the centre of our teaching programme. This programme covers digital methods, data analysis, critical inquiry of datafication and data practices.[3]

In addition, Utrecht Data School is currently developing a media track for a one-year MSc programme Applied Data Science. The courses for this programme are Data Mining Cultural Archives, Data-driven Content, and Personalisation in Public Service Media. The MSc Applied Data Science is expected to start in fall 2019. Other faculties approached us for developing courses for their programmes as well. Moreover, UDS is involved in the development of the Media Track as part of an interdisciplinary, one-year Master of Science for Applied Data Science. The Media Track involves the courses

[3] The courses offered include:
Practicum New media & digital culture I & II, a Bachelor (BA) level course divided into two academic blocks (starting in September and February for Internship I and starting in November and April for Internship II. The internship is taught twice during the academic year. <https://dataschool.nl/education/practicum-i/?lang=en>
Digital Data Analysis for Media and Communication Studies, a BA course for students of communication and media studies. An introduction to scientific work, with a special focus on digital humanities and digital methods is offered here.
Cultural Analytics. Mining Large Cultural Archives, a seminar as part of the Masters New Media & Digital Culture. Here, students of media studies use methods of digital humanities.
The Datafied Society, another seminar as part of the Masters New Media & Digital Culture. This seminar discusses data validation from the perspective of critical data studies.
Research Lab I & II, two exercises in which students develop their academic skills and learn digital methods.
Digital Ethics, a seminar offered as part of the Research Masters Philosophy and the Masters Applied Ethics.
The four courses *Cultural Analytics*, *Datafied Society*, *Research Lab I & II*, together with a research internship (see Embedded Research Assistants) and the final Master Thesis form the independent profile *Media, Data and Society* within the MA program New Media & Digital Culture: < https://dataschool.nl/education/media-data-society-master-track/?lang=en>

Data Mining Cultural Archives, Data-driven Content and Personalization for Public Service Media. This MSc Applied Data Science is expected to start in autumn 2019. In addition, UDS is developing a seminar on data, ethics and politics for the Faculty of Law at the University of Utrecht, which is expected to be offered in the academic year 2019-2020.

Seminars for professionals

The practicum is also open to professionals who attend classes as so-called contractors. Their participation in class has proved to be an enrichment, as they bring different experiences and a very domain-specific understanding of the application of data practices. With *UDS for Public Management* we offer a course for municipal employees and local councillors. In ten four-hour classes, an understanding of political implications of datafication and data practices is developed. In addition, the participants will be trained in data analysis techniques.[4]

Research in cooperation with external partners

In addition to the applied research projects during the practicum, the staff of UDS and its affiliated research platform Datafied Society, coordinated by Karin van Es, carry out research projects on behalf of, or in collaboration with external partners or academic partners. In one case, the Association of Dutch Chief Editors wanted to know whether and how politicians refer to reports from the press, television and radio in their social media communication during the election campaign (Wieringa & De Winkel 2017). In cooperation with *Nieuwsuur* (news program on Dutch public radio NPO) and the monthly magazine *Vrij Nederland*, a team from Utrecht Data School investigated the Dutch, right-wing and centre-left networks on Twitter (Wieringa et al. 2018). These projects vary greatly in duration, scope and cost. In September 2018, in cooperation with the Chair of Public Innovation at the University of Utrecht, we started a two-year research project on the scope of actions for citizens and public administration in the 'Datapolis'. The external partners consist of three Dutch municipalities and the

[4] Innovating through data <https://dataschool.nl/cooperation/uds-for-public-management/?lang=en>

province of South Holland.

Embedded Research Assistants

In most internships outside the university, students are largely left to themselves and their respective contexts. Lecturers supervising these students find it difficult to evaluate the more or less meaningful possibilities of subject-specific or labour market-relevant knowledge of an external internship. The high demand for students with data analysis skills enables Utrecht Data School to offer external internships as small applied research projects for students. As Embedded Research Assistants, students from the New Media & Digital Culture Master's program carry out a project with an external partner, working for the most part on their own. They work four days a week with the external partner and one day at UDS, where they are supervised in the execution of the project and receive support and training tailored to their needs. The external partners pay a market-compliant remuneration for the interns and the supervision from UDS.[5] Supervising students actively during their internships affords a better evaluation and increases the quality of the research activities carried out at the external partners.

3. Selection of external partners

In each UDS practicum, which spans a half a year, we collaborate with three external partners. The selection of partners is guided primarily by three criteria: a) research interest, b) learning and self-development opportunities for students and c) ethical considerations. In principle, we seek collaborations in the following domains: public administration, (public) media, and public space.6 Here, we are interested in the transformation of institutions and values of the open society through datafication, the participation of citizens in political deliberation and cultural production.

[5] Utrecht Data School, Embedded Research Assistants <https://dataschool.nl/research/embedded-research-assistant/?lang=en>

[6] As many projects make use of digital methods and use software applications for data analysis and data visualization, the critical reflection of the epistemological impact of these tools on research findings emerged as a fourth area of research. Under the label *tool criticism* a critical inquiry of digital methods practices is currently emerging (Wieringa, Van Es, Schäfer 2018).

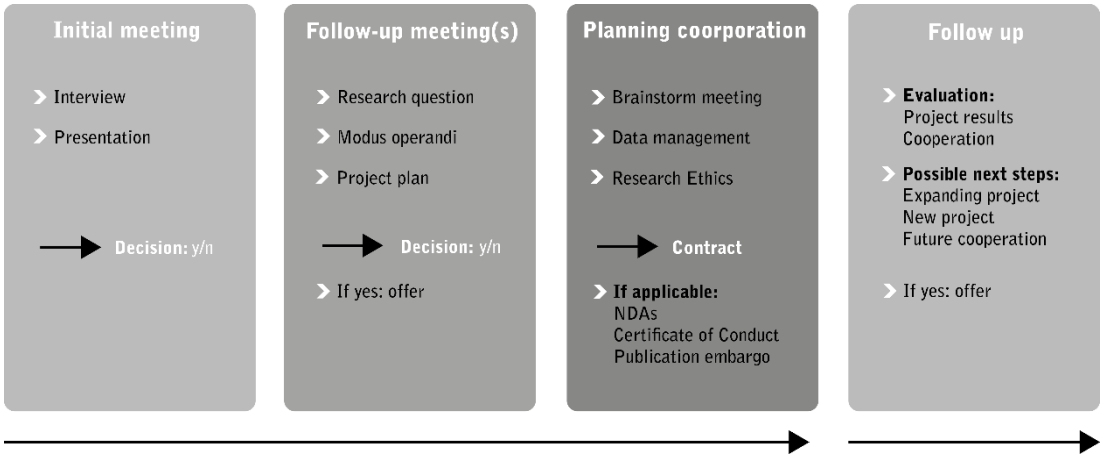

Figure 2: Selection process of external partners

The selection of partners takes place through at least three interviews (see Figure 2). In the first meeting, the external party describes its questions about data and data practices. What are they already doing with data? Which operational capacities have been or should be developed? What kind of projects are being carried out, or should be carried out in the future? Which data are collected and how and what changes are planned for these processes? A lot can already be read from this in terms of expectations regarding big data, practical implementation and strategic planning. During this meeting, the work and methods of UDS will be presented. It is repeatedly emphasized that projects should offer opportunities for learning and fit in with research interests. Furthermore, it is pointed out that the conditions for contract research at Utrecht University stipulate a best effort investment rather than a polished end product. This is important as we a see learning as a playing field. In our experience, the final outcome usually exceeds expectations (on both ends). The external partners are informed that cooperation must above all enrich the learning process of the students, that the project work is not left to itself, but is part of the overarching research interest in datafication and its consequences.

In the first interview with a potential partner we discuss the values on which the work of UDS is based. With reference to Lisa Spiro's proposal of a canon of values for the Digital Humanities, we orient ourselves here using the values she formulated (Spiro 2012):

- Openness
- Collaboration
- Collegiality and Connectedness
- Diversity
- Experimentation

Spiro has thus proposed a canon of values that is strongly oriented towards the traditional code of academic research. In discussions with external partners, we emphasize that openness also means the willingness to accept the distinctive working methods of UDS and its students, to meet the students openly and to provide them with insights into data and practices of the cooperating organization. The same applies to the students, who should also meet each other with openness and willingness to cooperate. Cooperation is essential in interdisciplinary projects. Students are expected to actively shape the cooperation within the team and use their respective expertise to jointly solve the task at hand. The external partners usually appoint one of their employees as contact person for the student team. However, it is expected that the broader staff, or at least the relevant department, will also be informed about the cooperation in such a way that the students can find a constructive working atmosphere there and quickly make contact. External partners are expected to treat the students with collegiality and to support them locally during the duration of the project. Students are also external experts in the partner organization, so they should nevertheless have the feeling that they can turn to the staff there with factual questions as if they were colleagues. Experimentation is a central part of the methodical procedure of the internship; often the tools used and the analysis processes are unstable, unproven, explorative and experimental. It is important to us that students try things out and make mistakes in order to discover something new. An unconventional or new approach to the problem can also open up new perspectives for external partners. During the first meeting it quickly becomes clear whether cooperation is desirable or not. It is important that those interested, recognize the opportunities but also the challenges of working together with students and scientists. It is important to point out that we do in fact refuse projects on ethical grounds or if they limit our ability to conduct and distribute our academic research output.

We have had partners who do not operate within the preferred domains of collaboration. An example is the Walraven Group - market leader in fasteners and other products used in the construction industry.7 Their product catalogue consists of over 10,000 items and the company has a comprehensive database with information on products, price developments, sales, margins, production, and storage costs, etc. However, despite initially turning them away because their company did not operate in one of the preferred domains, we later decided to proceed with their assignment. The commitment of the company and the learning opportunities their case offered outweighed this concern. Walraven offered the students an ideal learning environment; providing students access to the complete database, and support from high placed employees. The Chief Information Officer, a process manager, and the Sales Director for the German market spent a lot of time with the students.

The financial contribution is small compared to commercial providers, but the partners themselves must invest time and support, and acknowledge that learning and research are central aspects of the project. Once this has been clarified, a second discussion takes place in which research questions are already outlined with the partners, the practical aspects of the cooperation are discussed and an initial project plan is drawn up. If the partners agree to the route taken, UDS will prepare a cost estimate. Once this is accepted, the partner organization is slotted to work with a team at the earliest convenience. In the third meeting, approximately two months before the start of the project, the project participants of both organizations meet to discuss research questions, to write a problem statement for the students and to discuss practical questions, such as data management, ethical and legal aspects (especially regarding the GDPR), where and on which devices the students should work within the organization. In some cases, preliminary work is required (e.g. police clearance certificate, non-proliferation agreement).

[7] Walraven Group <https://www.walraven.com/>

UDS practicum project - Environmental data and residential burglaries in the City of Gouda

For the City of Gouda, a team of students in the practicum investigated correlations of environmental data and burglaries in Gouda (Khouani et al. 2018). This municipality ranks highest in the Netherlands for a risk of a home burglary. Despite recent figures indicating a decline in the rate of burglaries, the municipality was interested in a data science experiment. The local authorities already had analysed data about offenders, victims and related addresses, but not about environmental aspects. Utrecht Data School students gathered these data for four different categories: Weather and time, quality of the neighborhoods, social cohesion, and perceived safety.

In cooperation with the local police and the city administration, databases that the students could use for their research were selected. Since some of the data also contained sensitive information such as postal codes and house numbers, the data protection commissioners of the city administration and the Gouda police became involved in the planning of the research design. For data protection reasons, the evaluation of sensitive data also took place exclusively in the building of the Gouda City Council and on the computers there.

The students studied different correlations: Tree population, street lamps, dog ownership, neighborhood WhatsApp groups, location of kitchens (to the street or to the garden), and other factors. This data was collected and compared with the history of burglaries. Some of the analysed factors correlated positively with burglaries, such as tree population, WhatsApp groups and the location of kitchens. Not all of these correlations constitute a causal relation to the burglaries. It was not possible to verify a causal relation between the presence of neighborhood-watch WhatsApp and burglaries. But it appeared plausible that street-facing kitchens constituted more opportunities for burglars in the evenings as residents then remain in their garden-facing living-rooms and cannot take notice of conspicuous activities.

A major challenge in this research project was the data collection and the preparation of the data sets. The use of data from the Central Bureau of Statistics (CBS) showed that the division of city districts was different from the division used by the city administrations itself, which in two cases led to a misrepresentation of the burglaries. The CBS promised to match its classification of districts with the Gouda practice.[8]

[8] See El Khouani, Saïd, Yade Rotte, Eva Siderakis and Demi van Weerdenburg: Residential burglaries in Gouda. A data-driven approach to prediction and prevention. Utrecht Data School 2018. Online: <https://dataschool.nl/wp-content/uploads/sites/272/2019/01/Definitief_onderzoeksrapport_UDS_woninginbraken_Gouda_index_aangepast.pdf.>

4. Process of an Utrecht Data School Practicum

At the beginning of the practicum, the three partners introduce their organizations and 'matter of concern'. The students have also received their problem statement in advance. Then in a joint discussion, questions on this problem statement are clarified and initial ideas on how to approach the project are developed. The group of students is always very heterogeneous, with participants from media studies, anthropology, psychology, computer science, artificial intelligence, sociology and other disciplines. The course is open not only to students of all disciplines, but also to non-students who attend the course as so-called contractors.

The practicum is divided into two parts. The first part, Practicum I, offers an introduction to data analysis and digital methods. There are often students in the course who first have to learn how to use Excel. The levels of competence are diverse. If students already have knowledge in statistics, programming and data analysis, they help their colleagues together with the lecturer. During the three-month Practicum I, students will learn basic practical data analysis skills: collecting data, cleaning data sets, performing various analyses, network analysis, and the visualization of data. The students work with programs such as R for statistical calculations, Gephi for network analysis, Tableau for data visualization, and receive an introduction to the Python programming language. In the second part, Practicum II, which takes place directly after Practicum I, students concentrate on the practical implementation of the research projects. Over three months, they will carry out a project on the basis of the research plan developed during Practicum I. If techniques other than those taught in Internship I are required, students will receive support from the Internship Lecturer and other staff members of UDS. Often the lecturer is supported in his or her work by a student assistant, usually a graduate of one of the previous editions of the internship. The students usually work with the partner organizations on site, so they can benefit from the specific expertise of the staff there. The different project teams meet weekly in class to discuss their progress and problems, and to get feedback on their work. Results are presented at a symposium at the end of the projects. Representatives of partner organizations and most of their staff, who supervised the student teams, will be present. Here external partners usually actively participate in the discussion and ask questions about the other projects with great interest or discuss directly with the other

partners. A detailed research report written by the students documents the method and the research results. Any 'proofs of concept', scripts and visualizations produced are enclosed in the research report.

5. The dual use of the Data Ethics Decision Aid (DEDA) for consulting and research

One of the products developed by UDS is Data Ethics Decision Aid (DEDA).[9] It will be briefly presented here as an example of 'entrepreneurial research'. In cooperation with the municipality of Utrecht, UDS was commissioned in 2016 to develop a guideline for data ethics. For almost a year, employees of UDS and students of the Master's program in Applied Ethics at Utrecht University examined the data practices at the municipality of Utrecht. In numerous discussions with their data analysts, project managers, the privacy officer and other employees, Aline Franzke, then MA student Applied Ethics, developed a dialogical process for reviewing data practices. DEDA enables the various participants and stakeholders of a data project to jointly identify possible ethical problems and to make decisions for project design, communication or other measures accordingly. DEDA was quickly employed by various communities, ministries and companies to raise staff awareness of data ethics and to evaluate projects structurally with regard to possible ethical problems. This is done during workshops organized by UDS. The implementation is not merely a commercial offer, but offers the opportunity to collect qualitative data for research. During the workshops we gain insight into the operational capacities of an organization with regard to data practices, current or planned data projects, learn about the impact of data establishment in the organization, and can document how the organization legitimizes data practices and to what extent these relate to standards and values.

The Data Ethics Decision Aid is both a product that contributes to the financing of UDS and a research tool that serves the inherent interest of a critical investigation of datafication. DEDA is licensed through Utrecht Holding, the commercial collecting society of Utrecht University. Persons or organizations that concentrate primarily on

9 Information and working materials for the Data Ethics Decision Aid are published at: <https://dataschool.nl/deda/?lang=en>

the activity of ´Data Ethics Consulting´ can thus work independently with the process. For the staff of UDS, DEDA is particularly relevant in combination with researching data practices; there is no interest in a repetitive routine of consulting on responsible data practices. UDS could not even meet this demand. For example, one of the main developers of DEDA has acquired a license to work with it on a freelance basis. The Association of Dutch Municipalities obtained a license to develop awareness of data ethics with DEDA among the 355 Dutch municipalities. Licensees learn to use DEDA in a ´Train-the-Trainer´ course conducted by us. They are regularly informed about changes and extensions in DEDA; the licensees also support UDS in collecting data on the impact of DEDA from organizations and their employees.

6. Impact

Utrecht Data School's dedicated approach not only provides a direct insight into the social sectors affected by datafication, but also offers numerous opportunities to directly generate impact. In addition, this cooperation enables the utilisation of practices and knowledge for academic research. And conversely, this can also be implemented directly through the results of (applied) research. We are therefore trying to understand the structural impact of our work. It manifests itself in the following areas:

Job market development and career orientation. Especially through Practicum II and the embedded research assistantships, students gain insight into possible fields of work and career paths; companies also come into contact with a target group in great demand on the job market. Since our practicum is also open to professionals and UDS offers specific courses for community employees and local councillors, we contribute to the life-long learning ambitions of various organizations and enable efficient knowledge transfer to socially relevant institutions.[10]

Civil society action and urban development policy: through both the courses for professionals and the jointly conducted (applied) research projects and our participation in expert meetings we reach those who can exert direct influence on the datafication of society. Sometimes this also happens indirectly. For example, without

[10] An overview of companies and organisations where our former students work can be found here: <https://dataschool.nl/about-uds/alumni/?lang=en>

any contact with UDS, the municipality of Zaanstad has prescribed the process of Data Ethics Decision Aid as a binding component for all data projects of a predictive nature. The cooperation with the municipality of Gouda led to an agreement between the city administration and the local police authority to continue using the analysis processes developed by the students for two years in order to gain more insight into the dynamics of break-ins and environmental factors. The results of studies on the influence of social media on local news coverage or the use of social media by campaign leaders were presented and discussed in seminars with decision-makers from the press and public media.

Media and public engagement: with articles in trade journals for e.g. public administration (e.g. *Binnenlands Bestuur*), engineers (e.g. *De Ingenieur*), national security (e.g. *Nationale Veiligheid en Crisisbehersing*), or data research (e.g. *eData Research*), we want to raise awareness for the social opportunities and challenges that arise directly among decision-makers and experts in specific social areas. Cooperation with mainstream media or popular platforms is ideal for broad-based dissemination. Our research on the right-wing audiences on Twitter was covered in the monthly *Vrij Nederland* and in the evening news. Thomas Boeschoten, co-founder of UDS, presented our research in the popular format *De Universiteit van Nederland*.[11]

The work of UDS is also manifested in *academic research*: for the project "Connecting Europe. Digital Crossings in Europe: Gender, Diaspora and Belonging" by Professor Sandra Ponzanesi, the researchers were trained in digital methods and data analysis. The principal investigator of UDS is a member of the project's advisory board and another a team member of UDS acts as a digital methods consultant. For Professor Anita Hardon's research group at the Anthropology Department of the University of Amsterdam, a team of students collected data from online forums and carried out data analysis (Krieg, Berning, Hardon 2017). With the interdisciplinary research platform Datafied Society topics and results of applied research at UDS are directly utilized for academic research. In 2018, this led to the establishment of at least two PhD projects, one research project on data ethics, and the above-mentioned consortium on governance perspectives for public administration and citizens in data-driven cities.

11 The media clippings are listed here: <https://dataschool.nl/about-uds/in-the-media/?lang=en>

Here, two research assistants will initially be employed for two years. In addition, the members of the Datafied Society formulate new research agendas for their respective disciplines, media studies, gender studies, law, political and administrative science, and philosophy.

7. Summary: Opportunities and challenges

Entrepreneurial research is no easy endeavour. Our challenges and framework conditions are very similar to that described by Professor Kai-Uwe Schnapp concerning his Project-Office for Applied Social Research (Schnapp 2017). Schnapp aptly sums up that there has to be an entrepreneurial person in the project "to set up such an institution and [who] has sufficient stamina to establish the project even over lean periods" (ibid). Schnapp explains that people who share the inherent research interest and are willing to commit themselves to active teaching and cooperation with external partners are necessary. We can also confirm the importance of the framework conditions described as "ideal", such as an institutional infrastructure in which the project will be embedded or the resources of the university that will enable such a project to be set up. Fortunately, founding and developing UDS was also possible without this support. The development of this project required the untiring willingness of the team members and the principal investigator, along with their personal investment of research and leisure time. When we talk to colleagues about our model, it is usually assumed that the greatest challenge lies in the alleged dependence on external partners. This is not the case; on the one hand, we have a good process for selecting partners and, on the other, clear rules for cooperation. We make sure that our financing generates sufficient capital to remain flexible and independent. This means that the practicum can also work with just one external partner if necessary. This takes the pressure off us to carry out a project only because of the financing. The challenges lie above all in other aspects, which are briefly listed here.

***Expenditure of time*:** The large additive time necessary for the selection of external partners should not be underestimated. The process described above leads to successful cooperation with suitable partners and interesting questions, but is very

time-consuming. The same applies to teaching, which requires more time than is normally allocated for a course.

***University administration*:** Academic administration is only partially compatible with the fast-moving world outside the ivory tower. Hiring staff or drawing up contracts requires some lead time and several meetings. Administration of projects is geared to the traditional research project, where a research funding organisation transfers a grant to the university. The amount corresponds with a budget calculated beforehand that cannot be amended. Dynamic income and expenses, as well as the necessity of advance payments or investments do not fit into this scheme. We owe it above all to the willingness of individual key employees in the administration of our faculty that UDS can now draw up and send out contracts, cost estimates, and invoices in a timely manner.

Personnel: Since the skills of Utrecht Data School employees are in demand in almost all areas of business, public administration, NGOs and educational institutions, our employees receive very attractive offers. The fluctuation is correspondingly high. The resources of UDS do not allow full-time employment. The university tries to avoid permanent employment, which leads to employees looking for another employer after two years. The fact that those employees leave who would be of particular importance for future development of the university is a problem that we can only point out, but not influence.

***Short-term planning*:** UDS is financed primarily through projects with terms of three to six months, and it won its first two-year project in 2018. This means that long-term planning is virtually impossible. We work with "what-if" scenarios to deal with this issue. Ultimately, it increases the time spent by the management team, which continuously tries to have a plan B ready. In such a case, temporary but substantial financial support from the university would give the project the necessary scope to develop larger projects with longer running times.

***"Cultural differences"*:** striking and certainly not unproblematic are also cultural differences that inevitably emerge between the entrepreneurial research project and the superordinate academic infrastructure.

Within academia, individual researchers are rewarded above all for the number of their articles in renowned peer-review journals and for the acquisition of grants from established national or European funding bodies. Social impact is only just beginning to be included in evaluating scholarly performance. Incentives to work with external partners, to combine teaching with applied research, and to engage in entrepreneurial thinking and action are not yet effectively implemented, especially in the humanities. There are little to no incentives for cooperating with external partners or for the time-consuming teaching formats that combine classes with actual applied research. The academic incentive system is mostly geared to the performance of individual researchers and not to the collective performance of a team. Entrepreneurial thinking and acting are largely absent, especially in the humanities. This has consequences for the planning and implementation of projects. Normally, the researcher waits until the money for her project has been transferred to the university account. The entrepreneurial researcher must proactively assess the possibilities of future research projects and make advance investments. For our Data Ethics Decision Aid, UDS itself financed an employee for almost a year to develop the prototype. It was only two years later that the success of this investment became apparent. But even for a small applied research project we have to pay in advance as invoicing takes place in the middle of the project duration.

The largely autonomous position of UDS, the success of its teaching and research, as well as the connectivity of its expertise and topics to daily discourses on 'Big Data', 'Smart Cities', algorithms, 'Filter Bubbles' or 'Fake News' makes it possible to meet many of the challenges mentioned above. The biggest challenge for us is to combine practical activities for external partners with academic research. Especially in the first years when the principal investigator was busy building up the platform and expanding the network, and the lecturer was involved in the development of teaching, they could not publish as frequently as they would like to. The work at UDS allowed little time for academic research. Meanwhile, the funds of UDS make it possible to produce a regular output of scientific publications and contributions at conferences. Young researchers in particular are thus given the opportunity to publish their research.[12]

[12] A list of publications can be found at Datafied Society: <https://datafiedsociety.nl/projects/>

Despite all the difficulties, the advantages of this undertaking clearly outweigh the disadvantages for us. Due to our expertise, we have a place within the social sectors that we want to examine in their transformation. We work with highly motivated students who have fantastic career opportunities. Together, we cannot only investigate data practices, but also develop them, and we stimulate debates among stakeholders and decision makers; through all this, we participate actively in shaping the future datafied society.

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