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BIGGER IS NOT ALWAYS BETTER: WHAT WE CAN LEARN ABOUT
DATA JOURNALISM FROM SMALL NEWSROOMS

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| | |
|--|----|
| Introduction | 4 |
| Why bring data journalism to small newsrooms? | 4 |
| Research Questions | 6 |
| Research Methods | 6 |
| Literature overview | 7 |
| Definition of data journalism | 7 |
| History of data journalism | 13 |
| The power of data journalism | 15 |
| It's a team sport | 17 |
| Advantages for small newsrooms | 18 |
| Best practices | 24 |
| Challenges | 30 |
| Disadvantages for small newsrooms | 38 |
| Outlook | 47 |
| Summary | 49 |
| Bibliography | 52 |

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Introduction

Why bring data journalism to small newsrooms?

The media industry is disrupted. Newspapers and magazines in Europe, North America and Asia are declining. In a world dominated by social media, “we have to tell stories in different ways and pay attention to how we disseminate (...) Excelling at journalistic content is their [media’s] raison d’être, and if new forms of storytelling need to be taken on board to keep doing that, then they will learn them”, Lucy Kueng writes.¹

A chart, a visualisation, video, text, or a combination of these: Data helps us tell stories in a different way, and it can help to provide facts and evidence to readers and sceptics – which we, in times of “fake news” and low trust in media, urgently need. While most large newsrooms often do invest in digital innovation and data journalism, smaller news outlets often don’t. “Even the British media system, where data journalism is generally well embedded into the news cycle, suffers from a central-regional divide due to scarce human and economic resources in smaller news outlets”, Colin Porlezza writes.²

Megan Lucero also strongly advocates the importance of data journalism within small newsrooms. She is one of the UK’s leading data journalists³ and head of the newly founded *Bureau Local*⁴ at the *Bureau of Investigative Journalism* and one of 13 data

1 Kueng, L., *Going Digital. A Roadmap for Organisational Transformation*. Reuters Institute for the Studies of Journalism, 2017, p. 5-9

2 <http://en.ejo.ch/specialist-journalism/how-data-journalism-is-changing-news-organisations> accessed 9 December 2017

3 <https://www.thebureauinvestigates.com/blog/2016-10-24/bureau-hires-megan-lucero-from-the-times-to-lead-new-data-journalism-team> accessed 8 December 2017

4 *Bureau Local* is an innovative journalism and technology team working with local reporters to dig into datasets and tell the stories that matter to communities across the UK. It was founded in March 2017 by *The Bureau of Investigative Journalism*, an independent, not-for-profit media organisation. According to Bureau Local’s managing editor Megan Lucero the three main goals are to tell and enable more public interest stories on a local level, to open more data sets and make them accessible to people and journalists at a local level, and to build a network and curate a network of people around the country.

journalists and industry experts I interviewed for this paper.⁵ She says: “[The industry is] going through massive change at the moment, all media outlets are struggling to find a business model that will work.”

These changes are particularly challenging for small and print-oriented newsrooms. They are even more threatened by cuts in advertising and falling numbers of subscribers than bigger news outlets, but at the same time struggling to adapt to the digital era. In my research, I wanted to find out why and how some small newsrooms decide to invest in data journalism. From my own experience as a reporter at *Wiener Zeitung*, a daily national newspaper in Vienna, I know that in a small newsroom⁶ it can, due to limited time and resources, be hard to invest in new technologies and try out new things.

“Will data journalism remain the preserve of a small handful of pioneers, or will every news organization soon have its own dedicated Data journalism team?” Mirko Lorenz asked five years ago.⁷ “Nowadays, even the smallest newsrooms have somebody who works with data, and there is more to come”, Julius Tröger, head of the interactive team at *Berliner Morgenpost*, told me. Within just three years, this local, Berlin-based newspaper has managed to shake off its rather dusty image by investing in data journalism.

While data has always played a big role in journalism, it is hard to ignore a new trend of journalists working with programmers, graphic designers and developers in order to tell stories. But in Austria, data journalists are still a rare species: Only the small non-profit investigative *Dossier*, the public broadcaster *ORF*, and the daily newspaper *Der Standard* have their own data journalist (yes, it is usually just one per newsroom, *Dossier* being the

5 All interview partners are listed at the end of this paper. If not stated otherwise, all the quotes in the paper come from those interviews.

6 *Wiener Zeitung* is a publishing house in Vienna, Austria, with about 170 employees, 60-70 of them working on the editorial side, including an online team of 9 reporters/editors.

7 http://datajournalismhandbook.org/1.0/en/introduction_1.html accessed 4 December 2017

big exception). “In Austria, there is still a lack in good data journalism”, Peter Sim, data journalist at *Dossier*, told me – but he does see change coming: „*Der Standard* is looking for new people, *Wiener Zeitung* is trying to develop expertise in data journalism.” This paper aims to show how newsrooms – particularly small ones who have been relying strongly on traditional, print-oriented journalists – can start and develop skills in Data journalism. This brings us to the hypothesis and research questions.

The inspiration for my research questions stems from the idea that you do not need a large newsroom in order to do data journalism. Following on from this, I ask following research questions:

Research Questions

1. What enables small newsrooms to do award-winning data journalism?
 - How can journalists become more data-savvy?
 - What supports change within the newsroom?
2. What are advantages and challenges for small newsrooms when working with data?
3. What kind of data journalism can be accomplished by small newsrooms, what is the potential of crowd-sourced data?

Research Methods

This report is based on 13 semi-structured interviews, literature and case studies. The interviews took place in Berlin (August 2017), Vienna (September 2017) and Oxford (October – December 2017). The interviews were conducted in person and, if not possible, via Skype or (in one case) via e-mail. Most of the times I talked to the heads of data or interactive teams of German newspapers *DIE ZEIT*, *Sueddeutsche Zeitung (SZ.de)*, *Berliner Morgenpost* and *Spiegel Online*. I also talked to one computer scientist / programmer (formerly *CORRECT!V*), data journalists (*Dossier*, *CORRECT!V*, freelance journalist Anastasia Valeeva), data journalism trainer Jonathan Stoneman and *The*

Guardian's former editor-in-chief Alan Rusbridger, now principal of Lady Margaret Hall College in Oxford. I talked to Meagan Lucero from the *Bureau of Investigative Journalism's Bureau Local* (founded in March 2017), to industry expert Nic Newman from the *Reuters Institute for the Study of Journalism* at University of Oxford and to Kira Schacht, co-founder of the new German data journalism start-up *Journocode*. I listened to Simon Rogers, who founded *The Guardian's Datablog* and now leads *Google News Lab* when he talked to journalism students at City University in London via a skype call from Silicon Valley. If not stated differently, all the quotes in this paper are from those interviews.

The next chapters include the main findings drawn from these expert interviews. We will take a look at the best-practice-example of a thriving interactive / data team at the local newspaper *Berliner Morgenpost*, whose success story provides an excellent example for change in a small newsroom. Following that, 10-step-guidelines for small newsrooms who want to develop skills in data journalism will be provided, including challenges and possible trap stones on the way. Towards the end of this paper, the current situation and challenges for data journalists in Austria will be explained briefly and an outlook will be given. Let's start with a brief literature overview.

Literature overview

Definition of data journalism

Whenever I talk about my research on data journalism, I am usually asked: "What is data journalism?" Mostly, this comes from people who are not involved in media production or research. Even within the industry, there is a high level of uncertainty what "data journalism" actually is. I want to provide some clarity on that.

“What is data journalism? I could answer, simply, that is journalism done with data. But that doesn’t help much”, writes Paul Bradshaw in the Data Journalism Handbook.⁸

I usually answer the question with “it can be any story or visualisation that is filled with data – from cancelled school classes to MP’s expenses⁹ or the journalistic outcome of big data leaks like, most recently, the Paradise Papers.” In literature, there is no coherent definition of data journalism – but there are several which describe what it can be.

A brief overview:

“Data journalism (...) can improve understanding by explaining complex stories through real people and their circumstances. The art (...) of the data journalist is to work out the salience of that data and to put it into form understandable to a non-nerd audience.”¹⁰ Tim Berners-Lee, the inventor of the World Wide Web, says that journalists will switch from getting stories from the people to “poring over data and equipping [themselves] with the tools to analyse it and picking out what’s interesting. And keeping it in perspective, helping people out by really seeing where it all fits together, and what’s going on in the country”.¹¹

“Data journalism incorporates such a wide range now of styles – from visualisation to long-form articles. The key thing they have in common is that they are based on numbers and statistics – and that they should aim to get a ‘story’ from that data”, writes Simon Rogers¹², and he also makes clear: “Data journalism doesn’t have to mean data visualisation”. It can be a lot of things: a chart, a video, or even text.

8 Bradshaw, P., *Data journalism Handbook*

http://datajournalismhandbook.org/1.0/en/introduction_0.html accessed 4 December 2017

9 In 2009, The Guardian released a complete list of all MP’s expenses, here is the spreadsheet:

<https://docs.google.com/spreadsheets/d/1nAF44s1NOOSzY2VIX9Rv5nEiOnFjDhZ-ToCnMkGPywg/edit#gid=0> accessed on November 29 2017

10 Mair, J. *Data journalism - Past, Present and Future*. 2017, p. 2

11 Arthur, C. “Analysing data is the future for journalists, says Tim Berners-Lee”, *Guardian*, <https://www.theguardian.com/media/2010/nov/22/data-analysis-tim-berners-lee>, accessed 26 November 2017

12 Rogers, S. *Data journalism – Past, Present and Future*. 2017, p. 16-17

Many describe data journalism as an “emerging form of storytelling which combines the skills and techniques informing journalists’ professional practice with data analysis and programming skills”¹³. Data guru Simon Rogers argues similarly: “If data journalism is about anything, it’s the flexibility to search for new ways of storytelling. And more and more reporters are realising that. Suddenly we have company – and competition. So being a data journalist is no longer unusual. It’s just journalism.”¹⁴

Even though it’s “just journalism”, it is quite *en vogue* to talk about it. The term “data journalism” pops up in job advertisements, in names of university courses and discussions about the future of journalism. But only five years ago, the term “would have produced puzzled faces”, argues Jonathan Hewett on one of the first pages of the newly published book, which, of course, carries “data journalism” in its title¹⁵. In the same book, John Burn-Murdoch writes: “(...) there are still newsrooms where statistical methods are seen as dark arts and proficiency with spreadsheets and visualisation tools – let alone the command line – is viewed with suspicion. Even today journalism internships and postgraduate courses are overwhelmingly the domain of arts graduates who dropped maths and the sciences as early on in their education as possible.

Gradually, the number of analytical types seeing journalism as a legitimate career will grow, but attitudes in the upper editorial echelons must change in order to expedite this transition. The editors of tomorrow face a simple question: ‘Is it enough for my journalists to keep throwing anecdotes at the wall in the hope that something sticks, or

13 Appelgren, E., & Nygren, G. *Data journalism in Sweden: Introducing New Methods and Genres of Journalism into “Old” Organizations*. In: *Digital Journalism* 2 (3), 2014, p. 1–12.

<http://www.tandfonline.com/doi/abs/10.1080/21670811.2014.884344> in Franklin, B. *The Future of Journalism* p. 485

<http://www.tandfonline.com/doi/pdf/10.1080/1461670X.2014.930254?needAccess=true> accessed November 29, 2017

14 Rogers, S. <https://www.theguardian.com/news/datablog/2011/jul/28/data-journalism> accessed 4 December 2017

15 Hewett, J. *Data journalism - Past, Present and Future*. 2017, p. 3

should they be carrying out social science on deadline?"¹⁶ So it's about providing evidence with data. I will talk more about that later.

"It sounds trivial, but all journalists are storytellers who want to tell their stories the best way. If they know that you have people that can develop things apart from great entry scenes, it is quite natural for them [reporters] to cooperate with data and interactive colleagues", Sascha Venohr, head of *ZEIT ONLINE*'s data journalism team, told me. So data journalism is a lot about collaboration. We will hear more about that later as well.

"A good story contains data and statistics. Every investigative story should work with data in order to quantify it", computer scientist Stefan Wehrmeyer says. What data journalism has in common with investigative journalism is that "it is supposed to bring additional value to a story, in this case from the data", Peter Sim, data journalist at *Dossier*, argues.

The two – data journalism and investigative journalism – often come in pairs. But the term "investigative" is also a bit unclear. Does it always mean months and years of undercover research, and is it only investigative if it has a huge impact? For small newsrooms, Simon Roger's answer to that might come as a relief: "Not all data journalism has to bring down the government – it's often enough for it to shine a light in corners that are less understood, to help us see the world a little clearer. And if that's not investigative, what is?"¹⁷.

But when is a newsroom considered as "small"? Often times, local newspapers can be considered as "small", as they have comparatively little circulation, a smaller staff of journalists in their newsrooms and less resources than big publishing houses. But there is "no agreed-upon definition of what constitutes a 'small' or 'medium' or 'large'

16 Burn-Murdoch, J. *Data journalism - Past, Present and Future*. Suffolk: arima publishing, 2017, p. 155.

17 Roger, S. *Data journalism - Past, Present and Future*. 2017, p. 17

newspaper”, Christopher Ali and Damian Radcliffe write in a report published in November 2017.¹⁸ Earlier this year, the authors did a survey on over 400 journalist, and define newspapers with circulations under 50,000 as “small-market”.¹⁹ For this paper, I am referring to this definition, and I categorise *Berliner Morgenpost*, *Dossier*, *CORRECT!V* and *Bureau Local* as “small”.

Despite of that, the interviews with bigger newsrooms *ZEIT ONLINE*, *Spiegel Online*, *The Guardian*, *SZ.de* and industry experts also helped me understand the advantages and disadvantages within small newsrooms.

The study mentioned above states that in the US, there is not much research on small-size newsrooms: “(...) local newspapers with circulations below 50,000 (...) tend to get overlooked due to the narrative dominance of larger players. However, small-market publications represent a major cohort that we as a community of researchers know very little about, and a community of practitioners that too often – we were told – knows little about itself”.²⁰

I argue that similar is true for Europe: Even though small newspapers bring value to their local communities, there have not been huge amounts of scientific research on them. One of Ali and Radcliffe’s key findings is that “change is coming to smaller papers, but at a slower pace (...) many local newspapers have enjoyed a longer lead time to prepare for the impact of digital disruption”. Often, smaller newsrooms were slower when they tried to adapt to the digital environment, and they were certainly slower in picking up on data journalism.

18 https://www.cjr.org/tow_center_reports/local-small-market-newspapers-study.php “New research: Small-market newspapers in the digital age” accessed 27 November 2017

19 https://www.cjr.org/tow_center_reports/local-journalism-survey.php accessed November 2017

20 https://www.cjr.org/tow_center_reports/local-small-market-newspapers-study.php “New research: Small-market newspapers in the digital age” accessed 28 November 2017

Another of their key finding is that there is “no cookie-cutter model for success in local journalism. Each outlet needs to define the right financial and content mix for itself (...) editors whose papers are part of larger groups were critical of corporate attempts to create templates—and standardize approaches—that remove opportunities for local flexibility. ‘What works in one area, won’t necessarily in another,’ was a message we heard from multiple interviewees, and a maxim which can be applied to both content- and revenue-related activities.”

In my interviews, I heard similar things. So when I give best practice examples and advice on how to implement data journalism, this may not be suitable for every journalist and every newsroom. But mostly, I will refer to quite easy steps one can follow through and adapt based on time and money they want to commit – and how much you are willing to change.

It may sound trivial, but you always have to distribute your resources according to what you are hoping to achieve. But at the same time, it is dangerous to use this as an excuse to not adapt: Often times, I hear that “we’re already doing so much”, “we can’t do more”. Well then, let’s drop some of the old stuff and do something new – or as Lucy Kueng writes: “Digital disruption has in the main involved addition: new products, new systems, new processes, new platforms. The partner activity – removing activities – has been less evident.”²¹

But most likely, giving out definitions will not get traditional journalists excited about data. Actually, the term “data journalism” might have the opposite effect, as Alan Rusbridger, *The Guardian’s* former editor-in-chief, told me: “The term confuses people, and mystifies it. It is such a broad term. If you are 45 years old and you’ve worked in a traditional newsroom, [you might not know] what data journalism [is].”

21 Kueng, L., *Going Digital. A Roadmap for Organisational Transformation*. Reuters Institute for the Studies of Journalism, 2017, p. 16

History of data journalism

Data journalism is nothing new. Data visualisation started in the beginning of the 19th century: The French civil engineer Charles Joseph Minard created a total of 51 maps during his lifetime, and was highly recognised for his information graphics in civil engineering and statistics.²²

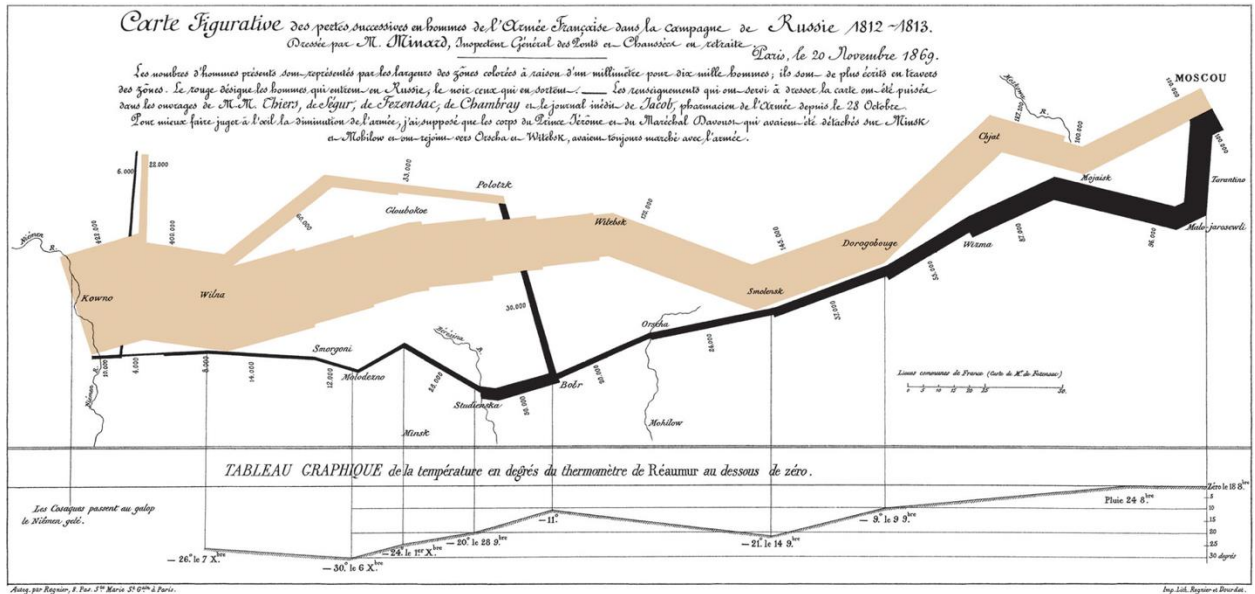


Figure 1: Charles Minard's map of Napoleon's disastrous Russian campaign of 1812. The graphic is notable for its representation in two dimensions of six types of data: the number of Napoleon's troops; distance; temperature; the latitude and longitude; direction of travel; and location relative to specific dates.²³

Today's data journalism evolved from computer-assisted reporting (CAR) in the US in the 1960's. "Even by the mid-2000's, the lack of such networks in the UK for sharing ideas, skills and discussions was another pointed contrast with the situation in the USA", Jonathan Hewett writes²⁴. By 2005, "more journalists grasped the opportunities offered by the internet, particularly financial reporters accessing records." In 2010, WikiLeaks revealed huge amounts of data from the conflicts in Iraq and Afghanistan,

²³ https://en.wikipedia.org/wiki/Charles_Joseph_Minard accessed 8 December 2017

²⁴ Hewett, J. *Data journalism - Past, Present and Future*. 2017. p. 4

and of cables from US embassies around the world. “It was a big deal for us – and it also made newsrooms see data people differently,” Simon Rogers, who had launched *The Guardian’s Datablog* the previous year, elaborates:²⁵ “The next step in data journalism at City [University in London] was the MA Interactive Journalism, which I set up in 2011.”²⁶

What’s different today is that there is more data available than ever before; the internet has democratised the access to statistics. “Today, there is more data and with help of machine reading, it becomes easier to combine them”, Peter Sim says. Therefore, data can be used to explain things we couldn’t understand before.

If small newsrooms want to use data to tell stories to their audiences, they first need to understand what can be done with data. “We had a young woman who was an intern and understood how to scrape data, and we said ‘go sit with the city team’ because they were – well they could have been working on the data set but weren’t – and then somebody was doing a big 3-week-investigation and she said ‘I could get that information in two hours’, and she just went ‘click-click-click – there is the information’. After that they asked ‘Can we keep her forever? We hadn’t even realized you could do that. We didn’t realise what data journalism is.’”

Therefore, one of this paper’s aims is *to show* what data journalism can be. I want to give an idea of how data can benefit journalism in small newsrooms. But first, I want to explain why data journalism is important in the first place.

25 Rogers, S. *Anyone can do it. Data journalism is the new punk*
<https://www.theguardian.com/news/datablog/2012/may/24/data-journalism-punk>

26 Hewett, J. *Data journalism - Past, Present and Future*. 2017, p. 11

The power of data journalism

Simon Rogers thinks of data journalism as world-changing: “Not only is data journalism changing in itself, it’s changing journalism too. And the world.”²⁷ “Data journalism can be really influential, really powerful, and not only in the projects that stand out. There are stories coming from data that can’t be found otherwise. And people need those stories”, data journalist Anastasia Valeeva says. *Bureau Local’s* Megan Lucero argues similarly: “Data provides evidence that often isn’t there. It makes it more difficult for government to turn their backs. Not always – but it can be very powerful. The great thing about data is that you can process things faster, you can stop doing repetitive things because coding can do that for you.”

Politics, business or daily life: In journalism, we use data for all kinds of stories. “In political reporting, there are many ways to enable transparency; when reporting on conflicting interests and lobbying, much more can be done – or in the visualization of daily life”, Christina Elmer, head of data at *Spiegel Online*, says.

So, for example, by providing numbers on how and by whom political parties are funded, data journalism can contribute to more transparency within our society. And if journalists not only provide the data in the context of their articles but upload the actual data set, they also contribute to transparency within journalism. *The Guardian* aims to do so by providing data on *Datablog*, as Alan Rusbridger explains: “We said: All the data we get, we will make open. Everything. Quite often the readers would take our data, and use it in ways that we thought were better than we did. They would visualise it, use it in a different way (...) We were road testing what it means to be open (...) some people despise the mainstream media, they ask: ‘Why should we believe you?’ The best answer is not ‘because we are journalists’ but: ‘well, here is our data, this is how we came to this solution.’ (...)”

²⁷ Rogers, S. *Facts are Sacred: the power of data*. London: Faber and Faber, 2013, p. 2

Data journalism increases transparency, helps to hold power to account and therefore stories can have more impact. But data-journalism is also a traffic-driver and can help to reach new audiences. “When we built a map for the England Riots²⁸, our traffic shot through the roof. We had millions of page impressions a day”, Alan Rusbridger recalls.

But not only big media outlets like *ZEIT ONLINE* and *The Guardian* can see that data-driven stories lead to more traffic on their websites. Julius Tröger, head of interactive at *Berliner Morgenpost*, told me: “Every year, the most successful stories are from us. Most of the time the 2nd and 3rd story best as well. When things go viral, five to ten percent of the traffic are generated from data stories. During elections, it can be ten percent and more.”

“Our data-driven stories often go viral and have a reach beyond our classic readers and users. Data stories would often reach users who usually wouldn’t go to *ZEIT ONLINE*”, told me Sascha Venohr, head of data at *ZEIT ONLINE*. Wolfgang Jaschensky, head of development at *SZ.de*, says that while data stories do not necessarily lead to more traffic, but: “We can see that data projects work when they are done well.”

And what’s in it for smaller newsrooms? “Telling a story with data often provides a way of conveying a bigger picture, but still illustrate local implications by highlighting a localized aspect of a dataset. It also helps set apart smaller newsrooms and provide a unique experience to their audience. Data-driven methods can also help aid the watchdog role of journalism, which is especially needed in local journalism that focuses on smaller communities which are not in the focus of the national press”, Kira Schacht, data journalist and co-founder of the German data journalism start-up *Journocode*, says.

28 <https://www.theguardian.com/news/datablog+uk/london-riots> accessed 10 December 2017

Key Findings

It's a team sport

Simon Roger states that his “dream data team” consists of six to seven people and consists at least of one designer or data developer who can build stuff quickly²⁹.

Interestingly, this is about the size of the successful data teams I talked to – and what stands out is, that this is regardless of the size of the newsroom. Of the six data teams I spoke to, all work in teams of mainly data journalists and usually between one and three programmers/developers. So regardless of the size of the news outlet, the size of the data team tends to be very similar (number of data journalists/programmers/developers stated in parentheses): *Spiegel Online* (5), *ZEIT ONLINE* (7), *Sueddeutsche Zeitung* (6), *CORRECT!V* (6-7) and *Berliner Morgenpost* (6).

The small non-profit investigative *Dossier*³⁰ can't really be compared as they are not part of a bigger news outlet but a stand-alone team of six in total (one designer/programmer/developer, one data journalist, three journalists, one editor-in-chief). But they also always work in teams: “Especially in bigger projects. The purpose is quality control, and we want to make sure everybody brings in different skills. There are very few who can do everything, some people know more about data and statistics, others are storytellers. Our web designer/programmer develops many of our tools, he is also our coder”, *Dossier's* Peter Sim explains.

Of course, having a data team of six or seven people is a bigger commitment for smaller newsrooms – which makes it even more interesting to see why they would do it. We will learn more about that in the next paragraphs.

²⁹ He said that during the during the book launch *The Media Society: Data journalism Today - The Good, The Bad and The Ugly* City University, London, 9 November 2017

Advantages for small newsrooms

Interviewees mentioned certain advantages for smaller newsrooms when doing data journalism. They have either experienced this themselves when working in a small newsroom or data team or are industry experts who shared their ideas and point of view. The mentioned advantages for small newsrooms are:

1) Better communication

“If you have got a leader who is committed to innovation, it should be easier to turn around a small newsroom, because you can have better conversations”, *The Guardian’s* former editor-in-chief Alan Rusbridger says.

Julius Tröger, head of interactive at *Berliner Morgenpost*, calls “knowing everybody” an advantage for small newsrooms: “I am convinced that it is easier to do data journalism in small newsrooms. The big advantage is that we all sit in one newsroom. In bigger organisations, people are more spread-out. In our newsroom, there is nobody you don’t know. You might have fewer resources and less journalists, but in big newsrooms you won’t hear about what others are doing.” How he was able to initiate change within his newsroom will be explained at the end of this chapter.

2) Easier to collaborate and experiment

Having less expertise in-house is not necessarily a disadvantage. “It is much easier for smaller newsrooms to change and introduce new things; this is your new resource. When you are small, you don’t have much, but this can be a benefit. It is great to be a smaller organization, because you can pair up with academics and researchers. But the thing to watch out for is to find a common ground regarding understanding each other, work flow and deadlines”, *Bureau Local’s* Megan Lucero told me.

Plus: Small newsrooms are a better playground for experiments. “We can take time to experience and try things out. When *Sueddeutsche Zeitung* or *Spiegel Online* don’t have output for a while, or if they fail, there will be a loud outcry. With us, it is the other way

around: Nobody knows us, nobody cares – until we do something that stands out. Then, people are really surprised”, Julius Tröger says.

3) Change can happen faster

Data start-ups have a big advantage of not having a “long-grown resistance against data”, as Peter Sim explains: “Small and new newsrooms can focus on establishing a data-supportive culture from the beginning. There are no fights between print and online, they are more flexible in working together and in choosing topics. In bigger, well-established newsrooms, there is usually no awareness for data journalism, neither within staff nor the editorial board. They don’t know what data journalism is, how it works and what it needs to do it. Access to data bases is missing, and there often is resistance like ‘Why do we need that? We have someone for graphs’. Change in bigger newsrooms happens, often, very slowly.”

It is easy to be intimidated by data visualisation projects done by a team of dozens at newspapers like the *New York Times*. But, as data journalist Anastasia Valeeva says: “It doesn’t have to be (...) shiny to be good. That is important to know for small newsrooms. You can be a small team. It is not just all about finance and size. It is mostly about enthusiasm; this really plays a great role.” And it’s definitely easier to spread enthusiastic start-up spirit within smaller newsrooms.

4) More permeability

Smaller newsrooms also hold the potential of being more permeable between its departments. “In other newsrooms, the IT says ‘this is the Content Management System and that is it’ (...) this is different at *Berliner Morgenpost*, our IT gave us full access to their servers. That is an advantage of being so small”, Julius Tröger says. And while it used to be necessary to “talk to IT”, new tools for combining and visualising data have changed that, digital strategist Nic Newman explains: “Previously, small companies couldn’t afford this and were always two steps behind (...) You don’t need big teams

anymore, one person with multiple skills can do it, [it all] comes down to the creativity of one or two people.”

Nerds in newsrooms: Case Study Berliner Morgenpost

Julius Tröger started working for *Berliner Morgenpost*'s Online Team in 2010, and at the same time began studying computer science (part-time, post-graduate). In 2011, he had the idea to try out data journalism on occasion of the parliamentary elections in Berlin. With the help of another journalist, he programmed an interactive map where users could select the results of their own polling station. "You weren't able to do that anywhere else back then", Julius Tröger says. In 2012, he did two internships in the USA: one at *The Guardian*, where he learned from his role model Gabriel Dance, and another one at the Investigative non-profit *ProPublica*: "They are among the best, real nerds, I learned so much from them."

All of this happened on his own initiative and during vacation time, but when his editor-in-chief realized how useful this is, he was reimbursed. When he came back to Berlin after his internships in the US, Tröger quit his duties at the online team and concentrated solely on data journalism. He said to his editor-in-chief Carsten Erdman: "I can do a little bit of programming, but I need a programmer." He got one, and from then on, the two of them were working with data. "Crucial was that everybody works in the same newsroom. They are part of the newsroom, but not delivering for the newsroom. On the contrary: They think stories digitally, and then we see what we do with it in the printed newspaper. This can only work when the developer think of themselves as part of the newsroom and if they are part of the team", Erdmann told Berlin-based newspaper *taz*³¹.

When they won their first journalism awards, the small data team received attention within the newsroom. "From then on, we did more projects in that field and became more and more freedom and people to do so. Eventually we had our own team that keeps on growing." (Their interactive team currently consist of six journalists: five full-time, including a Google fellow, two developer work half-time). "When we were

³¹ <http://www.taz.de/!5318834/> accessed 4 December 2017

nominated and received those big journalism awards, the print reporters were surprised: ‘Oh, online journalism is more than copy and pasting, they receive awards?’³² This was a new, exciting development. In 2013, at the latest, everybody had realized what we had done. Sometimes the editor’s and reporter’s kids would show them our stories and say: ‘Look what cool things *Berliner Morgenpost* is doing’. This is when the more senior print colleagues started wanting to work with us, they became co-editors of data-driven stories. By now, we have done data stories with almost everybody. We are now an integral part of the newsroom. When our colleagues have questions regarding data, about Excel or statistics, they approach us. Today, we are totally integrated – but during the first couple of years, we were a foreign body.”

In 2014, Tröger was awarded “journalist of the year” and *Berliner Morgenpost*’s interactive team was on the cover of the “Medium Magazine”, title: “Nerds in Newsrooms”. Other newsrooms started sending their journalists to intern at the interactive team in order to start their own data unit.³³ Since January 2017, the data team develops data-driven stories for the whole Funke Gruppe³⁴, their stories are adjusted with local data for local outlets like *Hamburger Abendblatt*. “This is quite practical, the data has already been programmed and only needs to be filled with new data and some text”, Tröger explains.

Sometimes they adapt ideas of big news outlets like the *New York Times*, they research how the issue applies to Berlin or Germany. Among German-speaking media, *Berliner Morgenpost* is among the data journalism pioneers – despite its “conservative and

32 Until end of November 2017, *Berliner Morgenpost*’s interactive team has received 50 journalism awards and was nominated for many more. <http://www.juliuastroeger.de> accessed 30 November 2017

33 http://datadrivenjournalism.net/news_and_analysis/the_story_of_a_transformation_in_three_years accessed on 4 December 2017

34 <http://www.funkemedien.de/de/presse/medienmitteilungen/news/Interaktiv-Team-der-Berliner-Morgenpost-unterstuetzt-zukuenftig-alle-FUNKE-Regionalmedien-bei-Datenjournalismus-Projekten/> accessed 7 December 2017

provincial image”³⁵. But if you look at their financial situation, the investment in data journalism might come as a surprise: With a relatively small newsroom of about 90 journalists, among them 8 people in the digital/online department, it is one of the German newspapers with the highest circulation losses: Since 1998, the amount of sold newspapers dropped 56% and currently holds at 79,934 copies.³⁶

35 <http://www.taz.de/!5318834/> accessed 4 December 2017

36

<http://www.ivw.eu/aw/print/qa/titel/1010?quartal%5B20172%5D=20172&quartal%5B20173%5D=20173#views-exposed-form-aw-titel-az-aw-az-qa> accessed 4 December 2017

Best practices

When one talks about successful data journalism in Germany, *CORRECT!V* is usually among the first ones mentioned. *CORRECT!V* is a small newsroom of about 25 reporters, editors, data journalists and programmers/developers in total and was the first non-profit investigative newsroom in the German-speaking world. *CORRECT!V* describes its goal to “give citizens access to information”³⁷. They are highly regarded for their data-driven investigations. I will refer to their experiences several times in this research paper, starting with one of their findings what works well:

1) Make it personal with data bases

With data journalism, you can tell a different story for everyone and this is a unique selling point of online journalism – no printed newspaper or TV program can personalize data the same way as digital can. And users want personalised stories. Databases are among their most popular content formats, Jonathan Sachse, data journalist at *CORRECT!V*, says: “Databases are generally very popular with readers – we haven’t had one database that was not successful. People love to personalise their search.” His former colleague Stefan Wehrmeyer, a programmer, adds: “Once you are personally concerned, or your parent’s nursing home, your doctor...it will catch your interest. That is a service we [as data journalists] can provide.”

CORRECT!V’s data base “Find your doctor”³⁸ allows users to find whether or not their doctor has received money from pharma companies, similarly to a project done by *Pro:Publica* – but while doctors in the US have to publish whether or not they received money from the pharma industry, Austrian and German doctors were able to choose whether or not they want to give their permission for publishing the numbers.

³⁷ <https://correctiv.org/en/correctiv/> accessed 5 December 2017

³⁸ <https://correctiv.org/en/investigations/euro-doctors/database/> accessed 5 December 2017

2) Let them play

Whether it is drawing the former GDR border or guessing how unemployment dropped during Barack Obama's US presidency: Users like to interact, and those exercises can be quite educational, too. Do you still remember where Germany was divided? 36,597 people have tried to answer this question by drawing a line on a German map on *Berliner Morgenpost's Einheitsreise*³⁹. "A lot of people participated", Julius Tröger confirms. After a user has drawn where s/he thinks the border was, the actual border is displayed, together with how well one did compared to the other users ("only 20 percent of users drew worse than you"). Tröger, whose brain child this project is, elaborates: "People like rankings, want to compare."

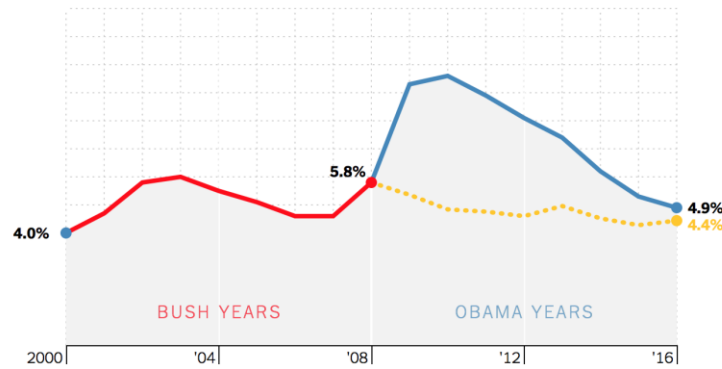
The *New York Times* wants its users to draw as well, e.g. how the unemployment rate developed during Barack Obama's US presidency. "You draw it"⁴⁰ challenges its readers "to see how smart they are". "It shows that data journalism doesn't always have to be a huge project, you don't always need a team of ten people, it can also be a small but ingenious idea, and you can copy it from others", Peter Sim says.

³⁹ <http://einheitsreise.morgenpost.de> accessed 28 November 2017, 36.597 people since October 2015

⁴⁰ <https://www.nytimes.com/interactive/2017/01/15/us/politics/you-draw-obama-legacy.html> accessed 5 December 2017

Draw your guesses on the charts below to see if you're as smart as you think you are.

Under President Obama, the **unemployment rate ...**



... **reached its lowest level since 2007**. The **current rate** is a stunning decline from the 9.3 percent in 2009, the year Mr. Obama took office.

ZEIT ONLINE follows a similar approach with its project “Diving into Urban-Rural Prejudice”⁴¹: The story is structured by quiz-like questions and users are asked to say whether they think statements like “People in small towns meet up with friends more often” are true or not. After they have taken their guesses, they see whether they were right – yes, city dwellers are more social – and the real data is displayed in graphs. This project is done by a *ZEIT ONLINE*, which is not a small newsroom, and quite “shiny” – but the idea behind it is simple.

These approaches can be categorised as gamification or edutainment. But data also has the potential to add more value to stories on sensitive topics. “Data helps you to give a story a new angle; one that is more straight-forward and based on facts. This is a huge benefit for highly emotionally discussed topics like refugees”, Peter Sim says. He works for the Austrian investigative non-profit *Dossier*, who did their first story on asylum in

⁴¹ <http://www.zeit.de/feature/germany-urban-rural-population-division-prejudice> accessed 5 December 2017

Austria and Germany which went viral. For the data, they visited 104 refugee shelters and revealed the poor living conditions provided for asylum seekers.⁴² That leads us to the next type of data stories:

2) Self-collected data stories

For the story mentioned above, *Dossier* spent many weeks obtaining and curating data. “It required a lot of work force, I think that is why it got so much attention by the public. We have good experiences with self-collected data, but it is very time consuming”, says Peter Sim. Two other news outlets also told me about their experience with self-collected data for stories on asylum: *Bureau Local*’s story “Thousands of vulnerable women turned away as refuge funding is cut”⁴³ required five months of investigation; local journalists interviewed women fleeing violence, they collected data through Freedom of Information requests from local authorities and police forces, and surveyed 40 refuge managers. “It was really useful and beneficial to have the feet on the ground”, *Bureau Local*’s Megan Lucero says. When *ZEIT ONLINE* wanted to do a story on attacks on refugee shelters, there was also no data available – so print and online journalists collected the data and developed a data set on their own for this story on anti-immigrant violence in Germany⁴⁴.

3) Crowd-sourced journalism

Crowd-sourcing is "a distributed problem-solving and production process that involves outsourcing tasks to a network of people, also known as the crowd".⁴⁵ If you are dealing

42 <https://www.dossier.at/asyl/karte/> accessed 28 November 2017

43 <https://www.thebureauinvestigates.com/stories/2017-10-16/a-system-at-breaking-point> accessed November 28, 2017

44 <http://www.zeit.de/politik/deutschland/2015-11/anti-immigrant-violence-germany> accessed 5 December 2017

45 <https://en.wikipedia.org/wiki/Crowdsourcing> accessed 8 December 2017

with a large data set and don't have the capacity to verify it, you might want to ask your readers for help. This is what The Guardian did with their story on MP expenses.⁴⁶

"We had 80,000 pages, so we said 'we can't cope' and put them all online and said 'if it is interesting, tell us briefly what it is'. This is how we whittled 80,000 pages down to 200 – those kind of exercises are brilliant", *The Guardian's* former editor in-chief Alan Rusbridger says. He concludes: "Crowd-sourced data journalism is an essential part of the future."

According to Michael Anderson⁴⁷, the lessons learned from this immense crowd-sourced project are: 1) Your workers are unpaid, so make it fun 2) Public attention is fickle, so launch immediately 3) Speed is mandatory, so use a time frame 4) Participation will come in one big burst, so have servers ready.

The small and larger news outlets I talked to have very different amounts of experience with crowd-sourced data journalism, and while some were very successful at it, others failed. Over the next few paragraphs, I will give an overview of what worked well and what didn't: The German non-profit *CORRECT!V* asked their users to collect data from their bank's annual financial statements, as only two thirds of the banks publish those online, but they pin it in their banks, so we asked users take pictures of those. 500 users provided data. In another case, they did a story on cancelled schools classes in Dortmund.⁴⁸ Until then, the German city Dortmund had only worked with samples, but

46 <https://www.theguardian.com/news/datablog/2009/jun/18/mps-expenses-houseofcommons> accessed 5 December 2017

47 <http://www.niemanlab.org/2009/06/four-crowdsourcing-lessons-from-the-guardians-spectacular-expenses-scandal-experiment/> accessed 8 December 2017

48 <http://www.niemanlab.org/2017/05/investigative-outlet-correctiv-crowdsourced-data-collection-with-the-help-of-a-local-newsroom/> accessed 8 December 2017

CORRECT!V asked their users to collect and provide data. Over one month, people added data on which classes were cancelled and what was happening instead.⁴⁹

“It is hard to keep people excited for a long time. The right period of time is an essential question for every crowd-sourced project, as well as marketing”, Jonathan Sachse says. He also recommends having a kick-off event, and showing users how many people are online and working on the project. He emphasized the importance of keeping contact and keeping the user’s email addresses, in order to get back to them.

One of the limitations of crowd-sourced data journalism is the potentially low response rate, which is why small newsroom often either have little or bad experience with it. Despite being very successful with data journalism, *Berliner Morgenpost* has not done crowd-sourcing. “We have asked readers to send in photos, this was never successful. But we should try again”, Julius Tröger says.

Another limitation of crowd-sourcing is that “we have to accept that the people who provide the data are not going to be representative”, *Bureau Local*’s Megan Lucero says. Also, crowd-sourced data has the danger of being bias. The UK Snow Map⁵⁰ is a great way of engaging people to contribute and there are probably enough people contributing to have reliable data – but who is on Twitter? Certainly not the general population. This is why *Sueddeutsche Zeitung* has not done it a lot, but their crowd-sourcing project map of danger zones for bikers in Munich was “extremely high in responses”, Wolfgang Jaschensky, head of development, says and recommends doing crowd-sourcing on subjective topics.

49 <http://www.niemanlab.org/2017/05/investigative-outlet-correctiv-crowdsourced-data-collection-with-the-help-of-a-local-newsroom/> accessed 5 December 2017

50 <http://uksnowmap.com> accessed 10 December 2017

Challenges

1) Project management

“It sounds bizarre, but the biggest challenge is project managing. If there is an academic, a developer or a coder who wants to volunteer time to journalism, it sounds great and resourceful, but the big challenge is to manage that. You have to learn how to work with academics and programmers – this is really tricky”, Megan Lucero says, and describes her job: “I am not a programmer. My role is more the one of a coordinator and a project- and quality manager. I assure that we have all the data we need, that we find stories in the data, that all the data and graphics are accurate.” The questions she frequently asks herself are: What is the data set we are looking for? What needs to be done with it? How long will it take to check the data, clean the data? Especially small newsrooms ask themselves these questions. As their resources are limited, time and project management becomes even more important.

“You should sit down and make a plan, estimate how much time the project will take you and how likely it is to be successful. List the pro and cons of the story, where you can get the data, and if you know, the data is there, but I won’t be able to get it, then forget it. You don’t need to start that project”, Peter Sim recommends.

Similarly, it is important to stop if a data project is not working: “In data journalism, you spend most of your time preparing a data set, and just a portion of that time analysing it. And sometimes you have to accept that at the end of it, there might not be a story at all, which is really difficult”, Megan Lucero says.

2) Work together from the beginning

Several of my interviewees emphasized the importance of collaborating from scratch: “If you want data to be part of the story, you should consider that early on, it should be a logical part of the story, not, for example, a graphic that is coincidentally in there. Ideally,

you have an expert that take care of the visualisations and has a good eye for that”, computer scientist Stefan Wehrmeyer says, and data journalist Jonathan Sachse, adds: “We have done a lot of mistakes in our collaborations, the work flow was often not quite clear. When do reporters start their research and at what point do the data journalists come in? Ideally the collaboration starts right at the beginning (...) how you work together makes the big difference. The most common mistake is that the reporter does research, and somewhere within that s/he has a big data set, and when s/he is done with the story, the reporter says: ‘Can you help me with the data? I will implement it in the [finished] story.’”

Data journalist Peter Sim also argues: “It is important that everybody is involved early on when planning the story. Developer, data journalist, classical journalists, and the person doing the info graphic or applications have to talk to each other. It should not be like this: When the story is finished you say to the data people ‘make it look pretty’”. But these mistakes can be avoided easier in smaller newsrooms.

And not only at the small *Berliner Morgenpost* print and online colleagues collaborate on data stories: data-driven stories are often the ones, where the weekly newspaper *DIE ZEIT*'s journalists and ones from their online newsroom *ZEIT ONLINE* work on collaboratively. An example for such a print-online-collaboration was the already mentioned story *Germany in Flames*⁵¹, and the by-line including 15 journalists reveals the work force behind it. But big teams can actually make cooperation more complicated. So here's another advantage for small newsrooms.

3) Data access and Freedom of Information (FOI) Act

How do small newsrooms get access to data? “We scrape the data from everywhere in the net, we ask for data, we buy data” *Berliner Morgenpost*'s Julius Tröger explains.

⁵¹ <http://www.zeit.de/politik/deutschland/2015-11/anti-immigrant-violence-germany> accessed 8 December 2017

Buying data can be more difficult for smaller news outlets, and actually accessing data can be very time consuming. Tröger criticises: “Almost always, the data is in a crappy format. Others have to decode text, we have to clear data, this makes up at least 1/3 of the work.”

“Civil services sit on big data bases, but they don’t think in data, they think in documents, and often they don’t know how to provide data. Often times, we tried to explain it to them, and often times we failed”, Stefan Wehrmeyer criticises and adds: “The huge disadvantage is that the provided data is often already old.” When dealing with civil services, data journalist Jonathan Sachse recommends finding out who maintains the database and to “ask them for the exact column or fact you need”. But smaller, less known news outlets might even have a harder time to convince authorities to give them access to their data.

The German Freedom of Information Act (FOI), which came into power in 2006, made it easier for journalists to request information from civil services – but, as Christina Elmer, head of data at *Spiegel Online*, explains: “The FOI is not very well-known yet, and often times you don’t know why they [officials] won’t provide you the data - whether they don’t know how to do it, or whether they don’t want to do it. I feel like they don’t trust journalists to handle sensitive data responsibly, for example that they will anonymize personal data. We [journalists] are not well-respected partners, but this would be essential for a better cooperation. Sometimes we have to fight for a long period of time before we get the data.”

“Access to data can’t be taken for granted. Compared to other countries, relatively little data is openly available [in Germany], and the authorities are often unwilling to comply with FOI- requests. Stalling tactics are common. The willingness of authorities to provide data varies significantly by region, which might make it difficult for regional

newspapers who happen to report on a city where open data isn't well developed," says Kira Schacht, co-founder of the German data journalism start-up *Journocode*.

No Freedom of Information in Austria

Data access is regulated by law in countries all over the world. There is FOI⁵² in the USA, in the UK, and, as mentioned, in Germany. But there is no such thing in Austria.

“In Austria citizens still do not have any legal right to the access to information. Public authorities hold back public information and data, which makes it difficult for journalists and particularly data journalists to do their work properly,” writes Magdalena Wadl⁵³, whose master thesis I recommend as overview on the current situation of data journalism in Austria.

Is the missing FOI the reason why we haven't seen more data journalism in Austria? Is it just harder to get data? “In Austria, official confidentiality ('Amtsgeheimnis') is a problem”, Peter Sim explains: “When we wanted to do a story about gambling, the municipal authorities said it would be too much work to give us the data on where those gambling machines are. In the end, the Austrian Economic Chambers had a list. So often times you get stuck somewhere and [have to] get creative. The best thing is to have a couple of projects running parallel, because sometimes you need to wait – but as soon as it becomes clear that you can't continue a story, drop it.”

Jonathan Stoneman, data journalism trainer in the UK, says “there is no direct link between FOI and Open Data – you can have one without the other, [but it does require a] spirit of openness and transparency”. He elaborates on that: “All governments need a

52 „Since 1967, the Freedom of Information Act (FOIA) has provided the public the right to request access to records from any federal agency. It is often described as the law that keeps citizens in the know about their government. Federal agencies are required to disclose any information requested under the FOIA unless it falls under one of nine exemptions which protect interests such as personal privacy, national security, and law enforcement.” (United States Department of Justice)

53 Waldl, M. *Datenjournalismus in Österreich: eine qualitative Untersuchung zu aktuellen journalistischen Entwicklungen und Arbeitsweisen*. Wien: Universität Wien, Fakultät für Sozialwissenschaften, 2016.

suitable philosophy of openness – after all, public data literally belongs to the public; we create it in our interactions with government, by driving around, using phones, using public services, being born, moving house, getting sick, dying, spending money, or having money spent on our behalf. We should be able to examine government data without having to ask for it.”

Of course having a FOI would be beneficial to data journalism and a more open, transparent society in Austria. But not having a FOI does not mean that there is no free press – after all, *Reporters without borders* ranked Austria place 11⁵⁴.

“Success breeds success. It will grow if journalists find data they can use. I would argue that Austria probably has further to go in changing the government’s mentality towards openness than some other EU members – but let’s see what happens,” Jonathan Stoneman says.

4) Recruiting data journalists – where are all the geeks?

“Data journalism takes a special kind of skill set. As a newsroom, you need access to people with data science skills that can deal with data proficiently but still employ a journalistic approach. You might even need developers and graphic designers to implement data projects”, data journalist Kira Schacht says. But newsrooms struggle to find the right people. A brief overview of my interviewees’ experiences:

“In the beginning, we couldn’t quite understand why not more young journalists want to do data journalism. Three years ago, it would have been a job guarantee. If [then’ you were just an average data journalist, you would have gotten a job at *Sueddeutsche Zeitung* right away. That has changed now, there is a market of good people. Our intern was already very skilled when he started here”, Wolfgang Jaschensky says.

54 <https://rsf.org/en/austria> accessed 10 December 2017

“It was very hard to find people, we had to work with career changers. It is not enough to educate journalists. We also need work with career changers with a great interest in journalism”, Christina Elmer, head of data at *Spiegel Online*, says. Her team includes two career changers (a former physicist, a former city planner).

Computer scientist Stefan Wehrmeyer agrees: “There are a lot of career changers in data journalism. If you have an understanding how the internet, data, computers work, you have a big advantage. To know web scraping and programming helps – even if you just need it to clean data.” He recommends small newsrooms to look for data journalists within the civic tech community: “Many computer scientists are disillusioned; they are working for profit in the private industry but actually would want to help society. There are many of them out there. They might not think like journalists, but in Open Knowledge Labs, people already do come together to develop apps to improve the neighbourhoods, compare local schools or so on. I think the civic tech community is the right place to look for good people. You might have to approach them, because they might not hear or think about journalism jobs.”

And what skill set does the “perfect” data journalist have? Is it better to be strong on the “data” or on “journalism” side? Jonathan Sachse says: “Someone will always be stronger either on ‘data’ or on ‘journalism’. Both is interesting. If you only have a small team of six or seven reporters, I would recommend adding someone who knows a lot about data. The journalism you can teach. The perfect data journalist knows how to do both.”

5) Costs

But people with such skills are expensive, why especially small newsrooms might hesitate to hire them. “You either need to outsource single projects, employ a data journalist or train current staff. Fortunately, many newsrooms see the potential in data driven stories and are willing to invest, but many still aren’t. Data projects often take

longer than 'traditional' journalistic research and story-telling methods. This is partly due to the problems in skillsets and access to data. Since time is money, that is also a factor discouraging for many newsrooms", data journalist Kira Schacht explains, and says that "these problems are especially inhibiting for smaller and local newsrooms, many of which, in our experience, would like to work with data but do not have the resources to get started."

6) There is a gender-gap

So recruiting is not easy. Putting together a gender-diverse data team seems to be an additional challenge. Because if you look at the existing data teams in German-speaking countries, the gender imbalance becomes obvious. Why is that? "Maybe because of the tradition of the topic. Computer-assisted journalism has a much longer tradition in the UK and US. It might also have something to do with education and intrinsic interest. Data journalism is often self-taught and there is a strong connection to the hacker community, which is also predominantly male", *Spiegel Online's* Christina Elmer, one of the few female data journalism pioneers in Germany, says.

So there are few(er) women in data journalism. But some of the women are – like Elmer – in a leading position. "Maybe this is because the position of the leader of the data team is a gateway between the data journalists and the rest of the newsroom", Elmer suggests.

Traditionally, journalism has been male-dominated. "Data journalism might be even more prone to this imbalance, since it uses methods from the IT and statistics fields, both of which have been even more male-dominated in the past", Kira Schacht says, and explains: "At *Journocode*, we do have slightly more women than men, but that was never on purpose. However, we embrace diversity in all fields and hope that the next generation will bring more women into journalism and the tech scene." *Journocode* has supported projects aimed at inspiring girls to code by contributing workshops and talks and continues to do so.

7) J-schools are slow in picking up on data

In Europe, there are fewer possibilities to be trained in data journalism than in the US. “It would be important to have something like the LEAD-program [at Columbia University], where journalist can do six months of intensive data training, in Europe”, Christina Elmer says, who has a LEAD-alumni in her team.

“There are some courses and seminars in many journalism schools [in Germany], but little extensive data journalism education. One seminar is usually not enough to learn the necessary skills and build a stable routine that can be practised and expanded upon. At the moment, aspiring data journalists have to bring a lot of self-motivation to the table”, Kira Schacht says: “Since data journalism hasn’t been part of journalistic routines for long in Germany, there are few experienced data journalists to learn from. That adds to the pioneer spirit, but also makes it hard for career changers to find mentors.”

Disadvantages for small newsrooms

Not all is better in smaller newsrooms. Bigger news outlets have more resources – and those come in handy when working on time-intensive investigations and data visualisations. Also, less reach can be an obstacle for crowd-sourced data journalism. “The downside is that they [small newsrooms] don’t have access to expensive data bases or experts like coders, scrapers, designers. Bigger newsrooms have more resources and reach, which is sometimes necessary for projects that involve user engagement or crowd-sourcing. Well-established newsrooms have a lot of know-how in specific topics and a large network, which helps with research”, Peter Sim says.

But bigger is not always better. This is very well illustrated by the success story of a small newsroom in Berlin. *Berliner Morgenpost* has done extraordinary things in the field

of data journalism: often, they use local data for delivering meaningful stories customized for their audience, as in “M29 – Berlin’s bus of big differences”⁵⁵ which won the German reporter prize for “best interactive” in 2015. It explains Berlin’s diversity visually and with small, easy digestible chunks of text. By now, *Berliner Morgenpost*, who started doing data journalism only a few years ago, has received 50 journalism awards and achieved profound organisational change.

10 tips how to bring data journalism into the newsroom

1) Set goals according to your newsroom

A visualisation, a page with data, a graph, deep research for over months – as we have seen, all that’s data journalism. It is important that the data-driven projects and the expectations towards data journalism suit the media outlet. Think about what your data team can achieve and what you want them to achieve, and then set it up accordingly.

2) Commitment from the top

“None of it stands a chance if you don’t have an editor in chief who believes in it. It has to come from the top. But it is very likely that the people who understand what needs to be done are at the bottom”, Alan Rusbridger told me. As editor-in-chief, he was leading *The Guardian* for 20 years. The data I’ve collected also suggests that shift in culture can be easier in small newsrooms – *if* you have an editor who supports it.

“The barriers are mainly about culture and leadership now, not about technology”, digital strategist Nic Newman confirms. “Employ the right people with the right skills and give them permission to do it. When news companies have done that, you can see the results.”

3) Enthusiasm on the bottom

⁵⁵ <https://interaktiv.morgenpost.de/m29/> accessed 9 December 2017

“Leaders can’t shift a culture alone”, Lucy Kueng writes⁵⁶ - and calls for “change ambassadors”. All the examples I came across showed me: You need somebody who is enthusiastic about data at the bottom as well: For example, Simon Rogers, who started *Datablog* at *The Guardian*. Or Julius Tröger, who left the comfort zone of copy-and-paste online journalism and went out to learn more about data. He returned and started doing his first data stories, received prizes, and *then* his editorial board became aware that this would be beneficial. Often times it needs bottom-up initiative and some results before the editorial board starts believing in it.

Sascha Venohr, head of data at *ZEIT ONLINE*, talks about similar experiences: “The editorial board noticed that we were getting high visibility [with data-driven projects], we received prizes and our stories had impact. This enabled us to do a lot of things that we otherwise would have had to fight for within the newsroom. If you want to stand out, data journalism does need a lot of resources. But, if you want it to be unique and perfectly programmed to fit the story on mobile screens, you need the right people for that. Luckily, our editors in chief always backed us up, they let us get the people we need, and let us sit in the middle of the newsroom.”

4) Communication is essential

In order to achieve change in a newsroom, communication is essential. “The only way to create change was to constantly make people talk about it”, Alan Rusbridger told me. “There is no point in standing in front of the newsroom and saying ‘let me take you to the Promised Land’. You know what journalists are like, they are not going to believe you, nor should they. I can’t tell them that there is going to be a pot of money at the end of this, because there probably won’t be, nevertheless I still think we need to do it. (...) the process of discussing it will make them understand why you are thinking what you are thinking. Journalism of the past has been far too much about 600-word-stories. There is a lot we can do that is not a story at all, it could be a visualization, or data...but

⁵⁶ Kueng, L., *Going Digital. A Roadmap for Organisational Transformation*. Reuters Institute for the Studies of Journalism, 2017, p. 36

if you say that to a room of 50 journalists, 49 of them would immediately say ‘he hates print’ or ‘he hates text’, so you would have to make them understand and show them what that meant.”

Not only the management, also the journalists need to communicate. As Julius Tröger told me: “In the beginning, it was a long fight. You have to be a lobbyist, go for coffee with people, and convince the people in IT. This is an important part.”

“Data journalism can be a one-(wo)man-show”, data journalist Anastasia Valeeva told me. But within a newsroom, it needs a team of at least two or three committed people – the editorial board must be willing to hire at least one or two developer programmer (all of the data teams I talked to have one).

5) Build up skills

“In the next five years, telling better stories using data is going to be critical, and that goes along with visualisation. What mobile devices are changing is the need to tell stories quickly on a screen, with graphs, interactive (...) visually instead of a lot of words will be one of the big trends. Media companies need to get different skills, they need to improve their skills of managing and understanding statistics and data visualisation”, Nic Newman says. As we have seen, this is especially important for small newsrooms.

There are three ways of bringing those skills into a newsroom: 1) Train your staff, for example by offering workshops, 2) bring in expertise by hiring data journalists, developer and/or programmer, 3) collaborate with others newsrooms or experts like data scientists and analysis. For small newsrooms with little resources, concentrating on collaboration might be the most realistic option. “If there already is a data journalist in the newsroom, encourage and support their communication with the rest of the team, so they work more efficiently together and teach each other, and encourage journalists to connect with the Data journalism community by visiting meet-ups and conferences”,

recommends Kira Schacht, co-founder of the young German data journalism start-up *Journocode*, which offers data journalism trainings for newsrooms.

Do we all have to become data journalists? Certainly not, but “every journalist should be able to understand how data journalism works: what programmers need, and how they work”, Christina Elmer says. “Not every journalist has to know how to scrape or to build something”, *Bureau Local*’s Megan Lucero agrees, but “every newsroom needs to have an understanding of computer-based journalism. You do need to know what is possible, and you need a basic understanding in statistics and Excel. Those are quite crucial.”

Lucy Kueng, who has interviewed 60 individuals for her research on organisational transformation, writes: “Organisational learning is a priority, widely seen as central to building a common understanding of external threats and accelerating strategic buy-in and implementation. Two aspects of learning initiatives stand out. First, many have a strong ‘DIY’ flavour. Second, they seek to make learning continuous.”⁵⁷ She has found that the *New York Times* has an embedded training team, because: „That’s how adults learn. They don’t learn by being taken out of their daily work environment, brought into a classroom, talked at, and then told to go back. They learn as they’re working, so we have people there as they are doing stories, as they’re writing headlines.”⁵⁸

6) Room and resources

“Everyone has to sit together”, Lucy Kueng emphasises: “Teams have long been the default structural module in tech firms (...), because of the agility-related benefits they bring: they are highly ‘targetable’ and can be focused on a specific goal (which increases the chances that it will be met); they make small experimental starts easier; they are flexible – and can grow and shrink, add, and drop expertise as required. The

57 Kueng, L. *Going Digital. A Roadmap for Organisational Transformation*. Reuters Institute for the Studies of Journalism, 2017, p. 33

58 Kueng, L. *Going Digital. A Roadmap for Organisational Transformation*. Reuters Institute for the Studies of Journalism, 2017, p. 33

multidisciplinary team is a newer concept to the media, but its benefits are becoming evident, as the *Financial Times* explains: The diversity of minds and people and backgrounds and functions, having this dynamic team of interactive people ... the visual people, the video people, the interactive people, the core journalists ... I wouldn't swap the newsroom we have now for the newsroom when I started here."⁵⁹

"A lot of technologists only work at *The Guardian* because they want to work on the editorial, so they want to be in the room. It would have been best if the tech people sat in a room next to journalists, where they can have a conversation. In a smaller organization, this is much easier", Alan Rusbridger explains.

In Germany (and Austria), news outlets traditionally do not work in newsrooms, but in separate rooms that " [reflect] newspapers' different editorial subjects and sections, thereby fostering their journalistic autonomy. Only recently can changes towards alternative structures and open-plan offices be observed"⁶⁰ – and some data teams prefer it that way: "When we are programming, we need it to be quiet, but still, we are very integrated in ongoing discussions in the newsroom", Christina Elmer says.

7) Hire a few geeks

"Data journalism is not a 'one-time-thing'" says Anastasia Valeeva. "To make it sustainable within a newsroom, you need support from the editorial board: they have to hire a programmer, or give you more time to work on data journalism." When *Datablog* started, *The Guardian* didn't have a data specialist. "Simon Roger was the sub editor or something, he was just a bit nerdy and could do math, which is not something most reporters can. He would put data sets up and the readers would come back with a beautiful thing. Simon said 'I didn't do that, the readers did'. We always thought he

59 Kueng, L. *Going Digital. A Roadmap for Organisational Transformation*. Reuters Institute for the Studies of Journalism, 2017, p. 29

60 Wilke, J. *The history and culture of the newsroom in Germany*. In: *Journalism Studies*, 4:4, 2013, p. 465-477

[Simon Rogers] was the boring guy. You didn't want to sit next to him in the canteen, because he was going to talk about math. When we gave him a couple of 22-year-olds, he suddenly became a rock star and Google hired him", Alan Rusbridger says.

8) Cooperate

The data journalism community in Germany is rather small and very responsive. I could experience that when contacting my interviewees: Most of them reacted instantly and all were willing to talk very open about their experiences. They were of course proud to share their successes, but also talked about what didn't work. Many stated that if they get stuck with a data project, they would seek out for help and help each other – beyond company borders. "Coopetition" (collaboration between competitors) is common practice, and Lucy Kueng writes⁶¹: "Legacy media now lack scale, meaning that many are seeking collaboration or 'coopetition' (collaboration between competitors) arrangements to gain critical mass." A good example for such a coopetition is the team work between *Buzzfeed* and the *BBC* on "The Tennis Racket"⁶².

"The general local media does not have enough time or resources for computer-assistant journalism", Megan Lucero says and explains why the *Bureau of Investigative Journalism* started *Bureau Local* in spring 2017: "We want to enable local news entities to collaborate and share similar as it was done with the Panama Papers: We bring in a data set, embargo it, and everybody breaks it on the same day. So the impact is not just an exclusive on a local level; it is an exclusive that is resonating around the UK, on a national level. We are folding into spaces that already exist and support initiatives that are already there, for example the civic journalism lab [a forum for journalists to meet, learn, collaborate and innovate together. Facilitated by Newcastle University]."

9) Start small and with a hypothesis

61 Kueng, L. *Going Digital. A Roadmap for Organisational Transformation*. Reuters Institute for the Studies of Journalism, 2017, p. 14

62 https://www.buzzfeed.com/heidiblake/the-tennis-racket?utm_term=.qrzxxq39jo#.if9nnmGJYV accessed 10 December 2017

“Journalist should start with Excel, basics of statistics, and start to learn to calculate medians or percentage”, Anastasia Valeeva says. Megan Lucero’s advice for beginners is to take a course on how websites are built and then: “Just start small, e.g. with pairing up with academics or volunteers. That’s the way I did it at the Times: We did basic Excel stuff in the newsroom, this helped to build up trust and showed the journalists what we could do, and then we worked with commissions and did bigger and bigger things.”

“All data journalists tell you: Start with elections. The data is there, and you can be sure that the data is correct”, Julius Tröger says, and Megan Lucero agrees: “Elections are your bread and butter for journalism.”

“Start with small projects on a local level, maybe personalize a database that is interesting to you”, Jonathan Sachse recommends: “Small newsrooms develop their strength when they’re not doing too many things at once, but concentrate on a few big projects per year. They should surprise their readers with those stories by going on different paths, offering exciting tools and make a story even more enjoyable.”

“In any data story, planning and designing the story is very important. There must be a hypothesis, questions to prove it, you can even make a mock-up version of the story to see which data you need in each paragraph”, Anastasia Valeeva says. “For example, when we did the story about domestic violence in Macedonia and Kosovo, participants came with the hypothesis that women who are uneducated and unemployed more often become a subject of domestic violence. From this departing point, you ask yourself questions how you can prove or disprove it with data. The data showed they were right, but even if not, they would still have a story.”

“We have data - what is the story around it?’ should be the exception. I prefer to have a hypothesis first, then a story, then the data. The exception is if you have exclusive data” Peter Sim says.

10) Don't be afraid

In 2012, Simon Rogers, argued that “data journalism is the new punk”⁶³ due to its similar DIY ethos, its shake-up of the old established order. In punk, all you need to learn are three chords, and applied on Data journalism it translates like this: 1) This is a dataset 2) Here's another 3) Here are some free tools – NOW GO BE A DATA JOURNALIST. Rogers stresses that you don't have to be a developer or a coder to be a data journalist: “In his talk in front of journalism students at City University in London in November 2017, he confessed that math did not come to him naturally either – and quoted his former math teacher: “Tries hard, but has little natural ability”.

“You don't need good genes to become a data journalist”, Peter Sim says. “In journalism, you already stand out if you're not afraid of numbers. Whenever I start talking about data journalism, 90% of journalists stop listening. Most of them are where they are because they didn't want to have anything to do with numbers. The only skill you need is not to be afraid – but if you don't want to work with data, you don't have to. It's like with anything: If you want to do it, and have fun with it, that is enough.”

For the research of this paper, I have talked to dozens of people who are – at times – having fun with data, and the sentence I have heard by far the most was: “It is not rocket science”. “Many media groups are starting with as much prior knowledge and expertise as someone hacking away from their bedroom. Many have, until very recently, no idea where to start and great groups of journalists are still nervous of the spreadsheets they

63 Rogers, S. <https://www.theguardian.com/news/datablog/2012/may/24/data-journalism-punk>

are increasingly confronted with”, Simon Rogers writes ⁶⁴. I argue that this little experience can be an opportunity for newsrooms to adapt to new technologies and explore different working methods and establish new skills. Or, as data journalist Anastasia Valeeva writes: “A certain culture shift takes place when people with new and different backgrounds enter the newsroom and bring with them a new approach derived from the open-source and hacker world.”⁶⁵

“How culture is viewed is one of the most profound differences between digital native and legacy organisations: while legacy media tend to view it as a gravitational force, anchoring organisations to their pasts, digital pure plays see it as the foundation of competitive advantage” Lucy Kueng states⁶⁶.

Outlook

So how does the future of data journalism look like? Julius Tröger told me that “data journalism will become bigger. Nowadays, even the smallest newsrooms have somebody who works with data, and there is more to come. What we discuss internally is whether we need opulent visualizations or not. The *Washington Post* has 24 people who do interactive, and they do great things, but maybe it is too much. Sometimes you surprise with content, and sometimes with visualizations”.

“Data journalism is gradually going to become more important, but that has more to do with telling visual stories”, digital strategist Nic Newman says. But he had expected more: “Everybody talked about data journalism being the next big things for many years. Apart from big investigations it hasn’t quite come to life as it could be.”

64 Rogers, S. *Data journalism - Past, Present and Future*. 2017, p. 16

65 Valeeva, A. *Open Data In A Closed Political System: Open Data Investigative Journalism In Russia*. 2017, p. 6

66 Kueng, L. *Going Digital. A Roadmap for Organisational Transformation*. Reuters Institute for the Studies of Journalism, 2017, p. 36

“Data journalism got stuck a bit, probably because of the economy”, Alan Rusbridger agrees: “Within the last two years, the ‘Google and Facebook effect’ came to bite on newsrooms. If you are a shrinking newsroom and have to lay people off, and at the same time you say need three good data people... [that] is just harder to explain...but the younger readers are more visual and less accustomed to read through longer texts.”

Will all journalists become data journalists or will more technologists work within journalism? “Both – journalists will not be allowed or proud to say ‘I don’t understand spreadsheets’ – they will need to know, as a minimum, how to make use of a spreadsheet to pull out key facts and figures. No excuses. Realistically, the future development of the field depends entirely on the willingness of newsrooms to invest in training and expertise, the motivation of journalists to employ data-driven techniques, and the motivation of developers, designers and computer scientists to work in journalism”, journalism trainer Jonathan Stoneman says.

“The demand for data journalism is still very high in Germany, and this is very similar in Austria, I think. Data journalists don’t have to worry about getting a job, they could also work for NGOs or earn much more in the private sector. I am not sure if journalism schools have recognized data journalism as future market”, Jonathan Sachse says.

“Hopefully, the research and visualization methods used by data journalists will become part of the everyday toolkit of journalists in the newsroom in a way. Building a simple bar chart, telling an arithmetic mean from a median and looking through the national office of statistics’ resources. In short, we hope that data literacy will thrive among journalists – and all citizens, for that matter”, Kira Schacht says, and: “We’d also love to see more cooperation in (data) journalism, from the regional to the international level, meaning: More sharing of knowledge, more cooperation on projects, stories and useful tools that can help every newsroom involved.”

Summary

The research conducted for this paper showed that you don't need a big newsroom to do award-winning data journalism and that what it does need is commitment from the top as well as bottom-up enthusiasm. The lack of resources and skills can be substituted by collaborations with others, reaching out to the vivid and supportive data journalism community or even asking help from readers ("crowd-sourced" data journalism). On the contrary, I found that there are in fact several advantages for small newsrooms, such as better communication, or that change can happen faster. I showed how can journalists can become more data-savvy and how a "show don't tell"-mentality supports change within the newsroom. A limitation of this paper is that I could not get into technical details on how the projects were realised. Also, I couldn't get into details on the importance of a Freedom of Information Act. My hope is that this overview of data journalism in the German-speaking world encourages more reporters and editors to dig into data. This paper ends with links to data journalism sites which are a good starting point if you want to learn more about data journalism.

Interviews

(in chronological order as they took place)

1. Jonathan Sachse, data journalist German non-profit *CORRECT!V*. Interview in Berlin, 28 August 2017
2. Stefan Wehrmeyer, programmer and web designer, formerly *CORRECT!V*, now working for *Open Knowledge Foundation Germany*. Interview in Berlin, 28 August 2017
3. Peter Sim, data- and video journalist, Austrian non-profit *Dossier*. Interview in Vienna, 12 September 2017
4. Julius Tröger, data journalist and head of interactive department, *Berliner Morgenpost*. Interview via Skype, 16 October 2017
5. Alan Rusbridger, *The Guardian's* former editor-in-chief and now principal at *Lady Margaret Hall College, University of Oxford*. Interview in Oxford, 20 October 2017
6. Anastasia Valeeva, freelance data journalist, data journalism trainer and activist from Russia. Interview via Skype, 23 October 2017
7. Wolfgang Jaschensky, head of development team *SZ.de*. Interview via Skype, 23 October 2017
8. Megan Lucero, head of data at *Bureau Local, Bureau of Investigative Journalism*. Interview via phone, 24 October 2017
9. Sascha Venohr, head of Data journalism at investigative team at *ZEIT ONLINE*. Interview via Skype, 25 October 2017
10. Christina Elmer, head of Data journalism team at *Spiegel Online*. Interview via phone, 2 November 2017
11. Jonathan Stoneman, former researcher, producer, reporter, editor and Head of Training at *BBC World Service*, currently journalism trainer who specialises on Data journalism and Excel. Interview in Oxford, 17 November 2017.
12. Kira Schacht, data journalist and co-founder of Data journalism start-up *Journocode*. Interview via e-mail, 30 November 2017.

13. Nic Newman, journalist and consultant on digital media, currently a Visiting Fellow at the *Reuters Institute for the Study of Journalism*. Interview in Oxford, 5 December 2017.

If not stated otherwise, all the quotes in this paper are derived from these interviews. Additional not-referenced quotes are from Simon Rogers, Google News Lab, who spoke via Skype Call at the book launch “The Media Society: Data journalism Today - The Good, The Bad and The Ugly” at City University, 9 November 2017.

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Data journalism – helpful links

Dataharvest – the most relevant networking event for investigative and data journalists in Europe <http://www.journalismfund.eu/european-investigative-journalism-dataharvest-conference>

Data Journalism Handbook

<https://medium.com/we-are-the-european-journalism-centre/inside-our-plans-for-the-new-data-journalism-handbook-c8eec43e3f98>
<https://datajournalismhandbook.org>

Doing Journalism with Data: First Steps, Skills and Tools – a free online course
<http://learno.net/courses/doing-journalism-with-data-first-steps-skills-and-tools>

Data journalism training at the Centre for Investigative Journalism
<https://www.tcij.org/courses/course-calendar>

Data journalism at Columbia’s journalism school

<https://journalism.columbia.edu/data>

Investigative Reporters and Editors network (IRE) - a rich source of tip sheets, training material, government datasets, beat books and archived stories.
<https://www.ire.org/nicar/>

Journocode – A German start-up offering training in data journalism
<http://journocode.com>

Some best practices:

<http://app.wheredoesmymoneygo.org/>
<http://www.zeit.de/serie/deutschlandkarte>
<https://www.propublica.org>
<https://sunlightfoundation.com>
<https://www.morgenpost.de/interaktiv/>
<http://www.pulitzer.org/files/2013/public-service/01day1.pdf>

DDJ gives an overview of Data journalism projects in Germany:
<http://katalog.datenjournalismus.net/#/> (online since 2014)

More about the Freedom of Information (FOI) Act

The Open Knowledge Foundation - a non-profit organization that advocates open knowledge, open data, transparency, and civil participation.

<https://okfn.de/en/>

Frag den Staat - A German platform where citizens can distribute FOI Requests

<https://fragdenstaat.de>

Global Open Data Index

<http://global.survey.okfn.org>

Open Data Network

<https://www.opendatanetwork.com>