KADIR HAS UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
NEW MEDIA DISCIPLINE AREA

A QUALITATIVE ANALYSIS OF
DATA JOURNALISM PRACTICE IN TURKEY

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SUPERVISOR: ASSOC. PROF. DR. ÇİĞDEM BOZDAĞ

MASTER'S THESIS

ISTANBUL, JANUARY, 2018

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Submitted to the Graduate School of Social Sciences of Kadir Has University in partial fulfillment of the requirements for the degree of Master's in the Discipline Area of New Media under the Program of New Media

ISTANBUL, JANUARY, 2018

I, İREM ORAN;

Hereby declare that this Master's Thesis is my own original work and that due references have been appropriately provided on all supporting literature and resources.

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ACCEPTANCE AND APPROVAL

This work entitled **A QUALITATIVE ANALYSIS OF DATA JOURNALISM PRACTICE IN TURKEY** prepared by **İREM ORAN** has been judged to be successful at the defense exam held on **09.01.2018** and accepted by our jury as **MASTER'S THESIS**.

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DATE OF APPROVAL: 13/4/2018

TABLE OF CONTENTS

TABLES LIST

FIGURES LIST

ABSTRACT

ORAN, İREM. *A QUALITATIVE ANALYSIS OF DATA JOURNALISM PRACTICE IN TURKEY*, MASTER'S THESIS, Istanbul, 2018.

The importance of data in the field of communication is increasing day by day; the usage of data in the media/news called as data journalism which produces news with data. There are many theses and academic articles on journalism and media studies, but the studies conducted in the sense of data journalism are limited. Despite resource constraints, it is important to work in the field of data journalism and provide resources for literature which has limited resource. The aim of this study is to examine the data and use of data at media which has a large role in communication studies. In research, the share of data journalism in terms of changing journalistic practices has been investigated. Semi-structured interviews were conducted and analyzed with editors, freelancers, academicians, and managers at news organizations who had data journalism trainings or have experience on the field to determine common and important points on the subject. Results were obtained by comparing the given answers and literature review. The findings provide information about the current state of data journalism in Turkey, the effects of media economy on the field and the diffuculties of reaching the open data and it gives idea of the future status of data journalism.

Keywords: data, data journalism, data reporting, open data

ÖZET

ORAN, İREM. *TÜRKİYE'DE VERİ GAZETECİLİĞİ UYGULAMALARINA YÖNELİK BİR NİTEL ARAŞTIRMA*, YÜKSEK LİSANS TEZİ, Istanbul, 2018.

Verinin iletişim alanındakiönemi her geçen gün artmaktadır; verinin medyada/haberdeki kullanımı ise veri ile haber üreten veri gazeteciliğidir. Gazetecilik ve medya çalışmaları üzerine yazılmış tezler, akademik makaleler bulunmakta ancak veri gazeteciliği anlamında yapılan çalışmalar kısıtlıdır. Kaynak sıkıntısı olmasına rağmen veri gazeteciliği alanında çalışmak ve bu kısıtlı alan için literatüre kaynak sunmak önemlidir. Bu araştırmanın öncelikli amacı, iletişim çalışmalarında büyük role sahip veri ve veri kullanımının medya alanındaki durumunu incelemektir. Değişen gazetecilik pratikleri açısından veri gazeteciliğinin payı araştırılmıştır. Konu ile ilgili ortak noktaları ve önemli noktaları belirlemek için veri gazeteciliği eğitimi almış veya eğitim almasa da bu alanda tecrübe edinmiş, editör, freelancer, akademisyen, öğrenci, haber kuruluşlarında yönetici pozisyonunda kişilerle yarı-yapılandırılmış görüşmeler gerçekleştirilmiş ve analizler yapılmıştır. Verilen cevaplar ve literatür taraması karşılaştırılarak sonuçlar elde edilmiştir. Bulgular, Türkiye'de veri gazeteciliğinin mevcut durumu, medya ekonomisinin bu alana etkilerive açık veriye ulaşmadaki zorluklara dair bilgi vermekte ve veri gazeteciliğinin gelecekteki durumuna ilişkin fikir vermektedir.

Anahtar Kelimeler: veri, veri gazeteciliği, veri haberciliği, açık veri

INTRODUCTION

Media have often been the focus and criticism point in communication studies and researches. Therefore; media content, media power and journalists are an important part of these studies. Today, new media technologies have changed the formation, content and transmission of news and so the business manner of journalist has changed. The speed brought by new media technologies, as well as information access-consumption habits, has transformed the media industry.

These developments, both in the world and in Turkey, have put "data journalism", which is actually based on corruption, into the changing practices of journalism today. When we talked about digital evolution, it became more and more important for journalists and news reporters to come out from the weighted text and to be visually predominant, which is often seen as web 1.0 web 2.0 difference. Data journalists are using techniques that can express more powerful news than text can make them stand out by visualizing their "research and analysis" with their infographic, interactive graphics, videos and maps. New media is no longer new, written too much about this issue and organized seminars. Besides having existing lessons about new media, there are degree programmes for this field. However data journalism have begun recently to take part in curriculum of communication faculties and used by data journalists.

Accessing, analyzing and using data are among the important topics of today's digital day. It offers significant opportunities for communicators in the field of digital marketing. It come across us as one of the best ways to achieve a competitive edge. However, the use of data in the field of journalism and preparing news with data, is not as effective and common as in marketing. Nevertheless, it is called as the future of the journalism at many articles and by academicians. The main purpose of this study is; to be able to make an inference about the future of data journalism by analyzing the current situation of data journalism in Turkey with journalists working in the field or ones trained in this field.

As data journalism is a point of intersection of technology and journalism, it is confronted as a profession that can be done by people who can use communication and information technologies more effectively. Digital and mobile usage forms are developing rapidly; so knowing these technologies is not enough, it has become imperative to become a follower of these changing technologies for long-term work.In fact, everyone who is in the news production department,either a data journalist or not,is a part of these technologies both before and after production. A journalist now has to use new technologies and improve his/her skills in order to be able to make his/her profession. As a result of this, the similarities and differences of traditional journalism and data journalism will be referred in the study. In addition, the necessary skills that journalist have to acquire to do data journalism will be examined.

The trainings given in the field of data journalism are also important to be examined. Trainings in this field which changes journalistic practices are needed to learn the tricks of data journalism and implement. Data journalism has been introduced into the communication faculty syllabuses of some universities in Turkey, and trainings have started to be given on this field. Therefore, one of the most important questions to be asked here is; how sufficient is data journalism education in Turkey?

With the development of new media and information communication technologies, data recording/storage and processing/using recorded data are among the subjects that are frequently discussed and planned on the present day. Understanding and managing data are on the basis of data journalism so concepts such as "open source", "open data" and "data validation" play a key role for data journalism. However, at this point it's needed to ask, "How much journalists in Turkey have access to data?" To answer this question, the state of data sources and access to open data sources will be searched for the journalists who want do data mining.

There are differences between data journalism in the world and in Turkey both in terms of development and present situation. According to datas in 2017, the state of data journalism in the world will be referred and the information will be compared with the answers of people who are consulted about data reporting in Turkey.

After literature review, will be passed to research design section and information will be given about research questions and research methods. In the research findings, the results of the semi-structured interviews with 8 participants who are working in the field of journalism in Turkey or had trainings about data journalism will be examined in detail. At analyze and discussion part research findings will be compared with literature review and research questions and analyzed.

CHAPTER 1

LITERATURE REVIEW

1.1. HISTORY OF DATA JOURNALISM

In Data Journalism Handbook, Simon Rogers notes that the first example of data journalism at the Guardian newspaper which contains a table of data was in 1821. It was a list of schools in Manchester and Salford, with how many pupils attended each one and average annual spending (Gray, Bounegru & Chambers, 2012). Also many practitioners date the beginning of the data journalism to 1952 for the prediction of the outcomes of the presidential election. But there were no data used.

In 1967, Philip Meyer at The Detroit Free Press used a mainframe to analyze a survey of Detroit residents for the purpose of understanding and explaining the serious riots that erupted in the city that summer. Meyer went on to work in the 1970s with Philadelphia Inquirer reporters Donald Barlett and James Steele to analyze sentencing patterns in the local court system, and with Rich Morin at The Miami Herald to analyze property assessment records. Meyer also wrote a book called Precision Journalism that explained and advocated using database analysis and social research methods in reporting (Houston, 2015).

Although data journalism is not completely new, it experienced a boost in its growth and importance due to the global interconnection by the Internet and the appearance of computers and their high performance in information processing. Moreover, it affected and changed the work and role of the journalist, because "by using data, the job of a journalist shifts its main focus from being the first ones to report to being the ones telling us what a certain development might actually mean" (Schulze, 2015, p. 24).

In 1989, the U.S. journalism profession recognized the value of computer-assisted reporting when it gave a Pulitzer Prize to The Atlanta Journal-Constitution for its stories

on racial disparities in home loan practices. During the same year, Jaspin established at the Missouri School of Journalism what is now known as the National Institute for Computer-Assisted Reporting (NICAR). Then, in 1990, Indiana University professor James Brown held the first computer-assisted reporting conference in Indianapolis (Houston, 2015).

Holovaty, a talented software developer at the Washington Post and founder of EveryBlock, decried how data was organized and treated by media organizations in a 2006 post on how newspaper websites needed to change. As Holovaty noted in a postscript, his essay inspired the creation of PolitiFact by Bill Adair and Matt Waite. The fact-checking website subsequently won the Pulitzer Prize in 2009 (Howard, 2014).

Another aspect that empowered the development of data journalism was the idea of open data. In accordance to its progression data journalism experienced a push, when the European Commission initiated the so-called PSI Directive - Directive 2003/98/EC. With the implementation, the member states started to provide data and information openly for re-use, which could be used by journalists to find stories and present them. By that journalists gained a new way to educate people, pass on knowledge and facts in form of datasets and visualizations. This open data approach is considered a fundamental component in (open) data journalism (Schulze, 2015).

In 2005, the visualization of data for news stories got a big boost when U.S. programmer Adrian Holovaty created a Google mash-up of Chicago crime data. The project spurred more interest in journalism among computer programmers and in mapping. Holovaty then created the now-defunct Every Block in 2007, which used more local data for on-line maps in the U.S., but the project later ran into criticism for not checking the accuracy of government data more thoroughly (Houston, 2015).

The use of data journalism gained momentum around the world after Tim Berners-Lee called analyzing data the future of journalism in 2010, as part of a larger conversation around opening government data up to the public through publishing it online. The year before, the Guardian had launched its Datablog. Using structured data extracted from the PDF that the United Kingdom's Parliament published online, the Guardian visualized the expenses of Ministers of Parliament, launching a public row about their

spending that has continued into the present day. In July 2010, the Guardian began publishing data journalism based on the War Logs, a massive disclosure of thousands of Afghanistan war records leaked through Wikileaks (Howard, 2014).

It was in 2014, however, that data journalism entered mainstream discourse, driven by the highly publicized relaunch of Nate Silver's FiveThirtyEight.com and Vox Media's April release of general news site Vox.com, as well as new ventures from the New York Times and Washington Post (Howard, 2014).

Today, the context and scope of data-driven journalism have expanded considerably from its evolutionary antecedent, following the explosion of data generated in and about nearly every aspect of society, from government, to industry, to research, to social media. Data journalists can now use free, powerful online tools and open source software to rapidly collect, clean, and publish data in interactive features, mobile apps, and maps. As data journalists grow in skill and craft, they move from using basic statistics in their reporting to working in spreadsheets, to more complex data analysis and visualization, finally arriving at computational journalism, the command line, and programming. The most advanced practitioners are able to capitalize on algorithms and vast computing power to deliver new forms of reporting and analysis, from document mining applied to find misconduct, to reverse engineering political campaigns, price discrimination, executive stock trading plans, and auto completions (Howard, 2014).

Even data journalism is based on the past years, in this age this process is reshaped by the Wikileaks files leakage to media. Working with thousands of files, integrating them into the news by the support of computers and the need to transform raw data into the best filtered and analyzed data, despite all the complexity of the information, has made newsrooms to work more with programmers, data engineers, hackers, designers and still continue to work them together. The future points out journalism based on data. When reporters write their stories directly with dialogue in conversation (still same a bit) now they also have to analyze data and find out interesting things (Dağ, 2014b).

1.2. WHAT IS DATA JOURNALISM?

Throughout its history, journalism has been shaped by various phases of technological innovation which have affected journalistic practices and forced the field to deal with novel work forms. New forms of work such as graphic design, computer-assisted reporting and photojournalism have all shaped the way journalism is practiced today.The latest phenomena, data journalism is the new form of work that news organizations have been struggling with. While data has an ability to create knowledge in society, it needs to be analyzed before any news organization can create stories based on it (Rapeli, 2013, p. 19).

Data journalism is defined as a rapidly developing and growing field, nevertheless it's not well defined yet. There are many approaches to describe what data journalism is and what components it contains.

Data journalism, in its simplest form, can be described as a type of journalism that uses data on the basis of stories. As a simple definition in Data Journalism Handbook, Paul Bradshaw who is a journalist and academician at Birmingham City University simply defines data journalism as "Journalism done with data" (Gray, Bounegru & Chambers, 2012). Also Banda defines data journalism as a field of journalism involves stories being written based on a collection of data (Banda, 2015).

Steve Doig, the Knight Chair in Journalism at the Walter Cronkite School of Journalism and Mass Communication at Arizona State University, defined data journalism as an other way of gathering information. He stated, "It's the equivalent of interviewing sources and looking at documents, except with data journalism you are essentially interviewing the data to let it tell you its secrets" (Remington, 2012).

In a wider sense Bradshaw explains data journalism as a type of journalism that simultaneously transforms digitalized news centers on the world scale by effective usage of data and creates consciousness changes at the same time, with many definitions such as transparent journalism and enhanced journalism which require a

rather large working discipline. But the most important things he takes attention are; by data journalism very few things can be hid, the accountability of states and more effective struggle with corruption (Dağ, 2014a).

Some definitions focus on collection of numbers, most likely gathered on a spreadsheet. Accoding to Egawhary and O'Murchu, data journalism is the ability to analyze and examine numbers and to know how to manage large datasets and read them correctly. At its most basic, data journalism begins by asking questions of numbers or proving something that you know is happening and is probably widespread, through numbers (Egawhary & O'Murchu, 2012). Likewise Broussard defined "Data journalism is the practice of finding stories in numbers, and using numbers to tell stories" (Broussard, 2015, p. 3).

Also skills, techniques and process of data journalism are some focus subjects for defining data journalism. Alexander Benjamin Howard described data journalism at a report for Tow Center for Digital Journalism as; "gathering, cleaning, organizing, analyzing, visualizing, and publishing data to support the creation of acts of journalism" (Howard, 2014, p. 4). According to Henk van Ess, data journalism is finding, processing and visualizing big data to get (questions for) a story (Henk van Ess, 2013).

Prof. David Herzog from Missouri School of Journalism as cited at Howard, uses this explanation when defining data journalism; "A data journalist could be a police reporter who's managed to fit spreadsheet analysis into her daily routine, the computer-assisted reporting specialist for a metro newspaper, a producer with a TV station investigative unit, someone who builds analysis tools for journalists, or a news app developer," (Howard, 2014, p. 5).

According to data journalist Simon Rogers who is data editor at Google, California and creator of The Guardian Datablog, data journalism is not just about graphics and visualizations. It's about telling the story in the best way possible. Sometimes that will be a visualization or a map. But sometimes it's a news story. Sometimes, just publishing the number is enough. 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 (Rogers, 2011a).

Troy Thibodeaux finds it difficult to define what data journalism is precisely because of the difficulty of defining data. After all, anything countable can count as data. Anything that a computer processes is data. So, on some level, all journalism today is data journalism (certainly it's all "Computer Assisted"). Real data journalism comes down to a couple of predilections: a tendency to look for what is categorizable, quantifiable and comparable in any news topic and a conviction that technology, properly applied to these aspects, can tell us something about the story that is both worth knowing and unknowable in any other way (Thibodeaux, 2011).

To become a good data journalist, it helps to begin by becoming a good journalist. Hone your storytelling skills, experiment with different ways to tell a story, and understand that data is created by people. We tend to think that data is this immutable, empirically true thing that exists independent of people. It's not, and it doesn't. Data is socially constructed. In order to understand a data set, it is helpful to start with understanding the people who created the data set-think about what they were trying to do, or what they were trying to discover. Once you think about those people, and their goals, you're already beginning to tell a story (Howard, 2014).

So these approaches show the difficulties to clearly define data journalism. It's sure that data journalism is more than infographics, top ten lists, and charticles though graphs, maps, and tables are often instrumental in effective displays of data. In summary, data journalism can be expressed as the point where investigative journalism is combined with advanced analysis techniques and new media. It's a form of journalism that news has emerged as a result of a long effort and endeavor, and is prepared in the diligence of an academic article. Also new concepts added to the definition of journalist; a journalist is still more curious, detailed, excited, but at the same time is able to use the analysis methods and techniques at advanced level, understands from the design, dominates the digital world.

1.3. THE DATA JOURNALISM PROCESS

In literature there are several models and workflows to produce a data story. At this part of the study some most known data journalism processes are summarized.

At 7th Innovation-Journalism Conference information architect and multimedia journalist Mirko Lorenz (2010), emphasized five points that data-driven journalism workflow consists; (1) Digging deep into (big) data (scrape, cleanse, structure), (2) Miningfor 'nuggets' of information (filter), (3) Visualizing information in graphics or multimedia specials, (4) Connecting classic storytelling with otherwise dry statistics, (5) Creating media that has value for readers/users.
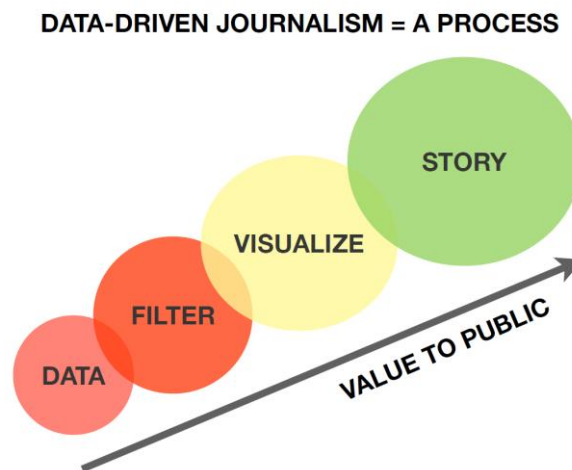

Figure 1.1   Data-Driven Journalism=A Process

Bradshaw (2011) details a model of data journalism process with The Inverted Pyramid of Data Journalism in fig. 1.2. He explains the stages as;

1. Compile: This compilation of data which is as an act of data journalism is the most important stage and can take various forms. At its most simple the data might be;

10

a. supplied directly to you by an organisation (how long until we see 'data releases' alongside press releases?),

b. found through using advanced search techniques to plough into the depths of government websites;

c. compiled by scraping databases hidden behind online forms or pages of results using tools like OutWit Hub and Scraperwiki;

d. by converting documents into something that can be analyzed, using tools like DocumentCloud;

e. by pulling information from APIs;

f. or by collecting the data yourself through observation, surveys, online forms or crowdsourcing.

2. Clean: Being confident in the stories hidden within it means being able to trust the quality of the data, that means cleaning it. Cleaning is needed for removing human error; and converting the data into a format that is consistent with other data you are using.

3. Context: Data cannot always be trusted. It comes with its own histories, biases, and objectives. So like any source, it's needed to ask questions of it. Having a clear question at the start of the whole process is significant and helps to ensure to not to lose the focus, or miss an interesting angle.

4. Combine: Good stories can be found in a single dataset but a more mundane combination is to combine two or more datasets with a common data point.

5. Communicate: The obvious thing to do at this point is to visualize the results – on a map, in a chart, an infographic, or an animation (Bradshaw, 2011).
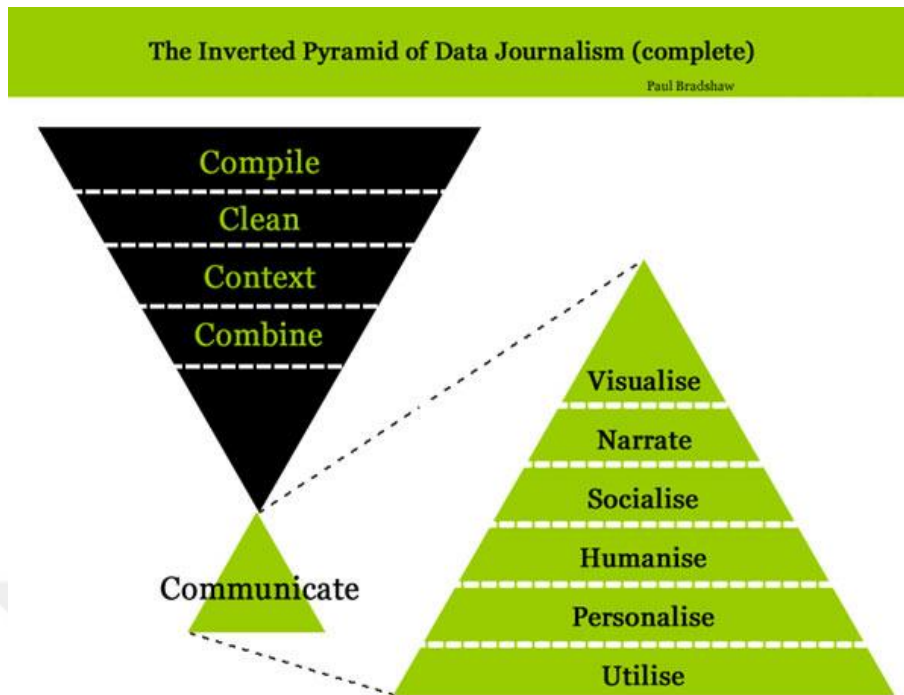
Figure 1.2   The Inverted Pyramid of Data Journalism

Bradshaw describes the step communicate with 6 different types:

1. Visualization: This step is the quickest way to communicate the results. Major advantage is, it can make communication incredibly effective but its major strength is also its main weakness.

2. Narration: A traditional article can struggle to contain the sort of numbers that data journalism tends to turf up, but it still provides an accessible way for people to understand the story. Using numerals rather than words, helps people scanning the page.

3. Social Communication: Communication is a social act, and the success of infographics across social media is a testament to that. But it's not just infographics that are social – data is too. Crowdsourcing initiatives aimed at gathering data can also provide a social dimension to the data.

4. Humanise: It's important to humanise the numbers. Going out and recording an interview with a person whose life has been affected by relevant data can make a big difference to the power the story.

5. Personalise: One of the biggest changes in journalism's move online is that it opens up all sorts of possibilities around interactivity. When it comes to data journalism that means that the user cancontrol what information is presented to them based on various inputs. One of the well-established forms of this is, users can find out how a specific subject affects them. Other common formsare geographical personalization to get information and personalization of a story created by users social networks as Facebook profile information or third party sites.

6. Utilise: The most complex way of communicating the results of data journalism is to create some sort of tool based on the data. Calculators are popular choices, as are GPS-driven tools, but there is a lot of scope for more complex applications as more data becomes available both from the publisher and the user. Again, there is overlap here with personalization – but it is possible to provide utility without personalization. And quite often, the complexity and consequent barrier to competitors presents commercial opportunities too (Bradshaw, 2011).

Rogers (2011b) describes The Guardian's data journalism workflow in fig. 2.3 which the Guardian graphic artist Mark McCormick helped him to visualize the process.

- We locate the data or receive it from a variety of sources, from breaking news stories, government data, journalists' research and so on

- We then start looking at what we can do with the data - do we need to mash it up with another dataset? How can we show changes over time?

- Those spreadsheets often have to be seriously tidied up - all those extraneous columns and weirdly merged cells really don't help. And that's assuming it's not a PDF, the worst format for data known to humankind

- Now we're getting there. Next up we can actually start to perform the calculations that will tell us if there's a story or not - and then sanity check them to see if it just sounds wrong

- At the end of that process is the output - will it be a story or a graphic or visualization, and what tools will we use? (Rogers, 2011b).
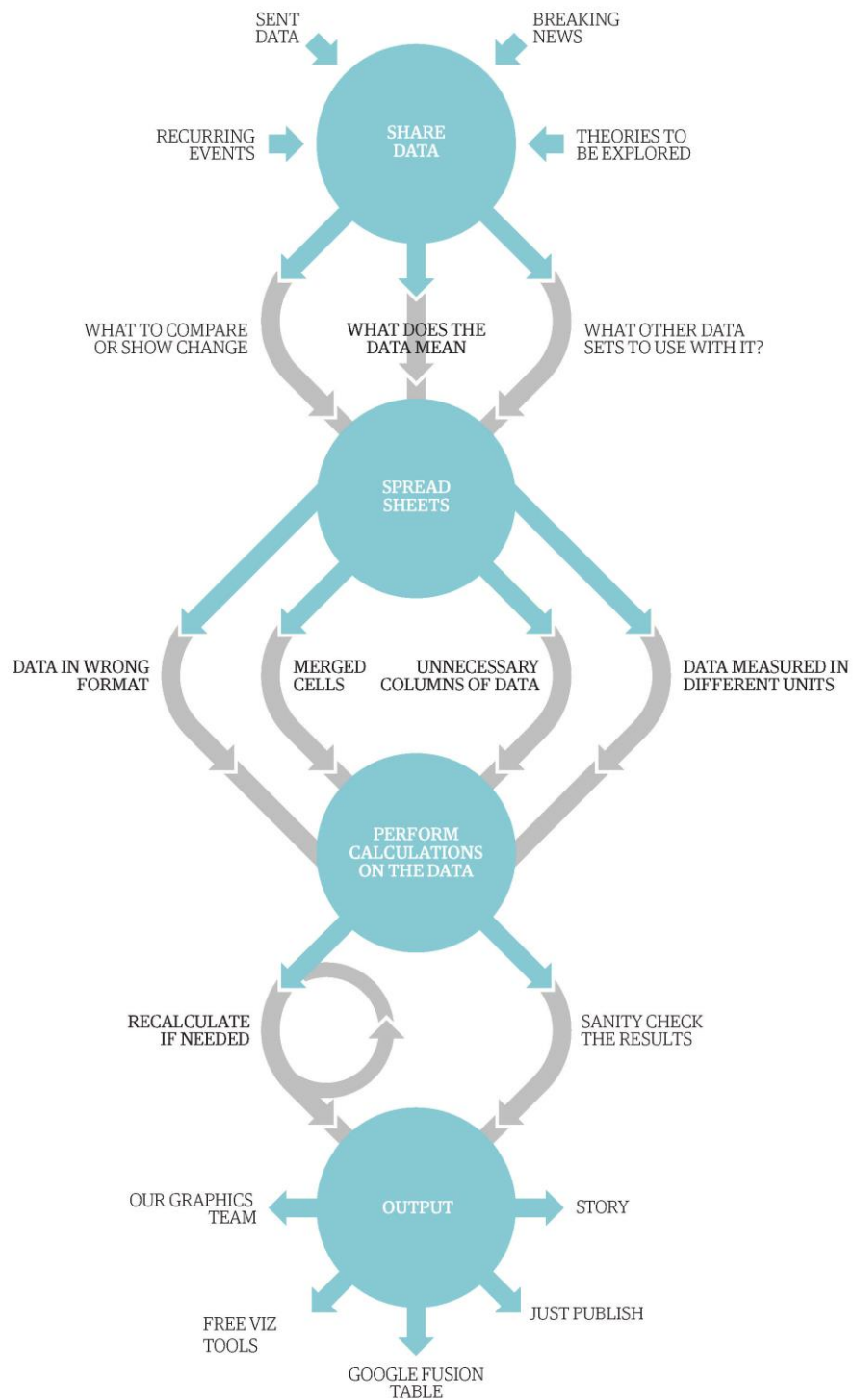
Figure 1.3   The Guardian's Data Journalism Workflow

In the study the The Inverted Pyramid of Data Journalism process which presented by Bradshaw was used and shared with the participants to compare with their workflow. The comparison of the processes are interpreted in research findings section.

1.4. DIFFERENCES BETWEEN TRADITIONAL JOURNALISM AND DATA JOURNALISM

Historically, there have been varying interpretations of the field. Some definitions focus on data journalism's purpose: the combination of the traditional "nose for news" with the sheer scale and range of digital information now available. Others emphasize the processes that help to produce it: "gathering, cleaning, organizing, analyzing, visualizing, and publishing data to support the creation of acts of journalism" (Howard, 2014, p. 4). Further complicating the definition is the evolution of other subdisciplines such as computer-assisted reporting and computational journalism (Rogers, Schwabish & Bowers, 2017).

In Data Journalism Handbook, Lorenz Matzat from OpenDataCity explains the difference as; "In traditional journalism, due to the linear character of written or broadcasted media, we have to think about a beginning, the end, the story arc, and the length and angle of our piece. With data journalism things are different. There is a beginning, yes. People come to the website and get a first impression of the interface. But then they are on their own. Maybe they stay for a minute, or half an hour" (Gray, Bounegru & Chambers, 2012, p. 53).

The transition from word journalism to zeros and ones journalism makes this area different. We can say that new tools and new professional disciplines have been added to the toolkit of journalism. Now the people who know to code, analyze the thousands of datasets, use excel or other tools effectively, understand from programming and data science and also have statistical knowledge are the part of the newsroom because now new techniques develop which tell stories/news more powerful than text. Moreover, the data doesn't mean "numbers" anymore. Photographs, video, sound recordings, texts can also be measured by programming languages (Dağ, 2014b).

Data journalism is no different from the journalism we know and consume every day. Where traditional journalism relies on human sources (e.g., insiders, experts, scholars, and scientists), data journalism treats data sources (e.g., spreadsheets, websites, and

databases) with the rigor and scrutiny that journalists treat human sources (Demian, 2017).

Paul Bradshaw answers the question "What makes data journalism different to the rest of journalism?" as; perhaps it is the new possibilities that open up when you combine the traditional "nose for news" and ability to tell a compelling story with the sheer scale and range of digital information now available.And those possibilities can come at any stage of the journalist's process: using programming to automate the process of gathering and combining information from local government, police, and other civic sources, as Adrian Holovaty did with Chicago-Crime and then EveryBlock (Gray, Bounegru & Chambers, 2012).

Just as in CAR, data journalism discourse foregrounds telling the story over using data, though it is looser in its connection to traditional journalistic practices in producing those narratives (Coddington, 2015). According to Data Journalist Jerry Vermanen, data journalism is a new set of skills for searching, understanding, and visualizing digital sources in a time when basic skills from traditional journalism just aren't enough. It's not a replacement of traditional journalism, but an addition to it (Gray, Bounegru & Chambers, 2012). Reporters frequently collect information from the same sources over and over again: building permits, police reports, census surveys. Obtaining and organizing this information can be made infinitely more efficient, even totally automatic, by keying in to the data behind the reports (Sunne, 2016).

Spiller and Weinacht pointed out three major differences in comparison to traditional journalism, which are the significance of visualization, journalistic selection on a lower level and transparency of investigative results. In other words, the research process happens in a more technical, computational way when gathering data. Furthermore, the gained information or data is disclosed and displayed as data visualization, which is not the case in traditional journalism. As a result of publishing the findings and raw data sets, the selection and interpretation of data is often left to the recipient when using interactive web applications like maps. Hence, the data journalist plays a less significant role as a gatekeeper compared to a traditional journalist (Schulze, 2015).

Liliana Bounegru from European Journalism Centre emphasizes that by enabling anyone to drill down into data sources and find information that is relevant to them, as well as to verify assertions and challenge commonly received assumptions, data journalism effectively represents the mass democratization of resources, tools, techniques, and methodologies that were previously used by specialists; whether investigative reporters, social scientists, statisticians, analysts, or other experts. While currently quoting and linking to data sources is particular to data journalism, we are moving towards a world in which data is seamlessly integrated into the fabric of media. Data journalists have an important role in helping to lower the barriers to understanding and delving into data, and increasing the data literacy of their readers on a mass scale (Gray, Bounegru & Chambers, 2012).

1.5. CURRENT STATE OF DATA JOURNALISM IN THE WORLD AND TURKEY

The Google News Lab published a research named "Data Journalism in 2017: The Current State and Challenges Facing the Field Today" in collaboration with PolicyViz to serve as a foundation for discussion and an impetus for action to better meet the needs of data journalists around the world.

The conclusions of the research are drawn from a two-phase survey. In the first phase, in-depth interviews were conducted with 56 journalists, and the second phase consisted of a large, quantitative polling survey with more than 900 journalists and editors in the United States, the United Kingdom, France and Germany.

According to report's findings:

- 42% of journalists surveyed said they use data regularly to tell stories. And 51% of news organizations have a dedicated data journalist on staff.
- Through a series of in-depth qualitative interviews and an online survey, many survey respondents-editors, reporters, digital experts, and designers- want their organizations to be using more data and employing it more effectively to tell stories. But there are barriers that limit the use of data in newsrooms.

- 53% of the sample saw cleaning, processing, and analyzing data as a speciality skill that requires extensive training, and not something all journalists have been able to pick up easily. That percentage varies across different types of newsrooms: 33% of people in broadcasting believe it's a specialized skill while nearly 60% in online or digital newsrooms agree that it is a specialized skill.

- Slightly more than half of all respondents said their news organizations have a dedicated data journalist, but that share rose to 60% in digital-only organizations. In the US, about 46% of survey respondents reported having dedicated data journalists in the newsroom, compared with 52% in the UK, 56% in France and 52% in Germany.

- About a third of respondents stated that stories on politics are the most relevant to data visualization with 32,9%. Finance 28%, investigative 25,3%, sports 24,7% followed. 12,6% of people chose the option for "None-data can be relevant for any topic."

- Survey respondents also discussed the time pressures they face as well as bottlenecks in the editorial process as a result of the limited bandwidth from dedicated data journalists. 49% of all respondents reported taking a day or less to create a data-driven story; about 44% reported taking up to a week or more; another 8% reported that they don't write data-driven storiesof data stories are created in a day or less.

- Data visualization tools are not keeping up with the pace of innovation. about 13% of respondents are mostly or entirely using external tools. One-fifth of the sample are using entirely in-house software and graphics, while another two-thirds of the sample are using some mix of in-house and external tools.

- For some newsrooms, there is an unclear return on investment as the production of data journalism can take significant time and resources (Rogers, Schwabish & Bowers, 2017).

The role of the journalist is also changing. Being able to report on data is now expected, but being able to collect, analyze, and visualize data is still largely viewed as a specialized skill. Not all newsrooms have the resources to employ a dedicated data journalist or data journalism team, but most organizations are exploring various methods to use more data in their reporting (Rogers, Schwabish & Bowers, 2017).

In Turkey, the first Data Journalism course was held in the workshop environment of the #ClanMade project, which lasted two days in 2013. In 2014, the start of giving data journalism courses at Kadir Has University was followed by the preparation of the first open syllabus and the extraction of the course catalog. In the same period, European journalists and developers metwith journalists from various media outlets in Istanbul under the title of Data Journalism meet-up and a data journalism presentation was made to İstanbul University Communication Faculty students (Dağ, 2014b).

One of the most important steps in Turkey is the establishment of Open Data and Data Journalism Association in December 2015 to increase data literacy and generalize skills and acquisition. The Association organized the first online course about data literacy at its' first year and 1st National Open Data Conference in 2016. It's also the first association working directly in this field in the world.

Data journalism has been introduced into the communication faculty syllabuses of some universities in Turkey, and trainings have started to be given on this field by 2014. By the year 2017, 86 programs at 40 universities in Turkey provide undergraduate level education in the field of journalism, new media and journalism, new media. But just at 12 of these 86 programs have courses about data journalism and big data in their syllabuses and 9 of these programs are in İstanbul where is the centre of media. At graduate level İstanbul University and Ege University are two universities which have courses about data journalism in their syllabuses. Also İstanbul University is the only one has data journalism courses in its' syllabus at the level of Phd education.

CHAPTER 2

RESEARCH DESIGN

2.1. RESEARCH QUESTIONS

The aim of this research is to analyse data journalism practice in Turkey. To fulfill this aim, specific questions have been developed to tackle the issue. The main research question is; "What is the current state of data journalism practice in Turkey?" and it will be examined by the subquestions below.

The study examines and try to answer the following research questions:

  i.   How do journalists in Turkey perceive data journalism?
 ii.   What are the problems journalists face practicing data journalism?
iii.   How sufficient is data journalism education in Turkey?

2.2. RESEARCH METHODOLOGY

2.2.1. Qualitative Research

As this study aims to analyze data journalism practice in Turkey, a qualitative research design was preferred by the researcher. Qualitative research design aims to provide the researcher a broad overview of the perspectives, values and beliefs of the participants. In study, semi-structured interview with standardized open-ended inter interview is applied to the participants. By this way, the researcher can find full and systematic information. The questions are flexible, allowing the researcher to deeply examine the events, correcting the misunderstandings and revealing unexpected relationships or

hypotheses and unexpected information. The collected data helps to develop a deeper understanding of the subject.

Strauss and Corbin defined qualitativeresearchas "Any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification" (Strauss & Corbin, 1998, pp. 10-11)

According to Holloway (1997) qualitative research is a form of social inquiry that focuses on the way people interpret and make sense of their experiences and the world in which they live. A number of different approaches exist within the wider framework of this type of research, but most of these have the same aim: to understand the social reality of individuals, groups and cultures. Researchers use qualitative approaches to explore the behavior, perspectives and experiences of the people they study. The basis of qualitative research lies in the interpretive approach to social reality.

Qualitative research doespresuppose a different understanding of research in general, which goes beyond thedecision to use a narrative interview or a questionnaire, for example. Qualitativeresearch comprises a specific understanding of the relation between issue andmethod (Flick, 2009, p. 90).

Denzin and Lincoln (2005) who are key theorists in this field, described qualitative research as: "Qualitative research is a situated activity that locates the observer in the world. It consists of a set of interpretive, material practices that make the world visible. These practices transform the world. They turn the world into a series of representations, including field notes, interviews, conversations, photographs, recordings and memos to the self. Qualitative researchers study things in their natural settings, attempting to make sense of, or to interpret, phenomena in terms of the meanings people bring to them."

Hoepfl (1997) lists the characteristics of qualitativeresearchasa synthesis of several authors' as:

- Qualitative research uses the natural setting as the source of data. The researcher attempts to observe, describe and interpret settings as they are, maintaining empathic neutrality.

- The researcher acts as the human instrument of data collection.
- Qualitative researchers predominantly use inductive data analysis.
- Qualitative research reports are descriptive, incorporating expressive language and the presence of voice in the text.
- Qualitative research has an interpretive character, aimed at discovering the meaning events have for the individuals who experience them, and the interpretations of those meanings by the researcher.
- Qualitative researchers pay attention to the idiosyncratic as well as the pervasive, seeking the uniqueness of each case.
- Qualitative research has an emergent (as opposed to predetermined) design, and researchers focus on this emerging process as well as the outcomes or product of the research.
- Qualitative research is judged using special criteria for trustworthiness (Hoepfl, 1997, p. 49).

2.2.2. Data Collection

The research tool used for this study is semi-structured interview. Interview questions have been developed about perception of data journalism, important aspects of data journalism, data journalism process, access to open data, comparison of the situation in Turkey and abroad, data journalism education and asked to 8 participants working in the field of journalism in Turkey or had trainings about data journalism which consisted of 3 females and 5 males. In the study, it is aimed to analyze data journalism practice in Turkey; so firstly a list of journalists who had trainings on data journalism and produced news in the field is created. Then contacted with the journalists who work in mainstream media, alternative media and as freelancer in different media companies from the list to reveal the general situation in Turkey and compare. When the research deepened and the role of the mainstream media became important, the criterion of data journalism education was removed and two mainstream media managers were added to the interview list. Semi-structured interviews were conducted with mainstream media, alternative media and freelancer employees who had received data journalism training

or produced news in the field of data journalism without discrimination of age and gender.

Firstly an introduction letter about the study is prepared and contacted with the participants via phone or e-mail. After, an appointment with each of them were made for the semi-structured interviews. Interview environment and conditions were chosen by participants, therefore they felt comfortable and secure. The participants were informed briefly before the interview and were given the opportunity to ask questions about the study. Interviews were made one by one, recorded and transcribed accurately. Interviews lasted approximately 22 minutes to 120 minutes. All of the participants attended to the interview positively, and gave clear and detailed responses to the questions.

Participant related code, descriptive information, interview date and interview time information are given on Table 2.1.

Table 2.1 Information About Participants

Code	Gender	Job Title	Interview Date	Interview Duration
P1	Female	Media Founder -Academician	21.09.2017	01:57:38
P2	Male	Freelancer	21.10.2017	01:22:41
P3	Female	Editor	22.10.2017	00:44:09
P4	Female	Freelancer	28.10.2017	00:22:10
P5	Male	Editor	02.11.2017	00:51:07
P6	Male	Department Manager	04.11.2017	01:07:19
P7	Male	Freelancer	21.11.2017	01:12:35
P8	Male	Deputy Executive Editor	22.11.2017	00:32:56

2.3. ANALYSIS OF THE MATERIAL

Yıldırım and Şimşek (2013) specify that data analysis in qualitative research has implications such as diversity, creativity and flexibility. Each qualitative research has its own characteristics so the researcher should formulate an appropriate data analysis plan considering the characteristics of the research and the data obtained and the current data analysis methods. However, qualitative data analysis should not be reduced to a standard format. A standard format reduced data analysis limits researcher and adversely affects access to in-depth results associated with the obtained data.

According to Kümbetoğlu (2015) qualitative data analysis requires a number of complex operations. But the main point to note before these procedures is to read the data repeatedly and carefully. If the data are read repeatedly and carefully, it will be possible to understand the points which are important forthe participant but not seen at first sight.

Data analysis is made for eliciting meaning and bringing order to the data. In order to discover and describe the content in a systematic way, content analysis was preferred. The main purpose of content analysis is to elucidate the facts that may be hidden in the subject data by reaching the concepts and relations that can explain the collected data. The data obtained in this process have been classified into similar entities by "coding list" and tried to be understood as a whole.

I analyze these answers in 8 different categories.

- Perception of Data Journalism

- Important Aspects of Data Journalism (Programming/Coding and Visulization)

- Data Journalism Process

- Access to Open Data

- Data Journalism ın Turkey

- Comparison of the Situation in Turkey and Abroad

- Fields of Data-based News Production in Turkey

- Data Journalism Education

CHAPTER 3

RESEARCH FINDINGS

Perception of Data Journalism

It is possible to define data journalism as a reflections of investigative journalism into today's digital environment. In the study, similar answers have been found as the definitions underlined in the literature review; "as a type of journalism that uses data on the basis of stories" and "gathering, cleaning, organizing, analyzing, visualizing, and publishing data to support the creation of acts of journalism." Freelance Journalist **P2** express that journalism is a cultural profession and data journalism is a more digitized version of that cultural profession. An interviewed **Mainstream Media Department Manager P6** defines as: "In the simplest case, journalism based on information"; **P7** who is a freelance journalist defines data journalism as: "Data journalism is a news production process with raw data which is open to analyze and manipulation."

As a result of these definitons data journalism is not perceived very differently from traditional journalism. Data journalism, which is based on traditional journalism, is perceived as a form of journalists workflow with today's digital technologies, focusing on data.

The reason of different perception and thought of data journalism from traditional journalism is the presentation of news and obligation of journalists having more information and skills according to the past. **P3** samples this situation as; "In traditional journalism, the journalist goes to the news, prepares the news and delivers it to the news center. But it's different in data journalism; a data journalist must be able to understand from the fields software, graphics, design and so on." **P6** emphasizes that data journalism requires more technical skills than traditional journalism but both have common aspects as reaching the truth in the end, creating the public good for public, etc.

In study, the question "Can anyone do data journalism or who can do it?" is also researched, in the interviews it's concluded that having some skills of those who want to work in the field of data journalism is important in terms of the quality of the work done. Some of these skills can be provided through trainings, the journalist's the researcher's identity and interest to the field is at the forefront. When **P7** tells that the journalism reflex should first be followed by basic data analysis, data manipulation and data cleansing skills, respectively; also **P3** with a similar interpretation, emphasizes that first of all a data journalist must have the all the necessary features as a traditional journalist and a good relation with the computer. **P5** express that by taking attention to imagination, creative ability is important; and the rest is journalism. According to **P8** who is Deputy Executive Editor at Mainstream Media; researchers' identity is the key point; so each data should be evaluated with news focus and excited, and also should be experienced with figures, numbers.

The common opinion from interpretations is; first of all, a data journalist is a journalist. So it starts by the same point with the traditional journalist. But the differentation is effective usage and control of digital and information-comunication technologies.

Important Aspects of Data Journalism

Data journalism is a field with extra practices compared to classical journalism. Those who are interested in or work in the field of data journalism be able to use programming/coding, visualization, and so on effectively, beyond being an opinion.

Programming/Coding

In journalistic practice, technical knowledge has an important place compared to the past. In data journalism, some softwares are needed to manipulate and analyze the data. As stated in the literature, software/code departments are now built in the news rooms. Therefore, programming/coding is an important point for the adaptation of journalism with new age and it's usage. It's not sought in traditional journalism, but programming/coding is an important part of data journalism. While data journalists are generating news, they pass through this software stage. But there is a different situation here; every journalist does not have to have the knowledge and skills in terms of software. Because there are tools available that make it ready.

P7 says that programming knowledge is important but it is not a necessity. Comments as; "If you want to work in this area, of course it is an advantage if you have code capability. But it is not necessary to know coding for a journalist starting from the base; because the necessary software, programs already have free or open access." With a similar expression **P5** tells that ready-made tools can be used without knowing any coding but when coding is known, better results come out.

It is possible to summarize this point through an example and conclude; programming/codding stage in data journalism can be thought as setting up a web site by special software or by using ready-made infrastructures. There is a similar situation in data journalism, too. Instead of creating the software part from basis, it's possible to create news with paid or free tools presented in this field. However, to be able to use the paid and free software tools developed for this field and to be interested are the basics of data journalism.

Visualization

Fewer texts and interesting images focused on today's communication studies are also very important in the field of journalism and data journalism; because in the background of data journalism, the journalist is busy with examining and analyzing data that the reader doesn't want to ponder and waste time. Therefore, it's important to publish the news at the end of this process and ask question "how" when delivering it to the reader. A visualization effort to convey messages more effectively is also a necessity for data journalists. Simple or complex datas worked on are presented to reader via infographics, interactive maps etc. **P3** says that visualization compose almost all of the work, as **P3** also Media Founder and Academician **P1** comments that a journalist wants to tell a topic to the reader in the simplest and most compact way. It's needed to present and summarize the subject to the reader in quickest way. For that reason, data visualization constitutes 90% of data journalism. According to **P5** visualization is 50% of data journalism. **P7** emphasis that "New trends are now more prominent in reporting. Currently the user doesn't want to read any text directly and wants more interactive reporting."

So visualization in data journalism plays an important role. Here again it's needed to ask the question "Whether a journalist should have knowledge and skill about visualization section?" As programming/codding there are paid and free tools for visualization, infographic, interactive maps. There are paid and free tools for who don't know how to use the design programs but want to work in this field.

Data Journalism Process

It's possible to talk about the standard practices and stages of data journalism. When Bradshaw's The Inverted Pyramid of Data Journalism process, which was also examined in the literature review, showed participants and asked to compare their own processes, it's seen that they apply a similar process. **P5** summarizes the workflow as: "You need to find the story first, then collect the data and be sure of the correctness of course. After you have to decide how to present it; is it a map, is it a graphic? Will it be given as a whole or partly? It's needed to make a decision. And write the story."

Journalists follow certain steps while producing news, but at the same time pass through certain difficulties. In this process; "Finding the data", "verifying the data found" and "cleaning" are the biggest difficulties. At this point, the **P7** emphasizes that the most important step is to clean the data after it has been delivered. Because there may be certain inconsistencies or mistakes at datas. According to **P1** the biggest ring is story, because data journalism's aim is to tell the story more effectively and tell the workflow as "If we talk about a general cycle, we can think as; to reach the data source first, collecting data; cleaning it after you have collected, analyzing after cleaning, visualizing and storytelling."

When **P3** express the biggest challenge in data journalism as the collection and visualization of data, Freelance Journalist **P4** underline the doubt from the truth of the data. **P7** brings a different approach to the subject and tell that it's now easier to get the data; but it began to pay more attention to manipulating and tracking that data, making it ready for analysis and visualization, to make sense of it. So **P7** emphasizes that the most time consuming point is the data cleaning phase, the rest process is got used to by practices.

Practicalization of this process, removing the parts that are considered as "difficult" by people who received this education or currently practicing it and doing it quickly are the important subjects for data journalism. Because these difficulties can not ensure the continuity of data journalism and therefore prevent its development. As the collection of data, cleaning, verification, visualization and storytelling become practical as a whole, there will be an increase in the number of news made in this field. Finding the source, proving the correctness of found data and cleaning are the processes that require skill. And we can count them as the biggest challenges.

Access to Open Data

In data journalism journalist produces news by data but it's needed to ask; Do those who want to produce news with data have access the data they want? and How much of them they can reach? One of the research questions of the study is; What are the problems journalists face practicing data journalism? So the common view of the interviews to this question is; it's difficult to reach data in Turkey, there is a problem with data sharing generally and formats of data shared.

The fact that the format of the shared data is in pdf is an important problem for data journalists. Even there are analysis tools for converting data in PDF format, it takes a long time for journalists in period speed is important. **P7** specify that the biggest challenge is the format of the datas; "The data of ministries or other public institutions is not a machine-readable data. They are not in the open data format for manipulate and analyze by excel or other analyze tools. Many public institutions share their datas in pdf format. To take this data from pdf it's needed to use some tools, it can take months to manipulate this data with other datas." According to **P6** "Turkish Statistical Institute has many data but not in the structured form; stuructured data is needed facilitate our work. We have to manually correct the data we get from public institutions." With a similar expression **P5** emphasizes that public institutions' situation is very bad for open data sharing and there is not independent institutions to provide data. **P3** underline that datas are very cursory and Turkey is relatively closed for open data and it's quite difficult to confirm the validity of open data.

One of the major data-related problems is that data is being stored at a near-term and is not regular. Mainstream Media Department Manager **P6** tells that the lack of data continuity is an other problem and gives an example; "Measurements of air pollution have been made for some years and not made for some years. We see that hundreds of data sources in the UK, the USA or Finland are fully open and approved by the government. In this regard I think we're very lack of in Turkey."

P1 take attention that there isn't a standardization about data in Turkey and offers suggestions to solve the problem; "The data must be in a format that we can fitler and easily download. In addition to this, the institutions that provide data also must increase. So we can have more resources and verify the data and analyze the reliability. Then there has to be a separate institution for the development of this area, which should not be under the control of the ministries. The government should open the data so that it can better serve it's services. Open government, open governance, open access. These are chained."

The use of data journalism and the progress of the current situation in the future is directly proportional to the increase in data usage and sharing. Participants have a common idea that importance of open data will increase but not very optimistic about the situation may develop in Turkey. **P7** mean that when compared to the years, data journalism is an increasing trend and this trend will increase more; and one of the biggest reason for this increase is the growth of the amount of data. **P4** doesn't think that the situation will improve in the future and reason for this is media economy; "When we investigate the ownership law in the media economy; "You can not reach the data because the doors are closed, because the main sources are closed, we can not say anything, so the subject has to be clogged."

Facilitation of open data access and development of data journalism is a matter of countries' development levels. In countries where democracy has developed, where information is transparent, it becomes possible to access open data sources and to generate news from the data being accessed. It's needed to force the institutions to share the information they had or to keep data regularly. Therefore, the activities of institutions as civil society gain importance. **P5** gives an example by underlying the need of institutions to force in Turkey; "It wasn't known how many workers died or

numbers of female murder until recent time in Turkey. However, in these areas, it has been started to be reached the data especially by the organizations that are working in the field."

Data, is a very important subject in the field of marketing and communication. Today's marketing communications and investments, superiority of the competition are made possible by the dominant and effective use of data. Efforts to record data, store and use data efficiently are increasing with the development of digital technologies. Graduate programs in managing the database are being launched. It is possible to say that the data which is important for the media as well as the employees in the communication field is still in the crawling stage when it is evaluated in terms of reporting. If open data sources and the access to these open data develops in the future also data journalism will develop or not in the same way.

Data Journalism in Turkey

The current situation of data journalism in Turkey is generally explained under this category bythe answers of P6 and P3 from mainstream media.

The public opinion why data journalism can't be done or done less in Turkey is; media revenue model. Advertisements, especially advertisements on internet sites, are an important source of revenue for media organizations. Therefore, major / mainstream news centers are not interested enough in data journalism because of their click-oriented approach to the continuity of this income. The situation in Turkey about this subject is summarized by **P6** who was trained on data journalism:

"The rules of game in Turkey is different. You always have to do things that appeal to very large masses. It's a commercial cause; the number of clicks that need to be taken in order for a news article to be amortized gradually increases. Unfortunately the advertisers in Turkey, just think that 'Our ads must be there, just visibility is enough.' In fact, itsn't necessary to look at the visibility, not even the click, it's needed to look if it has been bought since the advertisement was clicked. But Turkey is not much in that perspective. So you have to produce very high volume contents. So the quality remains a bit backwards. In order to qualify for quality, you need to be aware of the new revenue models or subscriptions etc. methods need to be widespread on the advertiser side and

reader side. Because there is a situation like this; an excellent work on data journalism has a volume of 100.000 clicks. But 100,000 reading is not a worthy reading for us; for example, we need to have 1 million impressions for a video to pay the salary of the video organizer in our video department. The same is true for news side too. In other words, the commercial source that is necessary for the institution to grow or to protect itself ultimately we need these advertisements. If there has been other methods and sources like subscriptions etc. this not the case maybe; but in this situation we always need high volume works. It's required to update the business model of journalism and a new business model must be. There are people who can work on data journalism very well in Turkey. There is no trouble with that. In addition, people get more pleasure from such a business. Every journalist wants to have a signature under such a job instead of a cheap and consumed immediately work."

P3 has a similar comment for this situation: "We produce the news and it has to have clicks. There is such a situation in general; work returns by ads. Most of the news read in Turkey are from news of life or magazine. When we try to prepare a special report, commercial effect is less so the tendency for this kind of news is less. In fact, there must be responsibility of big media organizations, but they are not interested at the moment. As a result, the media has a transformative power. It needs to be aware of this power, but also get rid of those ads. Maybe a different economy model is needed. As long as my salary depends on the clicks of these ads, it's difficult.

The media revenue model which journalists are related and the fact that digital media is becoming more and more "click-focused" day by day discloses the current state of data journalism. As long as the income model remains unchanged, data journalism will not really develop unless the mainstream media devotes labor and budget to it.

An editor from alternative media tells that he and his company attempted to data journalism field, they had trainings as a team and they produce news also by working on related softwares on data journalism and they also want to produce news on this field in the future. He comments that "The mainstream media doesn't really get into this filed. It's not possible to find a section about data at their websites. Instead of dealing with them, they are writing 15 tech news and saving the day. They don't have the intention to convert the reader's mass. They create galleries by saying the public want it."

Comparison of Situation in Turkey and Abroad

When the major news organizations in Europe and USA set up news centers related to data journalism with serious investments, the number of news media organizations are very few for the people who want to intend to this field. Therefore, those who are educated in the field or interested in it can't find the necessary working environment in Turkey. **P7** exemplifies comparison with abroad as; "New York Times, Washington Post, Guardian, BCC try to do data journalism. Because they already have the necessary equipment, the news reporters who own data journalism skills and have a news center. However, when we look at Turkey; there is a few people who say 'I will work as data journalist' or there is any news center wants to employee a data journalist in their departments." With a similar comment **P2** tells that major news centers in Europe and USA set up news rooms for data journalism; "In Turkey, there is no a such situation, and therefore could not develop. There isn't alternative media sources for the people who want to work as a data journalist in Turkey, they work personaly. Sometimes they get support from international organizations. However, in such a way the budget is the major problem. According to **P5**, the main reason data journalism can ben done abroad is; there is a differentiated democracy and people can use their critical power more effectively. Freedom of journalist is also very important."

Another important point in data journalism is reader group. How many people read the news after long work and effort. Do the news centers gravitate to click targeted news for quick consumption because of the reader demands or it is not possible to talk about data-driven journalism because news centers impose such news?" is as important as to be a main question of another research.

Fields of Data-Based News Production in Turkey

In study, it was also asked to the participants who work in the field of data journalism or had trainings; "Which subjects/fields do they mainly work with data?" In data journalism there is a long timeline, labor and effort to produce comprehensive news contrary to news about quick clicks and fast production, fast consumption. It's observed that the journalist work on data journalism mainly produce news in fields like policyand economics. **P7** mostly produce news in the field of policy and one of his most recent

projects was to examine the policy agenda through the referendum process in Turkey by looking at the politicians Twitter shares. **P8**; emphasizes that it changes period to period; policy at the time of election; but mostly works on in the field of economy or sports when all the year examined. **P1** decides what to work on according to the data; recently worked projects are in the field of education, animal exploitation, workers' deaths.

Producing news on a subject in data journalism; can be likened to writing an academic article. Finding a subject, reaching many data and sources as possibleas about the subject, and analyzing them afterwards is an ingenious process. Today, the consumption of news has changed by the influence of social media.

Data Journalism Education

One of the key points in the development and expansion of data journalism is the trainings in this field. To get a response about the research question "How sufficient is data journalism education in Turkey?" talked to participants and asked them if they work as a data journalist or not even they had the trainnigs. So P3, freelancers P7, P2 and P4 don't work in the field even they had trainings. Just P5 has a few works on data journalism.

Journalism graduates or journalists have to adapt the change in todays information-communication technologies and use them effectively. Digital changed the practices of work done in both communication and media fields. Those who can not adapt to these technologies are not able to work or produce in the field of communication or media. Therefore, the trainings in the field are important for development and widespread of data journalism, but there is a general consensus that the current situation is inadequate. **P7** expressing that journalism is not the same journalism taught 10-20 years ago; and adds "Now computer based journalism is on the rise. State universities should also integrate into this field. As this integration has not been achieved, less data journalism courses are now put into their syllabuses." According to **P3**; data journalism education and data literacy isn't enough in Turkey, so it's needed to prepare trainings at least on how people can use data. In an other opinion **P4**, states that the trainings should not be limited to the communication faculties and only journalists. And **P2** expresses that

enough resources are not reserved for the works in the field, so volunteers try to work on data journalism without budget. **P5**, an alternative media editor, both has been trained in the field and worked makes a similar comment about data journalism educaton as other participants: Data journalism must be a necessity so there can be general education. A journalist has to perceive this as a necessity when trying to find a job or doing his work. It has to be a differentiated feature than the others, as coding, then education is a need. So educational institutions multiply and also the quality rises. There are people trying to do something in a very narrow area. Even most journalists can devote time to had trainings. Both in terms of time and money.

CONCLUSION

In this study, the current situation of data journalism in Turkey is examined and analyzed by semi-structured interviews with the participants working in the field or had trainings.

Data journalism, as expressed in the simplest case in the literature, means news made with "data". Participants reported that "data" plays a key role in defining the "data journalism" and in addition referred to coding and visualization information. Coding and visualization information are presented ready tools with the development of today's digital and communication technologies.

There are similarities and differences with data journalism and traditional journalism. There is a similarity between the information in the literature search and the opinions of the participants in the research. One of them is "investigative journalism" is on the basis of both journalism. Investigative journalism is in the basis of traditional and data journalism. Data journalism also means journalism's adaptation to the times we live. Nowadays, we can learn about many things and do various researches by new media and new media technologies. Data journalism actually means the effective use of present-day technologies by journalists. It is a priority for the data journalist to talk to the data and interview; if necessary can interview with experts. In traditional journalism, data is not always in the front; expert opinions, interviews are on the front plan.

The data journalist must have some features and skills. It's important that the researcher, curious and questioning personality as well as the use of new media is dominant. We can express it as the point where investigative journalism combines with digital. Data journalists are people who can master new technologies, analyze and interpret them, visualize their work and make them interactive at the necessary points.

In the study, it has been found that data journalism has serious difficulties in accessing the data base and using open data sources. Participants stated that it's not too difficult to learn data journalism practices but they experienced difficulties in reaching data. The

biggest challenges of data journalists are the lack of historical data, the irregularity of data storage, the lack of sharing, the attainment of long efforts, and the frequent formatting of data.

Some certain processes are encountered in the literature review of data journalism. There is a specific workflow plan; finding the story, data manipulation, storytelling, data visualization are the main steps. Participants also pointed out the process with similar comments. And there is a consensus that it is a difficult stage to find the data and story in this process.

It's observed that the journalist work on data journalism mainly produce news in fields like policy and economics. Data journalists who add different dimensions to the news in terms of visuality and interactivity have made news in the fields of policy and economics especially during and after the elections period.

One of the major problems with data journalism is education. The importance given to marketing for data doesn't have the same concern in the media right now. Literature review and the opinion of participants in the research support this situation. By the year 2017, 86 programs at 40 universities in Turkey provide undergraduate level education in the field. But just at 12 of these 86 programs have courses about data journalism and big data in their syllabuses and courses are mostly under the "new media and journalism" "new media" programs. Therefore, it's possible to say that data journalism education is not common at communication faculties at the moment. Participants also pointed out that any source is transferred to this field and there is a great lack because of work done by the self efforts of the volunteers. Participants trained in data journalism can not work in data journalism.

One of the major obstacles to data journalism, and one of the important results of this researchis; clicks of internet sites that internet journalism focuses on and money they earn from clicks. The media industry is able to sustain its presence with advertising areas. One participants who had trainings about data journalism nad works at one of the major news centers in Turkey stated that although wanted to do this work, could not do it because the salary was linked to the page click and could not get material and spiritual support from the institution working for. On the other side; one of the participants who

is department manager at internet website of mainstream media, expresses that it's not possible at the moment to have time for such a job in a 70-person digital team, and underlines that certain clicks of pages should not be low to pay editor's salary. Therefore, states it as an obstacle for development and widespread of data journalism. In the current situation news centers are focusing on how to earn more from the pages with the data rather than producing news with the data. At the forefront of the proposed solutions for the development of this obstacle in front of data journalism is the change in the revenue model of media organizations.

In the study, based on interviews with representatives of mainstream media, alternative media and freelance journalists, it was observed that the mainstream media didn't devote much time and effort to data journalism despite having more material and spiritual power, but the alternative media with limited budget and fewer employees made more efforts in data journalism.

At the forefront of the proposed solutions for the obstacle to data journalism is the change in the income model of media organizations. Although the development of the digitalization facilitates access to information and sharing of information, journalists are adversely affected by this digital world. Journalists' salaries depend on clicking on their websites, so it leads journalists produce click focused news. In order for journalists to get rid of this situation, the income model is needed to change. At abroad; the subscription system in newspapers like Guardian, New York Times is one of the examples brought to the income model.

Data journalism is laborious; a process that requires material and spiritual labor. As a result of today's fast news consumption, high click effort, the revenue-generating model as it's clicked; traffic data that news sites had come to mind first when "data at journalism" meaned instead of data usage in news.On the other side, the importance of data journalism will increase and become widespread while visibility is at the forefront and interactive content is beginning to attract attention nowadays.

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