



The Effect of Using Data Journalism on Journalists Working in Jordanian News Websites

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Abstract. Over the last several years, the concept of data journalism has garnered a significant attention from academics as an innovative journalistic practice. This study investigates the effects of the use of data journalism on journalists working in Jordanian news websites. The study applied quantitative method in collecting data from a sample of one hundred journalists employed by Jordanian news websites. This study finds that the use of data journalism has significant and advantageous effects on the journalists' performance, especially through the enhancement of the accuracy and dependability of their reporting, the improvement of their narrative aptitude, and the refinement of their skill in providing data analysis. This study also identifies some challenges that journalists should deal while engaging in the practice of data journalism, including the lack of adequate training and competency in data analysis, restricted supply and accessibility of data, and technical infrastructure of news websites.

Keywords: data journalism; newsroom; Jordanian journalist; Jordanian newspapers.

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1. Introduction

The gathering and interpretation of news by journalists have undergone a sea change in recent years as a direct result of the expansion of data sources and the advent of big data. Data journalism, which may be loosely described as the process of applying data analysis and visualisation tools to discover and report on news topics, has emerged as an effective instrument for journalists all around the globe (Zaid et al., 2022). Data journalism has the potential to improve the accuracy and credibility of news reporting, assist in the telling of complicated stories, and help journalists discover hidden stories and trends that would otherwise go unreported. However, the use of data journalism does present some challenges, including a lack of training and expertise in data analysis, the availability and accessibility of data, and the technical infrastructure of news websites, among other things.

As of right now, there are over 200 data journalism courses being taught all around the globe at journalism faculties of colleges. These programmes educate journalists so that they are better equipped to cope with upcoming trends in business analysis. The development of data-news or data-based news reporting signifies the growing relationship between

specialists in technological design, computer programming, data analytics, and journalists. Reporters have described data journalism as an interrelated set of skills that are used in a variety of fields to convey data in a more straightforward manner. Therefore, this data-journalism phenomenon also highlights the new specialised journalism expertise in the field of digital and graphic data for creating media stories, including simplified visual graphs and tables that are easy for the general public to comprehend and absorb. This new digital storytelling also actively engages viewers across a wide variety of existing and upcoming social media platforms by primarily using image-rich news articles, fast-paced films, and short documentaries, despite the fact that it is not well acknowledged for the kind of serious journalism that can be found on more established news sites (Zayani, 2020).

The use of software, algorithms, programming, and other data-processing tools are ushering in a new era of data-driven reporting in the world's media outlets, especially those located in many of the industrialised countries. The practice of data journalism is gaining more and more followers. Therefore, it is essential to investigate how it could be utilised to hold power holders accountable, particularly in authoritarian and competitive authoritarian regimes, which frequently violate democratic principles and restrict citizens' access to information. In these types of regimes, it is difficult to obtain information, especially any sensitive information related to politics, national securities, and others (Jamil, 2019).

In recent years, there has been a rise in the use of data journalism in Jordan. As a result, a growing number of news organisations have begun using data journalism approaches in their reporting. On the other hand, there are few studies that examine the effects of data journalism on the performance of journalists working for Jordanian news websites. This research attempts to address this knowledge gap by examining how the use of data journalism influences the work of journalists who are employed on Jordanian news websites (Baranetsky, 2018). Thus, the research questions of this study are: what are the most commonly used source of data, data analysis and visualization tools by journalists working on Jordanian news websites? How do the journalists in Jordan perceive the impact of data journalism on the accuracy, credibility, and storytelling capabilities of their reporting? What are the most significant challenges faced by journalists in Jordan when using data journalism?

2. Methods

This study employs a quantitative research approach. A survey questionnaire was designed and sent to a randomly selected group of one hundred Jordanian journalists employed by websites that cover news in the nation. The questionnaire consisted of both open-ended and closed-ended inquiries, with the purpose of collecting information on journalists' utilisation of data journalism, perceived impact of data journalism on their work, and the challenges they encounter while using data journalism.

Furthermore, a subset of the journalists employed by Jordanian news websites who had completed the survey participated in semi-structured interviews. These interviews aimed to gather supplementary and detailed information on the respondents' previous experiences with data journalism.

3. Literature review

The emergence of data journalism has fundamentally altered the practice of journalism all across the globe. The term data journalism refers to the practice of reporting on complex social, economic, and political topics via the use of data analysis and visualisation tools (Alzubi, 2022). Data journalism involves the process of using datasets, computational tools, and algorithms to create news stories (Heravi et al., 2021). It gives journalists the capacity to reveal stories that were previously unavailable or concealed, providing openness and accountability in matters pertaining to the public sector.

Data journalism may be traced back to the emergence of computer-assisted reporting (CAR) in the 1960s and 1970s. CAR was a response to the increasing accessibility of electronic data. Initially, Computer-Assisted Research (CAR) relied on mainframe computers and specialised software to do data analysis on government spending, crime rates, and other societal matters (Houston, 2021). The widespread use of personal computers and the internet throughout the 1990s facilitated the expansion of computer-assisted reporting (CAR) and equipped journalists with the necessary resources to handle extensive datasets and create interactive graphic representations. The term 'data journalism' was used in the 2000s, referring to the application of data analysis and visualisation methods in the area of journalism. Presently, data journalism is a crucial element of modern journalism, as shown by the substantial resources allocated by several news organisations towards data journalism teams and technologies (Bradshaw, 2017).

Desai et al. (2021) and Heravi et al. (2021) are two examples of historians who have conducted research on the development of data journalism throughout the course of time, as well as the factors that played a role in its inception. Some studies have been conducted on the creation of data journalism, distinguishing the work of a limited number of newsrooms that are well-resourced and devoted to team-based, often interactive data journalism projects (Wright & Doyle, 2018; Bhaskaran et al., 2022). Nowadays, more widespread practice of individual journalists generate data-driven articles (Stalph, 2017), while under a significant amount of time strain (Stalph et al., 2022; Arrese, 2022), and other pressures and difficulties (Beiler et al., 2020; Zayani, 2020).

Data journalism has garnered scholarly interest as a novel approach to journalism in recent years (Bhaskaran et al., 2022). Nowadays, journalism is undergoing a shift towards a more quantitative approach, where journalists are required to effectively combine and analyse large sets of data in order to convey a narrative (Sackey et al., 2022). As a result, there has been a noticeable rise in the use of data-driven journalism. Previous studies have investigated this phenomenon and determined that data journalism is a distinct kind of journalism that differs from standard journalistic practices (Borges-Rey, 2017; Heravi & Lorenz, 2020). The news articles utilise textual, audiovisual, and data visualisations to provide information based on data (Heravi, 2019). In this sense, data visualisations are primarily interactive in nature and extend beyond the scope of a single picture.

Studies about data journalism in third-world nations often focus on the difficulties that are present in such countries (Lewis & Nashmi, 2019; Palomo et al., 2019; Fahmy & Attia, 2020; Jamil, 2019). The impact of data journalism on the actors involved in the process of creating news and the introduction of new players into the production of news were the subjects of many studies. This is especially true in the 'poor world' (Cheruiyot, Baack & Ferrer-Conill, 2019; Palomo et al., 2019; Mutsvairo, 2019), where a broad range of data

professionals, non-governmental organisations, and big tech organizations are becoming more often involved (Borges-Rey, 2016; Lopezosa et al., 2021).

Journalists and news organisations stand to gain from data journalism in a number of important ways. Firstly, it helps journalists to present tales that are data-driven and evidence-based, which improves the accuracy of their reporting, as well as the credibility of their work. Secondly, it enables journalists to find fresh perspectives on complicated topics and to discover hidden patterns and trends that are not obvious in conventional reporting. Thirdly, the use of data journalism has the potential to improve audience engagement and extend the reach of news stories. Readers may be drawn in and encouraged to spend more time on news websites if the websites include interactive visuals, maps, and data visualizations. Fourthly, data journalism may help journalists acquire new abilities, such as data analysis and visualisation, which are in great demand in the current labour market (Mutsvairo, 2019; Hannaford, 2022).

Data journalism also poses a number of issues for reporters and news organisations. Firstly, necessity for journalists to have a high degree of technical skill in data analysis and visualization. This need presents a challenge for those who do not have a background in statistics or computer science. Secondly, it might take a lot of time and require a lot of resources since journalists have to gather, clean, and examine a lot of data. Thirdly, individuals who dispute the veracity of the data or the interpretation of the findings may criticise the use of data journalism. Fourthly, gaining access to data may be difficult since many governmental and non-governmental organisations are hesitant to share data or may offer data that is either incomplete or erroneous (Wright et al., 2019; Mutsvairo, 2019).

4. Results

Table 1. Frequency of data journalism use by journalists

Frequency	Percentage of respondents
Daily	16%
Weekly	32%
Monthly	25%
Rarely	20%
Never	7%

Table 2. Types of data used by journalists in data journalism

Type of Data	Percentage of respondents
Government data	52%
Survey data	46%
Social media data	39%
Publicly available data	36%
Corporate data	24%
Personal data	8%

Table 3. Use of data journalism techniques by journalists

Data Journalism Techniques	Yes	No
Use data analysis tools	78%	22%
Use data visualization tools	64%	36%

Table 1 shows that the frequency of data journalism use among journalists is relatively high, with 73% of respondents reporting its use on a weekly or daily basis. While Table 2 shows the types of data used by journalists in data journalism, including government data (52%), survey data (46%), and social media data (39%). In addition, Table 3 shows that the majority of journalists working on Jordanian news websites use data journalism techniques, with 78% reporting the use of data analysis tools and 64% using data visualization tools. Altogether, Table 1 to Table 3 answer the first research questions concerning the most commonly source of data, data analysis and visualization techniques used by journalists.

Table 4. Perceived impact of data journalism on journalist's work

Impact of Data Journalism	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Increases accuracy and credibility of reporting	43%	38%	10%	6%	3%
Enhances storytelling capabilities	35%	42%	15%	5%	3%
Improves data analysis skills	41%	39%	13%	5%	2%

Table 5. Perceived benefits of data journalism for news organizations

Benefits	Percentage of respondents
Increased audience engagement	49%
Improved accuracy and credibility of reporting	45%
Enhanced storytelling capabilities	40%
Improved data analysis skills	38%
Improved revenue and profitability	18%

Table 4 shows that journalists perceive data journalism has a positive impact on their work, with a majority agreeing that it increases the accuracy and credibility of reporting (81%), enhances storytelling capabilities (77%), and improves data analysis skills (80%). While Table 5 shows that journalists perceive the benefits of data journalism for news organizations, including increased audience engagement (49%), improved accuracy and credibility of reporting (45%), and enhanced storytelling capabilities (40%). These two tables satisfy the second research question about journalists perception on the impact of data journalism on the accuracy, credibility, and storytelling capabilities.

Table 6. Challenges faced by journalists when using data journalism

Challenges	Percentage of respondents
Lack of training and expertise in data analysis	42%
Availability and accessibility of data	36%
Technical infrastructure of news websites	28%
Time constraints	22%
Difficulty in finding relevant data	18%
Lack of support from editors or managers	12%

Table 7. Sources of training in data journalism

Training Sources	Percentage of respondents
Self-taught	44%
Workshops or conferences	37%
Online courses	31%
University courses	22%
On-the-job training	17%

Table 6 shows the main challenges faced by journalists when using data journalism, including the lack of training and expertise in data analysis (42%), availability and accessibility of data (36%), and technical infrastructure of news websites (28%). It confirms the third research question about the challenges encountered by journalists when using data journalism. While Table 7 shows the most common sources of training in data journalism, including self-taught methods (44%), workshops or conferences (37%), and online sources (31%). This data may be useful to show how to up-grade journalists skills in data journalism, also how deal with the challenges encountered by journalists when applying data journalism, especially through providing workshops, conferences, or online materials for journalists.

5. Discussion

These findings indicate the employment of data journalism methods among journalists working on Jordanian news websites and the effect that these approaches have had. They also shed light on the challenges that journalists encountered, as well as the advantages that data journalism offers news organizations. Additionally, the findings also suggest that a significant number of journalists use data journalism on a regular basis and feel that it has a positive impact on the work that they do. These results may advise both news organisations and journalism instructors on the need to provide training and assistance for journalists to enable them to make good use of data in their reporting. However, there is a need for more training and support for journalists so that they can make effective use of the techniques of data journalism and overcome the challenges they encounter when using data.

These findings also confirm a general conclusion that data journalism is an expanding discipline in Jordan, with journalists increasingly using technology to cover a diverse array of subjects. In recent years, a number of news websites have invested in data journalism teams and technologies. A previous study has revealed a growing trend of data journalism implementation in newsrooms throughout Jordan (Alzubi, 2023c). A multitude of initiatives and programmes have been implemented to foster the development of data journalism within the nation (Alzubi, 2023b). The Jordan Open Source Association (JOSA), which has been at the forefront of promoting data journalism in the nation has hosted various workshops and training sessions for journalists (Al-Quran et al., 2022). In 2019, Internews created the 'Jordan Data Journalism Training Manual' and launched the 'Jordan Data for Change Data Journalism Programme Application' with the goal of providing Jordanian journalists with the necessary abilities to engage in data-driven reporting, including how to use statistics in reporting on significant topics, including socioeconomic changes, local government, and human rights. Furthermore, ARIJ collaborated with ICFJ to advance the practice of data journalism in the Arab region (Alzubi, 2023a).

However, questions and doubts about data journalism's function and usefulness persist. There are a lot of journalists who are afraid to get their hands dirty when it comes to data, statistics, and programming. In spite of this, news organisations are slow to adopt novel methods, especially data journalism, which has not yet shown that it can be a sustainable revenue stream for the news media. This is mostly because news organisations have limited resources. When local media outlets have fewer resources at their disposal and less open data from the local government to work with, the problem becomes much more challenging. According to the findings of recent research, data journalism is not used in an efficient and substantial manner in the everyday work of Jordanian journalists (Alzubi, 2023a). According to the findings, there is a deficiency in Jordan since there are only a selected few specialists and technicians that specialise in data journalism. The provision of training opportunities for Jordanian journalists is both a required and vital need. There is a need for curriculums and classes to be developed in order to educate journalists on Jordanian news websites on how to do data journalism.

6. Conclusion

In recent years, Jordanian journalists increasingly using technology to cover a diverse array of subjects, and a number of news websites have invested in data journalism teams and technologies. As an expanding discipline in Jordan, data journalism has had a substantial influence on the field of journalism in Jordan. Data-driven techniques have empowered journalists to cover a diverse array of subjects. In general, the use of data journalism has substantial positive impacts on the general performance of journalists working for Jordanian news websites, including enhancing the quality and precision of news coverage, improving the accuracy and trustworthiness, developing greater storytelling powers, and increasing data analytic abilities. However, data journalism still faces a number of challenges in Jordan, the most significant of which are the limited availability of data, the dearth of technical expertise among journalists, and the requirement for improved technical infrastructure on news websites. The findings of this study overall show that data journalism may have the potential to alter journalism in Jordan; yet, concerted efforts are necessary to properly satisfy its promise.

It is important to note that the findings of this study will have significant implications for news organisations, journalists, and educational institutions in Jordan and other countries that are increasingly using data journalism as a tool for producing high-quality data-driven news content. Therefore, this study proposes some recommendations. First, news organizations in Jordan should prioritize investment in providing training and support for journalists to effectively use data journalism techniques. Second, journalism educators in Jordan should prioritize data journalism education in their curricula to better prepare students for the changing landscape of journalism and equip them with the skills necessary for effective data journalism. Third, journalists should be encouraged to use data journalism techniques as they have a positive impact on their work, including increasing the accuracy and credibility of reporting, enhancing storytelling capabilities, and improving data analysis skills. Fourth, efforts should be made to overcome the challenges encountered by journalists in using data journalism, especially through providing training and support, as well as improving access to data and technical infrastructure. Fifth, news organizations should recognize the benefits of data journalism, including increased audience engagement, improved accuracy and credibility of reporting, and enhanced storytelling capabilities. Sixth, policymakers and civil society organizations should work to improve the availability and accessibility of data in Jordan to support the use of data journalism in reporting. Seventh, future research should focus on the effectiveness of different methods of training journalists in data journalism techniques and the impact of data journalism on audience engagement and perceptions of news credibility in Jordan.

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