Newsroom Engineering Teams as “Survival Entities” for Journalism? Mapping the Process of Institutionalization at The Washington Post

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To link to this article: https://doi.org/10.1080/21670811.2023.2195115

Published online: 10 May 2023.
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ABSTRACT
Engineering teams – a form of newsroom innovation labs – have been heralded as survival entities in the news ecosystem as they have the potential to improve where news goes and moves. At The Washington Post, these teams have been around for three years, and they started to implement tools like election models fueled by AI and smart data pipelines that can possibly affect the autonomy and the tasks of the broader newsroom. By applying the process of institutionalization as an analytical framework, this study enhances our understanding of how the interaction takes place between these rather novel engineering teams and the established newsroom. In addition, we get a glimpse if the tools that are being implemented by these engineering teams are taken for granted and what forms of interaction obstruct or drive the way these tools are institutionalized. This study conducted 16 expert interviews focusing on the interaction and the process of institutionalization in combination with digital ethnography where that interaction is observable. Results reveal how the innovation justify – via interaction – the implementation of these tools to the broader newsroom and vice versa. The ways in which the tools are trusted to a minimal group of the newsroom show that the process of institutionalization, for both the teams and the tools, are still in a nascent state. The journalists in the broader newsroom that trust these tools are mostly data savvy and are therefore very homogenous. Transparency is key in order to increase institutionalization across the newsroom for these engineering teams and their tools.

Introduction
Over the last decades, news outlets have been named as slow innovating entities, sometimes even with reactive, defensive, and pragmatic approach towards newness, what Boczkowski (2004) has called a “conservative mentality” (p. 52). A review by Paulussen (2016) on innovation adoption in newsrooms has shown that news outlets with respect to digital developments and innovations have little to no experience with the renewal of routines and tasks. Although the introduction of the Internet has
forced news outlets to rethink their business models, they have been struggling with the digital strategies (e.g., paywall policies and social media platforms) that have been implemented (Bossio and Holton 2021). In hindsight, the digital age has resulted in an acceleration of the deployment of new tools and platforms that reached far and beyond the daily dynamics of newsrooms. However, it also forced the same news outlets to come up with new ways of doing journalism in “a digital-first way.”

As news outlets like the BBC, The Washington Post, The Wall Street Journal, and Der Spiegel wanted to come up with solutions for these digital challenges, they have founded newsroom innovation labs (Hogh-Janovsky and Meier 2021). A survey by the World Association of Newspapers (WAN-IFRA) in 2019 found 123 innovation labs all over the world by which more than 85% of existing media labs were created in the past 15 years, 85% of them between 2011 and 2018 (For a more comprehensive overview of innovation labs, see Nunes and Mills 2019). At their foundation, they were heralded as entities within the news outlet that could be the driving force for innovation, resulting in the potential renewal of working routines and tasks for the broader newsroom (Diakopoulos 2020; Paulussen 2016).

Newsroom innovation labs have become what Küng (2013, p. 43) called, “not just an enabler of the news reporting processes, they have become a central contributor to it”. In doing so, these labs and its tools will become more institutionalized or taken for granted over the years, making the news organization survive in the future (Küng 2013; Nunes and Mills 2021; Pavlik 2013). Therefore, in this study, we want to evaluate whether the labs – here the engineering teams – and its tools are institutionalized and to what extent they are taken for granted. In essence, institutionalization is a process within news organizations that boils down to what extent new roles, tasks, and work routines are being trusted (Napoli 2014; Scott 2008). In essence, we have opted for the process of institutionalization as it is a useful lens to understand how news organizations respond to structural barriers when it comes to the development and implementation of new tools.

To enhance our understanding of these engineering teams and their potential as so-called “survival entities” for journalism, we will evaluate the process of institutionalization of one news outlet, namely The Washington Post. The Post is a world-renowned news outlet that has been investing in newsroom innovation for at least two decades and that has established newsroom innovation labs in the form of engineering teams. In this study, we have opted for the generalizing term of innovation labs and embed engineering teams in the categorization of these innovation labs for at least two reasons. First, they are in place to innovate, provide tools, and to renew roles, tasks, and work routines. Second, these engineering teams consist of data scientists, developers, and sometimes members of the broader newsroom – a constellation that corresponds with how newsroom innovation labs are composed (Nunes and Mills (Nunes and Mills 2019).

**Literature Review**

**The Turn Towards Newsroom Innovation Labs: The Process of Institutionalization**

Over the last two decades, scholars in communication sciences, media studies, and journalism studies have begun to recognize and to explore the importance of tools
that are fueled by algorithms in a wide range of processes such as effects gatekeeping (Vos and Heinderyckx 2015; Welbers 2016), cultural production (Geels 2004), the construction of audiences (Anderson 2011; Hrynshyn 2008) and the development of technology (Anderson 2018; Holman and Perreault 2022). Since 2013 in particular, research has shown that journalism “as an institution” has been subjected to new technologies that have changed, albeit partially, the work of the journalist (Diakopoulos 2020; Manovich 2013).

To explain the turn towards the deployment of newsroom innovation labs in this study, we use institutional theory and the process of institutionalization as our theoretical and analytical framework. Indeed, institutional theory encompasses a very broad range of conceptualizations, spanning topics from economic-driven agency theory over the more socially driven to the rational choice theory grounded in political science (Moe 1990; Schudson 2002), to the sociologically oriented theoretical approaches such as social constructivism (Berger and Luckmann 1966). Given the theoretical and disciplinary breadth that characterizes the field, this study builds on the social constructivist perspective where institutional theory is defined as the way in which the role of autonomy (e.g., the freedom to make decisions autonomously), tasks (e.g., routines and habits), and interaction (e.g., patterns of behavior and how humans and technology relate to each other) is being taken for granted within that organization (Napoli 2014; Scott 2008).

Institutional theory and the process of institutionalization has been an often-preferred theory for at least two decades within journalism studies (Katzenbach 2012; Schudson 2002; Vos 2019). Seminal works have focused, but were not limited to, the impact of online journalism (Hjarvard 2014; Ryfe 2019), the issues of media logic (Altheide 2013), and the boundaries of institutional isomorphism within news outlets (Koliska and Assmann 2021; Lowrey 2011). We want to draw upon the above-mentioned works and add them with research by Napoli (2014), Tolbert and Zucker (1996), and Lowrey (2011, 2018). They argue that institutional theory and its process of institutionalization enhance our understanding of “interaction,” “routines,” and “change” within news organizations. In the past, news outlets have tended to confirm their needs in relation to other institutions like the political or the judicial apparatus and held other institutions accountable (Lowrey 2018; Ryfe 2019). In doing so, they can adhere to routines (Shoemaker and Vos 2009), and trust already-existing models for decision-making by mimicking these models of other (competing) news organizations (Lowrey 2011, 2018). Through interaction and change, these latently existing routines are shared to sustain internal consistency concerning the roles, tasks, and work routines of the journalistic institution (Lowrey and Woo 2010).

In this study, the process of institutionalization, a process that is the central element to institutional theory, is used to evaluate to what extent the technologies developed by the engineering teams are taken-for-granted by the broader newsroom. In Table 1, the process of institutionalization and its stages – (1) pre-, (2) semi-, (3) full – are being visualized and the concept of innovation is defined. We have used the pioneering works of Berger and Luckmann (1966) and Zucker (1987) who deepened the concepts of the process of institutionalization and supplemented it with the work of Tolbert and Zucker (1996), who proposed a first version of the table that is being presented below.
in the pre-institutional stage, there are causal forces from inside and outside the organization that impose news outlets to innovate (the so-called endogenous and exogenous forces, see Zucker 1987). As this study centralizes “innovation,” it is valuable to define the concept, as it has led to theoretical conundrums in the past (Paulussen 2016). On a more abstract level, Bleyen (2014) has referred to it as “something new with an element of valorization” (p. 44). For instance, new technology such as artificial intelligence (e.g., the development of tools for automated and computational journalism) or new legislation, which ensures that an organization has no choice but to adjust its policy (e.g., the development of tools for protecting personal data (GDPR)).

As we want to uncover institutional change, it is crucial to elaborate on the three phases of the process of institutionalization. In the first phase, which is called (1) “Habitualization,” different members of the organization, i.e., journalists, observe the innovations, i.e., tools that can lead to institutional change and new routines. Each member reacts differently to these tools, although members who adapt to these new tools seem to have homogeneous profiles (Tolbert and Zucker 1996). In other words, these members can be seen as early adopters that have data science degrees and are more curious to interact with these tools because they understand the technicalities behind it. The early adopters that interacted with the new tool will imitate each other (Napoli 2014). In this habitualization phase, the variance of implementation and use of tools is highly individual (e.g., some members will enjoy the new tool, others will not), which entails that the risk of failure is high (e.g., when a large group of early adopters dislikes the tool, it can block the implementation for the larger organization). Therefore, the select group of early adopters are key actors to what extent this new tool will be trusted.

In the semi-institutional stage, after the “Habitualization,” an (2) “Objectification” phase takes place whereby the new tools become more implemented in the organization and therefore become more part of the woodwork of the news ecosystem (Napoli 2014). This objectification can only occur if the new tools are trusted by a part of the organization, and when there is already information available about the

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<th>Table 1. Stages of the process of institutionalization and comparative dimensions (adapted from Tolbert and Zucker 1996).</th>
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<td><strong>Dimension</strong></td>
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results of the usage of the newly developed tools. This information can be obtained internally by supervising the results of the early adopters, but it can also be achieved externally by one organization monitoring another one. As in the pre-institutional stage, early adopters of new tools are still imitating each other, but there is a more normative way of imitation (e.g., there will be rules that oblige members of the organization to start using the new tool). The members that interact with a new tool are in this phase even more driven by the desire to both add value to the organization and to make processes more efficient. As a result, the usage of the new tool could eventually contribute to the survival of the organization (DiMaggio and Powell 1983; Lowrey 2011; Napoli 2014; Reese 2022).

To move from the semi-institutionalization stage to the full institutionalization stage, it is important for the organization to define two conditions. First, the structural problems arising from the implementation of new tools must be defined and, second, there must be increasing confidence in their usability (Strang and Meyer 1993; Tolbert and Zucker 1996). Therefore, during the first step the biggest problems should be identified and solved, whereas the second activity may result in increased confidence that demystifies dissatisfaction or reduces failure as much as possible (Napoli 2014). Once these two conditions are met, the full institutionalization stage begins where objectification is transformed into (3) “sedimentation” or “full acceptance.” This can be obtained by taking the new tool “for granted” and ensuring that the autonomy, interaction, and tasks created by the implementation of the tools are maintained (Scott 2008). This stage is characterized by a general recognition of them, which intrinsically means that they are accepted and trusted by the majority of the members of the news organization (Tolbert and Zucker 1996).

In the sedimentation stage, the new tool becomes part of the structure of the organization and will be used for a longer period (e.g., the use of smart election models that predict the winner based on polls and precinct data). It is important to notice that these stages of institutionalization occur incessantly within news outlets and that not every new tool reaches the stage of full institutionalization (e.g., an election tool that is unable to scrape new content) (Küng 2013).

**Newsroom Innovation Labs: Balancing between Continuity and Change**

Research on newsroom innovation labs has grown significantly since 2018 and has primarily focused on user-generated content (Belair-Gagnon and Holton 2018; Hogh-Janovsky and Meier 2021), algorithmic and computational journalism (Anderson 2018; Diakopoulos 2011), social media (Hermida 2010; Lehtisaari et al. 2018) and metrics (Zamith 2018). Innovation labs are defined in this study as teams of technologists and journalists that pursue novel approaches and practices in the newsroom, ideally combining high quality and high ethical standards to enhance offerings, as well as to increase revenue or foster new audience relationships (Pavlik 2013; Stalph 2020). To contribute to a more solid framework, this study builds on the research by Cools, Van Gorp, and Opgenhaffen (2022) that have defined three different types of newsroom innovation labs, namely (1) the static type (an established team), (2) the dynamic type (labs put together from time-to-time depending on the project) and
the (3) hybrid labs (permanent core group within the innovation lab that are composed with additional members based on the project).

Since 2012, newsroom innovation labs have emerged in newsrooms all around the world and are there to stay (Hogh-Janovsky and Meier 2021). A survey commissioned by the World Association of Newspapers (WAN-IFRA) identified 123 innovation labs in 29 countries; a number that includes university incubators and accelerators, taking up 31% of the total amount (Nunes and Mills 2019). In this study, we have opted for the generalizing term of innovation labs and embed engineering teams in the categorization of these innovation labs for at least two reasons. First, they are in place to innovate, provide tools, and to renew roles, tasks, and work routines. Second, these engineering teams consist of data scientists, developers, and sometimes members of the broader newsroom – a constellation that corresponds with how newsroom innovation labs are composed (Lewis and Usher 2016; Nunes and Mills 2019). When these engineering teams are considered, this study has found that these teams are at least established at newsrooms like The New York Times, The Wall Street Journal, and The Washington Post. To date, literature has not described in an existent way how many engineering teams are founded at US newsrooms, nor at other news outlets worldwide.

If we zoom-out from a historical perspective to understand where they come from, research refers to two types of newsroom innovation labs. First, there were the so-called “first generation innovation labs.” These labs were mostly founded ten to fifteen years ago and were mostly isolated from the larger newsroom (Hogh-Janovsky and Meier 2021). They worked in parallel with the larger newsroom but were often not involved in the specific journalistic routines or were less aware of the exact needs of news workers (Tameling and Broersma 2013). The bureaucratic nature of a news outlet often challenged the balancing act between continuity and change within a news ecosystem, as the concrete ideas around newsroom innovation came about in isolation, outside of “the bloodstream of the broader news organization” (Boyles 2016, p. 43).

Second, between 2018 and today, second-generation newsroom innovation labs have emerged. They attempted to blend more into the organizational structure of the larger newsroom (see for example, Hogh-Janovsky and Meier 2021). In these labs, there would be a larger focus on the needs of the news workers, as well as more attention to journalistic work routines (Napoli 2014). Generally, these innovation labs are more deeply rooted in a desire by news organizations to change their business models in a thorough quantitative and qualitative manner (Hogh-Janovsky and Meier 2021).

In this study, we will evaluate the process of institutionalization of one specific news outlet that has established engineering teams – a form of newsroom innovation labs - at The Washington Post. These teams are intellectually and sociologically interesting objects of study because these engineers and developers challenge and question the existing institutional stability of the already established routines and tasks of news outlets (Belair-Gagnon and Holton 2018). First, as we will map these tools and link them to a stage in the process of institutionalization, we are able to formulate whether these teams are survival entities for journalism and to what extent they invoke institutional change. In other words, these teams and their tools are becoming
capable actors who have the potential to determine how journalistic roles, tasks, and work routines are shaped and, therefore, how the journalistic institution is affected by both exogenous and endogenous factors (Napoli 2014; Reese 2022). This brings us to the first research question:

RQ1: In which stage of institutionalization are tools that are being developed and implemented by engineering teams at *The Washington Post* situated?

**Mapping the Process of Institutionalization at The Washington Post**

At *The Washington Post*, a clear digital transformation has taken place that has merged the offline newsroom with the online newsroom, resulting in a digital-first strategy. This digital transformation has especially been accelerated since Jeff Bezos, CEO of Amazon, bought the news outlet in 2013, and started to invest in the newsroom and the development and implementation of tools.

Therefore, the already-converging newsroom has been changing rapidly in at least two ways. First, there was an expansion of the editorial staff, from 500 journalists to roughly 1,000 in the broader newsroom. Second, there has been a clear focus on investments in technology, resulting in a department of “Engineering,” where engineering teams innovate the news that is produced ((1) the elections team, (2) the data visualizations team and (3) newsroom publishing tools team). They are closely connected to the broader newsroom and are installed to improve the way news reporting could be done (ibid.).

*The Washington Post* has established three newsroom engineering teams, a form of newsroom innovation labs, that produce tools and datasets for the broader editorial staff. In this study, we will utilize these engineering teams to identify how the process of institutionalization becomes apparent in the interaction between the labs and the broader newsroom (e.g., Anderson 2018; Boyles 2016). Interaction has the potential to be a discerning factor in the process of institutionalization, as it reveals whether something new like a tool or a new routine will be taken for granted (Scott 2008). Earlier research by Diakopoulos and Koliska (2017) has shown that interaction invokes (algorithmic) transparency which could improve or even accelerate institutionalization.

To date, however, it remains unclear what role interaction is playing in the process of institutionalization when new tools are being implemented. To build our theoretical argument, we link interaction to the model of the process of institutionalization (see 2.1) as the various stages have shown that the different members of the organization imitate one another in adopting new tools (Napoli 2014). As it is not clear what role interaction is playing in the process of institutionalization and how this interaction is facilitated at *The Washington Post*, we want to evaluate whether this newsroom-lab-interaction is a crucial element for a tool to be “taken for granted.” In this way, this study wants to contribute to the field of newsroom innovation as it goes beyond the diffusion of innovation, and as it advances our understanding in how news organizations respond to structural barriers when it comes to the development and implementation of new tools. This brings us to the second research question:

RQ2: What role does the newsroom-engineering team-interaction play in the process of institutionalization in the development and implementation of new tools at *The Washington Post*?
The potential uncovering of what role interaction is playing in the process of institutionalization could reveal whether the broader newsroom puts trust in the tools developed by the engineering teams. Most importantly, trust and institutionalization should not be considered as one topic or phenomenon in within newsrooms. The extent to which these teams and its tools are trusted can indicate what is institutionalized, but the “taken-for-grantedness” is not a “conditio sine qua non.” In other words, roles, tasks, and work routines that are institutionalized are not necessarily trusted and vice versa (Kosterich 2022; Vos 2019).

In this study we evaluate trust in these engineering teams as a necessary precondition for the successful adoption of tools by individual journalists (Kadefors 2004). Trust through interaction could in result in an institutionalization of both the engineering teams and the tools they are developing and implementing (Boyles 2016, Paulussen 2016). Research by Lajqi and Lischka (2021) concluded that trust is key for newsroom innovation but that it results in a “what-will-we-gain and what-will-it-change dichotomy” among members in the news organization. This ambiguous attitude from the broader editorial community (continuity) may slow down or obstruct the work of the engineering teams (change), even and especially in times of crisis.

The way in which teams and tools are trusted is strongly related to the degree to which newsroom innovation labs are integrated into the newsroom (Hogh-Janovsky and Meier 2021; Napoli 2014). The degree of integration and the degree of trust could indicate what will become more institutionalized and whether this engineering lab and the larger news ecosystem – in part due to interaction and trust – are more likely to survive (Van der Meer et al. 2017). In this study, it is therefore relevant to map, in addition to the interaction, the degree of trust between the engineering teams and the editors of The Washington Post as this study evaluates trust as a discerning factor for the successful adoption of tools by individual journalists. In doing so, this study focuses first on the trust towards each other and second on the trust that the broader editorial team has in the development and implementation of new tools. This brings us to the third research question:

**RQ3:** What are the main rationales from the broader newsroom for (dis)trusting tools from engineering teams at The Washington Post?

**Method**

This study uses digital ethnography with members from both the engineering teams and the broader newsroom of The Washington Post from October 1, 2021, till March 31, 2022.

**Expert Interviews**

The sample of the qualitative expert interviews consists of nine members of the engineering teams and seven members of the broader newsroom (eight men and eight women of which three managers). The snowball method was used to compose our sample where two interviewees from each lab were contacted, in
combination with two members of the newsroom. The newsroom innovation labs at *The Washington Post* consist of three news engineering teams that have been founded in 2019, namely a team that focuses on elections (12 members in total), a team deployed for digital visualizations (7 members in total), and a team that develops publishing and editing tools for the broader editorial staff (8 members in total).

In the initial selection of the respondents, we focused both on members of the engineering teams and the newsroom that identify themselves as journalists and data scientists/engineers. The average age of the respondents is 29.1 years, with the youngest being 22 and the oldest 39. An informed consent was signed, and the names of the respondents were anonymized, and an identifier is used (respondent 1–16). In addition, we have added a label to distinguish between members from the newsroom (NR) and from the engineering teams (ET).

The interview guide consists of four parts. During the first part of the questionnaire, we asked for information about the individual news employee, such as job title, background, and responsibilities. The second part focused on the process of institutionalization where the researchers explained thoroughly how institutionalization should be understood in the light of the development and implementation of new tools. In this part of the interview, the table of the process of institutionalization used in the literature review of this study was shown to the respondents. After, respondents were asked to identify two tools that were developed and implemented in 2022. These tools were used throughout the interview to further structure the results and to determine in which stage of institutionalization they are situated (see RQ1). In the third part, questions were asked about the interaction between the engineering teams and the larger news organization (see RQ2). In the final part, questions were asked about the mutual trust and how that complicates or facilitates the deployment of new tools. In addition, we have probed whether the respondents trust these tools by validating to what extent they use them in their daily work routines (see RQ3). The 16 interviews lasted an average of one hour and nine minutes and were conducted via Zoom in connection with COVID-19.

**Digital Ethnography**

The digital ethnography consists of observing over sixty meetings between members of the teams and the broader editorial staff (For similar methods, see Domingo 2008; and Hendrickx and Picone 2022). The meetings took place via Zoom as a result of the pandemic and were used to further substantiate RQ2 and RQ3 in particular. During the meetings, we took notes and after each of them we listened to the recordings and transcribed them (Hendrickx and Picone 2022). Two types of meetings were attended: (A) daily stand-up meetings (members from the engineering teams and one member from the newsroom) and (B) stakeholder meetings (both members from the engineering teams and the newsroom). By attending these daily online meetings, the researchers were able to better substantiate the process of institutionalization between the teams and the newsroom and complement these observations with the results that resulted from conducting the expert interviews. It is important to note here that these observations took place exclusively online, as members of *The Washington Post*...
were not allowed into the offices due to the pandemic. When reading and interpreting the results, this “online aspect” should therefore be considered.

Although The Washington Post is the property of Amazon, the researchers have not signed a non-disclosure agreement, and they were free to utilize production documents, as well as attend meetings over the course of five months.

**Analysis of the Data**

A qualitative, descriptive method (Braun and Clarke 2006) was used to process the transcripts of the recorded interviews and the transcripts of the online meetings. In order to answer the research questions, an open coding scheme was used in NVivo with generic codes like “interaction” and “trust” and subcodes like “internal” and “external transparency”. In addition, the notes obtained during the interviews and the meetings were used to better contextualize the results. In addition, access to internal documents and roadmaps by both the elections team, the data visualizations team and newsroom publishing tools team was also provided in order to get a better idea of what tools are being developed and implemented.

**Results**

**Tools at The Washington Post**

The first engineering team is working on an election model which is a predictive platform that could be used in coverage around presidential elections, as well as the primaries or midterm elections (Liu and Bronner 2022). The election model works with turnout data and can thus indicate where turnout is higher or lower in certain districts, and, for example, what the gender distribution is (for more on how the election model works, see Bronner, Johri, and Bowers 2021). In addition, this team is working on a *document pipeline* called “fast FEC” which collects the many bills passed by the House of Representatives and the Senate.

The second team, the one that focuses on digital visualizations, works on more eclectic projects that are needed in the short term for the newsroom. For example, they have built a scraper that collects large chunks of data from TikTok-videos. They also built an interactive game to demonstrate how gerrymandering works (The Washington Post 2022). The last team, the newsroom publishing tools team, built a tool that can efficiently scan through thousands of PDF documents in a few minutes. In addition, they have developed a kind of scraper in the form of an API (application programming interface) that will automatically record the number of police shootings in the US in a database.

Overall, we have observed in the attended meetings (both daily stand-ups and stakeholder meetings) that each team works on its own tools and at its own pace. In addition, respondents stated that the engineering teams are at the service of the editors from the broader newsroom. This specific “dependent work relationship” creates certain challenges that we will discuss in the segments below (for more information on ongoing project of the engineering department of the Washington Post, see https://washpost.engineering, 2022).
**Stages of Institutionalization**

The results of the interviews and the digital ethnography show that most of the tools described above are situated in the stage of *habitualization*. Respondents cite that the tools such as the police shootings tracker or the PDF reader are mainly used by editors in the broader newsroom who are already tech-savvy, such as the data team or the data forensics team. Thus, the group of users of the tools are quite homogeneous, as some of those tools are also developed *à la tête du client*. The only tool that is considered semi-institutionalized by respondents is the election model. This model was used during the primaries and the presidential elections of 2020 and that it has been used for the primaries and midterms ever since (see also 4.3 (Dis)trust in tools).

Overall, we see that a lot of resources have been invested in the engineering teams over the past few years, causing the number of people to quadruple since 2019 (there was one engineering team that consisted of five people). This sudden expansion of the teams has also led to the need for more structure within the teams, as they organize daily stand-up meetings. Respondents from the different teams mentioned that these meetings have increased the way in which tools are being developed and implemented. Due to the expansion of the teams – more tools were developed and implemented (from 1 tool in 2019 to a dozen tools in 2022 – the number of tools differs from team to team, some tools are still in use, others have been dismissed). As the number of tools and the number of resources has increased over the years, respondents from both the newsroom (R2, NR; R7, NR; R9, NR; R10, NR) as from the engineering teams (R4, ET; R8, ET; R11, ET) mention that it has accelerated the process of institutionalization. One respondent (R15) compares the initial period of news engineering in 2019 and 2020 to that of a start-up.

> Our team felt like a start-up when I first joined in 2019 because we were so young and like we were only a handful of people. Now there are more people on board, and it feels like we got a lot more infrastructure. We became a little bit more institutional in that sense. (R15, ET)

Like members of the editorial staff, members of the newsroom engineering teams point out that *The Washington Post* is still in the process of adapting to the digital ruptures being implemented by the newspaper’s leadership, such as, for example, the development and implementation of tools, the use of more quantified methods, or the hiring of people with digital skills. Both the meetings we observed and the interviews we conducted show that the process of institutionalization through tools is not only continuing because it is a priority of the newspaper’s leadership (endogenous), but that they are also required to develop and implement tools because other major news organizations such as *The New York Times* and *The Wall Street Journal* also established innovation labs (exogenous) (45 labs exist in Northern America, these labs are both situated in academia as in the journalistic profession).

The engineers at *The Post* are just like the finches on the Galapagos. These birds changed over the years and their beaks were at some point perfectly built to eat this particular kind of seed. *My job is to make journalist evolve like these finches so that they become more data-savvy. That's one of the reasons why these engineering teams were formed, you know. Nowadays, as a journalist, you need to use tools to survive on almost every beat now, right? And to me, that is institutionalization.* (R14, ET)
It is definitely still an adaptation. From 2019 onwards, it became clear that the executive editor wanted to invest in engineering teams because it can augment our reporting. (R5, NR)

As more tools are developed and implemented, respondents point out that these tools are going through the process of institutionalization in an accelerated way because they have become more visible for the broader newsroom. Respondents mention in the observed meetings and the interviews that the pandemic has caused a sudden demand for quantified forms of journalism, whereas editors from the newsroom have relied more on the engineering teams (e.g., members of the broader editorial team can send a request to one of the teams to work on a tool via a request form in the messaging application Slack). This study thus provides a snapshot where many tools are still in a nascent state. However, respondents both from the broader editorial newsroom and from within the teams state in the meetings we observed, that they would soon find themselves in the semi- or full-institutionalization phase.

**Interaction between the Teams and the Newsroom**

Since the creation of the engineering teams in 2019, first attempts were made to accommodate the engineering teams across the editorial staff such as the politics desk or the health desk (the so-called model of newsroom convergence, see for example Tameling and Broersma 2013). Respondents indicated that this form of “full integration,” i.e., the embedding of engineers across the newsroom, did not lead to constructive interaction as the engineers were mainly consulted by the broader editorial staff when some technicalities of tools were not working. This resulted in a rather unilateral relationship in which, respondents indicated, members of the engineering teams used to work as a kind of “service desk members.” One respondent indicated that it was a mistake to strive for that model of “full integration” because there is no guarantee that members of the engineering teams will actually interact with each other, just because they sit next to editors.

When I was embedded in the newsroom, I've directly experienced it. Some journalists would come up to me and be like: “Hey, I need this tool now” and it honestly feels like “a-fix-my-printer-request.” It feels just like a one-way relationship. (R6, ET)

The journalists I was working with just used me when I was embedded. So, what I started doing is hiding away from my desk in the newsroom. (…) It's really hard to work with journalists sometimes because again, they're working like 16 hours a day and they want everything immediately at their disposal. (R16, ET)

In the early years, namely 2019 and the beginning of 2020, the embedding of engineers across the newsroom led to a one-sided relationship between the editorial team and the newsroom. The model of “full integration” with the newsroom was abandoned in 2020, clustering the engineering teams into three independent teams at the department of engineering of *The Washington Post*. Respondents indicated that after this reorganization, the interaction with the editors was better because more structure was put in place in the form of daily stand-up meetings and weekly stakeholder meetings, which in turn, respondents (R5, NR; R13, ET; R15, ET) mention, has resulted in more institutionalization. Since 2021, engineering leads have been assigned to every team. They monitor and manage the requests from the broader newsroom
and act as “Gatekeepers” (R12, ET) (e.g., these leads select which requests from the newsroom they will work on). So, the way requests for tools can be filed from the newsroom has become more structured as well, making the interaction between the engineering teams and the editors more formal.

Depending on the schedule each engineering team, there is a weekly contact via (online) meetings where the various stakeholders – in most cases the engineering teams, the product managers, and the members of the broader newsroom – are given time to provide feedback on existing tools or to pitch new ideas for projects or tools. Despite the increased interaction, the results showed that there is still a divide between the engineering teams and the editors.

There is a divide in the company, you’re either on the engineering side or you’re on the newsroom side. We have our stuff we’re working on in the newsroom and we want to publish it very quickly and then the engineers are working on the long-term projects. (R4, ET)

Apart from the frequent meetings, there are a number of members of the engineering teams who, partly due to the model of “full integration” in the past, still have some informal contacts with the members of the broader newsroom. As a result, there are sometimes projects that arise outside of the structured interaction between the teams and the broader newsroom (e.g., one team built an interactive game to demonstrate how gerrymandering works because one editor wanted to make an explainer).

With the various observations of meetings in mind, we identified three challenges that complicate the – mostly formal – interaction between the broader newsroom and the engineering teams. The first challenge is overarching and indicates an overall priority problem. The meetings we observed have shown that it is far from clear who is prioritizing projects and who is making the decisions on whether or not to develop and implement certain tools. During the period this study was conducted (October 2021 through March 2022), two new positions were created in the newsroom in order to increase oversight of the numerous projects of the engineering teams. Some respondents (R6, ET; R8, ET; R12, ET) indicated that these two positions (with direct decision-making power) are crucial to further promote and better structure the interaction between the engineering teams on the one hand and the editors on the other.

Like the traditional problem is that there are not enough people to make the decision on what’s a priority, because there’s too much going on. So just having more support in general across the board will be really helpful for the organization to make sure we have our priorities in line. (…) So hopefully, these new managers can help us do better work in the long term too. (R10; NR)

The one thing I tell engineers is that their partnership with the newsroom is their number one priority. (…) Sometimes they just want to pursue their own projects, and that can create problems when projects are needed in the short term. (R1; NR)

A second challenge is that, and this is partly related to prioritization, members of the engineering teams want to maintain their independence and thus be free to work on projects that are not requested by the broader newsroom. In several meetings, it was mentioned that members of the engineering teams often do not have enough time to work on projects that they initiate themselves. Respondents indicated that the urge for prioritization and the importance of making decisions sometimes contrasts with wanting to maintain independent or to guard their autonomy. Therefore,
in some teams, there is also focus on projects that originate within the teams. This sometimes has a detrimental effect on the interaction, as the newsroom prefers to see tools being developed and implemented rather in the short than in the long term.

With these new managers in place, I think the engineering teams will have less autonomy, and that is something that I am concerned about. (...) Over the years we have acquired a lot of expertise in newsroom engineering, so I hope they will give us the benefit of the doubt. (R13; ET)

A final challenge that often emerged from the results is also related to the “priority problem,” namely the tension between the work routines of the engineering teams and the broader newsroom. Because editors often work on short notice and are very deadline-driven, certain projects are sometimes requested only days in advance, forcing members of the engineering teams to refuse those requests. This sometimes causes frustration on both ends. The work routines of the engineering teams are slower compared to those of the newsroom because they often need several weeks before a new tool is ready (“the news does not wait several weeks like tools do,” R5; NR). These two working rhythms frequently put the interaction between the engineering teams and the editors under pressure, with both parties feeling misunderstood.

There’s always this push and pull between the newsroom who is very short term minded and the slower engineering teams. For me, it is sometimes unclear why certain projects take weeks instead of days. (...) I guess that would improve if there was more mutual understanding of each other’s work. It is a little hard to crack the glass when it comes to workflows. (R9, NR)

(Dis)trust in Tools

Overall, we have observed that the journalists’ responses to new tools have been indicative for the (dis)trust in the engineering teams, and these responses could therefore stimulate or obstruct institutional change. The more they trust these tools, the more likely they will integrate them in their toolboxes. Despite the fact that most tools (except for the election model) are still in the habitualization stage, we can conclude that they are mostly trusted, as respondents from the newsroom have explicitly mentioned that they are using these tools in their (daily) work routines. Two respondents (R1, NR; R9, NR), however, pointed out that they did not know how these tools work and therefore decided not to include them in their work routines. From the interviews, it appears that the group of “early adopters” in the newsroom are data savvy and are therefore homogeneous in nature (e.g., same degree, work in similar departments where data is involved) which in turn corresponds with the characteristics of pre-institutionalization phase. Tools such as the scraper for TikTok-videos and the document pipeline “Fast FEC” are in a sense still in a nascent state.

To get a more nuanced picture of what the rationales are for this trust (RQ3), we distinguished three prominent reasons that emerged from the interviews and observations. In doing so, we also focus on the elements that can fuel distrust of the use of those tools. A first overarching rationale is related to the part of the results around interaction; respondents mention that constructive interaction is one of the most prominent reasons why they trust tools. Hence, it is critical to have the higher-ups
at The Washington Post on board, in part by inviting them more to the meetings of the engineering teams. If the interaction is lacking, or there is little openness on the part of the engineering teams, respondents (R4, ET; R8, ET) say, then the same adaptability is much less likely to be obtained (e.g., no communication from the engineering teams around a particular dataset usually creates skepticism).

Internal communication is crucial in order to raise awareness around certain tools or projects. Journalists that attended our brown bag meetings or our test events, have a higher chance of using our tools. (R4, ET)

Talking with the newsroom folks on new tools definitely helps. The engineering team needs to have more interaction with them because some of them don’t even know that we exist. (R8, ET)

A second rationale is closely aligned with that interaction, namely, that there should always be some degree of transparency between the engineering teams and the broader newsroom about the technicalities in the development and implementation of the tools. By having (daily) meetings, editors can get a clear view of how a particular tool works (e.g., where a particular dataset comes from, how the tool is designed). The transparency of the engineering teams, the results show, is not fully present. Respondents state that it is not relevant to share full mathematical formulas with the members of the editorial team. Being too transparent, they say, creates confusion and would lead to more questions being asked by potential users of these tools. Thus, transparency is important, respondents state, to the extent that it discusses how the tool works and what kind of output it can generate. Respondents also state that the lack of transparency can cause journalists to distrust tools because they do not know anything about the technical functionalities of the tools.

I think that they don’t need to know how it works because we know how it works. We need to be clear about our work, but that does not imply that we explain all the technicalities of a model or a tool. (R11, ET)

A final rationale is related to the two previous ones, namely the effective use of tools. If the tools cannot be used on a regular basis, or they cannot be integrated into the journalist’s workflow, this can fuel distrust. The interviews and observations show that many of the tools are only really trusted after use because journalists can then discover the functionalities one-on-one. This usually removes doubts about their applicability or usefulness. In addition, respondents indicate that it is not crucial to be aware of all their technicalities.

I think the election model is already situated in the semi-institutionalization phase because people in the newsroom have interacted with it. There is some sort of validation that took place and people started to trust it, also because it is now embedded in our live reporting and members from the engineering team are asked to add context to the results. (R3, NR)

**Conclusion**

This study enhances our understanding of to what extent the engineering teams and their tools at The Washington Post are taken for granted. Our overall conclusion is
that the engineering teams and their designed tools, are still in the early stages of the process of institutionalization. The group of early adopters is often homogeneous in nature, although the results reveal that both the engineering teams and the stakeholders in the broader newsroom are becoming more heterogeneous. In recent years, *The Post* has actively invested in newsroom innovation, as they hired engineering leads who act as gatekeepers to improve the monitoring of requests from the larger newsroom. Over the years, the engineering teams have expanded, and they have been moving away from the “model of full integration” in 2019 and 2020, when engineers were spread across the newsroom. As a result, the engineering teams have now clustered their members back together. This allows them to maintain their independence and work on their own projects, liberating themselves in what respondents called the “service desk” role. These results are in line with earlier studies on the deconvergence of newsrooms where online and offline editors were kept separate from one another (e.g., Peil and Sparviero 2017; Tameling and Broersma 2013).

The findings should be embedded in the still-complex digital and highly divided environment where news outlets are still trying to overturn their traditional mentality of “making a physical newspaper every day.” As Nunes and Mills (2021) have demonstrated, innovation labs are a response by news outlets to both the internal and external challenges of the digital age. The labs are one of the building blocks that further reveal the future of journalism as an organization and as an institution by coming up with new ways to respond to shifting roles, tasks, and work routines of journalists and to changing needs of news consumers in an online information ecosystem. From that perspective, we still observe internal struggles where distrust can obstruct the development and implementation of these teams and its tools. Hence, the output of these engineering teams is not always innovative, and should therefore be included in future research, namely to what extent these engineering teams have the capacity to be innovative.

New tools by newsroom innovation labs and engineering teams have enabled news outlets to tackle digital conundrums. At the same time, they have challenged the very existence of these labs as they are not always being trusted by the broader newsroom (Zaragoza-Fuster and García-Avilés 2020). As research by Hogh-Janovsky and Meier (2021) has shown, newsroom innovation labs and engineering teams are likely here to stay. Over the years, they have proved to remain entities in the news ecosystem with their own methodologies and work routines, something we refer to as an institution within an institution. We believe that engineering teams of *The Washington Post* and their tools will likely become more institutionalized and will make journalists more tech-savvy in the future (e.g., being able to use a tool to search through datasets using coding). The way news reporting is done, has in a sense become more complex, and we have observed a “creative destruction” in which routines are “destroyed and recomposed again” (Paulussen 2016 p. 193).

In this study, we have pointed towards the most prominent challenges of interaction and trust between the engineering teams and the broader editorial staff. The lack of prioritization remains the most prominent hurdle in the interaction between the two actors. With respect to trust, we have observed that the amount of trust has increased over the years because of a more structured relationship between the engineering teams and the broader newsroom which also improved the usability of
tools. Keeping the challenges of interaction and trust in mind, we can conclude that the engineering teams act as “improving” entities for the broader newsroom of The Washington Post. In other words, these engineering teams are more likely to tune the toolkit of the news reporting process rather than reinventing or redefining the news outlets’ journalism.

This study was limited by the COVID-19 pandemic in the sense that all the meetings that have been observed and the interviews that have been conducted were organized online. The results therefore only provide a mediated snapshot of how engineering teams are operating at The Washington Post and longitudinal research is required in this regard. The global health crisis has made data collection difficult, and many interviews and observations were conducted online. Of course, conducting interviews from a distance brings about challenges. For example, it is more difficult to observe nonverbal behavior, and it is often more arduous to build a trusting relationship with your respondents.

With respects to future research, we argue that due to the novelty of many innovation labs and engineering teams, scholars should consider evaluating other media or innovation labs, both at media outlets on a local and on a national level focusing on trust, tools, and communication problems between journalists and technologists. In addition, future research could compare different innovation labs and evaluate how concepts like transparency play a role in the change management of news outlets.

Acknowledgements

We would like to thank the reviewers for the useful comments that helped us improve the manuscript.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

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