THE INSTITUTIONALIZATION

OF THE TECHNOLOGY FIELD

WITH JOURNALISM

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the Faculty of the Graduate School

At the University of Missouri-Columbia

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by

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THE INSTITUTIONALIZATION OF THE TECHNOLOGY FIELD WITH JOURNALISM

The undersigned, appointed by the dean of the Graduate School, have examined the

thesis entitled

THE INSTITUTIONALIZATION
OF THE TECHNOLOGY FIELD WITH JOURNALISM

Presented by Joseph Siess,

a candidate for the degree of [master of arts in journalism,

and hereby certify that, in their opinion, it is worthy of acceptance.

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Professor Tim P. Vos

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Professor Yong Z. Volz

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Professor Ryan J. Thomas

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Professor Benjamin (Ben) R. Warner

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journalism in the end.

# TABLE OF CONTENTS

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## ABSTRACT

The following analysis is the result of employing the constant comparative method to distinguish connections among data collected by way of semi-structured interviews with tech savvy individuals in the journalism field. The people interviewed came from a variety of educational backgrounds and experiences, and either work in newsrooms, or outside of newsrooms but employing technical skills in the service of journalism.

Some of the participants came into journalism from the tech field, more specifically, computer science and computer engineering, and therefore do not have any formal educational or experiential background in journalism. However, the findings of this study indicate that certain elements from the tech field are being absorbed into the journalism field as the importance of tech skills become more important on an institutional level.

The theoretical framework for this analysis is institutionalism given that the elements of tech being absorbed into the journalism industry are being abided on an institutional level

## Chapter 1: Introduction

The post-digital disruption newsroom looks a lot different from its predecessor.

Focused on getting the story printed and into the hands of a public eager for information

was the prerogative that is most widely associated with the journalism that served our

parents and grandparents. However, today, a new kind of journalism is stepping in to

continue the field's legacy as a check on power and the source of an informed public.

This newsroom 2.0, if you will, is far more diverse and arguably defined by the

perceived necessity for technological innovation as a means to more efficiently seek out

and deliver the news to a more digitally inclined public within a data saturated online

informational environment.

According to Nikki Usher, in her book, Interactive journalism: Hackers, data, and

code, there is a small, albeit "distinguished group of journalists who have come to the

newsroom from the programming world" (Usher, 2016, p. 72). As journalism continues

its soul-searching process within a rapidly changing digital environment, coding and tech

skills have increasingly become important tools in the service of journalism (Usher, 2016,

p. 72).

Many who possess these skills "resist the label 'journalist,' but to be successful

they must understand the editorial workflow, demands, needs and expectations,

communicate according to journalistic norms, and more importantly, expand the

professional jurisdiction over work and knowledge for journalism" (Usher, 2016, p. 72).

Alternately, journalism must learn to understand and work with individuals who provide

technical skills in the service of facilitating the journalistic process. This process can be

characterized as a kind of institutionalization of the technology field within journalism.

Adding to the mix in newsrooms across the country, and the world, more and

more journalists, meaning individuals who started their careers as journalists in the

traditional sense, are teaching themselves how to code (Usher, 2016, p. 72). Given their

background, they think in terms of the story more than anything else, but are typically

more or less versed in the technical elements of what their programmer first counterparts

bring to the field, and are therefore able to connect and collaborate on a wide range of

projects.

On another side of the spectrum, there are data journalists, or journalists who may

be specialists who create interactive content, and sometimes though not always, know

how to code, and who "descend from a legacy of computer-assisted reporting" (Usher,

2016, p. 72). Data journalists primarily deal with the manipulation of data as a means of

delivering news or elements of the news that would otherwise go overlooked. Working

with data provides an augmented breadth to the stories journalists tell, and the importance

of data in the field as well as the technical skills required to facilitate that increased

breadth, continues to increases in importance and prominence.

## Statement of Purpose

The purpose of this analysis is to better understand the diverse nature of

technically savvy individuals working in or on behalf of journalism. The interview

process included ten individuals working in the journalism field, all of whom have

technical skills involving data analysis, computer programming, computer coding, and

software developing. While each individual employs one or multiple of the

aforementioned skills in their work, each individual's educational and/or experiential

background in journalism varied from virtually none to many years employing traditional

journalistic skills in newsrooms. These distinctions are important to consider given how pervasive technical skills are becoming in newsrooms given how journalism as an institution continues to adapt to an increasingly digital, data laden informational environment following the advent of the internet.

The analysis begins by establishing certain themes and nomenclature associated with the literature that addresses this branch of inquiry, as well as the theoretical framework upon which the following analysis is composed. Next, the research design, including the methods used to acquire and analyze the data, is explained in detail, followed by the analysis itself. The analysis itself explores six dominant categories, or themes, isolated from the data, which were elicited from employing certain lines of questioning designed to answer five research questions. Finally, the conclusion addresses some of the major takeaways explored in the analysis, and briefly describes the importance of these findings for the field of journalism.

This study is important given the radical changes the journalism field has gone through since the advent of the internet and the subsequent post-digital disruption. In essence, the modern newsroom is changing in its substance in the sense that certain individuals from outside of journalism, namely, individuals from the tech field, are coming into journalism with new skill sets. Further, many traditional journalists are adapting their own technical capabilities in an effort to broaden the scope of their work in doing journalism. Ultimately, this institutionalization of certain elements from the tech field in journalism will change the way that journalism is done, and therefore requires attention moving forward.

## Chapter 2: Literature Review and Theoretical Framework

## Institutional Outsiders

These categories outlined by Usher, namely, hacker-journalists, programmer-journalists and data journalists, are not clear-cut, and many of the skills that define each category overlap, and therefore, they "work more as Venn diagrams than they do necessarily independent categories" (Usher, 2016, p. 98).

Further, scholars such as Holton and Belair-Gagnon (2018) refer to some of these diverse actors in the journalism field, such as programmers and mobile app designers, as "outsiders" and "technology-oriented strangers" who have not traditionally belonged to journalism as an institution, but who are increasingly contributing their qualities and expertise to the field (Holton & Belair-Gagnon, 2018, p. 70).

Certain material, organizational and institutional ties are further exposed by Holton and Belair-Gagnon (2018), who charted the substantial evolution of journalistic practice since the world wide web emerged, opening the doors of journalism to groups previously viewed as strangers, but now seen, in some cases, as disrupters (Holton & Belair-Gagnon, 2018, p. 70). Holton and Belair-Gagnon explore the concept of journalistic outsiders coming into the industry, providing a sense of terminology and characterization that can be applied to a study of the process of the technology field and journalism becoming socialized within the field's broader institutional order.

## New Institutionalism and Discursive Institutionalism

Scholars such as Vos and Thomas (2018) maintain that journalism is understood as an institution characterized by "a set of rules that take shape and gain legitimacy over time"; rules that constitute a consensus around the proper way to practice journalism, or

in other words, the gathering and sharing of information, i.e. "the transformation of

information into news" (Vos & Thomas, 2018, p. 2002). This institutional approach to

conceptualizing journalism focuses on the role of institutions as political and social actors

who have a stake in determining political and social outcomes, and given that these

institutions are related, they are constrained and shaped by other institutions (Vos &

Thomas, 2018, p. 2002).

   Another process is occurring within journalism as an institution, and it involves

the synthesis of certain elements from the tech industry. While journalism's raison d'être

is "the transformation of information into news", the tech field is dedicated to making

computers do things more efficiently than before. As will be discussed later on in this

study, these two missions collide as the tech field and journalism continue

institutionalizing. While journalists view tech as a way to make the news more efficient,

impactful, as well as interactive, people from the tech industry in journalism view

journalism as a tool that can be improved and perfected, and ultimately used to solve a

problem.

   The concept of *New Institutionalism*, which conceptualizes ideas "as constitutive

of institutions even if shaped by them", is a sufficient framework in which to consider

this institutionalization between tech and journalism (Vos & Thomas, 2018, p. 2002).

Within the context of the institutionalization of the tech field with journalism, it can be

argued that journalism is effectively being influenced by another institution, namely, the

tech field, and thus the rules concerning how to practice journalism, are also being

influenced. In other words, as tech continues to influence journalism by treating "the

transformation of information into news" as a problem that needs to be solved, ideally

through tech, journalism will continue to adapt to the new technological, data driven,

landscape that now exists.

More so, *New Institutionalism* conceives ideas and interests as bound in the sense

that ideas are assembled in the form of discourses that favor certain interests, and thus,

ideas are incorporated into an institution when the idea aligns with the interests of the

institution and "its vision of itself" (Vos & Thomas, 2018, p. 2002). Therefore, *discursive*

*institutionalism* has emerged as a type of new institutional theory emphasizing the role of

discourse as an organizational impetus that gives an institution its meaning (Vos &

Thomas, 2018, p. 2002). In other words:

> Journalism is, at bottom, a belief system and this belief system finds expression
> through metajournalistic discourse that polices the institution to safeguard its
> authority and is activated in times of institutional strain. This work, then, "creates
> an institution, recreates it as new actors are socialized, and reshapes it during
> discursive contestation or reflection" (Hanitzsch & Vos 2017, 121). This is central
> to the process of authority-buttressing, for these discourses should be understood
> as a site of *"struggle over discursive authority in conversations about the*
> *meaning and role of journalism in society"* (Vos & Thomas, 2018, p. 2002).

Further, conceptualizing journalistic roles through a lens of discursive-

institutionalism accounts "for the fluid nature of journalistic roles in a changing world,"

and Hanitzsch and Vos (2018, p. 160) conclude that, "the institution of journalism as it

exists today represents the 'state of play' in an ongoing struggle over discursive authority

in conversations about the meaning and role of journalism in society" (Hanitzsch & Vos,

2018, p. 160).

Therefore, as long as journalism remains autonomous from the state, the field is

capable of solidifying around certain roles, formulating 'professional' values that exist

externally from societal ones (Hanitzsch & Vos, 2018, p. 151). The role that tech plays,

and the values that it offers to the field of journalism continues to solidify with the

broader institutional role of journalism as a protector of the public interest, and as an

independent actor capable of keeping the powerful in check, and this phenomenon is

partially expressed in the changing conceptions of how modern media operates in the

post-digital disruption world. In other words, the way that data is leveraged, analyzed,

and ultimately incorporated to either increase the scope of news in the traditional sense,

or in some cases, fashioned into the news itself across a variety of interactive platforms,

is becoming the new institutional norm.

Where tech finds a new purpose in solving the problem of journalism, journalism

is absorbing elements of the tech field as it naturally stabilizes itself in the post-digital

disruption world. This process is imperative if journalism is to reach its maximum

capacity as the fourth estate, asserting itself in an increasingly globalized world as an

institution.

## The Run-Down on Institutionalism

Western journalists perceive the news media as reasonably independent from the

state, and journalists historically perceived themselves as "independent agents engaged in

an antagonistic relationship to power while representing the people" (Hanitzsch & Vos,

2018, p. 150). This Western conception of journalism exists as the hegemonic framework

of an institution that conceptualizes journalists as the so-called "superego of the news

industry", or as serving the public through independent fact verification (Hanitzsch &

Vos, 2018, p. 150).

This civic duty does not explain the broader institutional process, given that both

the tech field and journalism both naturally share the desire to make the world a better

place. As will be described later on, it is the cultural norms and ethos that tech brings to

journalism that characterize the nuances of institutionalization.

Further, from the institutional perspective, journalism constitutes an institution

given that it comprises patterns of social behavior, which can be identified "across

organizations that extend over space and endure over time, and that preside over a

societal and/or political sector" (Hanitzsch & Vos, 2017, p. 119). Thus, the news media

exists as "an ordered aggregate of shared norms and informal rules that guide news

collection" (Hanitzsch & Vos, 2017, p. 119). These norms and informal rules are

internalized as a cultural unanimity concerning "how we do journalism" as opposed to

explicitly set rules of conduct (Hanitzsch & Vos, 2017, p. 119).

The institution of journalism is in essence, a means for which journalists might

"navigate the complexities and uncertainties of news making;" however, the institutional

perspective lacks the ability to fully realize how diverse journalistic roles across societies

and news organizations actually are (Hanitzsch & Vos, 2017, p. 119). This element of

diversity in journalistic roles is exposed as the tech field continues to institutionalize with

journalism given the diversity of elements, perceptions and roles tech savvy individuals

bring to journalism, and how this emerging element is changing the way journalism is

done in a rapidly changing and increasingly digital, data laden informational

environment.

This historically rooted philosophy outlining the tenants of the hegemonic

Western model of journalism, results in a principled reluctance among professionals

towards alternative journalistic models. Although journalists historically practiced

alternative roles, they have grappled with articulating "a normative basis for these roles in

the absence of an obvious linkage to Liberalism's privileged political sphere" (Hanitzsch & Vos, 2018, p. 150). In other words, the institution itself challenges any role propagated within the field of journalism that does not adhere to the core tenants of the Western hegemonic institutional model of journalism. As will be discussed later, this seems to be more pronounced with the institutionalization of fact-checking with journalism, given its more pointed challenge to institutional norms, than with the tech field and journalism.

While this may be the case when considering roles propagated within the field of journalism that directly threaten the historically established norms of how journalism operates, the development of the internet and digital disruption that it elicited has created a previously nonexistent element, i.e., the tech field, which possesses its very own role conceptions, or in other words shared and informal rules, outside of the ones being formed as the two components institutionalize.

According to Usher, "Hacking as a technical craft has a long history of innovation and creation with the goal of using code to improve society", a goal that originated during the early years of the internet (Usher, 2016, p. 75). In this sense, the ethos of the tech field, namely the idea that their work aims to benefit society, is congruent with the core principles of the journalistic ethos, thus facilitating the process of institutionalization.

Further, it seems as though the tech field is being increasingly welcomed into journalism, and while points of friction and misunderstanding exist, the two fields appear to be institutionalizing smoothly; in other words, elements of the tech industry are being absorbed by journalism, ultimately changing the institution and the way journalism is done.

This contrasts when comparing the institutionalization of tech in journalism with the friction that characterizes the institutionalization between journalism and fact-checking which Graves considers "signs of both convergence and divergence among fact-checkers" – a movement that "is understood in different ways by practitioners operating in diverse media-political contexts" (Graves, 2018, p. 614). Part of the reason for this institutionalization is rooted in a perceived institutional necessity for technical skills in the newsroom as a means to reformulate the way news is gathered, analyzed and delivered in the modern world. Perhaps the institution, struggling to maintain itself in a new economic and technological environment, realizes that its survival partially relies on technological innovation in "how we do journalism", and is therefore eager to institutionalize elements from the tech world as a means to address an acute need for adaptation. The following are the first two research questions addressed in this study:

RQ 1: How do technologists working in newsrooms, employing programming and developing skills, view themselves in relation to the Western hegemonic model of journalism?

RQ 2: Where are the lines drawn between "journalist" and "strangers" in the industry? That is, who considers themselves as a technologist in the journalism field, and what vision do technologists who consider themselves journalists have of themselves?

## The Run Down on Institutional Logics Approach

Aforementioned above, when considering the process of institutionalization of the tech field with journalism, there are parallels that can be drawn between the same process that is happening with the international fact-checking movement. It is assumed that fact-

checking, over time, will "develop amid institutionalizing mechanisms that tend to lead

social forms toward legitimacy, coherence, and isomorphism (sameness)" (Lowrey, 2017,

p. 377).

However, it is also an assumption that fact-checking exists within "unique fields

and logics, some of which conflict with one another" (Lowrey, 2017, p. 376-377). Thus,

as fact-checking continues developing as a component within the journalistic field, it will

inevitably experience convoluted circumstances as it continues towards

institutionalization. The same cannot be said about the tech field, however, given the core

"fields and logics" that constitute the two fields, namely, acting in the service of society,

are not experiencing any protracted institutional friction. Further, explicit points of

institutional friction are not present given that the elements of the tech industry being

absorbed by journalism do not directly challenge journalism's role as the verifier of fact,

as is arguably the case when considering the fact-checking movement.

While fact-checking has increasingly experienced legitimation overall, the

legitimacy of certain fact-checking sites has been challenged for perceived political bias"

(Lowrey, 2017, p. 377). This conflict between journalists and fact-checkers perpetuated

by the institutionalization of the international fact-checking movement can be better

explained through this institutional logics approach.

This same approach can be applied to the institutionalization of the technology

field with journalism given that individuals who come from the technology field possess

their own inherent system of beliefs, or in other words, "fields" and "logics". The

primary difference between these two phenomena is that while fact-checking inherently

threatens journalism's traditional role as the gatekeeper of facts, the tech field does not

pose the same fundamental threat. While certain elements within journalism tend to feel

threatened by the presence of the tech field in the newsroom, the sense of being

threatened stems more so from a fundamental misunderstanding of the tech field as

opposed to a sense that one's institutional power is being usurped, as is arguably the case

concerning journalism's institutional friction with fact-checking.

An institutional logics approach aids in determining the forces behind the

emergence and development of the fact-checking movement, however it should provide

more detail into the reasons why certain facets of the movement deviate from institutional

processes (Lowrey, 2017, p. 380). The institutional logics approach isolates certain

"institutional orders"; namely, abstract elements such as profession, the market, religion,

and the state, and there are a variety of logics corresponding to these elements.

In regards to institutional logics, they are "the socially constructed, historical

patterns of cultural symbols and material practices … by which individuals and

organizations provide meaning to their daily activity, organize in time and space, and

reproduce their lives and experiences" (Lowrey, 2017, p. 380). Thus, institutional logics

serve as theoretical frameworks for making sense of everyday activity, and they also

"emerge as responses to complex external institutional conditions" (Lowrey, 2017, p.

380).

Furthermore, different from past institutional approaches, the perspective based

on institutional logics enunciates change and agency. It is possible for environmental

disruption, such as social media and the fake news phenomenon, to cause conflict

between institutional orders, fostering the necessity for a shift in logics among

organizations as well as individuals. In regards to journalism, grim economic

circumstances as well as shifting technological trends, have elicited tensions between the

traditional logics of professional journalists, and certain logics that have emerged in their

salience, such as the volatility of the consumer markets (Lowrey, 2017, p. 380). These

trends are also present when considering the increasing importance of the tech field in the

newsroom, given journalism's disrupted business model and its resultant prerogative to

adapt accordingly.

This conflict, on an institutional level, creates an ambiguous and uncertain

environment among actors, who require that their beliefs, values, assumptions, and

practices settle into a grounded state within the framework of a broadly legitimized

institutional order (Lowrey, 2017). Therefore, as these new logics manifest, a process of

negotiation occurs as the conflicting actors interpret the process of change, ultimately

leading to the inevitable re-emergence of stasis and homogeneity as the actors embrace

the newly legitimized logic (Lowrey, 2017, p. 380).

Within the context of the institutionalization of the technology field with

journalism, there is a negotiation process playing out between tech savvy components of

the field and its more traditional components, in the sense that the ultimate effect of

institutionalization will, as Usher maintains, "expand the professional jurisdiction over

work and knowledge for journalism" (Usher, 2016, p. 72), Additionally, Vos and Thomas

describe this as "a set of rules that take shape and gain legitimacy over time", and that

ultimately dictate the institutional consensus around the proper way to practice

journalism (Vos & Thomas, 2018, p. 2002). The following is the next research question:

RQ 3: What specifically motivates technologists to apply their technical skills to

journalism? How, if at all, does this motivation change when considering

individuals who identify as both a technologist and a journalist?

While Graves (2016) provides the broader conceptual framework concerning fact-

checking and its struggle to align with the institution of journalism, Hanitzsch and Vos

(2017) provide the theoretical framework describing the process and elements of the

institutionalization process, offering a lens of discursive institutionalism. Finally, scholars

such as Holton and Belair-Gagnon (2018) explore the concept of journalistic outsiders,

such as individuals who enter journalism from the tech field coming into the industry,

providing a sense of terminology and characterization that can be applied to a study of

the process of tech savvy individuals becoming socialized with journalism as an

institution.

However, this shift toward technological innovation that appears to be defining

the next phase of journalism as an institution, is characterized by an influx of

technologically minded individuals migrating from the tech industry into journalism, or

in many cases, individuals who already have a background in journalism, but developed

tech skills in order to enhance their effectiveness in the field. Therefore, the fourth

research question is as follows:

RQ 4: How do technologists consider their role within journalism as related to the

reporting process? How does this conception differ for technologists who also

identify as journalists?

**Journalistic Roles Defined**

Finally, most of the studies on journalistic roles are focused on journalists'

cognitive and normative ideas, and researchers are only now beginning to invest more

time in finding out how these roles are translated into practice (Hanitzsch & Vos, 2017, p.

118). One of the primary methods in these studies was to compare journalists' ideals with

how they reported on their own "performance" (Hanitzsch & Vos, 2017, p. 118).

Hanitzsch and Vos (2017, p. 118) argue that journalistic roles may be studied with regard

to "normative ideas (what journalists *should do*), cognitive orientation (what they *want* to

do), professional practice (what journalists *really* do), and narrated performance (what

they *say* they do)." Thus, the fifth and final research question considered in this study is

as follows:

> RQ 5: What professional practices, and narrated performances can be
>
> attributed to technologists working in the journalism field, and how compatible
>
> are they with that of journalists?

## Chapter 3: Research Design

## The Method

For this analysis, I employed semi-structured in-depth interviews with ten tech savvy individuals in the journalism field. This method is the most appropriate for this topic given the complex and multifaceted nature of the skill sets, and role perceptions involved. Given that virtually all of the participants had slightly different skills, backgrounds, and perceptions of what they do as it relates to journalism, the only way to finesse an answer to the research questions central to this study, was to employ semi-structured in-depth interviews. The reason for this is because this method allows the participants to express themselves freely and in broader detail without unnecessary restraint.

Further, given the fact that tech savvy individuals working in the journalism field possess a distinct set of jargon when describing their work, which can be laden with technical details and require specific knowledge, it was important to approach interviewees with open-ended semi-structured interviews, as "The less a researcher knows about a topic, the more appropriate is the use of open-ended and less structured interviewing techniques" (Johnson & Weller, 2002, p. 495).

This so-called "bottom-up" approach turned out to be a viable technique for interviewing tech savvy individuals in the journalism field and the approach was helpful in generating new theories as the study progressed and more data was generated, and is similar to the approach espoused by proponents of "grounded theory" (Johnson & Weller, 2002, p. 495).

Further, the data analysis for this study was guided by the constant comparative

method. There are four stages to the constant comparative method and they are as

follows: "(1) comparing incidents applicable to each category, (2) integrating categories

and their properties, (3) delimiting the theory, and (4) writing the theory" (Glaser &

Strauss, 2017, p. 105).

When analyzing data using the constant comparative method one is essentially

generating theories by way of systematically developing each stage of the method into

the next until the data analysis is complete (Glaser & Strauss, 2017, p. 105). It is

important to first "generate theoretical ideas – new categories and their properties,

hypothesis and interrelated hypothesis", a process that can be hindered by the

unnecessary process of first coding the data (Glaser & Strauss, 2017, p. 101-102).

**The Process**

The following analysis is the result of employing the constant comparative

method to distinguish connections among data collected by way of semi-structured

interviews with individuals working in newsrooms, or outside of newsrooms, but in the

service of journalism, and who possess a diverse array of ways to identify themselves

both personally and professionally within the context of journalism.

These individuals may or may not have educational or professional background in

journalism, but what unites them are their technical skills employed in the service of

journalism. Some of the participants came into journalism from the tech field, more

specifically, computer science and computer engineering, and therefore do not have any

formal educational or experiential background in journalism. Further, the point of this

study is to better understand how this cohort is facilitating the development of new

institutional norms within journalism.

The process was done according to what Sheila M. Fram (2013) explains as a

process of employing the "theoretical coding stage" which "asks "questions about the

conditions, actions/interactions, and consequences of categories, thus making links

between the ideas being conceptualized from the data" (Fram, 2013, p. 5). Essentially, the

data was coded in such a way that looks "for causal conditions, contextual factors,

actions, and interactions in response to a phenomenon, intervening conditions that help or

hinder actions and interactions and consequences of actions and interactions" (Fram,

2013, p. 5).

In other words, this paradigm, or coding process, is established upon the

presupposition "that condition/consequences do not exist in a vacuum;" and that, "most

situations are a combination of micro and macro conditions; a full range of possible

interrelationships between micro/macro conditions are not visible, but hidden; conditions

and consequences exist in clusters; and action/interaction and emotional responses to

events are not confined to individuals" (Fram, 2013, p. 5). With this paradigm in mind, it

was possible to work through the data collected via semi-structured in-depth interviews,

and to draw upon certain themes that link the interviews together providing substance as

to how the participants expressed their emotional response to certain experiences.

The individual tech savvy individuals working in the journalism field interviewed

for this project were contacted via Twitter or through a mass recruitment email sent out

on the National Institute for Computer Assisted Reporting (NICAR) listserv. After

agreeing to participate, the individuals were screened and interviewed based on a certain

criteria. The desired criteria included individuals working in the field of journalism who possess certain technical skills, such as coding, data, programming or developing skills. While it was not essential that these individuals have an educational background in journalism, it turned out that the vast majority of the participants had a formal education in journalism or had worked in the field in a non-technical capacity for some time.

The participants partook in semi-structured interviews designed to answer certain research questions geared toward providing better insight into the process of institutionalization of the technology field with journalism (see Appendix A for question guide), or in other words, what scholars such as Holton and Belair-Gagnon (2018) characterize as "technologically-oriented strangers."

However, while the participants in this study employ similar skills in the service of journalism as these so-called "technologically-oriented strangers", the fact that the vast majority of the participants have an educational or experiential background in journalism would effectively remove them from the categorization of "strangers" in the journalism field.

Three of the participants, however, can effectively be characterized as "strangers" given that they came into journalism from the tech field, and may or may not have experience working in newsrooms.

The average length of the interviews was 43 minutes and 56 seconds, and the range was about a half an hour. The longest interview took around one hour and the shortest took 28 minutes and 49 seconds.

## A Cross-section of Modern, Tech Savvy Journalism

For this project, 10 participants with a variety of specific skills and backgrounds were interviewed (refer to chart in Appendix A). The participants were categorized based on what kind of organization they work for and how they identify professionally. The categories are as follows: P1: Journo-coder at a private commercial radio station, P2: Journalist, software developer, and independent media consultant, P3: Journalist turned software developer at a technology company, P4: Hacker-journalist at a media company, P5: Developer/software engineer working in the context of journalism on a team that creates an open source tool used to build interactive charts, P6: Journalist-programmer at a not-for-profit news agency, P7: Web and data applications developer working remotely for an independent non-profit organization, and P8: A computer engineer working on a data investigations team at an online media outlet, P9: A freelance journalist who "does computational journalism" as a consultant working on investigative projects, and P10: A journalist/coder, and "data wrangler" who also works in graphics design for two digital news content providers.

## Ethical Issues and Limitations of Research Design

Given that the participants willingly indicated their desire to participate, and that no identifying information is used in the above analysis that could potentially compromise their identities, there does not seem to be any major ethical issues associated with the research design.

However, a major limitation to the research design exists in the disparate experiences described by each participant. While all the participants in some form or another employ tech skills in the service of journalism, the fact that each experience varied quite a bit from the next, perhaps detracted from the definitive nature of the

theories generated during the analysis process. In other words, the fact that some of the

individuals work in newsrooms while some do not, could have resulted in limitations of

the research design.

## The Process, Sample Size

The majority, or seven, of the participants constituting the research sample for this

study were recruited from the National Institute for Computer-Assisted Reporting

(NICAR) Listserv, two were recruited from Twitter, and one was recruited via snowball

sampling, a process of identifying participants via recommendations, or networks of

contacts. The participants were sent an email, a Tweet, or a direct message via Twitter

depending on how they were recruited.

The recruitment letter, and direct message via Twitter included all relevant

information pertaining to the study and its affiliation to the University of Missouri School

of Journalism, and those who responded to a Tweet with their contact information were

promptly sent the same information.

Every participant who responded to the recruitment email via the NICAR listserv,

with the exception of one person, participated in the study. Five people responded via

Twitter, however only two participated, and two people responded via snowball

sampling, but only one participated.

## Explaining the Research Sample

The ten individuals who participated in this study all work for news organizations

either as staff or consultants, with the exception of one participant who works for an

organization that designs data visualization tools for newsrooms. Therefore, unlike the

"outsiders" and "technology-oriented strangers" who have not traditionally belonged to

journalism as an institution, but who are increasingly contributing their qualities and

expertise to the field, the individuals who participated in this study overwhelmingly had

some kind of journalistic background; whether it be educational, experiential, or a

combination of both (Holton & Belair-Gagnon, 2018, p. 70).

Seven of the ten participants have a background in journalism, but eventually

learned tech skills either in their free time or on the job. One participant, P5, who has a

background in computer science and media studies said that before working at his current

job he worked in a newsroom employing technical skills and while, "my job title says,

'data journalist', it was clear to everyone in the newsroom that I don't have real proper

qualifications in journalism or had worked in the field before."

Thus, P5 is a kind of outlier in the sense that while he has technically worked in

the journalism field before, he does not have a background in journalism and currently

works as a software developer for an organization that develops data visualization tools

for newsrooms.

Two out of the ten participants came to journalism from the tech field, specifically

P7 and P8. P7 came from the computer-engineering world and currently works remotely

as a web and data applications developer at a not-for-profit news agency. P8 currently

works on data investigations at an online media outlet and came into journalism from the

computer science world, and like P7, P8 employs his tech skills in the service of

journalism, but works in a newsroom alongside traditional reporters.

Thus, the majority of the participants in this study are not "outsiders" to the

journalism field, though while they employ technological skills and exhibit certain

qualities characteristic to the tech field, their journalistic backgrounds allow them to

effectively employ their skills in the service of journalism from a journalistic perspective.

The kind of hybrid nature of these individuals gives them an edge in the field given that

they understand both the tech and journalism sides of the work that they do.

P5 employs his computer science skills developing tools for newsrooms, and

while he does not have a background in journalism, his background in media studies

allows him to approach his work with the knowledge of the practical applications of the

software he creates to the field he creates it for. P7 and P8 both employ technical skills

for their respective organizations, and despite technically being "outsiders" in the field,

both seem to feel that their journalistic oriented colleagues value their work and

contributions both on the organizational and institutional levels, an indication that certain

elements of the tech field are being absorbed into journalism's institutional order.

Further, four of the participants (refer to chart in Appendix A) work as

independent contractors or consultants, employing technical skills on behalf of

newsrooms and media organizations. These individuals each have a background in

journalism that is either educational, experiential or a mixture of both, and each

eventually learned technical skills at some point in their careers as journalists. These

individuals all started their careers as journalists working in newsrooms, but eventually

left the newsroom, choosing to employ technical skills in the service of journalism as

outside consultants or independent contractors.

Finally, the majority of the ten participants were men from the United States,

however, three participants were from the European Union, and two participants were

women. For the purpose of this study, the initial terminology chosen to refer to the

participants was "technologist", however, the phrase "tech savvy individuals" is also used

interchangeably with "technologist" in order to be more inclusive.

## Сhapter 4: Findings and Analysis

**The Post-Digital Disruption Newsroom**

This study focuses on the three categories of tech savvy individuals working in

the journalism field mentioned by Usher, but it does not neglect individuals who work as

newsroom developers, another category independent of the latter, but equally related and

fundamental to the modern post-digital disruption newsroom.

Also included in this study are those working on the periphery of journalism,

namely as independent consultants or computer engineers working for companies,

employing coding, programming and/or developing skills in the service of journalism.

These individuals may or may not have an educational background in journalism, but

seem to define what they do as it relates to the facilitation of journalism, and the ethos

that drives journalism, by way of developing and making available tools and information

for both the public and journalists alike.

Many of the participants felt as though there was a distinct lack of understanding

between individuals in the newsroom with technical skills, whether they be associated

with coding, or programming, and individuals who exist more-so on the "editorial" side

of the newsroom. Some participants also expressed a concern for the fact that in many

newsrooms, the technically skilled people are physically separated from the editorial and

reporting staff, creating a kind of schism between the two sides that exists both physically

and professionally, exacerbating this lack of understanding and ultimately impeding in

the optimal execution of a particular organization's shared goal of informing the public.

Based on the data collected from the interviews, it seems as though the overall

consensus concerning this lack of communication and understanding between the various

factions of the modern, tech savvy newsroom, is that the collaborative, goal-driven effort

of the newsroom would be better served, and effectively institutionalized, if there were a

broader mutual understanding of and respect for the technical skills present in the

newsroom on part of the more traditional journalist faction of the industry, as well as an

understanding of the reporting, storytelling and editorial processes on part of non-

journalistic individuals employing technical skills in the journalism field. In other words,

a sense of team effort and mutual respect and understanding in the pursuit of certain

institutional and/or organizational goals remains in a state of flux as tech and journalism

continue their discursive process of institutionalization.

Further, the following analysis of the data isolated certain distinct role perceptions

as well as points of tension among the participants that seem to characterize the shifting

idea of how news is sought out, analyzed, and disseminated to the public within the

broader context of journalism as an institution, shedding light on the institutionalization

process the field is undergoing with the technology field. Overall, the data shows a

consistency in how tech savvy individuals working in the service of journalism view

themselves and their role in society and profession.

Based on the analysis, tech savvy individuals, with some exceptions, tend to view

themselves either as journalists or components of its institutional order. Even individuals

with no journalistic background viewed their work as a means toward the facilitation of

the act of producing journalism and therefore identify with the field's institutional ethos

of serving the public by way of informing and keeping the powerful in check.

Further, another process is occurring within journalism as an institution, and it

involves the synthesis of certain elements, or professional practices, from the tech

industry. While journalism's raison d'être, as maintained by Vos and Thomas (2018, p.

2002), is "the transformation of information into news", the tech field is dedicated to

making computers do things more efficiently than before.

As will be discussed later on, the former is effectively absorbing elements of the

latter as institutionalization process unfolds. While journalists view tech as a way to make

the news more efficient, impactful, and interactive, people from the tech industry in

journalism view journalism as a tool that can be improved and perfected, and ultimately

used to solve a problem; the current state of journalism being one of those problems.

Further, the process that Vos and Thomas describe as "a set of rules that take

shape and gain legitimacy over time" is currently working itself out as tech skills become

more pervasive in journalism (Vos & Thomas, 2018, p. 2002). Given that an institution is

essentially a set of rules that are discursively established over time, and that are

influenced by other institutions, it is clear from the following analysis of the data that

journalism is going through a discursive process of establishing new institutional rules

concerning how journalism is done; which results from the fourth estate's necessity to

adopt elements of the tech field in order to adapt to an increasingly online, data driven

digital news environment.

## Technological innovation in Journalism: RQs and Principle Themes

Many of the studies concerning technological innovation in journalism are

focused primarily on the role of tech as it relates to technological innovations or on the

production and distribution of content (Evans, 2018, p. 4). Further, scholars like Sandra

K. Evans (2018) examine technological innovation in journalism by considering how

management and employees grapple with the meaning of innovation on an organizational

level (Evens, 2018, p. 4). Using an interdisciplinary approach, Evans assesses how

journalism organizations attempt to employ innovation in an effort to both improve the

way they serve their missions as well as a mechanism for survival in an environment that

is becoming increasingly competitive (Evans, 2018, p. 5).

Another growing body of literature is dedicated to the perspective of staff at news

organizations regarding the editorial-business divide within the context of certain

"seismic changes in how journalism is funded and practiced" (Drew and Thomas, 2018,

p. 197). Scholars like Drew and Thomas (2018) compliment this branch of the literature

by taking into account the experiences of staff at news organizations who have

collaborated with members of their own organization who work in different departments

on specific business initiatives; ultimately breaching the proverbial "wall" that separates

the editorial and business oriented sides of any given news organization (Drew and

Thomas, 2018, p. 197).

This study considers technological innovation in a journalistic environment on

both the organizational and institutional levels, but focuses broadly on individuals who

employ technical skills in or in the service of journalism as it relates to the field on an

institutional level.

Further, this study compliments the literature that is concerned with technological

innovation in journalism by way of considering the absorption of tech culture in

journalism on an institutional level. While the institutional level is the primary focus of

this study, this study also outlines certain organizational trends that serve in providing a

more nuanced understanding of institutional levels of change in how journalism is done

in the modern post-digital disruption newsroom.

On the institutional level, this study considers the institutionalization of certain elements of tech culture in journalism. This absorption of tech culture is explored further on in this chapter, and relates to certain themes which include the following: 1) All in the service of journalism and the public interest - A sense that most, and arguable all of the participants, see what they do as being in the service of journalism and in the public interest, 2) The importance of data and tech skills to journalism - The perceived importance of technical skills, and their impact on journalism as the fourth estate, and 3) Treating data as a source – The way in which tech savvy individuals in the journalism field, specifically those working with data, perceive what they do as consisting of both a technical and journalistic component.

Further, on the organizational level this study considers the following themes: 1) The lonely coders – a sense of loneliness and isolation that comes with providing nontraditional skills in the service of journalism, 2) A lack of understanding - An often times mutual lack of communication and understanding between non-technical, traditional reporters, editorial staff in newsrooms, and their tech savvy colleagues, 3) Wearing multiple hats – the reality that many tech savvy individuals working in journalism are required to engage with multiple roles, 4) A sense of being threatened - A sense, on part of the more traditional journalists working in the field, that their institutional power is being usurped.

The organization level themes serve to point out certain characteristics of tech culture that are effectively being absorbed by journalism as an institution, and therefore this aspect of the study compliments the literature that is concerned with exploring technological innovation as it relates to the organizational level.

The overarching research questions that this analysis sought to answer based on the data acquired, listed in a more concise manner are as follows: 1) how do tech savvy people working in journalism view themselves in relation to the institutional model of journalism? 2) What distinction can be made between those who identify as journalists and those who identify as coders, programmers, developers, etc., and those who straddle both fields? 3) What motivates tech savvy individuals who work in journalism? 4) How do tech savvy people working in journalism see themselves in relation to the reporting process? And 5) How is the so-called "coder mentality", attributed to many tech savvy people in journalism, compatible with the ethos that drives journalism as an institution?

Finally, the following contains an analysis of the data acquired via semi-structured interviews with tech savvy individuals working in the journalism field. While the analysis considers both the institutional and organizational levels, the aforementioned research questions were answered based on the institutional level themes outlined above.

## The Absorption of Tech, or "Startup Culture" in Journalism

This process of absorption, adaptation, or socialization occurring between tech and journalism is happening not because the way journalism is done is changing, though in fact it is, but because much of the information required to produce the news is becoming increasingly accessible only to individuals capable of employing technical skills; and therefore the institution of journalism abides this process given that it must survive as the fourth estate.

Scholars such as Jan Lauren Boyles maintain that many news outlets are adapting their newsrooms by way of "establishing spaces for experimentation"; a process Boyles refers to as *intrapreneurship* (Boyles, 2016, p. 229). Further, this process is defined by

integrating "startup culture" into the newsroom in an effort to help media organizations

adapt to change (Boyles, 2016, p. 229-230). It can be argued that this so called "startup

culture" is synonymous with "tech culture" in the sense that in absorbing "from tech

culture, intrapreneurial reporters need more time to "mess around" or "tinker" (Boyles,

2016, p. 239).

The reason this process is necessary is due to the fact that past studies analyzing

managerial studies of traditional newsrooms have come to the conclusion that leaders at

news organizations tend to be highly resistant to change in the following three ways: 1)

first, historically, managerial power in newsrooms has been split between "the editor-in-

chief and the publisher", "one prioritizing the civic value of journalism and the other

prioritizing the economic value of the news product", which in turn leads to different

visions for organizational goals; 2) second, journalistic culture in newsrooms fosters a

managerial structure that bestows a high level of autonomy to journalists on an individual

basis; and 3) third, the proliferation of the 24-hour news cycle has placed constraints on

how much time news executives are able to dedicate to strategic planning on a daily basis

(Boyles, 2016, p. 230).

Thus, the difference between past institutional changes in journalism in which a

new technology or a new way of doing journalism was adopted and abided by the

institution, and journalism's current adoption of elements from tech, is that tech is

changing the way journalism has been traditionally done. On both an institutional and

organizational level, elements from "tech culture" are changing the way newsrooms are

managed, and how organizations produce content.

The uniqueness of this absorption of "tech culture" in journalism is expressed in the sense that a field that prides itself in its division between the journalistic and business elements is absorbing elements of a field traditionally associated with capitalistic endeavor, i.e. tech. Thus, in adopting elements from tech, and incorporating individuals from the tech field, journalism as an institution is changing the way it perceives "'The Wall'" between journalism and business, or in other words, "'Church and State' – which project a enduring need for division"… further, "Challenging the strict separation of editorial (news) and business (advertising staffs – a long-held and deeply felt article of faith within American Journalism-*Innovation* asserted that "increased collaboration, done right, does not present any threat to our values of journalistic independence" (Drew and Thomas, 2018, pp. 196-197).

Therefore, while "tech culture" is changing one of the fundamental pillars of American journalism, namely, the separation between the editorial and business components in the sense that "tech culture" serves as a catalyst for innovation, the institution of journalism abides given the importance of the tech skills being absorbed to its survival.

Alternately, while the individuals employing tech skills in the service of journalism are effectively changing the perception of the field's separation of "Church and State" by way of brining "tech culture" into the newsroom on an organizational level; and as will be discussed further, these individuals also seem to overwhelmingly express the fundamental sentiment that the two sides are in fact separate, and that on an institutional level, the central ethos of journalism is ultimately embraced.

Therefore, while elements from the tech field are being absorbed by journalism, journalism seems to effectively incorporate tech savvy individuals into the field, and thus a two way exchange is unfolding as the discursive process of institutionalization plays out.

## The Coder Mentality

In his book, Coders: The Making of a New Tribe and the Remaking of the World, journalist and technology writer Clive Thompson characterized a kind of "radical openness" early computer programmers had regarding their work. Like the foundation of the Associated Press in the late 1800s, which allowed the press to collaborate and therefore fulfill their collective goal of getting the news out quicker and more efficiently, a central component of the tech field is a desire to collaborate.

This sense of collaboration between tech savvy individuals and their traditional journalistic counterparts is similar to the study by Drew and Thomas (2018) which complements and builds upon the literature that considers "the *experiences* of news organization staff who have collaborated with members of the same organization but from a different department on a *specific business initiative*" (Drew and Thomas, 2018, p. 197).

Further, Thompson describes the "hacker ethic", in which programmers "believed that there was a hands-on imperative, that everyone in the world ought to be allowed to interact directly with a computer. They also believed in radical openness with code: If you wrote something useful, you should freely share it with others" (Thompson, 2019, p. 36).

This kind of open, sharing, collaborative tech culture materializes in journalism via, for example, the web-based hosting service, GitHub, were journalists and coders consistently share their work with each other. This collaborative spirit is quickly becoming an institutional norm when considering that for many journalists, it is a sign of professional acumen and an adherence to this collaborative approach, to have a GitHub account, and to share their work with others in the field.

In fact, at the recent 2019 NICAR conference in Newport Beach, California, forums and workshops concerning GitHub use for journalists were held, as well as seminars related to training journalists to employ coding skills in a number of computer programming languages. Collaboration and learning seemed to emerge as a unifying ethos among the cohort at the conference ultimately reflecting the institutional changes addressed in this study.

## Tech and Journalism: A Two-Way Exchange

As part of this institutionalization process, the individuals coming from the tech field into journalism appear to leave the field, and in doing so, leave behind higher paying jobs at more profitable organizations, in order to fulfill a desire to serve a greater purpose that they believe journalism represents; an indication that while tech is influencing journalism, journalism is also influencing the technical elements being absorbed and abided by the institution.

P4, for example, previously worked in the tech industry for part of his career before going into journalism. P4 said that his life "would probably be less stressful," and that "I can make a lot more money if I was working in tech," however, "the reason I'm in

this industry is because of the difference that we make" and because he believes

journalism is a "central component of democracy."

P4 went on to explain this as one of the reasons that he has devoted his career to

supporting local news given the dire need in many communities for something to fill the

"void" and that ten years from now, he fears, "we're not going to have local newspapers

anymore."

P5 said that although he is not the person directly holding the powerful

accountable, he sees his role working on an investigations team by employing his tech

skills as helping his colleagues do just that, by way of creating tools for them. P7 said

that the main problem he hopes to solve with his work is "to help journalists with the

technical side of the work."

P7 added that there is a lot of work to do "whether the data set is big or not," and

that he see's his role and the role of other people like him, to facilitate that work to make

it easier to produce the "journalistic product." P5 said that given his background in

computer science and media, he could potentially work on "making the next social

network or something," but he maintained that "the journalism ethos is probably the

reason for working in journalism and not working in another field, or in tech where I can

probably earn more money."

P4 and P5 both seem to realize their professional need to serve a greater cause

that they feel is absent in the tech field but that they find through working in journalism.

Finally, this sense of identifying with the ethos of journalism is part of how journalism is

influencing the elements being absorbed and abided from the tech field.

**Journalists can Speak Coder, but Coders can't Speak Journalist**

Further indication of this two-way exchange between journalism and the elements from the tech field that it continues to absorb is the fact that most of the tech skills employed in the service of journalism are being employed by individuals who started their careers in journalism and adopted technical skills later on.

For example, P9, who identifies professionally as a "freelance journalist", but also provides "programming needs to newsrooms, said that while his primary role working as a consultant in the journalism industry is "primarily… technological," it "is informed by journalism, like my straight journalism experience." P9, similarly to other participants, expressed a sense that "there's a lot of people who know how to code, but there's not a lot of people who know how to code, who know what newsrooms and journalists actually need."

The fact that P9 has technical skills gives him a unique position in the journalism field given that what he does "is give journalists the tools to do more journalism with less resources." Doing things more efficiently and with less time and resources, a characteristic of the "hacker ethos" as described by Thompson, is a key sentiment that the tech field brings to the newsroom.

Therefore, this discursive institutional process goes both ways in the sense that while traditional journalists are learning to be more tech conversant, tech savvy individuals working in journalism are learning to be more conversant about the nuances of the reporting and storytelling process through their experience working alongside traditional reporter types.

Thompson characterizes in his book the programmer/coder mentality, as focused on a desire for "efficiency and scale" (Thompson, 2019, p. 21). Thompson writes that this

fixation on efficiency and scale is the reason, "why programmers fit so easily into

business building and part of why some slide so frequently into libertarian thinking. Their

talents are torqued perfectly for capitalism's central trick, which is, basically, "do

something marginally more efficiently than before and then skim off the profit"

(Thompson, 2019, p. 21).

     While Thompson characterizes the programmer/coder mentality this way, the

mentality changes when applied to journalism in the sense that the profit driven

motivation is replaced by a desire to support the public interest through journalism, while

maintaining the basic goal of "efficiency and scale."

     In other words, for programmers/coders in the field, journalism becomes a tool

that is in need of reformation in the sense that it needs to be increased in its efficiency

and reach. The ultimate goal is not capitalistic in its essence, but is dedicated to a sense of

solidarity, in working toward some sort of rendition of journalism's central goal, which

continues to be articulated as this discursive process of institutionalization continues to

play out. Further:

> Coder culture is also all about sharing technology. In his book, Thompson writes:
>
> A piece of software is a thing, a machine that does something, so you can own it,
>
> but it's also a form of speech, it can be easily shared. And so it is shared, almost
>
> incessantly. Coders are remarkably chatty and open about their everyday work,
>
> regularly posting their software problems to online forums and spending hours
>
> helping other people solve theirs (A study in the '80's concluded that coders were
>
> "less loyal to their employers than to their profession.")" (Thompson, 2019, p.
>
> 21-22).

Thus, it can be argued that this element of tech culture is part of what journalism is currently absorbing and abiding as discussed above. For example, this "chatty" problem solving oriented culture is present on the numerous email chains on the NICAR listserv. Most of the emails on the listserv consist of threads dedicated to a single, specific issue that any given member on the listserv hopes to solicit advice from other like minded professionals, both journalism professionals who understand and manipulate data using code on a regular bases, as well as individuals who come from the tech field and employ similar skills in the service of journalism.

Thompson also characterizes a kind of "tinkering culture" which expresses itself as a desire to put in the necessary time and concentration into making computers do things more efficiently (Thompson, 2019, p. 38). P1 expresses this "tinkering culture" in the sense that he prefers to do a lot of his coding work in the comfort of his home rather than in the newsroom. P1 said that when he is working on a "really big project", he likes to sit on his couch and spend hours coding, where he can concentrate because "I'm alone by myself focusing on my couch, and yeah, that would be my day I believe."

P1 also embodies this "chatty" coder culture given that one "can share your problems with them [other tech savvy individuals in journalism] and say something like, I have this script and I don't know why it's not working." P1 said that despite how lonely he is in his current position as the only "journo-coder" at his organization, he finds answers from other eager coders in the journalism field who are on the NICAR listserv or on certain Slack channels, such as the News Nerdery Slack channel, which serves as a similar collaborative, "chatty" forum for tech oriented journalists.

These two characteristics brought into journalism from tech, namely, that of the "chatty" coder eager to share their work with others, as well as the desire to "tinker", are slowly changing the way work is done in newsrooms and in the journalism field in general. The ability to work remotely like, P7 while still maintaining a sense of team "solidarity", as P3 put it, as well as this sense of creating a sense of "transparency" as articulated by P4, all seem to be characteristics of the tech field adopted into journalism, the former being on the organizational level and the latter on the institutional level.

Further, P7 said that working remotely creates some tricky situations regarding how things are handled in his organization. However, he added that the communication issue is not just in journalism, but it happens in all industries. P7 added that while people on the tech and journalism sides of the field have their specific goals in mind, the two elements unite around the overall organizational goal.

P7 said that he has to focus on creating good tools, "and that's it." His goal is not to find stories, but he could, with a journalist by his side, work on technical elements of a specific project as they relate to the story. P7 pointed out that while the journalist focuses on the story, the technologists focus on the tools and data analysis. P7 doesn't mind whether or not that he is considered a "journalist" by his coworkers, but is more interested in solidarity with his team around their shared organizational goal.

## Institutional Level Themes

The following sections cover the institutional level themes, the analyses of which were used to answer the research questions central to this study.

## All in the Service of Journalism and the Public Interest

The following emerged from a line of questioning designed to address RQ's 1 and 3, which are concerned with how tech-savvy people working in journalism perceive themselves within the institutional model of journalism, as well as where they view themselves professionally in relation to journalism as an institution.

Many, if not all, of the participants see what they do as providing the necessary skills that the field requires to realize a specific goal, whether it be "the story", or the development of tools, holding the powerful accountable, or providing the public with data that was previously inaccessible. The ultimate goal, it seems, for many of these tech savvy individuals, is to help journalism by investing their time and energy into enabling journalism through tech. In other words, to tell a story that wouldn't be told otherwise, and in essence, make the scope of journalism ultimately broader.

P7, who works remotely for his organization writing code for data analysis, said that he has to focus on creating good tools, "and that's it." His goal is not to find stories, but he could, with a journalist by his side, work on elements of a specific project. Essentially, while the journalist focuses on the story, the technologist focuses on the tools and data analysis. P7 doesn't mind whether or not he is considered a "journalist" by his peers, but is more interested in solidarity with his team on an organizational level, while he views the broader purpose of his work as it relates to the institutional level.

P10, who calls herself a "journalist/coder" and who both works in graphic design and with data, made it clear that even though she wears all these different "hats", she does all these different "things for journalism." P10 said:

I always like to sort of put that at the top (journalism). So, like… I want to be

clear, I'm not just a coder, you know… But like I want to make it clear that this is

all done in the name of journalism. So, I like to put that first.

More so, when asked about how they perceive their professional goals, and role in

society, the participants unanimously expressed that they see themselves and their work

as catering to the public interest in some way, which is consistent with how journalism is

viewed on the institutional and to an extent, the organizational levels. Most of the

participants said their work was motivated by a sense that they are contributing to what

Hanitzsch and Vos describe as the hegemonic framework of an institution that

conceptualizes journalists as the so-called "superego of the news industry", or as serving

the public through independent fact verification (Hanitzsch & Vos, 2018, p. 150).

While the participants did not specifically mention the "Western hegemonic

model" of journalism, they expressed deference toward journalism's institutional role as

the fourth estate. P1 said that his ultimate goal at his organization "is always to inform

people, if I can do it in a way that people really understand what's going on, that's my

main goal." P1 also said his "main goal is the story," and said, "I know the technical part

is important, but to me always my focus is the story… I'm more focused on the

journalistic side of it." Like P10, P1 said that he chose to focus his goals on the

journalistic outcome of his work, and he views his skills in the newsroom as a means to

that end. P10, while dedicated to the journalism side of things, institutionally speaking,

said she is not a writer, and therefore prefers to contribute to the organizational goal by

way of her technical skills.

P1 made it clear that there should be a clear divide between the advertising side of the industry and the journalistic side, because he views the purpose of journalistic work as holding the powerful accountable, and that "knowing how to code doesn't change that at all." This element of the data is indicative of an adherence to the Western hegemonic model of journalism, and this model seems to be a major underlining motivational factor in the work that certain tech savvy individuals do in the service of journalism and the goals associated with it.

Additionally, P5 said his primary motivation working on his team is less about keeping the powerful accountable, but more so to create a "more informed public." For P6, the goal seems to be enhancing the capabilities of his newsroom, and using technology to "do stories that we otherwise wouldn't be able to do. So, we can take perspectives that, you're not going to get by interviewing three people and seeing what their responses do or don't have in common." P6 likened his work, which he said is mainly working on "distribution platforms," as "basically the pipes getting content to other news organizations." P7 described his team's mission as deriving "knowledge from data," and ultimately making it possible to produce, from that data, "the journalistic product." P7 added that for him personally, his "first motivation is the data work" and that he is motivated in his work by the prospect of "discovering something new."

Essentially, for P6, his work is about taking a wider look at the broader trends, and to "see if what our reporters on the ground are seeing actually lines up with the whole reality." P6 seems to characterize the purpose of his work as more so a mechanism of making the journalistic process less myopic, and perhaps providing a wider perspective that might not always be possible to achieve on the ground reporting; in essence, solving

an issue associated with journalism through tech, a frame of mind, or characteristic that is

being absorbed by journalism on an institutional level. P6 brought up the example of

location to demonstrate this mechanism, namely by way of pointing reporters on the

ground toward better locations in which to employ the newsgathering process.

P6's perspective is consistent with how data journalists in general perceive

"journalism differentially from traditional journalists," in the sense that they often look

"for numerical or categorical data rather than qualitative evidence" (Usher, 2016 p. 72).

This discursive process seems to be playing out in the sense that journalism doesn't

necessarily need to change, but is in need of adaptation which manifests as an absorption

of elements usually associated with the tech field. The line between change and

adaptation seems to express itself in the data as a need to employ tech skills as a way to

draw more accurate and impactful conclusions, and to leverage data as a means to

enhance journalism's storytelling capabilities.

For P4, his old "joke" for a long time was the he was "going to save journalism."

P4 said in the beginning of his career, the notion in the industry was that hackers, and

programmers were going to save journalism, and for a long time P4 remained incredulous

of this particular box he was placed in. However, now more advanced in his career, he

said, "I think that's what I'm trying to do." P4 went on to say that the goal he hopes to

realize through his work is "transparency", and "showing our work… as a method of

engaging with your audience."

P4 has dedicated a lot of his career to working on new ways for local journalism

to be successful, and while he mentioned several things that can be done, the one he feels

"certain" about is "transparency" in the sense that being transparent provides an audience

with not only "your methods, but your beliefs, you know, being able to express to your

public, to your audience, to the people your serving, what you believe, why you're doing

the work you're doing, how you do that work every day."

P4 said that this approach is about getting people on board "with your

organization's mission," but it's also "showing them that this is work, it doesn't just

happen in a vacuum." P4 made it clear that his ultimate goal of "saving" local journalism

through providing transparency does not include "saving" the "New York Times and

Washington Post," which establishes his professional goal as being firmly rooted in the

public interest given how important he believes local journalism is to preserving

democratic institutions.

P2 said his professional goal, or role in society, is linked to "political

accountability and corruption," however, he takes a more pessimistic stance on the state

of journalism as it currently exists, and more specifically as it pertains to the lack of

funding that is needed to implement some of the projects that he believes are necessary

for realizing the full potential of the public service component of journalism.

P3 said that in her work, she is "working towards like a positive civic purpose,

and a lot of times that overlaps with journalism, but it doesn't always." P3 said some of

the projects she works on are not intended for public consumption, but given their nature,

serve "a greater public purpose." P3 said that part of her team's work is "helping

government better serve people," by way of making government programs "and things

that are really intended to help people more accessible." P3 said she views the function of

journalism as "taking complex things and making them easier for regular people to

understand and act upon."

P8, who does not have an educational background in journalism, said that he got

into journalism as a means to facilitate the professional end goal that he has envisioned

for himself. P8 said, "I got into technology because I thought I could do things that had

some impact. It was just sort of like, it's just a tool and like a tool belt to get shit done or

like make the world a better place or like world, a more fair place." P8 added, "so what I

like about journalism, I think it gets like the end goal here. Like, it'd be nice to get

somebody sued or to get them to change some policies somewhere. Make someone's life

better or someone's life worse when it needs to be worse."

In other words, tech oriented individuals working in the journalism field see what

they do as foundational to the news production cycle in the sense that scraping, cleaning

and analyzing data to then be used as the raw materials upon which a story is built, has

become an essential step in what partially defines the discursive process underway that

ultimately will define the way journalism is done.

These so-called "outsider" sensibilities are changing journalism as an institution

given that the institution is absorbing and abiding these sensibilities, while at the same

time, tech oriented individuals are embracing the central institutional ethos as it relates to

journalism.

## The Importance of Data and Tech Skills to Journalism

The subsequent section was formulated based on a line of questioning designed to

answer RQ 4, which is focused on role conceptions of tech savvy individuals working in

journalism as related to the reporting process. The participants seem to all view the

ability to work with data and employ technical skills as essential to modern journalism

and to the understanding of contemporary society. P4 explicitly expressed this sentiment

when he said that in order to be a good reporter, "you need to be able to work with a

spreadsheet to understand our contemporary society." P4 went on to say, "shoe leather

reporting is wonderful, don't get me wrong, I love a good hunk of shoe leather. But like

to understand the world today, journalists need to be at least, you know, technologically

savvy."

This sense of how important data and tech skills are to journalism is expressed by

P3 as "kind of helping serve the business interests of that institution so that they can

continue to fund the work that they're doing." P3 specifically pointed out how her team

employed web-developing skills to design a "highly indexable" site for her organization,

which in turn drove up site traffic. P3 said that such outcomes are an example of how

"technological work" can "kind of help institutionally." This notion that "technological

work" can "kind of help institutionally" is a beautiful articulation of how tech savvy

journalists view the importance of their work. This notion of serving journalism through

tech is a theme that has emerged throughout the analysis, and it provides a glimpse into

the discursive nature of the process of institutionalization that tech and journalism are

currently experiencing.

Like P6 who views his work as facilitating a wider look at broader trends as a

means to "see if what our reporters on the ground are seeing actually lines up with the

whole reality", P8 characterizes one element of the role that tech plays as helping

reporters "identify which people, the reporters should reach out to," and thus helps to

focus traditional reporting tasks.

P3 provided what she characterized as a "hoity toity journalism answer" about the

importance of her work to the institution of journalism, that in an "era of like, pick your

own truth…that it is really vitally important… to like be able to present, not just like

anecdotes, but also evidence like broad evidence for statements" in order to help

"illustrate reality." P3 believes "data work can be a really powerful tool for doing that."

P3 added that data work "can also be done really badly… so it's also sort of a risk, but I

think that it's a really important thing to do and I see the work that we do as sort of

serving that purpose as well."

P2 views the purpose of his work as "essentially to start with public data and

make it into something that's usable." P2 said, "I'm trying to make sort of inaccessible

like hard to manage government data sort of easily manipulatable, downloadable,

searchable, that kind of thing." Like P4 who views "transparency" as essential to the

future of the industry, especially as it relates to local journalism, P2 said his team is

"trying to make the code open source," which while he admits a lot of the "code is crap",

it is important in the sense that "it is just sort of encouraging other folks."

P5 said his organization helps "make it easier for people to make charts" that

"they can publish with their stories" that help "them analyze and visualize their data." By

providing these tools, P5 said about his team that they "basically provide tools that makes

it easy for people to make charts", and by extension help journalist's job as it is

traditionally perceived within the context of the Western, institutional conception of

journalism.

Thus, in employing a line of questioning designed to answer RQ 4, the

aforementioned data was acquired, and shows that tech savvy journalists perceive their

role and the role of the work that they do, as firmly rooted within the Western conception

of journalism as an institution, however, they view themselves as a component of said

institutional order working in the service of journalism.

## Treating Data as a Source, Journalism Adopting Tech

The following also was elicited from a line of questioning designed to answer RQ

4, which considers role conceptions of tech savvy individuals working in journalism as

related to the reporting process.

P10, who makes it clear that she is a journalist before anything else, views the

process she employs as it relates to data reporting, namely writing code and computer

programming, the "same way as writing an article." P10 went on to explain that when she

writes a code in order to scrape data, she treats the data like she would treat "another

source. You know, except it's like that it's a data source. I'm using code to get it."

P8, whose background is in tech, also spoke about data as if data represented a

source like any other source. P8 said that at his organization, "sometimes the tasks are

purely technical" in the sense that there is "some math that has to get put together or

something like that," but that other times, he is tasked with pulling "insights" out of

datasets, or in other words, essentially interviewing the data as it is sometimes referred to.

P8 characterized these two elements, the former being "purely technical", and the latter

as the more "journalistic" "task", or component of what he does for his outlet.

Further, P3, who got her start as a traditional journalist, explained that:

"Journalism has sort of been forced into adopting tech, just like with the internet

and all that stuff… like it couldn't… journalism, like literally afford to be

anymore, so they need to get batter at it. And so I think there's like that push sort

of thing. But I also think like in terms of data journalism itself, like I think that

there's lots and lots and lots of data and more every day. And I think that's part of

why it's being adopted [tech] is because it's so accessible, for better or for worse,

you know, because there's a lot of examples of bad data work. But I think  those

are two reasons why like technical work is sort of being rolled into journalistic

work."

P10, who in addition to working with data also creates graphics for her

organization, said, "the way reporters approach writing, you know, communicating

something, like that is how I approach making interactive graphics, making something

tangible, you know, something clear because I'm communicating." P10 went on to

compare her contributions to journalism with those of "traditional reporters", in the sense

that she contributes "in ways that are just not the regular… I just use different tools. I do

the same thing. It's like, you know, get data that no one has ever gotten before. I just use

code to do it."

Therefore, there seems to be a sense that data work is both technical – in that data

must be retrieved and processed using computer programming and coding skills – and

journalistic – in that data is only useful if it can be mined for what P8 referred to as

"insights"; as if one were interviewing "another source" as P10 described it. P10, in

describing what she does as technically the same as what traditional reporters do, but by

way of employing different tools, she is essentially indicating that journalism as an

institution, is in effect, absorbing tech as it continues to adapt in the modern world.

P3, as mentioned above, was explicit about this absorption of tech into

journalism, and in her words, journalism is "adopting" tech as a kind of strategy for

survival. This process of "adopting" tech into journalism is part of the larger discursive

process of the institutionalization of tech with journalism, which appears to be happening

deferentially based on the perception that journalism must adapt accordingly within an

increasingly digital and data laden informational environment subject to dire economic

constraints.

## Organizational Level Themes

The following sections cover the organizational level themes identified in the data

collected, the analyses of which serve to provide a perspective on the institutionalization

of certain elements from the tech field from the organizational level.

## The Lonely Coders

When pursuing a line of questioning designed to answer RQ 1 and 2 concerning

role perceptions in relation to journalism as an institution as well as the distinctions that

exist between tech savvy and traditional journalists working in the field, a sense that

employing certain technical skills in the service of journalism can lead to a feeling of

loneliness or alienation.

P1, who identifies as a "journo-coder", but more specifically as a "journalist that

can code", expressed a sense of loneliness at his job as the only "journalist that can code"

in his organization, a commercial radio station. P1 said that "not everybody is on the

same page, when you speak about making online things," and that he wishes there were

more people in his newsroom like him "because I can only focus on one project." P8 also

expressed a desire for his organization to "hire more data reporters and tech people."

Therefore, the reason for P1's loneliness is both a sense of social isolation in the

workplace that comes with being the only individual with his particular skill set, but also

in the fact that other individuals in the newsroom typically lack any kind of technical

understanding concerning the skills, and the value of the skills, that he provides to his

organization. This is a sign that a discursive process is currently unfolding in the industry,

which is addressing who takes part in doing journalism, and what roles each element

plays. In this sense the institutionalization of tech and journalism remains in its early

stage, and only continues to grow more multifaceted and complex as these new

institutional roles begin to solidify and ultimately change the way journalism is done.

     While this nuance was most pronounced with P1, other participants also

expressed similar feelings related to loneliness and a systematic lack of understanding

from their non-technical colleagues. P3 experienced a sense of loneliness at an

organization she worked for in the past, "just by the nature of being the only person in my

office that is doing that kind of work… especially because I wasn't formally part of the

data team." P3 continued that she was "sort of in the middle" and would consult

newsroom clients, "but because I didn't really have that formal structure of like, I'm part

of this team, and like kind of the solidarity that comes with that, it was definitely like felt

a bit lonely."

     P5 expressed a sense of alienation when attending journalism conferences given

his lack of a formal journalistic background, and said that he felt like an outsider when

interacting with "cool investigative journalists." This sense of alienation seems to stem

from a lack of mutual understanding between tech savvy individuals and traditional

journalists in the field, which is occurring on an organizational level as certain elements

from the tech field continue to be absorbed and abided by journalism as an institution.

**A Lack of Understanding**

Another common theme in the data was that there seems to be a general

misunderstanding of the work that tech savvy individuals in newsrooms do on the part of

the editorial staff and organizational leadership. These responses that comprise the

majority of this section were elicited through questions designed to answer RQ 4, which

is concerned with role perceptions as they relate to the reporting process. P4 said that he

believes there is "a lack of understanding, especially in leadership," and that "product and

technology need to work really closely with the people who are making the content and

they should have shared goals." In other words, "collaboration" is a desired outcome on

the organizational level.

P4 went on to say that from his perspective newsrooms do a poor job at "thinking

about things like goals," given that the tech side and the editorial side of the newsroom

are "physically separated." P4 said there is "definitely room for much greater alignment,"

or in P3's words, "solidarity", and that there needs to be more energy dedicated to

making sure everyone in the newsroom can "consider themselves all teammates." P4 said

that for a lot of tech people, it can feel like as though they are simply "building the box

for the news to go into." P4 added that this dynamic is a disservice not only to the news

but also to the "box and to the audience."

While there appears to be a desire for more "solidarity" or sense of teamwork,

that does not necessarily require that tech savvy people in newsrooms be considered

journalists. For example, P7, who spends most of his time coding remotely for his

organization and who's background is in computer engineering, said it does not matter if

he is "considered a journalist" by his peers, but what is more important is to be

considered "a team… and that we all be recognized, and I think the cool thing is to all be

recognized in this work." P7 added, "whether they call us journalists or not, to me that

doesn't matter at all."

Alternatively, P8 who works on the technical element of special investigations at

his organization and who also comes from the tech field and does not have any formal

journalistic background, feels that getting bylines like his more traditional journalist peers

"feels good", and that when the tech people get bylines, "both sides of the team are

happier, and feel more "equal" based on their respective "input on a story."

Thus, the discursive process of defining who is and isn't a "journalist" is

expressing itself in the data as an element of institutionalization that lacks articulation,

and in some cases may seem trivial. While it is important for many tech people working

in the service of journalism to get the credit they deserve for their work, not all of them

are fixated on being labeled a "journalist" but are more interested in being part of the

same mission that defines what a "journalist" does. In other words, there is an emerging

sense and desire for collaboration between the tech and journalistic elements of the

newsroom.

Further, P1 said that "no one understands" him given that he is the only "journo-

coder" at his organization. P1 brought up the example of trying to explain to his co-

workers and editors that he needs time to work on a specific tech related issue, but given

the lack in understanding he said it is difficult to explain that he has "a book," and while

he doesn't "know how to solve it," he… "is focusing on it" and needs more time. In other

words, P1 is expressing that he requires more time to "tinker", a characteristic absorbed

from tech culture into journalism. P10 described that some of her co-workers see what

she does as "magic" and lack a fundamental understanding of the processes that she goes

through to produce results. P10 said:

> they don't understand the kind of work that goes into it. Because sometimes they
>
> only see the end results. So, it's hard to like explain the process of coding, and the
>
> process of like, designing things, the process of like what goes on when you like
>
> get a dataset.

Thus, this lack of understanding makes it difficult to establish parameters and

express personal needs as they relate to P1 and P10's work in their respective

organizations.

P1 explained that his work is sometimes the butt of newsroom jokes when his co-

workers catch a glimpse of his computer and compare it to the "Matrix", and ask, "what

the hell are you doing with that black screen?" P8 said he had similar experiences in the

newsroom, given that "for the most part," it gets most difficult for tech savvy people

when "reporters ask you to do really big things in a short amount of time because they

don't know how big the task is." P8 added, "and that's more about setting kind of clear

expectations about what you can and can't do." This is another sign of the discursive

interaction that is taking place in the field as tech and journalism institutionalize in the

sense that tech minded individuals require the same amount of autonomy that is afforded

to traditional journalists in order to execute their work, or in other words, "tinker".

In this sense, P8, in setting clear expectations, is facilitating an important channel

of communication with his non-tech savvy colleagues. This setting of parameters, or in

other words, the establishing of new institutional rules and practices, as well as this desire

for a better understanding, is part of another discursive process that is playing out; and as

tech skills become more commonplace in newsrooms, perhaps more non-tech savvy

journalists will be conversant with their tech savvy peers and vise versa.

P5 expressed a desire for others to understand what he is capable of in the

newsroom, and that despite many tech savvy people having a multitude of skills, they are

"fixing printers." P5 said that in his country, which is in Europe, many technically skilled

people are leaving the journalism industry because many times they are asked by others

in the newsroom to perform tasks like "fixing computers, or helping people to print their

stuff, and that's just not very convenient for people." Essentially, P5 believes that this

lack of understanding in the newsroom prevents many technically savvy individuals from

performing at their highest potential.

P8 said that "nine out of ten people" at his organization are "not technical" and

that he believes he was hired on as a means to change this paucity of technical skills in

the newsroom. P8 said that he has helped reporters do rather simple technical tasks "like

an advanced Google search," for example, and while he doesn't mind helping out his

non-technical colleagues, he believes that there is "low hanging fruit" that "I feel like

every reporter should know that isn't a programming task", and that this lack of

knowledge in certain kinds of "research techniques definitely hold people back."

Thus, in answering RQ 4 concerning how tech savvy people in newsrooms view

their role in relation to the reporting process; the data seems to show that institutional

friction stemming from a lack of mutual understanding between tech savvy and

traditional components of journalism continues to work themselves out.

Contrarily, P7, who works with his team remotely, was emphatic when describing

how he feels that his non-technical peers, despite not understanding what he does on a

technical level, value the skills that he brings. P7 said that "my journalist co-workers are

interested and happy by this side of the technology" and that some people on his team are

"super technology savvy". However, he also said this level of appreciation is dependent

on the specific project in question. P8 added that in his newsroom, "we're all on the same

team. You know, like I think everyone just wants to make more like hard hitting and

investigative work and they want to do some serious work. So, however they get there...

But so long as that's the direction we're moving in."

## Wearing Multiple Hats in the Newsroom

Another common theme that came up across the board was a sense that

technically skilled people in newsrooms are often forced by circumstance to perform a

multitude of different tasks, especially when those individuals come from a journalism

first background, meaning their formal education or early career development was in

journalism. This data was elicited from a line of questioning designed to answer RQ 2,

and 5, which are concerned with the distinctions between traditional journalists and their

tech savvy colleagues, as well as the professional practices and narrated performances

attributed to them and the compatibility with that of their traditional journalist peers.

Thus, given his status as a "journo-coder," P1 said he serves as a kind of

interlocutor in his newsroom between the editorial staff and the IT staff, who he said

typically don't understand journalists. However, while P1 said he can confidently call

himself a journalist, he is not yet confident in his coding skills to be able to call himself a

coder. This feeling of being in between in the sense that he "can think as a journalist, I

know how to write the code and I can write the code thinking as a journalist, you know,

and I can like be the bridge between both places," sometimes requires him to perform a

multitude of tasks in his newsroom.

Further, although P1 is relatively new to his organization, he is known as the

"data guy", and given his diverse array of skills, he said, "I always get a front seat on the

big stories because of that."

P4, who identifies himself as a "hacker-journalist", has an educational

background in both journalism and software development. P4 said, "I certainly wouldn't

say I identify as a reporter. I'm not a reporter. I haven't been one since my first internship

in journalism, but I've been an editor and now my work these days is more publishing.

But I still consider the work we do acts of journalism." During the interview, P4 used the

word "hats" to describe four things that he could potentially have to do on a given day.

The "hats" he described include, "design, product, audience," and "technology."

P4 went on to say that these four roles remain inseparable given that "you'd

design a product for your audience and build it with technology." In this sense, P4 seems

to be articulating, via a discursive process of defining new institutional roles, or "hats",

that define, and specify the emerging new way that journalism is now beginning to be

done. As these roles, or "hats" become more common and better defined within the

context of journalism, they will effectively become institutionalized roles, and thus alter

journalism and how it operates.

Additionally, P5 identifies professionally as an "engineer or developer working in

the context of journalism or data journalism," and currently works for an organization

that creates an open source tool used to create interactive charts. P5 said that he

previously worked in a non-profit newsroom, and that, "I basically moved from working

on newsroom tools in a newsroom toward just making newsroom tools outside the

newsroom." P5 also expressed this sense of having to perform several tasks while

working in the newsroom given his technical skills, "because we were a very small team,

like everyone had to wear multiple hats at all times." P5 is a good example of how

individuals from another institution, namely tech, can influence journalism from the

outside. While P5 doesn't view himself as a journalist in the traditional sense, he views

what he does as being in the service of journalism, and therefore he is motivated by the

same institutional goals.

P6, who works for a not-for-profit newsroom identifies professionally as a

"Journalist…programmer" and "data journalist" according to his Twitter bio, and used

the phrase "lots of hats" several times during the interview to express the multifaceted

nature of his work. Given his diverse technical skill set in conjunction with a clear-cut

educational background in journalism, P6 said that he tends to float between the tech side

and editorial sides of the newsroom. P6 said of his newsroom that, "most of the team

tends to specialize more in one or the other. I tend to wear both hats more often."

P2 identifies as a journalist who works on a freelance basis, but makes the bulk of

his income working as a "contractor" for news organizations building tools and

databases. Despite not publishing anything in a year, P2 said "I essentially sort of fund

my writing by doing tech stuff." P2 has experience working in a newsroom, and said,

"I've like sort of aged out of newsrooms by being competent at both programming and

editing." P2 said:

I actually played both roles and that's going to sound sort of funny, but like I'm

the person who explains the technology to the reporter types and I'm that person

that explains the reporting ethos to the technology types.

Given this dynamic, P2 said he thinks of himself "increasingly as an outsider"

given that he has not worked in a traditional newsroom for several years. P2 said that

given that he works as a contractor for newsrooms and is not actually in a newsroom, P2

feels that he has lost credibility in the news profession.

Thus, this section of the analysis is in response to RQs 2 and 5, which address

distinctions between traditional journalists and their tech savvy colleagues, as well as the

professional practices and narrated performances attributed to each cohort and how

compatible they are. The data seems to indicate that given how in demand tech skills are

in the field, many people who have such skills are often times performing multiple tasks

and sometimes are required to bridge knowledge gaps in newsrooms. The disconnect that

seems to exist in the field between technical and non-technical individuals also manifests

itself among more traditional journalists as a sense of being threatened by their tech

savvy peers.

## A Sense of Being Threatened

As mentioned in chapter 3, the difference between the institutionalization of the

fact-checking movement and the institutionalization of the tech field with journalism is

that while in both instances there is perhaps a sense of having one's power usurped, the

latter mostly stems from a sense of misunderstanding on the part of non-tech savvy

journalists. Thus, this section addresses RQ 5, which is concerned with the compatibility

of the professional practices and narrated performances between technical and non-

technical individuals in the journalism field.

For example, P3 said that she believes "some people would feel threatened," and

that for a lot of people, "it's usually more just like not understanding the value" of

technical skills on the part of non-technical individuals in newsrooms. P4 said that in his

experience he has faced "very suspicious people", and that in his organization, for

example, he has "facilitated sort of product thinking exercises," and this kind of role has

caused people to be "threatened by that." The reason for this sense of feeling threatened,

according to P4, is this feeling of shifting power dynamics in the newsroom, another

indication of the discursive institutional process playing out in the field.

P4 said that at one of his previous positions, "our graphics team was really treated

like a service desk," in the sense that others would solicit their services ad hoc instead of

"treating a graphics editor or reporter… as good as a normal reporter, a traditional

reporter." P6 expressed something similar in the sense that in his organization, the

technical component of the team is treated with a "sort of like a service mentality, where

it's like, I need some computer things done and like the computer guy will do it for me."

P4 continued explaining that from the perspective of the product team that he worked on,

others would come to them and were "used to just telling the team what to do", and that

when P4 eventually told them that they "can't actually tell us what to do", but that "we'll

work with you on it… people feel threatened by that."

P4 characterized this sense of feeling threatened as a feeling that "you've moved

their cheese, they've lost power, they've lost a sway in how things happen." P4 explained

that because of these power dynamic tensions, he has "made a number of enemies, in

newsrooms specifically, because I wasn't going to just do what they told me to do. I was

going to do what was right." Because of the way P4 asserted himself in the newsroom, he

said that while many people "got right on board", there were others who "were trying to

get me fired."

      Contrarily, P10 described her experience working on stories and projects as being

"in the process, like from the beginning," and that if there is "some overlap with some big

story, it's not like a graphic we slap on at the end, we come in like at the beginning or

middle and be like, okay, what can we build so that we can like, you know, really

illustrate the story because they have all this data and I want to like, you know, do

something with it." P10 went on to explain what she does as "not like a service desk,"

and not something that is simply slapped on at the end, when "they want a quick graph or

whatever." In P10's case, it seems as though, given her articulated allegiance to

journalism as being "at the top", she has found a happy medium in her organization

between the tech elements and the more traditional reporters that she works with on a

daily basis.

      More so, P8 also expressed that with his brief experience providing technical

skills in the service of journalism, "the more that the leadership values a technologist as

like, a person who can investigate things and like have good ideas for stories or like just

actually sort of value a tech person as opposed to like treating them like the 'code

Barista'", the better off the organization will be. In P8's case, he believes that there is a

give and take in the relationship in that for a sense of mutual understanding between

technical and non-technical elements of the newsroom to occur, both must work to

understand the role of the other.

Thus, in answering RQ 5, a distinction has emerged concerning the reaction that journalism as an institutional order is having in response to the influx of technically skilled people in the field; namely, a sense of fear that traditional journalists are having their power usurped by so-called institutional outsiders, when in reality this perception that these individuals are outsiders, is a result of a fundamental misunderstanding of what these individuals do.

## Answering the Research Questions

RQ 1 asked: How do technologists working in newsrooms, employing programming and developing skills, view themselves in relation to the Western hegemonic model of journalism? The main answer to this question is that many tech savvy individuals in the journalism field view their role as employing technical skills in the service of journalism and the public interest, and many explain that they are motivated by what they perceive as the traditional, institutional ethos of journalism.

RQ 2 asked: Where are the lines drawn between "journalist" and "strangers" in the industry? That is, who considers themselves as a technologist in the journalism field, and what vision do the technologists who consider themselves as journalists have of themselves? The chief answer to these questions is, first, that the line between "journalist" and "stranger" is based largely on how well a given individual is capable of communicating and functioning with either the technological or journalistic elements in their respective organization, or perhaps their ability to communicate and function around both. Secondly, those who consider themselves technologists in the journalism field varies tremendously on a case by case basis depending on educational or experiential background, and those individuals who consider themselves journalists, view themselves

as a kind of hybrid, tech savvy version of a journalist; for example, "journo-coder" or

"hacker-journalist"

RQ 3 asked: What specifically motivates technologists to apply their technical

skills to journalism? The main answer to this question is that technologists are largely

motivated by a desire to enable the act of doing journalism through employing

technological skills, and most view what they do as serving in the public interest. RQ 3

also asked: How, if at all, does this motivation change when considering individuals who

identify as both a technologist and a journalist? The answer to this question is that the

motivation does not change all that much, however, there were certain cases in which

technologists with limited or virtually no background in journalism seemed to be more

motivated by a desire to, for example, achieve success as it relates to a specific tech

related endeavor.

RQ 4 asked: How do technologists consider their role within journalism as related

to the reporting process? The chief answer to this question is that technologist see what

they do as providing the tools and means for journalists to engage and succeed in the

reporting process. RQ 4 also asked: How does this conception differ for technologists

who also identify as journalists? The answer to this question is that for technologists who

also identify as journalists, their involvement in the reporting process is an essential part

of how they consider their role in the process of ultimately doing journalism.

RQ 5 asked: What professional practices, and narrated performances can be

attributed to technologists working in the journalism field, and how compatible are they

with that of journalists? The main answer to this question is that technologist in the

journalism field tend to express a need for just as much autonomy as their traditional

counterparts for the purpose of tinkering as a means of solving the issues that they seek to

solve through the work they do for their respective organizations.

## Chapter 5: Conclusion

This analysis, which considers the institutionalization of the tech field with journalism through a theoretical lens of discursive institutionalism, provides evidence that the journalism field is currently going through a discursive process of absorbing certain characteristics associated with the tech field, specifically a collaborative "chatty" work culture which functions on an institutional level by providing transparency and collaboration between organizations; as well as a necessity to "tinker" in order to find solutions to certain issues  in the pursuit of finding innovative means of facilitating the news gathering process as well as presenting the news.

This discursive process between journalism and tech is leading to the manifestation of new institutional roles, and ultimately overhauling the way journalism is done, however, unlike the direct challenge to journalism's institutional role as the purveyors of fact posed by the international fact-checking movement, elements of the tech industry, though not seamlessly, are effectively being absorbed.

As this process unfolds, it will be important for journalism as a field, to incorporate and institutionalize the roles played by the variety of technically savvy individuals who are moving from the tech field into journalism, or individuals who began their career and education in journalism, but developed technical skills later on. For the latter, this articulation of their role in the newsroom and in the industry, is more pronounced and aligned with journalism's ultimate institutional goal of informing the public, which is consistent with how journalism is viewed within the Western hegemonic framework as described by Hanitzsch and Vos (2017).

The data collected and analyzed revealed that regardless of whether or not tech savvy individuals in journalism have a background in the field, they see the tech skills that they employ as being in the service of journalism, and most expressed a desire to contribute their skills in the public interest despite being able to easily find more lucrative positions in the tech field.

As was described above, nearly all of the participants, whether they had a formal educational background in journalism or not, saw the importance of their work as being inherently linked with the public interest, and most of them view themselves as components of journalism's institutional order. While individual conceptions differed from person to person, a sense of civic duty and the importance of the public interest defined the modus operandi of tech work in journalism across the board, indicating that elements of the tech industry as it relates to journalism are arguably institutionalized and in a sense, emerge as a new dimension of the industry's "superego" as it is described by Hanitzsch and Vos.

The data also reveals how integral the skills that these hybrid journalists and programmer-types bring to the field are, and the analysis exposes the presence of a lack of communication as to what these individuals have to contribute as well as the technicalities of what they do. Granted, this was not all across the board, and some of the participants expressed a sense of gratitude concerning the understanding coming from the editorial components of their organizations; a sign that parts of the journalism industry are adapting accordingly to emerging institutional roles.

Further, some participants expressed hostility on part of their non-technical peers in the sense that they feel their institutional power is being usurped by these so-called

"outsiders", as Holton and Belair-Gagnon (2018) refer to them, via an influx of non-traditional skill sets in the newsroom. However, the conclusion reached by this analysis is that these tech-savvy individuals in journalism are anything but outsiders given their absorption into the journalistic institutional order.

Another issue that was revealed in the data is a sense that while some journalists are learning how to engage in dialogue concerning the role and capabilities of their tech savvy peers, many people working in the field who came in with a programming background, lack a fundamental understanding of the reporting and storytelling process. Thus, both elements require an enhanced sense of mutual understanding, something that seems to be developing as the two fields, tech and journalism, continue the discursive process of institutionalization.

One of the primary conclusions derived from this analysis is that, based on the data, several of the participants expressed a belief that technical skills are essential for understanding the world to the necessary extent required to produce the kind of journalism required to preserve democratic institutions. By extension, data and technical skills are imperative for the survival of journalism, and while some of the data work can be "risky" or bad, it is essential if journalism is to continue functioning as the fourth estate.

Thus, the absorption of elements of the tech industry with journalism that is manifesting as a discursive process of institutionalization, continues to unfold as the institution ultimately abides these seismic changes in the industry, ultimately adapting to an online, data laden digital environment. Finally, once this process is takes its course, and the state of flux that the institution is currently experiencing is sustained, the way

journalism is done will be markedly different. This new way of doing journalism will be

characterized by the importance attributed to data and technical skills as a fundamental

component of how the news is sought out, analyzed and ultimately disseminated to the

public.

## Impact on Journalism

The impact of journalism's institutionalization with tech on the institution is more

adaptive than transformative. The post-digital disruption has created a difficult economic

situation for a field that is struggling to adapt to a data laden, and increasingly digital,

informational environment. Given these seismic changes in how news is gathered,

analyzed and consumed by an increasingly digitally inclined public, the profession has

found itself in dire need of absorbing elements from the technology field in order to

increase the reach and impact of journalism as a public service.

As more journalists enhance their tech skills and join their colleagues from the

tech world, the way journalism is done will continue to change, and these new roles will

eventually become new institutional norms. Coding and programming skills will continue

to increase in importance as the societal need for a more engaging, interactive, deeply

reported, and data heavy version of journalism will only grow. While traditional reporting

will continue to constitute the backbone of how journalism is done, the increasing

technical element will help guide the fourth estate into the next phase of its history as a

profession dedicated to providing transparency and facts in the public interest.

The main contribution of this analysis to the field of journalism studies is a more

complete understanding of how elements from the tech field are being institutionalized

with journalism, ultimately altering the way that news is sought out, analyzed and

disseminated to the public. While there are studies by scholars such as Holton and Belair-

Gagnon (2018) and Usher (2016), concerning elements of this specific cohort in the field

of journalism, this study in particular contributes to the field of journalism studies in the

sense that it reveals the institutional changes elicited by the discursive institutional

process unfolding between journalism and tech.

     Further, this study, by way of employing semi-structured in-depth interviews, was

successful in gauging the substance of this aforementioned institutionalization given its

focus on individual tech savvy people working in or on behalf of journalism. In the end,

this analysis contributed in expanding the scope of this branch of inquiry by including not

only individuals working in newsrooms, but also private contractors, as well as

individuals working remotely for media organizations or for external organizations that

employ technical skills as a means of developing tools in the service of journalism.

## Limitations

     One of the primary limitations of this study is the lack of a significant body of

scholarship dedicated to the subject of technically inclined individuals working in the

journalism field. Though media scholars are just starting to explore the role of so-called

"strangers in journalism," there is a lack of analyses on how different groups, such as

technologists and to an extent, fact-checkers, relate with one another within the broader

institution of journalism (Holton, Belair-Gagnon, 2018, p. 76). Given this paucity in

scholarship, in conjunction with the importance of tech to modern journalism, the topic

will require more attention as the institutionalization process continues to unfold, and

more of these fissures begin to seal, ultimately defining how journalism is done at this

point in the history of the fourth estate.

## Other Areas of Research

The original plan for this analysis was to focus on individuals dedicated to the

development of Automated Fact Checking technology (AFC). AFC research and

initiatives are primarily focused on certain overlapping objectives, which include,

spotting false or questionable claims circulated in the media or on the internet, the

authoritative verification of stories or claims that are in doubt, the facilitation of

verification by journalists and the public, and the capability to instantaneously deliver

corrections across different media platforms to audiences exposed to false information

(Funke, 2018).

An informant was identified for this project, who has worked on the development

of this kind of technology on behalf of Duke University's Reporter's Lab. The informant

made it clear that there are very few people in the world working on this particular

initiative, and that a Buenos Aires-based non-profit fact-checking organization called

Chequeado has become a global leader in the fight against fake news and misinformation

on the Web (Goujard, 2018). The head of Chequeado's AFC efforts, Pablo Fernandez,

believes that despite the steady advances in AFC technology, human gatekeeping will

remain an essential component of the fact-checking process for the foreseeable future

(Graves, 2018).

Thus, while this project was initially focused on this small cohort of technologists

working on AFC technology, it eventually changed into an analysis of technically

inclined individuals working in the journalism field or on behalf of the journalism field.

Therefore, more research is required concerning the individuals developing AFC

technology around the world, as well as the implications the technology has, or ultimately

will have, on journalism as an institution when and if the technology fulfills the

anticipated role of fact-checking questionable claims in real time.

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**Appendix A**

**Interview Guide for Coder/Programmer/Data Journalists & Newsroom**

**Developers**

**RQ 1:** Do you consider yourself a technologist or something similar? Probe: What does a

technologist do on a daily basis? Can you take me through a day in the life of a

technologist? Do you also consider yourself a journalist? What you do as at your

organization that directly related to what you do as a journalist? Probe: Do you see your

work as a technologist as contributing to the journalism industry? What is your dream

accomplishment/end goal as a technologist, and what role do you see yourself playing in

society? Do you see your work assisting a technological or journalistic role? Is that role

that you see yourself playing fulfilled by your work as a technologist? Probe: Why? If

they say no: What needs to be done for you to realize that role that you see yourself

playing? Do you feel that your work as a technologist challenges or supports journalism's

traditional role as being the purveyors of facts? What is it like in the workplace being

both a technologist and a journalist? Probe: What kind of role do you play in the

workplace? Is it different than the role played by your more journalistic peers? Can you

help me imagine what it's like to work as a technologist in the newsroom?

**RQ 2:** As a technologist, what is the purpose of the work and the skills you bring to

journalism? Probe: Many journalists are motivated by this idea that their role in society is

to hold the powerful accountable and to provide the facts to the public so that they are

better equipped for self governance, or in other words, in order to ensure a healthy

democracy. How do you feel about that? Is that something that motivates you in your

work? Probe: What motivates you in your work as a journalist? Is it a different

motivation? What is the overarching problem to be solved or goal to be reached as a

technologist/journalist? Can you think of any instances when you and your non-

technologist peers have had a discussion about these goals/hopes/desires?

Why is the work that you do as a technologist, or the technology that you develop in the

service of journalism, important to journalism? The technology that you develop and its

importance to the industry, do you think it is a reaction to a market demand? Or perhaps

more a reaction to an increase in misinformation and fake news as well as the influx of

information that needs to be verified? Do you view journalism as an institution? And if

so, do you see yourself as part of that institution? Alternate way to frame the question: In

your mind, what role does journalism play in society? Is this role important to you as a

technologist? How do you perceive journalism as an industry/institution? Why is it

important to society?

**RQ 3:** As a technologist, do you see yourself as an outsider or an insider relative to the

journalism industry/institution? Probe: How much of an insider/outsider do you see

yourself as? Probe: Could you tell me about a specific time you were made to feel this

way? Do your non-technologist colleagues elicit these feelings? Because you identify as a

journalist, how do you think that changes your role as a technologist, if it changes it at

all? Prompts: Does working as a technologist detract from your work as a journalist?

How do you feel around your non-technologists colleagues? Do they understand the

importance of what you do? Can you give me any specific examples? Do you perceive

that some of your non-technologist colleagues feel threatened by what you do? Do you

think that what you do as a technologist challenges the institution? Is (working as a

technologist/journalist) compatible as far as shared goals are concerned? Or as far as

what you hope the outcome of your work brings? As a technologist, what is your primary

motivation for the work that you do? Do you see the technology that you develop as tools

to make it easier for journalists to do their jobs and ultimately realize similar objectives

that you as a technologist in the service of journalism hope to accomplish?

Have there been any instances in which your non-technologist peers have acknowledged

the importance of what you do? What are some of the things that you do, or aspire to do,

as a technologist that reinforce your professional identity as a journalist?

**RQ 4:** As a technologist, do you see the role you and your work play in journalism as

being consistent with the role played by the journalists who utilize that technology to

produce the news?

Alternate way to ask the question: What would you say is the difference between the

people creating the tools (technologists) and the people using the tools (journalists)

Probe: Do you view any kind of distinction between the technologists who produce the

tools, and the reporters who go out and use it within the context of your outlet's

overarching goal? Given that, would you say your work and the role it plays differs from

the role of journalists and their work?  Do you believe technologists should be viewed as

journalists just like anybody else in the newsroom? If they feel they are not viewed as

journalists but think they should be viewed as such: How do you think being considered a

journalists in the newsroom would change the dynamics of the industry? As a

technologist, what, if anything, makes you feel professionally bound or connected to the

journalism industry/institution? Are there any specific examples you'd like to share?

**RQ 5:** Research question 5 was originally research question 4, and was focused on

understanding role conceptions as they relate to individual technologists working on the

development of Automated Fact Checking (AFC) technology. However, given that the

focus of this study shifted from specifically technologists working on AFC technology, to

technologically inclined individuals in general, the line of questioning designed to answer

RQ 5 was eliminated. Instead, RQ5 was altered to reflect the professional practices and

narrated performances attributed to technologists working in the journalism field in

general, and also, how compatible they are with that of traditional journalists. The

interview guide for RQ 5 is as follows: As a technologist, what is your primary

motivation for developing the products/tools that you develop? How do you identify the

importance of the products/tools you create in the service of journalism? What do you

perceive as your role and motivates you professionally? If you identify as a journalist,

does this role/motivation change? If it does change, how so?

## Table: Tech Savvy Individuals/Technologists in the Journalism Field Interviewed

| Participant | Background | Gender | Nationality | Type of Organization | Recruited from |
|---|---|---|---|---|---|
| P1 | Journalism | Male | Portuguese | Private commercial radio station | NICAR Listserv |
| P2 | Journalism | Male | American | Independent/consultant | NICAR Listserv |
| P3 | Journalism | Female | American | Independent/consultant | NICAR Listserv |
| P4 | Journalism | Male | American | Independent/consultant | NICAR Listserv |
| P5 | Computer science/media | Male | German | Software developer designing open source data visualization tool for newsrooms | Twitter |
| P6 | Journalism | Male | American | Non-for-profit news agency | NICAR Listserv |
| P7 | Computer engineering | Male | Spanish | Non-for-profit news agency | Snowball |
| P8 | Computer science | Male | American | Online media outlet | NICAR Listserv |
| P9 | Journalism | Male | American | Independent/consultant/freelancer | NICAR Listserv |
| P10 | Journalism | Female | American | News website | Twitter |