

Media-Tech Companies as Agents of Innovation: From Radical to Incremental Innovation in a Cluster

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Submitted: 31 July 2023 **Accepted:** 13 November 2023 **Published:** 29 February 2024

Issue: This article is part of the issue “Unpacking Innovation: Media and the Locus of Change” edited by Scott A. Eldridge II (University of Groningen), Frank Harbers (University of Groningen), and Sandra Banjac (University of Groningen), fully open access at <https://doi.org/10.17645/mac.i397>

Abstract

During recent decades new players, forms, and practices have been entering the journalism field, prompting a re-examination of journalism’s professional and organizational boundaries. Many scholars argue for expanding the scope of journalism studies beyond the newsrooms to encompass actors labelled as strangers, peripheral players, or interlopers. Those actors do not belong to traditional journalism but are becoming involved in the production of news, challenging journalism borders from the inside and out. Their influence has been growing and scholarship is increasingly mapping out these strangers and assessing their role in journalism innovation. In this article, we examine the role of one type of implicit interloper in journalism innovation: media-tech companies. We consider companies that provide video management and virtual reality services as implicit interlopers, due to their connection to journalism through the boundary object of news production and lack of claim over journalistic authority. We argue that media-tech companies have been under-researched based on a review of literature on innovation according to Holton and Belair-Gagnon’s (2018) typology of interlopers. Therefore, we examine what kind of innovation comes from the periphery of journalism, and the prerequisites for and the role of those innovations in the context of a specific cluster. We conducted a case study of Media City Bergen based on a thematic analysis of semi-structured elite interviews with executives of media-tech companies. Our findings show how media-tech companies bring innovation to production and distribution, content, and content consumption. Furthermore, they show how disruptiveness and the degree of innovations change with the maturation of the cluster.

Keywords

interloper; journalism boundaries; media cluster; media innovation; media-tech companies

1. Introduction

In recent decades, the media industry has gone through transitions in structures, consumers, and business models, while journalism is becoming highly diversified in terms of actors and practices. The research on innovation has grown significantly alongside and encompasses a variety of perspectives, actors, and factors that influence innovation (Belair-Gagnon & Steinke, 2020). However, researchers mainly examine news work, media organizations, and business models, while the role of interlopers in innovation has only recently gained attention. Interlopers, also labelled as strangers or peripheral players, are actors or practices that do not belong to traditional journalism but are increasingly getting involved in the production of news, challenging journalism's borders from inside and out, influencing workflows, professional norms, and values. Scholarship is starting to map out these strangers and assess their position and role in journalism (Hanusch & Löhmann, 2022) and its innovation. Using Holton and Belair-Gagnon's (2018) typology of interlopers (intralopers, explicit and implicit interlopers) we review the literature on peripheral players and journalism innovation and identify media-tech companies as an under-researched type of implicit interloper.

In this article, we consider media-tech companies as implicit interlopers which are connected to journalism through the boundary object of news production and are a source of professional transformation and tech innovation, without challenging journalism's authority. We focus on media-tech companies that provide cloud solutions for video management, enhancement of video production, visuals, 3D graphics, and similar. Such media-tech companies have a different role than companies specialized in web analytics, which have been studied as implicit interlopers by other scholars (see Belair-Gagnon & Holton, 2018). Therefore, we believe that our research contributes to recent scholarly endeavours to obtain a more nuanced understanding of what happens at the periphery of journalism. At the same time, media-tech companies are an important part of the innovation system, and a source of professional transformation. As they infuse new tech solutions and ideas into journalism, they challenge journalistic norms, emphasize new values, and influence professional jurisdiction. Therefore, we believe our research contributes to innovation literature as well, by bringing new insights into how innovation happens in journalism, and what kind of innovation media-tech companies induce in a clustered setting. Since the media-tech industry is growing quickly, in both strength and scope, with new players, ideas, and tech solutions constantly appearing, we contribute to keeping track of these developments as well.

The main research question we pose is how media-tech companies as implicit interlopers contribute to innovation in media and news work. We address this question by undertaking the case study of a media cluster, Media City Bergen (MCB), examining what kind of innovations media-tech companies bring, the prerequisites for and the role of those innovations in the context of a specific cluster. Empirically this study relies on thematic analysis of eight in-depth semi-structured interviews with executives of the media-tech companies that operate globally from MCB, Norway. Given the number of internationally relevant media that these companies work with, partnerships with tech giants, and the number of employees and offices they have, these interviews can be considered elite.

Our study identifies accidental innovation as a catalyst for tech solutions upon which several tech companies have been built, eventually evolving into a cluster. This chain of events was initiated by a group of developers employed by a broadcaster who have developed a close collaborative network characterized by trust and exchange between technologists and journalists. Initial accidental, disruptive, and radical

innovations were switched by sustaining an incremental innovation with cluster maturation. Nevertheless, media-tech companies continue to bring innovation in three main areas: the process of production and distribution, content, and content consumption.

2. Literature Review

2.1. *Expansion of Journalism Boundaries: Strangers, Peripheral Players, or Interlopers*

During recent decades journalism has been undergoing a deep restructuring. New players, forms, and practices have been entering the journalism field, prompting a re-examination of journalism's professional and organizational boundaries. Many scholars argue for expanding the scope of journalism studies beyond the newsrooms (i.e., Deuze & Witschge, 2018) to encompass citizen or blogger acts of journalism (Singer, 2005), as well as the production of startup (Carlson & Usher, 2016; Slot, 2021) and interloper media (Belair-Gagnon & Holton, 2018; Eldridge, 2014, 2019). Notions of boundaries and boundary work are crucial for understanding this new fluidity within journalism.

Professions employ different (boundary) strategies to claim authority and demarcate themselves from competitors and outsiders performing similar roles. According to Gieryn (1999), these strategies are expansion (new authority assimilation), expulsion (revoking authority to other agents in the field), and autonomy protection (retaining power against competitors). Compared to other professions, journalists have always had more problems in defending their boundaries, because they are challenged from within and outside of news organizations. In that respect, Fontoura (2023) argues that a comprehensive matrix for considering contemporary boundary work in journalism should complement Gieryn's (1999) categories with Carlson's (2015) differentiation between agents, practices, and professionalism.

Following that matrix, boundary work lies in practices such as entrepreneurial journalism, merging economic and business tasks (Coddington, 2015). Also, boundary work lies within intersections of technological actors and their practices, which are "both internal and external to an organization, considered not central to the production of news nor performed by traditional journalists" as Royal and Kiesow (2021, p. 1549) phrase it. Those boundary roles usually ensure the application of the newest technologies in news production, for example, analysis of big data and data visualization for news stories, use of AI for generating content in news videos, etc. The number of technology-based positions in media is growing, along with the number of outside companies which provide services to enhance news production. Examples of those boundary agents include consultancy company Hearken, specialized in helping media to engage their audience (Fontoura, 2023), and web analytics companies that "have a connection to journalism through the boundary object of news production and an interest in the success of journalism" (Belair-Gagnon & Holton, 2018, p. 496).

Holton and Belair-Gagnon (2018, p. 72) have used Simmel's (1950) metaphor of strangers to explain the position of these newcomers (tech-savvy actors and practices) in the journalism field. According to Simmel (1950), the label of strangers always carries a stigma, because a stranger is "fixed within a particular spatial group" in which his position "is determined by the fact that he has not belonged to it from the beginning" and "that he imports qualities into it which do not stem from the group itself" (p. 402). Relating this metaphor to the journalism field, Holton and Belair-Gagnon (2018, p. 72) underline that journalistic strangers involve both individuals and institutions of varying kinds, who bring new ideas and innovations

that disrupt journalism from the outside or within. To encourage scholars to examine these strangers in all variations of actors and roles in co-shaping innovation, Holton and Belair-Gagnon (2018, p. 71) introduce a categorization of strangers or interlopers following Eldridge (2014, 2019).

Eldridge (2014, p. 2) introduced the notion of interloper media in examining WikiLeaks as challenge to journalism primacy and legitimacy, and in difference to reparative discourses of internal faults such as phone hacking. In his later work, he described interloper media as “digitally native media and journalistic actors who originate from outside the boundaries of the traditional journalistic field, but whose work nevertheless reflects the socio-informative functions, identities, and roles of journalism” (Eldridge, 2019, p. 858). Following up on his work, Holton and Belair-Gagnon (2018, p. 75) distinguish between explicit and implicit interlopers and intralopers. Explicit interlopers, such as bloggers and citizen journalists, produce journalistic content outside of news organizations and they are usually neither recognized as journalists nor welcomed into the field. Implicit interlopers also come from outside of media organizations but advance content production, dissemination, or audience engagement with IT solutions, web analytics, etc. They contribute to journalism without challenging its authority. Therefore, they are accepted by journalists more than explicit interlopers. Intralopers are non-editorial workers who supplement and complement journalistic work from within news organizations. Usually, they are considered “distant strangers” in the newsroom “less...by proximity than they are by the work they perform in relation to news production” (Holton & Belair-Gagnon, 2018, p. 75).

In a more recent effort to establish a comprehensive framework “for identifying, classifying and comparing different types of peripheral actors in the journalistic field,” Hanusch and Löhmann (2022, p. 7) abstracted 10 main components of peripherality from the literature (values, experience, belongingness, professionalism, competencies, formats, transformativity, autonomy, audience-centricity, and organization). They further grouped components into three dimensions—identities, practices, and structures—completing a framework that could lead “to a more nuanced understanding of what happens on the periphery of journalism” (Hanusch & Löhmann, 2022, p. 7).

We undertake this research to contribute to a more nuanced understanding of how innovation is brought into journalism by the peripheral actors. We focus on the type of actors that, to the best of our knowledge, have not received much research attention so far—technological companies that provide diversified tech solutions for easier, faster, more efficient news production and enhancing media content from outside of media organizations. We use the label “media-tech companies” to make a distinction from most similar interlopers that have been addressed by other researchers—companies that provide web analytics (Belair-Gagnon & Holton, 2018) and engagement consultancy (Fontoura, 2023). The similarity lies within the relation to journalism, which is neatly captured by Belair-Gagnon and Holton (2018, p. 5): “These companies have limited their encroachment on journalism by not claiming to be journalists, rather casting themselves as an aid and non-antagonistic to journalism.”

We proceed with a literature review on media innovation structured according to Belair-Gagnon and Holton’s (2018) classification of interlopers to show that media-tech companies (as implicit interlopers) have not received enough research attention in all its variety.

2.2. Previous Research on Interlopers as Agents of Media Innovation

Besides peripherality in journalism, recent challenges in the media industry have spurred academic interest in innovation as well. As a systematic journalism literature review of news innovation research from 1990 to 2018 highlights, interest in innovation has increased “dramatically” during this period, accelerating after 2000 and especially since 2015 (Belair-Gagnon & Steinke, 2020, p. 1731). This valuable study also showed that journalism scholars have employed different theories and concepts, including gatekeeping theory, diffusion of innovations, convergence, professionalization, and role conceptions, among others, to explore the dynamics, actors, factors, and interactions involved in the process of innovations (Belair-Gagnon & Steinke, 2020). In the neighbouring disciplines—media economics and media management—there is similar growth in research interest and scope. According to Dogruel’s (2015, p. 154) literature review, media economics researchers usually use micro- and meso-level perspectives to understand product (new media titles, formats, services) and process (new communication technologies) innovation, as well as corresponding organizational restructuring. While García-Avilés (2021) identifies technology, management, organization, commercialization, and narrative as primary areas of media innovation research, in the most recent and broadest literature overview.

All authors of these overviews agree that most of the innovation research in journalism and media studies is centred around traditional actors, and examines news work, media organizations, and business models, while the role of peripheral players remains on the margins. Furthermore, we argue that many studies have examined peripheral players as a source of innovation without labelling or considering them as interlopers, or specific types of interlopers. In what follows, we review the literature on innovation and identify which type of interlopers were studied previously (with or without reference to interlopers) according to Holton and Belair-Gagnon’s (2018, p. 75) differentiation (between explicit and implicit interlopers and intralopers), as we understand it. Since types of interlopers are partly defined by identity marks, some might disagree with our categorization of some actors. However, strict categorization of interlopers is not of the utmost importance for the main argument of this article.

Among the actors that we consider explicit interlopers, scholars have studied bloggers and citizen journalists as trendsetters in online content production. Singer (2005) described how journalists monitored the successes and failures of bloggers and experimented with their style of writing and content delivery accordingly. Initially, authors aligned in praising blogs for introducing new ways of producing, disseminating, and analysing news (Singer, 2005) but later studies voiced scepticism about the potential of blogs for innovation (Mitchelstein et al., 2017). Nevertheless, the influence of bloggers and citizen journalists in shifting the boundaries of traditional journalism has been investigated. From the perspective of innovative business models, start-ups, and news entrepreneurs were examined as agents of innovation. The lessons the traditional media should take from entrepreneurs are on how to develop successful reader membership schemes and promote synergies that underline the added value of collaboration (Zhang, 2019). Researchers explored start-ups as “role-models” for established media around how to adapt to market challenges and to be more “in tune with the needs of the public (Carlson & Usher, 2016; Slot, 2021).

The innovative potential of implicit interlopers has also been assessed. For example, innovation labs within most advanced news organizations have been explored as sites of experimentation with content, products, genres, tools, and boosters of technological, editorial and/or commercial innovations (Zayani, 2021). Lewis

and Usher (2016) examined processes of communication, exchange, and work production at the intersection between journalism and computer programming, based on a case study of an online Learning Lab aimed at journalism innovation through open-source software. Boyles (2020) undertook exploratory research of journalism hackathons as laboratories for developing news and showed how hackers and journalists collaborate with individuals located outside of news organizations, “facilitating an external and collaborative space for both product innovation and civic conversation within communities” (Boyles, 2020, p. 1339). Belair-Gagnon and Holton (2018, p. 492) focused on web analytics companies and examined how managers of those companies “understand and position their work in relation to news production as a boundary object.” Fontoura (2023, p. 1533) shows how consultant company Hearken changes the conceptualization of daily work, by performing tasks related to those carried out in newsrooms, such as developing audience engagement plans.

Media scholars have also studied innovation brought about by actors that we understand to be intralopers—actors working in media organizations in non-traditional roles (product managers, programmers, experience designers, data analysts, engagement managers). Nielsen (2012, p. 959) analysed processes of technological innovation in two Danish newspaper companies that integrated blogs into their websites, by examining how three different communities—journalists, managers, and technologists—were involved in the development process. This “community of technologists” has dramatically gained importance since Nielsen’s research, because news organizations increasingly hire staff with computational skills to perform tasks that journalists are not skilled at. According to Wu et al. (2019) the extent of the pressure that the technological field has on the journalistic field is yet to be seen. A few years ago, technological firms were inclined toward co-development of ideas and innovations, not acting as active agents in the journalistic field. However, they predicted more technologists would enter newsrooms as more organizations set up digital teams in-house. Technologists’ skillset enables them to climb up the organizational ladder fast and take dominance in the field (Wu et al., 2019, p. 1253). Royal and Kiesow (2021) investigated product managers as intralopers, showing that they feel less influential than people with more traditional business or editorial functions. Also, this study highlighted a discrepancy between technological and journalistic approaches to change, with technology valuing innovation and journalism valuing consistency (Royal & Kiesow, 2021, p. 1561). Lischka et al. (2023, p. 1) examined editorial technologists as an emerging professional group and showed how “they critically reflect on their roles and strive to augment their agency in the field through normalizing their computational skills and accumulating social capital” to bring innovation in journalism.

As this literature overview shows, scholars have addressed the role of different interlopers in shaping innovations, but media-tech companies specialized in video management, video enhancement, visuals, and similar have rarely been the focus of research. Therefore, we aim to contribute knowledge about the role of implicit interlopers in journalism by examining the following research question (RQ): In what aspect of journalism do media-tech companies operating from the Norwegian media cluster bring about innovation?

We will answer the question in the following two dimensions: (a) disruptive-sustainable and (b) radical-incremental. In considering the first dimension we draw upon Bakker (2013, p. 162), who distinguished between sustainable and disruptive innovation, where the former aims to improve existing products and the latter aims to develop new products that can disrupt the market. Under degree of innovation, we differentiate incremental innovation as a gradual improvement from radical sudden changes (Bakker, 2013, p. 163). The dimensions of innovation will be discussed in the context of maturity of

the cluster. Our assumption is that innovation tends to become less disruptive and radical as clusters are institutionalized.

We organize the discussion of our findings according to Bleyen et al. (2014, p. 35) classification, which includes:

- 1) A production and distribution innovation (a new means of creating, producing, reproducing, distributing or showing content);
- 2) a consumption and media innovation (a new way of consuming content);
- 3) a content innovation in the core (a theme or message) and in the form (a new stylistic feature); and
- 4) a business model innovation (a new business model, including the reorganization of an industrial sector).

3. Method

To answer the outlined research question, we conduct a case study of MCB in Norway, considering media clusters as environments that allow for examining the interplay between media and media-tech companies in a “natural” setting.

Research on industry clusters in general and media clusters in particular finds that there are both internal and external drivers in cluster formation and growth (Komorowski & Fodor, 2020): urbanization economies, localization economies, agglomeration economies, and perception economies. In the context of MCB, the concept of “agglomeration economies” is particularly relevant, meaning closeness to similar businesses as well as competitors. Furthermore, arenas for collaboration, exchange of ideas and “knowledge spillovers” are important dimensions of a successful media cluster. Media clusters are different, depending on the composition of media companies in the cluster. Even though MCB was formally established in 2010 and co-located in one city centre building in 2017, the cluster has a history dating back to 1992. This was the year of the opening of a second national broadcaster in Norway. Based on competition between several consortiums, the Norwegian Parliament decided to locate the new broadcaster in Bergen, the country’s second-largest city. TV2, as the channel was branded, became an engine for the audio-visual sector in the region and for technological innovations in the area of broadcasting. MCB has similarities with the media cluster type Komorowski (2017) labels as “the giant anchor.” However, even though TV2 is the largest media company and was the driving force behind the cluster formation (co-location), the cluster currently has large members from regional news media, the national public service broadcaster NRK, University of Bergen, and international software companies like Vizrt and IBM. Thus, the cluster could also be classified as a “specialized area” (Komorowski, 2017), as it consists of approximately 100 companies in the urban area of Bergen, specializing in media production and media technology, sharing a pool of highly skilled manpower and combined collaboration and competitive relationships and the informal circulation of knowledge.

To approach the RQ we first identified influential media-tech companies in the cluster. As we will see in the empirical analysis, the media technology industry in the current cluster formation is to a large extent spun off from TV2. TV2 is the largest player in the MCB-cluster, very much driving the process of co-locating the media industry in the region, together with the regional University and the largest technology spin-off from TV2. We established contact with the CEO of that company with the help of the CEO of MCB. Furthermore, the CEO of MCB had additional suggestions about what companies to include in the research, after we explained

our goals. We established contacts with selected companies through her, asking their CEOs for interviews. The response rate was excellent, and only two companies did not respond.

The first author of this article conducted interviews with eight CEOs in March, April, and May 2021, during the Covid-19 pandemic. Therefore, all interviews were done online using software for online meetings. Interviews lasted from 45 to 90 minutes, and the conversation was in English. We have anonymized all interviews because some of these individuals wanted to remain confidential. We refer to them and quote their words using a code constructed simply by using the letters MT to refer to the executives of the media-tech companies and a number to point to the exact respondent—MT1, MT2, etc.

We consider our interviews as elite because selected MTs represent a small group of businesses who currently dominate the market of tech providers for broadcasters. Media-tech companies included in this study work with some of the most recognizable media globally, i.e., BBC, CNN, ESPN, FOX, US Today, and Al Arabiya. Also, the list of their partnerships includes tech giants such as Adobe, Amazon Web Services, Apple, and Microsoft Azure. The companies collectively employ more than 700 people in over 26 offices worldwide. Companies are owned by actors such as a private equity firm that has raised 17 billion euros in capital since its inception.

Given that media-tech companies have rarely been researched, we employed semi-structured interviews to help reveal how these CEOs see their position in the media industry, how they describe their role in relation to journalism, what kind of innovation they bring, and how they started as tech companies. Semi-structured interviews have a reflexive format, and we followed up on respondents' answers, raising questions in correspondence with the flow of conversation, rather than holding strictly to the interview guide. The guide included explanations and questions:

It seems that the boundaries of media work are expanding with media-tech companies getting a stronger foothold on the market. What is the role of your company in the media industry? What do you provide for media and how do media use your products/services to make journalism better?

Interviewers varied these questions depending on the conversation:

How do you work with news organizations to implement change? How are products developed for journalism? How do you see the role of your company in providing better news or service to society? Do you think your services are influencing the role of media in society?

The respondents were also asked to reflect on their career paths and the history of their company.

Once we collected and transcribed the interviews, we used NVivo software for qualitative content analysis to code, group, and further analyse respondents' statements. Initial coding was aimed at identifying statements that fell under predefined types of innovation. To understand in more depth the technical innovations our respondents talked about, we additionally cross-checked interview data in the available technical documentation of the various services that media-tech companies provide. Once statements were grouped, we merged co-occurring themes under which we presented our findings to showcase how disruptiveness and the degree of innovations change with the development of the cluster.

4. Research Findings

4.1. *Accidental Disruptive, Radical, Cross-Sectional Innovation*

The history of innovation in the context of MCB illustrates how innovation can be accidental and brought about by intraloper programmers employed in the media, not specifically with the intention of creating innovation but out of a desperate need for personnel. Disruptive, radical innovation started when an emerging broadcaster could not find qualified people for the newsroom, ending up employing software developers instead. As our respondent reflected on the beginning of his career, “Few people with experience in traditional broadcasting were available for hiring, so I ended up in the newsroom” (MT8).

Therefore, the case of MCB shows how innovations can begin accidentally and circumstantially. Additionally, innovations were accidentally disruptive. To explain the initial spark of innovation, our respondent needed to describe the state of the art in the journalism field at that time. His words resonate with the notion of isomorphism Boczkowski and de Santos (2007) introduced to refer to the process of homogenization of content across different media platforms, due to factors including the use of similar technologies and tools for content production, and the journalistic practices around them. Although our respondent (MT8) does not express this in so many words, his sentences clearly point to mimicry and rigidity in the media industry:

All the broadcasters in the world were extremely alike. What one broadcaster did in Asia was the same as one did in the US and in Europe. It’s incestuous because they didn’t look much beyond their own little universe of things. So, their solutions were very predictable and evolutionary. Everybody was doing the same.

In more concrete reference to journalistic practice, MT8 talks about his shocking discovery of “where these broadcasters were in terms of treating information on the technology side.” To illustrate he stresses how much time it took to get a map on the news broadcast back then. The way he describes the innovation that he and his fellow programmers introduced for creating maps, echoes journalistic doxa about the timeliness of news, and the relevance of breaking news:

The map is what you need first in breaking news, so I was struck by the mismatch between what you need and how long time it takes, and the first thing we did was to create a map system so they could create maps automatically. (MT8)

This also indicates how important the intraloper position was in the newsroom: It enabled them to bridge very distinct universes—journalistic and technological. As MT8 remarked, “The technical department and the editorial departments used to be so segmented that the work processes in the editorial part were not clear to the technical department.” Similarly, another programmer, MT6, succeeded in capitalizing on his innovative tool only after acknowledging how useful it could be for journalistic work, when he started working with media companies on a solution for searching media archives.

Regarding the distinction between incremental and radical innovation, the words of MT8 clearly indicate that solutions such as automation of making maps were radical. MT8 used the attribute “revolutionary” when he talked about the achievements of programmers, while he described changes that the media

industry implemented as “evolutionary”: “Since we didn’t have a background in the broadcast industry, we couldn’t know that what we did was seen as quite revolutionary from the outside...we just applied the normal IT-based techniques” (MT8).

This quote brings us back to the most important condition that enabled these radical and disruptive innovations—the intraloper positioning of programmers in the newsroom. This is highlighted in the words: “Although I’m from the technology side, I was hired in the news department, and that was very important” (MT8). It was important because he was able to apply his technological way of thinking and logic to the journalistic field: “I worked in-between journalist and technologist within the news channel, so the crossover made it relatively easy to be innovative.” This quote highlights interlopers as in-betweeners with one foot in journalism and the other in programming. Also, it echoes previous findings about intralopers as agents of innovation.

This case also shows how mimicry can work both ways, against and in favour of the diffusion of innovation:

So very quickly other broadcasters from around the world came to see what our TV station was doing. They were very impressed with what we did with software and wanted to buy this stuff. After some years, it didn’t make sense to run this from within the news department, and we started our own company. (MT8)

Similarly, one solution—a video management system built on cloud technology—outgrew the scope of the broadcaster. A different group of programmers created over-the-top (OTT) or a streaming service based on video management, but this was more through incremental innovation. As MT1 elaborates:

The driving idea was basically that we had been developing a lot of technology and we’ve done a lot of trial and errors and gained experience from building what we believe was the first OTT service in the world. Then we started our company. Of course, having seen other companies spinning out of a broadcaster, and making success outside Norway was an inspiration.

We argue that when initial intralopers distanced themselves from the journalistic field by establishing their own companies, the character of innovation they were able to generate was modified towards sustaining and incremental innovations. Nevertheless, media-tech companies bring innovation in three out of four aspects of journalism according to Bleyen et al. (2014) classification, as we demonstrate in Section 4.2.

4.2. Incremental, Sustainable Innovation in Production and Distribution

Several companies established by the extended group of programmers initially employed in the broadcaster have brought innovations to production and distribution, such as innovation in visualizations, video management, automation of live production, and sports analytics. They have also been upgrading broadcasting (distribution), through the development of streaming services.

Innovation in visualizations includes all graphics, from nameplates to the most advanced 3D visualizations displayed on the television screen. One of the tech companies provides a process tool for media to create visuals, basically a large set of templates from which journalists select the appropriate template for their

story and then fill in the content: “If they are working on nine o’clock news, they find a template set for that. Of course, content is isolated from expression, so anyone can use it in their own way” (MT8).

Another product innovation is related to video management—creating a system for storing, archiving, preserving, and finding videos. Stored content is tagged with metadata manually or automatically to make content easily searchable. AI is employed in those systems to enrich metadata, or to create suggestions for editing a video story. In explaining how companies use AI developed by tech giants, our respondents echo previous findings about collaboration as an important part of the tech doxa that supports innovation. On the other hand, the words of programmers also correspond with journalistic doxa. News timeliness was mentioned once more as the driving force behind the solution for cloud video editing. Innovation was aimed at accelerating work, enabling journalists to record a video, upload it into the cloud, edit it quickly, and then distribute it using social media in the first instance. MT4 explains:

There are other ways to use that tool, but in these times of high-velocity content, it’s very important for news organizations to get content out and to create that kind of buzz around the story in a very short time.

These words demonstrate a deep understanding of the production process and at the same time put weight on the “Silicon Valley ethos consisting of (1) a focus on the needs of audiences, (2) a desire to provide widespread access to data, and (3) the drive to create easy-to-consume products,” according to Wu et al. (2019, p. 14).

The third innovation is the automation of live content production—doing every task that is known upfront before the live show. In the words of MT8:

So if you are covering a sports event, you know possible outcomes. Take a football game. There are yellow cards, red cards, and goals, I mean, it’s a very limited set of possibilities that can happen. So, you set those predefined possibilities in the system.

In such a way, automation significantly reduces the number of people that need to be involved in production, the amount of work, and enhances the quality of the product.

Fourth, media-tech companies have created innovation through sports analytics, providing tools for making analytics of games and goals, assisting in recognizing the players, drawing a live path for the ball, players’ movements and more. These systems include tools to insert ads, sponsorships, or commercials onto the field in the process of production. AI is crucial for identifying and tracking players on the field and replacing billboards in the arenas. This system is somewhat related to the business model because it enables the media to replace commercials and sell different commercials in different countries.

The fifth production innovation was started by the developer who was involved in an attempt at “categorizing the web” when the internet was growing. According to him, this venture was far ahead of its time:

When the internet was growing, we realized a need for information retrieval. At the time, everyone said it was impossible to make money from search engines. But we thought the content was growing exponentially and we needed ways to access this information, so we built the search engine and

text analytics tools to see connections between documents. And this proved very useful with publishers. (MT6)

Our respondent additionally explained that his media-tech company provides real-time analytics of what people in the country are reading. Basically, they collect all the news published in one country, check those articles on social media, and show which are most shared:

Journalists use it to pick up stories. They see what stories are popular elsewhere and republish that or see what's trending within local news and make national news. Other media use it to see how they are doing over time, compare themselves to competitors, or to stay on top of the current events. (MT6)

All these production innovations were clearly described as the outcome of previous tech solutions. Also, our respondents mentioned the building blocks of these innovations, discussed how innovations proceeded from previous examples, and stressed continuing progress, so we consider them sustainable and incremental innovations.

The main innovation in distribution was already mentioned as maturation of the radical tech solutions accidentally initiated by a broadcaster—a service that allows content owners to stream to end users. The media-tech company that developed this streaming service continued with fine-tuning its product, to overtake the competition: “We differ in our offering with a curation tool which allows a human touch on top of AI-based recommendations. So, editors can go in and filter the AI and give it parameters” (MT1). Besides underlining the sustainable and incremental traits of distribution innovation our respondent also highlights how their customers use the tool in innovative ways: “I know several of our customers are using the data to predict who is most likely to leave the platform, to see what they can do to prevent that” (MT1). This way of using the tool gives us reason to echo scholarly concerns about the discrepancy between tech and traditional journalistic understandings of audience needs: Technologists tend to push journalists to accommodate audience needs seen through analytics, while journalistic practice is traditionally pulled by an idealized image of audience needs.

4.3. Incremental, Sustainable Innovation in Consumption and Content Innovation

Consumption innovation was discussed by one of our respondents as a development that began when one of his internationally relevant news providers decided to go beyond their accustomed B2B (business to business) model to start catering to consumers directly. In the words of MT1, their client “decided to create a news production that could mimic a studio production. This is like nine o'clock news, but always up-to-date, always there when you click, and always personalized” (MT1). This required several levels of personalization to be integrated into the existing system. The first level allowed every user to obtain a personalized selection of stories based on their previous consumption. In the second level, users were able to set the duration of viewing: “If you want to dig deep, you can dig deep and have a lengthy news programme or you can go short and just have a five-minute brief” (MT1). Developers consider personalization as empowerment of users: “System is driven by the consumers. So, if they don't like a certain type of news story, they can swipe it away. And the system would learn about the user behaviour and then target news to them” (MT4). During the interview, MT4 aligned first with techno-optimists who argue that personalization enhances people's news autonomy and fosters more diverse news choices among others (Heitz et al., 2022). However, when asked to assess if

and how media-tech companies assist media in serving the public, he explicitly mentioned the risks of users ending up in “rabbit holes.” His initial stance was relativized when he was posed a question that required him to put on his journalistic hat—Then he aligned with scholars criticizing social media algorithms for causing citizens’ disengagement from the political process and polarization of the public sphere (Sunstein, 2018).

Another CEO started their company because of his personal experience as a user. He was missing bonus material on streaming services, as he puts it. He used to search for additional information about the actors, situations, or places all the time while watching various content. So, he decided to develop a solution to add information he would usually look for, on top of streamed content. He describes the innovation they bring to the streaming services as “access to a library,” equipped to help users with questions like, “I’ve seen this woman before, what is her name?” In a nutshell, this company develops “an overlay that pops up on the screen,” containing various information, such as “GPS coordinates of a beach, information about the song playing in the background, the clothes people on screen are wearing” (MT5). This can also be considered in part a business model innovation since it opens doors for product placement and similar marketing possibilities—opportunities to partner with Booking.com, for example. When a place is shown on screen, information about hotels can be relevant. Similarly, scenes from a Christmas movie could be overlaid with information from a shopping website (MT5).

The second content innovation comes from a media-tech company engaged in transforming broadcasting from physical into virtual reality:

Everything you see in some of the news channels that we are working on now is virtual. Soon, the only physical part on TV will be the human telling the story in front of a green screen or LED screen-based environment. (MT7)

Basically, they simulate the surroundings of a person, although technology allows them to simulate a person as well. Our respondent is aware of the ethical implications of this technology, but he believes the progress will continue and soon we will be telling stories in a different way despite the possibilities for misuse. During the pandemic they simulated a meeting between officials of two countries in a virtual setting: “We were able to create a room where they could sit and speak as if they were in the same room” (MT7). In his opinion, that was a groundbreaking event, not only on a technological level, but also on a societal level, because leaders of the world can be in the same room and discuss important issues without leaving their physical location. Although these words might indicate the disruptiveness of innovation, we argue that sustained innovations in virtual reality coming from the gaming and film industry have led to incremental enhancement of broadcasting studios.

5. Discussion and Conclusion

Adding to the previous research that started to unpack the highly relevant role of different types of interlopers in media innovation, our study offers a dimensional portrayal of the innovative role of media-tech companies in three aspects of media work: production and distribution, content, and content consumption. We also examine the degree and sustainability of innovation and showcase how accidental changes can have longstanding effects. Our case study reveals innovations beginning from the boundaries of a new broadcaster as disruptive and radical innovations but due to accidental circumstances—a group of

developers starting to work in the editorial department of the broadcaster. Importantly, the developers were hired out of desperation, as broadcast technicians were in short supply in the regional workforce. Our research documents the value of these outsiders' views on existing practices in media production in relation to the initial innovation. Applying computer science skills to existing practices—highly mechanical and physical—led to new solutions, that were more cost-effective and creative both technically and content-wise. New solutions were not only welcomed by the management of the new broadcaster but encouraged. They facilitated a culture of innovation, founded upon a close collaboration between journalists and technologists with backgrounds in computer science.

Based on the technological solutions of this group, several media-tech companies were built along with the media cluster in which they operate today. Initial innovations of this group were enabled by several factors: the crossover between media and technology; the characteristics of the broadcaster; and the culture of experimentation, collaboration, and trust that was created. Such culture continued in resulting ventures (media-tech companies established by that group of intralopers) and expanded into the media cluster. Within the dynamics of the media cluster, media-tech companies continue to bring innovation but in a sustained and incremental fashion. Even though the cluster today is institutionalized and creative processes are formalized, the cluster has preserved a vibrant culture of collaboration and knowledge sharing between technologists and journalists. This collaboration is still vital for innovation in the three areas of media work, but as the companies and the cluster develop the importance of international partnership for the technology companies is increasing, and there are tendencies to staff in-house technology departments in the media companies.

In the context of previous research that approached innovation as an internal or external incentive (Zayani, 2021), our study outlines the interplay between internal and external sources of innovation and suggests that future research should go beyond discussing various start-ups and labs as “examples of good practice” and innovation only in the dissemination phase. Although the identification of factors that contribute to resistance or embracing of novel technologies in the newsroom is highly valuable for understanding innovation, we believe that the success story of one accidental crossover highlights that we need more knowledge of accidental innovation. Such innovation might be more widespread than we realise, more potent for disruptive innovation, and potentially more valuable in times of scarcity in the media industry.

All conclusions we draw must be taken with respect to the scope of this study. It is a single case study with a meso-level approach. Media clusters, as Komorowski (2017) and Komorowski and Fodor (2020) have documented, are different in composition and have various regional and national prerequisites. MCB is unique, and the historical and industrial specificity of the cluster must be recognized, as we have underlined in this study. However, the companies that were included in this research work with very influential media organizations from around the world, they operate in a competitive and innovation-driven environment of a media cluster and on the media market which could be representative of the highly developed and financially stable markets. Nevertheless, we believe that comparison with other clusters or media-tech companies in different markets and settings could bring important insights in the future.

Acknowledgments

This article is based on the research that was conducted during the first author's postdoctoral research position at the Department of Information Science and Media Studies, University of Bergen. This research was affiliated with the SFI MediaFutures partners and the Research Council of Norway (grant number 309339).

Funding

This article is part of a project that has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement number 895273.

Conflict of Interests

The authors declare no conflict of interest.

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