FROM JOURNALIST TO CODER:

THE RISE OF JOURNALIST-PROGRAMMERS

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ANALYSIS

As the newspaper industry started to collapse in 2006 and the whole U.S.

economy fell into recession in 2008, Chris Amico placed his bets on computer coding.

The economic downturn made the journalism job market more competitive. As a

result, the career path of moving up from a small community newspaper to a major news

organization, as Amico said, "seemed really unlikely" to him.

Living in Dalian, a coastal city in northern China, he kept thinking about one

question, "Am I going to have a journalism career going forward?" Fortunately,

daliandalian.com, a website project he was involved in, strengthened his interest in

computer technologies and introduced him to the possibility of combining journalism and

programming.

Amico taught himself how to code and gradually shifted his career as a print

reporter into a news developer. After returning to the United States, his programming

skills helped him land jobs at PBS NewHour and NPR. Now he is an interactive editor

for PBS Frontline.

Journalist-programmers, including Amico, are advocates for journalism

incorporating computer technologies. As media outlets have grown savvier about the web

in recent years, newsrooms have offered more positions that require people fluent both in

journalism and web development. Computer technical skills expand journalists' career possibilities.

However, learning how to code without any technical background can be overwhelming and frustrating, particularly for working journalists already burdened with regular assignments.

That challenge prompted me to speak with media practitioners who have made the shift from being a conventional journalist into a journalist-programmer, to gain perspective on the motivation behind their transition and their career trajectory.

I interviewed eight journalists from national and regional news organizations, and a journalism educator who used to be a journalist-programmer. Their day-to-day jobs include interviewing, writing, crunching numbers, typing code and designing graphics. All of the journalists enrolled in journalism programs without any programming courses or started their careers as traditional reporters. Some journalists dabbled in programming as full-time reporters. Some younger journalists, who had seen the rise of digital production, made the transition while attending college.

There were two female journalist-programmers among my interviewees. They both said that they were not treated differently based on gender in the workplace. The annual American Society of News Editor Census shows that men greatly outnumber women in the newsroom in the U.S.

No matter when and how the transition into a journalist-programmer occurred, the journalists I talked to agreed on three main points. First, the desire to create distinctive journalism pieces was their primary motivation. Second, the most effective way to learn is by working on journalism projects. Third, networks played a significant role in their

career paths. The journalists had mentors, friends and co-workers who influenced their learning.

Getting started

The journalists who made a transition nearly a decade ago were initially impressed by the potential of computer-assisted reporting (CAR). They picked up how to analyze a dataset in an Excel spreadsheet or database manager software. The next logical step down this road was programming for more advanced CAR.

Ben Welsh, a data editor from the Los Angeles Times, said that he became attracted to the combination of computer technologies and journalism while he was helping two legendary reporters -- Carol Marin and Don Moseley -- on an investigative project for the DePaul Documentary Project in 2003.

During this project, Welsh made his first public records request and did his first data analysis in a Microsoft Excel spreadsheet.

The local government of a Chicago suburb, he recalled, sent him and his reporters the documents in the form of a massive printout. His responsibility was to hammer all the numbers from the printout into a spreadsheet line by line. After hours of tedious, manual data-entry, he added up the final figure and a story on corruption in the local government came out. The moment Marin read the numbers on camera, it clicked to Welsh about his journalism career.

"I learned that technical skills were a way I could contribute," he said. "Even [the digital tools] just as simple as a spreadsheet kind of opened my eyes."

Like Welsh, Serdar Tumgoren, a data journalist from The Associated Press, was also fascinated by how journalists could tell a different story by working with spreadsheets.

He considered his journey to programming a traditional "CAR path," a road that was expanded from spreadsheets to database manager software, programming languages and web development. He said that it took him nearly a decade to completely transform from a print reporter to a news developer.

For journalists who made the transition, the realization that programming could make their work stand out sparked their motivation to continue learning.

Matt Waite, now a professor of practice at the University of Nebraska-Lincoln, saw some news publications put searchable databases online in the '90s. Then he told himself that such transparency could be the future of investigative journalism. It inspired him to pitch a similar idea to his newsroom, the St. Petersburg Times, but nobody there knew how to publish an interactive database on the Internet. To create such a project, Waite started to teach himself how to build a web application from scratch, bit by bit, line by line, item by item.

In 2007, Waite finished his first web application: He was one of the primary programmers for PolitiFact, an online platform to fact check politicians' statements. He said that the experience of learning Django, the web framework used to build Politifact, was transformative and changed his thoughts on journalism. In 2009, PolitiFact became the first website awarded a Pulitzer Prize.

Adopting programming changes how journalism can be presented to the public. In addition, it alters a journalist's workflow. Instead of constantly checking a website's

update manually, he or she could automate this task by writing lines of code. Rather than depending on a source for a scoop, journalists can use Pandas, a Python library, to concatenate different datasets and find stories that nobody else can. With the assistance of JavaScript, a journalist can add interactive narratives to storytelling.

Before learning how to program in R, an open-source computer language for statistical analysis and graphics, David Montgomery, a former political reporter from The St. Paul Pioneer Press in Minnesota, had a toolbox which he thought obsolete to him now -- Excel, Adobe Illustrator and Tableau, etc.

His first venture into programming came as he was working on a personal project for which he needed to make a graphic for each state. Generating 50 graphics one by one in Excel, a method he had been familiar with, was possible but tedious. Instead, he found an R script online that could achieve the same goal by automation.

Now Montgomery could create a word cloud based on the governor's speeches, scrape data from websites and analyze spatial data, tasks that he couldn't do without knowing how to code. "It [ability to code] made my job more efficient and sophisticated," he said.

For younger journalists, the story is different. They went to college when online journalism was on the rise, learned basic HTML and CSS in class and moved on to acquire more sophisticated programming languages through their internships. This was the path for Sisi Wei, an investigative reporter from ProPublica, and Darla Cameron, a visual journalist from The Washington Post.

Getting your hands dirty

For anyone who wants to get their feet wet with coding, he or she has ready access to learning resources. There are many tutorials online, teaching various programming languages to beginners, mostly for free. However, for a working journalist, the biggest constraint is time. Journalists are already under the stress of needing to meet deadlines constantly. It seems impossible for them to squeeze out a few hours every day to sit in front of a computer and follow the tutorial videos.

The most effective way to learn, nearly every journalist I interviewed said, is a project-oriented approach. They said the learning experience should be modified for a news environment, and a journalist could learn by working on a journalism project.

Welsh saw every opportunity to work on a news project as a chance to stretch his programming skills and pick up something new. He learned how to analyze geospatial data by creating Mapping L.A., an interactive online platform displaying the neighborhoods in Los Angeles. Later, he applied the knowledge to analyze emergency response time in Los Angeles.

He said he didn't have any secret to learning how to program. All he did was to "aggressively experiment with them on really practical projects, not on things that are academic or unrelated to journalism."

Montgomery also valued every possibility to transform his programming knowledge into a tangible product, rather than attend a lecture full of the nitty gritty of programming. The combination of reporting and programming skills allows him to create distinctive journalism products. The better his story turned out to be, the more time his editor would grant him to experiment, a cycle that Montgomery described as "a snowball effect."

Acquiring new knowledge while having a full-time job means sacrificing a lot of personal time and having strong determination. Several journalists said that the early days of learning how to code were the most intense period of their lives.

Amico learned web development as being a freelance reporter in California. "I went out to report a story for a newspaper, wrote it and sent it off," he said. "Then I came home and stayed up late at night, doing Python tutorials or building little web applications."

Tumgoren also attributed his learning experience to lots of late-night hacking. He recalled his life in those days as "a reporter by day and a coder by night."

He started tinkering with programming by himself around 2005, but the result didn't go very well. He enrolled in a Perl class at community college. After the class, he continued to teach himself at night, intensively, for a number of years.

" I was totally obsessed, and I didn't have a girlfriend who was close to me at the time, to be perfectly honest," Tumgoren said. "I'm not recommending that approach for people today. I think there are much more sane ways to do it."

Several journalists I interviewed, including Tumgoren, talked about the work-life balance during their transitions. They said that being single and without a family gave them more time to code outside of their daily jobs.

Cameron, who just had a baby girl, said that she experimented with more new digital tools and skills in the early stage of her career.

"I've definitely gone through a period that I worked all the time," she said. "But now I always have to leave at 5 to pick up my child."

The journalists said that one of the worst ways to learn programming is to learn it like you're studying an academic subject.

Greg Linch, a news developer at the McClatchy Group, still remembered the first time he learned how to code in JavaScript, a programming language commonly used to create interactive web visualizations.

"I was reading a physical book. And I would read it like I was studying history or science," Linch said. Soon after, he realized that reading books was not working and felt the need to go back to the computer.

The learning experience is a loop of fumbling with typing lines of code, reading others' documentation, figuring out the reasons behind the code and experimenting with a new project. "Repeat. Repeat. Repeat. It's a constant process," he said.

Despite the misconception of learning programming as a subject, another common mistake that novice coders may make is to set a goal of learning as many digital tools as they can - ambitious, but impossible and unnecessary.

The journalists I spoke with suggested that beginners set an achievable goal, make medium- and long-term plans and then find ways to make them happen. "Every time I learn a new language or a new concept, it's because I need it," Wei said. Working on projects frequently is the best way to sharpen one's programming skills, she added.

Everybody needs a network

During my conversations with these journalists, I noticed everyone mentioned they had mentors and a strong community that they could turn to for help. How they connect to a community varies according to the size and structure of the newsrooms.

The national news organizations may have a larger group of newsroom programmers than smaller or regional media. Therefore, journalists there have more opportunities to build their skills through in-person interaction.

Linch said his path to becoming a journalist-programmer was different from the ones of many other journalists. The transition took place through an internal experimental fellowship when he worked at The Washington Post.

He had many friends who were journalist-programmers, and he was always fascinated by their jobs.

The idea came out on the day that he was watching a baseball game with Jeremy Bowers, who was a senior developer at the Post.

"He said, 'Why don't you pitch an internal fellowship to work on?'" Linch said. "It was experimental and we wanted to try this and see how it worked."

After the Post's technology department approved the proposal, Linch was embedded in the newsroom development team, a mixed group of people with technical and journalism backgrounds. During the following six months, Linch was kept busy with building tools for the newsroom and asking questions, an experience he considered "very important" for his transition.

"It was something that nobody had done before, and I don't think anybody has done since," Linch said.

Cameron, who works on the Post's graphics desk, told me that her team was very supportive of journalists learning to program. She said that the desk holds an hour-long weekly meeting called Skillshare, where every member can present a new project or share fresh knowledge.

The team also has a Slack channel where they can communicate virtually.

Comparatively, journalists at smaller newsrooms have less of a chance to be around someone that they can turn to for correcting a coding error. The solution is to go to the Internet.

The lone coder in his newsroom, Montgomery is active in the Lonely Coders Club, a Slack channel filled with like-minded people. He posts questions there and tries to answer others'.

"I like sitting down to hash out a problem by myself," Montgomery said. "And I turn to the Internet for help if I get stuck."

However, a bigger hump for the lone coders to tackle is how to let the rest of the newsroom understands their jobs. For Montgomery, the approach is "very much finished-project-based." He said that it was especially necessary during the early stage that he tried to establish himself as a journalist-programmer.

"So a lot of time what I do is to work on something in my personal time, and the next day I would show my bosses something quasi-finished," Montgomery said. "I couldn't describe what I wanted to do if no one understood the method. "

The debate persists

When Adrian Holovaty called for more programmers in the newsroom in 2006, he didn't get much response. A decade later, after the decline of the newspaper industry and the rise of digital media, more journalism professionals have awakened to the advantages of learning web development. However, whether all journalists should learn how to code is an ongoing debate.

An [article](#) published by The Atlantic in 2014 said that the knowledge of how to code cannot advance someone who wants to do serious reporting. As the marketplace for a reporter has become increasingly competitive, journalists should not waste time picking up programming languages because they would never be as good as professional programmers, the author wrote.

The article ignited fierce debate among media professionals, including some who believe that coding skills are essential for anyone who wants to survive in the news industry in the future.

"You will be scooped by a reporter who knows how to program," Scott Klein, the deputy managing editor from ProPublica wrote in the same year. He was against the idea in The Atlantic article that jobs such as web design and data visualization should be performed by professional programmers.

The journalists I talked to agreed that it is unnecessary, as well as impossible, for all journalists to be expert coders, yet they should at least be literate on data and programming.

The availability of massive amount of data, from governments, organizations and individuals, has made the world that journalists cover more complicated. The lack of data and programming skills leaves many stories out of reach for many journalists.

"If we choose not to have the skills to verify that information, we are completely reliant on what is given to us." Wei said, "It seems to me the equivalent of saying, 'Well, just believe everything your sources say.'"

Conclusion

The journalists I interviewed, regardless of their different job titles and various digital tools they use, demonstrate a common set of qualities: being forward-thinking and willing to learn.

The journalist-programmers, particularly the pioneering ones who made the transition early, saw the power of computer programming. To stay at the forefront of media innovation, they sought every opportunity to apply their new skills and expand their knowledge.

As Waite said, curiosity should be at the center of a journalist's career, regardless of whether he or she learns programming.

The media industry is rapidly changing and competitive. Perhaps in a few decades, newsrooms will be saturated with journalists who can code. Journalist-programmers perhaps will no longer represent a niche in the job market. Instead of discussing which particular set of journalistic skills distinguishes a journalist from the crowd, it will be more meaningful to emphasize the traditional values: keep learning and always be curious.