Data Journalism 2.0: Innovation and Transformation in Data Journalism Visualization Production - Postprint

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Abstract

Data journalism has introduced innovations in news narrative forms for news products, yet it continues to face experiential challenges. Contemporary data journalism works generally lack user-centric awareness and exhibit weak design sensibility; monotonous and uninspired data visualization approaches have failed to deliver satisfactory audience experiences with news products. To transcend conventional visualization production paradigms and innovate the intrinsic morphology of visualization, data journalism visualization production must steadfastly adhere to the core of news products, emphasize user-oriented design principles, incorporate interactive elements into visualization methodologies, humanistically integrate data within news narratives, and further optimize existing data journalism visualization practices.

Full Text

Data Journalism 2.0: Innovative Transformations in Data Journalism Visualization Production

Abstract: While data journalism has introduced innovative narrative forms to news products, it still faces significant experiential challenges. Contemporary data journalism works generally lack user awareness and design sensibility; monotonous visualization approaches have failed to deliver satisfactory audience experiences. To transcend existing production models and innovate visualization' s intrinsic forms, data journalism visualization must firmly grasp news products' core essence, adopt user-oriented design principles, incorporate interactive elements, and humanely integrate data into news narratives, thereby optimizing current visualization practices.

Keywords: data journalism; visualization; data visualization

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Data journalism visualization represents an artistic processing of journalistic data that interprets news through visual decoding, triggering entirely new visual experience spaces for audiences. However, as the volume of visualized news continues to grow, readers have become increasingly discerning, demanding greater innovation in both content and form. Information charts such as bar charts, pie charts, line graphs, and column charts generated by numerous visualization tools lack aesthetic design sensibility, and their overly uniform presentation creates visual fatigue and a monolithic understanding of data journalism among audiences. When mined data is directly fed into software backend analysis and combined with design modules to automatically generate visual charts, a developmental pitfall emerges: users become dependent on software companies to continuously improve or update their design modules, consequently losing their perception of artistic creativity and lacking design inspiration.

Moreover, much data journalism focuses solely on data visualization while neglecting the visualization of news story content. Excessive emphasis on visual communication can also cause the core elements of data journalism to be overlooked, easily diverting audience attention from news information points to other visual symbols. How to optimize existing data journalism visualization production models, how to organically integrate data into news reporting itself, and how to enhance audience interaction and improve audience recognition of data journalism products have become key focus areas for the next stage of data journalism production.

2. User-Centered Design for Data Journalism Visualization Products

The visual presentation of data can be traced back to the earliest preserved Egyptian stone tablets from the second century, initially used as nautical tools to record astronomical information. Generally considered, data visualization is "a presentation of data in graphic or diagrammatic format," or can be described as "the display of abstract information in diagrammatic form." Data visualization enables us to identify overlooked patterns, trends, and correlations that traditional reports, tables, or spreadsheets might miss. In a sense, data visualization serves as a "translation" of data, converting it into intuitively perceptible content forms for audiences, creating distinguishable sizes, shapes, or trend diagrammatic relationships. In data journalism works, enabling audiences to access data news information most quickly and conveniently, while simultaneously leaving a lasting impression on them through product design, constitutes an excellent data "translation" —one that provides aesthetically stunning data visualization products.

Currently, data service companies have developed various data visualization software that facilitates data screening and classification for users, allowing them to directly apply visualization tool templates. For most data service companies,

different data contains inherent structured and strongly directional expression logic, which indeed offers certain advantages in data visualization work efficiency, but simultaneously creates an innovation dilemma. When visual information graphics are generated directly without manual design, production lacking product thinking falls into a fixed cycle, which in the long run is detrimental to the richness and diversity of data journalism visualization development. The use of basic charts such as bar charts, pie charts, line graphs, and column charts —common in our daily experience—belongs to the elementary category of data journalism visualization. While these are streamlined and make data easy to understand, they cannot effectively convey the complete associative meaning between data information and news content, resulting in short effective retention time and fleeting diagrammatic impressions in audiences' minds. Improvements in data journalism visualization must focus on enhancing the quality of basic visual elements, eliminating ineffective and valueless images and graphics that cannot tell news stories effectively, and using high-quality visualization methods to stimulate lasting audience interest in data journalism.

Therefore, data journalism visualization design must abandon traditional singular design thinking and genuinely pivot toward users. Starting from user-oriented logic, the first step is to gain insight into user needs, clarify the communication intentions and objectives of data journalism products, break away from superficial manifestations of data visualization software production, combine user thinking with engineering thinking, and establish proper product positioning. In data journalism production, the role of product designers must be emphasized. Product designers utilize visual creativity to solve digital information communication in data journalism and are core members of the data journalism production team. Unlike text reporting, data journalism designers focus on visual communication, transforming data into concrete and perceptible graphic designs to deliver news value and information. Google News Lab, for instance, highly values designers' working status, requiring designers to participate alongside data scientists in Google Trends projects to help audiences understand how the world utilizes Google.

In the Data Journalism 2.0 era, data journalism should not be regarded as an innovative approach to news reporting but as a fundamental news form that exists widely. Therefore, when considering how data journalism can aggregate massive user traffic, we should approach from the user perspective, refine data journalism products to perfection, fully enhance users' visual satisfaction with data journalism products, and implant design inspiration and creativity into the aesthetic design and interactive experience of data journalism. Simultaneously, balancing design form and content in visualization design is crucial. To achieve this balance, we must adhere to the principle that form serves content, following the minimalist principle of "less is more" to convey information accurately and efficiently. A healthy balance must be achieved between the visual design aesthetics of data journalism visualization works and the effectiveness of clear data transmission.

3. Enhancing Interactivity in Data Journalism Visualization and Emphasizing Data Humanization

Data journalism is not reporting formed by data stacking but rather a form of "participatory reporting" that encourages user participation in news. Traditional data journalism visualization works focus on transmitting data information behind news stories, whereas reformed visualization works emphasize the social attributes of data journalism. Establishing interactive relationships with audiences is an effective way to mobilize their initiative. An interactive data journalism piece produced by *The New York Times*, which aimed to reveal the relationship between American family income and children' s college attendance, first asked audiences to draw what they believed to be the relationship curve before presenting statistical results. This allowed audiences to learn about other readers' predictions and compare them with their own, greatly mobilizing user participation and engagement in news interaction, and proving more effective in conveying information than direct presentation of media viewpoints.

Personalization brings audiences closer to data, enabling them to establish digital cognition of data journalism through building personal relevance to news events and actively engaging in interactive data communication on social media. Meanwhile, user-centered design orientation must achieve precise push and personalized customization, requiring consideration of what devices audiences use to access data journalism products. Data journalism products should fully consider interactive methods for mobile devices. Mobile-first products differ from PC versions, requiring differentiated design in data visual presentation methods, mobile interface layout, and user habit preferences. User testing should be conducted before final product release, with design improvements made based on feedback.

To make data journalism truly readable and interesting, the mined data must be made more "humanized." Data is not only the source of data journalism but also a storytelling tool with "people" as the subject. Narrating data journalism means telling human news stories; people-oriented approaches must emphasize "humanity," never placing numerical symbols or visualization images above human beings. We must find ways to humanize data, grasp the organic integration of data and news events, truly refine data journalism products to perfection, and achieve the transformation of user fans into active community development.

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Note: Figure translations are in progress. See original paper for figures.