| New Media: A Critical Introspection |

Imagine An App for That: Using Science Fiction Prototypes to Conceptualize Media Tools That Empower People

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Abstract:
Besides envisioning our future, science fiction and fact have enabled us to develop new technologies and products. Based on creative science prototyping, the research reported in this article elucidates a futuristic interactive media tool named WeMedia, which represents the synergistic convergence of information and media to deliver power of knowledge.

As a creative science prototype, the WeMedia empowers its users with nearly omniscient knowledge combined with infinite awareness, understanding, and insight. The WeMedia's reciprocal fact-checking and other features are powered by a participatory network of citizens who collaboratively deliberate, curate media content, disseminate news, generate innovative ideas, contribute creative work, and connect with people with similar interests.

This article presents two science fiction vignettes of Anita, a lawyer turned activist, and David, a laid-off journalist, who uses the WeMedia to earn success in their rejuvenated roles in the imagined world of the future. It also features a historical timeline delineating the evolution and growth of consumer technology. This article elucidates the critical role of creative science prototyping in the innovation process as dramatic changes in mobile technology, cloud computing, media management, journalistic culture, and user-generated content are transforming the future of media technologies.
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Research Highlights:
- Science fiction has inspired media innovations
- Critical role of creative science prototyping in the innovation process
- Prototype called WeMedia, a device that combines Information Media and Power
- Synergistic convergence of information and media to deliver power of knowledge
- Historical timeline delineates the evolution and growth of consumer technology

Keywords:

creative science prototyping, interactive media, news media, future of media technologies, consumer technology, interactive media tool, information and media convergence

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1. Introduction

"With great power comes great responsibility."

-- Narrative text by *Spider-Man* co-creator Stan Lee, in the *Amazing Fantasy, No. 15* comic book, August 1962 (Lee, 1962)

The pithy proverb from *Spider-Man* illustrates how science fiction accentuates society's dilemma about power and responsibility. Media reflect the society they serve and science fiction has inspired visions of future media developments conjured by the fertile imagination and visionary extrapolations of sci-fi authors. Besides envisioning our future, science fiction and fact have enabled us to transform technologies and tools. For instance, William Gibson coined the word "cyberspace" in his popular 1984 science fiction novel *Neuromancer*, to delineate a networked "Matrix as a world within the world, a global consensus- hallucination with the representation of every byte of data in cyberspace" (Gibson, 1984).

In the realistic realm of society, cyberspace has redefined the media of the future in sharp contrast to the journalistic dictum of "comfort the afflicted, afflict the comfortable" (Dunne, 1906, p. 240). That dictum also originated from fiction and translated well to the role of news in the real world. . American journalist Finley Peter Dunne's persona, Mr. Dooley, delineated the role of the newspaper in these words: *"Th' newspaper does ivrything f'r us. It runs th' polis foorce an' th' banks, commands th' milishy, controls th'ligislachure, baptizes th' young, marries th' foolish, comforts th' afflicted, afflicts th' comfortable, buries th' dead an' roasts thim aftherward."* (The phonemic spellings signified Mr. Dooley's wit, humor and charm) in his 1902 essay on "Newspaper Publicity," For more than 100 years, newspapers, as a prominent arm of the media, thrived in their role of "burying the dead" and roasting "them afterward" (Dunne, 1906, p. 240). However, rapid diffusion of innovations has transformed the role of newspapers and media, similar to several other industries such as healthcare and travel (Malerba, 2007).

The news media have faced significant survival challenges with emerging technologies that disseminate news through networked computers, handheld devices, mobile telephones (Lyytinen & Yoo, 2002) and the advent of new technologies such as the e-paper (Ihlstrom, Akesson, & Nordqvist, 2004). The inception of the online newspaper genre in the mid-1990s has reshaped the consumption of news (Boczkowski, 2004). This change in news consumption patterns and technology has proved to be a tremendous challenge for the news media. The newspaper industry's early attempts to adopt Internet

technology were geared to replace the printed genre under significant influence and interdependence between the printed and online news genres (Ihlstrom, et. al, 2004). Print and online news genres are now interwoven in such a way that they cannot easily be dissolved. This has led to a radical shift in how newspaper firms organize their production and presentation of news and services to readers.

Researchers have established that the relationship between innovation and industrial change are replete with uncertainty over radical innovations and periods of more incremental technical change that differs across industries and countries (Dosi, 1982; Dosi, 1988; Freeman, 1982; Pavitt, 1984). Several studies (Jensen, Johnson, Lorenz, & Lundvall, 2007; Zuscovitch, 1986) have revealed that the path of innovation or the type of technology determine shifts in locus of industrial leadership and firm-level strategies. Some innovation models (Foster, 1986; Tushman & Rosenkopf, 1992; Utterback, 1996) depict or predict the technological evolution. This led researchers such as Christensen (1997) to posit strategies to negotiate disruptive innovation instead of traditional sustaining innovation that has been disrupted by the competition among existing large corporations, small entrants and innovators (Foster & Kaplan, 2011; Nesheim, 2005; Shane, 2005).

1.1. Research preamble for this study

Astounding innovations in mobile technology, cloud computing, media management, journalistic culture, and user-generated content are transforming the future of the interactive media milieu. Researchers have explored the relationship of firm-level strategies corresponding with distinct industrial stages and innovative types (Christensen, Anthony, & Roth, 2004; Christensen & Raynor, 2003; Hill & Jones, 1998).

Research efforts to envision the future of media lack new perspectives such as science fiction prototyping. By definition, "science fiction prototyping is a practical guide to using fiction as a way to imagine our future in a whole new way," according to Brian David Johnson, a futurist at Intel Corporation (Johnson, Doctorow, Warner, & Perkowitz, 2011). As a process to brainstorm innovation, science fiction prototyping provides the tools to conceptualize the future with science fact and fiction. Creative science fiction (CSF) prototyping thus advances the innovation process through CSF prototypes and provides innovators to envision their work in the real world through fiction. The prototypes empower consumers and innovators alike to explore the social, political, legal and ethical implications of the improved technologies in an imagined world (Johnson, 2010).

By situating technological innovation within a larger intellectual context of CSF, this article delineates a creative science prototype named WeMedia for futuristic media technology. The WeMedia represents the synergistic convergence of information and media to deliver power of knowledge. Besides envisioning our future, science fiction and fact have enabled us to develop new technologies and products. Based on creative science prototyping, the research reported in this article elucidates a futuristic interactive media tool named WeMedia, which represents the synergistic convergence of information and media to deliver power of knowledge.

As a creative science prototype, the WeMedia empowers its users with nearly omniscient knowledge combined with infinite awareness, understanding, and insight. The WeMedia's reciprocal fact-checking and other features are powered by a participatory network of citizens who collaboratively deliberate, curate media content, disseminate news, generate innovative ideas, contribute creative work, and connect with people with similar interests.

This article presents two science fiction vignettes of Anita, a lawyer turned activist, and David, a laid-off journalist, who uses the WeMedia to earn success in their rejuvenated roles in the imagined world of the future. It also features a historical timeline delineating the evolution and growth of consumer technology. This article elucidates the critical role of creative science prototyping in the

innovation process as dramatic changes in mobile technology, cloud computing, media management, journalistic culture, and user-generated content are transforming the future of media technologies.

As a creative science prototype, WeMedia is designed to empower people with knowledge through seven distinct interactive media features: Wearable Mega-Mobile Device, Robust Technology at Low Cost, Power of Research Insight, Unlimited Research Resources, Personal Health Monitor for the Mind and Body, Wealth of the Web for World Peace, and Social Networking for Freedom Worldwide. A striking feature of the WeMedia is its Achilles heel-like frailty that works as an ethical check. If a WeMedia user inputs false information to the WeMedia, the technology fact checks the incorrect or false information and restricts the errant user from using the WeMedia's suite of features. The WeMedia then requests the errant user to correct the error within 12 hours or face the consequence of permanent denial of service. Besides its ethical significance, the WeMedia's reciprocal fact-checking and other features are powered by a participatory network of citizens who deliberate collaboratively, curate media content, disseminate news, generate innovative ideas, contribute creative work, and connect with people with similar interests.

In myriad ways, this article posits a future when consumer technology tools such as the WeMedia are an indispensable supplement to the limitations of the human mind. This article presents two science fiction vignettes of Anita, a lawyer turned activist, and David, a laid-off journalist. Both Anita and David use the WeMedia to earn success in their rejuvenated roles in the imagined world of the future. This article also discusses the role of CSF in the innovation process, features a timeline that delineated the evolution of consumer technology over two decades (the Internet era of 1991-2000 and the digital epoch of 2001-2014) and elucidates the value of CSF in inspiring ideas for innovation.

Based on a meta-analysis of the theory and practice of CSF, this article seeks to inspire conceptual and contextual thinking about the future. The article presents a thought provoking analysis into what may be possible in the changing world of media content and contributes to the development of the improved media technologies based on envisioning the impact of the WeMedia creative science prototype on people, culture, industry, government and society.

2. Theoretical contribution of science fiction to innovation

The science fiction writer William Gibson has exemplified how the best science fiction knits together cold scientific details with visions of the future to delineate the human face of technological change. Writing on an antiquated manual typewriter, Gibson coined the term "cyberspace" in his 1984 novel *Neuromancer* to describe the real and cultural dynamics of people and machines working within the confines of computer-based networks. Gibson described cyberspace as a place of "unthinkable complexity," with "lines of light ranged in the nonspace of the mind, clusters and constellations of data. Like city lights, receding..." (Gibson, 1984).

An expatriate American living in Canada, Gibson used cyberspace as the setting for his early novels and short stories. In his science fiction work, cyberspace is a computer-generated landscape where characters enter by "jacking in" or plugging electrodes directly into sockets implanted in the brain. What they see when they get there is a three-dimensional representation of all the information stored in "every computer in the human system"-- great warehouses and skyscrapers of data (Gibson, 1986). Today, Gibson's imaginary world has been invoked into reality in the consumer technology landscape. Similar to how the steam engine and automobile transformed our lives in the late 19th Century, interactive media have radically changed the way we live, work and play.

The process of CSF prototyping thus facilitates science fiction based on science fact with three primary goals. First, CSF prototypes advance the development of the improved technologies based on envisioning the impact on people, culture, industry, government and society. CSF prototypes become a

platform for discussion and deeper exploration of areas that may not have initially been understood or conceived. As Johnson states, exploring "new areas can shed new light on the technology, lay out points for validation and even new scenarios to test" (Johnson, 2010).

The second goal of CSF prototypes is to offer a possible vision for the future that is based on science and reason. This type of fiction provides the parlance to converse about the future. CSF prototypes are a way for everyone to discuss a future that we can build. Frayling demonstrates that science fiction texts shaped, and even gave rise to, certain concepts and desires that advanced the science of space rockets by elucidating the multifaceted cultural meanings of rocketry (Frayling, 2005). Frayling illustrates this by examining the intellectual collaboration between German-American space engineer Werhner von Braun and American film entrepreneur Walt Disney. To garner greater public interest in the future of the space program, von Braun began working with Walt Disney and the Disney studios as a technical director. Von Braun served as technical advisor on three space exploration-related television films that Disney produced in the 1950s. Together, von Braun (the engineer) and Disney (the artist) used the new medium of television to illustrate how high man might fly on the strength of technology and the spirit of human imagination. *Man in Space*, the initial broadcast devoted to space exploration, was first broadcast on March 9, 1955, attracted 42 million viewers to earn the unofficial distinction as the second-highest rated television show in American history. Six years later, on May 5, 1961, astronaut Alan Shepard became the first American in space aboard *Freedom 7,* launched by a Redstone booster on a 15-minute ballistic (suborbital) flight. Science fiction, as Dinello argues, can help us extrapolate the future and make decisions about where we're headed now (Dinello, 2005).

The third goal of CSF prototypes is to facilitate the conceptualization of new theories, scenarios and visions to supplement technological advances and their evidenced or imaginary social and commercial implications. Compelling connections inspire scientists and technologists to accomplish the innovations imagined by science fiction creators. Dinello combines the popular culture of science fiction with actual scientific development to argue that "science fiction not only reflects popular assumptions and values, but also gives us an appraisal of their success in practice" (p. 5) (Dinello, 2005). Though often misunderstood, science fiction is a culturally important genre because it enhances critical thinking about science and technology with important humanist questions: Does great scientific power warrant greater social responsibility? How are science and technology reshaping our understanding of humanity? How can the ethical development of science and technology sustain human dignity, social justice, moral rectitude, and intellectual autonomy? Is humanistic science an oxymoron? While scientists have a right to explore innovative research ideas, are they responsible for its social, political and economic implications? How can science and technology address the problem and peril of its misuse? What science and technology problems should we solve to make our world a better place? Science fiction inspires innovation by addressing such questions that forge the pragmatic views of consumers, creativity of writers, artists and scholars with the technological visions and prototype designs of engineers, designers, technologists and consumer architect specialists.

As Dinello observed, science fiction uses current developments in science and technology to predict where the world is headed, and it doesn't like what it sees (Dinello, 2005). The possible perils of today's cutting-edge technologies have been described in science fiction stories and films. For example, George Orwell's classic dystopian novel *1984* and its predecessor, Yevgeny Zamyatin's *We*, both describe the perils of using invincible technology tools for law enforcement, interrogation, and intelligence gathering, or the rehabilitation of political criminals. Science fiction can, and does, highlight those intellectual perspectives and bring them into sharp relief to inform innovation.

3. Timeline of epochal events in the evolution of consumer technology

Dinello views science fiction as a cultural critique of technology and its applications (Dinello, 2005). Science fiction comprising sci-fi comics, novels and films has yielded accurate forecasts of future scientific advances. The most powerful science fiction thus moves beyond prophesies of future technologies and concentrates on the social and professional changes such developments might spawn. CSF proponent Johnson derives prophesies of future technologies and science fiction prototyping from history, real world examples and events such as "Men in the Moon," Asimov's robots, Einstein's thought experiments, and Asimov's second dream (Johnson, Doctorow, Warner, & Perkowitz, 2011). It is important, if not essential to trace the evolution of consumer technology to inform science fiction prototyping for the interactive media. It is, therefore, important, even essential, to trace the evolution of consumer technology to inform science fiction prototyping for the interactive media.

In his seminal book, *Science Fiction Prototyping: Designing the Future with Science Fiction,* Johnson illustrates that history, real world examples and events enhance science fiction prototyping as we explore new ideas as "dreams and nightmares duke it out on the safety of the page or screen" (Johnson, Doctorow, Warner, & Perkowitz, 2011). As an example of fiction turning into fact, the concept of cyberspace has surpassed its science-fiction fantasy origins. It has attained relevance in the increasingly interconnected consumer technology landscape. The interactive media are fast emerging as an evolving information universe transforming business, education, and personal spheres as among the fastest growing segments of consumer technology.

As Johnson states, "All good stories are primarily about people not technology" (Johnson, Doctorow, Warner, & Perkowitz, 2011). Based on Johnson's method, this section features a historical timeline of important innovations that have contributed to the evolution and proliferation of consumer technology in our society in 1991 through 2012. This section also features chronological vignettes of the people, perspectives and epochal events that contributed to the evolution of information and proliferation of consumer technology. The timeline is divided into two epochs classified by their distinctive character:

❖ The Internet Era Drives Innovations in Consumer Technology, 1991-2000, and
❖ The Digital Epoch Reshapes Consumer Technology, 2001-2014.

Both in content and design, this timeline is not intended to be exhaustive because it encapsulates a complex chronicle of events that trace more than two decades of progressive proliferation of information challenges in the consumer technology landscape.

3.1. The Internet Era Drives Innovations in Consumer Technology, 1991-2000

During the early 1990s, the Internet diffused into society and pervaded the consumer technology landscape. In the mid-1990s, the advent of the World Wide Web spearheaded the popularity and commercial growth of the Internet. Besides attaining notoriety as a persistent purveyor of information, the Internet emerged as a consumer technology tool for bringing together contributions of millions of people and making them matter.

1991: On August 6, 1991, British physicist and computer scientist Tim Berners-Lee, the inventor of the World Wide Web, posted a summary of the Web project on the alt.hypertext newsgroup. This date also marked the debut of the Web as a publicly available service on the Internet (Berners-Lee & Fischetti, 1999).
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1990s: With the ease of Web access for the general public, the Internet ushered widespread changes in work and play. The Internet enabled people at home, work, and beyond to forge robust services that increased business efficiency and developed social exchanges (Ryan, 2010). Until the end of the 1990s, networked computers were connected through expensive leased lines and/or dial-up phone lines. High speed Internet-linked computer networking in the late-1990s led to closer coordination and collaboration among people in far-flung areas. Search engines enabled everyone to use the Internet as a personal ready reference of learning and lore (Ryan, 2010). Open-source applications, such as Linux, created self-organizing communities, launched a collaborative revolution, and redefined globalization (Torvalds & Diamond, 2001)**.**

1993: Internet media converged with traditional media. Broadcast entities, newspapers and magazines offered free online content and thereby failed to adequately monetize their media product and services. This also perpetuated a persistent mentality of "free content" among online news consumers (Winget & Aspray, 2011).

1995: Billing itself as the "world's largest bookseller," Amazon.com launched online in 1995 (Amazon, 1995). Amazon stated that "a physical bookstore as big as Amazon.com was economically impossible because no single metropolitan area was large enough to support such a mammoth store. Were Amazon.com to print a catalog of all of its titles, it would be the size of seven New York City phone books" (each of which lists more than eight million phone numbers) (Amazon, 1995).

1996: Beginning in 1996, Stanford University graduate students Larry Page and Sergey Brin built a search engine called "BackRub," which used links to determine the importance of individual web pages. By 1998, they had formalized their work and launched the search engine, Google, named after a play on the word "googol," the mathematical term for a 1 followed by 100 zeros (Vise & Malseed, 2008). Even though it was not the first Internet search engine, Google quickly became the most popular.

1997-2000: The dot-com bubble (also called the *Information Technology Bubble, dot-com boom*, and the *Internet bubble*) marked the boom, bust, and resurgence of the Internet economy. Sparked by the success of Internet startups such as Cisco, Yahoo! and Amazon.com, the dot-com boom represented a speculative bubble over a formidable period of three years, 1997 through 2000. The largest electronic equities exchange in the U.S., NASDAQ, which is also an indicator of technology stocks, peaked at 5132.52 on March 10, 2000 before closing at 5048.62. The rapid growth in the Internet sector and related fields contributed to the rise in equity value of stock markets in industrialized nations (Kraay & Ventura, 2005). The bubble ended in 2000 with catastrophic meltdowns

resulting in the fall of several Internet startup companies, employees with lost jobs and investors with lost fortunes (Adams, 2004). Despite the boom and the bust, the dot-com bubble redefined the Internet as an essential tool and medium for conducting business (Preissl, Bouwman, & Steinfield, 2004).

3.2. The Digital Epoch Reshapes Consumer Technology, 2001-2014

The 21st Century digital age has transformed the consumer technology landscape. Empowered by digital tools, people with a myriad of motivations have launched innovative user-generated communities such as YouTube, new forms of television, and electronic gadgets. Social media, mobile communication, and other forms of new communication have swamped individuals and small groups in a global glut of consumer technology. Even as scientists in a wide range of disciplines are overwhelmed with data, people download and distribute megabytes of data and have become principal players in the 21st Century marketplace.

2001: A major turning point that reconceived technology perspectives, the September 11, 2001, terrorist attacks in the US killed thousands of innocent people and launched a geo-political-military response (the War on Terror). Consumer technology applications such as Web content, text messages, cellphone videos and even mobile phone messages defined public perception of the tragedy. The events of September 11, 2001, also sparked a technological revolution that reshaped consumer technology for cyber security, e-commerce transactions, surveillance tools and online networks (Utley, 2011).

2004: A 19-year-old Harvard sophomore, Mark Zuckerberg, launched Facebook (then called "thefacebook.com") as a social networking service on February 4, 2004. In fewer than five years, Facebook transformed itself from a dorm-room novelty to a company with more than a billion users in 2011 (Kirkpatrick, 2010). Many Facebook users spend several hours a day on this site and admit that, Facebook causes information overload with increased challenges of maintaining social relationships.

2005: In February 2005, three former PayPal employees launched a video-sharing website, YouTube, where users could upload, share, and view videos. Before the launch of YouTube, there were few easy methods available for ordinary computer users who wanted to post videos online. With its simple interface, YouTube made it possible for anyone with an Internet connection to upload a video that a worldwide audience could watch within minutes of posting (Gauntlett, 2011).

2006: Twitter, the real-time information network and microblogging service, was developed in 2006 by three programmers, Jack Dorsey (@Jack), Evan Williams (@Ev), and Biz Stone (@Biz), in San Francisco. At the heart of Twitter are small bursts of information called tweets, which are limited to 140 characters with a details pane that provides additional information, deeper context,

and embedded media. Since its launch in July 2006, Twitter has rapidly gained worldwide popularity, with more than 400 million users in nearly every country in the world (O'Reilly & Milstein, 2009). While Twitter has helped open exchange of information, most users complain that it contributes to rising expectations to keep up with information overload (Beard & McNayr, 2010).

2009: The year 2009 marked a global shift toward digital transformation of broadcast television. Since June 12, 2009, full-power television stations in the U.S. have been broadcasting in a digital format (Bennett & Strange, 2011). U.S. television stations started airing 3-D television serials based on the same technology as 3D movies, possibly opening a new era in TV programing.

2010: In May 2010, with more than 2 billion views per day, YouTube's viewership surpassed all three major broadcast networks (ABC, CBS, and NBC) combined during their "primetime" evening time slot (Gauntlett, 2011).

2010: As the latest innovation in consumer technology, e-readers proliferated in 2010. The online retailer, Amazon.com, announced in January 2011 "Kindle books have now overtaken paperback books as the most popular format on Amazon.com" (Amazon, 2011). In 2011, for every 100 paperback books sold, Amazon sold 115 Kindle books (Amazon, 2011).

2011: Mobile phones emerged as a near-ubiquitous tool for information seeking and communication. A U.S. survey conducted by the Pew Internet and American Life Project found that 83 percent of Americans reported owning mobile phones and of these, more than half said they have used their phones at least once to get information they needed right away. The report stated: "Mobile devices help people solve problems and stave off boredom, but create some new challenges and annoyances" (Smith, 2011).

2011: Information overload swamped citizens and scientists alike. In a special issue, "Dealing with Data," the renowned research publication, *Science*, explored the issues relating to the increasingly huge influx of research data (*Science* Staff, 2011). Two themes dominate: Most scientific disciplines are finding the data deluge to be extremely challenging, and tremendous opportunities can be realized if we can better organize and access the data (*Science* Staff, 2011)

2012: A plethora of mobile and portable tablet computers emerged as yet another innovation in consumer technology. In its fourth iteration in two years, Apple launched in October 2012 the latest version of Apple iPad with a premium screen, a high-resolution camera, speedy Wi-Fi, and a growing library of tablet-focused apps. (Rosenzweig, 2011).

2012: The year 2012 marked an apps explosion in the five years since the launch of the Apple iPhone in June of 2007 that germinated a revolution in mobile technology. An app, short for applications or computer programs, enhances the function and features of consumer technologies. There are more than 200,000 apps available to do just about everything from balancing budgets to reading the news. The popularity of apps has soared because users considered them as an essential tool for everyday life. Media companies like *The New York Times*, *The Wall Street Journal*, CNN and the BBC have developed apps to present digital content that complements their print and broadcast fare (McCann & Coldiron, 2012).

2013: In May 2013 an American whistleblower, Edward Snowden, leaked more than 200,000 files that exposed the extensive and intrusive nature of phone and internet surveillance and intelligence gathering by the US and its western allies. Internet privacy emerged as an issue because people were shocked to how various governments worldwide and their secretive agencies were able to record, track, and analyze the personal communication and digital footprints of millions of private individuals (Gurnow, 2014; Harding, 2014).

2014: Social media are transforming democratic societies worldwide. Dubbed as India's first "social media election," the 2014 Indian elections involved significant online participation by citizens and politicians (Chao, 2014; Khursheed, 2014; PTI, 2014). As Cadel observed, "the 814 million eligible voters" and "a record 66% turnout" meant a significant segment of India's electorate "turned to Facebook and Twitter to talk politics" (Cadel, 2014). As the world's largest democracy with over 1.24 billion people, India provides intriguing insights into the role of social media[i] in a democratic society.

In tracing the evolution of portable consumer technology and its proliferation in society, this timeline chronicled the growing role of information in the consumer technology landscape. The timeline highlights four important issues. One, the exponential growth of the Internet in the 1990s has transmuted the consumer technology landscape. Two, the proliferation of media, entertainment, and other sources of information have contributed to a complex consumer technology landscape in this digital age. Three, the 21st Century has witnessed a deluge of data, 24/7 media, and other information that inundate professionals as well as common citizens, leading to the phenomenon of information overload. Four, the evolving consumer technology landscape has emerged as an important research paradigm of reshaping its future.

4. Introduction to the WeMedia prototype and vignettes

The Internet-enabled consumer technology landscape has been romanticized as a zone of freedom and empowerment. Besides envisioning our future, science fiction and fact have enabled us to develop new technologies and products. Based on CSF prototyping, the research reported in this article elucidates a futuristic interactive media tool named WeMedia, which represents the synergistic convergence of information and media to deliver power of knowledge. The WeMedia tool works with devilish efficiency to access media and information within nanoseconds. The WeMedia empowers its users with omniscient knowledge combined with infinite awareness, understanding, and insight.

This section presents a discussion of the inspiring ideas and innovations that distinguish the WeMedia. We also present in a later part of this study, two brief futuristic vignettes from the life of Anita, a lawyer turned activist, and David, a laid-off journalist. With its robust combination of sophisticated technology, low barriers to entry and instantaneous outreach to billions of users, WeMedia enables both Anita and David to earn success in their rejuvenated roles in the imagined world of the future.

Based on the CSF prototyping method, the WeMedia is a conceptual tool that empowers its users with omniscient knowledge combined with infinite awareness, understanding, and insight The WeMedia is designed to empower users with knowledge through seven distinct interactive media features:

~~ **Wearable Mega-Mobile Device:** The WeMedia is an ultra-portable wearable mega-mobile device equipped with an adjustable projector that acts as its "display screen." For instance, Anita, a WeMedia user, may access the "display screen" by focusing the projector on any flat surface such as palm of her left hand. Using the index finger and thumb of her right hand, she may navigate the WeMedia "screen." The WeMedia may also be projected on any blank surface such as a wall to work as a computing device. Through voice-activated commands, the WeMedia may be operated on multiple modes. It is equipped with a powerful camera, a multi-processor computer, a broadcast-quality microphone, and high bandwidth link that connects the user to any part of the world.

~~ **Robust Technology at Low Cost:** The WeMedia provides robust technology at low-cost because it is subsidized by a North-South collaboration among government agencies and advertising support. It is powered by solar energy. As a consumer technology, the WeMedia's defining advantage is its low threshold with minimal cost, ease of use and ubiquitous technical support.

~~ **Power of Research Insight:** At its primary core, WeMedia provides the power of knowledge to the user through research analytics. The WeMedia serves as a research powerhouse that turns data about neighbors, customers, governments, performance, financials and more into meaningful information. WeMedia helps people anticipate opportunities, empower action and drive impact. The WeMedia transforms the way people live, work and play.

~~ **Unlimited Research Resources:** With its promise of providing unlimited research resources, the WeMedia provides easy access to secure and private financial information. It thus enables users to better understand their online footprint and

learn about their earning and spending habits and also compare and contrast such information with other people. The WeMedia's dynamic database of celebrity profiles, photos and videos provides real-time information the public whereabouts of famous people. The WeMedia also contributes to ethical transparency of public figures with real-time information about their public activities.

〜 **Personal Health Monitor for the Mind and Body:** The WeMedia also serves as a personal health-monitoring tool that is integrated into a telemedicine system. Through real-time monitoring, the WeMedia facilitates prompt detection of abnormal mind and body conditions and thereby prevents serious consequences. Such a personal health-monitoring tool also integrates sensing, communication and data analysis to enable individuals, especially those with chronic illnesses such as heart disease, hyper-tension and diabetes, to track, predict and maintain their health.

〜 **Wealth of the Web for World Peace:** The WeMedia is powered by a robust worldwide network that provides 24/7 news, entertainment, connectivity among other services that interlink millions of users around the world to stay connected to the people with content that matter most throughout their day. Such communication seeks to foster world peace and understanding. The WeMedia merges *social network data* (social media profiles, word-of-mouth information, blog messages, etc.), and *real life information* (address, email address, marital status, etc.) with *public records* (tax records, property details and other data in the public domain) to compile information that helps people find friends, learn about people with similar interests, and connect with others more easily than ever.

〜 **Social Networking for Freedom Worldwide:** More than two billion people live under oppressive rule. In recognition of such oppression, the WeMedia motivates people power by disseminating messages against the main threats to democracy and empowers users to exercise their fundamental rights. The WeMedia's freedom network is designed to champion global freedom from oppression. The WeMedia provides users with tools to analyze the challenges to freedom, advocate for greater political and civil liberties, and support frontline activists to defend human rights and promote democratic change.

Designed as a wearable device, the WeMedia can be operated on two modes: *Access* (send and receive information from any source worldwide) and *Action* (instruct man or machine to do things). With the simplicity of *Access* and *Action* modes, the WeMedia enables its users to be entertained, informed and connected with the world. The WeMedia's voice-activated feature contributes to security protection. For instance, the WeMedia will reject voice commands from other users. Each WeMedia user may train the tool to operate on customized and individually identified voice inputs.

WeMedia App + Media Tool
The synergistic convergence of information and media to deliver knowledge
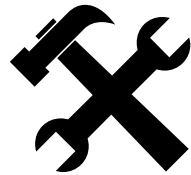
Enlighten

WeMedia provides insights, information, greater knowledge and understanding about a subject or situation

Entertain

WeMedia is equipped with an array of applications that will amuse its audience.

Educate

WeMedia facilitates exchange of information that dispels ignorance with beneficial instruction.
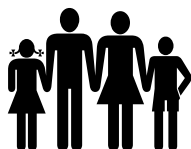
Enrich

WeMedia endows users with valuable media content that enhances their prosperity and spiritual wealth of ideas.

Empower

Activists and authorities may use **WeMedia** to get time-sensitive information to assume the power to act with confidence.

Engage

With its global reach, **WeMedia** unites communities to pursue truth and foster peace and protect human rights.

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5. Ethical and theoretical context to the WeMedia prototype

The most unprecedented new technologies come with onerous burdens of moral, ethical, and legal applications—along with the gravest potentials for abuse. Several theoretical constructs such as media interactivity, ethical transparency and fact checking fuel the WeMedia. Important ethical constructs distinguish the WeMedia as an interactive tool. To further the cause of an ethical society, the WeMedia's seemingly invincible power comes with reciprocal transparency and fact-checking features that restrict or revive this tool for a specific user.

While respecting the privacy of citizens in society, the WeMedia provides special provisions for public figures such as politicians, celebrities, business leaders and other role models who are expected to be committed to ethical living and moral rectitude. The WeMedia assigns "public figure" status to a relatively prominent spectrum of people who are widely known. This may range from people who play a recognized role in shaping society such as political apparatchiks to government officials and business leaders. For the WeMedia, a public figure then could simply be renowned persons such as politicians, CEOs and celebrities who attract media attention or those known by a significant segment of society. The WeMedia's provision for "public figure" is based on the theory that most public figures disseminate their message across to the public through the media, which furthers their agenda. The public figures wield enormous power in shaping public opinion and perceptions and therefore, should be held to a higher ethical standard.

From a journalistic sense, the WeMedia's "public figure" provision re-defines the role of the media. Based on their role as a watchdog of society, the media publish information about the private lives of public figures in the public interest. On the other hand, public figures argue that while investigation into their public lives is fine, their private affairs should be treated differently because they still deserve the right to privacy, which remains a cherished privilege in civilized society. The WeMedia also addresses the extent of media intrusion into private lives by restricting unethical media intrusions. This was highlighted by the closure of the UK newspaper, *News of the World,* in 2011 following revelations that *News of the World* journalists hacked into phones of celebrities, politicians, victims of terrorism and even minor teenagers such as Amanda Jane "Milly" Dowler, the 13-year-old English girl who was abducted on her way home from school in Surrey, UK, on March 21, 2002, and subsequently murdered.

As a global information tool, the WeMedia melds the extent to which the media are legally free to investigate and publish details about the private lives of public figures. The WeMedia, therefore, acts as a unifying system for standards and practices that vary from country to country. For example, France is much stricter than England on protecting personal privacy. The issue of privacy has attained additional importance with the development of human rights law within Europe. Privacy is now classified as a right under the European Convention of Human Rights, as well as by political scandals in many countries that have highlighted the need to scrutinize more closely the behavior of public figures. The WeMedia enables that scrutiny.

The next section features two brief futuristic vignettes from the life of Anita, a lawyer turned activist, and David, a laid-off journalist. Both Anita and David use the WeMedia to earn success in their rejuvenated roles in the imagined world of the future. This section also presents a discussion of the factual research inspiring such ideas and innovations.

5.1. Vignette of Anita, lawyer-turned-activist, using the WeMedia

In the year 2050, Anita, a 29-year-old lawyer-turned-activist from Hong Kong, used WeMedia to re-unite a handful of Chinese citizens to launch a WeMedia site for bloggers and citizen journalists to report, document and map incidents of political corruption and illegal action by politicians.

Beginning as a small initiative in Hong Kong, Anita eventually motivated 4,300 people to upload incident reports from various parts of China. The WeMedia site titled "China Against Corruption" modeled grassroots information-sharing in a time of crisis and censorship. This WeMedia site emerged as a stellar example of the far-reaching impact of citizen journalism.

The "China Against Corruption" campaign taught Anita Smith an important lesson in transparency and fact checking. The WeMedia's reciprocal transparency and fact-checking feature forced Anita and her group of Chinese activists to engage in honest reporting. Whenever they failed, the WeMedia site would get de-activated until they corrected wrong information. The WeMedia also enabled Anita and her group of Chinese activists to use probing reporters and the power of the World Wide Web to examine more than 8,000 political corruption reports, separating rhetoric from truth to inform the people. The WeMedia illustrated how online databases were rapidly becoming one of the important tools of watchdog activism in the digital age.

The WeMedia helped Anita spark widespread audience engagement, encourage new forms of information sharing, spur non-traditional interactions that impact community, foster animated two-way conversations between audiences and news providers and create new ways of imparting useful information.

5.2. Vignette of WeMedia helping David, a laid-off journalist

In the year 2055, David, at age 32, joined thousands of newspaper journalists that had lost their jobs in in endless rounds of layoffs and buyouts in the newspaper industry. David was not expecting to be laid off because he was young, relatively inexpensive and well-versed in blogging and video production. David quickly realized that he lost his job because the business changed, not because he did anything wrong. So, he decided to take stock of where journalism was headed, anticipate where it would be in the next 15 years and prepare for that change.

Once he started searching for a new job, David found that his expertise in cutting-edge media technology seemed to mean very little. David attended more than 30 interviews but did not receive a single offer. After searching for 20 months and spending $20,000 on career consultants, David gave up. "I'm a journalist, so I know rejection," he said. "But I've never experienced rejection on that scale my whole life."

Faced with such failed options, David turned to the WeMedia to restore his self-esteem. The WeMedia enabled David to overcome depression by suggesting a relaxing exercise regimen. When David interviewed at a digital news agency, a younger colleague told him, "David, it's time to re-tool your career with journalism skills of the future." David took that advice to heart and assigned the WeMedia to help him. The WeMedia empowered David with the research insight to plan for a more radical change in his journalism career. The WeMedia provided David the right resources to re-tool his career, shift directions and get back into the work force.

With the help of WeMedia's social networking feature, David brought together 6,743 former journalists to form a news exchange network of that systematized the process of crowdsourcing, conducting experiments, polishing their process and tasking fellow journalists worldwide with serious assignments. He thus used some of WeMedia's collaborative applications to blend data, video, blogging and social networking tools to cover live news events. He also paved the way for inventive collaborative work, developing a number of news applications to make data accessible to many.

Using the WeMedia, David now helps colleagues learn new journalism skills and identify new trends to publish community news sites. He accomplished this by developing WeMedia learning modules that taught colleagues critical steps to populate sites with content and use new technologies to jumpstart citizen journalism. David adopted WeMedia resources to research and report on current trends in community media. He also incorporated WeMedia's two human-interest features, Wealth of the Web for World Peace and Social Networking for Freedom Worldwide, to empower colleagues to start their own news ventures. He thus opened up new opportunities to develop new paths for traditional news organizations to embrace user-generated content and citizen journalism. David excogitated the WeMedia to impart among community members an understanding of the journalistic qualities that make for responsible and credible media.

6. Lessons Learned from the futuristic vignettes

The vignettes illustrate how the WeMedia empowers its users such as Anita and David with omniscient knowledge combined with infinite awareness, understanding, and insight. The WeMedia enabled Anita to amplify activism and create social change. The WeMedia helped David revive his career by facilitating new opportunities for collaboration with his colleagues in the news industry. The WeMedia enabled both Anita and David to unite their peers with a "knowledge network" that amplified, linked and disseminated their ideas to niche audiences segments that would be otherwise unavailable.

As the interactive media milieu reshapes the consumer technology landscape, the WeMedia features the potential to reshape the spectrum and magnitude of the future of media. Professionals may also use the WeMedia to develop innovative approaches to media content, to research new paradigms of civic participation and to share practical insights. The WeMedia creates a vibrant space for experimentation, identifies paths for excellence and applies those insights to the future of consumer technology. The WeMedia thus turns ideas into action through its seven distinct interactive media features of Wearable Mega-Mobile Device, Robust Technology at Low Cost, Power of Research Insight, Unlimited Research Resources, Personal Health Monitor for the Mind and Body, Wealth of the Web for World Peace, and Social Networking for Freedom Worldwide.

A significant aspect of the WeMedia is its capability for activism. Watchdog activism to prevent disruptive groups such as dark networks remains a critical goal for fostering peace and security in our society (Conetta, 2006; Cronin, 2004; Department of Defense, 2008; Office of the Coordinator for Counterterrorism, 2009). As conceptualized by Raab and Milward (Raab & Milward, 2003), dark networks are organized groups of individuals involved in illegal and covert operations (such as smuggling, terrorism, human trafficking, drug running or illicit weapons trade or printing counterfeit currency). Rapid changes in technology and communication tools have transformed propaganda, information warfare, dissemination of disinformation and media misinformation in traditional warfare and the seemingly unceasing war on terrorism (Schrage, 2004). Few realize that the technology tools that empower the war on terrorism also equip terrorists and other nefarious groups in society. Even as people use social media tools to connect and communicate, miscreants and their accomplices use the same tools to further their unrighteous deeds. Soldiers are publishing information online to stay in contact with friends and family abroad, while unintentionally providing strategic information to enemy forces (Cluley, 2009). Mobile technology has been both a target and a tool of terrorist networks that use it as a medium to disseminate misinformation, plan operations, and communicate threats. Technology enables terrorists to coordinate operations and form organizations through the management of information. Managing information is salient to devising appropriate strategies in order to dismantle terrorist entities (Cluley, 2009). Information advantages can severely

tilt the balance of power between sovereign governments and their adversaries. Studies have shown that lack of adequate information was costly in the run-up to the Iraq War (Desouza, 2009) and in dealing with the insurgency in Iraq Desouza & Wang, 2007). Terrorist networks are governed by information exchanges between the nodes of the network, and it is this very exchange of information that fuels the network. The intelligence apparatuses of nation states expel great energy and resources to infiltrate these networks to obtain valuable information (Desouza, 2009). The WeMedia's ethical features are designed to check such negative uses of technology.

On the other hand media entities face a different challenge. As media organizations explore innovative ways to target prospective partners in their communities, the WeMedia provides powerful media engagement strategies that convert readers into activists, advertisers, donors, content contributors or volunteers. The WeMedia engages and encourages users to consume content, involve citizens worldwide to comment and contribute as active stakeholders. The rise of social media tools has magnified the WeMedia's potential to re-energize content distribution, disseminate research resources, and track critical information to empower professionals to lead.

7. Conclusion, Implications and recommendations

This concluding discussion covers the role of CSF prototyping in technological forecasting and social change. Dramatic changes in mobile technology, media management, journalistic culture, and user-generated content are transforming the consumer technology landscape. This article reports original research that incorporates CSF prototyping to facilitate conceptual and contextual thinking to recommend features for a futuristic media technology named WeMedia for the for the interactive media milieu.

Drawing upon a meta-analysis of the theory and practice of CSF, this article reports research that delineates WeMedia as a futuristic interactive media tool. As a conclusion to this article, we report three important lessons learned from this study.

7.1. First lesson: CSF and the future of media

The first lesson is the important role of CSF in advancing new theories, scenarios and visions in re-shaping the future of the consumer technology landscape. CSF prototyping facilitates conceptual and contextual thinking about consumer technology and enables innovators to conceptualize how technologies may foster social change in the interactive media milieu. Consumer technologies and the media do not exist in isolation but they benefit from each other. The power and peril of technologies drive the development of its social structure, cultural values and creative science. This is especially true for media technologies that have become ubiquitous and pervasive, embedding themselves not only into laptops, desktops, and the Web, but also into mobile devices, cars, medical equipment, toys and other artifacts of consumer technologies.

Such media trends have spawned new genres of ubiquitous interactive media. In this changing milieu, media consumption is emancipated from restrictions of time and places (e.g., breakfast table, living room, office). Indeed, most citizens now consider as given their access to ubiquitous consumer technology. The rapid diffusion and adoption of new mobile technologies have transformed media consumption. In this emerging consumer technology landscape, media companies are faced with both opportunities and challenges. In addition to traditional newspaper production, newspaper firms need to respond to the increased magnitude and fragmentation of consumers' daily media use by developing ubiquitous information environments capable of leveraging value-adding media services in a cost-effective way. However, designing computing environments with the capacity to support media

services adapted to a multitude of devices (PCs, mobile phones, handheld computers, e-paper devices, and so on) and audience contexts (home, work, car, on the move, and so on) is a challenge in itself.

7.2. Second lesson: The WeMedia prototype fulfills essential human needs

The second lesson relates to the relevance of the WeMedia, as a future consumer technology prototype that is geared to address critical needs for human information. The WeMedia prototype incorporates CSF to facilitate conceptual and contextual thinking about the future of media. As a prototype designed to thrive in the interactive media milieu, the WeMedia empowers people with knowledge and fulfills seven essential aspects of human life. Two significant features of the WeMedia comprise the "Wearable Mega-Mobile Device" and the "Robust Technology at Low Cost." These features will enable WeMedia users to personalize and customize a technology without worrying about its cost.

The Internet-enabled consumer technology landscape has been considered as a zone of freedom and empowerment. To this end, two WeMedia features, **"**Wealth of the Web for World Peace" and "Social Networking for Freedom Worldwide" help consumers connect with their community. As a consumer technology tool, the WeMedia empowers users with data and health monitoring to fulfill important human need for information. The "Unlimited Research Resources" feature provides users with critical information for specific careers such as research resources for educators and students, commercial data for those in business and the government. The "Personal Health Monitor for the Mind and Body" feature tracks physical and mental wellbeing with a myriad of healthcare resources.

Like all technology, the WeMedia consumer technology prototype is ethically neutral but its applications are not. So, a defining aspect of the WeMedia is its Achilles heel-like frailty. In spite of its overall strength, the WeMedia gets deactivated for 12 hours if a WeMedia user feeds it with false or dubious information. The WeMedia may be instantly re-activated when the errors are corrected. This feature illustrates the need for ethical use of technology. By itself, technology is neither good nor bad. However, the WeMedia raises the ante for a consumer technology tool by propounding ethical applications for favorable environmental, social, and human consequences.

The WeMedia also highlights its sustained relevance as an innovation that negotiates three challenging media trends. First, the ongoing convergence of different information and communication technologies trigger the emergence of new channels for media content (Lyytinen & Yoo, 2002). Second, the average consumer has access to a range of powerful digital and mobile devices that have contributed to changing technology use patterns and behavior (see e.g., Henfridsson & Lindgren, 2005]. Third, the media industries meld boundaries among different media domains (Fidler, 1997). For instance, many traditional newspaper entities have diversified beyond newspapers printing to multifaceted dimensions such as online publishing, web content, radio, and e-commerce in their transformation as media companies (Ihlstrom, et. al, 2004).

7.3. Third lesson: The Power of CSF

The third lesson relates to the power of CSF to harness the creativity of artists, the intelligence of technologists, the skepticism of management theorists and the pragmatism of consumers to develop new theories, scenarios and visions to supplement technological advances and their social and commercial implications in re-shaping the innovation process.

The persistent dilemma between the power and peril of technologies emanates an implicitly deterministic model of human behavior against the concepts of personal choice, individual responsibility, and free will. The WeMedia's role in providing fact-checking features help us

understand that there is no right answer, and that each must ultimately arrive at his or her own interpretation of the truth—an ambiguous and subjective conclusion the very nature of which is at odds with the objective endpoint of most communication efforts.

Journalists like David and activists like Anita, who have devoted years immersed in the rational, objective world of truth-seeking may explore more subjective domains such as philosophy or ethics while maintaining a comfortable connection to the familiar.

Similarly, CSF enables people to who have no experience of prototyping to enjoy the challenge of developing their own science fiction tool. The task can engender both heightened appreciation for the challenge of creation and determination to pay more attention to the creative, non-technical sides of journalism and activism, just to cite two fields.

Given the rapidly shifting nature of consumer technology, the accelerating pace of interactive media and the controversies surrounding current technology use, science fiction is more relevant to media now than ever before. For both the content creator and the audience, science fiction can inspire new achievements while warning us of possible dangers, frame moral and ethical dilemmas in understandable terms, and most importantly, help make sense of a rapidly changing world by putting a human face on looming technical developments. Science fiction can disabuse us against ignorance, ethical conduct of research, and the debilitating threat of technological change. But, ultimately, citizens in a society must weigh the plain truths behind fact and fiction, consider the power and perils of new technologies, and use all the tools at their disposal to ensure that the people's interests are served. It's a lot to ask, but the power of modern media demands a lot from its people.

The WeMedia is powered by a mass-mediated participatory network that has enabled users of consumer technology to work collaboratively, generate and disseminate news and other forms of media content, entertainment ideas, creative work, and connect with people who share similar interests. This participatory network has enabled new voices that empower people and democratize access in the consumer technology landscape (Henfridsson & Lindgren, 2005).

The larger social contribution of this participatory network may be that it increases manifold the ideas in the marketplace. In theory, the participatory network subverts the engulfing hegemony of corporate entities that monopolize the consumer technology landscape (Fidler, 1997). As an artifact of this participatory network, the WeMedia empowers its users with omniscient knowledge combined with infinite awareness, understanding, and insight. As a creative science prototype, the WeMedia thus enhances the consumer technology landscape

The WeMedia features a robust combination of sophisticated technology with low barriers to entry and instantaneous outreach to billions of users. Bloggers, citizen journalists and consumer activists intensify the interactive media milieu by acting as watchdogs of not just the government but also of corporate entities. CSF has thus helped us conceptualize WeMedia as an essential information tool that empowers citizens to thrive in the consumer technology landscape of the future.

Acknowledgment

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