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MONSANTO'S FORAY INTO SOCIAL MEDIA: A GROUNDBREAKING EXPLORATION

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Abstract:
Experiments play a crucial role in high school physics education, providing a solid foundation for establishing concepts and discovering laws in physics. Experimental teaching is an essential component of the physics curriculum, as it aids students in understanding fundamental principles, developing basic skills, and cultivating scientific thinking. Relying solely on textbook knowledge and teacher lectures is insufficient for students to thoroughly grasp and comprehend physics concepts. By incorporating physics experiments, students can effectively integrate theoretical knowledge with practical exploration, facilitating the transformation of textbook knowledge into personal understanding. This article presents a specific simulated apparatus for high school physics velocity experiments, aiming to improve the accuracy and convenience of simulating physics velocity experiments through equipment enhancements.

Keywords: Physics; Velocity Experiment; Simulated Apparatus

Abstract: This study delves into the profound impact of information and communications technologies within the context of sociohistorical conditions, echoing Karl Marx's recognition of their dual nature as tools of both capital and labor. As Marx anticipated, these technologies have evolved to possess subversive potential, capable of either reinforcing capital's dominance over labor or being harnessed by labor for challenging power structures and political redistribution. Drawing from Dyer-Witheford's contemporary perspective, the research highlights the inherent vulnerabilities within capitalist social relations and their potential to catalyze a more equitable future.
Dyer-Witheford's framework positions the information revolution as a lens through which to analyze social conflicts rather than viewing progress through a deterministic lens. Digitalization, a cornerstone of capital's expansion, paradoxically provides the channels for disparate sectors of social labor to converge and form strategic alliances. This study explores the concept of "the other globalization," acknowledging the ability of global counter-movements to co-opt communication channels to reconstruct themselves and bolster resistance efforts. The Constituent Imagination anthology further underscores the pivotal role of information and communications technologies in empowering social movements within their ongoing struggles.
Keywords: Information Technology, Social Movements, Digitalization, Capitalism, Resistance Strategies

Introduction

As Karl Marx (1846, 1975) recognized long ago, the design, development, and deployment of machinery and technology emerge under particular sociohistorical conditions. In discussing the advances being made in the communications technologies of his day, Marx similarly perceived the subversive potential of such technologies, which could function as both a weapon of capital to impose its power relations on labor and

as tools that can be appropriated by labor in its own struggles against capital for a redistribution of political power. The technological advances in communications thus represented a dualedged sword forged by the bourgeoisie that would play a role in its own undoing (Marx, 1975; Marx & Engels, 1962). In a more contemporary rendering, Dyer-Witheford (1999) also seizes on an immanent weakness inherent in capitalist social relations and glimpses within capital's expanded drive to commodification forces that might be co-opted to bring about a more equitable future. The framework he develops in his work situates the information revolution as a phenomenon that can be analyzed most successfully when construed as a social conflict rather than the outcome of science's teleological march toward progress. Digitalization, which contributes to the technical infrastructure necessary for capital to expand its commodification drive, also furnishes the channels within which different sectors of social labor can come together and develop strategic alliances. Dyer-Witheford (1999, p. 131) therefore speaks of "the other globalization," in recognition of the ability of counter-movements around the world to co-opt global capital's means of communication in order to reconstruct themselves and help in their resistance struggles. The *Constituent Imagination* anthology similarly offers a variety of works that elucidate the importance of information and communications technologies for social movements in their struggles against capital (Shukaitis & Graeber, 2007). Cleaver (1994, 1999), in referring to an "electronic fabric of struggle," also provides us with an analysis of the subversive potential afforded social movements through the active use of digital communications technologies. To cite the no doubt most well-known example, the Chiapas uprising was bolstered by the ability of those involved to alert the world to their plight and to build alliances with other movements around the globe through the use of information and communications technologies.

Of course, the appropriation of digital media by various activists has today become a theme and topic of discussion that goes well beyond Marxist circles. For example, Yochai Benkler (2006) outlines in explicit detail the multiple alternative and Indymedia projects that have blossomed in direct response to the increased proprietary control being exerted by capital over social information. Similarly, although seldom from an explicitly Marxist perspective, a considerable corpus of theoretical and empirical literature has been developed over the last two decades that examines the way that computer-mediated communications technologies have become potent tools in the arsenals of various social movements (Diani, 2000; Melucci, 1996; Pickerill, 2003; Wright, 2004). There is a clear recognition among many social movements that a significant component of campaigning for social change encompasses the production and dissemination of information that challenges the systems of meanings developed by corporations and their sympathetic allies in government. Compared to traditional media, computermediated communication offers powerful development and distribution capacities that allow an organization to craft, control, and circulate its messages to potentially large and widely dispersed audiences at relatively low cost. This is certainly not meant to discount the very real material and intellectual resources required to create and maintain computer-mediated communications networks and their content; requirements that can limit an organization's ability to avail itself of these technologies. These potential constraints notwithstanding, the relative economy, flexibility, range, and increasing sophistication and user-friendliness have helped make the use of some level of computer-mediated communications almost ubiquitous among many social movements. As de Wilde et al. point out, "The Internet is not used as a mere supplement to traditional media, it also offers new, innovative opportunities for mobilizing and organizing individuals" (as cited in van de Donk, Loader, Nixon, & Rucht, 2004, p. 6).

But remaining consistent with our previous metaphor, the double-edged sword cuts both ways. In addition to unyielding aspirations to commodify cyberspace, the corporate world has begun to learn from its

opponents about the potentially subversive applications of computer-mediated communications. As the Critical Art Ensemble pointed out more than a decade ago, corporate reappropriation of information and communications technologies will have implications for "tactical advantage and … the degree of resistant intensity" (Little, 2009, p. 196). Corporations are beginning to awaken to the perceived need to fill the "cracks that appear in the mediascape" that social movements have been exploiting to their advantage (Meikle, 2002, p. 120). For example, Monsanto learned some time ago about the value of the Internet in influencing the message being disseminated publicly about genetically engineered crops. The company's director of communications, Philip Angell, admitted to *The Wall Street Journal* that "maybe we weren't aggressive enough. … When you fight a forest fire, sometimes you have to light another fire" (as cited in Monbiot, 2002, para. 11). That is, Monsanto drew on its lessons from the widespread refusal of genetically engineered food in Europe in the late 1990s, a refusal that was nearly the undoing of the company – Monsanto executives identified the Internet as the medium that had facilitated the rapid and expansive uptake of European protest against its products. Jay Byrne, former Monsanto director of Internet outreach, counseled colleagues beyond the company to "think of the Internet as a weapon on the table. Either you pick it up or your competitor does, but somebody is going to get killed" (as cited in Monbiot, 2002, para. 12). Despite its objectionably violent content, this sentiment nonetheless aptly demonstrates the corporate recognition of the benefits a reappropriation of computer-mediated communications technologies can provide in service of broader strategies of capital accumulation.

Against this general background, the intent of this paper is to elaborate on the communications strategies employed by Monsanto, placing particular emphasis on the way the company is beginning to employ new social media as an integral element in its attempts to influence broader debates around industrial agriculture and biotechnology. Aside from the pragmatic reason that among the dominant biotech companies Monsanto is at the forefront of engagement with social media, I also chose to focus on Monsanto because it is the clear market leader in the agricultural biotechnology industry. Through a concerted campaign based on aggressive corporate mergers and acquisitions in the 1990s, as well as partnerships with some of the other large players in the agricultural biotechnology sector, Monsanto required less than a decade to emerge as the largest player. Indeed, Monsanto accounted for 23% of the global genetically-engineered seed market, which was worth $6.9 billion in 2007. Perhaps most dramatic in terms of level of control, it is estimated that 87% of the total land area across the globe planted with genetically engineered seeds was sown with Monsanto products in 2007, either directly or through licenses to other companies (ETC Group, 2008).

Yet the company's stellar rise to prominence in the industry has not been uncontroversial. In fact, even before its rebirth as an agricultural biotechnology company, Monsanto had a checkered past as a chemical company that had produced a variety of carcinogenic products and was responsible for a number of environmental and human health calamities. In establishing itself as the market leader, Monsanto allegedly pursued ownership interests in a wide variety of potential competitors not only to expand and consolidate its existing seed-trait monopolies but also to block development and market entry of alternative herbicide-tolerant seed varieties that would have facilitated increased competition. In a class action brought against Monsanto by Texas Grain in 2007, it similarly was claimed that Monsanto leveraged its market power in seed-trait markets in such a manner as to reduce competition in the separate herbicide market, thus permitting it to engage in supracompetitive pricing for its glyphosate herbicide formulations ("Texas Grain Storage, Inc. dba West Chemical & Fertilizer v. Monsanto Company," 2007). Although Monsanto and other

biotechnology companies are quick to assert that the putative higher yields of their genetically engineered seeds more than offset any price increases, recent evidence contests such claims.

In fact, the West Virginia Office of the Attorney General has launched a probe into whether the company engaged in unfair or deceptive practices in marketing its latest type of genetically engineered soybean seeds. Investigators are basing part of their investigation on the U.S. Department of Agriculture statistics and several studies by agronomists that dispute Monsanto's advertised claims of increased yields for these newest seeds (Gillam, 2010). A more plausible explanation for increasing costs is that the heavy industry consolidation witnessed over the past decade has resulted in an oligopolistic market structure in which the largest actors are able to increase prices while reducing the supply of non-genetically engineered seed varieties. Neil Harl, an agricultural economist at Iowa State University who has studied the seed industry for decades, estimates that Monsanto has "control over as much as 90% of (seed genetics). This level of control is almost unbelievable. . . . The upshot of that is that it's tightening Monsanto's control, and makes it possible for them to increase their prices long term. And we've seen this happening the last five years, and the end is not in sight" (as cited in Leonard, 2009, para. 12).

As a result of these purported practices, both the U.S. Department of Justice and at least seven state attorneys general have announced that the company is being investigated for possible violations of antitrust laws (Fitzgerald, 2010). Aside from committing possible antitrust violations in order to consolidate its market position, Monsanto also is known for its aggressive litigation practices against farmers accused of using its genetically engineered seeds without a license when engaging in millennialold practices of seed saving and re-use.[1] Typically portrayed in a register that invokes the David versus Goliath trope, these practices provide additional fodder in the arsenal of activists who also challenge the health, environmental, and efficacy claims made by the company in respect to its genetically engineered seeds. As a global leader in agricultural biotechnology and a controversial target that attracts a substantial amount of opposition from a variety of activists across a range of issues, Monsanto provides an opposite subject for studying some of the corporate organizational communications strategies being adopted in the Digital Era.

The main empirical evidence offered in this paper derives from interviews I conducted in late 2009 with various communication personnel at Monsanto corporate headquarters in Creve Coeur, Missouri (a suburb of St. Louis). Tami Craig Shilling, public affairs director at Monsanto, arranged for me to speak with five interview informants, all of whom are engaged with various communications functions throughout the company. Although I originally was scheduled to speak with Ms. Schilling, she was unexpectedly unavailable on the day of my visit. Two of the interviewees are directors and the other three are line employees. All interviews were recorded with an audio device and later transcribed. In what follows, my account relies heavily on the information provided by Mica Veihman, director of social media; and Glynn Young, director of electronic and employee communications. Given their managerial positions and integral role in driving Monsanto's new communications strategies, I believe their comments accurately reflect the company's corporate position on the issues discussed in this article. In a further effort to ensure the validity of these findings, I also sent them to Ms. Shilling for her review and comment.

[1] According to a report issued by the Washington, DC-based Center for Food Safety, Monsanto has an annual budget of US$10 million that includes a toll-free number for people to inform on others suspected of "seed piracy" and a staff complement of 75 people who are dedicated to investigating and prosecuting farmers. According to this same report Monsanto has launched patent infringement lawsuits against almost 100 farmers in the United States. As of 2005 Monsanto had been awarded over US$15 million in the United States against farmers, although that number underestimates the true amount collected by Monsanto since it does not include those sums obtained in the large number of lawsuits settled out of court (The Center for Food Safety, 2004).

In setting out my arguments, the first section of the paper will outline the general communications structure and strategies traditionally employed by Monsanto in what we might consider "Web 1.0." The following section goes on to discuss the motivations and aspirations driving Monsanto's recent foray into social media, as well as the main uses made thus far of these technologies. As we will see below, Monsanto's appreciation of the potential powers and benefits of new social media to its broader communication strategies has been relatively recent. In order to make sense of this new situation, the penultimate section of the paper rehearses some of the main elements of the concept of "framing," which, along with a basic political economic analysis, provides what I believe to be a suitably rigorous theoretical frame on which to develop an analysis of the empirical evidence offered in the previous two parts of the article. As will be made more evident in that section, framing is particularly apt because it helps explain not just the use of new social media but the messages Monsanto is endeavoring to make mainstream in respect to agricultural biotechnology. But aside from conceptual acuity, I also hope that the findings and their analysis offered in this article furnish activists with guideposts of where they will need to respond and possibly regroup in order to check Monsanto's efforts to control the discourse around agricultural biotechnology. Thus, by way of conclusion, I will offer some broader observations about what implications these results might portend for social movements mobilizing against agricultural biotechnology, as well as future areas of research suggested by, but beyond the scope of, the present work.

Monsanto's Communications Strategies—Web 1.0

Aside from typical corporate promotion of its products and its financial performance, Monsanto, as an industry leader, devotes a substantial amount of effort to issues management and education around agricultural biotechnology. Engaging in what Mica Veihman, a company director, refers to as "basic education," Monsanto provides answers to various questions about the technology, such as: What is it? Why is it good? What is the safety record with it? How is the testing done? . . . and so forth. Organizationally, Monsanto has a number of communications teams structured around the company's multiple target audiences. The mandates and parameters of these groups are established according to the audiences with whom the company needs to communicate, the type of people who need to be in place in order to develop relationships and have those types of dialogue, and the different channels to be employed to disseminate messages to these various audiences. For example, the government affairs group works with policymakers and lawmakers; an industry affairs group is responsible for outreach and communication with industry stakeholders, including customers and other entities in the value chain; a corporate marketing team is responsible for controlled messaging through advertising and marketing activities; and a public affairs group is primarily responsible for outreach to the media.

An executive communications group scouts out speaking opportunities for the executive team at various external venues. Although by default many of these fora are focused on agriculture, an effort has been made in the last couple years to insert executives into nontraditional settings in an attempt to explore more opportunities outside of the agricultural industry and talk more broadly with people who are interested, among other things, in climate change, population growth, and meeting different needs for the developing world. As we will see below, this aligns closely with some of the messaging the company is currently constructing around agricultural production, sustainability, and feeding the world.

Monsanto also maintains an employee communications group that, utilizing mainly the intranet, is responsible for broad communications across the approximately 20,000 people employed by the company. Visited on average 2.2 times per day, the intranet allows employees to rate stories, leave comments, and even set up their own blogs. As part of its efforts to keep abreast of relevant news items, Monsanto

subscribes to Nexus. Through this arrangement, the company is able to import news into its internal communications with employees, who are thus given access to stories from all the major news sources. In fact, the in-house research team aggregates news from a variety of traditional and online media sources for wider dissemination within the company. In order to expand this information function, Monsanto is currently working with an outside agency to develop its overall system of information collection, distribution, and disposition. Interviewee Glynn Young is quick to add that the company posts all stories internally, not just the favorable ones. The belief is that by making accessible bad, critical, indifferent, neutral, and positive news employees will be furnished with a broader and more complete understanding of the environment in which the company operates. According to Young, "Our philosophy is, if employees understand that – the better they understand that environment, the better they are able to do their jobs." Although senior management was initially less thrilled with this degree of openness, Young argues that this approach makes strategic sense since most employees, in fact, are able to access this information through external sources. By making it readily available, the company is better positioned to proactively comment on a news item, indicating what the company line is, and how and why it might differ from the news story. In this way employees are equipped with the information the company considers vital to talking about a particular issue. As a complement to providing access to news sources, the company also uses employee-accessible internal wikis that contain the company's latest position on any issue that has been cleared for external distribution. Employees are then free to circulate this information beyond the company, as they deem appropriate.

The bulk of message development at the company falls within the purview of the public affairs group, with appropriate input from and coordination with the government affairs and industry affairs groups, who then craft a particular message in a way that is appropriate to their respective audiences. As part of its efforts to develop and disseminate the broad message platform for the company, the public affairs group has a team that engages in media relations in order to get stories placed that are positive about the company, biotechnology, and industrial agriculture. Media relations are split between mainstream and trade so there is also a team that conducts outreach to the agricultural trade media. Other teams within the public affairs group engage in outreach in respect to financial information, research science, and some food publication. An in-house research team compiles a monthly media report that outlines what was the sentiment and tone of media coverage of the company for that month, with tone classified as positive, neutral, or negative. This report also tracks seven categories of news items employed as barometers for assessing the company's reputation. In addition to monitoring how much and the type of coverage the company receives in each of the seven categories, these reports assess and compare the coverage afforded Monsanto against the rest of the industry, which includes all of its competitors and most of agriculture in general. According to Veihman, Monsanto consistently garners the highest amount of coverage compared to any of its competitors or other industry players. Of course, with the greatest amount of coverage also comes the, no doubt, unenviable position of being the industry whipping boy, such that negative news in respect to agriculture and agricultural biotechnology in particular is typically a lightning rod for attracting criticism against Monsanto.

In the past, communications personnel engaged in media outreach, promotion, and issues management. The difficulty with this model was that staff rarely had the opportunity to engage in promotion activities because they were so busy reacting to the myriad issues bombarding the company from without. Similarly, as Veihman tells it, the company tended to be confronted repeatedly by the same issues, yet it failed to develop an easily accessible institutional repository of responses. The result was that communications

personnel were constantly having to redevelop responses to issues rather than consolidating previous best practices. In order to address the shortcomings of this strategy, Monsanto recently designed and implemented a "promote, influence, and respond model" of communication. The promote function, to which the media team is dedicated, centers around efforts to disseminate and achieve wide distribution of those stories that the company wants to tell. The second element of the model, influence, focuses on questions around how to talk to people who have influence over others and who are thought leaders well positioned to help carry Monsanto's message. This function typically falls within the purview of the government affairs and industry affairs outreach teams. The respond function, which is driven by issues management concerns, tends to be executed by the social media team. Moving forward, however, the goal is utilize social media beyond response to engage in promotion functions. As will be elaborated more fully below, rather than have to continually respond defensively, Monsanto is endeavoring to develop and drive a conversation different from the typical questions regarding whether the technology is safe, whether it is really yielding, and whether farmers really are benefiting.

Part of the challenge in developing the company's online presence revolves around surmounting an acquired internal mindset among some staff, particularly those involved with traditional media, that views online media as secondary and tangential. As Veihman asserts, any online plan requires just as much advance thinking and planning as other media outreach pieces. Both Veihman's and Young's teams are thus working diligently to get the message out within the company that online channels need to move beyond being considered mere complements within which to place the messages developed for traditional media. Rather they need to be employed as important venues within their own right that based upon the issue in question might need to contain their own distinctive content. In Veihman's own words, it is a matter of "proving the value of … online, I think, as well, and getting people to think about it holistically versus the 'yeah, and you throw your news release up on the Web site.' "

As part of its online communications strategy, Monsanto is engaging in what it calls the Global Web Presence project, through which the company is striving to create a common look and feel to all of its Web sites around the world. Whereas in the past Monsanto, like many other companies, would typically develop various project-driven Web sites that varied in size, variety, design, content, and longevity, the current project is dedicated to consolidating best practices to design a global Web site template that both corporate headquarters and subsidiaries can populate with content specific to a particular locale. The overall goal is to create an international web presence based on a consistent and readily recognizable look for the company's Web sites while remaining tailored to local conditions. Within this broader project, search engine optimization continues to be a high priority for the Web team. Young, who has direct responsibility for the corporate Web site, says the top search rankings are now more "balanced." While in the past a Google search for "Monsanto" would retrieve the corporate Web site followed by "nine really nasty things about the company," today the top results contain "a positive thing or two, a couple of neutral things, and then maybe … the nasty stuff." One of the main prongs in the strategy to achieve this goal relies on ensuring that the web team codes and writes headlines in ways that correspond to people's information-seeking behavior. Young is quick to assure that "we don't manipulate information," but instead try to ensure that the information people are searching for is readily captured by various search engines. There also has been a marked increase over the last few years in the amount of traffic coming into the main Web site. Perhaps more interesting is the source of this traffic, which historically tended to be either directly when users typed the Monsanto URL into their web browser, or through a search engine (mainly Google). Now

Facebook and increasingly Twitter are among the top five sources for incoming traffic to www.Monsanto.com.

Monsanto Discovers Web 2.0

Yet it has only been relatively recently that Monsanto began to recognize the potential opportunities offered by what is popularly referred to as "Web 2.0" and new social media technologies. The awakening to social media and the importance of an active online presence emerged internally as a number of people began to see how much traction various actors were achieving online, especially activists. The online presence of this latter group was especially disconcerting for Monsanto, which perceives activist information about the company as oftentimes taken out of context, spun from an oppositional perspective, or even patently false. Taking note of these developments, a few key individuals within the company, according to Young and Veihman, began advocating for the necessity to monitor and engage with what was occurring online, including ways that people and various groups—and again, especially the activists— were networking and building relationships to drive information. And, as noted above, although the company has long had a Web site presence, up until about this same time it tended to be relegated to secondary status in terms of overall media and information dissemination strategies. With this new emphasis in place a dedicated staff member was tasked with responsibility for social media, and the public affairs team was doubled in size in 2008 in order to establish a full-fledged social media team.

In order to operationalize this new recognition of the importance of the web and new social media as critical components of how the company communicates with people, Monsanto began placing unique content on its Web site. Although still struggling with this, according to Veihman, the company is striving to position itself as a credible source of information. In part the motivation for this comes back again to issues management; in this case the need to respond to and counter negative information being circulated online by the company's opponents. For example, in the past an online search about "Agent Orange and Monsanto" would return a wealth of hits around activist Web sites, but Monsanto itself had nothing about this topic on its own Web site. Yet the company's search statistics revealed that the most searched term on www.Monsanto.com was, in fact, "Agent Orange." So from an issues standpoint, Monsanto realized that it needed to insert its own information into cyberspace. Thus was born a new section on the company Web site called "For the Record," which provides the company position on a wide variety of issues. Limited to 500 words or less, these entries are written in a very conversational tone for people who do not necessarily have a background in agriculture or who perhaps do not know what the issues are that attach to agricultural biotechnology. Some of the topics handled here include: terminator genes; whether the company sells terminator traits; why it maintains intellectual property protection over its seeds; why Monsanto sues farmers; and what Veihman regards as "any kind of crazy rumor, including farmer suicides in India."[2]

[2] According to a number of social activists, particularly Vandana Shiva, the massive increase in the number of farmer suicides in India is directly attributable to World Bank and International Monetary Fund structural adjustment policies in the late 1990s that forced open India's seed market to foreign corporations. Companies like Monsanto, Syngenta, and Cargill flooded the Indian market with patented seeds that not only could not be saved and re-used but that also required a suite of high-cost inputs to grow. The result was a staggering increase in debt loads farmers were forced to take on, which became absolutely crippling in bad harvest years. Monsanto's dismissal of responsibility and dispute of the actual number of suicides notwithstanding, its culpability stands in rather stark contrast to the message it is articulating around helping farmers and feeding the world. [3] It is interesting to note the degree of concordance between Monsanto and many activists on this point. While conducting previous research among social activists opposed to various aspects of agricultural biotechnology, a consistent theme that emerged was the typical lack of critical media coverage of biotechnology beyond its financial implications.

Given the vast nature of the information sources found on the Web, it also became obvious that these efforts to build out the company Web site required additional complementary strategies to establish a stronger online presence for its messages. So the company established a Facebook page and a Twitter account. Again, both of these things were driven primarily from an issues-management perspective. Unlike a lot of companies that tend to employ these tools to talk to customers for promotional purposes and to build brand loyalty, Monsanto adopted more of a defensive position. Says Veihman:

We need to be out there because somebody else may take our space, and we need to know what people are saying because so much of these rumors and attacks start online, that we have to be able to monitor the conversation.

Indeed, one of the challenges specific to online media is the relative ease with which opponents are able to enter into conversations in ways that are seldom possible with traditional print and broadcast media. Similarly, it is more difficult to target your audience when using social media than is the case with the traditional media, particularly print media. Despite these types of strategic challenges, Veihman believes that new social media also allow the company to compensate for some of the decreased coverage of science and technology by the mainstream media, most of which tend to cover agricultural biotechnology solely from a financial performance perspective.[3] But online a number of very specific blogs have emerged that elaborate on science and technology issues and into which Monsanto would like to be plugged. Aside from being produced and read by scientists, several of these blogs are helping to explain the technical aspects of the science to a general audience. Monsanto also employs these various social media technologies in synergistic ways. So, for example, it tweets about things on the blog, various posts on the Web site direct users to the company blog, or to Facebook, YouTube, or Flickr and vice versa.

There is also some crossover between traditional media and new social media, such as the company's YouTube channel, which streams several Monsanto television commercials.

In their first year of operation in 2008, Facebook (Monsanto has around 2,600 fans as of mid2010) and Twitter (the company has around 4,600 followers) were for the most part used passively as virtual places to monitor and "listen" to what was occurring. In fact, social media, particularly Twitter, have been helpful in alerting Monsanto to imminent issues much faster than has been traditionally the case. Moreover, these media enable the company to monitor in real time how a conversation about a particular issue is developing and from what perspectives it is being discussed, especially among activists. These two social media were followed in the subsequent year with Monsanto's blog "Beyond the Rows," in which employees write about the company's business, the agriculture industry, and the farmer. In response to the documentary "The World According to Monsanto," the blog was originally entitled "Monsanto According to Monsanto," until being renamed in November 2009. As outlined on the blog, its purpose "is to speak to Monsanto's vision of the world of agriculture and biotechnology and truthfully explain the company for what it is." Part of the motivation behind creating the blog was the ability this medium provides to address issues quickly, to launch and sustain conversations about different topics, including controversial ones, with people online, and to do so in a much more informal way that is unburdened by legal restrictions around official corporate positions. As might be expected, reader comments are moderated, although it is stated on the blog that negative and critical comments will be approved as long as they are not profane or threatening. Company responses to comments are offered only when doing so provides clarification on a particular point or topic. Indeed, given the relative ease in initiating and sustaining online conversations using new social media, Monsanto is also forced to be strategic in terms of how and when it will respond to critics. Such decisions are impacted by the level of wider influence enjoyed by a critic as well as the level

of attention a particular issue is projected to attract. As Veihman makes clear, it comes down to the basic and age-old calculus of whether you respond to something and risk lending it additional attention or instead remain silent and let it die a quiet death. Again, one of the benefits of online media is that they often function as a type of early warning system that alerts the company to whether or not a particular issue is receiving traction, and if so, what type.

The thematic content for the Monsanto blog is determined by the issues management team, which also researches and writes the posts. According to Veihman, this was a somewhat flawed approach since it meant that only a few people within the issues team were writing week to week, which made it difficult to develop a consistent voice with which people could identify and learn from. Indeed, this problem still poses a complication since no one on her team is a dedicated blogger. Instead, people write as time and opportunity allow, which is certainly not ideal given the substantial amounts of information with which most bloggers need to engage when developing meaningful posts. Thus as an organizational issue, the challenge is how to populate the blog and utilize it effectively while still allowing bloggers to execute their primary job responsibilities. Although the blog apparently has garnered a significant amount of traffic among employees, a few other pro-biotech people, people interested in the company, as well as a number of activists, Veihman says that things are undecided in terms of moving forward. At the time of its launch, even though it was created as an issues blog, not much thought was put into how long it should last, and what should occur once most of the big issues had been covered. This admission highlights again the reactive impetus for Monsanto's entrance into Web 2.0, which could portend serious implications for the ability of the company to sustain its efforts in this new communications environment. Nonetheless, Veihman suggests that there may be more opportunity to do things other than issues management and to talk about other things beyond agriculture that the company believes merit discussion.

As mentioned above, one of the chief opportunities Monsanto perceives in new social media is the ability to move beyond response to promotion. That is, rather than having to continually respond to the latest accusations by activists or regulatory and policy changes, the company wants to develop a different dialogue. As outlined above, there is a desire within the company to drive a conversation beyond questions about whether the technology is safe, whether it is really yielding the promised benefits, whether farmers are truly benefiting. Instead, as Veihman points out, Monsanto wants to open up and steer a conversation about how agriculture is going to meet the needs of the world in 2050, when, according to current population estimates, there will be 9 billion people on the planet, meaning that we will have to produce as much food in the next 50 years as we have in the past 10,000. Indeed, precisely this message is displayed prominently on Monsanto's homepage across a number of moving banners populated with corresponding idyllic pictures of diverse farmers and their young families against a backdrop of fields and farm equipment. On the main Web site this message is elaborated exhaustively in the "sustainability" section, which contains a series of textual and video resources that outline Monsanto's "Produce More. Conserve More. Improve Farmers' Lives." mantra. The company has also created a separate Web site (http://producemoreconservemore.com) dedicated specifically to this message. Each prong of the triumvirate has its own section on this Web site that contains a blog, videos, photos, audio, and various text documents specific to that particular element. Given Monsanto's potentially controversial position that technology is the solution, it is readily comprehensible why the company wants to be driving this conversation as much as possible while still managing the issues. According to Veihman, the company is achieving some success in developing conversations around sustainable yield, improving farmers' lives,

and conservation as evidenced by the fact that the competition is beginning to pick up and develop similar messages.

Raegan Johnson, a member of Monsanto's communications team, also points out that the commitment to sustainable yield message is being developed intensively for internal audiences, something she refers to as "education awareness." In fact, in 2009 the company conducted an employee survey to determine how well its people understand the commitment to sustainable yield, as well as how comfortable employees are discussing this message with people outside of the company. According to Blaen Abraham, who works at Monsanto's in-house research unit, the survey revealed that almost 80 % of employees globally have communicated this message to family and friends. Indeed, internal "education awareness" appears to enjoy a prominent role within the company. Upon entering the lobby of Building A on the Creve Coeur Campus (interestingly, Monsanto refers to its various corporate sites as campuses), which houses much of the company's communications teams, one cannot help but notice the prominently displayed poster entitled "Essential Conversations," which asks employees if they "feel confident in responding to challenging questions about Monsanto by friends and family" and whether they "feel a passion to share Monsanto's commitment to farmers, new technologies and sustainable agriculture?" In order to help employees communicate with friends and families about these issues, "Essential Conversations" ambassadors lead one-and-a-half-hour "Learning Express Classes," during which participants learn where to "find out more about Monsanto and related topics/issues; how to feel comfortable in sharing your story with friends and family; and how to build relationships through conversation and engage people in a positive way." Such internal efforts aimed at garnering and solidifying support for Monsanto's mission among employees both within and beyond the confines of the workplace reinforce the company's overall communications strategy articulated above, by which the venture into the world of social media represents one prominent element within the broader, integrated communications ecology that Monsanto is attempting to construct around agricultural biotechnology.

Conceptualizing Monsanto's Use of Computer-Mediated Communications Technologies

So how do we make sense of Monsanto's relatively recent embrace of the potential benefits of new social media for its broader communications strategies in support of its agricultural biotechnology products? In order to interrogate this question, I propose a theoretical admixture that incorporates the concept of "framing," as developed by social constructionist theorists, coupled with a basic political economic approach that contemplates the way technology in general and, more specifically to the context of the current paper, computer-mediated communications have been incorporated into capitalist social and production relations. As I noted in the introduction, more than a few commentators have articulated the dual-edged nature of the Internet and computer-mediated communications, contending that the celebrated liberatory effects of these new technologies might also be reappropriated and subverted by business in service of capital accumulation imperatives. It seems to me that the communications strategies being developed and implemented by Monsanto confirm precisely this thesis. It was the success and traction that activists were achieving online, particularly through social media, coupled with a relative lack of mainstream media attention that prompted Monsanto to engage these technologies as part of its strategies to counter its opponents. From a political economic perspective, my argument is that the online success of activists when mobilizing against agricultural biotechnology, as admitted by Monsanto personnel, coupled with the persistent rejection of genetically engineered food in many countries across the globe, particularly in Europe, poses significant threats to the expansion of the industry and thus Monsanto's own future growth and profit prospects. Despite Veihman's contention that Monsanto successfully addressed the

many claims articulated by activists who have challenged the purported yield and environmental benefits biotechnology companies attribute to genetically engineered seeds, I suspect that the strength of evidence marshaled by activists has, in fact, been quite effective. Indeed, substantial research is emerging about the environmental impacts of genetically engineered crops, including such things as evolving herbicide tolerance in weeds, gene escape and introgression among wild relatives, and impacts on soil fertility as well as bird, insect, and aquatic wildlife (Belcher, Nolan, & Phillips, 2005; Desser, 2000; Knispel, McLachlan, Van Acker, & Friesen, 2009; Marvier & Van Acker, 2005; McAfee, 2003). Similarly, and again despite claims advanced by the biotechnology industry in general and Monsanto in particular, intrinsic yield increases as well as a host of additional characteristics—such as disease resistance, grain size, maturation period, and responses to biotic and abiotic stresses—have been shown to be attributable largely to the robustness of the traditionally bred germplasm rather than the one or more genetically engineered traits inserted in the seed (Clark, 2003; Gurian-Sherman, 2009; McIntyre, Herren, Wakhungu, & Watson, 2009).

Given the potential implications such remonstration poses for company profitability, a number of savvy communications personnel recognized the need to change the conversation away from questions and problems with the technology and instead open a discourse around issues that have a natural appeal to large numbers of the global population. In its efforts to craft and disseminate these new messages around agricultural biotechnology, Monsanto is availing itself of new social media that provide the company a higher level of control than would be the case with more traditional communications channels. By linking agricultural biotechnology with the rapidly approaching burden of feeding an exploding global population, Monsanto (and to a lesser extent others in the industry) is positioning itself as the benevolent corporation vital to solving potentially disastrous global problems. If successful in establishing this link among large parts of the population, Monsanto will potentially be able to diffuse much criticism by portraying opponents as narrow-minded and self-serving activists who demonstrate little care for the plight of the starving masses. At its most basic level, the decision to begin engaging new social media as part of a revamped communications strategy thus represents a strategic decision motivated by capital accumulation imperatives. If this explains the motivation, accounting for the message and its channels of delivery requires a different conceptual instrument.

Although framing as an analytic tool has been employed across a number of academic disciplines, the rendering developed and employed here draws primarily on the literature from sociology and media/communications studies.[4] Gamson and Modigliani (1987, p. 143) define a media frame as "a central organizing idea or story line that provides meaning to an unfolding strip of events. . . . The frame suggests what the controversy is about, the essence of the issue." Snow and Bedford (1992, p. 137) refer to a frame as "an interpretive schemata that simplifies and condenses the 'world out there' by selectively punctuating and encoding objects, situations, events, experiences, and sequences of actions within one's present or past environment." In general terms, frames represent broad organizing ideas employed by an individual or organization to describe or represent a certain issue or state of affairs. They can refer to a particular situation or be developed more extensively to encompass a variety of interconnected issues. Frames thus provide signposts that guide the identification and interpretation of problems, their scope, sources, and oftentimes—probable resolutions.

While it remains important to define what it is that we mean when we talk about frames, we similarly need to ensure that we do not end up reifying frames as thing but instead concentrate on the process of framing and its attendant social construction, negotiation, contestation, and transformation. Put another way, we

need to keep in mind that frames are modes of interpretation that are socially and culturally constructed and contested. At perhaps the most elemental level, Monsanto's newfound

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Many accounts, and particularly those in the sociological literature, trace the roots of framing to Goffman's (1974) book *Frame Analysis: An Essay on the Social Organization of Experience*. Tuchman (1976, 1978) and Gitlin (1977, 1980) were among the first to apply framing to media studies followed by Gamson et al. (1982) and Snow and colleagues (1986) in sociology and social movement research. fondness for social media technologies as integral elements in the company's broader communication strategy that seeks to develop and drive its own crafted conversation in respect to agricultural biotechnology reflects the basic preoccupation of framing processes, namely the mobilization and countermobilization of ideas and meanings, or what Hall (1982) has referred to as "the politics of signification." This is not to imply that message recipients are construed as a type of tabula rasa onto which the media inscribe without challenge the messages they deem relevant. Instead, framing theories are more nuanced, recognizing that the way individuals process, interpret, and ultimately assimilate information is affected by their own preexisting meaning structures and worldviews. That is, interpretation of macro-level frames is mediated by individual frames, which Entman (1993, p. 53) defines as "mentally stored clusters of ideas that guide individuals' processing of information." Frames thus aid people in making sense of experience and guiding action.

Drawing on and synthesizing a vast amount of literature from a variety of disciplines that employ the concept of framing, Benford and Snow (2000) discern the following three interrelated core framing tasks that together with discursive processes constitute collective action frames. Diagnostic framing entails the identification and attribution of the issue of interest. Prognostic framing is tasked with propounding potential solutions and means to resolve diagnosed problems. Although lacking definitive empirical proof, they point to some research that supports the intuitive connection between diagnosis and prognosis, in that the range of available solutions and their consequent strategies are typically bounded by the nature of the issues and problems identified at the diagnostic stage. The final core framing task is motivational framing, which is concerned with articulating both the rationale and a concomitant "vocabulary of motive" designed to induce and sustain action (Benford & Snow, 2000). Encompassing both oral and written forms of communication, there are two elemental and interactive discursive processes integral to the development of collective action frames: frame articulation and frame amplification. Frame articulation seeks to highlight and emphasize particular issues, information, events, or beliefs as being more salient than others. Processes of frame articulation thus involve the development of consistent and aligned narratives based on the events, ideas, information, and experiences pertaining to the issue in question in a way that will be compelling for the individuals the frame is designed to address. The amplification of particular elements can similarly reinforce articulation processes by offering the conceptual thread with which to weave together various events, information, and issues that comprise the particular frame. These amplified, punctuated renderings might thus serve as powerful synecdoches that furnish the broader frame of which they are a part enhanced visibility, recognition, and mobilizing capacity (Benford & Snow, 2000). As we saw previously, the driving motivation behind Monsanto's use of social media is to steer the conversation around agricultural biotechnology in a new direction more favourable to the company. Conceived of in terms of framing processes, Monsanto is diagnosing the overarching problem in somewhat Malthusian terms as one of a rapidly expanding global population and finite natural resources, especially

arable land and water. The consequent prognostic frame offered by Monsanto consists, not unexpectedly, of technical solutions embodied in industrial agriculture in general and agricultural biotechnology more specifically. This framing also resonates with the broader, contemporary political economic context in which technology is equated rather uncritically with progress among a majority of both business and government elites. From a motivational frame perspective, claims by Monsanto that its products are being designed to solve ecological and food shortage problems provide ready discourses grounded in ethics that on the surface prove difficult to challenge. Articulation processes and tactics are important for Monsanto in its efforts to move debates away from issues of health, yield, and the political economy of genetically engineered seeds, to a frame that articulates the need to feed the world in a sustainable way. By constantly amplifying this theme, the company is framing its interests as extending beyond its primary motivation of expanding sales of genetically engineered seeds in service of basic capital accumulation imperatives. By invoking information dissemination practices that predominantly emphasize the favourable and sanitized aspects of agricultural biotechnology and its applications, Monsanto is attempting to construct a frame that renders apparent a "common sense" need to expand the amount of global arable land dedicated to the cultivation of genetically engineered crops. The presumable ultimate goal of such strategies is to open a window of opportunity to sell as much genetically engineered seeds as possible in an attempt to integrate them so deeply into markets that potential regulated withdrawal would result in such a degree of economic upheaval that it is no longer considered a viable policy option.

In the United States, at least, policymakers appear sympathetic to these frames that position agricultural biotechnology as part of the solution to mitigating world hunger. The U.S. Global Food Security Act of 2009 (Senate 384), sponsored by nine U.S. senators from both the Republican and Democratic parties, would authorize appropriations for fiscal years 2010 through 2014 "to provide assistance to foreign countries to promote food security, to stimulate rural economies, and to improve emergency response to food crises." Having passed the Senate Foreign Relations Committee in early 2009, the bill is expected to reach the Senate floor for a vote some time in 2010. However, the bill contains a controversial amendment to include "research on biotechnological advances appropriate to local ecological conditions, including genetically modified technology." By singling out genetic engineering to the exclusion of any other named farming methods or technologies, the bill effectively earmarks agricultural biotechnology for billions in federal funding—$7.7 billion is attached to this bill. As might be expected, Monsanto has been at the lead in lobbying for this bill. According to Business Week, Monsanto spent $2.46 million in the first quarter of 2010 to lobby the federal government on various agricultural issues (n.a., 2010).

One aspect of framing processes that may prove more challenging for Monsanto is the issue of resonance, which has direct implications for the mobilizing effectiveness of a particular frame. Resonance is typically affected by the two interrelated desiderata of credibility of the frame and its relative salience to the everyday, lived experience of the people being addressed and potentially mobilized by the frame. The credibility of a frame depends, in turn, on its consistency, empirical credibility, and the verisimilitude of the individuals or organization articulating the frame. A frame is considered consistent if the claims, beliefs, and actions of a frame articulator accord with one another. That is, are the claims articulated within the context of a particular frame internally consistent and do they correspond to the actions undertaken by the frame developers. Although Benford and Snow (2000) point to a relative lack of empirical research in respect to this aspect of frame resonance, the intuitive assumption is that higher levels of consistency

between beliefs, claims, and actions will strengthen the mobilizing potential and efficacy of a particular frame. Empirical credibility is achieved when the frame corresponds to actual events in the world. Put another way, does empirical reality support the diagnostic claims advanced by the proffered frame? Again, on the surface the emphasis on feeding the world in a sustainable way is empirically credible given the data on population growth, sustainability, and climate change being generated by various international organizations. The empirical credibility of the prognostic frame, however, has been a source of challenge and critique leveled against Monsanto by a number of social activists opposed to genetically engineered seeds, as briefly outlined above. Indeed, and although certainly not the explanation offered to me, if one examines the actual experience of many farmers with genetically engineered crops, it becomes clear why Monsanto wants to change the tenor and direction of the debates around agricultural biotechnology by couching them in the rhetoric of feeding the poor, increasing agricultural production in socially and environmentally responsible ways, and contributing to environmental protection if not even remediation through such things as carbon offsets for no-till agriculture and carbon sinks for genetically engineered tree plantations.

The final element of credibility of a particular frame is dependent upon and varies according to the degree to which the frame articulator itself is perceived as being trustworthy and persuasive. In addition to knowledgeability around the issue in question, status also impacts levels of persuasiveness. Again, the assumption is that individuals or organizations with higher levels of perceived expertise on the issue of concern will attract higher levels of resonance for the frames they articulate than would be the case for frames developed by less knowledgeable and compelling framers. Here is where Monsanto will no doubt experience the most difficulties given that it is the same company to bring us a variety of carcinogenic products like polychlorinated biphenyls, dioxin, and the incredibly destructive defoliant Agent Orange. Moreover, the company is suspected of being responsible for more than 50 Environmental Protection Agency Superfund sites (an uncontrolled or abandoned environmental site contaminated by hazardous waste) in the United States (Barlett & Steele, 2008). Monsanto appears to be attempting to compensate for this credibility problem by drawing on and linking within its Web sites and social media channels to the work of external organizations that are supportive of agricultural biotechnology.

Conclusion

Contemplated through our conceptual lens of framing, the present paper is limited to a mainly descriptive, exploratory account. Nonetheless, it does provide a foundation on which additional research in respect to the capitalist reappropriation of computer-mediated communications and new social media might be built either more generally or more specific to Monsanto and agricultural biotechnology. For example, important work remains to be done employing Scheufele's (1999) typology based on media vs. audience frames and frames as independent vs. dependent variable. In the case of Monsanto, the main emphasis is on the media frame, which is dependent upon the broader goals of the company to which communications strategies are rendered instrumental. Returning to the dual-edged sword metaphor outlined in the introduction, we might also make the case that the media frame is the dependent variable from a cycles-of- struggle perspective given that Monsanto began engaging with social media as a reaction to the success activists were having in disseminating their own messages in respect to genetically engineered seeds. Put another way, the success of activists in developing and communicating their own frames directly influenced the uptake of new social media as well as the framing of particular issues in ways designed to

develop a more proactive conversation around agricultural biotechnology that deflects criticism while simultaneously promoting Monsanto's technology.

Designed to win over broader segments of the public, this active framing process is targeting more than agricultural producers in an effort to construct a new "reality" in respect to the putative inescapable need for agricultural biotechnology to mitigate an apparent pending world hunger calamity. In fact, through its own research efforts Monsanto has determined that its main customer base, farmers, do not tend to avail themselves of social media technologies in any large or consistent fashion. Although substantial numbers of agricultural producers do have access to the internet, they are online predominantly to search for news such as weather information, commodity prices, and other relevant market information. The fact that Monsanto has made social media a critical prong in its broader communications strategies, despite not being a significant source of information for its traditional clientele, demonstrates the expansive scope of the potential base of people the company is attempting to convince with the frames it is constructing around agricultural biotechnology. Again, this brings up important questions, particularly from the perspective of activists and those opposed to genetically engineered crops about how they will respond to the frames being developed and deployed by Monsanto.

It would also be quite valuable to engage in future research that treats Monsanto's media frame as the independent variable in a way that interrogates the effects these frames and these new media channels exercise on influencing audiences. Associated questions might seek to answer how individual frames influence the evaluation and uptake of the media frames being developed by Monsanto, as well as activists for that matter. The analytical implication of the presumed multiple-effects construction of reality, as discussed above, is that research into media effects needs to occur at similarly multiple levels of analysis. Indeed, Gamson (1992, p. 67), who has provided important work on social movements from a sociological perspective, articulates precisely this demand, albeit implicitly, when he bemoans the lack of theoretical work devoted to interrogating the "interplay between two levels—between individuals who operate actively in the construction of meaning and sociocultural processes that offer meanings that are frequently contested." Functioning as both a means of communicating and understanding information, frames thus occur at two levels: media frames exist at a macro level while individual frames are found at a micro level, both of which, as indicated above, are linked with and interact with one another. As we saw previously, at the corporate level Monsanto appears to be scoring some success at both levels through its employee education efforts, which reflect a concerted strategy to integrate its message around agricultural biotechnology into broader social discourses, both mediated and interpersonal. However, beyond the confines of the company these types of study are difficult given the complexities of measurement, something that, in fact, continues to vex Monsanto. In the absence of direct metrics, the company, according to Veihman and Young, relies on a combination of quantitative and qualitative measurements. Aside from basic measures of traffic volume, the web team monitors where users are navigating while on the Web site and what stories, or parts of stories, are being viewed, and what is the traffic on Twitter, Facebook, and the blog. More qualitative methods rely on assessing what people are saying within these channels about the company and more generally about agriculture and associated questions such as sustainable yield, whether and how the conversations are changing, and whether such comments are being distributed beyond these channels more widely on the web.

As this article has endeavored to elaborate, the Internet and particularly new social media technologies provide additional weapons in Monsanto's communications arsenal to mobilize and intervene in public debates and the social and political struggles being waged around agricultural biotechnology. Having

developed new message platforms around sustainability, reduced input farming, increasing yields to feed the world, and farmer benefits, Monsanto, through the use of various new social media, is attempting to make active inroads in steering the debate around agricultural biotechnology. Indeed, the discourses of "sustainable development" and "biological conservation" being deployed by Monsanto will no doubt facilitate new processes of capitalizing nature, as suggested by Escobar (as cited in Castree & Braun, 1998, p. 16). The new frames Monsanto is trying to develop might also reflect a type of rebranding effort designed to link Monsanto's genetically engineered seeds with a "green" lifestyle and values around sustainable development emerging among various segments of the population (Rosenkrands, 2004). If Monsanto is successful with these strategies, it could potentially derail much of the work activists opposed to genetically engineered seeds have conducted in elaborating the negative implications of this technology. Indeed, Monsanto's use of social media and its attempts at developing new frames around agricultural biotechnology raise a number of questions for those seeking to defeat this technoscience. For example, because social movements tend to have a more fluid, perhaps even amorphous, existence, is Monsanto better positioned to make effective use of social media technologies in influencing the debate and responding to activists? These questions in turn raise the issue about how activists should respond, or perhaps better regroup, if Monsanto is successful in leveling the cyber playing field. Or alternatively, is Monsanto, by trying to frame the debate in these "new" terms, which tend to be wider than questions about yield and safety, opening the door for activists to establish some of the broader links between agriculture and the environment and sustainability that could expose Monsanto to even more serious scrutiny and critique? From an organizational communications perspective, what might be the prospects for the long-term sustainability of Monsanto's Web 2.0 presence and success given the reactive nature of its original foray into this new communications environment? As we saw above, Veihman admits that the company's perceived need to establish a stronger online presence across various social media was mainly a responsive measure. But in executing this strategy, particularly with regard to the blog, the company proceeded without clearly articulated goals or plans, which could well result in organizational inertia and ultimately an ineffective use of online tools. Again, this is an area of organizational communications research that begs future study.

While in the end this paper has raised more questions than it has answered, my hope is that the findings presented herein might spark the requisite interest in pursuing further research designed to answer some of these queries in ways that help activists construct and articulate counter-frames in support of their struggles against Monsanto and agricultural biotechnology.

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