

Spinning science: The commercialisation of nanotech and financial news

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ABSTRACT

As nanotechnology's risks and benefits continue to be debated in both specialist science and popular media, there has been a call for more social scientists to examine public perceptions, understandings and involvement in the governance of nanoscience and technology. There has been little research into the how nanotechnology has been communicated to the investing public and as the commercialisation of nanotechnology intensifies, this area will be more significant over the next few years.

While there has been much research and scholarship developed on communicating risk to the public through popular media and the contestations over understanding science and technology in society, there has been virtually no work on communicating financial risk or critical, sociological examinations of financial journalism. This research is investigating the primary relationships between the public relations and communication firms who are promoting the commercialisation of nanotechnology and scientists who are spinning out start-ups from their nanotechnology research, and how the financial potential (and risks) of the technology is being communicated to venture capitalists, financial journalists and the investing public.

This paper will present the preliminary findings of the year-long project that is researching the commercialisation of nanotechnology in the United Kingdom and the United States.

Keywords: nanotechnology, science communication, technological commercialisation, financial news, public relations.

1 THE NANOTECH FIELD TO SOCIAL SCIENTISTS

"Nanotechnology is this great buzzword. That's fine. But people like to invest on the buzz, and investing on the buzz can lead to great things or it can lead to nothing." – CJ, U.S.-based financial journalist [1].

In 2003 the Department of Trade and Industry (U.K.) announced that it will invest £90 million over the next six years on microsystems and nanotechnology research and development initiatives. While this figure is low when

compared to spending by other governments globally on nanotechnology, such as the U.S. government's National Nanotechnology Initiative that has earmarked more than \$6.5 billion since its inception in 2001 or Japan's £200 billion by 2010. These government-funding initiatives and the placement of nanotechnology on national agendas signals that nanotechnology will become an even more significant growth area for investment in the private sector. At the same time that governments world-wide are earmarking funds for nanotechnology research, investment bankers, venture capitalists and established industry leaders are investing billions into nanotechnology research and start-up companies. Current estimates of the worth of the global nanotech industry may reach \$1 trillion in 10 years [2].

As more investment funding is driven towards nanotechnology, we are interested in how the financial potentials and risks are communicated between different stakeholders as well as in the financial media. The nanotechnology market research firm Lux Research Inc. predicted in 2004 that there will be much more "media hype" (in large part created by public relations firms that place stories for their nanotech clients in the financial media) around nanotechnology and investment opportunities [3].

Nanotechnology has become a convenient shorthand word or a label to signal the exuberant financial potentials of a technology that is so new and unproven it cannot possibly say much about what the technology is or what qualifies a product to be marketed as 'nanotech'. This issue of clarifying definitions of the technology and how it should be classified by those marketing it has become so important that the U.S. Patent and Trademark Office created a special class of patents to provide guidance to patent officers on what exactly can be classified as nanotechnology and what cannot [4]. However in our discussions with scientists, marketing firms, journalists and investors the very term nanotechnology has different meanings, depending on where you are positioned within the field. So if the term nanotech is much more complicated than we assumed it to be, the term 'nanotech company' is completely fraught. With more than 700 closely held companies and another 200 publicly listed companies involved in nanotechnology research and development (and promoting themselves as nanotech companies), hype around 'nanoinvesting' continues to rise [5].

How do nanotechnology and the hype surrounding its financial potentials appear to a social scientist? As social scientists who study new technologies and public

understandings of science, we tend to be primarily concerned with looking at the dynamics of communication that occur around a cutting-edge technology that is attracting investment funding, and which is in turn generating a lot of buzz. We focus on the connections between stakeholders and trace the networks of communication [6]. When we started looking at the circuits of communication between entrepreneurial scientists, investors, public relations firms and financial journalists who cover the commercialisation of nanotechnology, we assumed the term ‘nanotechnology’ to be a given. Even in our initial proposal for the research we referred to a ‘nanotech industry’ in order to describe what was happening to the commercialisation of the technology [7]. Of course very soon after starting our research we have quickly discovered that there is no ‘nanotech industry’ and that we were also just as susceptible to ‘nanohype’ as investors may be. We mistook a multidisciplinary engineering process for a substantive industry, an ‘investable’ industry. We also assumed that these communication traces would be visible because we assumed that most of the information mediation occurs in the financial press. These misunderstandings, however, provide us with a lot to work with sociologically speaking, because it represents the crux of our question: what purpose does nanohype serve?

2 INITIAL FINDINGS

The research is being conducted in the United Kingdom and the United States. We are using qualitative, ethnographic research methods to collect and analyse data. The initial findings presented in this paper are drawn from open-ended interviews with 14 participants who work in marketing research firms, venture capital and angel investing firms, scientific news journals, financial news outlets and financial papers of record, and scientists who are commercialising their research through university spin-out companies. Findings are also drawn from data collected from financial news articles, public relations firms’ websites and nanoinvesting websites. The research project is ongoing, so these findings are still preliminary.

2.1 Scientists

“So there are two major aspects of nano. One is clearly miniaturization, so you can put more transistors, more components within a given volume. Smaller, faster, cheaper, efficient, integrated. But that does not truly qualify as nano if you do not have the following which is [that] it is truly disruptive. So it is not just the slow evolution of properties, of phenomenon, it is disruptive. It ... occurs because at that scale surfaces are about the same magnitude as the bulk. And then dramatically different phenomena occurs,” – VR, materials scientist and entrepreneur [8].

Entrepreneurial scientists who are commercialising their nanotechnology research make a distinction between

engineering on the nanoscale and nanotechnology. Simply because a component is very small, does not necessarily make it ‘nanotech’. To qualify as being truly ‘nanotech’ the technology must exploit the unique physical properties that exist at the nanoscale. A computer chip manufacturer who is able to shrink a part down to less than 65nm has not necessarily made a piece of nanotech, according to some scientists. These distinctions have also been made by patent offices and regulators but tend to fall apart in marketing communications, especially when companies who are investing in nano research and development are promoting the use of the technology to address larger financial woes.¹

2.2 Marketing to the ‘Nanoinvestor’

“[A] lot of what people are generating buzz about aren’t nanotech at all, they’re things that are renamed. Of the companies that are actually dealing in nanomaterials, many of them are these bullshit plays that are nothing more than attempts at personal enrichment and aggrandizement. ... The crowd that gets affected the most ... is the doctor who wants to buy a beach house and will subscribe to stock newsletters and is always looking for some little interesting thing. I think nanotech is particularly confounding for these people, more so than they were with Internet stocks, because you used the word ‘industry’ to define nanotech and that is one of the words that is verboten here. Because you define an industry as a group of companies that ... [are] unified by something, a similar manufacturing process or similar supply chain, or similar customer segmentation. Nanotech isn’t like that; it’s a set of tools and processes that can be applied directly to composites to electronics that have nothing to do with one another. Therefore we don’t use the word sector industry, we usually rely on the word ‘field’ or ‘space’. ... [T]he likelihood that you as an individual investor have enough sector knowledge in different sectors to be able to make sense [of the diversity] is extremely low. That’s one of the things that we struggle with at our firm,” –NK, marketing and research firm [9].

The small, individual ‘nanoinvestor’ is being heavily marketed to by marketing companies and self-styled nanoinvesting experts. There are a number of recently published books on growing ‘personal wealth’ from the coming ‘nanotech boom’ and dedicated websites created by marketing and pr firms to provide ‘industry news’ to ‘nanoinvestors’. There are firms that have positioned themselves to cash in once the boom starts; ESH Sciences, for example, owns more than 900 domain names with the

¹ Intel Corp. announced in January 2006 that it had engineered a chip that included components as small as 45nm. This announcement came directly after it reported that it had missed its FY05 fourth quarter estimates. Another example is Burlington Industries Inc. purchase of Nano-Tex LLC while it was in Chapter 11 bankruptcy protection in 2001.

word ‘nano’ in the hopes of selling them on once ‘nano’ takes off, similarly as the Internet did in the late 1990s [10].

When standing from this position in the ‘nanofield’ it appears that the marketing of nanotechnology to the investing public relies heavily on buzz and the assumption that the investing public should not have a clear understanding of what constitutes a ‘nanotech company’. ‘Nanobuzz’ compounds and feeds on itself. If investors, especially institutional investors, for example, ignore the buzz around a new investment opportunity in an emerging technology such as nanotech, they could be left behind when their competitors followed the buzz and their portfolios rise. Investors pay attention to buzz, despite being aware that it is hype and that they should approach such information warily, in addition to the more fundamental business information and indicators that help them to make investment decisions.

2.3 Financial Journalists

During the late 1980s and 1990s financial news and journalism experienced unprecedented growth that mirrored the growth in the financial services industries, especially the creation of the derivatives market. At the same time that the financial media has grown, the complexities of finance have become more difficult to report on and represent [11]. The emergence of ‘nanoinvesting’ and the buzz around it, underlines these difficulties and makes reporting on the commercialisation of nanotech complex for financial journalists.

‘I think there are two interrelated reasons for buzz. There’s an immediate one and a long term one. Buzz exists immediately because there’s a lot of activity, financial investing, people moving around, people talking about it, companies starting up in the field, research papers coming out, Nature and Science wanting papers and review articles on the field. That’s one thing. Then obviously that all depends on the field having some long term world changing importance and the two feed on each other. And if there’s going to be buzz about nanotech it’s going to be because it’s going to change industry and the world. [I]f the buzz gets too great one is just focusing on the immediate ... you’ve got to keep thinking about what is this all going to mean for the future and ... whether it deserves the hype or if it’s exaggerated,’ –LP, journalist for financial newspaper [12].

Journalists who cover science and technologies in financial news outlets as well as those who cover the financial industry that is buying and selling securities in the nanotech field are pursued heavily by marketing and PR firms working for ‘nanotech companies’. These journalists also struggle with defining the nanotech field and are dubious of the label the ‘nanotech industry’. However, there is also immense pressure on them, as there is with institutional investors, to give weight to buzz and at least acknowledge it by writing stories on nanotech. These pressures to acknowledge the buzz is due in large part to the

demands of news flow. These journalists have tread a very fine line between breathless enthusiasm and skepticism because as one journalist told us, the nanoinvesting field is ‘so polarized ... you don’t really have a constituent readership for it’ [13].

2.4 Informal, Oral Circuits

Harry Collins, a sociologist of science, suggests that science is primarily an oral culture; so too may the culture of private equity investing [14]. Most nanotechnology investment is not occurring through the buying and selling of publicly traded securities but rather through venture capital and angel investing. This is due in part to the change in funding for European scientific research since the Lisbon Strategy shifted more of the responsibility of investing in research and development from governments and to the private sector [15]. More recently a larger part of the onus of national interests in scientific and technological competition has moved from an interest of national governments to the interests of the market. This has large implications for how nanotech will be commercialised (will it develop in the interests of citizens or that of ‘industry’).

It has been suggested in our interviews that part of the reason for nanohype is to attract second stage investments, especially from private equity investors. With an increase in competition for not only public funding for research but now competition for private investment, entrepreneurial scientists are becoming much more savvy about the process of commercialising their technologies and are learning to hone not only their scientific skills but their managerial and financial management skills. They are also becoming more adept at marketing their business ideas to potential investors.² The culture of venture capital and angel investing, however, tends to focus on the people who run the small start-ups and spin-out businesses and that venture capitalists are more dubious of ‘nanohype’ [16]. They tend to be less susceptible to over-exuberant claims of the financial potentials of an emerging technology. They are also less concerned with whether or not a company and the technology that they are commercialising will succeed beyond the point that the investor wishes to exit from the company and cash in on their investment.

Because of the nature of this type of investing, communication on the financial potentials and risks of start-up companies using nanotechnology is informal and hidden, the messages cannot be traced through publicly visible mediators such as financial journalists.

² There are several organisations and businesses that are interested in the commercialisation of emerging technologies and that provide support to scientists seeking investment. These organisations help scientists to put together business proposals that are sent to venture capitalists and angel investors.

More work in the informal networks of communication between scientists and venture capital and angel investors needs to be done.

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