

Anticipation on societal embedding of nanotechnologies in the domains of food & health: an emerging super heuristic?

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2nd March 2009

Paper proposal for *Atlanta Conference on Science and Innovation Policy*

Abstract

The development and introduction of new and emerging technologies requires dedicated work. New and emerging technologies such as nanotechnologies are often associated with opening up new markets and transforming industries. Such expectations are not fulfilled automatically. Development of new ventures and products often face a relative lack of legitimacy resulting from unfamiliarity among stakeholders with the new activity and disputed conformity to existing institutional rules (Aldrich and Fiol 1994). New ventures also face other problems that are of a different kind than traditional business: not just integration within existing supply chains and business practices, but also broader societal embedding such as admittance according to regulation by authorities or the sector and broader societal acceptance (Deuten, Rip et al. 1997). Business opportunities related to new technologies, including their preconditions, are not there yet, but need to be created by dedicated actors and spaces. Actors such as institutional entrepreneurs (Garud, Hardy et al. 2007) and particular spaces for interactions such as field configuring venues (Lampel and Meyer 2008).

In the case of nanotechnologies, broad anticipation on future societal embedding is likely to play an important role in such forms of entrepreneurship as is already visible in recent attention for codes of conduct and responsible innovation in policy circles and companies. Still, the uptake, including anticipation on future introduction, of nanotechnology enabled products might differ across sectors of industry, cf. the uptake of biotechnology in the domains of food and health.

This paper examines the distribution and evolution of instances of institutional entrepreneurship and field configuring venues in the food packaging and drug delivery sector respectively. I examine whether indeed dedicated actors and spaces such as institutional entrepreneurs and field configuring venues emerge and how they anticipate on introduction of new nano-enabled technologies. In the concluding section I will reflect on how industry structures and articulation processes affect distribution and evolution of institutional entrepreneurship and venues. In addition I will discuss whether the findings are indicative of a pattern that appears to be emerging in the case of nanotechnologies, i.e. the emergence of a super heuristic of anticipation aiming for societal robust nanotechnologies.

To answer the research questions two sorts of data are gathered. On the one hand background material on the two sectors relating to the composition of these two sectors. On the other hand data related to the uptake of nanotechnologies. To identify and analyze instances of institutional entrepreneurship and field configuring venues in the food

packaging and drug delivery sectors, I conducted interviews and retrieved articles from the trade press and presentations in conferences. I checked whether actors and spaces appeared as institutional entrepreneurs or field configuring venues. I used as criteria that actors/venues were (1) mobilizing resources, (2) promoting the broad diffusion of rules, norms and practices related to nano enabled food packaging or drug delivery outside their own organization, (3) were introducing 'institutional novelty', e.g. through combining disparate institutions, and or breaking with existing institutions in the sector. I examined whether actors and venues had a history or prospect of promoting and working towards the realization of novel standards, regulations, organizational routines, or the application of nanotechnologies in packaging or drug delivery technologies as an established practice. Subsequently I developed a chronological narrative of institutional entrepreneurship and activities within field configuring venues to analyze how they developed new linkages between nanotechnologies, actors in the sector and institutions.

Findings indicate that institutional entrepreneurship associated with nanotechnologies in the food packaging sector has evolved in terms of heterogeneity of actors involved and their anticipation on future introduction of nano engineered products since 2000. The mapped instances of institutional entrepreneurship showed that these activities were no 'cannonball trajectories' in which present day activities can be traced back to singular entrepreneurship initiatives and strategies. Actors emerged as institutional entrepreneurs at different points in time.

Salient in the mapped instances of entrepreneurship is the involvement of broader societal aspects in (future) exploration and exploitation activities of nanotechnologies. Notably the consideration of and systematic coping with health, environmental & safety risks, and acceptance of nano enabled food packaging technologies. Contrary to what might be expected regarding the organizational background of the actors, not only civil society groups and regulatory agencies take this as their focus, but also firms. The identified institutional entrepreneurship activities add up to a patchwork of increasingly heterogeneous linkages between nano enabled food packaging technologies and actors in the food packaging sector.

Preliminary findings in the drug delivery sector suggest the existence of more field configuring venues at the level of the sector than in food packaging. The European Technology Platform for Nanomedicine is a case in point. Anticipation in field configuring venues appears to be more focused on integration in business and medical practices, and regulation, than broader societal acceptance.

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