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Social Construction of Innovation Narratives: Implications for Management Studies

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"No object is mysterious. The mystery is your eye."
Elizabeth Bowden,
In her book '*House of Paris*', (1935)

Abstract:

The paper is an attempt to understand innovation from social constructivist framework and an effort to theoretically map how innovation embodies social goals and power relationships. It examines how socio-cultural approaches can reveal deeper insights in understanding different facets of socio-technical change. We argue that the concept of innovation (at least as framed within a certain literature of innovation studies) is a social construction itself culturally and historically determined. We draw our theoretical discussions from social construction of technology and actor-network theory. The first part of the paper briefly introduces the concept of innovation, and its different perspectives. It also opens up debates about social constructionist approaches to understand innovation. The second part of the paper states the problem and highlights the limitations of the dominant management perspectives. The paper concludes setting a future research agenda for management scholars, which takes into account some of the lessons provided by the social constructivist framework.

Keywords: Innovation, Social Construction, Perspective

Introduction

The study of Innovation is undoubtedly the most fashionable of the social science area of the last three decades. Innovation literature indicates that it cannot be confined to any single discipline. The concept has been dealt in various fields ranging from economics to anthropology and from business to philosophy. There are multiple perspectives and theoretical models in different fields which have attempted to de-construct and re-construct the concept.

The basic assumption of post-constructivist Science & Technology scholars is that socio-technical change - and its formulation in the form of innovation studies - is not a neutral process. By the term 'neutral', we mean a process that is totally detached from its cultural, social and historic context. In contrast, socio-technical regimes are the very expression of a social dynamic strongly embedded in cultural and historic contingencies. The process of technological progress itself is not unattached to the power structures that determine social life. Such structures of interests in many ways influence the direction and the 'teleological nature' of technical change (Winner, 1980). Technological evolutionism is not enough to explain the evolution of socio-technical regimes. We need to introduce the notions of narrative, discourses and power. Innovation thus must be seen as a vector, in which direction is socially constructed (Stirling, 2007). Those notions are historically produced only in specific cultural contexts. That's why a cultural lens to understand why certain narratives prevail on others is crucial (Bijker, Hughes, & Pinch, 1987).

The paper is an attempt to understand innovation from social constructivist framework and explore the implications of such an approach for the management academic community. The paper is also an effort to theoretically map how innovation (technology and technical products but also organizational and institutional innovations) embodies social goals and power relationships. It examines how socio-cultural approaches can reveal deeper insights in understanding different facets of innovation. We argue that the concept of innovation (at least as framed within a certain literature of innovation studies) is a social construction itself culturally and historically determined. We draw our theoretical discussions from three theories namely social construction of technology, actor-network theory and socio-technical network theory.

The first part of the paper briefly introduces the concept of innovation, and its different perspectives. It also opens up debates about social constructionist approaches to understand technological innovation. The second part of the paper states the problem and highlights the limitations of the dominant management perspectives. The paper concludes setting a future

research agenda for management scholars, which takes into account some of the lessons provided by the social constructivist framework.

Understanding Innovation

Innovation[1] is a multi-faceted expression generously and commonly used to refer to new, original or improved ideas that create value to strategic and operational levels of a business and society. At a very generic and practical level, it can be defined as "implementation of a new or significantly improved product (good or service), or process, a new marketing or organizational method in business practices, workplace organization or external relations' (OECD, 1992; p. 46). Technological innovation specifically refers to a new technology, systematic application of the new knowledge and resources to produce new goods and services. Innovation indicates something new with high marketable features and potential. It includes development of new technologies and refinement of existing technologies. In a more philosophical sense, it is a process of exploiting and conversion of new ideas and creativity into marketable product and services.

There is robust evidence in the extant literature that suggests that more innovative economies have better economics performances. Economists have examined innovation patterns at the level of industry sectors and national innovation systems (Dosi & Freeman, 1988) and have found a strong correlation between the economic condition of a country and innovation activity (Jan Fagerberg, Srholec, & Verspagen, 2010). Innovation from a macro-economic perspective provides high levels of growth in an economy (Stone et al. 2008). As a consequence, innovation activity is thought to be a fundamental aspect of economic growth. The work of Schumpeter in the first half of 20th century highlighted the crucial role of innovation and innovators in creating competitive advantages within the firms that are striving to survive in a capitalist market economy (Schumpeter, 1934). Schumpeter's work proposed an idea radical for its time: the evolutionary nature of economic processes. Technical change proceeds through the creation of new varieties and combinations of technologies, which result in specific technological paths and trajectories. The equilibrium of "*the normal mode of economic affairs*" continuously destroyed by visionary entrepreneurs who introduce innovative process or products. As successful innovation introduces turbulence in the system and produces a disturbance or even a breakdown in the normal flow of economic that Schumpeter calls "creative destruction". Actually this process turns the already existing technologies obsolete forcing them to lose their positions within the economy (Schumpeter, 1934).

[1] The word 'innovation' originates from the Latin word *innovatus* which refers to the creation or improvement of products, technologies, or ideas.

As technical changes constantly take place in the economy, then some kind of evolutionary process, that can be compared to Darwin evolution theory, must be in act (Nelson & Winter, 1982). According to evolutionary approach, innovation is the engine of the economic process. The process of continuous innovation, as in the Darwinian approach, is limited to technical regimes or paradigms (Dosi, 1982) that, once established are difficult to modify (Dosi & Freeman, 1988). The accumulation of technical changes periodically yields technical revolution that usually triggers major social and economic transformations (Freeman & Soete, 1997; Pérez, 2002).

Modern developments of evolutionary thinking tend to consider technology as the genes in the DNA double-helix. In the book, *The Nature of Technology*, Brian Arthur (2009) describes the evolution of technology as a combinatory process where fundamental blocks, likewise the genes in the DNA, combine with each other to create new clusters of technologies with original functionalities. It is important to note that the concept of technology encompasses the technique to produce physical means as well as the knowledge or software, the organization of labour and the technology as a product. Hence, evolutionary theorists do not consider innovation as the outcome of a linear process, but as the result of a complex process of interaction between several actors such as firms, providers, research centers, R&D department and users among many others (Kline & Rosenberg, 1986). Development process is not deterministic or mechanistic and, above all, rather unpredictable. Furthermore, the rationality and homogeneity of the markets actors is seriously challenged (Castellacci, 2007).

One important consequence of evolutionary thinking in terms of development and underdevelopment is that technology does not flow freely from north to south as neoclassical economists claim (Ulku, 2011). Innovation does not occur in the desert. To explain such a phenomenon, several concepts such as “technological capability,” “absorptive capacity,” “social capability,” and “national systems of innovations” have been introduced.

The *technological capability* approach was introduced by Kim (Kim, 1980) after the study on Korean manufacture industry. Observing the catching-up process of Korea in the 1980s, he realized that Korean firms went through three different phases: Implementation, assimilation and improvement of Western technology. In other words, they have been able to adopt and absorb foreign technology and then start an independent technological path.

A similar notion is the *absorptive capacity* defined as*: “the ability of firms to recognize the value of new, external information, assimilate it and apply it to commercial ends, driven by firms’ prior*

knowledge from activities in R&D and manufacturing, and efforts aimed directly at promoting knowledge and training" (Cohen & Levinthal, 1990). This approach has been used to understand the different performances of firms and countries in the adoption of innovation. Other authors stress the importance of human capital or "social capability" in triggering economic growth (Temple & Johnson, 1998).

One of the most successful theoretical frameworks based on evolutionary thinking is the Innovation System (IS) approach. IS supporters consider innovation as learning process that require the interaction between markets and public actors (Lundvall, 1992). Innovation creation is the outcome of a systemic process that involves a network of relationships. That holistic view advocates development of a national or regional innovation policy to promote the development and boost the creation of innovation (Edquist, 2005, 2006). This systemic approach is believed to be quite relevant in the case of developing countries. Empirical studies suggest that systemic failures such as inadequate physical and digital infrastructures, low human capital capacity and degraded institutional environment affect negatively the innovation performance on national and regional basis (Fagerberg & Srholec, 2008; Fagerberg et al, 2007). Ulku (2011) concludes that low-income countries have lower performance in key determinants of innovation such as low human capital and high rate of immigration associated to low innovation score. He stresses the fact that a national or regional policy is needed to strength strategic sector and the pillars of the determinants of innovation. Moreover, those analyses underline the need for more investment in indigenous technologies. A similar approach is the Triple helix model. This model identifies three major actors in the process of innovation creation: university, industry, and government (Leydesdorff, 2000; Leydesdorff & Etzkowitz, 1998). Several authors have also attempted to apply the model to developing countries (Saad & Zawdie, 2008; Seidl, Longo, Etzkowitz, & Leydesdorff, 1999).

Evolutionary theories as well as the IS theoretical framework do not describe innovation phenomena as neutral processes; in contrast, they tend to analyse and include the social and historical contexts in which innovations occur. However, those theories mainly focus on the economic aspects of socio-technical change. In other words, the main aim of the majority of modern innovation theories is to understand how socio-technical change contributes to economic growth. This approach tends to neglect other factors that affect the evolution of technology and the social phenomena associated, i.e., how technology constructs relations within society, how power is shaped by technological evolution and how power relationships influence technological trajectories. Those aspects have been treated by a large number of scholars who name themselves as *constructivists*. The following

section analyses the contribution of constructivism to the analysis of socio-technological change and to the extant innovation theories.

Social Construction of Technology

Social constructivism refers to a variety of predominantly sociological and related approaches in science and technology studies (STS). The beginnings of social constructivist tradition can be placed in the mid-eighties (Bijker et al., 1987). The roots of these approaches largely lie in the sociology of knowledge (Bloor, 1976). In a narrow sense, the term is used to refer to the influential Social Construction of Technology (SCOT) approach that was outlined originally in Pinch and Bijker (1987) and a number of related approaches such as those of Collins (1985) and Woolgar (1991). The broader usage of the term includes 'social shaping approaches'(MacKenzie & Wajcman, 1985) and the actor-network approach of Bruno Latour, Michel Callon, and John Law, and their followers (Callon, 1986; Latour, 1987).

Social constructivism refers to a conception of technological development/innovation as a contingent process, involving heterogeneous factors. Thus, socio-technological change cannot be explained by some inner technical logic or with the help of some economic laws. It can be best explained by reference to a number disagreements, difficulties and technological controversies in the given social context. It could involve *actors* (individuals) or *relevant social groups* (groups of actors that share a common conceptual framework and common interests.) Technological change and innovation results and get shaped when these actors or groups engage in strategies to shape technological change according to their own design. Secondly, social constructivist approaches employ the principle of *methodological symmetry* or *methodological relativism*[2] (Pels, 1996; Pinch & Bijker, 1984). It implies that the analyst remains impartial to the "real" properties of his/her object of analysis, viz. technology. The analyst refrains from evaluating any of the knowledge claims made by different social groups about the "real" properties of the technology under study. Instead, the analyst should explain them with reference to similar (sociological) factors. It was a supposition that the social factors are important in settling controversies between different claimants (Brey, 1997).

[2] The principle of methodological relativism was originally formulated in the sociology of knowledge (Bloor, 1976). Methodological relativism, when applied to innovation and technological change, suggests the analyst to avoid making claims about the true nature of innovation or technology. It includes claims about the operability of artefacts, (in)efficiency, (ir)rationality of the technological choices and procedures, technological progress, success and failures, the real function/purpose of the innovation and its intrinsic effects. It is argued that the above properties should not be appealed to explain innovation/technology. For example, Staudenmaier (1995) explains that no reference should be made to the actual properties of an artefact while explaining the commercial success or its selection from a pool of several other designs. Facts about innovation or technology are not objectively given by the technology itself, but are rather determined by the interpretations of relevant social groups.

Technology is hence socially shaped or socially constructed. Its properties are largely if not exclusively determined by the negotiations and strategies of relevant social groups. The outcome of the process of disagreement and strategy mapping that surrounds innovation or technical change is the *stabilization*[3] of a technological innovation, which is simultaneously associated with social relations. The rhetorical process of dialogue and agreement on the true nature of a technology and the outcome of negotiation and social action is called *closure*. Social constructivists claim technology to have *interpretive flexibility.* It has no fixed properties or objective and allows for different interpretations of the way it works. It includes both functional/technical content and socio-cultural properties (Brey, 1997).

Strong social constructivism, Mild social constructivism and Actor-network theory

Within the social constructivist approaches, there is a variety of different approaches which vary from each other. Scholars namely Bijker and Law (1992); Sismondo (1993); Collins and Yearley (1992); Woolgar (Woolgar, 1991); Grint and Woolgar (1995) have proposed different classifications. For the sake of brevity, we describe the taxonomy suggested by Brey (1997). This classification proposes three broad branches of social constructivism: *strong social constructivism, Mild social constructivism* and *Actor-network theory,* which is also simply called as 'constructivism'. The strong social constructivism is closely aligned with sociology of scientific knowledge. According to this approach, innovation and technology is a genuine social construction. Social elements alone can explain the stabilizing of a certain technology. In other words, no power or property can be attributed to technology and technological change. Innovation is explained by reference to social practices alone. Mild social constructivism refers to moderate approaches and sometimes called as Social shaping approaches (MacKenzie & Wajcman, 1985). They retain the distinction between the social and the natural, and between social and the technical, and study the way technology is shaped by social factors. The role of non-social factors in explaining technological change and innovation is not rejected. Non-social factors can attribute properties and effect technology and innovation process. The third influential approach is the *Actor-network theory,* sometimes simply called "constructivism". It centres on the stabilization processes (of technical and scientific objects) which results from the networks of human actors and natural or technical phenomena.[4]

[3] Most social constructivists, attribute the stabilization of an artefact or innovation to an agreement or settlement between different social groups, which arrive at a similar interpretation of a technology, as the result of a series of controversies and negotiations. Stabilization of a technology implies that its contents are no longer a site for controversy. The stabilized properties come to determine the way that the technology functions in society (Brey, 1997).

[4] While Strong social constructivism gives special preference to social elements, (such as social groups and interpretation processes,) on which its explanations are based, Mild social constructivism also emphasizes on natural forces and technical devices besides social forces

Criticisms on Social Constructivism

There have been several criticisms against social construction approaches. Winner (1993) has criticized social constructivist studies for focussing more on processes of technological innovation and thereby disregarding the social consequences of technical choices. Secondly, social constructivist approaches tend to recognize only social groups that have a role in technology or innovation and ignore social groups that are impacted by it. There is a possibility that there are social groups which have been deeply impacted and suppressed in the process of its construction. Thirdly, it ignores autonomous properties of technology as well as the deeper cultural, social and intellectual origins of social choices about technology. Fourthly, it refrains from taking any evaluating or moral stands. Brey (1997) points out that Winner has critiqued only the narrowness of the scope of the social constructivist studies; its limited social and political relevance, but fails to points out the methodological shortcomings of the approach. By limiting their scope so as to exclude analysis of consequences, study of the impacted groups, refraining from normative claims, they argue that their principal aim, i.e., to explain technical change, is possible without such analysis. Brey points out that these limitations are the inherent flaws in methodology. He appreciates Winner's third criticism as it questions the micro-level sociological analysis of social constructivists while explaining the dynamics of technological choice.

Winner's criticism may cease to be relevant due to various developments in the social constructivist studies. Primarily, there have been several studies which address the social consequences of technical choice. Secondly, studies reveal that more attention has been paid by the social constructivists to the excluded social groups in technical choice.[5] Thirdly, social constructivists claim that there are studies (Carlson, 1992; Pfaffenberger, 1992; Rosen, 1993) which have attempted to translate macro-level variables such as power relations or characteristics of the culture, into cultural values and goals in the technical frames of relevant social groups. Last, the social constructivist's interest in normative and evaluative pursuits regarding the role of technology in society has considerably increased (Bijker, 1993, 1995; Grint & Woolgar, 1995; Jasanoff, 1996; Radder, 1992). Thus six years after, Brey (1997) in response to Winner's criticism justifies that the scope of constructivist technology studies is widening. However, he tentatively concludes that social

in explaining innovation and technology. Actor-network theory allows for technical devices and natural forces to be actors in networks through which technical or scientific objects are stabilized. Since stabilization is not just the result of social factors, entities may not be socially constructed in an analysis of actor networks (Brey, 1997).

[5] There are studies within a social shaping or actor-network approach which analyse the way in which social consequences are "built into" technologies (Akrich, 1992; Latour, 1992) while others study the way in which "truths" about the consequences of a technology are socially negotiated and constructed (Bijker, 1992, 1995; Bruhèze, 1992).

constructivist politics, in its current form, is unsatisfactory.[6] Brey and others through their work have opened up both strengths and challenges of social constructivist' models of technological change. While the methodological inadequacy and lack of empirical evidence continue to be shortcomings of the mentioned arguments, the essay nevertheless opens up new ideas and questions over the innovation narratives.

Thus, SCOT approach discussed here is not just a theory but a method. It includes steps and principles to understand and analyse innovation or technological artefacts. The concepts under the approach can be summarized as;

(1) Interpretative Flexibility: Indicates that each technological artifact has different meanings and interpretations for various groups. These interpretations pose problems (for example; luxury, convenience, efficiency, aesthetics for any artifact can be prioritized differently for different groups).

(2) Social Groups: Although 'users and producers' constitute the important groups who use the artifacts, there are actually many subgroups such as 'users with different socio-economic status', 'competing producers', 'groups who are neither users not producers', 'groups who are both users and producers', etc. One can define as many groups as possible based on the different interpretations made by the sub-groups on the technology or artifacts in question.

(3) Problems and Conflicts: The divergent interpretations lead to conflicts which may not be solved technologically (e.g. the use of an artifact by varied groups with different cultures, practices, habits dressing code, etc). These groups define and construct their problems differently; technological artifact alone may unable to solve it immediately.

(4) Closure: The problem gets solved; (though not a permanent solution). It could be a 'rhetorical closure' (when groups accept the artifacts due to peer pressure, advertisements, the problem is solved). Secondly, the problem can be closed by redesigning it. The 'redefinition of the problem' creates a new problem and can be solved by appropriate design flexibility.

The first stage under the SCOT methodology includes reconstruction of the alternative interpretations of technology; analysis of problems that arise out of these interpretations and

[6] Social constructivists should study powerful and less privileged groups asymmetrically, siding with the less privileged group in their analyses (Martin, 1993; Scott, Richards and Martin, 1990), if political analysis is desired. Although, the analyst is aware that his or her analysis is mere social construction, he/she may attempt to adopt the technological frame of less privileged groups, and present analyses from a perspective that are claimed to represent the "actual character" of a technology and its "real impacts". Such attempts could suggest courses of action to the less privileged groups, and be more directly helpful than analyses that are merely deconstructive (Kling, 1992; Soper, 1995).

connecting them to the design features for solutions. The second step involves the 'closure' of the way conflict is resolved. In the third stage of the SCOT methodology, there is an attempt to relate the technological artifact to the wider social and political scenario.

The key assumption is that there are choices inherent in both the design of technologies and their usage/appropriation by relevant groups. It is argued that technology/innovation cannot be understood without understanding how a specific technology is embedded in its social context (Rieger, 2008). Scholars using social constructionist paradigm have produced variety of studies addressing technological innovation and technological change. Studies (Cooley, 2004; Mitev, 2000) have illustrated that application of social construction framework on innovation (in the context of emerging information and communication technologies) support deeper analysis as it includes broad aspects of social, cultural, and political factors (Dayton, 2006; Jackson, Poole, & Kuhn, 2001).

The management approach to innovation and its limits

Evidence that innovation activity is crucial to gain competitive advantages for the firms encouraged several scholars to search for managerial practices that could somehow speed the pace of innovation creation within organizations. They attempted to identify the key change agents inside and outside the organization in driving and shaping how management innovation comes about (Birkinshaw, Hamel, & Mol, 2008). Innovation thus became something to be managed and planned. This process occurred at least at two different levels: at macro-level, where innovation policies are supposed to be designed to boost the innovative capacity at a country level, i.e., IS framework; at micro-level, where the focus is on the single firm and its capacity to sustain innovation activity over the time. In this section, we analyse the most common model of managing innovation at the micro level. This model is often described as 'pipe-line model' that organizes innovation activity within the firm in a set of sequential steps (Bessant, Lamming, Noke, & Phillips, 2005; Dabholkar & Krishnan, 2013; Tidd & Bessant, 2009).

The general and most accepted model of Innovation framework from a management perspective is given in Figure 1**.** It begins with a problem, followed by an idea to solve the problem resulting in an invention/solution which finally ends with some kind of impact. The four-step model is essential in an innovation process and the absence of any one step will make it incomplete. In simple words, it refers to the practical translation of ideas into new or improved products/services as solution to the problems and has the potential to impact.

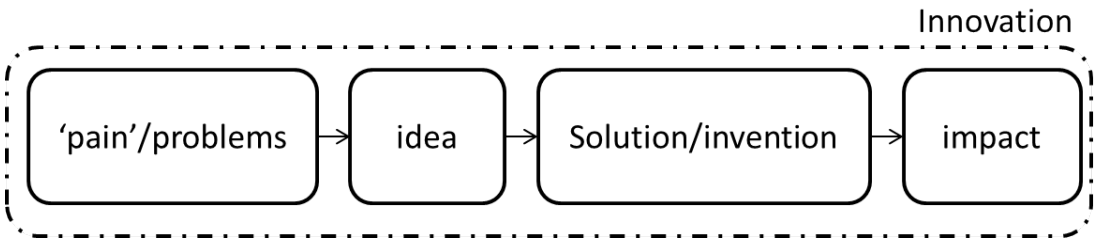

Figure 1 Managing Innovation in four conceptual steps

The modern notion of Innovation stresses on the functional aspects of socio-technical change. The logical consequence is that Innovation is seen as a process. From academia to industry, scholars stress on the fundamental distinction between 'invention' and 'innovation'. Inventions imply novelty and technical ingenuity, innovation always implies an impact. Within the capitalism framework, innovation implies 'market impact'. Inventions that rest on the shelf and never reach the market are not innovation. Ideally, an innovation process involves the following stages namely; Problematization, Idealization, Implementation and Diffusion.

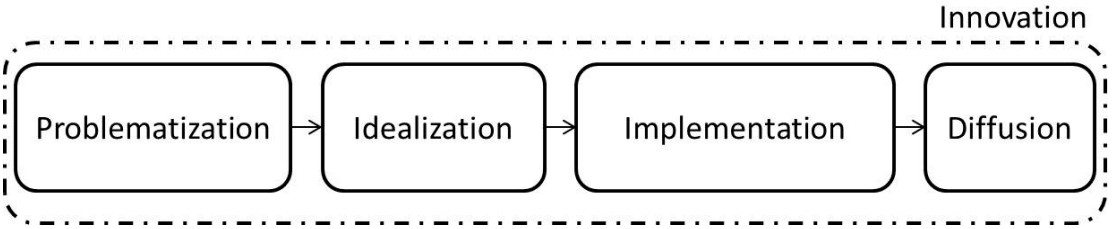

Figure 2 Four Innovation stages

Problematization: In this stage, problems or 'pains' are identified, described and analysed. In some, cases are constructed from the scratch (i.e. the 'invention' of endless new luxury gadgets can be seen as a process of 'creation of pains' rather than a way to address critical problems).

Idealization: The pains are addressed by the formulation of potential solutions often in the form of more or less abstract ideas. In this stage, a more or less huge variety of solutions pops out, and competes with each other. The results of this phase are always uncertain and are not always influenced by technological feasibility but, as the SCOT literature suggests, they are influenced by social, economic and political factors.

Implementation: This phase implies a practical solution, which is commonly known as invention. An invention can be a new technology, new product, process, a new organizational setting, or a new business model. Similar to the previous stage, this phase is affected by high uncertainty since the

success of a specific solution might encounter unexpected failures in the most important phase of innovation process: the marketization or diffusion.

Diffusing: In modern capitalism, this step is maybe the most important. This is when an invention acquires the status of innovation. The solution is marketed and diffused and eventually creates (or not) an impact. The impact can be efficiency improvement, higher profits or higher productivity. In the overwhelming majority of the cases, extant literature talks about 'competitive advantages', cost cutting and higher profits. In other words, innovation creates new markets, increases the firm share in existing markets or reduces costs.

Innovation theories, with different degrees, focus on those steps to improve in turn each stage of the innovation process. Several approaches have been developed to improve the process of 'identification of pains', the rate of ideas generation and the diffusion of products and services. It is important to notice that the technological aspects in those approaches are rather limited. Much attention is paid to managerial, organizational, strategic and even marketing aspects.

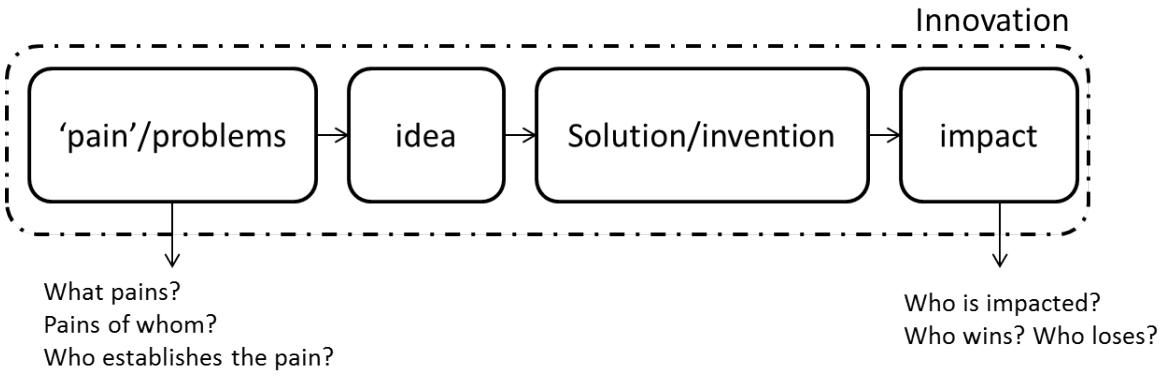

Figure 3

Limits of Mainstream Models

What's wrong with this model? This model is incomplete for the simple fact that it describes a process in a vacuum environment. The process is neutral and the social and politics are totally neglected. Social actors are depicted in a minimalistic way and often as consumers rather than human beings. Novelty is generated for the sake of novelty. Introduction of formal and informal institutions in those models (see new institutional economics and innovation systems mentioned above) has attempted to model tools of governance and guidance of the innovation process. However, in the overwhelming majority of the cases, those approaches never really interfered with the alleged automatism of market economy. Furthermore, in many cases, pains can be invented.

Pains can be false or constructed pains or the pains or certain sectors of society. As a consequence, the impact is undefined. There is no moral, ethical or even spiritual specification of what the impact should be or should not be. In a nutshell, the extant framing of innovation process neglects at least two relevant aspects of socio-technological evolution: *What's innovation for? Who's innovation for?* Who establishes what pains are real pains? Who and for what reason new pains are created for? Why the pains of certain sectors of society are privileged, whereas other are completely neglected? Furthermore, the same applies to the outcome of the process. Who is impacted? How? Who wins and who loses?

If one introduces those questions in the process, innovation becomes a 'vector' (Figure 4) (Stirling, 2007). The direction of such a vector is given by the relative weight of its components. In this game, there are many variables: profitability, efficiency, productivity, equality, social welfare and environment among many others. In order to better understand the role of socio-technical change in human society, we have to re-politicize the study of innovation process introducing new research questions: Who decides which direction is legitimate? How do those decisions become dominant? How are they embedded in discourses? Also finally, why have those questions been removed from the mainstream of innovation studies?

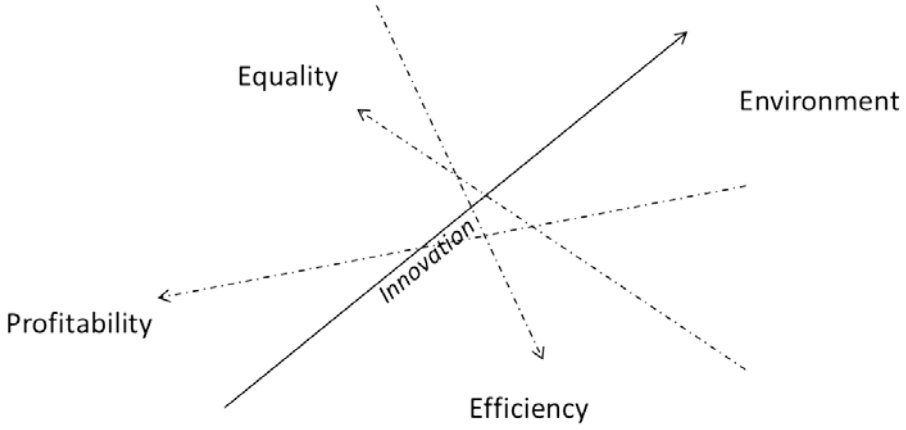

Figure 4

Is it possible to shape the innovation vector in a way that combines positively all the relevant direction? (e.g. environment, equality, profitability and efficiency). Our first hypothesis is that all the components cannot have an equal weight. Some narratives (e.g. the BOP one) claim that it is possible to be profitable by doing good. They tend to de-politicize innovation and depict societies as uniform settings. They remove politics, alliances and power relationships from the social. This is a real political move. Evidence from the analysis of the hegemonic discourse (academic literature,

political discourse and media), suggests that this description is strongly associated with neo-liberal discourse. Is it possible to shape socio-technological regimes? Is it possible to create a framework of 'responsible innovation' (Owen et al., 2012)? Is it possible to engage society in the shape of socio-technological change?

Concluding remarks and future agenda

To summarize, Social construction of technology/innovation is a framework which enables us to study innovation in the social context. Innovation is a complex process wherein the technology and the users together negotiate the meaning of technological artifacts. The key assumption is that there are choices inherent in both the design of technologies and their usage/appropriation by relevant groups. It is argued that technology/innovation cannot be understood without understanding how a specific technology is embedded in its social context. The present working paper aimed at the understanding innovation from alternative approaches. The methodological tools produced by cultural studies and the sociology of science and technology have been barely used to analyse the raise of an indigenous innovative. In a nutshell, we can propose the following research questions that might be potentially relevant also in the Indian context.

- By which cultural and political mechanism, has the hegemonic discourse about S&T and innovation become dominant?
- How has the hegemonic discourse disrupted traditional power relationships and which kind of new relationships has it produced? Who wins and who loses in this process?
- Are there dissidents who oppose the dominant narrative? Who are those dissidents? What strategy do they deploy and with what results?
- How is the concept of 'Innovation for development' constructed and how is 'BOP innovation'[7] framed in certain narratives and embodied in certain organizations?
- How do those narratives emerge from the practices the actors perform and how do they influence them?
- By what routes (and practices) have certain narratives became powerful and others have not, or, how is power constructed?
- Those specific questions set the scene for a more basic research question about the very nature of innovation process thought as a process of 'deployment of scientifically pursued

[7] We refer here to 'BOP innovation' but we could have said more properly 'pro-poor innovation'. However, it needs to be noted that labels and names are also part of a process of narratives' construction. That means that labels such as "BOP", "below the radar", "frugal", "jugaad" and so on also underlie different narratives.

and valuable knowledge': What's innovation for? How is the expert-driven and scientific narrative of innovation constructed? By whom and why? If there are other constructions, how are these to be made visible? What is their relation to dominant models? How can this relation be modified given the global innovation discourse that prevails?

The intention of this paper is to expose management scholars to social constructivist/SCOT approaches towards the study of technology and innovation. We have reviewed relevant literature and strands of argument on the subject. The paper inherently points out that SCOT approach is not just a theory but a method; embedded in it are the concepts and principles to analyse technological failures and success. One of the limitations of this paper is philosophical abstraction which gets reflected in some sections. An ethnographic study of any technological artefact and its users could throw up more practical and empirical questions. Such a study reveals the details of relevant social groups, interpretative and design flexibility of the artefact to its users and many other important questions. While we attempt to empirically argue a case using social constructivist approach in our next project, the working paper at present concludes that management approaches to study innovation may not be holistic and complete as such to address the problems and issues of larger socio-political milieu.

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