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Dear Sir/Madam:

I am submitting my application in consideration for a postdoctoral fellowship in the Innovation Policy working group within the NBER Productivity, Innovation and Entrepreneurship (PIE) Program. I am structuring this application to highlight my research and present a brief proposal for the postdoctoral academic year. After reading my proposal, I am positive that you share my view that my research project is congruent with the themes of NBER Productivity, Innovation and Entrepreneurship (PIE) Group. Working within the **Innovation Policy Group** will be a delightful yet challenging opportunity for me as I hope to not only enhance my own academic rigor by learning from the NBER community but also constructively contribute to the pertinent literature through the research outlined below.

Should you have any other questions regarding my application, please do not hesitate to contact me. You time and effort in reviewing my application is much appreciated.

Sincerely,

Prashant Shukla

My research focuses on the economics of creative industries – industries that are heavily focused either on science and technology or on arts. On the technology side, I am interested in innovation possibilities and policy implications of crowd-engaging technologies. I draw upon the works of Hayek to reason that the crowd-engaging technologies that, today, allow us to harness the knowledge and intelligence from the crowd are quickly becoming the basis of innovation and *knowledge advantage* for firms. I reason that the resources so generated, crowd capital, will become increasingly important in the era where technological progress allows for large scale knowledge assimilation and collaboration. Specifically, I investigate the impact of geographical location, the type of technology used to engage the crowd, and the use of social capital in developing crowd capital resources within organizations under contexts such as governance, education, scientific inquiry etc. In this vein, my recent paper on crowd capital, an organizational level resource harnessed from the crowd by the use of technology, has been the most downloaded paper on open innovation in 2013 on *Social Science Research Network*.

As a direct upshot of my training under Prof. Ajay Agrawal, Rotman School of Management, University of Toronto, in my research, I strive for clear identification strategies and apply economics and management theories, to better answer the research questions pertaining to innovation and entrepreneurship within creative industries. On the arts side, my dissertation investigates the tradeoff between commercial success and creativity in the Hindi film industry, Bollywood. I build on Caves' notion of *'humdrum inputs'* and expose that the humdrum inputs, those that facilitate art by aiding in financing, exhibition, distribution etc., in fact significantly inhibit creativity and entrepreneurism in creative industries by imposing constraints.

Crowdsourcing: Taking Stock and Unlocking the Innovation Potential

It is taken as axiomatic in economic theory that information and knowledge asymmetries are ubiquitous and pivotal in the decision making process. Indeed, this is what Hayek (1945), called the knowledge problem: that useful knowledge is dispersed all over, and identified it as one of the major economic problems. By utilizing the technological advances, we have, like never before, tapped into the knowledge, innovation, and information that exists dispersed in the crowd and solved the most significant contemporary organizational, political, economic, scientific, and humanitarian problems. Here, I reason that in so far as our technological and computational capabilities continue to advance, crowd-engagement, will continue to grow in significance as a means of innovation; and consequently so will the need for putting proper policies in place.

A Look Back

Crowdsourcing, as a technology-intensive, distributed problem solving model (Brabham, 2008) has now been used within (Dvorak, 2008) and outside the organizations; in different forms (Boudreau & Lakhani, 2013); in scientific inquiry (Hand, 2010; Silvertown, 2009), governance (Bott, Gigler, & Young, 2014; Silva, 2013), and humanitarian aid (Zook, Graham, Shelton, & Gorman, 2010); for ideas and innovative solution (Brabham, 2010; Jeppesen & Lakhani, 2010); and as a simple aggregation tool (iRevolution.net, 2013; von Ahn, Maurer, McMillen, Abraham, & Blum, 2008). Amongst the plethora of examples and research studies, however, few strive to develop theoretical insights—that encapsulate central tenets of a *theory* such as external validity and predictability—about crowdsourcing (e.g Afuah & Tucci, 2012; Jeppesen & Lakhani, 2010).

The problem scholars of crowdsourcing, including myself, face is that of lack of data that allow us to test generalizable hypotheses. My observation is that most datasets in today's crowdsourcing and open innovation research are platform-specific, i.e. if we are interested in online tournaments, we look at crowdsource, crowdflower, or eYeka etc.; if we are researching crowdfunding, we look at indiegogo and kickstarter; similarly, if we want to investigate specific types of knowledge accumulation, the data options get even thinner. However, any theory of crowdsourcing, if it is to pass the external validity test (Creswell, 2013), has to speak to predictability across platforms, motivations, goals, institutions, and cultures involved in crowdsourcing endeavors. I reason that just as economists of the 18th and 19th century have been correct in their insights but limited in their data and methods (Piketty, 2014), so to are we, scholars of a young and growing discipline, limited in out data and methods. I seek to address this limitation by introducing the advanced quantitative methods of meta analysis, used widely in other social sciences (Doucouliagos & Ulubaşoğlu, 2008; Hedges & Olkin, 1985), to build a dataset that allows us to perform some research-synthesizing and paradigm-developing research in the field of crowdsourcing. In doing so, I strive to develop strategy and policy implications for firms and regulators respectively so that the former can use this new phenomenon attain knowledge advantage and the latter can enhance the process of innovation through and across a variety of sectors in the economy.

Meta Analysis—Not Vote Counting

Given the theoretical adolescent, yet burgeoning nature, of crowdsourcing research, a meta analysis, which evaluates the balance of evidence, is befitting (Geyskens, Krishnan, Steenkamp, & Cunha, 2009; Miller & Cardinal, 1994). Starting with Hedges and Olkin (1985), homogeneity analyses are appropriate to synthesize evidence from extant research and arrive at cumulative verdicts. Previous topics that have been addressed using the tools include universal discussions on the impact of democracy on economic growth (Doucouliagos & Ulubaşoğlu, 2008), agency issues

in corporate governance (Carney et al., 2011) etc. Today, in addition to the traditional homogeneity analyses that meta analyses are attributed to, more advanced meta-analytic regression analysis (Lipsey & Wilson, 2001; MARA) are also available to us. Thus, we are in a position to use meta analysis more as a theory building technique rather than a vote counting tool (Eden, 2002).

In putting the cutting-edge tools of meta analyses to use for our purposes, I am proposing to build the first and biggest data set of research evidence in the extant literature on the use and efficacy of crowdsourcing across platforms, innovation motivations, cultures, and institutional contexts. A data set so collected will easily harvest evidence on the aforementioned attributes of crowdsourcing from hundreds of papers on crowdsourcing and contain the most exhaustive data across platforms, allowing us to take steps toward a theory of crowdsourcing. We need not stop here, meta analyses allows us to combine the data so collected from the extant published and unpublished papers with secondary data on economics, culture, and institutions, of home countries of different crowdsourcing platforms and endeavors to make theoretical advances that would simply be impossible without this dataset.

A Framework for Developing Crowd Capital through Crowdsourcing

For any organization—for profit, not for profit, governments, non-governmental etc.—the benefit of crowdsourcing is in harnessing the knowledge of the crowd for their own benefit: BestBuy, Lego Ideas, Citizen Science, IPaidABribe are examples of such applications. The organizational level resource so accumulated is called, crowd capital: because it is accumulated through investments in crowd-engaging technology and because the resource so generated has the potential to pay dividends, in terms of innovation and profits, for the organization (Prpic & Shukla, 2013; Prpic, Shukla, Kietzmann, & McCarthy, 2015). A meta analysis of the extant literature allows us to develop data-driven innovation insights for organizations in terms of deciding the crowd to be engaged, the technology to be employed to acquire the knowledge, and process to be used to assimilate the knowledge. As such, it supplements the theoretical advances in literature highlighting using crowd as innovation partners (Afuah & Tucci, 2012; Boudreau & Lakhani, 2013).

What about Policy?

In this day and age, when knowledge advantage is tantamount to competitive advantage, the study is not just of relevance for firms. The investigation has applications in a variety of other current and future endeavors in our society and to policy making. First and foremost, a data-driven understanding of innovation potential of crowdsourcing allows policy makers to encourage and regulate crowd-engagement for firms, thereby catalyzing the level of innovative activity across firms of different types and with disparate knowledge motivations. Second, with the potential insights from the study; regulators will be in a position to make more informed decisions in regulating several other nascent yet significant crowd-engaging activities outside the profit-driven businesses setting, but popular and relevant in our society (Prpic & Shukla, 2014). In particular, literature points to a need for policy leadership in efforts relating to advancement in science and technology (Silvertown, 2009), better understanding politics and economics in our society (Bertot, Jaeger, & Grimes, 2012), opening governance and democracy (Aitamurto, 2012) and to humanitarian and disaster response mechanisms (Zook et al., 2010). Together, the implications for policy making are immense.

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