A COMPUTER-BASED APPROACH TO ANALYZE SOME ASPECTS OF THE POLITICAL ECONOMY OF POLICY MAKING IN INDIA

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by

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Certificate

This is to certify that the thesis titled **A Computer-based Approach to Analyze Some Aspects of the Political Economy of Policy Making in India** being submitted by **Mr. Anirban Sen** for the award of **Doctor of Philosophy** in **Computer Science and Engineering** is a record of bona fide work carried out by her under my guidance and supervision at the Department of Computer Science and Engineering, Indian Institute of Technology Delhi. The work presented in this thesis has not been submitted elsewhere, either in part or full, for the award of any other degree or diploma.

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Acknowledgments

Growing up in a middle class family, a meaningful life looked pretty straightforward to me. Get a degree, get a job, start a family and you would have accomplished enough. I happened to disagree. Eight years later, after quitting my job to get back to academics, here I am, submitting my PhD thesis, and I am not sure if I will be able to do justice to this section as the support and help I have received throughout is uncountable and immense.

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Ideas are like seeds which once sown in your mind, shall grow to become a tree. The seed of research was sown in my mind by my master's guide, Dr. Saptarshi Ghosh.

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Abstract

To understand the policy process appropriately, it is essential to obtain a bird's eye view of the political economy around policies. According to Wikipedia, 'Political economy is the study of production and trade and their relations with law, custom and government; and with the distribution of national income and wealth'. Analysis of political economy deals with the study of relationships between the government and the market, which includes corporations, business-persons, and other corporate entities related to trade and production. We develop a technological platform to analyze some facets of the political economy around important policies in India, which in turn shall aid citizens in obtaining a good understanding of the policy issues. The contribution of this thesis is that it shows that such analysis can be performed using publicly available web and media data, using a suite of computer scientific tools and techniques.

There are different facets of political economy analysis. In this thesis, we study a few of them, namely the interlocks between the corporate and state entities, the kind of statements made by these entities in popular media, the bias in policy representation carried by the mass media and the social media, and the policy discourse that occurs in

these media sources and in the Parliament. Our findings suggest that interlocks between corporate and government entities are increasing over time, which could lead to their increasing influence in policy-making. We also find that the mass media is biased towards various entities and topics relevant to the policies, and that the representation of policies in the mass media and the Parliament does not equitably cover issues of all sections of people. Moreover, policy discourse in popular media chiefly includes the views of politicians and business-persons, and does not provide adequate attention to the views of policy experts or academicians who can provide valuable insights on technical nuances and problems in policy implementation. Social media is seen to accentuate the biases carried by mass media, and it closely follows the topics covered by the mass media regarding various policies. Additionally, we also propose a novel news recommendation algorithm in this thesis, which can counter the issue of algorithmic bias by ensuring fairness and diversity in representation of various topics relevant to the policies.

While several studies have already been done in the domain of political economy analysis, this thesis is the first work that attempts to analyze some aspects of the political economy around policy-making, in the Indian context, using computer scientific techniques on large scale, and publicly available data. Our findings from this work have been updated in a website with the objective of reaching a target audience of journalists, social activists, policymakers, researchers and citizens in general. We believe that the technological platform suggested in this thesis can serve to make people more aware of the political economy that affects policy-making, peoples' opinion on these policies, the democracy, and ultimately their lives and lives of others.

सारांश

नीति प्रक्रिया (Policy Process) को उचित रूप से समझने के लिए, नीतियों से संबंधित राजनीतिक अर्थव्यवस्था (Political Economy) के बारे में विहंगम दृष्टि प्राप्त करना आवश्यक है। विकिपीडिया के अनुसार , `राजनीतिक अर्थव्यवस्था उत्पादन और व्यापार, तथा कानून, प्रथा, सरकार और राष्ट्रीय आय और धन के वितरण के साथ उनके संबंधों का अध्ययन है'। राजनीतिक अर्थव्यवस्था का विश्लेषण सरकार और बाजार के बीच संबंधों के अध्ययन से संबंधित है, जिसमें कंपनी, व्यवसायी तथा व्यापार और उत्पादन से संबंधित अन्य कॉर्पोरेट इकाइयां शामिल हैं। हमने भारत में महत्वपूर्ण नीतियों से संबंधित राजनीतिक अर्थव्यवस्था के कुछ पहलुओं का विश्लेषण करने के लिए एक तकनीकी मंच विकसित किया है, जो नीतिगत मुद्दों की अच्छी समझ प्राप्त करने में नागरिकों की सहायता करेगा। इस थीसिस का योगदान यह है, कि यह दर्शाता है कि इस तरह का विश्लेषण, सार्वजनिक रूप से उपलब्ध वेब और मीडिया डेटा का उपयोग करके, कंप्यूटर वैज्ञानिक उपकरणों और तकनीकों के एक सूट का उपयोग करके किया जा सकता है।

राजनीतिक अर्थव्यवस्था विश्लेषण के विभिन्न पहलू हैं। इस थीसिस में हम उनमें से कुछ का अध्ययन करते हैं, जैसे कॉरपोरेट और राष्ट्रीय संस्थाओं के बीच अंतर सम्बन्ध, लोकप्रिय मीडिया (समाचार पत्र) में इन संस्थाओं द्वारा दिए गए बयान, समाचार पत्र और सोशल मीडिया द्वारा नीतिगत प्रवचन में किए गए पक्षपात, तथा मीडिया और संसद में किए गए नीतिगत चर्चा। हमारे निष्कर्ष बताते हैं कि समय के साथ कॉर्पोरेट और सरकारी संस्थाओं के बीच अंतर सम्बन्ध (interlocks) बढ़ रहे हैं, जिससे नीति–निर्माण में उनका प्रभाव बढ़ सकता है। हम यह भी पाते हैं कि समाचार पत्र विभिन्न लोगों और नीतियों के लिए प्रासंगिक विषयों के प्रति पक्षपाती है , और जनसंचार माध्यमों और संसद में नीतियों का प्रतिनिधित्व सभी वर्गों के लोगों के मुद्दों को समान रूप से कवर नहीं करता है।

इसके अलावा, लोकप्रिय मीडिया में नीतिगत प्रवचन में मुख्य रूप से राजनेताओं और व्यवसायी व्यक्तियों के विचार शामिल होते हैं, और नीति विशेषज्ञों या शिक्षाविदों के विचारों पर पर्याप्त ध्यान नहीं दिया जाता है , जो तकनीकी बारीकियों और नीति कार्यान्वयन में समस्याओं पर मूल्यवान अंतर्दृष्टि प्रदान कर सकते हैं। सोशल मीडिया बड़े पैमाने पर समाचार पत्रों द्वारा किए गए इस पक्षपात को बढ़ाता है, और यह विभिन्न नीतियों के बारे में समाचार पत्रों द्वारा कवर किए गए विषयों का बारीकी से अनुसरण करता है। इसके अतिरिक्त, हम इस थीसिस में एक समाचार एग्रीगेटर एल्गोरिथ्म का भी प्रस्ताव करते हैं, जो नीतियों के लिए प्रासंगिक विभिन्न विषयों के प्रतिनिधित्व में निष्पक्षता और विविधता सुनिश्चित करके एल्गोरिथम में पक्षपात के मुद्दे का मुकाबला कर सकता है।

हालांकि कई अध्ययन पहले से ही राजनीतिक अर्थव्यवस्था विश्लेषण के क्षेत्र में किए गए हैं, यह थीसिस पहला काम है जो कंप्यूटर के उपयोग से भारतीय संदर्भ में नीति–निर्माण के आसपास की राजनीतिक अर्थव्यवस्था के कुछ पहलुओं का, बड़े पैमाने पर वैज्ञानिक तकनीक, और सार्वजनिक रूप से उपलब्ध डेटा की मदद से, विश्लेषण करने का प्रयास करता है। इस काम से हमारे निष्कर्ष एक वेबसाइट में पत्रकारों, सामाजिक कार्यकर्ताओं, नीति निर्माताओं, शोधकर्ताओं और नागरिकों के लक्षित दर्शकों तक पहुंचने के उद्देश्य से अपडेट किए गए हैं। हमारा मानना है कि इस थीसिस में सुझाया गया तकनीकी मंच लोगों को राजनीतिक अर्थव्यवस्था के बारे में अधिक जागरूक बनाने का काम कर सकता है, जो इन नीतियों पर, लोकतंत्र पर, और अंततः उनके जीवन और दूसरों के जीवन पर सकारात्मक प्रभाव ला सकता है।

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