Big Data in the Global Realm: An Assessment of International Relations' Ability to Study 21st Century Developments

by

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Abstract

This thesis examines Big Data as the latest and perhaps most potent iteration of a number of transformative technologies that have had and continue to have an impact of global politics and international power hierarchies. The thesis seeks to examine if the discipline of IR, with its current disciplinary boundaries and underlying rigidities, can adequately acknowledge and provide ontological space to developments such as Big Data. By examining the impact of Big Data upon global politics through qualitative analysis, as well as employing some major paradigms of International Relations to assess the efficacy of International Relations Theory in studying Big Data, this thesis attempts to simultaneously highlight the need to study Big Data as well as International Relation's inability to provide sufficient academic scrutiny to it. The thesis attributes this inability to the aforementioned rigidities which manifest largely in its understanding of agency, non-state actors and what constitutes an 'IR issue'. With this in mind, the thesis attempts an examination of Actor-network Theory as an alternate frame of reference which may provide insights into linking the study of Big Data to International Relations. This thesis contends that the discipline, in its present form, does not possess the necessary academic space to accommodate developments like Big Data as 'IR issues' or the necessary tools to study developments of a non-conventional nature. This is a reoccurring problem with the discipline. The thesis asserts that as global issues evolve and grow more complex each day, International Relations needs to tackle its rigidities and start a conversation surrounding Big Data in particular, if it is to stay on top of the new global developments of the Twenty-first century.

Preface

This thesis is an original work by Sagnik Guha. No part of this thesis has been previously published.

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Introduction

In March 2018, *The Guardian* reported on a scandal involving British Data Analytics firm Cambridge Analytica exploiting the Facebook data of millions of Americans, obtained without their explicit knowledge or consent, to influence the 2016 Presidential election in the United States. The scandal elicited a media frenzy and global public discourse surrounding social media, the open proliferation of personal user-data through a multiplicity of websites and media platforms. It raised poignant questions surrounding themes of privacy, civil liberties and the role of data in the 21st century. The scandal presented a clear picture of how Big Data (BD) bears the risk of exploitation and underlined how rapid digitalization and the increasing value of data as a resource has been a staple of the twenty-first century so far.

Despite not even being a full quarter into the century, there is ample reason to believe that the remainder of the 21st century will be characterized by large-scale digitalization of almost all aspects of life from consumption, entertainment, education, military, policymaking, health and beyond. With millions of people gaining access to the internet and all that it has to offer and with governments around the world placing an emphasis on cybersecurity and moving into a digital realm with designs of smart cities and national databases for their citizens, the prospect of a digital future is paramount to study how humanity will evolve in the years to come. Particularly, in the discipline of International Relations (IR), it is essential to consider how varying actors on the world stage will interact with each other in a digital future and how power dynamics might be affected as a result of this.

Today, the rate of data being produced has increased to an extremely rapid rate in comparison to the decades before. Every activity in this digital world, from e-commerce, browsing websites, using social media, coding computer programs that run complex systems,

artificial intelligence and cyberattacks, military and research that goes into framing the rules for systems and operations that structure the world, data is produced at an extremely voluminous rate. However, what is poignant to remember is that not only is the amount of data produced increasing rapidly each day, but also the capacity to harvest said data, to organize it, categorize it and thereafter instrumentalize it. This presents the most consequential result of the rise of Big Data.

The Cambridge Analytica scandal presents just one example of the many ways in which data can be harvested and employed with very meaningful impact. As will be discussed in a later chapter, in this particular instance, data was harvested to such a deep level and with so much comprehensiveness, that it gave rise to a new brand of data that spoke to not just the demographic information about a person, but also their psychological inclinations and influences. This presents a particularly unique challenge for individuals who may think they are taking a simple personality test for an academic study or a harmless online quiz, but are actually involuntarily volunteering personal information about not only themselves, but also anybody that are in touch with on social media platforms.

For nation-states and governments, this also presents quite a unique challenge insofar as defining the rules and regulations for how data can be regulated in an increasing Big Data society. Data as a resource functions in a markedly different way than other resources such as oil, weapons or narcotics. In recent years governments have been trying to develop data protection and regulation frameworks at a national and international level with varying levels of success. However, the example of Cambridge Analytica's activities, not only in the 2016 US elections but the slew of national elections across the world where it has instrumentalized its data analytics capacity, bears testament to the fact that regulating BD, especially with rapidly increasing digitalization, is a far more complicated task than anticipated.

The question then arises: what is BD in terms of its role within IR? The most self-evident response would be that BD is the most recent iteration of a long line of technological developments that have had a profound impact on the discipline or events studied by the discipline but has ultimately remained understudied and pushed to the margins as a mere peripheral subject of interest. Only one technological development has merited extensive scrutiny in IR and that was the advent of atomic bombs and other Weapons of Mass Destruction (WMDs).

Scholars with a more traditional outlook on IR would argue that BD is merely another weapon or tool that is utilized by states or corporations. While this assessment is not untrue on paper, it is extremely narrow in perspective and shallow in nuance. Ascribing something as a mere 'tool' or instrument' denies it any form of agency. It suggests that unless a development is capable of as much immediate destruction of life as a WMD, it does not merit a more nuanced study within IR. This has been substantiated by the lack of scrutiny given to various technological developments in the 19th and early 20th centuries that largely facilitated the Great Power conflicts that led to IR being formalized into an academic discipline in the first place. As Schwab (2016) asserts, " The history of warfare and international security is the history of technological innovation".

Understanding the social impacts of developments like BD is crucial because it does notstop at just being a weapon or tool for other seemingly more legitimate actors to use for their own purposes. Over the years, multiple developments in technology have facilitated a movement of ideas, change in existing norms and most importantly, affected power hierarchiesboth within societies and among the community of nations. An example of this exists in the Printing Press which facilitated the flow of ideas regarding religion and played an important role in numerous revolutions and in ushering in a new age of political thought in Europe. Or

developments such as railways and the steam engine which facilitated global colonialism through allowing easier access from ports of colonized lands into heartlands and vice-versa.

The point remains that when these developments have been relegated to mere 'tools', they have remained a niche within IR. The advent of BD is a momentous occasion with longstanding implications for the future of the world. What is the future of elections if foreign data firms can mine one's online footprint and create such a detailed profile of individuals that informs them of their deepest inclinations, beliefs and suggestibility? How will nations interact when the data of their citizens becomes a resource in the hands of foreign companies and social media firms? How will governments interact when they are able to spy on minute aspects of their rival nations' citizens and businesses? How will international conflict occur in an age of increasingly more sophisticated cyberattacks?

These questions and many more cannot be answered by relegating BD as a mere tool and pushing it to the peripheries of IR as has been done for years. To return to the earlier question, this thesis contends that BD is the latest iteration of a growing trend in digitalization that will have profound impact on international relations (more so than it already does that is) in the near future, however has not been given the adequate scrutiny it merits in IR. This thesis contends that this is due to certain core rigidities within the discipline of IR that have made its various paradigms unsuitable in terms of accommodating a development such as Big Data.

When looking at the volume of research conducted on domestic implications of BD especially in more developed states where technological advancements have opened up several frontiers of surveillance, automation and digitalization, it is clear to see that a Big Data society has been studied to a greater degree than its international impact. While there is some research done into various applications of Big Data technologies within national borders, for policymaking in health, education, commerce, military, policing and more, the degree of

research done into exploring the relation between BD and international politics, how the development affects the discipline in terms of changing power hierarchies or disrupting norms long upheld in IR, has been decidedly lower.

However, a similar level of research into BD and its applications does not seem to have taken place as far as the international stage is concerned. Does this imply that the impact of Big Data is less pervasive on the international stage than in a domestic sphere? This thesis would assert that it is quite possibly the reverse. Both International Relations as a discipline and Big Data have one thing at their core that links them: power. BD serves as an impactful development upon power relations and hierarchies at a trans-national level. It grants nation-states unprecedented powers upon their own citizens as well as citizens of other states. It grants corporations unprecedented powers even over some governments.

As we have seen in the case of Cambridge Analytica, it allows companies to cross national borders and play 'kingmakers' to a degree that has never been seen before, using means that are unethical at best and illegal at worst, but made entirely possible with the onset of BD capabilities. It is because of cases like these that this thesis asserts that BD as a development needs to be studied in IR, and not merely as a marginalized niche within the discipline. This can, unfortunately, be situated within a broader context of IR proving itself to be more reactionary with certain developments, such as the environment or the role of gender, and technologies of the past.

This is substantiated by Buzan and Little (2001, p. 24-25) who argued that not only was the impact of nuclear weapons evident decades before their conceptualization but that it was the linear and single-minded, forward-looking nature of IR as a discipline which pushed it to disregard the long history of industrial developments such as the steam engine or the telephone, the telegraph and later the radio, that led up to and facilitated the global wars from

which IR as a formal academic discipline was born. This aspect of IR, therefore, plays a great part in how Big Data has escaped any significant scrutiny within the discipline and leads to what Buzan and Little (2001, p. 24-25) describe as "an economistic, natural science based understanding of the social world".

Furthermore, for all intents and purposes, International Relations has been perceived as an academic discipline that can be considered to be dynamic, largely by virtue of the fact that the scope of the discipline has expanded greatly from when it first emerged as a formalized academic discipline in the early 20th century. From the need to understand and prevent Great Power conflict and war among nation-states, to now encompassing a multitude of themes, including but not limited to gender, environment, security, international organizations, trade and commerce and much more, IR today is by and large considered a far more comprehensive discipline than its earlier iterations.

While this understanding is not incorrect by any means, this thesis contends that it presents the discipline in a light that is not quite as dynamic and comprehensive as it might like to think. For all its apparent dynamism, IR remains mired in its own tradition, functioning according to the logic of what Buzan (2001, p. 25) terms a 'Westphalian straitjacket' i.e. a 17th century Eurocentric understanding of an international system, its occupants and how it should function. While IR is certainly more dynamic today relative to the 1940s or 1950s, its relative dynamism does not step in sufficiently for its absolute rigidity in including certain aspects and issues as subjects of study within the discipline. Considering what could be studied as an 'IR issue' has certainly expanded over the past century, however it has only expanded from the core that was set into place in the Interwar period without question if that core itself requires scrutiny.

As a result of this, one of the major problems that this thesis examines is the lack of meaningful tools within IR to study and adequately accommodate a development like Big Data or any of

its applications as a bonafide ‘IR issue’. It underlines why this thesis later turns to Actor-network theory, an adjacent but external theory to IR, in order to bring link the developments in Big Data to IR as a discipline.

It highlights the reason why certain topics have remained excluded from the purview of IR and if studied, are only examined as a niche (or in some cases, a niche within a niche). In his influential article exploring the perceived absence of international theory, Martin Wight (1960, p. 38) attributed what he described as the ‘paucity’ as well as the ‘intellectual and moral poverty’ of IR, largely to a disproportionate reliance on the sovereign state. This and other core norms that IR as a discipline has been built upon can be classified as ‘rigidities’ existing within the core of IR. It is these rigidities that prevent the discipline from reaching further heights of comprehensiveness. It is the reason why several definitions of IR till date, both in text books for new learners or on websites for the casual viewer, considers the discipline merely an interaction of states at the international level.

Such an understanding of IR is inimical to the understanding of this greatly complex and multi-layered discipline. This thesis aims to start a conversation on precisely this missing element. It attempts to visualize what the impact of Big Data on International Relations has been and might be in the years to come. It examines the impact of Big Data at a trans-national level and what kind of role it could play in International Relations keeping in mind the growing influence of data and digitalization in the trans-national sphere.

It is due to not only what has been achieved through BD thus far, but what can be achieved in the future as well that makes for another reason why it is a topic worth the attention of IR at the soonest. At present, the existing paradigms in IR do not offer adequate space to allow for BD to be studied and explored as anything other than the niche sub-topic within an already niche exploration of science and technology’s role in IR. As mentioned before, BD seems to

be set to revolutionize many aspects of our daily lives in a myriad of ways both at the micro and macro level, hence the lack of attention from theory is not ideal.

The practice of global trade, the nature of conflicts between states, the role of the individual citizens' privacy and the powers accorded to states and corporations through data and information are all likely to become crucial issues in the near future with BD underlying these developments. The advent of cryptocurrency and developments like the rapid rise in popularity of Non-fungible tokens (NFTs) are major steps in advancing the digital economy. Cybersecurity and artificial intelligence are hot-topic issues within military and security studies. With the growing importance of the digital realm and BD in global affairs as will be explored in further chapters, IR needs to be able to grapple with what BD even is and how to situate its ontological position within the discipline before even attempting to figure out the best epistemological tool to study it.

This need largely arises from the fact that if IR has, at its core, a network of power relations between different agents on the international stage, then Big Data's ability to shake up this network and change hierarchies is one that will affect the very core of the discipline. The ability to gain detailed information and instrumentalize it in a myriad of ways, the ability to build digital parallels to existing technologies and the growing enveloping of our daily lives into the Internet and social media, the global nature of data flows, particularly in commerce, entertainment and military, all remain extremely important facets of IR that will experience developments in the near future. Without studying Big Data and creating space to accommodate it within IR, it will not be possible to adequately study said developments.

The first step to addressing a problem is to begin with admitting that a problem exists in the first place. One major obstacle to being able to situate BD within IR, as mentioned before, lies in some of the core rigidities of IR that prevent the inclusion of newer developments within the

discipline. If BD and its derivative technologies are not even permitted to be viewed as 'IR issues' owing to the core rigidities or the aforementioned 'westphalian straitjacket', then the task of conceptualizing their inclusion in the discipline becomes next to impossible.

Thesis Structure

The following chapter presents a review of the literature regarding the role that science and technology has played in global politics at large. It highlights how, despite remaining largely ignored and understudied within the discipline of IR, technological developments have played a pivotal role in several stages of the global history. As mentioned before, it was not until the atomic bomb and nuclear weaponry were developed and used in the second World War, was the impact of technology touched upon meaningfully within IR. However, the impact of technology on IR does not lie only with bombs, guns and other forms of weaponry, but equally with technologies of transport, communication, medicine and more.

This chapter leads into the discussion of Big Data as the following iteration of technological development. Though some dismiss titles and phrases such as 'new wave of Globalisation' and a 'Fourth Industrial Revolution' as mere buzzwords, their conceptualization stands testimony to the fact that there is anticipation among leading industrialists, politicians and scholars that the digital age and the 'Big Data society' (a term explained in following chapters) require scrutiny.

Chapter 2 presents a greater elucidation of the problem that IR has in grappling with new developments such as Big Data. It attempts to frame the central issue that prevents Big Data from being considered an 'IR issue' and highlights the rigidities at the core of IR. It exposes the fact that the perceived dynamism of IR, for which it is often lauded, may not be as flexible and dynamic as it may seem. It is telling that the critique of international theory presented by Wight over sixty years ago still holds true to a large extent in the 2020s. In particular, he

highlights the perceived "recalcitrance of international politics to be theorised about" (Wight 1960, p. 48).

This implies a marked resistance to what Wight considered the process of theorisation that IR's sister-discipline (or umbrella discipline depending on one's perspective), political theory had adopted. Keeping these limitations of IR in mind, this chapter attempts to conceptualize the notion of a 'Big Data society' and what it means to live in one. The contrasting discussions highlight the pressing need to find new means of fitting Big Data within the ontological borders of IR.

In chapters 3 and 4, this thesis examines the interactions and connections of BD upon IR in terms of realpolitik and theoretical paradigms respectively. Chapter 3 serves as a demonstration of just some iterations of the real world impact that Big Data and its derivative technologies and developments have on international politics. It contends that data and its mass proliferation as a resource in most aspects of life is already proving to be a source of contention among nations that have different capabilities to benefit from them. It also predicts that a lot of the international conflict that will be witnessed in coming years will be in the digital realm.

Chapter 4 similarly explores the confluence of BD and International Relations, but with specific focus on the theoretical paradigms within IR. It examines the importance of theory and the value of having theories with regard to a development like BD, and thereafter it explores three paradigms of IR – Realism, Liberal Internationalism and Critical Theory – in detail with the objective of looking at how each paradigm might accommodate BD within its boundaries.

These chapters aim to established the fact that there is a disconnect between BD's real impact on international and global politics and the space it can occupy within IR's existing theoretical paradigms. In the context of this disconnect, the final chapter examines the Actor-network

Theory (ANT) as a potential avenue to provide BD with a theoretical foundation that it deserves. If IR does not provide adequate room for BD, then perhaps a theoretical paradigm outside of IR, but still connected to social science study can be a useful framework to situate BD within. ANT is an interesting paradigm, particularly for a development like BD, owing to its rather unique understanding of agency and what makes an 'actor'.

This thesis does not claim that ANT perfectly allows BD to be situated within IR, or even the fact that ANT is the perfect tool to study BD (given its many drawbacks). Many authors stress that ANT needs to be developed and moulded to be a proper paradigm. Rather, it argues that certain central tenets of ANT can prove useful to explore BD and attempt to mould them into a bridge that allows BD to be looked at as an important development in IR worth study.

This thesis questions if a new transformative technology like BD that has had and will continue to have an impact on global power hierarchies can be studied by IR with its existing paradigms and norms. It seeks to [a] question the paradigmatic rigidity at the core of IR and [b] problematize the notion of agency broadly used in the discipline which has, for a long time, served as a gatekeeper for what is considered a worthy subject of study within the discipline. These dual themes are explored in more detail in subsequent chapters.

Chapter 1. Technology and Big Data in International Relations: A Historical Review

International Relations (IR) has enjoyed a century of existence as a formal discipline of study after the establishment of the IR Chair position at the University of Aberystwyth. In a hundred years of its existence, the discipline has seemingly been relatively dynamic, with multiple competing paradigms providing different lenses and perspectives through which to observe and study the world and global actors. Newer developments have also facilitated an expansion of the discipline's ontological boundaries, from the atomic bomb to the establishment of a global market society and all the way to the Internet and beyond, several developments have played a transformative role within the discipline.

Despite this, IR continues to struggle with properly situating the diverse influences upon its discipline. There is, in many ways, a divide created between what is considered the mainstream and what is relegated to the periphery. After the growth in popularity of the Critical Theories in the 1990s that sought to include considerations of gender, the environment, postcolonialism, development, globalisation and more, IR emerged a more diverse discipline, however, the divide between what might be considered the 'mainstream paradigms' and 'the rest' is still observable.

This chapter looks at the question of technology – a relatively niche topic within IR – and its influence on the discipline over a period of time. It works under the assumption that IR does not begin and end at any particular moment, that developments that long preceded the academic formalisation of the discipline and developments that will occur in the near future, deserve a prominent role as subjects of study within the discipline. This chapter further takes up the recent growing influence of BD on IR. It explores some of the scholarship that has emerged on BD and how its definition has evolved over a relatively short period of time. Finally, this chapter explores the notion of a 'big data society' and its implications.

1.1 Buzan & Interaction Capacity

One of the most comprehensive studies on technological developments as transformative agents on the international stage can be found in Buzan and Lawson's work on 'Global transformations'. Asserting that IR scholarship has thus far largely ignored the relevance of the 19th century by assuming a 'big bang' jump from the Treaty of Westphalia to the First World War, Buzan and Lawson (2013) argued that a number of developments in technology, ideology and changing relationships of states laid the groundwork for IR as a discipline in later years. This 'global transformation' fundamentally altered the structure of the international order – from a polycentric to a core-periphery world – and led to the development of modern international relations (Buzan & Lawson 2013).

Buzan's concept of 'interaction capacity', in particular, was an important conceptual label developed to refer to the "physical and organizational capability of a system to move ideas, goods, people, money and armed force across the system" (Buzan & Little 2000). In the expansion of his 2013 article with Lawson, Buzan includes a multiplicity of technological developments from the 19th century such as the steam engine which improved 'physical interaction capacity' and telegraphs, telephones and radio which improved 'communication and organizational interaction' capacity (Buzan & Lawson 2015). These developments, in Buzan and Lawson's view, had significant implications for more overt concerns of IR such as war, diplomacy and immigration but also for more subtle concerns such as social interaction and knowledge of foreign affairs.

1.2 History of Technology in IR

When examining the impact of technology on IR, the first few examples that usually come to mind tend to be those whose influence on the discipline is the most overt. Developments in military technologies, such as Weapons of Mass Destruction (WMDs) are some of the first

answers that come to mind when thinking about what technologies have had the most pervasive impact on IR. While this is a natural route to travel, structural changes brought about by the developments in interaction capacity have been extremely impactful on global politics for years before IR ever became a formalized discipline.

One such change was brought about by major advancements in widespread communication and the precursor to more electronic modes of communication: the printing press. The printing press is considered by many to be one of the most influential inventions in all of history which unleashed an information revolution that remained unmatched for several centuries until the advent of mass media and the Internet. The 'positive externalities' of widespread print media, while less measurable have been pervasive and relatively understudied by historians and economists (Dittmar 2011, p. 1133), and by extension by IR scholars.

More books were produced in the 50 years following the invention and popularization of the Gutenberg Printing Press than had been produced in the previous thousand years (Hanson 2008, p. 14) which contributed greatly to an information revolution with deep socio-political and theological impacts that challenged the established structures, norms and institutions of society at the time. The Printing Press also serves as a useful glance at a transformative technology whose impact on global power hierarchies and cultural dominance and hegemonies can be felttill date. As Elizabeth Eisenstein (1980, p. 704), one of the foremost scholars studying the Printing Press as an 'agent of change' states

> The somewhat chaotic appearance of modern Western culture owes as much, if not more, to the duplicative powers of print as it does to the harnessing of new technologies in the past century. It may yet be possible to view recent developments in historical

> perspective provided one takes into account neglected aspects of a massive and decisive cultural ‘change of phase’ that occurred five centuries ago.

What is crucial to observe is the effect of broader media and more scope to share your own ideas and receive that of other peoples, on the ordinary individual. Structural change in the international system on the European continent at the time began with the advancement of a new technology such as the Printing Press which amended power structures in a ways to empower the broader masses through information and the ability to spread and consume information at rates and speeds that were unprecedented at the time. This presented a challenge to the traditional power structure that empowered the clergy class (which previously monopolized the religious texts and claimed themselves the foremost source of moral and spiritual authority) and suppressed the working class and peasants (Hanson 2008, p. 14).

In the realm of international diplomacy the Printing Press is considered to have considerably shifted the balance of power and influence from ‘Eastern’ powers such as the Chinese, Mongol and Sasanian empires to western powers in Europe after the Gutenberg’s invention which flourished over the next few generations and greatly facilitated the spread of information and communication across the European continent (Fletcher 2016, p. 29-30).

Beyond the Printing Press, further developments in communication technology has had a profound impact on politics both within national borders and on the international stage. Gaining a monopoly over the use of the electric telegraph, for instance, gained the British empire a significant lead in its ability to administer its many colonies and dominions throughout the globe, giving it an edge over its colonial peers (Hanson 2008, p. 19). According to Buzan (2015, p. 76-77) the drastic fall in communication times led to greater ability for colonial powers to reinforce their structural command in colonies, reducing the autonomy of ambassadors and local representatives.

Advancements in communication technologies also laid the foundation for a new kind of institution relevant to IR in the coming years: the international institution. One of the first international organizations to be conceptualized and put into practice was the International Telecommunication Union (ITU) founded in 1865 which laid the groundwork for international cooperation and policymaking at international stages as representative nations negotiated and agreed upon governing principles for how telecommunication networks were to be administered.

As communication technology continued to grow driven by public demand, investments and developments in the technological side, more than 30 governments were brought to the table in 1906 for more international cooperation to regulate these new developments (Hanson 2008, p. 25). This would also start a new precedent for the private sector as communication technologies developed beyond the telegraph and companies on either side of the Atlantic began engaging in more international cooperation to administer growing global interconnectivity.

Despite these developments, a number of scholars have raised questions regarding the absence of technology from any mainstream enquiry within IR (at least until the atomic bomb). Fritsch (2011, p. 28) expresses surprise at the neglect of technology in the disciplines of IR and International Political Economy (IPE). Instead, at best there has been a tendency to either ignore technology or view it as an instrument within the confines of existing structures and rarely as an agent influencing the structure itself. Talalay, Farrands and Tool (1997, p. 2) observe, "mainstream IR/IPE does not have at present what we regard as an appropriate and articulated framework which acknowledges the key role of technology itself as an integral part of the theory and practice of the world political economy". Similarly, Winner (1986, p. 4-5) laments what he terms 'technological somnambulism' i.e. the tendency to ignore the philosophical contributions of technology.

In Buzan's view, the technological advancements taking place in the 19th century not only influenced the international system but laid the foundations of a modern international order (Buzan & Lawson 2013, p. 620). One of the major reasons why the role of technology is often underplayed in International Relations is because these developments are often viewed merely through the lens of increased efficiency in whatever field or task they are supposed to aid in. In reality, however, much of the advancements emerging from the Industrial Revolutions of the 19th and 20th century have far reaching socio-economic, political and cultural impacts (Philbeck & Davis 2019, p. 19) which are transformative of the existing status quo especially in relation to existing power hierarchies within and beyond national borders.

The international relevance of many of these developments tie-in with existing political realities of the time such as colonialism and nationalist conflicts in Europe; and spill over into the 20th century. Thus, Buzan extends an expanded concept of what he considers the 'long nineteenth century' stretching from the Atlantic revolutions in France and the United States all the way to the First World War in 1914 (Buzan & Lawson 2013, p. 620).

Technological developments also facilitated the great shift in power across the medieval and early modern era, where power shifted from erstwhile economic and military superpowers such as India and China which had ancient civilizations far in advance of the European continent, to western Europe. As Buzan and Lawson (2013, p. 624-625) observe, economic power shifted drastically from the 'Third world' states like India and China to 'Developed' states in Western Europe and North America, both in terms of total GNP and GNP per capita.

There have admittedly been limited and sporadic attempts at generating an element of discourse surrounding the impacts of major technological developments upon the discipline. Most of them, however, emerged after the advent of the atomic bomb. In his first major publication after emigrating to the United States - *Scientific Man vs. Power Politics* (1946) - and its sequel

- *Science: Servant or master?* (1972) – Hans Morgenthau made a stinging critique of 'scientific thought' and technological advancements on human nature, international politics and social problems.

While *Scientific Man* served as Morgenthau's philosophical critique of what he believed was a misguided "technocratic political impulse" (Scheuerman 2009) among American policymakers, it was in his later works that his views evolved from viewing technology as a passive instrument of for use by competing political forces to a force in itself that was growing out of human control. Following the development of the atomic bomb, Morgenthau (1972, p.3) warned that blind faith in linear technological progress "threatens to destroy man and his natural and social environment through war". While technological progress had always been a feature of the human race, Morgenthau (19721) contended that for the first time, mankind had tapped artificial sources of power that risked the security of the human race as a whole. These developments represented an inevitable change to human nature itself (1972, p. 141-143), a development that ties into his theorising of Realism as a paradigm connected with human nature.

Morgenthau's pessimistic outlook on technological development was challenged on a number of fronts by other scholars and even some fellow Realists. Misa (1994), for instance, contended that the causality of technology, as an inevitable socio-political force functioning in spite of human control, can be rejected depending on the perspective a viewer takes on social development. Deutsch (1959, p. 671) argued that though technological advancements in armaments had rapidly grown, so to had the ability of multiple nations to develop their own weapons. Using Huntington's concept of the narrowing gap between 'lead time' i.e. the time taken to develop weapons and 'use time' i.e. the period where the weapon can be used as a monopoly, Deutsch (1959, p. 671-72) warned that nations incapable of maintaining monopolies in mass destruction for long were deterred from largescale violence.

Hence the role of rapid technological expansion going out of human control – at least militarily – was a vast overstatement. A similar argument was forwarded by Morgenthau's peer in the Realist school, John Herz who argued that the speed of acceleration in military technology could lead to strategies and technologies being rendered anachronistic no sooner had they been developed (Herz 1976, p. 187).

Winner (1986) takes a more ambivalent view on the impact of technology on human nature. He argues that many of the 'alterations' facilitated by technology, come as a development or modernization of activities humans have been doing for eons and therefore do not necessarily represent a negative phenomenon (Winner 1986, p. 13).

Morgenthau's critique of technology also extended to its usage by states and the belief that with a centralization of power in the government and the ability to subjugate the domestic population, states were more able to employ technological advancements for totalitarian purposes without resistance (Morgenthau 1972, p. 73-74, p. 79-80). In Morgenthau's (1972, p. 81) view

> … no technological obstacle stands in the way of a worldwide empire if the ruling nation is able to maintain superiority in the technological means of domination. A nation that has a monopoly of nuclear weapons and control of the principal means of transportation and communications can conquer the world and keep it conquered, provided it is capable of keeping that monopoly and control unimpaired.

Winner (1977, p. 261) argues to the contrary, however, that technocratic societies are more likely to witness a widespread diffusion of power rather than centralization. Further, Deutsch (1959, p. 678) warns against overestimating the impact of technology on international politics and rejects the claim that technology could be monopolized by dictators to subdue populations and control them (Deutsch 1959, p. 674, 678).

Ultimately, in the limited discourse that has existed on the role of technology in IR, scholars have viewed technology either as a mostly negative development that affects the existing status

quo in international politics in a mostly negative manner (Morgenthau 1946, 1972) or as a 'grey entity' which can bring about certain positive developments but whose advancement must not be blindly accepted and must be viewed with adequate caution (Wright 1949; Herz 1967).

To reflect on certain conclusions gained from this overview, it is true that the very pervasive impact of a lot of technology may not appear to be evident upon a cursory glance in the same way as space for gender and feminism or environmental politics in International Relations was not provided for many decades after its inception. While scattered studies of the socio-political and economic impacts of technology on this discipline may have taken place, they are often relegated to the study of international history or the specific periods in history such as the Industrial Revolution or the age of colonialism. There has been no attempt to develop a cohesive paradigm exploring the impact of technology on IR or make amendments to create ontological space in existing disciplines for the same.

1.3 Defining Big Data

This thesis takes a comprehensive look at one such manifestation of technological development that has had a significant impact on the discipline of IR: Big Data. There is an emphasis placed on BD because of its perceived capabilities to challenge existing norms of power at the international stage significantly and potentially change many pre-existing assumptions and institutions of this discipline. This is what Weiss (2015, p. 415) refers to as the ability of technology to be a 'game changer' in International Relations. It is a development that affects pre-existing systems and changes them through the redistribution of power balances or by creating new capabilities or information deficits that change existing power hierarchies and allow some actors and states to gain strategic or systemic advantages over others. Any technological change, as Drezner (2019, p. 287) observes, is an "exercise in redistribution" that presupposes "new winners and losers…and allows the strategic construction of new norms". I

attempt to lay some basic groundwork for starting a conversation on whether IR, in its current iteration, is able to acknowledge the impact of BD within its discipline. I begin by discussing how BD has been defined over the years and highlighting the extremely dynamic nature of how it has been interpreted over time.

The first documented use of the term 'Big Data' is believed to be a 1997 NASA report on the difficulties of visualizations of data sets within limited system mainframe capacities. Cox and Ellsworth (1997, p. 1), the authors of the report, adopted a very literal understanding of BD, stating, "Visualization provides an interesting challenge for computer systems: data sets are generally quite large, taxing the capacities of main memory, local disk, and even remote disk. We call this the problem of big data". Thus, the origins of BD as a term were very literal. This definition continued to be used into the 21st century with the McKinsey Global Institute defining Big Data as "datasets whose size is beyond the ability of typical database software tools to capture, store, manage, and analyze." (Manyika et al. 2011, p. 1). While some organisations like the McKinsey Institute chose deliberately to leave the definition of BD open-ended in terms of quantified values in order to accommodate anticipated future changes, other organizations such as Intel present a quantified sum of data that organizations can consider 'big' data i.e. a median of 300 terabytes of data (Ward and Barker 2013, p.1).

The World Bank defines BD as, "a term widely used to describe the exponential growth of data, particularly the data flowing from ubiquitous mobile phones, satellites, ground sensors, vehicles and social media. It also explains the rise of the computing technologies and algorithms that harness big data for valuable insights." (World Bank 2017). In the view of Hartford, the sort of 'big data' that interests more companies is what he refers to as 'found data' i.e. "the digital exhaust of web searches, credit card payments and mobiles pinging the nearest phone mast" which are "a messy collage of datapoints collected for disparate purposes and they can be updated in real time". (Hartford 2014). A similar definition is extended by the United

Nations which sees BD as "passively collected data deriving from everyday interactions with digital products or services, including mobile phones, credit cards, and social media." (United Nations).

The massive quantities of data produced each day are not static but are increasingly fluid and marked by a rapid degree of velocity. The growing volume and velocity of data, in an age where not producing a data footprint is practically impossible, is referred to as 'Big Data'. Zwitter (2015, p. 378) defines BD as "the enormous amounts of data that, using sophisticated analytics techniques, can be mined for information in order to reveal patterns and spot trends and correlations" as well as "the enhanced ability to extract information from, and interpret, massive amounts of unstructured data". Zwitter builds on the definition provided in a 2001 META (now Gartner) report expanding on the 3Vs of data – velocity, volume and variety (Laney 2001) as well as a fourth 'V' of veracity - how accurately data gathered reflects realities – developed by IBM (Wardman 2013).

An interesting definition of BD comes from the former CEO of the data analytics firm Cambridge Analytica, Alexander Nix who defined BD as "the aggregation of as many individual data points that you can possibly get your hands on which are then synthesized in one database of record, cleaned or hygiene, and then used to inform or create insight on your target audience" (Nix 2016). While the first part of his definition presents a common theme about the vast size of BD, Nix's definition includes the crucial and more controversial element of BD in its second half: the ability to 'inform' an audience which becomes a 'target'. This has serious implications for BD and its role in politics in particular.

Mayer-Schönberger and Cuckier (2013) argue that BD as an entity can largely be viewed as a transformative force that will change every aspect of everyday life, work and even the way humans think and behave. Thus, they define BD as "…things one can do at a large scale that

cannot be done at a smaller one, to extract new insights or create new forms of value, in ways that change markets, organizations, the relations between citizens and governments, and more" (Mayer-Schönberger and Cuckier 2013, p. 6). This approach argues that BD opens new avenues and removes limits on ways of living life and conducting businesses. It bolsters the ability to gather information on unprecedented scales and with unprecedented speed and efficiency, which allows us to gather useful information, spot trends, derive insights in new ways. This results in a challenge to the status quo way of conducting life, work and human behaviour and demands a fundamental reorganization of some entrenched aspects of life.

On a similar theme, Boyd and Crawford (2012, p. 663) define BD as a "cultural, technological and scholarly phenomenon" whose primary characteristics lie in the ability to gather, cross-reference and compare massive data sets, analyse them along economic, political or socio-cultural terms and assert utopian myths of BD capabilities. Much like Mayer-Schönberger and Cuckier, Boyd and Crawford see BD as a transformative process, however, they adopt a more cautious approach to the impact of BD and feel the need to raise questions regarding the assumptions and biases that it is based off. Unlike previous approaches mentioned, Boyd and Crawford (2012) do not view BD as a purely technical development, believing it to have significant correlations with the social sphere of existence and labelling it a 'socio-technical phenomena'.

Markus and Topi (2015) argue that definitions of BD that focus on its characteristics such as volume or velocity as well as definitions that emphasize the sources of BD such as social media or government data, are inherently limiting in nature since BD is an extremely dynamic development. They adopt a 'sociotechnical' understanding of BD and define it as, "a cluster or assemblage of data-related ideas, resources, and practices" (Markus and Topi 2015, p. 3). In their view, BD is best defined, not in terms of what it is but, "what is or could be done with data and the goals and values that motivate that use" (Markus and Topi 2015, p. 3).

Shoshana Zuboff (2015, p. 75) extends this line of argument even further by asserting that not only does BD maintain intersections with the social sphere of life, it finds its origins within said social sphere and the attempt of tech giants such as Google and Facebook to extract, quantify and commercialize social existence for revenue. Zuboff (2015) develops the concept of 'surveillance capitalism' from her understanding of BD as an extractive process built upon a deceived and indifferent population who is not only exploited for commercial gain but has significant influence asserted on their behaviour and way of thinking.

While the aforementioned definitions and perspectives on BD by no account represent the totality of views regarding it as a phenomenon, they do allow us a glimpse into trends and patterns often adopted when attempting to define BD and what is the 'correct' way to view it, if any. Based on the definitions discussed above, we can delineate five different 'lenses' through which BD can be observed.

1. **Size**: During its nascent development, BD is largely taken at face value and defined in very literal terms as datasets too large to fit computational frameworks and systems existing at the time. In the initial years, these datasets were largely relegated to highly sophisticated government and certain industry specific datasets in highly complex activities. However, as time has passed, the inflows of data have spread from government agencies and corporations to the everyday individual.

2. **Extractive Capability:** The growth of data and datasets has largely been facilitated by the capability to gather and harness more and more data with increasing speed and efficiency which is the second way BD is defined. The growing capacity to gather data exploded with the onset of social media and the ability to collect data from every corner of the planet. With increasing reliance on digital banking and technologies such as the

'smart car', the 'smart watch', the home systems and of course the smartphone, the means to collect data have never been more ubiquitous and more difficult to avoid.

3. **Sources:** A third trend in understanding BD looks at the sources from which it extracts information. Sources from which data is gathered range from expected sources like one's phone or websites of companies like Google, Amazon and Facebook to less expected sources such as grocery stores to downright bizarre sources such as Barbie dolls (Gibbs 2015a, 2015b). The ability to not only derive data from obscure sources but also to draw correlations between them that are not evident at first glance form an important facet of understanding BD.

4. **Usage:** A fourth aspect looks at BD and sees its value in how it can be instrumentalized. Among those who emphasize this are Alexander Nix, former CEO of Cambridge Analytica who argued that psychographic data could be (and had been) harnessed to not only gather information about an electorate but to target and influence voters at very individualistic psychological level. The ability to micro-target and tailor political ads to an individual's specific orientation is one of many ways BD can be harnessed with exceeding efficiency.

5. **Long-term impact:** Finally, a fifth perspective on BD looks at its long-term impact and how it affects the status-quo in terms of revolutionizing established facets of life, work and pleasure. While some chose to view the growth of BD with neutrality and positive caution – viewing it as a natural progression of technology that can make life easier and more efficient for many, others adopt a more cautious and distrustful vision

> of a future characterised by disproportionate asymmetries of power and information and the growth of capitalism to unprecedented rates of exploitation.

Based on the discussion thus far, it is perhaps best to view BD in the broadest terms possible with an emphasis on its effects just as much as its size and capabilities. BD is a development that must be defined by more than just its size, speed and volume but by how it is able to attain them, how it uses them and what the results of its use are. For the many years now that BD has been informing first government agencies, businesses, social media corporations then data analytics firms and more, adopting a largely surface-level and literal definition of BD has been partly responsible for its unchecked proliferation and overspill into the civil society and the everyday lives of individuals. If one is unable to grasp or acknowledge the full scope of BD, they are also unable to respond to it.

With this in mind and for the purposes of this thesis, BD can be understood as data received from the mass extraction of information from diverse sources, with or without the consent of individuals, which are then instrumentalized for a variety of purposes and bear the potential to fundamentally alter existing norms and patterns of economic, political and social life in ways that could and have been inimical to civil liberties and democratic freedoms. The power to gain deeply detailed information can affect ways that elections are conducted or how goods and services are produced and consumed. On an international level, it is a transformative technology that facilitates shifts in power relations and hierarchies between developed states with sophisticated data harvesting technologies and developing states with large populations connecting with the web. It is important to note that despite the many perspectives on BD and its extensive definition, there are still other ways to interpret and observe the influence of BD both in itself and as a subject of study in IR.

1.4 The Big Data Society

The importance of BD as a development in IR can be further perceived by extrapolating it on top of the study of the technological developments of the past discussed earlier in the chapter; in particular, Buzan's concept of interaction capacity. Not only does BD bear the capacity to transmit vast swathes of information within the blink of an eye, it has sparked new ideas and revolutionized existing processes to remarkable extents. With widespread digitalization being witnessed in every field, from government policymaking to business and commerce to the military and more, BD is only likely to develop further into a significant player in the discipline. Under existing definitions of agency in IR, the role of BD maybe be viewed through an instrumentalist lens, however, as discussed in chapter five, if we consider a more comprehensive understanding of agency, BD could be viewed as an agent unto itself within IR.

In terms of policymaking, at both a national and international level, BD has been playing a more prominent role in recent years. National policymakers in particular seem interested in "how insight and analysis gleaned from massive and disparate datasets can help them better identify, prevent, disrupt and mitigate threats to governments throughout the world" (De Busser et al. 2015, p. 3) as well as seeing "an unparalleled opportunity to improve the speed, accuracy and consistency of decision making" (De Busser et al. 2015, p. 3). BD is also emerging as a prominent development in international policymaking, featuring heavily in the UN's renewed efforts towards the Sustainable Development Goals of 2030 ("Big Data for Sustainable Development" n.d.) as well as the UN's Global Pulse project that seeks to use BD to facilitate developmental goals around the world (UN Global Pulse 2012).

As mentioned in the UN's Global Pulse report, the advent of BD has allowed more information to be gained about entire populations in ways that have never been witnessed before (UN Global Pulse 2012, p. 6). Further, BD has allowed this information to be transferred from an unorganized mass to a structured pattern and thus has fed policymakers with extremely

accurate, vast and often real-time information that has facilitated good policymaking in the effort towards development goals (UN Global Pulse 2012, p. 6).

BD has also been a greatly influential force in facilitating new business models to the extent of creating entirely new forms of capitalism and reinforcing existing norms of a global capitalist society. Referring back to Zuboff's argument regarding BD as an emerging force in the social sphere, she goes on to further interpret BD as a "deeply intentional and highly consequential new logic of accumulation" (Zuboff 2015, p. 75) that she terms 'surveillance capitalism'. In Zuboff's view, this new form of capitalism seeks to "predict and modify human behavior as a means to produce revenue and market control" (Zuboff 2015, p. 75).

Wang et al. (2020, p. 1451) refer to the development of new Internet financial models brought about by BD and its revolutionization of the field of network communication. Chou (2019, p. 113) mentions that physical resources can now be used with greater efficiency and in more diverse ways than ever before, a development that could support new business models. This is without even considering the emergence of new 'digital resources' such as voter or consumer information, digital assets, cryptocurrencies, intellectual properties and most recently the digitalization of art as witnessed in the advent of Non-fungible tokens (NFTs).

Many have taken the advent of digitalization and BD with its derivative technologies as the harkening of a new form of society where further digitalization into every aspect of life and existence is inevitable. These notions of a 'big data society' have been further qualified by many experts seriously considering the arrival of a 'Fourth Industrial Revolution' (4IR): a term popularized by Klaus Schwab, President of the World Economic Forum (WEF). Referring to the unique characteristics of BD and mass digitalization, Schwab (2016) sets the 4IR apart fromits previous iterations.

> There are three reasons why today's transformations represent not merely a prolongation of the Third Industrial Revolution but rather the arrival of a Fourth and distinct one:

> velocity, scope, and systems impact. The speed of current breakthroughs has no historical precedent. When compared with previous industrial revolutions, the Fourth is evolving at an exponential rather than a linear pace. Moreover, it is disrupting almost every industry in every country. And the breadth and depth of these changes herald the transformation of entire systems of production, management, and governance.

Already we have witnessed an increasing push towards digitalization when existing norms, procedures and operations fail or collapse. This goes for policymaking, for military purposes, for economic models and everything in between. Perhaps the most well-known example of this exists in the creation of the oldest blockchain cryptocurrency Bitcoin, which was launched soon after the 2008 financial crisis and according to some was a response emerging from a loss in trust in the existing centralized financial infrastructure (Chou 2019, p. 117). Similar processes take place in different fields each day on a global scale.

All of this brings us back to the concept of 'global transformations' that make up the central theme of Barry Buzan's research. There is still much debate and research to be done before we can definitively say that we are living in a 'big data society'. However, what is not up for debate is that BD has already begun the process of transformations, right from the level of an individual to a global level. At its core, BD is about the transformations of power, hierarchies and systems of power that regulate how we interact with each other. This thesis will explore the notion of power hierarchies and how it relates to BD and why it is so crucial for IR further along.

What is particularly concerning about BD that sets it apart from the technological advancements that came before it is the fact that despite all of the influence and capabilities of BD , we are only starting to scratch the surface. BD differs from previous developments like the Printing Press or the radio in the sense that it is also a resource as much as it is a technology. And it is a resource that is seemingly available in abundance and can be used creatively for as many reasons in as many ways as can be conceived of by the human mind. It is, therefore, with

great haste, that IR should likely be taking a greater interest in BD as a development. However, this has not been happening thus far. The following chapter frames the problem of BD and IR and the central issue guiding this thesis. It seeks to identify the fundamental obstacle at the core of IR holding it back from adjusting to these new developments that are very relevant to its discipline as well as present the central research question underlying this thesis.

Chapter 2. Framing the Problem – The Deceptive Dynamism of IR

The previous chapter presented an overview of the impact some crucial technological developments have had on the discipline of IR. While the impact of technology in IR has merited scholarly examination for a long time, one of the main reasons for its inclusion being warranted is the persisting element of state-centrism which has coloured IR for the entirety of its lifespan. States start and end wars, participate in global commerce, engage in the creation of global laws and frameworks. As a result, the state as an actor is considered the agent that has been studied the most in IR. This has not only resulted in the marginalization of certain topics from IR but in the view of some scholars, has contributed to moral and intellectual 'poverty' within the discipline that has, in turn, stunted the development of international theory (Wight 1960, p. 38).

It has led to the formation of rigidities within the discipline that seems incompatible with a discipline studying the world and the interactions of various actors at a global level.

This rigidity is witnessed in a reluctance within a large part of the discipline to view developments that are not directly derivative of or linked to the state, to be a crucial part of the study of IR. This presents an obstacle at a very structural level for a development like BD for which there is no existing space within IR. While it is true that IR is a discipline that is characterised by a plurality of theoretical paradigms, it is also true however, that the discipline holds certain assumptions at its very core that are reflected in the worldviews of some of its most important and well-known theories and terminologies. Despite the dynamism and expansion of the discipline over the 20th century, these assumptions have remained steadfast underlying roots ofmost of the major paradigms of IR. One such assumption that colours the discipline is the centrality of the state to the study of the topic rendering it more 'worthy' or more 'relevant' toIR.

2.1 The State vs. Non-state dilemma

IR was formalized as an academic discipline of study in the early 20th century in the years following the first World War through the need of scholars and policymakers to understand conflict and war on the unprecedented scale that had taken place in the previous years. Though this thesis alleges that developments and events relevant to IR long preceded the formalization of the discipline in the early 20th century, most historical depictions of the discipline present this period as the birth of IR distinct from Politics as an umbrella discipline. As a result of these perceived origins of the discipline, the state has claimed its positions as the 'primary actor' in IR. Wars were fought between states, calculations of state interests, the roles of weaker states compared to stronger ones and much more meant that much of the early enquiry into IR revolved entirely around the state.

However, over a century later, the state, while important, is no longer the sole subject of study within IR. Despite an acknowledgement that other actors exist as meaningful players in international society, they often tend to be viewed largely in relation to or derived in some manner from the state. This is witnessed particularly in the dichotomy between state and what are widely characterized as 'non-state actors'. The term 'non-state actors' is common parlance in IR and is broadly employed across most textbooks of the discipline. It emphasises the fact that even when an actor is not the state, it attains relevance as a subject of study in IR by virtue of some form of link or relation to the state. Such a dichotomy creates the notion that as far as IR is concerned, a non-state 'actor' only becomes an actor when it interacts with or plays off the state in some manner (Smith 2000, p. 378).

It is a term that generalizes a myriad of unique subjects and blurs their diversity – which is relevant since diverse actors interact in diverse ways upon the world stage – and ultimately ascribes a forced generalization upon them. Cowles (2003) argued that non-state actors have been 'ghetto-ised' and several paradigms of IR tend to be propped up on, what she terms, the 'false or artificial dichotomies' of the state and non-state binary that binds the actions of diverse non-state actors to the state. Cowles (2003, p. 103) observes

> There is a tendency to narrow non-state actors' functions by limiting their activity to a single level of governance, by confining certain roles to the realm of traditional state and institutional actors, by pre-assigning normative labels to them, and/or by restricting our analysis to certain kinds of policy analysis.

Effectively, 'non-state actor' becomes an umbrella term where anything that isn't considered to be under the abject authority of the state is relegated to the 'non-state category' and its own unique interactions with other actors are subordinated. It has led to the incorrect notion that the state is the primary actor within IR. As Wight (1960, p. 38) asserts

> The principle that every individual requires the protection of a State which represents him in the international community, is a juristic expression of the belief in the Sovereign

> state as the end of political experience and activity which has marked Western political thought since the Reformation.

In the contemporary age, we are witnessing a growing interconnectivity and interdependence between the state and actors such as corporations, NGOs and more through Public-Private Partnerships (PPP), outsourcing of several government tasks such as visa-processing, policymaking or distributing funds through grants. It becomes increasingly apparent that the privileged position of the state, entrenched into the discipline due to the foundational myth of state-centrism established by Realist scholars who dominated the early academic explorations in the discipline, does not reflect the political realities playing out in the world. One might even argue they have not reflected political realities for some time now.

This thesis makes an attempt to explore how BD can be ontologically situated within the discipline of IR due to a belief that the existence of BD and the technologies it drives and possibilities it creates has already begun reshaping and redistributing power hierarchies at an international level. It is likely that it will continue to do so less covertly in the near future. As a discipline that studies a dynamic world characterised by frequent change, evolution and growth, it is important for the paradigms that form the main body of the discipline to be flexible and amenable to adjusting and including newer developments that impact the discipline in a variety of ways at multiple levels.

It is perhaps telling that the literature on BD that has emerged from the academic community so far has seen little contribution from scholars of Political Science and IR, especially prior to the revelations surrounding the instrumentalization of Facebook user data by Cambridge Analytica in 2016. A lot of the literature in BD has emerged from scholars and industry professionals in business schools and data science programs. IR, by contrast, has been relatively slow to acknowledge the relevance of BD to its discipline. There is an understanding that data and digitalization is an important means of communication, organization and

operation, however, there has not yet been an extensive conversation surrounding the underlying socio-political and transformative impacts that BD could potentially have on the discipline. This mirrors the scholarly attitude to the technological developments of the 19th century as highlighted in the previous chapter. It might further be interpreted to indicate a lack of proactive interest in the topic.

One of the reasons why this could be is not because IR scholars are uninterested in BD and its impact, but more likely because it is not yet fully thought of as an 'IR issue'. Herein lies the problem this thesis attempts to grapple with. The criteria through which a development or new issue is considered 'relevant' to the study of IR tends to be viewed through a state-centric lens. It raises serious questions about what we consider 'IR issues' and how they come about being so.

While on paper it would appear that IR has certainly been marked by a degree of dynamism and flexibility in terms of what has come to be understood as an 'IR issue' in the last half-century, Smith (2000, p. 376-377) argues that the disciplinary plurality of IR is somewhat of a 'foundational myth' that seeks to exaggerate and embellish how open and progressive IR has actually been. In actuality, the influence of Realism and the core assumptions of the discipline that emerged in its formative years with this paradigm have coloured most aspects of IR's development and as Smith (1987, p. 192-93) notes, even in the paradigms that developed in opposition to Realism.

Vasquez (1998) argued that aspects of Realism such as the centrality of the state, the irrelevance of the domestic on international politics and the scope of IR being limited to power and peace (i.e. the prevention of war and conflict), were all reflected in the paradigms that developed after Realism, even those that ultimately took an opposing stance to it. This relegated several IR paradigms, and the discipline at large to a 'colour it Morgenthau' (Vasquez 1979) attitude

wherein aspects of formative Realist thinkers like Morgenthau could be detected in most paradigms of the discipline.

It can therefore be surmised, that though on the surface IR may appear to be a very dynamic discipline that had adjusted to and grown to address the challenges of its time, can retain a certain degree of rigidity at its very core which is what prevents a lot of developments from being taken seriously as 'IR issues' when they should be. It is clear therefore, why technology (and BD specifically) has not been given sufficient scholarly attention within the discipline of IR.

The primary impact of a lot of technological developments that has been observable so far has been more covert than overt, changing underlying patterns of power, opening new possibilities, privileging certain actors (whether it be a group of people, a state or a community of states) over others. Not until the most overt technology that threatened an all-encompassing shift from the status quo i.e. the atomic bomb arrived on the scene, did it receive attention from IR on a very significant scale.

Nuclear weapons 'changed everything' in the equations of how states interact with each other. They facilitated a rapid and observable behavioural change among states. Even states that previously engaged in bitter skirmishes and armed conflicts refrained from escalating conflicts beyond a certain point if one or both parties involved had nuclear weapons. States were incentivised to change their traditional behaviour in order to avoid paying a cost they deemed unacceptable in a nuclear-armed world. It is not too difficult to conceive of a world where the weaponization of BD may bring about costs also unacceptable to many states, where massive swathes of personal information about citizens (including army and government personnel) may be vulnerable to rival hostile states through unknown channels. While this has already been observed to some extent in the proliferation of app bans particularly related to China and

Russia among states like the US, Australia, India and so on, apps are only one means of harvesting personal data.

2.2 Why has Big Data remained understudied in IR?

Ultimately, it is important to consider that this thesis is as much about IR as a discipline as it is about a new relevant development like BD. Indeed, in examining the potential impact BD can have on the discipline and where it could be ontologically situated has led to a number of observations regarding IR as a discipline in itself and what it considers within and relevant to its disciplinary contours. One of the most notable factors about IR has been its willingness to adapt and expand its scope as and when new developments emerge. The dynamism of the discipline is generally considered praiseworthy and lauded. However, the fact remains that, as observed earlier, any amendments to the scope of IR, any expansions in the discipline tend to be reactionary in nature and still exist within the boundaries of the core assumptions of the discipline.

For instance, gender and IR, the role of women in global politics did not begin in the 1990s when Feminist IR scholars became more vocal about such gaps in existing literature and theories. Gender, feminism and the role of women have always played an important role in global politics since its inception. Similarly, as detailed in the previous chapter technology has been playing a crucial role in the practice of international affairs for years with little to no recognition from the scholars in the discipline. There is rarely a proactive recognition of new and important developments in the discipline which often stays fixed to its American and Euro-centric origins(Smith 2009, p. 3).

Thus, the enquiry into the ontological positioning of BD within IR leads me to believe that while IR has proven itself to be dynamic and willing to evolve, there is more work to be done to adapt more rapidly and more flexibly to new developments that affect the discipline. Steve

Smith's noteworthy introduction to the Oxford Handbook of International Relations begins with Smith making 'six wishes' which in his view renders IR a more 'relevant' discipline, thus implying that while the issue-areas and matters of concern considered important by IR at present continue to be so, there also needs to be a recognition of newer developments within the discipline if it is to be considered relevant to modern day socio-political realities.

Despite the dynamism of the discipline, Smith (2009, p. 4) observes that "the vast majority of [IR] work in the United States focuses on developing existing research paradigms, and the major innovations tend not to come from academics based in the main departments of international politics". This is already an existing reality for BD and IR, as much of the interest in examining the impact of BD on IR seems to emerge from scholars in the fields of Business, Commerce, Data Sciences and not from Political Scientists or IR scholars. It is only after the high-profile case of the Facebook-Cambridge Analytica scandal in 2018 that some attention was given to the role of BD in international politics. While some articles have been published in academic journals, a proper body of literature purely dealing with the nexus of BD and IR hasyet to come to fruition.

Drezner (2015, p. 134) observes that the 'analytical leverage' of IR paradigms over 21st century problems is 'eroding' and that these paradigms have not adequately adapted to the asymmetrical, non-state based threats that the human race faces. Drezner's exploration of the impact of a fictitious threat of a zombie apocalypse and the policy response from IR paradigms might be relatively tongue-in-cheek, however, his observations regarding what he terms as the 'incomplete' tool kit of IR paradigms being unable to adequately respond to a threat of such magnitudes stands true for more new developments in IR that have not been situated within the discipline and are not being studied with enough academic rigor (Drezner 2015).

This thesis attempts to start a conversation that takes the role of BD in IR seriously, but situates it within a larger spectrum of what IR needs to do to remain, in Steve Smith's words, relevant to contemporary political realities. It aims to begin a proactive conversation into the role of BD and technology in IR given its increasing relevance to public policy and global affairs. It explores how BD has affected the discipline so far and how IR can grapple with its growing relevance to international affairs.

Growing interconnectivity even among devices used by people, from smart-watches, smart-fridges, smartphones, smart home systems and even smart-toys, has created a massive network of personal data and surveillance mechanisms known as the 'Internet of Things' that can allow access to multiple facets of sensitive data being leaked and used for dubious purposes. BD can have a significant impact on the integrity of democratic elections, the privacy of a nation's citizens, the flow of crucial and sensitive information within a country's security network and the practice of armed conflict along new frontiers. Though not as stark as mutually-assured destruction, BD can raise stakes to levels that states would deem unacceptable to compromise upon.

It is important, thus, that IR begin viewing these new developments with increasing seriousness. This thesis attempts to start a conversation in this direction, however, at a very rudimentary level. IR's task is made difficult in that it has to often respond to new and important developments with frequent regularity, however, the ability to meaningfully do so would also enhance its disciplinary rigour and allow it to more accurately represent and study the world in a less one-dimensional manner. In the next two chapters, the struggle to situate Big Data – both in terms of realpolitik and theoretical paradigms respectively – is discussed at greater depth.

Chapter 3. Big Data and International Relations in *Realpolitik*

Big Data (BD) has been an important factor in a number of international incidents in recent years. However, its role is not always very overt and as a result, it has largely stayed out of the mainstream conversation taking place on newer developments in Political Science or International Relations discourse. With more of the world's population being connected to the internet every day, the amount of data being generated and transmitted grows with every passing second. Further, due to advancements in data technology, there has been a widespread shift towards the digitalization of business and government operations and services.

This extends to both developed countries that have digitalization and largescale data-gathering engrained in multiple aspects of daily operations as well as developing countries that have seen the push for digitalization in many aspects of public policy from policing to education or trade policies. Data is now being produced at a rate faster than ever before and with BD capabilities growing by the day, the ability to collect, organize and instrumentalize (or weaponize depending on one's perspective) this data has rapidly accelerated. However, what has not rapidly accelerated at a proportional rate is the attention paid to BD as a subject of study within IR.

This chapter explores some of the dimensions of BD influence on contemporary global and international political events and developments with the aim to qualify the argument that BD and BD-technology needs to be treated as a serious development and subject of study within IR itself and not as a niche within an already marginalized field of study within the discipline.

3.1 Digital Dimensions of Existing Conflicts

One of the main ways BD has been asserting an influence on IR and global politics is by the creation of what we can refer to as a 'digital dimension' of pre-existing conflicts and fissures between nations. Hansen and Porter (2017, p. 2) argue that one of the two primary ways in which BD affects global governance and global geopolitics is through "new boundary issues that are not primarily territorial, but rather about access to and control of data, creating complicated new conflicts and exclusions globally".

These conflicts include aspects of divisions between groups of nation, mostly along the lines of their level of development and pace of economic growth. Conflicts like the North-South divide between the developed 'North' countries and the developing and underdeveloped 'South' have been further exacerbated through the addition of a data dimension to them. This has largely centered around the question of protectionism and access to markets and the

conflicting interests of developed countries with large technology corporations clashing with those of developing countries with massive markets slowly getting connected to the internet.

In a world were data as a resource gets more and more valuable each day, access to large markets of people increasingly getting connected to the Internet can be an extremely lucrative opportunity for Big Tech firms from the West. Already global social media platforms such as Facebook, Twitter, Instagram and more have become daily staples in popular culture for both younger and older sections of the population. A lot of developing countries, however, have become cognizant to the fact that the data produced by their citizens can prove to be a valuable and much sought-after resource for these corporations and if provided too liberally, could be against national interest.

Increasingly there has been a protectionist sentiment within some developing countries towards how much access to their citizens' data they would provide and towards protecting the data of their citizens as they would a natural resource. However, due to the conflation of the actual platform and mediums being owned mostly by foreign Big Tech, the latter has been aggressively campaigning and lobbying for more access to these lucrative data markets.

These conflicting interests were perhaps perfectly encapsulated at the 2019 G-20 Summit in Osaka, in response to then Japanese Prime Minister Abe's initiative for global digital cooperation labelled the 'Osaka Track'. The Osaka Track called for the establishment of an international standard of rules and procedures creating an open network for the free flow of data across borders. The initiative sought to effectively liberalize the flow of data on a global scale with the objective of sparking innovation and economic growth (Sugiyama 2019). Though most G-20 member states signed onto the declaration which received support from former President Trump, some major developing economies such as India, Indonesia and South Africa declined to sign onto the initiative even on a symbolic level.

Further, even among the countries that did sign onto the initiative, the actual interests and actions of those states conflicted with their seeming agreement with the Osaka Track objectives. Russia and China, for instance, have developed stringent data regulation frameworks within their own national jurisdiction that is counterproductive to the liberalizing goals of the Osaka Track.

China in particular has been infamous for its vast array of data protectionism and the outlawing of several western social media and technology corporations, instead developing its own national parallels which are heavily policed, censored and monitored by a combination of laws, policies and technology known as the 'Great Firewall of China'. At the Osaka summit, despite signing onto the Osaka Track, President Xi defended his nation's data framework on the basis of national security (Sugiyama 2019).

Ironically, a similar strategy was employed by former President Trump to emphasize the need for enhanced protection of 5G networks, in what was undoubtedly in reference to the Chinese firm Huawei which had been labelled a 'national security threat' by the American government owing to allegations of ties between the corporation and the Chinese government. Fears of espionage and data harvesting were also present among European Union members. The EU had recently developed and adopted an extremely stringent data regulations framework known as the General Data Protection Regulation (GDPR) to protect the data of all EU member states' citizens.

What can be gained from this example is a twofold conclusion. First, that there exists a definitive divide between developed and some major developing economies in relation to the liberalization of their data markets and how much to open up. Developed countries in the global North like Japan, the US and European countries benefit from developing countries like India and Indonesia (with large populations emerging from poverty into the middle class and

accessing the internet) opening up their 'data markets' and allowing access to Big Tech corporations. However, for developing countries there exists the risk of granting too much access to the private information of their citizens and squashing any chance of technological development within their own borders as competition with billion-dollar foreign corporations would be next to impossible.

Signing onto an international agreement that broadly reflects the interests of the developed world (an agreement would not exist without these interests represented) could prove particularly disadvantageous for several developing countries as well. It has already been observed that mega-corporations can hold immense influence in lobbying governments in the developed world towards either developing national policy or influencing international law to their benefit. One particular example could that of the treaty on Trade-Related Aspects of Intellectual Properties Rights (TRIPs) which was heavily pushed for by Big Pharmaceutical firms in the US against developing countries like India due to the former producing and distributing life-saving drugs at cheaper prices which ate into the profits of American Big Pharma.

A second conclusion that can be derived is that even among developed countries, there is apprehension and reluctance to sign onto a completely free network of flowing data due to reasons of national security and corporate edge. A key player here is China with its decided lead in the development of advanced 5G technology but whose corporations are treated with a degree of distrust owing to their legal obligations to work in conjunction with the Chinese government (despite reassurances to the contrary). This makes calculations of digital economic liberalization more complex.

This is just one example that demonstrates the growth of building distrust and conflicting interests among countries regarding Big Data. Digitalization and the growth of BD is an

inevitability as technology advances each day. However, with developed countries concerned over national security and data protectionism and developing countries concerned with data colonialism and distrusting the intentions of the Big Tech firms of the developed world, a new parameter of global conflict is bound to emerge as a result of these clashing concerns.

3.2 Big Data and the corporate issue

Another significant global dimension of BD is in the growth of data analysis firms and corporations presenting a risk to election integrity in foreign countries. It is pertinent to remember that BD is not just about the volume of data that can be gathered or the velocity with which it can be processed, but rather equally important to consider is the *type* of data that is being harvested and instrumentalized. The most prominent example of this being highly dangerous and prone to abuse is the case of Cambridge Analytica and its interventions into the Presidential elections in the US in 2016 as well as contributions to the 'Leave' campaign for Brexit in the UK.

Cambridge Analytica, a UK-based data analytics firm was able to unethically source personal information data from hundreds of millions of Americans through social media platforms like Facebook. This information was taken without the explicit consent of the users who, for the most part, were unaware that their data was being used for anything or that they were even producing much data to begin with. Using the aforementioned data, Cambridge Analytica was able to produce a vast and comprehensive database of psychographic data.

In contrast to demographic data which reveals demographic information about a person such as their age, height, nationality, gender and so on; psychographic data provides information regarding a person's personality and psyche. This includes their browsing history, their purchasing habits, the sort of content they consume online, their attention span, how open they are to influence and suggestion and perhaps most useful for Cambridge Analytica, their

political preferences and leanings. Combining psychographic data with the microtargeting that Big Data allows for, Cambridge Analytica was able to not only show personalized advertisements to millions of voters in America, but was able to categorize which voters to prioritize based on who would be most susceptible to changing their political opinion or if they were undecided, being swayed to whichever client Cambridge Analytica was working for at the time.

What is interesting about this, is that the actions of Cambridge Analytica only become known as controversial and began eliciting widespread global condemnation once the news of how the data had been unethically sourced from social media platforms became public in early 2018. However, for almost two and a half years prior to that, there was no major outcry regarding Cambridge Analytica's methodology. The use of psychographic data was certainly not a secret as then CEO Alexander Nix spoke quite openly and proudly about the use of psychographic data in a talk at the Concordia National Summit in 2016 ("The Power of Big Data and Psychographics" 2016).

Nowhere was the use (or abuse) of psychographic data by Cambridge Analytica more evident than in the firm's involvement in a previous general election in Trinidad and Tobago as revealed in Netflix's documentary 'The Great Hack'; on the actions of Cambridge Analytica post its fall. Using witness testimonials from former high-level Cambridge Analytica employees, the documentary revealed how psychographic data was used to initiate a nationwide behavior manipulation campaign targeting young voters of the two main competing political parties in Trinidad and Tobago ("The Insane Cambridge Analytica Election Interference Revelations in The Great Hack" 2019). Using a combination of 'trendiness', youth culture, popular symbols of resistance and family values, Cambridge Analytica was able to increase apathy among one section of the youth population enough to sway the election in favour of their client by 6% (The Insane Cambridge Analytica Election Interference

Revelations in The Great Hack" 2019).

This is just one example that reveals how dangerously efficacious psychographic data can be in compromising the integrity of an election. The methods employed in Trinidad and Tobago were later repurposed for Ted Cruz's Presidential campaign in 2016 and once the Cruz campaign conceded to the Trump campaign ("The Insane Cambridge Analytica Election Interference Revelations in The Great Hack" 2019). Given Trump's narrow margin of victory in a number of important swing states, it would not be a far cry to say that Cambridge Analytica potentially played kingmaker in the 2016 Presidential election, all through the extremely sophisticated abuse of the personal data of hundreds of millions of American citizens who would remain ignorant of their data being harvested in this manner for another two years.

The fact that corporations in the developed world can unethically harvest and weaponize the data of hundreds of millions of citizens in not only developed but developing and underdeveloped nations with weaker protections and regulations on citizens' data is rapidly emerging as an IR issue. This stems from the fact that any rules of international law surrounding data rights would likely be in favour of corporations that might be liable to misuse said data for profit or security purposes. In past instances, infamous international agreements and laws such as the TRIPS Agreement have largely been conceptualized after intense lobbying by large pharmaceutical corporations in the United States and Europe. This sets up possibilities for conflict with reference to how nations might want an international framework to regulate data issues to look like, if they want one at all.

In the absence of a framework however, there is equally an opportunity for conflict, seeing as nations have begun taking more stringent actions at a national level to protect the data of their citizens and begun making efforts towards data localisation i.e. storing and handling the data of a particular country within its own national servers as opposed to letting it flow beyond the

borders of the state. There is also an economic incentive here, as several states, both in the

developing and developed world have felt that digital corporations have often not been paying adequate taxes in states where they make billions of dollars in profits.

In 2019, France passed a 'digital tax' of 3% on income made by Big Tech corporations (mostly American) on all income that they made within French borders, out of an argument that these corporations did not pay sufficient taxes in the states where they made most of their sales (BBC 2019). Similar taxes are said to have been considered by other European states like the UK, Spain and Italy as well as non-European states like Japan, India and Singapore (BBC 2019). This has elicited concerns of retaliatory tariffs, most prominently from the US as former President Trump lashed out against these tariffs.

3.3 Surveillance Capitalism

Connected to the aforementioned issue, the actions of big tech corporations and data firms, using the vast BD of the citizens of a nation are able to use the data in sophisticated ways to create a 'Surveillance Capitalism' network that enacts a version of the microtargeting seen in the case of Cambridge Analytica on voters, but instead targets an individual as a potential customer rather than a potential voter for a certain candidate. Surveillance Capitalism was a concept developed by Harvard scholar Shoshanna Zuboff which she describes as ways in which big tech corporations are able to commercialise the lived experiences and habits of humans to sell them products hyper-tailored to them (Zuboff 2015).

Where this has emerged as a matter of interest for IR has been in the response from several states at the prospect of their citizens' data being harvested and instrumentalized by large foreign corporations to sell them back products. There is a two-fold concern here, the first being that it might violate the privacy of their citizens in many ways and the second being that large mega-corporations using such data would have a near insurmountable edge over many domestic companies and ventures, thus disadvantaging home-grown business.

It is observed that while both these concerns go hand in hand, states have generally trended towards focusing on the former when enacting stronger data protection legislation, mostly out of an interest to avoid the negative optics of data protectionism. However, the intertwined concerns are evident. Take, for instance, the primary statement regarding the scope of the EU's sweeping GDPR, which states that, "if you process the personal data of EU citizens or residents, or you offer goods or services to such people, then the GDPR applies to you even if you're not in the EU" (Wolford n.d.). It is notable that the scope of the GDPR is particularly mentioned as including not just those actors that handle the data of EU citizens, but those that conduct commercial activities that involve EU citizens as well.

In one of the first few articles in the actual GDPR document, it is stated that

> The economic and social integration resulting from the functioning of the internal market has led to a substantial increase in cross-border flows of personal data. The exchange of personal data between public and private actors, including natural persons, associations and undertakings across the Union has increased. (GDPR.eu 2016)

With the growth of globalisation and the increased efficiency of digitalisation, there has been growing contact and transactions between markets which now include vast swathes of BD resources crossing borders with foreign entities, both state and non-state. Legislation like the GDPR recognise that the information gained from these vast swathes of BD can not only become an issue of national security concerns but can also become a systemic economic challenge through the creation of an entrenched business model or economic system that places foreign (mostly American) data and technology corporations at an advantage in the domestic European markets. This problem is even more enhanced in developing economies with less stringent existing data protection protocols and a newly emerging data-connected population.

That being said, while growing advancements in digital technology leading to the volume of BD produced every minute growing rapidly each day has led to a globalisation of digitalisation,

some have also noticed a near simultaneous 'Deglobalisation' of data especially from certain key states in the past few years (Fan & Gupta 2018). The GDPR is an excellent example of this. While upon first glance, the GDPR primarily constitutes a comprehensive set of legislation to safeguard the handling of EU citizens' data, it also blocks data transfers to states that it views as insufficiently protecting EU citizens data. States like China and Russia also have erected comprehensive data security frameworks with China's complex set of laws and policies cordoning off the data of its citizens assuming the moniker of the 'Great Firewall'.

Countries like India are witnessing a massive growth of its youth population getting connected to the internet with more widely available electronic devices, such as smartphones and computers available at cheaper costs. The country is presently in the process of framing a comprehensive data protection bill called the Personal Data Protection (PDP) Bill 2019, which takes inspiration from the GDPR. Currently in the formulative parliamentary committee discussion stage, the PDP Bill, among other things, "introduces a central data protection regulator, as well as institutes data localization requirements for certain forms of sensitive data" (Kittane et al. 2021).

Ultimately, the simultaneous 'twin movement' of both globalisation and deglobalisation of BD is likely to become a point of friction between states even more so in the coming years as digitalisation is unlikely to stop innovating and the worth of data (especially personal data) grows exponentially in value. The result of this growing 'twin movement' is that we witness a simultaneous reduction of borders in many ways with information and people flowing more accessibly across established national borders, but also a re-establishment of new borders between digital Haves and Have Nots (Hansen and Porter 2017).

Already we have seen an element of this friction in the divide between states on the global liberalisation of data frameworks at the Osaka G20 Summit. Conflict between states on this

matter is likely to be more intense than mere trade disputes. If anything, this friction would likely resemble the global contentions around energy resources like oil, except unlike oil, BD is looking to be an ever abundant resource that can be weaponized far more effectively and creatively in the years to come.

3.4 Asymmetries of Power

Despite the diverse applications of BD and the eclectic manifestation of friction that is facilitated by BD and its derivative technologies, one concept binds all these examples together at the very core: power. The struggle for power is perhaps the oldest and most pervasive of factors in IR conflict. Whether it has been discovering new lands, modes of governance, trade systems, strong naval might, newer weapons, bigger bombs or greater cultural might, conflict in IR has always held power as a central concept. This is precisely why BD has the capacity (beyond what has already occurred) to have such a big influence on IR. This influence can be positive in nature, of course, however thus far, from what has been observed the negatives seem to outweigh the former.

BD's influence is derived from its ability to impact and modify power relations with relative ease in a modernizing world that is increasingly subscribing to a 'digital life' in so many ways. In doing so, BD has the profound ability to create asymmetries of power, the likes of which have not been seen before. It is important to note that asymmetries of power have been a lasting feature of the international system since time immemorial. However, with the unique circumstances of a world in 'digital flux', more creative applications for digital technologies and online activities emerging every day, BD is uniquely positioned to create new hierarchies and asymmetries that may entirely escape the notice of IR owing to the latter's lack of ontological attention on the topic thus far.

Given that the development of digital infrastructure and BD technologies is disproportionately weighed in favour of a select number of technologically advanced nations, it can further entrench power disbalances at the global level. We have already seen a version of how the digital edge can provide nations with an advantage in global conflicts, such as the STUXNET virus being used as a highly effective cyberweapon allegedly developed by the USA and Israel to severely damage the Iranian nuclear program in 2010. Cyberweapons and AI-driven weapons such as drones are likely going to be the future of global conflict once technology keeps advancing. This will privilege the states with a strong digital infrastructure and several established mega-corporations dealing with data and AI. It will thus be a question of how global rules surrounding cyberweapons and BD will be framed in order to address this seemingly lawless field at the moment. Presently legislative limits on the use of BD have mostly peaked at the national level. It would take a great degree of global cooperation, negotiation, compromise and perhaps even conflict to develop a robust international legislation infrastructure to govern BD. There will also be newer questions surrounding national interest for nations with the ability to gather massive amounts of metadata about citizens/electorates of other countries, or hire companies that are able to do so.

There will also be the economic factor to consider. Asymmetries of power are likely to very deeply manifest themselves in giving developed, technologically-advanced states greater knowledge about market trends and practices, that could lead to them gaining a decided edge over the domestic producers of a nation-state. This could either lead to the demise of several domestic chains of production or spark high protectionist sentiments from both governments and civilians of the state leading to trade disputes and diplomatic spats.

Without much ontological space beyond relegating BD to a niche within a niche topic within the discipline, IR cannot hope to acknowledge and grapple with the conflicts and fissures that are going to define the future years. Though IR is a dynamic discipline in that it has evolved

and changed its scope over the near century of its existence as an organized academic discipline, it still needs to achieve a more flexible perspective in looking at developments that are originally external to the discipline, but ultimately end up impacting the very core of the discipline's sensibilities and ways of operating. The discourse on BD and power relations could be a very fruitful discussion for IR literature, but scholars wishing to begin or build upon this discourse might find themselves struggling where to situate it within IR's ontological space. This must be rectified in the years to come.

Chapter 4. Big Data and International Relations Theory

The theoretical paradigms in International Relations (IR) offer a useful kaleidoscope through which to view the world and the interactions of the actors that exist within the international system. While some theories visualize these actors as constantly clashing 'billiard balls', others observe a more cooperative interconnected 'network'. Each theory is rooted within its own unique reality (though some derive their realities from previously existing theories) and have their own unique ways of conceptualizing the world and the complex political realities that are studied in IR. As Robert Cox (1981, p. 128) asserts, every theory develops its own perspective rooted in the social, spatial and temporal realities of the period when said theory is originating. This is especially true for the discipline of IR, owing to the sheer expanse of the subject matter explored within this discipline. While there can be specializations regarding subjects of study, IR is basically a scholarly examination of the world and how everything within it interacts.

For a discipline as broad and expansive, it is only natural for the subjects of study within it to be in a constant state of flux. As social, spatial and temporal realities change, either through the development of interactions among existing actors or the introduction of new actors that disturb the status quo, the perspectives of the theories being developed change as well. For

instance, the proliferation of the Liberal-internationalist theory of IR following the Bretton Woods conference and the post-war reconstruction of the world marked a defined change from the worldview of the war-based Realist school which could not conceptualize a liberal internationalist global structure in a favourable light. Further along, as many countries broke free from the shackles of colonialism and emerged as independent on the global stage, it complicated the international system and added a large number of new units to consider, leading to an interest in a more all-encompassing and structural approach to IR, witnessed in Structural realism or neo-realism.

Even further on, into the 90s, several paradigms were brought into the mainstream with the explicit purpose of critically addressing the existing paradigms of IR which often ignored its Euro or America-centric origins and thereby ignored the contributions and roles of the post-colonial world, or the dominance of men in the discipline leading to questions such as "Where is the woman in IR?" (Zalweski 1998). The Critical theories emerged out of a desire to fill the gaps left by the existing paradigms of IR and criticize the prejudices that many of these theories were foundedupon. This period also saw a new interest in reacting to current events which were viewed to be relevant to the study of global politics such as climate change, global energy politics and perhaps most notably, globalization.

At every juncture of its history, IR has seemingly evolved by responding to previously existing paradigms or to new developments that have been viewed as relevant to the discipline (Stein 2009, p. 203). However, as has been discussed in previous chapters, this special dynamism does maintain an element of paradigmatic rigidity at its core, mostly influenced by Realist and Positivist thought. IR is not as dynamic as it may appear, however, the special brand of dynamism is of utmost necessity if the discipline wishes to retain relevancy in accurately assessing the world over a period of time. The political realities of the present look very different from those of even half a decade prior, let alone ten, twenty or thirty years ago. New

developments create new problems that play out and have an impact across the world in unprecedented ways. Thus, Cox (1981, 128) observes

> A primary task of theory is to become clearly aware of these problems, to enable the mind to come to grips with the reality it confronts. Thus, as reality changes, old concepts have to be adjusted or rejected and new concepts forged in an initial dialogue between the theorist and the particular world he tries to comprehend.

For the discipline of IR, one such change in problem has become the ever-increasing sense of who is considered an 'actor' or a subject worth studying within the discipline. Perhaps this is the result of the fact that IR was formalized as an academic discipline with very focused and specific intentions in mind, reflecting the major socio-political reality of the time. This was, of course, the Interwar period where a growing corpus of literature emerged along competing lines: the liberal idealism (also labelled 'utopians') of Woodrow Wilson, Norman Angell and Alfred Zimmern versus the proponents of the 'Realist' school of thought such as E. H. Carr, John Herz and Hans Morgenthau. Both traditions had the same objective: to explain the causes of Great Power conflict (the likes of which had not been experienced in recent memory at the time) and how to prevent it. Needless to say, both traditions provided radically different and opposing lenses through which to view the global political reality at the time and to address their common objectives.

So, if it can be assumed that IR is a discipline that evolves and expands its borders based off whatever is assumed to be necessary to respond to the most pressing issue of the time, then Big Data (BD) and its growing influence on international affairs and impact on both pre-existing global power structures and new parallel power structures, ought to be considered the next important development in the discipline worth exploring. However, technology at large and BD in particular have been largely ignored as relevant subjects of study in IR and where they have been studied, it has largely been relegated to the pages of international history or in limited niche sets of literature looking at Science and technology at large.

4.1 Big Data and International Relations Theory: The 'Zombie Test'

Given the state-centric perspectives of many of IR's most well-known paradigms, when the time comes to respond to socio-political, economic or military challenges in the contemporary era, most of these theories cannot help but refer back to the state as a central player repeatedly. This is one of the main reasons for the shortcomings mentioned before. While it is true that in many cases the state is involved, being unable to view conflict or developments without linking them to the state risks creating a lacunae within the kaleidoscope of IR theories and allowing important developments to slip through the cracks. IR remains reluctant to view new developments as an important actor in the discipline unless it somehow ties itself to what IR might consider a legitimate existing actor or to a pressing issue in the broader political discourse.

Big Data represents one such development where there has been little attempt to learn more about this new development. As a result, little effort to rectify the significant gaps in knowledge about BD and what it means and could mean for global political realities. Due to this, IR ends up becoming merely reactionary in responding to these new developments, rendering itself slow and passive and unable to pre-empt or understand what led to such a development, especially compared to other disciplines that have begun taking BD more seriously as a subject of study.

The roots of BD have spread to near every major corporation, to governments, to dictatorial-authoritarian regimes and the ways in which it can be instrumentalized are manifold and disturbing to conceive of. Further, it disturbs the status quo on the international system and can create conflict among states along more traditional lines. BD severely undermines the state-centric understanding of players in IR. While the state is involved in many ways, trying to always refer to a new development in relation to the state and not a subject of study in itself

can be a futile practice. However, at present, IR seems ill-equipped to situate BD into its paradigmatic canon. Where would an actor like Cambridge Analytica, for instance, fit in? Would Facebook be an actor? What about the people whose information was harvested? Or would the Trump or Brexit 'Leave' campaigns be the actors since they patronized the data?

These questions do not have a clear answer partly due to the aforementioned problems in IR regarding how subjects become 'worthy' of scrutiny into the discipline. Thus, to gain further insight as to how BD might feature as a subject of study in IR, I undertake a brief study into how some paradigms of IR might observe BD, paying close attention to each theory's perspective (in the Coxian sense) as well as basic tenets and the role they might play in providing for an ontological space for BD.

I focus on Realism, Liberal IR Theory and Critical Theory due to the former two often being considered the most broad and fleshed out theories of IR and the basis for a lot of later theories which either developed off them (the Neo-neo synthesis) or emerged as a critical reaction to them and among those reactions, Critical Theory stands out in being a particularly flexible paradigm that can offer some valuable linkages for BD from the perspective of IR.

4.1.1 Realism

Realism is often the first theory of IR that students of the discipline are introduced to at the start of their academic journey into the myriad of theoretical paradigms in IR. Realism is not only one of the oldest theories in the discipline, tracing aspects of its origins back to ancient times and scholars like Sun Tzu, Kautilya, Thucydides and later Machiavelli, it is also one of the oldest formalized paradigms in IR, developed in the Interwar period. It is also important to observe that due to the time Realism has had to develop a broad and rigorous academic structure and the large variety of well-known scholars and academics who have identified themselves

with this tradition, it is a theory of theories in the sense that it is characterized by a significant amount of internal diversity (Lawson 2017, p. 44; Wohlforth 2009, p. 133).

Referring back to Robert Cox, it is important to remember that theories rarely emerge out of a void but instead are rooted in the political realities of the time they originate and thereby are coloured by those very realities. This, in Cox's view, is what leads to theories developing their own unique perspective that separates them from other theoretical paradigms and allows us to view one world through many different lenses. For Realism, this perspective is largely bleak, pessimistic, conflict-oriented and distrustful due to the its origins in one of the darkest periods of international history in the 20th century. However, proponents of this school of thought counter this assertion by claiming that the tenets of Realism only lean towards what they perceive as being logical, 'realistic' and "based on the dispassionate observation of human affairs the way they are as opposed to the way we might wish them to be" (Wohlforth 2009, p. 135).

Despite the above assertion, Realism, presupposes some basic tenets that do get coloured by the context within which the theory emerged. Realism envisions a world in a state of anarchy i.e. a world where there exists no single sovereign entity at the international level to serve as a source of authority that controls its subservient units. Nation-states are therefore the highest cohesive unit on the world stage and thus, cannot rely on a higher source of authority to provide security to them and are largely responsible for their own safety (Drezner 2015, p. 37). Conversely, states can also resort to violence to get what they want or to advance their national interest.

Realism proclaims that nation-states largely function as a result of a desire to advance their own national interest which governs their behaviour on the world stage. Realists remain cynical about any action of the state that doesn't claim to have national interest as a core underlying

purpose which is where they often clash with those who subscribe to a more cooperative outlook. Realism also proclaims that the nation-state is the primary actor of note within the discipline. This derives from an assertion from Wohlforth (2009, p. 134) which argues that all politics is derived from groups and when it comes to IR, the main 'group' unit that exhibits power as a "single, coherent, undifferentiated unit" is the state (Lawson 2017, p. 46). After all, if assumptions of an anarchic world are true, then Realists would consider it a given that the subject of study is the state given that individuals or supranational organizations are not perceived as exhibiting much power on the world stage compared to the state.

In Realism, power is generally viewed in absolute terms instead of relative terms. Since Realism is perpetually concerned with security, states are constantly in a race to secure a more powerful position for themselves within the broader community of states. As Drezner (2015, p. 38) observes, "States will consider the distribution of gains when thinking about cooperating with another actor. The question for realists like Kenneth Waltz is not 'will both of us gain?' but 'who will gain more?'". This absolutist view of power is also what contributes to states remaining distrustful of each other and viewing gains in power by other states, especially if they are strong states, with hostility thus creating what is known as a 'security dilemma'.

While this basic exploration of the some of the broadest tenets of Realism certainly does not account for the full depth and ideological diversity of the paradigm, it should still serve as sufficient to view the pillars which hold up the paradigm at its foundation and in some form or the other serve as the basis for most of the intra-paradigmatic debates within Realism. It also highlights how little ontological space Realism could afford to a development such as Big Data. Indeed, of all the major theories of IR, it is likely that BD would find the least ontological space within Realism out of the sheer incompatibility of some of Realisms most base foundations and the growing role of BD in international politics.

For starters, Realism commences its analysis of world affairs with a predisposed notion that 'political units' or groups alone are worthy subjects of study in IR. Consider this quote from Frankel (1996, p. ix)

> From the beginning realism has offered explanations for how political units – today we call them states – protect and preserve themselves in an anarchic environment in which dangers to security and welfare are always present, and even survival itself is not assured. The pursuit by states of their own security and autonomy is impinged upon and limited by other states' pursuit of their … security and autonomy. The relationship among states is thus fundamentally and inalterably a conflictual relationship, with states constantly and continuously jostling with and elbowing each other as they try to improve their security and enhance their autonomy.

The aforementioned quote derives from the first page of the introductory chapter of a book entitled 'The Roots of Realism' thus implying that the academic enquiry into Realism and its origins begins with the understanding that states are the main actors atop the world stage and being able to understand states and the lengths they go to for the sake of their security forms the basis of enquiry into this theoretical paradigm. Power is exhibited by states because only states have the capacity to influence the behaviour of other states. What then could be the potential role for something like BD in such an understanding?

Since BD itself is a relatively new phenomenon, we can venture an educated guess through what reactions technology and technological advancements have elicited from Realist scholars. Perhaps unsurprisingly, Realism can largely be considered to employ a rather instrumentalist understanding of technologies. In Morgenthau's (1972, p. 81) view

> … no technological obstacle stands in the way of a worldwide empire if the ruling nation is able to maintain superiority in the technological means of domination. A nation that has a monopoly of nuclear weapons and control of the principal means of transportation and communications can conquer the world and keep it conquered, provided it is capable of keeping that monopoly and control unimpaired.

Such an instrumentalist understanding of BD can be seen as a source of conflict in contemporary realpolitik as well. For instance, the conflict surrounding the Chinese company

Huawei and the new 5G technology it has been developing. In recent years, a number of Western countries led most vocally by the United States have expressed significant concerns about Huawei with the FCC in the US recently labelling it a 'national security threat' due to Chinese laws that require Chinese corporations to cooperate with the military in matters of national security as well as the background of Huawei's CEO in the Chinese military and as a former member of the CCP (Kuo 2019). According to former FCC Chairman Ajit Pai (2020)

> Both Huawei and ZTE have close ties to the Chinese Communist Party and China's military apparatus, which obligates them to cooperate with the country's intelligence services…The US government…cannot and will not allow the Chinese Communist Party to exploit vulnerabilities in US communications networks and compromise our critical communications infrastructure.

There are strong concerns regarding Huawei in the US that have banned Huawei from manufacturing key components of smartphones with 5G technology. This is largely owing to concerns that Huawei could be working with the Chinese government to steal data from American companies and engage in both industrial and military espionage (Riley 2020). The vocal accusations from the US have also influenced allied nations in the West with some like Australia and New Zealand also banning 5G network access by Huawei whereas other allies such as Germany, Canada and the UK, while resisting an outright ban have expressed significant concerns and have begun investing into developing 5G technology from European and North American corporations such as Sweden's Ericsson, Finland's Nokia or the US's Qualcomm, in order to reduce reliance on Huawei.

At the heart of what started out as an industrial dispute which has spiraled into an international geopolitical conflict, is data. A second manifestation of this was also witnessed with the popular social media app Tiktok being investigated by the US and being banned by India alongside a host of other Chinese apps such as Weibo. Tiktok, which has exploded in popularity in the last two years, was previously known as Musical.ly was bought in 2017 by the Chinese

company ByteDance and rebranded as Tiktok. Besides concerns of political censorship and propaganda from China, there are concerns in both India and the US that China's 2017 National Intelligence Law could allow the sensitive personal data of hundreds of millions of users to be provided to the Chinese government and military which has led to an investigation and national security review from the Committee on Foreign Investment in the United States (CFIUS) (Jennings 2019). According to experts, there is sufficient reason to be cautious of apps such as Tiktok given that the Chinese government is known for collecting data in bulk and gaining access to information networks for purposes ranging from espionage, propaganda, quashing protests or criticisms and generally abusing internet freedom (Schiffer 2019).

In both examples, there are a number of actors involved from the respective states involved in either side of the conflict but also a number of actors other than the state including corporations, individual users as well as the data itself. However, from a Realist perspective, both cases would probably be represented as a source of conflict between states, whether it be the US and its western allies against China in the case of Huawei or the US and India against China in the case of Tiktok. All actors other than the state are effectively subsumed within the broader aegis of the state despite the fact that there has yet to be an actual occurrence of conflict between the governments of two countries.

It is important to note that in both cases, there has yet to emerge any concrete evidence that the Chinese government and military have been involved with the harvesting of data from other countries. However, the nature of BD itself is a factor that is not acknowledged by a Realist examination of these cases. For instance, why has there been so much contention over 5G network technology when previous networks have not been met with labels of national security risks? This can largely be attributed to BD capabilities which in the case of 5G networks allows for the accumulation of far larger sets of data as well as access to an entire ecosystem of data-based appliances such as smartwatches, smart-cars, smart home devices and more that

could allow any hacker to gain every bit of information about an individual in every aspect of their life due to growing dependence on digitalization (Riley 2020).

BD is different from the technological developments of the past that have had an effect on IR. Admittedly, besides nuclear weapons, very few such technologies have brought out a significant reaction from Realism. However, unlike nuclear weapons, BD does not possess the deterrent quality of mutually-assured destruction. Realism cannot treat BD as a resource along the lines of oil and petroleum either for BD flows in abundance and is intangible for the most part. BD is simultaneously able to transcend national borders and geographical boundaries that oil is subject to, yet also maintain a level of nationalization due to states having their own servers through which to maintain databases.

One way that BD is similar to other technologies and resources of the past is in the way it facilitates the creation of asymmetries of power. The reason why data has emerged as such a crucial resource in the contemporary era is linked to all the usual reasons why resources become precious in the first place: power, money, control. States like the US and countries in western Europe have a strong incentive to keep data flowing freely across national borders because in most cases they have the infrastructure and corporations to serve as a depository for such data which can be used for various commercial purposes. This is true also for data-protectionist states like China on both a domestic and international level.

Realism's reliance on merely presuming the state i.e. the 'political unit' to be the actor presents a decided narrower perspective on the contemporary reality. Apps and devices can be used as means of gathering vast amounts of information which can lead to conflict thanks to the scale of data, the speed with which it can be gathered, organized and instrumentalized, and the variety of ways in which it can be employed. Ultimately, however, all of this would remain on the peripheries of Realism since every aspect of BD, even those that are not linked to the state or

are linked to both the public and private sector, would end up being subordinated to the state with BD being viewed as just the next form of weapons for states to employ against each other.

4.1.2 Liberalism

Liberalism is in many ways a theory of theories. There is no one liberal theory of International Relations. However, there have been multiple manifestations of the paradigm over an extended period of time which have been consolidated under an 'umbrella term' for conceptual clarity. Not all thetheories contained under this term share the same tenets since many of them were developed with extended gaps between their conception and therefore reflect differing political realities. However, much like Realism, most of these theories share certain basic understandings that form a foundational core and a conceptual link that allows them to still be classified as a 'liberal' theory of IR. As Doyle (1986, p. 1152) observes

> There is no canonical description of liberalism. What we tend to call liberal resembles a family portrait of principles and institutions, recognizable by certain characteristics - for example, individual freedom, political participation, private property and the equality of opportunity – that most liberal states share, although none has perfected them all.

Many of these characteristics and prominent theoretical contributions to liberalism in IR can be traced back to the age of Enlightenment and in particular to the works of Immanuel Kant who made the initial argument for what later became known as the 'democratic peace thesis'. Kant asserted, among other things, that democracies are less prone to engage in warfare due to the level of influence their citizens have over the governance of their respective states and further envisioned a 'perpetual peace' thesis wherein a community of states would develop and commit themselves to fostering peaceful relations propped up by interdependence of economic factors and rejection of violence (Doyle 1986, p. 1157-1159; Lawson 2017, p. 43).

If Realism choses to 'see the world as it is', then Liberalism choses to see 'the world as it *ought* to be'. As such there is an inherent idealism within Liberalism that has faced harsh criticism,

especially from the Realist school which developed in many ways as a response to what is considered the 'utopian liberal internationalism' of the Interwar period scholars like Norman Angell, Hans Zimmer and Woodrow Wilson. The Interwar period was by no means a time of cooperation though it enjoyed a relative peace in the aftermath of the First World War. However, when it is argued that theories in IR develop their perspective based on the political realities of their time, liberalism is particularly unique in that the depressed, conflict-prone and bleak political reality of both the Interwar and Post World War 2 eras inspired a desire to aspire for something better, a global community that could achieve the Kantian notion of perpetual peace someday.

One major point of difference between Realist and Liberal theories in IR is the actors considered the most central and worthy of study. As mentioned before, for Realists, the state is the primary actor on the world stage and politics is carried out between political units and groups of which the state is the most powerful and cohesive. Liberalism adopts a somewhat similar attitude with reference to the state, acknowledging it as a primary actor on the world stage. However, unlike Realism, it allows for a more pluralistic view of actors in IR and gives space to actors that are not the state. Though there are no rules as to which developments are considered relevant to IR scholars, a number of high profiled academic enquiries were made that rejected the Realist position on the exclusivity of the state and sought to complicate the global picture by expanding the scope of IR. It is in some of these enquiries that an examination can be made to assess the compatibility of BD and how these developments might view BD.

One such enquiry was made in the 1970s through the concept of 'interdependence' formalized and popularised by Robert Keohane and Joseph Nye. Keohane and Nye placed their agreement with a growing observation among modernist scholars in the discipline that technological advancements (especially communicative in nature) was significantly changing the modes and structures of the international system, primarily though the reduction of the role of the state.

However, both scholars sought to develop a thesis that struck a compromise between the arguments of the modernist scholars and the rejection of the same by 'traditionalists' (mostly Realists). Keohane and Nye (1977, p. 4) asserted

> …modernists point correctly to the fundamental changes now taking place, but they often assume without sufficient analysis that advances in technology and increases in social and economic transactions will lead to a new world in which states, and their control of force, will no longer be important. Traditionalists are adept at showing flaws in the modernist vision by pointing out how military interdependence continues, but find it very difficult accurately to interpret today's multidimensional economic, social, and ecological interdependence.

Keohane and Nye observed that the world, at any given time, was in a state of both continuity (which the traditionalists argued for) and progress (which the modernists argued for). Just because there are new developments that change aspects of the status quo, it does not automatically imply that every feature of the existing order gets drastically amended. Rather, change occurs incrementally and often covertly and is able to subtly amend the way the world operates while still functioning within the broader international system. This understanding of liberal interdependence could be applied to BD as a new form of information and communication technology transmitting vast masses of information.

In the follow-up to their initial exploration into interdependence, Keohane and Nye (1998, p. 85) stress that "the information revolution alters patterns of complex interdependence by exponentially increasing the number of channels of communication in world politics—between individuals in networks, not just individuals within bureaucracies" however that any alterations that may occur, do so within the existing borders of the existing international system thus underlining their compromise between continuity and change.

Applying this to BD, for instance, 5G technology which, as mentioned before, has emerged as a point of contention due to the sheer amount of data it can accumulate which then presents an equivalent risk of being exploited by hackers or used for espionage or other dubious purposes.

However, as has already been seen, 5G technology has not successfully brought about changes at a structural level and can still be contained by the methods of the international system of the sort the US and allied countries have used: greater investigation, banning aspects of production, blocking access to subsidy funds and so on.

However, where a limitation crops up is in the fact that digital technologies such as BD and sophisticated digital networks such as the Internet of Things (IoT) cannot be conceptualized and ontologically located merely in terms of what has been achieved so far, but are far more valuable to look at in terms of the potential they have to bring about changes in the future (Danilin 2018). These changes are occurring rapidly and could very well develop the capacity to bring about amendments at a structural level internationally. One such area where there have already been significant advancements made in BD fundamentally changing aspects of existing operations is the military and in BD driven Artificial Intelligence programs serving as a catalyst for a new kind of warfare.

In 2018, the Defence Advanced Research Projects Agency (DARPA) of the US Military committed 2 billion dollars in funding towards AI and data-driven machine learning technology to bring about a systemic change, moving away from human-driven systems that can be slow and error prone to machine-driven systems that can significantly speed up operations, be more energy and time efficient as well as be less error-prone (McFarland 2018). Fierce competition is already brewing among major countries such as the US, China and Russia on investments into AI. As of 2018, almost 85% of the total equity funding for AI start-ups globally came from just two countries: China contributing 48% and the US contributing 38% (Robles 2018). These investments are not just for military operations but are made to revolutionize systems and operations in every sphere of life from governance, education, healthcare, environmental control, infrastructure and of course business and military. The following diagram shows China’s long-term objectives for AI.

Fig 1. China's AI plan. Pablo Robles, "China plans to be a world leader in artificial intelligence by 2030", 2018, *South China Morning Post*, https://multimedia.scmp.com/news/china/article/2166148/china-2025-artificial-intelligence/index.html. [Screenshot by Author].

Naturally, such deep systemic advancements from a country like China would not be met without similar investments from rival states like the US and its allies, as well as emerging regional rivals like India and Vietnam. Already China's global advancements in 5G technology has sparked concerns among a host of Western nations, spurring investments to develop their own 5G technology and not fall behind China's advancements. It is highly likely, that advancements in data-driven information technology is likely to spur nations towards structural changes in not only their own internal modes of operations, but also in their external outreach because such changes will have significant impact on military interactions as well as global trade.

The interdependence model proposed by Keohane and Nye is only one paradigm among many within liberal IR theories. However, the purpose of highlighting this argument was largely to apply a similar response to the broader liberal international theory and what its response to BD driven transformations of the global structure might be. Liberal theories of IR are decidedly more accommodating than their Realist counterparts and more open-minded with who or what can claim to be a worthy subject of study within the discipline. However, there may be a way to reconcile the fact that BD technologies can have a structural impact on the global system similar to how nuclear weapons behaviourally influenced states at a structural level through the concept of mutually assured destruction.

BD can significantly affect the ways that states tackle a host of issues in its present form. The mass data accumulative abilities of corporations, states and other actors is already being utilised to develop massive databases of individuals at a physical and psychological level and have already been deployed by countries like China to try and quash protests in Hong Kong by identifying and targeting protesters. Drone warfare and its extremely liberal usage by countries like the US under President Obama, for instance, have been a contentious issue in IR for a number of years already but the implications for international armed conflict or terrorist groups if the ability to use arms or develop non-human soldiers (as is already being attempted in the US and Russia) succeeds, could be devastating.

Liberal IR theory's emphasis on the cooperative nature of states may have an answer to the growing development of BD technologies. It is important to observe that when we talk of cooperation among states, most liberal theorists understand that if and when states cooperate, they do so not purely out of a moral prerogative to be 'kind to thy neighbours and community' but out of some degree of incentivization and self-interest. This form of cooperation can be ontologically accommodating to certain manifestations of BD technologies which can be used not for destructive, but for constructive purposes. Already a lot of emphasis is being placed on digital infrastructure sharing on a bilateral and/or multilateral basis among states as well as a broader global effort towards 'digital cooperation' or 'digital interdependence' by organizations such as the UN.

In 2019, as part of the UN Secretary General's High-level Panel on Digital Cooperation, a report titled 'The age of Digital Interdependence' was released which, among other things, recognized the massive transformative potential of large-scale digitalization as well as the opportunities and challenges that came along with the outbreak of such a rapidly spreading new technological development. The report claimed that, "Digital technologies are rapidly transforming society, simultaneously allowing for unprecedented advances in the human

condition and giving rise to profound new challenges" as well as the fact that "Digital dividends co-exist with digital divides. And, as technological change has accelerated, the mechanisms for cooperation and governance of this landscape have failed to keep pace" (United Nations 2019).

The UN, as the poster institution of liberal internationalism, viewed digitalization and advancements in digital technologies as opportunities and advancements that could (and in fact, *should*) be utilised to strengthen and bolster the foundations of liberal multilateralism.

> The critical need to improve digital cooperation comes at a time when many of the mechanisms of multilateral cooperation developed since World War II are under unprecedented duress…Reinvigorating multilateralism alone will not be sufficient. Effective digital cooperation requires that multilateralism be complemented by multi-stakeholderism – cooperation that involves governments and a diverse spectrum of other stakeholders such as civil society, technologists, academics, and the private sector … (United Nations 2019, p. 12).

A report on digital cooperation published in June 2020 by the UN also stressed a similar argument: arguing for the need to engage in 'multi-stakeholderism' by involving actors such as the private sector, the academic community, influential individuals, NGOs and so on but also highlighting that the UN could serve as the best platform for these stakeholders (United Nations 2020, p. 22) who would naturally have differing perspectives and interests to meet and deliberate, thereby further entrenching liberal multilateral institutionalism within a future where data and digital advancements form a crucial avenue of global governance. In the same report the Secretary General also expresses an intention to appoint a 'Technology Envoy'

> …whose role will be to advise the senior leadership of the United Nations on key trends in technology so as to guide the strategic approach taken by the Organization on such issues.…The Envoy will also serve as an advocate and focal point for digital cooperation – so that Member States, the technology industry, civil society and other stakeholders will have a first port of call for the broader United Nations system. (United Nations 2020, p. 22-23)

Even outside of international organizations, nation-states have made attempts to develop norms and institutions to regulate the advancements of technology such as BD and fit it within the

framework of a broader liberal internationalist order. At the G20 summit held in Osaka, Japan in 2019, one of the major global issues that leaders brought up in the summit's declaration was digitalization and specifically, flows of data and the structures that would govern them. Japanese PM Abe touted the concept of 'data free flow with trust', expressing the desire for the community of G-20 states to cooperate and commit themselves to building a global system that sees vast masses of data flowing freely without restrictions across national borders among trusted partners to foster digital opportunities and economic advancements (MOFA 2019). Digital cooperation and data-sharing infrastructure is now also a major part of several bilateral and multilateral trade agreements among states.

Overall, it would appear the a liberal institutional approach to BD does recognize its potential as a transformative technology, however as witnessed from the application of the interdependence model as well as the examples discussed above, it seems as if a liberal theory of IR applied to BD would view it as a means of potential cooperation among states and that the paradigmatic changes that BD brings about could be used to bolster a liberal-internationalist world structure. Liberal IR theory would be confident in states' incentives to cooperate with each other in building a robust digital infrastructure given that the future of economic, military and in some cases, even political operations lies in digitalization.

Further, it also employs a pluralistic vision for the future with an understanding that with the current trajectory for how BD has emerged, simply viewing the state as a stakeholder is not enough. 'Multi-stakeholderism' as mentioned in the UN reports is likely to be the norm, with states increasingly cooperating with technology companies as well as military and arms companies like Boeing and Boston Dynamics to be at the cutting edge of whatever newest development in data-driven AI or machine learning comes about.

As such liberal IR theory provides far more ontological space to BD than its Realist counterpart and even views BD as an important means to modify and bolster itself in the future. One factor possibly influencing the ontological space that liberal theory affords BD is its intertwined relation with global capitalism and the reality that many of the advances in BD driven technologies are now taking place not in academia but in industry with the potential to add trillions into the global economy as far as lucrative fields like AI are concerned (United Nations 2020, p. 17).

Despite this, however, liberal theory does not always constitute the best lens through which to view BD as a transformative technology in IR. For instance, there is not much to be said for the way the existence of BD affects the behaviour of states in relation to other states owing to the myriad of opportunities that BD can, and does, provide for abuse, surveillance, espionage, data and privacy breaches as well as military and geopolitical benefits. There have been significant differences among major actors such as the US, Europe, China, India and more on how a data-infrastructure might be constructed (Sacks & Sherman 2019). The very nature of BD is that it is potent in not just its quantity but the depth of information it can provide, the scale it can provide it on as well as the speed with which it can provide information.

There is no epistemological tool in liberal theory that adequately examines the very nature of BD in itself. Despite acknowledging its transformative potential in many instances, liberal IR theory, for the most part seems to assume that the way global politics operate would largely remain unchanged even in a digitalized world. It assumes that states would interact with each other as well as with non-state actors in the same way as they are, perhaps only through a different medium. This is not always accurate.

When there are differences among states on other resources, such as the EU not being satisfied with the quality control of a product coming from China and thus stopping its import, there can

be a compromise and resolution achieved by either stepping up quality checks or finding different sources of trade. However, a simple compromise cannot be the solution when dealing with the rules and norms that would regulate massive flows of data which could provide rival or hostile nations with an endless supply of strategic information regarding the individuals of a state. There are also near-irreconcilable differences in how states view data and their philosophy on data and the rights of their citizens which colours their actions internationally. The extremely robust and rigid structure for data privacy rights developed by the EU called the General Data Protection Regulation (GDPR) which imposes stringent conditions to protect EU citizens' data beyond European borders would clash firmly with the data regime in China which is extremely opaque, thus making it difficult for Chinese companies to operate in Europe (Sacks & Sherman 2019) without vastly liberalising its own data-regime and going against China's internal policy.

Most of these ontological incompatibilities arise from an absence of in-depth analysis of BD itself and the technologies that are driven by it. As mentioned before in the case of complex interdependence, it is not enough to merely assume that BD would foster transformation at a mere surface level and the global structures surrounding it would remain largely unchanged. BD is best viewed in terms of its potentials and has already begun showing how much of a paradigmatic transformation it can bring about at a structural level. This is one sphere where academia could have a central role to play. A sphere where a growing body of literature and increasing research into BD and its confluence with IR could be truly beneficial into examining the systemic changes that could emerge in the coming decades. It would allow for a more proactive approach rather than the existing reactionary approach to BD developments.

While it would be dramatic to compare it to a nuclear weapon, it is not unreasonable to assume that BD could create stakes of a similar stature for states. In other words, stakes that nation-states would be averse to compromise upon such as Mutually-assured Destruction. In order

for BD to be adequately situated ontologically within a discipline, there needs to be a means to reconcile the transformations it could bring about at the level of the underlying structures that form the international system and the basis of interactions among states and other actors.

4.1.3 Critical Theory

In the brief explorations of Realism and Liberal IR Theory – two of the more traditional theories of IR – a number of distinctions have emerged. Indeed, the two are often compared in contrast to each other as having opposite ontological dispositions. However, in many ways both theories can also be considered similar to each other. In particular, both share a particular penchant for taking aspects of the global socio-political order as given and only seek to develop a theoretical response to the international system based on unchallenged assumptions regarding said system (Cox 1981, p. 128-129). This allows for the compartmentalization of problem-areas which allows these theories to divorce a problem from a larger whole and develop theoretical responses for that problem. This comes at the cost of taking for granted the way in which interactions occur and institutions function on the world stage.

The Critical Theory of IR was formalized in contrast to these traditional theories and adopts an opposing position to the ontological and epistemological assumptions they rest upon. Critical Theory constitutes one of a larger set of theoretical paradigms emerging in the 1980s and 1990s considered the 'reflexivist' theories that were pitted against the 'rationalist' theories of IR - Realism, Liberalism, the neo-neo synthesis and to an extent, Constructivism - (Smith 2000, p. 380).

Critical Theory, as postulated by one of its main proponents Robert Cox, stands in contrast to the rationalist school in not (a) assuming a central role for the state and (b) taking pre-existing assumptions regarding institutions and interactions among elements in the international system as granted. Rather it concerns itself with their origins and the intricacies of the process through

which they change and transform over a period of time (Cox 1981, p. 129). Critical Theory views the world to be in a near-constant state of historical change, in contrast to the rationalist theories which, according to Cox (1981) dwell on a continuing present and function along the assumptions of a permanence of existing institutions and norms of interactions among states.

Critical Theory forms an interesting analytical framework from within which to consider BD due to its enduring focus on viewing the international system as a product of constant change and evolving social and political relations. While much of the incompatibility of BD with Realism and Liberal theory emerges from an attempt to fit this new development into the existing structure, Critical Theory offers an opportunity to theorise how BD might transform the structural status quo in the near future. Where the rationalist theories hold certain core assumptions that ascribe a degree of rigidity to what they consider worthy subjects of study within the discipline, Critical Theory offers some more flexibility.

As mentioned in the previous chapter, BD and the technologies it powers have the capacity to strongly affect existing power relations, deepening existing asymmetries and creating new ones. Cox (1981, p. 130) argues that while rationalist theories are better suited to periods of stable power relations such as the Cold War, periods of power relations in flux or instability are better explained by Critical Theory owing to its more flexible and in-depth examination of international structural relations as a whole. In other words

> To reason about possible future world orders now, however, requires a broadening of our enquiry, beyond conventional international relations, so as to encompass basic processes at work in the development of social forces, and forms of state, and in the structure of global political economy. (Cox 1981, p. 130).

In a similar way to how the advent of nuclear weapons significantly amended the modes of interaction and communication between states, providing an incentive to even long-time enemy states on the brink of petty warfare to find means of de-escalation so as to avoid a nuclear

conflict, BD driven technologies have the potential to be structurally transformative developments that would imply a period of instability and flux in the international system, as new norms and standards are conceptualized for how actors would interact given these new and hitherto under-explored developments.

Admittedly, Critical Theory doesn't have all the answers to how BD might impact power relations between states, or between state and non-state actors or even between non-state-actors on the global stage. A fairly significant portion of Critical Theory looks into the moral and philosophical elements of enquiry into international affairs that may not be entirely suited to a study of a development of advanced technologies at this initial nascent phase in the latter's developmental story. However, one advantage that Critical Theory has is that it allows for a multiplicity of perspectives to be synthesised within its theoretical borders. According to another founding scholar of Critical IR Theory Andrew Linklater (1992, p. 79)

> …critical theory possesses a vision of international relations which, when articulated more fully, can give direction to the field as a whole. While Critical Theory itself may not be the next stage, it can nevertheless shed light on what the ensuing phase should be. Critical Theory can clarify the nature of the common scholarly enterprise to which different perspectives are related by setting out the particular strength of different approaches and by showing how they can be drawn more closely together.

Critical Theory is not a perfect analytical framework within which a new development like BD technology can be placed and understood. As Linklater asserts, Critical Theory may not even be developed enough to grow into a major theoretical paradigm of IR in the way Realism or Constructivism have. Much of Critical Theory still remains occupied with the goal of responding to the traditional/rationalist theories of IR, to the extent that its own purpose as a theoretical framework remains diminished.

However, Critical Theory has a strategic advantage in not being a developed, entrenched and all-encompassing paradigm and in its ability to synthesize diverse perspectives within itself

due to its understanding of international society as a constant state of evolution, thus making it amenable to newer developments (like BD) that impact the discipline. While Critical Theory itself may not be the paradigm that binds a marginalized topic like BD with the broader discipline of IR, it can shed light on the ontological links that are needed to bridge the gap.

4.2 Final Thoughts

The theories explored in this chapter do not represent the full spectrum of what the broader theoretical ecosystem of IR can offer to new and developing topics like BD. There are other paradigms which could provide a certain insight into certain aspects of BD's functioning on an international level. Neo-Marxist theories of IR such as the World Systems theory might conceive of BD as yet another layer of foundation for a global capitalist structure, a digital rendition of a system that continues to siphon wealth and resources from the periphery and deposit them into the core. Both World Systems theory and Post-colonialist IR theory could focus their attention on and draw focus to a concept that is being increasinglytalked about with the spread of BD: data colonialism which is what many developing countries like India have raised concerns over (Goel 2018). Feminist theories of IR might examine the gendered dimension of technology and the heavily male-oriented influence and phrasing of technological developments as has been the case for the case of atomic bombs, missiles and other weapons of mass-destruction.

With most of the big technology corporations and sophisticated machine learning and data-driven advancements taking place in developed countries, there are strong implications for considering how data from heavily populated developing countries might be harvested and transferred to databases in the developed world from where they can be used for a variety of commercial or surveillance purposes or as a means of gaining strategic capital over certain states and interfering in their internal affairs for the benefit of the developed country in

question. The capacity to do this has already been seen in the functioning of Cambridge Analytica's parent company harvesting data from developing countries to sway elections through data-driven psychological profiling and misinformation campaigns (Freeze and Mackinnon 2018). Thus, paradigms other than the three explored in this chapter can make a contribution to the discussion on what sort of ontological space BD may inhabit within IR's disciplinary borders.

However, it is not enough to selectively cordon off aspects of different paradigms of IR in the hopes of cobbling together some form of a kaleidoscope of a theory that could examine the breadth of the impact of BD and other new developments on the world stage adequately. Attempting to do so would not take away from the fact that Big Data would remain a marginalised object of study within a paradigm whose main focus lies on another, more prominent subject that they must relate Big Data to. What is more important, perhaps, is for IR to look within itself and examine some of the core rigidities and assumptions that hold it back from bringing in developments like BD within its fold before we can talk about a more comprehensive paradigm that studies these new developments.

Coming back to the quote from Cox on theory, Acharya and Buzan (2007, p. 290) assert that although some of the grand theories discussed at length in this chapter claim to be 'universal' in applicability, in practice they tend to reinforce and maintain the status quo that decades of Western political thought in IR has created. Though they speak from the perspective of scholars examining the lack of the non-western perspective in IR, their work is applicable to the example of Big Data as well. Though elements of the major paradigms of IR may well accommodate aspects of Big Data – Realism focusing on conflicts, Liberal Internationalism focusing on data cooperation, Constructivism examining the concept of a 'data society' and information in the contemporary age – it does not take away from the fact that Big Data as a whole does not fit into the paradigms of IR as they are currently.

Ultimately, IR is a discipline that exhibits considerable conservatism despite the diversity of theoretical paradigms operating within it. Twenty years ago, at the height of emerging theoretical diversity in the discipline with the onset of globalization, feminist IR, environmental and postcolonial paradigms, Steve Smith (2000, p. 378) made some pointed remarks about the enduring nature of state-centrism in IR

> It is very difficult to challenge that definition of the core problematic of the discipline without placing oneself outside the discipline. Thus, those approaches that do not start with both inter-state relations and with war are axiomatically placed in a defensive position with regards to their fit within the discipline. This move has been of massive influence in the process by which the mainstream has dominated the discipline.

Conceptualizing an ontological position for BD and connected technologies within IR will involve overstepping the elements of gatekeeping reflected in Smith's writing which is true of the discipline till date. Despite a new era powered by new socio-political, technological, economic and cultural consciousness, IR operates on the basis of theoretical paradigms developed in the 30s and 40s and refined in the 70s and 80s. In order to be more accommodative of developments that afflict the field in the present, but more importantly, in the near future, IR theory will have to be more open-minded to theoretical lenses which don't engage in state-centrism and tend to be more eclectic in nature that represent the world not in a clean, structured systemic manner but as the kaleidoscope of complex interrelations and associations it is.

Chapter 5. Actor-network Theory as an Alternate Framework

Given the shortcomings to the study of a development like BD in IR as discussed in the previous chapters, it is important to conceptualize some alternative means through which to bridge the gap between IR and BD in a way that would make it easier to conceive of space for the latter within the discipline. Due to the aforementioned shortcomings being entrenched relatively deep into most major theories and paradigms of IR, it is difficult to apply them to a

topic like BD without either viewing BD through an 'instrumentalist' lens that conceives of it as merely another tool to be employed by actors (mostly the State) in global politics or reducing the significance of the transformative role BD plays at a structural level in the international system.

As a result, in order to transcend the state-centrism in IR paradigms and conceptualize a more flexible paradigm that allows for a broader vision for what counts as an 'IR issue', one mode of enquiry might be to look beyond IR itself. This thesis undertakes one such enquiry and examines a framework of analysis that exhibits potential in being able to allow for BD to be conceptualized within IR. This is the Actor-Network Theory (ANT), a paradigm emerging from the discipline of sociology which has been gaining prominence in IR and IR literature in recent years. Following some initial explorations made in this direction by Foucault, ANT emerged in the 1980s in the work of sociologists such as Bruno Latour, Michel Callon and John Law who, among other objectives, sought a "new social theory adjusted to science and technology studies" (Latour 2005, p. 10).

In the view of Latour, the particular need for the development of this new paradigm, at the time, was the growing compatibility of science and technology in social processes (Latour 2005, p. 10). In fact, Latour, in a piece clarifying several misunderstandings regarding ANT close to fifteen years since his original published work which laid the groundwork for the theory, goes even further than simply suggesting a compatibility between technology and social relations but going so far as to proclaim

> ANT has been developed by students of science and technology, and its claim that it is utterly impossible to understand what holds society together without reinjecting into its fabric the facts manufactured by natural and social science and the artefacts designed by engineers. (Latour 1996, p. 370).

From a macro-perspective, it then appears that one of the major motivations for the development of the ANT was the understanding that science and technology in particular had a pervasive effect on social processes and perhaps more importantly, social relations and thus deserved some degree of academic scrutiny. The scope for what precisely is considered under the definition of 'science and technology' is not set in stone but based off the literature of IR scholars attempting to apply ANT to IR, it appears to be considerably broad. For instance, Bueger (2013, p. 338) observes that ANT is predisposed to often include the study of topics considered extremely 'exotic' ranging from "laboratories, fish farms, diseases, transport technologies and bush pumps".

While not a major theoretical paradigm in itself, ANT has been employed with increasing frequency in articles published in IR-related journals and has played a more prominent role in the works of IR scholars in recent years. This is largely attributed to the simultaneous advantage of ANT and IR examining similar issue-areas and concerns (albeit at different levels). Bueger (2013, p. 338), for instance, observes that, "It [ANT] shares many concerns with the pragmatist and practice theoretical ideas that have recently been introduced to IR."

Ideas from ANT enrich our theoretical and methodological repertoire for understanding the international. While IR has, on the whole, been a seemingly dynamic discipline that has evolved through the decades to reflect political realities, as has been explored in previous chapters, it is often felt that the dynamism is not fast enough, especially now in keeping up with the rapidly evolving technologies that make an impact in the political realm. Pursuing a theoretical framework external to the discipline, therefore, potentially allows for insight and viewpoints that are otherwise brushed aside under traditional IR paradigms. Further, being able to attain a more unique and external perspective on specific areas of concern for IR can prove methodologically rewarding.

ANT's most valuable contribution to the subject matter of this thesis is with regards to its unique notion of 'agency' and who is considered an 'actor'. Within IR, agency tends to be relegated to humans and/or anthropomorphized entities such as the state or corporations. Such an understanding of agency leaves no room for developments like BD and its derivative technologies to attain space within the discipline. ANT's understanding of agency is decidedly more broad. It presents an interesting alternative to consider in terms of ascribing agency to entities that were divorced from it before. While it may not be a perfect equation, it is worth delving into two specific aspects of ANT's understanding of agency as it pertains to BD – *Non-human agency* and *agency without intentionality*.

5.1 Non-human Agency

ANT draws from relational and practice theories increasingly used in social-constructionist analysis in IR, with the former focusing on actors and levels of analysis and the latter revisiting common dichotomies moulding IR paradigms. However, in drawing from them, it also critiques certain methodological drawbacks in these paradigms. Nexon and Pouliot (2013, p. 343) observe, "Actor-network theory also offers a useful corrective to common forms of relational and practice theory that focus exclusively upon transactions among human individuals or anthropomorphized collectives, such as firms, states, or international organizations". Social-network analysis in IR places non-human actors as external to the frame of analysis which is not, in their view, necessitated by any social approach. Hornborg (2017, p. 96) argues that the perspective propagated by ANT, "has proven congenial to several categories of researchers aiming to relativize and challenge traditional paradigms associated with a 'Western' or 'modern' ontology".

For the purpose of this thesis' sphere of interest, one area where IR scholars have exhibited a growing interest in ANT has been in its novel perspective on the concept of agency. This is

owing to the unique understanding of agency that ANT proposes which can be used quite diversely to conceive of new ways to view nascent developments in the discipline that cannot be adequately analysed through traditional means or to challenge existing norms of understanding what constitutes agency in IR. The understanding of 'agency' in ANT is derived from a desire within the initial proponents of the paradigm to understand the nature of society (Latour 1996) and a belief that the existing epistemological notions of studying this presented an understanding of agency that is relatively limited in nature. As a result there is an inherent intention to surpass paradigmatic boundaries, or 'tyrannies' as Latour puts it, and propagate a wider and more inclusive understanding of agency.

In many social science disciplines, including Political Science, agency is largely discussed within the context of a debate between structural constraints and agent-actions where there exists a perennial tug-o-war to determine if agents exist within broader structures that shape and guide their actions or if they retain an ability to act independent of the broader network. Wendt (1987, p. 337-338) highlights what he refers to as the two 'truisms' at the heart of the agent-structure debate, stating that, "human beings and their organizations are purposeful actors whose actions help reproduce or transform the society in which they live" and "society is made up of social relationships, which structure the interaction between purposeful actors".

Braun et al. (2019, p. 788) highlight the assumptions made about agency in IR particularly, where agency is mostly conceptualised in its broadest sense as the 'capacity to act' and this capacity is considered "analytically given" for those considered 'actors' in IR, primarily the state. Wight (2006, p. 177-178) echoes a similar argument, stating that IR as a discipline does not grapple seriously with the notion of agency because the status of IR as a discipline that is distinct from broader Political Science, is presupposed on the assumption of the state as an actor.

ANT is unique in that it extends the title of an 'actor' to non-human entities and asserts that agency is not limited to simply human beings but can be exhibited meaningfully by non-human 'actants'; further they argue that in addition to being non-human, agency can be ascribed to *non-individual* agents which is where they mark a divorce with social relations since social relations are devoted to the study of human individuals (Latour 1996, p. 369). Latour (1996) declares that the purpose of according agency to even non-human, non-individual actants and avoiding the study of purely social relations is due to ANT's purpose of studying the very nature of society. As a result, much of the clarifications he offers in the piece denote a desire to break free from the limitations or 'tyrannies' set into place by existing paradigms of social understanding, whether those are spatial limitations such as geographical proximity, agency-based limitations such as the anthropocentrism of actors or conceptual limitations of actors and networks.

When it comes to actors, Latour (1996, p. 373) argues that

> An 'actor' in ANT is a semiotic definition – an 'actant'-,that is something that acts or to which activity is granted by others. It implies no special motivation of human individual actors, nor of humans in general. An actant can literally be anything provided it is granted to be the source of an action…There is no model of (human) actor in ANT…because the human, the self and the social actor of a traditional social theory is not on the agenda.

Latour's point returns to the argument that when considering agency and actors, the ANT is able to ascribe agency of even non-human, non-individual entities because it is not so much concerned with the entity itself but its effect and more importantly, it's relationality and associations with another entity (which can be both human or non-human). Indeed, Latour (1996, p. 373) qualifies this by arguing

> So what is on the agenda [of ANT]? The attribution of human, unhuman, nonhuman and inhuman characteristics; the distribution of properties among these entities; the connections established between them; the circulations entailed by these attributions, distributions and connections, the transformation of those attributions, distributions and

> connections of the many elements that circulate, and of the few ways through which they are sent.

5.2 The issue of reflexivity and intentionality

Traditional understandings of agency in IR presuppose a degree of intentionality i.e. having a purpose or desire to act or change something; as well as a degree of reflexivity i.e. establishing a causal relationship between (purposeful) action and consequences. ANT adopts an alternative perspective to this notion of agency. It instead carries out a 'dehumanization' of agency, divorcing the concept from being the presumed prerogative of human intentions and action. Agency in Latour's propositions of ANT is removed from both consciousness and intentionality (Kim 2020, p. 10 ; Coker 2018, p. 29) but instead is viewed and understood simply through what it might "authorize, allow, afford, encourage, permit, suggest, influence, block, render possible, forbid, and so on" (Latour 2004, p. 72).

This notion of agency appropriately reflects the paradigm's interest in underlining, what was in their view at the time, the growing compatibility of science and technology in social processes (Latour 2005, p. 10). In fact, Latour, in a piece clarifying misunderstandings regarding ANT close to fifteen years since his original published work which laid the groundwork for the theory, went further than simply suggesting a compatibility between technology and social relations and proclaiming

> ANT has been developed by students of science and technology, and its claim that it is utterly impossible to understand what holds society together without reinjecting into its fabric the facts manufactured by natural and social science and the artefacts designed by engineers. (Latour 1996, p. 370).

Divorcing agency from intentionality and reflexivity allows ANT to conceptualize the notion of 'non-human agency' better, extending agency from being generally relegated to the prerogative of human intention and action to non-human 'agents'. It removes the limits of

agency as traditionally understood in IR. When IR asserts that agency is a 'capacity to act' it also implies a reason for the action and, in most cases, a purposeful intention behind the actor carrying out the action. This excludes developments such as the atom bomb, the printing press and now, BD – all of which have had profound impacts on global politics – and relegates agency only to humans or anthropomorphized entities.

ANT finds the significance of agency in not the actors themselves necessarily but in the many 'relationalities' or 'associations' the actors form with each other. This means that unlike IR which understands agency as a 'capacity to act', ANT understands and sees the value of agency in how it affects other players in a network and what connections i.e. the manner of influence it asserts on them.

The term 'network' often confuses those initially looking into the theory, a semantic critique Latour and other early contributors to this tradition fully acknowledge. In fact, ANT is not so much the study of networks (as Latour painstakingly points out) which is a limited concept as we understand it, but more so the process of forming associations and relations i.e. the actor-network, in other words, the network itself as an actor. There is an understanding that agency need not be exhibited only by an actor but also by the network that actors create in associating and interacting with one another.

As Braun et al. (2019, p. 796) observe, "The ability to act is not an intrinsic characteristic of an individual entity, but derives from its embeddedness in a network of links to other entities". This is particularly relevant to BD which has been creating networks since its inception and further development. Joining an ordinary individual to the state or to a corporation that could exist on the other side of the world by virtue of the detailed psychographic data or any other form of meta-data is just one of the noted impacts of BD so far. The ability to manipulate this data created further associations and networks as well.

This makes ANT particularly suited to act as a framework through which to view BD in IR, given that BD's relevance to the discipline does not stem merely from the data companies and other 'actors' (as understood traditionally in IR) using it, but also from the data itself, the technology that emerges from it and the networks and association it forms in its fluid movements.

The notion of agency and the criteria by which one can be labelled an 'actor' is broader in ANT compared to most traditional IR paradigms, moreover, ANT is unique in that it accords a centrality to technology in socio-political processes of day-to-day operations. As a result, it offers greater room for BD itself to be ascribed agency i.e. be considered an agent/actor on the international stage by virtue of the influence it has on other actors and the networks it forms. By considering BD as an actor with its own sense of agency and impact on other actors such as governments, media or even individuals, it might be possible to conceptualize some ontological space within which to situate BD and BD-technologies within IR. As Wight (2006) mentions, agency in IR remains decidedly state-centric to an extent that such an understanding is almost a prerequisite. After all, Realism holds a state's national interest as a major tenet and similarly liberal IR theory argues that states act to cooperate and build an international liberal system.

Most interpretations of agency like the two examples mentioned above would focus on the actor entirely, what their motivations are, what their capabilities to act are, who they act against or for, how their actions are regulated and how their behaviour is shaped. However, in ANT, emphasis is given not to the actor primarily, but the networks being created through the action. If we return to Latour's earlier understanding of agency, BD offers multiple channels to 'authorize', 'allow', 'afford', 'encourage', 'permit', 'suggest', 'influence', 'block', 'render possible', 'forbid' the flow of information across borders and hemispheres . It has allowed for

the monetization of surveillance in the creation of newer business models and a new form of 'surveillance capitalism' (Zuboff 2015) as discussed in previous chapters.

What is also important to understand about an 'actor' in the ANT, is that it is not a static concept but rather a dynamic or relational semiotic concept. Latour (1996, p. 374) points out that "actors are not conceived as fixed entities but as flows, as circulating objects undergoing trials, and their stability, continuity, isotopy has to be obtained by other actions and other trials". Thus, the very nature of an actor within the ANT is something free-flowing and dynamic, that changes its shape and form depending on the associations it forms with other entities. Barry (2013, p. 414) observes

> In actor-network theory, the actor does not refer to an individual agent, but rather an entity whose existence depends upon their network of alliances within a shifting, heterogeneous and expansive relational field…The identity of an actor necessarily mutates as it enters into, or is enrolled or mobilised into, a field of relations with other entities. It is the relations that matter, not the actors in themselves.

This can and has affected and often redistributed the structures and hierarchies of power that form the international system. This has been manifested in global crowdfunding initiatives like Ushahidi, the Kenyan crisis mapping initiative that has used global user-submitted data to develop into a robust election-monitoring outfit, as well as the UN's Global PULSE project that is using mass-data to aid in global development and speedier achievement of the Sustainable Development Goals (SDGs).

5.3 Big Data and the Printing Press: A Comparative analysis

Indeed, 'relationships' or 'networks' can be formed through a large variety of means and can serve as an extremely interesting lens through which to study BD. The vast flows of information that move through BD capabilities greatly exhibit an influence on systems and operations of various kinds across the world. Technology has always had an inherent

'flattening' effect in reducing obstacles between actors. The associations that BD creates between actors has a distinct impact on power relations, affecting existing asymmetries of power and either entrenching or redistributing them in a myriad of ways. This has been true for technology at large long before the proliferation of BD-driven technology.

It is prudent to consider the Printing Press as an example here. While quite distinct from BD, the Printing Press worked as a major development in the middle ages in terms changing power hierarchies, much like BD is doing today. During the Protestant Reformation, the Printing Press served as a catalyst for amending the relationship between the ordinary people of Western Europe and the Catholic Church through the dissemination of both Martin Luther's 95 Theses critique of the established clergy and the enhanced accessibility to the Bible allowing for the freer flow of ideas and critiques that significantly affected the socio-political, religious and economic culture of Europe. This was also observed later, during the French Revolution as pamphlets spreading the journalism and philosophy of Jean-Jacques Rousseau played a critical role in the dissemination of revolutionary ideas and concepts. It is no wonder then, that the Press got labelled the 'Fourth Estate', joining the three great 'Estates' that served as pillars to society.

It would be prudent to note here that under a traditional lens of agency in IR, the Printing Press as an inanimate object would be nothing more than an instrument for the 'real' actor – the Printer. However, when looking at it from an ANT perspective, the social networks created and opportunities 'rendered possible' by the existence of the Press makes it an object with agency of its own. In that sense, the Printing Press (and through a more contemporary application of the same logic: BD and BD-technologies) can be considered actors in their own right and not just instruments.

One could argue, of course, that in these instances that agency could be accorded to the printers, bookmakers and travelers who created and spread the new ideas across Europe. However, the fact remains that their capacity to act in this instance, indeed the event that spurred their agency could be the capabilities brought into being by the invention of a device such as the Printing Press. Under ANT, the Printing Press would be considered to have a degree of agency unto itself, merely by virtue of the networks it creates and the associations it allows. Despite not having any intentionality of its own due to it being an inanimate object, its impact on the behaviour, relationships and actions of other agents would be enough to render it an agent under ANT lens. In this sense, it is very similar to BD. BD is a massive vault of information on millions of people that are operationalized for a variety of purposes and does not exhibit any intentionality of its own. However, it is also poignant to note that with further developments into AI and machine learning, the prospect of BD technologies gaining intentionality of its own divorced from the intentionality of its designers could be a possibility in the near future.

ANT would conceptualize an element of nonhuman agency in this instance which impact the associations between the general public on one hand and the Church on the other. It does so by influencing human intentionality and reflexivity through the capabilities it opens up for the dissemination of information in forms and extents that were unprecedented at the time. The ability of ordinary people to read the Bible, for instance, greatly impacted the monopoly over religious piety by the Church and affected the distribution of power between them and the populace. While a traditional understanding of agency would only support agency, in this instance, for the printers and travelers who printed books and took them across the European continent, ANT would envisage nonhuman agency for the Printing Press itself, as an entity whose existence allowed for the redistribution of power hierarchies through the spread of information.

This suggests that the cyclical association between ‘cause’ and ‘effect’ understood as Reflexivity in the social epistemology of knowledge-gathering is facilitated by the capabilities and associations opened up by the aforementioned technologies. Such an understanding of nonhuman agency in ANT provides an excellent opportunity to view and study BD and its derivative technologies in the fields of AI and more, through the capabilities it opens up, especially now when we are still in a relatively nascent phase of witnessing the capabilities of BD on politics, society and economies.

Employing an ANT analysis to the cases such as Cambridge Analytica, which have been discussed in previous chapters, allows for an examination of the nature of BD itself and how it can be distinguished from earlier technologies. The capabilities offered by BD for surveillance and the depth of information regarding an individual that can be attained from an open source such as a Facebook profile or Instagram account holds implications for electoral microtargeting and manipulation: this is how Cambridge Analytica was able to send different advertisements to members of the same household on different issues tailoring ads to their individual personalities (Nix 2016).

These developments cannot be studied only keeping the actors on either end of the action (i.e. the state and/or the corporations) in mind which is where ANT serves a useful framework of analysis to study the network itself i.e. the content between two traditionally accepted actors and the specific agency the network exhibits in influencing the behaviour of said actors. The nature of BD itself, its volume and velocity, the depth of interconnectivity between one source of personal information opening the box for multiple potential outlets for information to be harvested especially as devices like watches, fridges, cars, phones i.e. ordinary everyday objects ‘go digital’, all with a data-storage capacity that is connected to a massive Internet of Things.

This is significant for IR, because as channels to collect data and the repositories of mass-data grow more varied; as the means to harvest and operationalise personal data on a national and international scale grow more sophisticated; and as the privacy and personal liberty of individuals grow more scarce, the more it will affect power relations at a global scale. IR, like most social sciences, holds 'power' as a central concept within its disciplinary borders. The capability of BD and BD-technologies to impact existing power hierarchies (both for the better and for the worse) makes it a development that cannot afford to remain beyond the boundaries of the field.

Data and especially personal data collated into BD can be, and is, generated with exceptional ease with every passing day. As Schneier (2015, p. 18) observes, much of the personal data of people that is gathered emerges from computers and this includes not just laptops and PCs, but he also classifies any device capable of carrying out a modicum of computing functions based on data as a computer, from cars, fridges, watches, ovens, toys, cameras, home devices and more. Creating a large 'data footprint' in today's day and age is inevitable. A simple activity such as making a phone call or purchasing something via a credit or debit card, or making use of an e-commerce website can produce significant amounts of sensitive personal data that is stored and recorded mostly for the purpose of advertising. However, several instances have cropped up of corporations selling the personal information of customers to 3rd parties and data companies or as in the case of Cambridge Analytica, misusing data for electoral advertisement and manipulation.

Though there are differences when comparing BD to the Printing Press, the key element to keep in mind is the impact of the proliferation of these new technologies on power relations and hierarchies. If IR does hold power as a central concept within its paradigms, then it cannot afford to further marginalize a development such as BD. Doing so in the past has largely led to

the role of technologies such as the Printing Press and many others discussed in Chapter 1, to books of history and not to books of Political Theory.

With new and novel means to influence the behaviour of actors, whether they be the State, corporations and private-sector entities or down to the individual (through microtargeting which BD allows), this thesis has sought an examination of how useful a newer epistemological tool such as the ANT may be in situating BD and its impact within IR. ANT offers a unique lens through which to examine BD and allows for an academic exploration into the *substance* of a network instead of just the actions and behaviour of either 'node' or actor involved in an action. The intention of this thesis is not to argue that the agency of actors on either end of an action is subordinate to that of the agency of the nonhuman network in between, but rather to present a framework of analysis to acknowledge nonhuman agency as one potential way in which BD may be ontologically placed within the discipline of IR.

5.4 Critique of ANT

This process is not likely going to be simple given that even without its associations to IR, ANT has come under certain critiques on its own right that must be borne in mind when studying its application in any form:

First, a number of scholars have observed that ANT, while calling itself a 'theory' does not have a significantly cohesive identity as a theoretical paradigm. Bueger (2013, p. 339) argues that due to the wide scope of subjects that can be conceived of as 'actors' or 'actants' within ANT among other reasons is why "ANT lacks a coherent identity in the sense of an 'ism' or a 'paradigm'".

Second, ANT can prove to be very semantically confusing given that 'actor', 'network' and 'theory' all are qualified terms that might not necessarily mean what one expects them to upon first reading. The term 'theory' has been qualified as being different from a simplified set of

ideas explaining complex realities, but rather a method of studying something. As Latour (2005, p. 142) puts it in his dialogue with a student, ANT is a theory "about how to study things, or rather how not to study them-".

Third, there are a series of obstacles and concerns that must be addressed in trying to connect ANT to IR. ANT proposes that relations and associations are always in a state of flux, never static and always given to forming new shapes and associations which can prove troublesome for the study of IR as the study of institutions and social structures makes up a key aspect of the discipline (Nexon & Pouliot 2013, p. 344). Further, due to its desire to get to the very essence of the nature of society, ANT tends to adopt a heavy micro-focus which can prove incompatible with IR which encapsulates the study of several topics with a 'macro-dimension' such as war, international organizations, climate and so on (Nexon & Pouliot 2013, p. 344).

Despite these limits, ANT provides a decided advantage to new developments which facilitate a state of change and flux within the status quo, which serves as a major drawing point for the paradigm. Latour (2005, p. 142) argues that most social theories are adept at making substantive observations regarding the social world but are not as useful when things are in a state of change which is what ANT is particularly useful for. Bueger (2013, p. 341) observes

> Actor-network theory wants to liberate research from many of the straightjackets of modern social science…ANT encourages us to build new conceptual apparatuses which do not rely on prior ontological commitments but take the worlds of practice as a starting point and build generalizations from within these worlds. Translating ANT into IR will, however, open reflexive space. Translating ANT is to reformulate its concerns in a way that brings IR research closer to the mundane everyday processes of organizing the international.

ANT theorists might deny that there is such a thing as a stagnant status quo, and might instead suggest that new developments must be considered in the vein of a new technology, for instance, changing the way relations and associations are formed instead of taking one stagnant reality and turning it into another. In my view, BD fits in well with this understanding, as a

new development that has not only changed policies and lives but changed the way we act, the manner in which we behave and the ways in which we form associations and relations both with each other and with technology which continue to become a more and more integral part of our lives.

Thus, with science and technology playing an important role in breaking geographical borders and 'flattening' the world by reducing communication obstacles, the ability to form connections and make associations, in one form has been enhanced by the onset of widespread digitalization. This, of course relates to not only the connection between, say one individual to another, but of an individual to the Internet as well as that of one digital entity to another (in a network of its own known as the Internet of Things). The jury is still out on whether Big Data and its various applications which in many ways have allowed for the growth of connections or 'associations' of many kinds, can be applied to IR through the means of ANT. The aim of this dissertation is not to prove that ANT and IR can be linked through the subject of BD, but rather to see if the conceptual space that BD lacks within the existing paradigms of IR can be understood better through an ANT lens.

CONCLUSION

'The future is digital' is a saying that is often repeated when it comes to considering the future of Big Data and its applications in the near future. While the slow creep of digitalization has crept so much so into our everyday lives that most people would not contest the aforementioned saying to a great degree, however, may remain unaware of just how extensive the scope of the saying may stretch to. As mentioned before in this thesis, at the core of this entire discussion, lies one concept: power. International Relations emerged as a formalized discipline with the

abject purpose of studying global conflict between Great Powers and how it could be understood and prevented.

However, the scope of the discipline today is far more complex than it was in the nascent years of its formalization into a 'science'. The salient question that comes to mind in the contemporary age is in trying to understand what is the purpose of International Relations as a discipline today. Why do we need to study IR? A simple response to this question would typically be that IR is necessary to study the interactions of nation-states with other nation-states and a variety of non-state agents on an international level.

However, a more nuanced response would probably posit that IR is all about studying, analyzing and reacting to the flows of power and influence at a global level. This is reflected in almost every aspect of this discipline, both which it has considered part of its purview and which it has not. From multi-lateral security agreements to international social movements. From terrorist networks to multi-national corporations and global charitable institutes. From religious organizations to environmental and workers groups. The workings of actors on a global stage is best observed with what ties them together at the core: the politics of power, and if we consider the future to be digital, in most aspects of life, then the politics of power lies in digitalization and in Big Data.

While this thesis, at one level, *is* a study of Big Data as a new development in IR, at another level it is largely a retrospective on the discipline of IR in itself. Primarily this alludes to the way in which IR has developed as a discipline till date and what it presently understands to be 'IR issues'. It presents a stress test of IR as a discipline, through the medium of a rapidly expanding new development that will envelope not only IR but various other academic disciplines.

However, the point of importance is that whereas other disciplines such as Business, Information Technology and more have already begun studying the evolution of Big Data, IR has lagged behind. One *could*, of course, make the argument that data is much more central and important to these other disciplines than IR, hence, they are able to and need to accord greater focus to it as a development than IR. However, the counter perspective to this would be that several social aspects of Big Data networks remained understudied, which are and can even further be extremely relevant to the scope of IR as a discipline.

The evolution of new frontiers of global capitalism based on data surveillance, for instance, has far reaching consequences for how the powerful state-corporation nexus from developed states can exploit and abuse individuals in not only developing states but in their own advanced societies as well. Further, we have seen that it births the creation of new modes of electoral advertisement influence, pushing heavily at the boundaries of what is ethical for data analytics firms and campaign firms to facilitate in both the global North and South. It can herald new modes of global conflict, from cyberattacks on an individual, mass or national basis to industrial espionage. And needless to say, it can have devastating consequences for civil liberties and individual privacy, allowing government watchdogs and security organizations to impede upon democratic liberties and weaponize the information gained for nefarious purposes like quashing social movements and any form of dissent.

The impacts of Big Data need not also just be negatives either. Initiatives like the Ushahidi project in Kenya, global data-sharing initiatives and projects conducted by international organizations such as the UN's Global Pulse project can have several positive impacts and push new frontiers of global development.

Keeping this in mind, IR as a discipline does not seem adequately prepared to accommodate the study of these pertinent new developments in a meaningful manner. This has been

applicable to other areas of study relevant to mainstream IR as well such as postcolonialism and non-western contributions to IR as well as feminist theories of IR. In their initial exploration into the question 'why is there no non-western international relations theory?', Acharya and Buzan (2007, p. 293) present one possible reasoning as the fact that IR remains concerned primarily with its pursuit of a 'scientific status' as a result of which it has been "excessively concerned with rather narrow, rational choice, views of motive in power politics, strategy and economics". Ten years later, in their follow up to this initial enquiry, Acharya and Buzan (2017, p. 346-347) observe a 'persistence' in the domination of Western (particularly American) influence on mainstream IR theories.

Similar explorations into how meaningfully IR incorporates the contributions of Feminist theories have yielded discouraging results. Despite having broadened its scope to include Feminist IR theory in the final decades of the 20th century, Peterson (2004, p. 40-41) contends that the truly transformative contributions of Feminist theories to IR, the contributions that are more than just 'add and stir', remain "invisible to the IR mainstream and omitted from the general perception of feminist-IR".

These examples reconfirm the argument that despite broadening its scope at the surface level, IR as a discipline remains set in stone to a large extent regarding what constitutes 'IR issues' and what influences the mainstream paradigms shaping the discipline. Additionally, this implies the way IR choses to view agency and its relatively narrow concept of who or what is considered an 'agent' on the world stage are some of the areas where change may need to happen for the discipline to properly be able to look at developments like Big Data.

Though this thesis has been looking at Big Data and its emergence in relevance to IR in particular, it barely scratches the surface of the discourse that must be established for its impact to be studied within IR. The intention of this thesis, as mentioned before, is not to present some

detailed framework for how Big Data is going to affect IR in the future. Rather, it intends to highlight how the slow creep of BD into every aspect of life, including global politics, has already begun, to present some potential avenues for how it may develop in the future and finally to highlight how IR as it is today, is not adequately suited to study BD and its auxiliary developments.

Therefore, if we consider 'power' to be at the center of many of IR's primary paradigms and norms, then studying a development that already has and will continue to have greater impact on power hierarchies and relations among actors on the world stage, is of utmost importance. IR's unpreparedness to deal with new developments that have made significant changes on an international, socio-political scale does not stop with just Big Data in the recent history but also with previous developments as explored in the first chapter.

One question that crops up consistently throughout the thesis is with reference to pinning down what exactly is Big Data within IR. Is it a reiteration of previous generations of technological development such as the printing press or the atomic bomb? Or is it perhaps something new and unique, a development unto itself? And in either case, is it merely an instrument that doesn't merit more academic scrutiny within IR?

This thesis contends that it is both of these things. Certainly Big Data is a new and innovative development that brings with it the potential for changes in ways of life that could not have been fathomed simply five to ten years ago. The scale on which massive swathes of metadata can be harvested, organized and instrumentalized with great velocity and accuracy has never been seen before and its impact is still being researched and studied. However, it is also true that looking at Big Data in abstraction, as a widescale informational or communication development that has broken social borders and norms and facilitated socio-economic and

political changes would also make it reminiscent of previous iterations of technological developments such as the printing press, the radio, the internet and more.

When considering these questions and the question on whether Big Data is only to be considered a tool or instrument, it is pertinent to return to the initial inspiration behind this choice of topic: Cambridge Analytica and its activities in various elections throughout the world. Though it has been mentioned before, it might be pertinent to reiterate how Cambridge Analytica's use of metadata, psychographic analysis, microtargeting and other methods employed to influence elections were public knowledge for a few years before the Facebook data scandal.

Once it came out, however, that Facebook users' private information were being exploited without their explicitly consent, Cambridge Analytica's actions were broadcast as a matter of grave concern and featured in the world media and on social media much more prominently. Hierarchies of power are more prominently exposed and entrenched with the revelation of how metadata is widely available due to the digitalization of everyday life and how it can be exploited. This affects not only individuals, but corporations, some of who have now begun profiting greatly off an entirely new paradigm of capitalism where individual data is the most lucrative commodity, and also nation-states which have to view data as not only a national security issue but also a powerful tool to maintain a control within its national borders.

The difference between considering Big Data as just a tool to be used by 'real' actors and Big Data being a development with its own agency therefore comes down to a question of perspective. It could certainly be argued that certain instruments of BD like micro-targeting, surveillance-based business models, national espionage etc. can be used as tools. However, claiming they are only tools implies that they are being used by 'real' actors in IR which is a perspective that needs to be critiqued and amended. As mentioned in previous chapters, at one

time, the state was only considered the 'real' actor in IR. Over the 20th and 21st century this understanding has expanded to include other actors, however, as discussed in chapter 2, their inclusion is often seen as an 'IR issue' only in conjunction to the state.

The primary objective of this thesis is to highlight the relative rigidity hidden within the seemingly dynamic nature of IR which prevents it from adequately acknowledging new developments that go against its deeply entrenched norms of what is considered an 'IR issue'. Big Data is a unique development in IR that has been viewed as an instrument that is used by the state and/or corporations by those with a more traditional understanding of 'agency' and what constitutes an actor in IR. However, like many of the technological developments of the 19th century that remained underexamined by IR during its nascent phase as an academic discipline, Big Data cannot merely be looked at as a niche topic that will just end up existing on the fringes of IR's sphere of interest.

Furthermore, if we apply the ANT understanding of agency to BD, then it could be seen as its own entity. ANT's inclusion in this discussion stems entirely from the assertions of the problem this thesis tackles, as laid out in chapter 2 regarding the lack of meaningful core dynamism within IR. The thesis therefore presents ANT as a potential framework of reference, increasingly seeing use in the academic literature of IR scholars, that exists outside the disciplinary norms of IR and could present an alternate understanding of how 'agency' might be perceived.

Towards the beginning of this thesis, Big Data was presented as a technological development with profound impact on the discipline of IR, with the various paradigms of IR being unsuited to properly accommodate it within its disciplinary confines. It is a development that can and has already begun serving as the basis of conflict among nations but cannot in its entirety be accommodated within existing paradigms of IR. The attempt to situate Big Data within the

ontology of IR has exposed a severe shortcoming of IR as a discipline in itself – the core rigidities - and highlights the need for change. The exact nature of these changes is beyond the scope of this discussion, however, by attempting to broaden the understanding of what constitutes an 'agent' or 'actor' within the discipline could be a useful starting point.

With Big Data set to become the basis of a significant portion of global conflict, both violent and non-violent, as explored in chapter 3, this thesis contends it is wiser to accord it a broader understanding of agency than one that is most commonly employed in IR. If Big Data is observed only through the lens of traditional agency as understood in IR, then it would appear no more than a niche development as has been the case for many previous iterations before. This would be a disservice to the study of what this thesis contends is a significant development in the study of international politics and therefore it should be treated and studied as such.

If it can be agreed upon that the traditional outlook of IR requires changes, then perhaps it can begin with the change in how technological developments like Big Data are considered within IR. Traditional understandings of IR would ascribe agency to the state but not to something like Big Data. But even the state itself is not a tangible object that can be said to have its own will. It is a collective of multiple strands of individual wills coordinated and governed by a government and only maintains legitimacy for as long as it retains the belief of its constituents. When it comes to Big Data, it is a technological development, however, it is set aside from previous iterations such as the Printing Press or the telegraph by its own unique aspects discussed in chapter 1. Though nations attempt data localization to protect the data of their citizens, as a resource it cannot be entirely regulated.

Therefore, it is once again important to reiterate that Big Data is a technological innovation that does not currently have adequate space within IR. It bears its own unique characteristics which set it aside from other technological developments of the past. Thus far, it has largely

served as an instrument for states, corporations, international organizations and NGOs. However, it has also opened up new avenues for how all of these 'legitimate' actors operate, opening up new frontiers (both negative and positive) in information processing. In order for developments like Big Data to be acknowledged for the impact it has had and will continue to have, changes at the core of IR must happen.

There is still much work and research to be done on the confluence of Big Data and global politics. Many have begun hailing it as the basis of a Fourth Industrial revolution, others have claimed it will become a more valuable resource than even oil in the coming years. It has heralded new frontiers of capitalistic growth and created new ways of coordinating on development. It has facilitated the manipulation of elections across borders and opened a pandora's box of concerning developments with regards to privacy, espionage and civil liberties.

The complexities of the international realm need to be reflected in the discipline that studies it. In order to achieve this, IR will need to evolve and adapt, not just by growing its scope and adding other agents only in relation to the state, but by looking closer at the complex interdependence of the world, and of all the varying actors within it, and studying how they interact and influence each other. This is likely to be a very difficult endeavor, especially since examining the social impacts of a development like Big Data might not have grown beyond a niche within IR thus far. However, difficult as it may be, this endeavor will prove itself extremely necessary in the near future.

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