Review of Socio-Economic Perspectives **Azhar, S, pp. 103- 124**
Vol. 2, No: 1 /June 2017

DOI: 10.19275/RSEP011

Received: *11.04.2017*
Accepted: *07.06.2017*

THE FOURTH INDUSTRIAL REVOLUTION AND LABOUR: A MARXIAN THEORY OF DIGITAL PRODUCTION

Dr. Shahram Azhar
Habib University, Karachi, Pakistan
E-mail: shahram.azhar@ahss.habib.edu.pk

Abstract

In recent years the birth of 'digital production' has spurred a lively theoretical debate in political economy, seeking to understand the implications of 'immaterial labour' for the labour theory of value. These discussions have identified a number of theoretical challenges pertaining to the conceptualization of capitalist production in digital space. In particular, scholars have been puzzled by the question of how the notion of 'abstract labour-time' applies to immaterial labour, how the 'free use' of websites/applications is compatible with 'commodity production', what role 'users' play in the production process, and whether digital firms can be simply seen as rent-seekers disengaged from value-production altogether. In this paper I present an answer to these questions using Marx's Circuits of Capital model which allows a clear understanding of 'commodity production' and 'labour-processes' to be drawn in any microeconomic arrangement. I then complement this theoretical analysis with case examinations of the actual revenue processes of two major firms: *Facebook* and *Google.* Using this model, I demonstrate how digital production in these firms can be theoretically modelled as *capitalist* production, and how the monopoly profits of these mega corporations can be seen as 'unpaid labour' extractions from spatially segregated people all across the globe. Thus, in contrast to celebratory accounts that posit digital profits as 'returns to innovation', the analysis presented here reveals how surplus-value 'exploitation' and the 'law of uneven development' plays itself out in the whole process, allowing the immense benefits of advancements in digital technology--- like other technological advances under capitalism--- to remain confined within a tiny elite that is *physically* located in a few advanced capitalist economies. The paper concludes that the latent possibilities of what has been termed the "Fourth Industrial Revolution", despite its socializing and democratizing *potential* to connect millions of workers to consumers *directly*---without the aid of capitalist intermediaries--- remain untapped as long as capitalist relations of production predominate the *physical*, and consequently the *virtual* economic and political milieu.

Key words: Digital Economy, Technology and Capitalism, Facebook Business Model

JEL Classification: B51, O14, O3

Citation:

Azhar, S. (2017). The Fourth Industrial Revolution and Labour: A Marxian Theory of Digital Production. Review of Socio-Economic Perspectives, Vol 2(1), pp. 103-124. DOI: 10.19275/RSEP011

Introduction

In 2016, the World Economic Forum summit startled its audience with a bold proclamation: digital production has ushered mankind into a "Fourth Industrial Revolution", where "the speed of current breakthroughs has no historical precedent", and developments are "evolving at an exponential rather than a linear pace".[1] Regardless of the merits of such a historic proclamation there is, nevertheless, little doubt that the meteoric ascent of the digital economy is remarkable by any metric of success. Consider for instance the fact that in little over a decade, *Facebook* and *Google* have emerged on the coveted Fortune-500 list of the world's wealthiest corporations. In addition to their financial success, these companies also exert an enormous amount of *social* influence simply by virtue of the sheer magnitude of the percentage of the global population that they are able to engage with on a daily basis. With global access to the internet ever on the rise, especially in Third-world countries where large reservoirs of populations without internet-access remain an 'untapped market' (Fig. 2) for digital production, one can be certain that digital corporations will exert an ever greater economic and social influence in the future economy. Estimates already suggest that the global digital economy represents a staggering $4 trillion industry, accounting for over 5% of the GDP in rich countries (Fig.1).

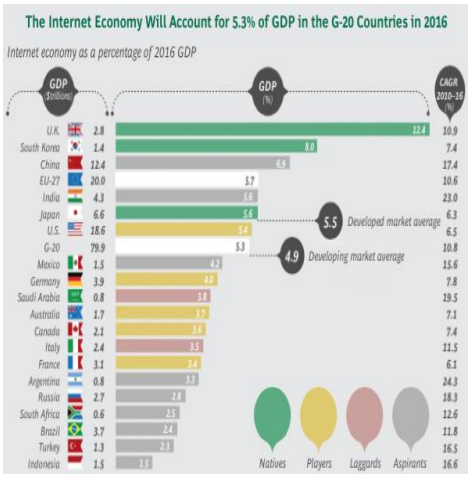

Fig 1: Size of the Digital Economy in Major Countries

Source: Boston Consultancy Group Report, 2016

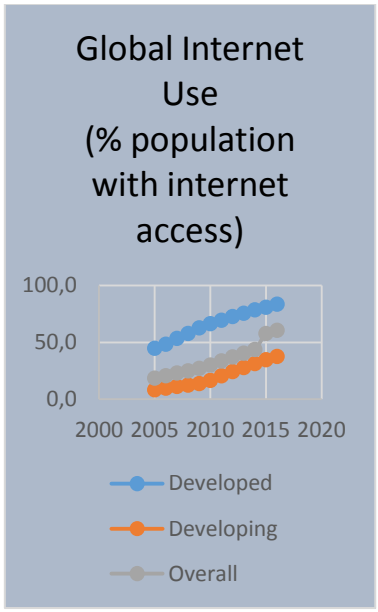

Fig 2-A Growing Market: % Population with Internet-Access

Source: International Telecommunications Union

[1] For details, see https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/

The spectacular rise of the digital economy has given birth to an array of intriguing theoretical discussions, that seek to assess the economic implications of these new forms of production. Scholars have approached the question from different entry-points, and as a result, have arrived at very different conclusions on how, and to what extent, digital innovation will transform human lives. In a host of studies, scholars such as Khumalo (2010), Basu (2010), Hersovici (2011), Chen, Tsai, and Hsu (2014), Yadav (2016) present theoretical and empirical analyses of the implications that digital technologies have had on factors such as 'knowledge', 'productivity', 'e-governance', and 'consumer satisfaction'. Neoclassical economic theory, which concerns itself primarily with questions of 'efficiency', 'growth', and 'profitability', rather than questions of 'distribution' and 'inequality', celebrates the success of digital corporations such as *Facebook* and *Google* as returns to their 'innovative genius'; for these groups of theories, the ascent provides yet another 'confirmation' of the immense 'entrepreneurial potential' of capitalism (Basu, 2009). Thus, the general consensus in most mainstream discussions is that the impact of the digital revolution is, on the whole, a positive one. What has received far less attention in these predominantly laudatory discussions, therefore, is the impact that digital production will have on *labour*, by transforming its fundamental questions: the 'why', 'what', 'where', when', and 'how' of *work* itself. Yet, it is answers to these central questions that will determine how the "Fourth Industrial Revolution" impacts *human* lives---as *workers*--- under these new forms of capitalist production.

This paper seeks to address that gap in the literature by developing a political economy theoretical framework, combined with case examinations of two major digital corporations (*Facebook and Google),* that allows us to focus on questions pertaining to digital labour. While there are multiple analytical frameworks within the broad political economy tradition, the Marxian framework provides the clearest understanding of the relationship between technological change and the matrix of social relations within which humans produce and consume goods and services. In particular, the conceptual apparatus of Marx's magnum opus, the three volumes of *Capital*, provide a general theoretical framework to examine social relations in capitalist production. This analytical framework starts from a very different premise than mainstream economic theory, specifically the concrete fact that all production---regardless of its *historical*[2] form--- requires *labour*: an exercise of human nerves and muscles to produce a useful product. While Neoclassical theory also *discusses* labour, it treats it as being no different than other "factors of production". In contrast, Marxian theory does not fixate on the mechanics of a production process, its 'efficiency' or 'profitability' per se; rather, the aim of the theory is to assess the impact that any change---and technological change is no exception--- exerts on the *social relations* of production: the

[2] For Marx, 'capitalism', just like 'feudalism' or 'slavery' are *historical* rather than *eternal* forms of producing goods and services.

organization of work. This leads the theory to distinguish, first and foremost, between the *direct-producers* (those performing labour) and the *appropriators* (those making decisions about those products) in any process of production, and then exploring the social relationships *between* these two groups of economic agents. This leads the two competing economic theories to ask a very different set of questions. While mainstream economic theory begins by analysing any technological innovation with the question 'is it profitable?', or 'does it maximize efficiency?', Marxian theory begins with a different set of questions: who produces the surplus? Who makes decisions about the distribution of this surplus? To whom are these distributions made, and why? As we will see, once these questions are asked in the context of digital production, one immediately understands the monopoly profits of mega digital corporations such as *Facebook* and *Google* (which are heavily concentrated physically in rich countries) to be, in fact, a result of what Marx termed 'unpaid labour' extractions from millions of people spread out all across the globe, rather than returns to superior intelligence and/or innovation.

In Section 2, I present an overview of some of the questions and challenges that scholars within the Marxian tradition of political economy, such as Hardt and Negri (2004, 2009), Virno (2004), Fuchs (2014, 2016), Pasquinelli (2009), Nixon (2014), and Fraysse' (2016) have pointed out in their recent studies on digital production. These discussions have given birth to a number of intriguing questions: 1) how does one understand 'website'/'cellular applications' to be *commodities* as in Marx's *Capital*, especially given the fact that in most cases a price is not charged for viewing them? 2) How does a change in the patterns of 'labour-time' under digital labour alter the premises of 'abstract labour' in Marx's value theory? 3) What role do audiences (users of websites/applications) play in the entire economic process? 4) From a value-theory standpoint, does 'production' take place in digital corporations at all, or is the labour performed more akin to 'rent-seeking', unproductive labour? The discussion in Section 2 achieves the twin goal of presenting a brief, critical overview of the recent debate on digital production, as well as identifying the importance of these four central questions to that debate.

In Section 3 of this paper I present a theoretical framework of digital production, premised on Marx's Circuits of Capital model, to present an answer to these analytical questions. I start off, although it may seem trivial, by presenting a clear definition of what exactly Marxian theory means by *capitalism* as our 'object of inquiry', so we can apply it to our concrete case of digital production. While I am aware that this is by no means a universally agreed upon concept even within the Marxian tradition, I follow the interpretation of a number of influential Marxian economists including Resnick and Wolff (1989), Shaikh (2016), and Gibson-Graham (2002) to understand any 'mode of production' as a distinct way of organizing---producing, appropriating, and distributing--- the economic surplus.

Capitalism, seen from this light, is any act of production that simultaneously involves two economic processes: a) the buying and selling of labour-power in the labour-process, b) commodity-production, that is the idea that the *product* of the labour-process is *sold* on the market as its aim is not its immediate consumption, or use-value, but rather the exchange-value that will be derived from its sale (See Harvey, 2015 or Fine & Filho 2016).

Next, I will proceed to show how *both* conditions are satisfied in various cases of digital production, including *Facebook* and *Google*. As we will see, website/application-development not only involves *production* and *labour*, this production takes place on a *capitalist* basis: it involves both the buying and selling of labour-power, as well as the selling of the products *as commodities.* A major source of confusion for existing theories, and their struggle with digital production, stems from their inability to grasp the 'commodity' that these companies produce. The confusion is understandable, as it seems at least superficially, that users are not charged a price for viewing a website or downloading a cellular 'application'; hence the entire notion of 'commodity-production' seems murky at first sight. However, based on Marx's discussion in *Capital Volume II,* I argue that the 'commodity' can *only* be understood from the perspective of the person *paying for its exchange-value.* Once this criterion is properly introduced into the discussion, it becomes immediately clear what digital corporations like *Facebook* sell as *their* specific commodity: 'promotion services'. Existing accounts fail to distinguish this *commodity* (promotion services), which results in their inability to identify the *customer* (the person paying for promotion services), which in turn results in an ability to identify the direct *producers, the productive labour,* since the commodity that is being produced was not identified in the first place.

Having identified both the commodification of labour-power and the product of labour in different digital enterprises, I make the 'profits' of these enterprises the object of analysis in the final part of the paper. An analysis of their revenue process reveals how *Facebook* and *Google* actually make their profits. This involves a two-stage process. In step one, a 'network' of internet users is created that results in the generation of 'traffic' on that website. In step two, the corporation finds a way of *monetizing* that traffic, by selling promotion services *as a commodity* to *others* (those seeking promotion) in the network. I demonstrate that the profits made by digital enterprises consist of two main channels: 1) Surplus-value appropriated from the labour of people *directly* hired by these companies (their employees), for example as code-writers, network-designers, and software engineers, whose labour results in the production of the promotion services that *Facebook* sells; and 2) Surplus-value *indirectly* received by these enterprises, as distributions made by other labourers (for example independent film makers uploading their content) who are not directly *employed* by the firm. This consists of individuals and small companies who produce and upload online

content (such as movies and songs) independently, which means that they bear the labour non-labour costs involved in production themselves, and although they are not directly employed by *Facebook* they nevertheless have to make *distributions* out of the revenues generated from their own labour, as a *condition* of uploading their content on *Facebook's* platform. In either case, the revenues made from 'promotion services'---as a commodity--- are a result of the *labour* of individuals engaged in enabling the production of that network.

Thus, the paper concludes that the massive rates of accumulation of digital corporations in the last decade, once understood via the conceptual arsenal of 'unpaid-labour' developed in Marx's *Capital,* provide yet another confirmation of how surplus-value exploitation under capitalism allows the immense benefits of advancements in digital technology--- like all previous technological advances under capitalist relations of production--- to remain confined within a narrow elite, which is itself physically located in a few advanced capitalist economies. As such, the immense potential of the Fourth Industrial Revolution---like its predecessor---will remain untapped as long as capitalist relations of production predominate the *physical*, and as a result, the virtual world.

1. Political Economy of Digital Production: Challenges and Unanswered Questions

In this section I present a brief critical overview of some of the recent discussions that have taken place on the political economy of digital labour and production. The aim of this overview is to present an appreciation for the set of questions that have emerged in recent debates with regards to Smith, Ricardo and Marx's labour theory of value. I will divide the theoretical discussions in this overview into two broad categories: a group of theories that follows the work of Hardt and Negri (2006) to assert that "immaterial" labour represents the demise of value theory altogether, and a second group of theories that responds to these sceptical claims, by showing how the conceptual apparatus of value theory is in fact applicable---albeit certain nuances---to digital production. The latter group of theories are themselves split into two sets of alternative explanations: 1) The rent-based approaches, that argue that *Facebook* and similar companies do not produce anything; rather, these theorists argue, they charge a rental fee for 'use of space'; 2) The 'audience-labour' approaches, that accept that production takes place in these companies, and argue that the 'audiences' of websites and applications----*Facebook* and *Google* users---perform unpaid labour without ever realizing. I examine each of these theories below, present their main arguments, and summarize the questions that have emerged from their investigations. This will pave the way in the next section for an alternative theoretical framework that addresses these questions using a Marxian Circuits of Capital framework.

1.1. Digital Labour and Disjuncture in Abstract-Labour Time

In a series of articles and books, Negri (1991) and Hardt and Negri (1994, 2000, 2004, 2009), followed by Virno (2004) and others have argued that digital production marks such a profound transition from 19th century classical capitalism that the labour theory of value no longer provides an adequate explanation of values and prices under capitalism. The theoretical framework developed by the classical political economists---Smith, Ricardo, and Marx--- their "law of value", we are told, "is shattered and refuted by capitalist development itself" (Virno, 2004; p. 100).

The crux of this claim stems from the idea that 'immaterial' forms of labor and production alter the concept of 'abstract labor-time', a concept central to Marx's entire discussion of value in *Capital.* Let us therefore concentrate on this particular aspect of the problem first, making an attempt to understand the chain of analysis in Hardt and Negri's famous study, *Multitudes*, where this claim is systematically presented as follows:

"Once we articulate Marx's concept of abstract labor and its relation to value, we quickly recognize an important difference between Marx's time and ours. Marx poses the relation between labor and value in terms of corresponding quantities: a certain quantity of time of abstract labor equals a quantity of value. According to this law of value, which defines capitalist production, value is expressed in *measurable*, homogeneous units of labor time. Marx eventually links this notion to his analyses of the working day and surplus value. This law, however, cannot be maintained today in the form that Smith, Ricardo, and Marx himself conceived it. The *temporal unity of labor* as the *basic measure of value* today makes no sense" (Hardt and Negri, 2004; *p. 259, emphasis not in original)*

Thus, Hardt and Negri's claim that the concept of abstract-labour time' is inapplicable to digital production, and hence their conclusion that the law of value is untenable today has to do with, in their own words, a disjuncture in what they term "the temporary unity of labor". Given the new immaterial forms of labour, Hardt and Negri claim 'temporal unity' as a measure of value "makes no sense" anymore. Since Hardt and Negri's conclusion rests pivotally on the concept one may legitimately ask: what exactly do they mean by the 'temporary unity of labour'? One needs to dig the argument a little deeper to see Hardt and Negri explain what they mean by this elusive concept:

"The working day and the time of production have changed profoundly under the hegemony of immaterial labor. The regular rhythms of factory

production and its clear *divisions* of *work time and non-work time* tend to decline in the realm of immaterial labor." (Ibid, 260, emphasis not in original)

As an example of the "profound" transformation hinted at in the above statement, Hardt and Negri point out that "companies like Microsoft try to make the office more like home, offering free meals and exercise programs to keep employees in the office…" while "at the low end of the labor market workers have to juggle several jobs to make ends meet" (Ibid). In other words, the mysterious concept of 'temporal unity of labor' is actually quite a simple reference to the distinction between 'work time' and 'non work' time, or 'work' and 'leisure' as it is typically understood in most economics discussions, or what is simply called the 'work-life balance' in colloquial use. For Hardt and Negri, digital production cannot be explained through Marx's theory of value because the distinction between 'work' and 'leisure' has become blurry. "Labour and value", they argue, "have become bio-political in the sense that living and producing tend to be indistinguishable" as there is an overlap between work and non-work time (Hardt and Negri, 2006; p. 249). Since this "biopolitical production is immeasurable" that is, it "cannot be quantified in fixed units of time", Marx's concept of abstract labor time is no longer applicable.

The connection that Hardt and Negri have drawn between 'value theory' and 'work-leisure' balance is as unique---for no one in classical or neoclassical political economy has made such a claim---as it is incorrect. For Marx, the notion of abstract-labor has *nothing* to do with work-life balance as Hardt and Negri have incorrectly claimed. Rather, the concept (which, like any concept, is useful only if it distinguishes itself from something else) stems from an understanding of what Marx and Marxian economists since have called "the dual character of labor": the opposition between 'individual' and 'abstract' labor time.

Individual labor-time, as Marx writes in the *Grundrisse* "exists as such only subjectively, only in the form of activity". He reminds us that "in so far as it is exchangeable as such, it is defined and differentiated not only quantitatively but also qualitatively, and is by no means general, self-equivalent labor time; rather, (individual) labor time as subject corresponds as little to the general labor time which determines exchange values as the particular commodities and products correspond to it as object" (Marx, 1973; p. 171)

'Abstract labor-time', in contrast, is 'indeed the labor-time of an individual, but of an individual in no way different from the next individual' (Marx, 1970; p. 32). In the value form "all labor is expressed as *indistinct* human labor, and consequently as labor of equal quality" (Ibid). As Tombazos (2014) rightly points out in his brilliant study on the '*categories of time in Marx'*, it is "only by having recourse to this (real) abstraction" that one can "speak of indifference as regards the individuality of the content and form of labor, for labor's quantitative dimension

does not erase its qualitative traits" (Tombazos, 2014; p. 19). It is in this precise sense that Marx argued that "labor, thus measured by time, does not seem, indeed, to be the labor of different persons, but on the contrary the different working individuals seem to be mere organs of this (abstract) labor. (Marx, 1970; p. 30)"

Of course, in any concrete activity of labor "the worker does not work twice, once 'individually' and then 'abstractly' (Tombazos, 2014, p. 19). But it is precisely in this dialectical opposition, between 'individual' and 'abstract' labor-time---in the "same that is opposed to itself", that is "one and the other" simultaneously --- that the secret of value lies. It is this discovery of Marx, his great contribution to political economy, that provides an answer to the *paradox* of value: why commodities with *qualitatively* different use-values can express *quantitatively* similar exchange-values. Marx's answer rests on the fact of commodity production, where products of different kinds of concrete labour (shoe-maker, brain surgeon, violinist etc.), representing different kinds of use-values interact with one another in the market, where they become 'equalized' as exchange-values: they are *only* representatives of 'homogenous labor'. The notion of abstract labour is contingent on the fact of *commodity production and exchange*, and not the balance of work and leisure in workman's lives, as Hardt and Negri have incorrectly assumed.

It obviously follows from this, that Hardt and Negri's claim about 'measurability' of 'abstract labour' in Marx's theory of value is also flawed since it is based on a false premise to begin with. Abstract-labor is not, as Hardt and Negri also incorrectly assume, a simple mapping of physical labor-times onto values. Rather, as I have already pointed out, the conversion of individual labor-times into abstract-time happens through the process of exchange and circulation--- the market mechanism--- where the products of different individual labors interact with one another and *become* homogenized, abstract labour. The mechanics of this process, that is to ask *how* abstract-labour hours are transformed in the market to dollar prices, is the object of a lively theoretical discussion in Marxian economics--- known as the 'transformation problem'--- and a detailed discussion of these debates is beyond the scope of the present paper (See Foley, 2014; Basu, 2009; Shaikh, 2016; Sweezy, 1946).

1.2. Digital Production or Digital Landlordism?

A second line of inquiry seeks to develop an understanding of the digital economy by drawing parallels with Marx's discussion of 'ground-rent' under capitalism. While there are at least three different versions of what I term the 'digital landlords' or 'rent-based' approaches, there is consensus in these lines of inquiry on two fundamental points: 1) that what is taking place in digital corporations, from a purely economic standpoint, is *not productive activity*, in the sense that no new values are produced in the economic transactions, and 2) that the labour

performed in reproducing these activities is thereby 'rent-seeking', and/or 'unproductive' labour. These two conclusions are arrived at from three different points of entry:

In one line of reasoning, owners of digital companies are seen as renting-out "the use of the medium to the industrial capitalist who is interested in gaining access to an audience" (Caraway 2011, p. 701). A seller of shoes, for example, who wants to advertise his new product in a market pays *Facebook* for a price on its 'wall'. This 'wall' is rented out by Facebook to this shoe seller. In this theoretical framework, the *latter* (the shoe making industrial capitalist) is the *productive* capitalist whereas *Facebook* is an unproductive, digital landlord. This notion of rent is closer to that of renting-out an asset (e.g. a piece of land) rather than Smith, Ricardo, and Marx's notion of *differential* ground rent, which emerges from the differential levels of productivities of different pieces of land (Marx, 1973)

Fraysse' (2016) presents an alternative rent-based explanation. He argues that companies such as *Facebook* or *Google* perform unproductive activities, as they can be compared to "an advertising agency of some type" (Fraysse', 2016: p. 173) since their activities, for Fraysse', are akin to billboard advertising. In both cases media owners "monopolize screen space" that enables them to levy a ground-rent on the "one (who) pays for a space in which to advertise for a given period of time" (Fraysse, 2016; p. 182).

A third rent-based theory looks at one firm (Google) and posits its revenues as 'cognitive rent' emerging from the "power to demand free labor" via the control over the 'common intellect' (Pasquinnelli, 2009). The internet for Pasquinnelli represents a 'common' brain that performs collective labour in its capacity as internet-users. Google (and by extension other similar enterprises), for Pasquinnelli, are able to extract rents from this common brain purely by virtue of their ownership of the platform. This line of reasoning is, in fact, closer to the 'audience-labour' group of theories discussed below. But before moving on to discuss these alternative sets of approaches, it is important to point out some of the general problems associated with a purely rent-based understanding of the digital economy.

First, it is crucial to remember that for Marx 'rent, 'interest', and 'profit' represented *distributions* out of surplus-value and dismissing something as 'rent' does not absolve the theorist of the responsibility to explain the *source* of that surplus-value itself, since something has to be produced before it can be distributed. Rent-based approaches are almost always based on some kind of a metaphoric use of the term. In one sense, it is used for 'rent-seeking activities' (which have nothing to do with rental relations between a landlord and a tenant for example), while in another it used as a fee similar to the one charged by advertising firms.

Second, a purely rent-based approach does not provide an adequate explanation of the digital economy as it fails to see that unlike rented out assets (e.g. a piece of land, or an apartment), which do not require constant production and reproduction, companies such as *Facebook* and *Google* have to actively engage in the production of their websites and applications.

Finally, and this is more so applicable to rent-based approaches that rely on the concept of 'unproductive labour' to explain digital labour processes, the conceptual distinction between 'productive' and 'unproductive' labour in Marxian economics has absolutely *nothing* to do with the concrete nature of a productive act but rather is determined by looking at the social relationship of production. This simply means that it is impossible to declare any kind of labour or production, a priori, to be *unproductive* just by looking at the mechanics of the process. For example, if we were only given the information that person X performs 'advertising services', 'security services', or 'legal services', we cannot deduce whether this labour activity is productive or unproductive with just this information. As Marx (1975) so clearly explains, the same labourer (he gives the example of a joker, performing labour as a self-employed independent worker versus in a circus operated by a capitalist) performing labour in different circumstances---whether under the employment of a capitalist or not---will be productive or unproductive, depending on the *social* relationship of production. Similarly, even if we accept the argument that digital labourers engage in advertising labour, we cannot deduce whether this work is 'productive' or not. In *Capital Vol.II*, for example, Marx gives the example of transport workers. He says that "what the transport industry sells is the actual change of place itself. The *useful effect* produced is inseparably connected with the transport process…" (Marx, 1978; p.135). In other words, services are *commodity-producing* activities if they are performed under the employment of a capitalist. As we will see in the next section, to deduce and distinguish productive from unproductive labour, one has to distinguish between the 'labour process' (whether or not the direct-producer was employed by the capitalist), and the commodity-process (whether or not the product of labour was sold in the market).

1.3. The Role of the Audience (Users) in Digital Production

A third stream of the literature approaches the question from a completely different lens, that of the 'audience': the users of websites and applications. This group of theories draw their inspiration from the work of Dallas Smythe, who had sought to understand the political economy of the forms of mass communication (television, films etc.) in the 1970's and early 80's. Smythe (1977, 1977b, 1981), in a series of articles that sought to shift the focus of discussions on mass media from merely providing cultural conditions of existence to capital, to the production of surplus-value in this industry itself, came up with the idea that "the

material aspect of communications is that *audiences* work, are exploited and *are sold as commodity* to advertisers" (Fuchs 2014, 77, emphasis not in original).

Smythe's idea has seen a resurgence in recent years with the work of Fuchs (2014, 2016), Nixon (2015), and Fisher (2015), who use it to argue against Hardt and Negri's claim about the invalidity of Marx's labor theory of value. Fuchs (2014) builds on Smythe's theory to develop an understanding of what he claims is an "expression of new qualities of the labor theory of value" (Fuchs, 2014, 27), in which users of *Facebook* perform labor without even realizing it themselves. For Fuchs, the act of visiting these cyber spaces, sharing information and photographs, constitute a *labor process* that results in the production of "attention", a commodity whose value is determined by the "average number of minutes that a specific user group spends on *Facebook* per unit of time divided by the average number of targeted ads that is presented to them during this time period" (Ibid). In other words, the time spent by the user 'browsing' on *Facebook* counts for Fuchs as productive labor time as he/she is in the process of producing 'attention', which will then be sold to advertisement companies for a profit.

In other words, for Fuchs and other audience-labour theorists the *commodity* that is being produced is 'attention'. As critics point out, the problem with this view is that it conflates 'production' and 'consumption'. The provider of 'attention'---the 'users'--- *consume* the content that is uploaded on their pages. They do not engage in the *production* of these pages. 'Audience' labour theorists retort by pointing out that if users are consumers then why do they never have to make any payments to *Facebook* or *Google* to view/consume the content? As we will see, this is an important question that merits an answer. I will provide an answer to this question in the next section by pointing out that there is a distinction in digital capitalist corporations between the *user* and the *customer*. The *latter,* seeking promotion services, *pays* for the service to get the attention of the *former*. The former gets 'free use' of the platform, but the flipside of his/her 'free consumption' is the 'forced consumption' of unsolicited content/ads.

But for audience-labour theorists, the only way out of the problem of 'free consumption of users' is that the 'users' perform labor, without whom, "*Facebook* cannot make money" if they "do not constantly use the platform and thereby produce data and attention" (Ibid). But one may ask: is this not true for *all* consumers? Capitalists--- physical or digital--- cannot survive without *consumers,* since surplus-values cannot be realized without consumption, but their importance to the reproduction of a capitalist activity does not undermine the fact that goods and services are *produced* before they can be consumed. Audience-labour theory blurs the distinction between 'users' and 'customers', and thereby blurs the distinction between the 'direct producers' of commodities and the 'consumers' of commodities.

To reiterate then, the recent debate on the political economy of digital production revolves around four central questions: 1) how does one understand 'website'/'cellular applications' to be *commodities* as in Marx's *Capital*, especially given the fact that in most cases a price is not charged for viewing them? 2) How does a change in the patterns of 'labour-time' under digital labour alter the premises of 'abstract labour' in Marx's value theory? 3) What role do audiences (users of websites/applications) play in the entire economic process? 4) From a value-theory standpoint, does 'production' take place in digital corporations at all, or is the labour performed more akin to 'rent-seeking', unproductive labour?

2. A Marxian Model of Capitalist Production in Digital Space: *Facebook and Google*

2.1. Network Traffic Monetization: The Revenue Model of Facebook and Google

In order to answer the aforementioned questions, in this section I will present a theoretical framework that allows us to situate the production processes of digital enterprises in the context of capitalist production. But before we can assess whether the activities of digital companies--- *Facebook* or *Google*--- can be described as capitalist forms of production, we must first understand how these corporations actually make money; that is, we must develop an understanding of their 'revenue-processes'.

The two major digital corporations, who are monopolistic competitors in the sense that although they produce the same commodity (promotion services, as discussed earlier), they have different specializations within this industry: *Google* specializes in delivering 'search-based' promotion services to its clients, while *Facebook* provides 'information-generated' promotion services. Both corporations are members of the elite group of *Fortune-500* companies. *Facebook*, with its $27,000 million revenues stands at 157th, while *Google's* parent company *Alphabet* (which entered the market earlier than *Facebook)*, stands at number 36 on the list with its $89 billion revenues. Given the fact that both these corporations have managed to achieve this in a relatively short time period, the profit *rates* of these firms are spectacular, even by historical standards. Between the decade 2006 to 2016, for example, *Google* saw an approximately 750% increase in its revenues (Fig-3) The accumulation spurt of *Facebook* is even more startling: since 2007, the corporation has increased its revenues by a mammoth 18,000 percentage points (Fig-4).

What is the revenue process that has resulted in these massive rates of expansion? This revenue process can best be summarized as a two-stage process. In step one,

the digital corporation generates a 'network of users' that creates "traffic" on its website. In this step, the corporation seeks to extract as much personalized information as possible from the 'user' during what seems like a 'free interaction' in the sense that the user is not charged a price in this interaction. The 'desirable result', from the perspective of the digital corporation, is that the set of 'free' services offered by the website---'search engine' in the case of *Google* and 'social interaction' in the case of *Facebook*---result in the generation of 'traffic' on the website. Once a significant threshold level of traffic is generated then, in step two, the corporation finds a way of monetizing the traffic that it has generated by allowing *others* to promote their message to specific *groups* of users. Thus, as more varied and diverse groups of users get connected to the network produced by the corporation, it attracts an equally diverse range of 'customers' from all across the globe. How each firm generates 'traffic' on its website varies from company to company but the general revenue model is the same: traffic generation, followed by monetization of that traffic.

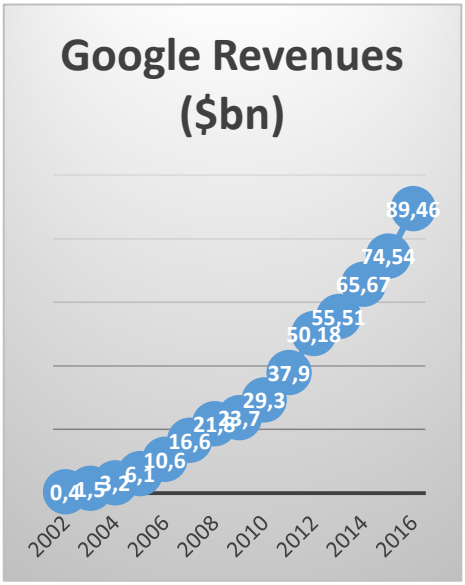

Fig-3 Google Revenues 2002-2016 ($bn)

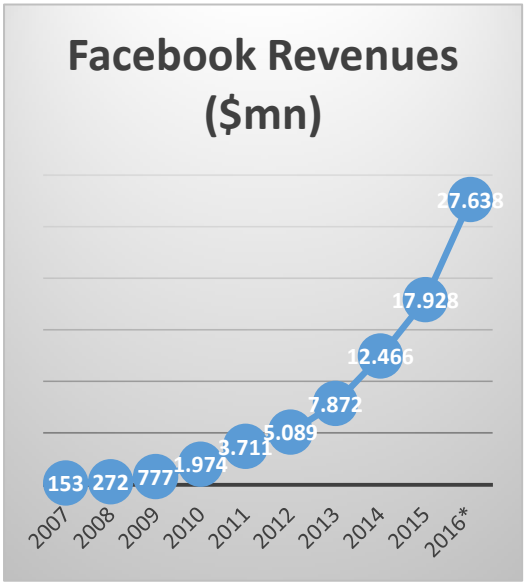

Fig-4-Facebook Revenues 2007-2016 ($mn)

2.2. Circuit of Capital Model and Digital Production

Let us now turn to the theoretical question at stake: how can this two-stage revenue process described above be understood as occurring on a *capitalist* basis? Of course, to answer this question we must first answer the following question: what exactly do we mean by capitalism? I am aware that this is itself a question of intense debate within the Marxian tradition. Resnick and Wolff (1989) and Gibson-Graham et al (2002) provide a detailed overview of the competing theories in Marxian theory.

In particular, the 'property', 'power', and 'surplus' based approaches are used by different scholars to examine and distinguish capitalism from non-capitalism in any concrete situation. The key to understanding this problem is that the particular approach to defining capitalism that one employs also defines, by extension, how one understands non-capitalism. For example, the property theory, which has been the privileged theory for orthodox approaches to Marxism, views capitalism as a system of 'private ownership of the means of production'. It thereby regards an economic arrangement with non-private ownership as non-capitalism. In contrast, as Resnick and Wolff (1989) and Gibson-Graham (2002) have shown, a surplus-based approach, that understands how in a given situation "surplus is pumped out of direct-producers" (Marx, 1973; p.155), provides the clearest exposition of Marx's unique understanding of modes of productions.

Following their insights, and Marx's discussion in *Capital*, I will rely on Marx's Circuit of Capital model to understand capitalist production, as it provides a simple and summarized understanding of capital, as value-in-motion:

$$M < \begin{Bmatrix} LP \\ MP \end{Bmatrix} - P \ldots . C' - M'$$

where *M* is initial money-capital, which goes into the sphere of circulation and is exchanged for two kinds of commodities: labor-power (*LP)* and means of production (*MP).* It then leaves the sphere of circulation and enters the realm of production (and exists as productive-capital *P),* where the capitalist must 'productively consume' the two commodities that have been purchased from the market. The productive consumption of these two commodities yields a new commodity, *C',* which is pregnant with surplus-value. This new commodity then returns to the sphere of circulation and realizes itself as *M',* "capital in its familiar form" (Marx, 1867; p. 186). Capital, for Marx, is self-valorizing value; or value that is in the process of increasing itself from *M* to *M'.* The productive workers, who produce 'new value' equal to *M'-M* are paid a value of *LP< (M'-M).* In other words, surplus or unpaid value is extracted from workers under capitalist production.

Thus, to talk about capitalist production---as a 'social relation'--- in any concrete form of economic activity, we must look for two kinds of social *interactions*: 1) *M-LP*, the buying and selling of labour-power, where a worker sells his/her labour-power to the owner of capital *M;* and 2) *C'-M',* the selling of the produced commodity to a customer willing to part with his/her money (*M'),* in exchange for the commodity produced through the labour of the wage-workers. Minus any one of these two conditions, an economic process *cannot* be understood as being a capitalist economic process from the lens of the Circuit of Capital. For example, if someone hires a personal driver on a monthly wage, the driver *is not* engaging in capitalist relations since the product of his/her labour (driving services) are *not*

being produced for sale *(C'-M')*. Conversely, a person performing driving services *independently* (for example as a person who drives his own taxi) is *selling* a commodity but is *not* engaged in capitalist activity since he/she is not *hired* by anyone and the exchange *M-LP* does not take place.

Given this simple model, one can examine any concrete case of production and ask the following questions: 1) Who furnishes the initial *M* and in what proportion does he/she allocate that *M* to purchase labour-power and means of production, respectively? 2) Who are the productive workers (who provide *LP)* engaged in the production of the commodity, *C'*? 3) What is the commodity *C'* that is being sold in any concrete case? 4) Who is the buyer, the owner of *M',* who is willing and able to exchange his money for this commodity? These are the questions that directly emerge from a model of capitalism premised on the circuit of capital model and they can be asked in the process of investigating any form of concrete production.

Let us now go back to our concrete case--- *Facebook* and *Google*--- using this circuit of capital model. We begin with the concluding branch of this circuit, *C'-M'* and ask: what is the commodity in the business model? From their financial reports, one learns that *Google* derives over 75% of its $89 billion revenues from a feature known as 'AdWords'. All keyword searches made by users on their website are run via an algorithm to sort relevant information from all over the web, and deliver the most relevant results to the user. The use of this algorithm is free for all 'users', which generates an enormous amount of traffic on the website. This is step one of the revenue process described earlier. It *does not generate* revenues for the firm but merely generates the 'traffic' that will be monetized in step two. *Google* processes 40,000 searches per second or roughly 3.5 billion searches in a single day[3] but none of these searches, in of themselves, are commodities. Rather, the revenue generating process involves the intervention of a *customer* willing to pay for promotion services in that traffic-generating network. This consists in converting those keyword searches into a monetizable activity. The way *Google* achieves this goal is by converting every keyword search to tailor the display of its advertisements for each specific user. These advertisements may or may not be from other 'industrial capitalists' seeking to sell their items. For example, if an individual consistently searches for 'charities to donate to', one will soon be flooded with all kinds of local and international charities prompting you to make contributions to their respective causes. The main point is not *who* the buyer is, whether another capitalist or a charity organization, but rather that there are people who are willing and able to buy the commodity and extract its use-value: promotion on 'walls'. Since there is demand for this labor, the production of these services---digital 'promotion'---on a

[3] www.internetlivestats.com

capitalist basis constitutes a new and independent branch of the social division of labor" (Marx, 1867, p. 87).

Similarly, *Facebook* derives over 90% of its own revenues from advertisements placed on, what are termed a user's "wall". *Facebook's* algorithm is built to collect personalized information about an individual---political views, sports interests, cultural interests, interests of friends etc.--- captured through what that user 'likes'/'dislikes': step one of the revenue process, which is non-revenue generating activity. In step two, *Facebook* gives its clients the opportunity to tailor a promotion message to specific 'types' of users.

Thus, in either case, it becomes immediately clear that it is this 'client' who is engaging with the company in the concluding monetary transaction, *C'-M',* the person/company willing and able to buy the commodity: online 'promotion services'.

Once we have settled the question of the commodity being sold by *Facebook* and *Google*---digital promotion services--- we can now inquire about the *production* of this commodity. A number of labour processes must be performed in order for 'promotion services' to be sold by the two companies. A host of software experts must write and run the algorithm, network specialists must design the server connections needed to operate the website, and marketing specialists must focus on the features that enhance the product's quality, like any modern corporation. It is clear that the commodity ('promotion services'), the sale of which results in profits for the firms *has to be produced* through the labour of *these* individuals (and not the users of websites). The provision of online 'promotion services', which includes everything involving the designing, code-writing, networking, and managing of the platform (website/application), involves *labour,* and that is performed in the circuit of production (*P).*

Thus, the two-stage revenue process of *Facebook* and *Google* can easily be summarized within a Marxian circuit of capital model. This is seen as soon as, firstly, the distinction in this business model between 'users' and 'customers' is properly understood. The goal of the business model is the sale of the product as a use-value to the latter by *luring* the former into the network. The former (the 'user' of the website) is 'an unavoidable middle', a mere 'condition' of existence for this concrete kind of capital to *serve* as capital. The *latter,* the client is the active agent in the realization of surplus-value. Thus, while the former is not charged a price for enjoying the services available at the space, the flipside of her 'free consumption' is the 'forced consumption' of unsolicited content (forced viewing of ads, promotions etc.) from the latter.[4]

[4] YouTube offers its clients, at a slightly higher price of course, the additional service of not allowing users to 'skip an ad'.

But are the profits of *Facebook* and *Google* just the result of surplus-value extractions from the workers that they directly hire? As we have seen, the key to the business model is the generation of 'traffic'. So is all the traffic generation on these companies the result of only their employees?

Certainly not. A host of *independent* labourers (artists, musicians, game developers, application designers etc.), spread out all across the globe also upload content that they *themselves* produce, incurring the labour as well as non-labour costs independently. Consider for instance a film-maker who uploads her own short videos on *Facebook.* She incurs the labour and non-labour costs *herself* and uploads the content on the website. While she is *not directly* hired by these companies, yet it is abundantly clear that her labour generates traffic *for* the website. Given this traffic that has resulted from her labour, she can directly charge 'customers' a price for 'promotion services' on her page. But this *possibility* is aborted by the *fact* that *Facebook* owns the platform on which she has uploaded the product of her labour and for this "service", she has to pay a cut to the company from the revenues that she makes from selling 'promotion services' to her customers. It is crucial to remember that from the perspective of the Circuit of Capital model, this is *not capitalist* production. Rather, this traffic---and the promotion services that result from it---are the product of *independent* workers since the transaction *M-LP* did not take place, even though they engage in commodity production. The digital corporation only *facilitates* the sale of promotion services which resulted from traffic generated by the labour of the independent worker. For performing the role of the 'middle-man' in this arrangement, *Facebook* charges these individuals a fee. This fee is a *distribution* out of the revenues made by *independent labourers.* Thus, the profits of digital corporations such as *Facebook* and *Google* can be summarized by the following equation:

$$\pi = SVempl + SVdist$$

Where *SVempl* and *SVdist* refer to the amount of surplus-value extracted directly from the exploitation of their own employees engaged in the production of 'promotion services', while the latter refers to *distributions* received from independent labourers (working on a non-capitalist basis). It is important to note that these 'independent' labourers are not the 'users' or 'audience' of Fuchs (2014) and others. Unlike the 'users' who passively watch content that is uploaded online, these people perform *labour* and incur costs of production to produce their videos, songs etc.

As we can see, in either case, the firm's profits are the result of unpaid labour extractions from these people in addition to surplus-value appropriated directly from their own workers. To summarize: digital profits cannot be made without

the production of online promotion services---the commodity produced and sold by *Facebook* and *Google*. Promotion services, in turn, cannot be produced without the labour of individuals directly hired by these corporations as well as the labour of independent workers spread out all across the globe.

Conclusion

Existing political economy theories of digital production fail to provide a satisfactory explanation of the *source* of the monopoly profits of digital corporations. Three major kinds of theoretical formulations have been proposed in recent years. The first account that assesses the implications of digital work for Marxian value theory follows the tradition of Hardt and Negri (2004) and Negri (2009) in proclaiming that "immaterial labour" exerts such a profound transformative impact on the way we produce and work that Marx's theory of value fails to account for it completely. A second line of inquiry, seeking to salvage value theory from these sceptical critiques, responds in two main ways. In one line of defence, despite internal theoretical nuances, the idea of digital 'production' is avoided altogether by positing these firms as rent-seeking digital landlords performing 'unproductive' and/or 'advertising' labour to extract revenues from value-producing industrial capitalists. An alternative line of inquiry, which disagrees with the rent-based approaches on the very valid grounds that "rented assets are not *produced* on a continuous basis" (unlike *Facebook* and *Google),* invokes the seemingly bizarre hypothesis that *'audiences*' (the users of Facebook and Google) perform 'unpaid labour'. In each case, as I argued in this paper, these theories fixate on one or another superficial differences in form between traditional ('material') and digital ('immaterial') labor: either the concrete *form* of labour, the *physicality* of the commodity, or on the conundrum of how 'free' use of websites/applications is compatible with commodity production at all. Rent-based approaches fail to take account of the 'fact of production' itself. They avoid the problem of value by assuming production away from the analysis. In contrast, audience-labour approaches accept 'production' but invoke 'audience-labour' to account for digital labour, thus conflating 'consumers' with 'direct-producers'.

To present a clear and consistent theoretical account of capitalist production in digital corporations this paper offered a 'Circuits of Capital' model that is consistent with Marx's analysis of capitalism in *Capital.* As we saw, this allows us to first and foremost distinguish the 'commodity' that digital corporations like Facebook and Google produce: 'promotion services'. The 'free' searches that users are allowed to conduct on *Google* or the 'free' accounts of users on Facebook that baffle audience-labour and rent-theorists alike, are *not the commodity sold by these companies*. Rather, it is the sale of 'promotion services' *in that free network* that is being produced and sold on a commodity basis by these companies. Next, we saw that it is only *once* that the commodity (and hence

the customer) is clearly identified that we can even begin to talk about the 'direct-producers' who engage in the act of producing 'promotion services' on a capitalist basis. This we saw consisted of two main types of unpaid labour extractions: 1) those made from workers directly hired by these firms; direct surplus value appropriations; and 2) those made from *independent* labours uploading their content on the platforms provided by these corporations; from whom these corporations receive surplus value *distributions.*

Thus, digital production does not mark the end of Marxian theory of value as Hardt and Negri (2004) and others who follow them have incorrectly concluded. Rather, digital space represents a new site for the exploitation of labour by capital. The promises of the "Fourth Industrial Revolution", like its predecessor, will remain unfulfilled for the working class as long as capitalist relations of production----the buying and selling of labour-power and commodity production----remain the dominant form of organizing work in human societies.

References

Basu, Deepankar. "Marx-Biased Technical Change and The Neoclassical View Of Income Distribution." *Metroeconomica* 61.4 (2009): 593-620. Web.

Basu, Subhajit. "Direct Taxation and E-Commerce: Possibility and Desirability." *International Journal of Innovation in the Digital Economy (IJIDE)*. IGI Global, 01 Jan. 2010. Web. 04 June 2017.

Caraway, Brett. "Audience Labor in the New Media Environment: A Marxian Revisiting of the Audience Commodity." *Media, Culture & Society* 33.5 (2011): 693-708.

Chen, Yi-Fen, Chia-Wen Tsai, and Shih-Mei Hsu. "How Online Consumer Reviews Influence Purchase Intention in Virtual Communities?" *International Journal of Innovation in the Digital Economy* 5.3 (2014): 40-50. Web.

Fine, Ben, and Alfredo Saad-Filho. *Marx's Capital*. London: Pluto, 2016. Print.

Fisher, Eran. "Audience Labour on Social Media: Learning from Sponsored Stories." *Reconsidering Value and Labour in the Digital Age*. N.p.: Palgrave MacMillan, n.d. N. pag. Print.

Foley, Duncan "Marxian Transformation Problem." *The New Palgrave Dictionary of Economics* (n.d.): 405-12. Web.

Fraysse', Olivier. "Is the Concept of Rent Relevant to a Discussion of Surplus Value in the Digital World?" *Reconsidering Value and Labour in the Digital Age*. Houndmills, Basingstoke, Hampshire: Palgrave Macmillan, 2015. N. pag. Print.

Fuchs, Christian, and Vincent Mosco. *Marx in the Age of Digital Capitalism*. Leiden: Brill, 2016. Print.

Fuchs, Christian. "Dallas Smythe Today: The Audience Commodity, the Digital Labour Debate, Marxist Political Economy and Critical Theory. Prolegomena to a Digital Labour Theory of Value." *Marx and the Political Economy of the Media* (n.d.): 522-99. Web.

Gibson-Graham, J. K., Stephen A. Resnick, and Richard D. Wolff. *Re/presenting Class: Essays in Postmodern Marxism*. Durham: Duke U, 2001. Print.

Hardt, Michael, and Antonio Negri. *Multitude: War and Democracy in the Age of Empire*. London, NY: Penguin, 2004. Print.

Hardt, Michael. *Commonwealth*. N.p.: Gallimard, 2009. Print.

Harvey, David. *Seventeen Contradictions and the End of Capitalism: David Harvey*. Oxford: Oxford UP, 2015. Print.

Herscovici, Alain. "Economic Growth, Technical Progress and Labor Productivity." *Business Innovation, Development, and Advancement in the Digital Economy* (n.d.): 208-20. Web.

Marx, Karl, and Martin Nicolaus. *Grundrisse Foundations of the Critique of Political Economy* Print.

Marx, Karl. *Capital Volumes I and II*. New York: Dutton, 1973. Print.

Nixon, Brice. "The Exploitation of Audience Labour: A Missing Perspective on Communication and Capital in the Digital Era." *Reconsidering Value and Labour in the Digital Age*. N.p.: Palgrave MacMillan, 2014.

Pasquinnelli, M. "“Google Pagerank Algorithm: A Diagram of Cognitive Capitalism and the Rentier of the Common Intellect." *Society of the Query Conference* (2009):

Resnick, Stephen A., and Richard D. Wolff. *Knowledge and Class: A Marxian Critique of Political Economy*. Chicago: U of Chicago, 1989. Print.

Schwab, Klaus. *The Fourth Industrial Revolution*. New York: Crown Business, 2016. Print.

Shaikh, Anwar. *Capitalism: Competition, Conflict, Crises*. Oxford: Oxford UP, 2016. Print.

Smythe, Dallas W. *Communications: Blindspot of Western Marxism*.

Smythe, Dallas W. *Dependency Road: Communications, Capitalism, Consciousness, and Canada* 1981. Print.

Sweezy, Paul Marlor. *The Theory of Capitalist Development: Principles of Marxian Political Economy. Paul M. Sweezy, ..* London: D. Dobson, 1946.

Tombazos, Stavros. *Time in Marx: The Categories of Time in Marx's Capital*. Leiden: Brill, 2014.

Virno, Paolo. "Les Anges Et Le General Intellect." *Multitudes* 18.4 (2004): 33.

Yadav, Vanita. "Technology-Enabled Inclusive Innovation: Evidence from India" *International Journal of Innovation in the Digital Economy* 7.1 (2016): 1-11.