Down the Yellow Brick Road to Singularity…

How our misuse of technology is leading us to a gruesome fate

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ABSTRACT

Title: Down the Yellow Brick Road to Singularity: *How our misuse of technology is leading us to a gruesome fate.*

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The human being is increasingly undervalued *vis-à-vis* machines. They surround us and are praised as essential to our daily lives; slowly but surely, these products of our uttermost creativity and ingenuity are pushing us out of employment and leave us with a reduced sense of purpose. Since the turn of the 21st century, our race seems to have taken a wrong turn along the road to progress, and left us in an undesirable position in which we may be becoming slaves to technology. The issue is as economic as it is social. Loss of employment and economic welfare seems to go hand in hand with an overall loss of social well-being, and life satisfaction. In a world where our Facebook "News Feed" is often more important than the person siting across the table at a family dinner, one cannot deny that such a widespread introverted behavior contributes to the fall of healthy relationships and social love. Are these changes inevitable? Are they desirable? Allow this dissertation to present the fruits of revealing exploratory research about the topic. It combines the analysis of articles and books from some key authors with scientific research and on-field interviews with qualified candidates.

PREFACE

This dissertation was challenging to write. At times, I felt like I was swimming upstream; every scribble seemed to go against popular belief or common thought about the matter. In the end, I achieved my goal by delivering a coherent paper, which voices concerns that must be addressed in a near future. I must say, the support of friends and family along the way has been crucial. They helped me see the topic from various angles, and reach a much deeper understanding.

I would like to thank my colleagues and fellow students, who have become close friends over the course of the two-year program. They were there when I sought help, be it on an academic or personal level.

I also owe thanks to Alexandro, Danny and Étienne, who provided vital insights to my research.

Finally, my dissertation advisor, Dr. Guillermo Dueñas merits my deepest thanks. He put me on the path of this dissertation three years ago during a brief half-year exchange semester in Austria. Back then, I still was an undergraduate. His unique teaching methods and alternative study material, sparked my curiosity. I was fortunate enough to keep close contact with him all these years, and knew from the day I was admitted to UCP, that I wanted him to supervise my Master's dissertation.

Thank you Guillermo.

"It has become appallingly obvious that our technology has exceeded our humanity."

-   Albert Einstein

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1. Introduction

It has been said and heard countless times: "Thank God for the Internet!" Thank God for cellphones, Google Translate, microwave ovens, eBay, alarm clocks, vending machines…and the list goes on.

Society has progressed more over the past 100 years than it has cumulatively since the dawn of our existence. Most of this progress was a direct product of a very important Industrial Revolution. It set the stage for some of the greatest technological advancements that completely revolutionized the World; it witnessed breakthrough inventions such as that of the car, the plane, and the radio.

Society has forever hailed technology for it has mainly bettered people's lives and facilitated many tasks; making life easier & finding solutions to various problems, such as reducing the time spent washing one's clothes or finding the cure to tuberculosis.

Much of the immediate consequences of the adoptions of a given new technological innovations are fairly evident to the untrained eye: an increase in productivity, a more efficient distribution system or safer working grounds. However much of the more subtle, detrimental consequences of such an adoption often go under the radar and are wrongfully neglected. The following dissertation will take a deep look into the dark side of innovation, and explain why, if untamed, it may lead us to a gloomy tomorrow.

Popular culture has long been foretold humanity's end at the hand of the machine, by the means of clever sci-fi novels and movies. The question may seem far-fetched, but are we really approaching such a prophetic end? Are we becoming victims or even slaves to technologies created by our deepest desires and impeccable calculations? The apocalyptical "Machine-controlled World" showcased in modern movies and a classic sci-fi novel is becoming more realistic than ever. "Terminator" or "The Matrix", and other Hollywood-style scenarios serve to exhilarate our senses and fill our need for quality entertainment, but these products

of great imagination often overlook (purposely or not) the in-depth economic and social implications that such worlds would entail. Hollywood aside, the socio-economic implications of technology are becoming increasingly alarming, as a result of economic changes and social distortions.

The information and arguments provided in this dissertation will help shed some light on the often-disregarded negative effects. Ultimately taking a clear stance on the issue and making the claim that there is a serious gap in our assessment of the impacts of technology.

To clarify any doubt, when stating the term "technology", the dissertation will mainly be referring to Digital Technology or Digitalism. Thus, when the term is used, be conscious that it is in reference to the aforementioned kind of technology, unless specified otherwise.

To set the atmosphere of the paper, consider the following: What happens to cab drivers if cars become driverless? What happens to pilots if planes no longer require them? What happens to waiters, if we can order food at the bistro through a tablet or smartphone application? One might reply: "Well, we aren't there yet, I don't see cars driving themselves!"… As a matter of fact, this reality is closer than we think according to one of the latest reports on technology in The Economist (2014). Case in point, just 8 years ago, economists Frank Levy and Richard Murnane described driving a car on a busy street as such a complex task that it could not possibly be mastered by a computer; only to see Google unveiled a small fleet of driverless cars a few years later. Several big-name car manufactures are now developing autonomous or near-autonomous vehicles, set to hit the road as early as 2020 (O'Brien, 2014).

Nonetheless, kindly allow for another set of questions to be posed: what of career translators now that Google Translate and several other free open-source programs can do the job? What of professors and lecturers now that entire degrees

can be obtained through MOOCs[1] e-Learning? What of librarians if we no longer need to go to the library because ever single book can be found online or downloaded on a Kindle? This is no hypothetical situation; this is a reality that has already taken place, and feeling its aftermath is around the corner. These common folk jobs are facing serious threats.

For some time already, we have effectively been "losing" the middle class. This was becoming more and more apparent in recent years. It first started with the slow but steady outsourcing of manufacturing jobs to developing and less-developed countries around the turn of the century, and progressed with the loss of more jobs in other sectors. Although, this only affected a specific segment of the middle class, our progression into an increasingly digital age has displaced and sometimes wiped out jobs completely. Nowadays with the steady increase in automation in various industries and computerization of others, technological advancements are threatening the very utility of the human being. Technological Singularity[2] is at our doorstep.

Economic prosperity is not the only concern. In addition to a plausible financial downfall, the very nature our World is showing some worrisome signs on a social level. The masses are merging to few large social networks where their daily interactions and human contact are reduced to instant messaging from a Smartphone or clicking the "Like" button on Facebook. The incredible expansion of ICT (Information Communication Technology) has undoubtedly facilitated our ability to communicate with people from all over the World, but it's abuse has been blamed for many new found disorders, and an overall decrease in well-being amongst its users. Research has shown that many cognitive, social, and critical skills are more in more in danger of being affected by our consumption of technology. Concepts explained by authors and experiments carried by academics will support this claim later in the paper.

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[1] MOOCs is the common abbreviation for: Massive Online Open Courses. [http://www.moocs.com]

[2] Technological Singularity, as explained by computer scientist and author Jaron Lanier (2010), is the ides that one day the human being be rendered obsolete through the increase and continuous improvement of robots and computers. He draws example off the theological "Rapture" in the Bible.

As a whole, the aim of this dissertation will be to look into our dependence on technology and the impacts it creates on society. To do so, it will review many articles about the topic and interview some key people to get a critical and founded take on the issue. Backed with the data collected from research and the analysis of the readings, this dissertation intends on showing that we are in fact heading towards a period of distress, in which a majority of the population will suffer both economically and socially. Something must be done in order for the human race to avoid the meeting the troublesome fate that lies ahead.

2. Literature Review

It is deep-seated in the human brain to always strive and outdo ourselves to reach new heights. Wave after wave of technological advancements have come crashing on us, and until now we have welcomed most of them with open arms. The human being has been able to adapt himself to these new technologies and used them to his advantage; either to alleviate daily tasks or create possibilities for new ones. From the invention of the wheel, to the microchip and all in between, humanity has, more often than not, embraced new scientific know-how.

However, we generally tend to forget that technology is in fact a double-edged sword. Acclaimed scientist, Isaac Newton famously stated: For every action there is an equal and opposite reaction. At the time, his statement regarded physics; yet, we have learned that his claim applies as a general rule to countless other matters in our world, and technology is no exception to that rule. The problem is, we often forget about the "reaction" *per se* create by these advancements.

In recent history we have witnesses very important leapfrog years: the Industrial Revolution, which took place between 1760-1850 (Montagna, 2014), and eventually stumbled into the 20th century (Second Industrial Revolution). Much debate exists on the specific dates of these events, or the speed at which socioeconomic change took place, but these Revolutions completely remodeled the way people lived. Many of technologies created back then are still use today, under different forms, such as the telephone or the sewing machine.

Specific details of this era are beyond the scope of this dissertation, but a brief discussion about the magnitude of the changes brought forth by the revolution are relevant as they demonstrate a very similar pattern to the Technological Revolutions we currently face.

Many of the inventions brought forth during that time were utterly disruptive, and soon enough, society was changing at a very rapid pace. Professions were wiped out, as new efficient machinery paved the way for new sources of employment. The Horse-Drawn carriage, for example, was no longer needed once

the automobile was invented. In addition to the carriage becoming of little use, the drivers, and carriage builder now found themselves out of jobs. This was the case for several laborers once their respective fields became irrelevant. Over time, several riots exploded, demonstrating the anger of the newly unemployed. And then something happened which can be observed time and time again, since disruptive inventions have come in and out into our world: the human-being adapted. He took up new jobs created by the new technology. Jobs that were no longer pertinent were quickly replaced with jobs new industries. Workers left jobless from the recent downfall of their industry, were quickly placed in newborn industries (Lanier, 2013). Fundamentally, there was a redistribution of labor. In our example, carriage drivers became automobile drivers and carriage builders became car builders.

One would assume the same thing would happen today, as it has notably happened in the past. But the circumstances are different now, the sectors being targeted are no longer only the physical-intensive, mindless manufacturing jobs; the knowledge-intensive jobs are also at risk. The following sections of this dissertation will take a closer look into the specific reasons why it is misguided to assume that, once more, the human being will simply adapt to his new environment. Assuming, of course, that we continue using technology at the same rate and for the same purpose seen in the last 20 years. We are not using technology responsibly, and it may lead to a significant downfall in the upcoming decades. As stated earlier in an earlier section, there is a significant gap in our assessment of the impacts of technology.

This quote by author Sarah Davis best epitomizes the theme of this dissertation:

> *"Our world is changing and growing more connected because of our rapidly expanding technology. For the most part these advances are beneficial to the individual and community. Yet it is a slippery slope from responsible technological use to allowing these advances to corrupt our relationships and involvement in the world." (Davis, 2014)*

In-depth analysis of articles and books written by some prominent authors will help provide a better understanding of this point of view.

2.1 Economic Consequences

There exists many different ways to interpret and measure economic consequences, but the focus of this dissertation will be specifically centered on consequences in the form of loss of employment and job opportunity, and concentration of wealth. Change is actively being witnessed in the middle working class;, and research is revealing some alarming signs. Jobs at risk of being replaced by computers in the next 2-3 decades according to an article relating to recent Oxford University study:

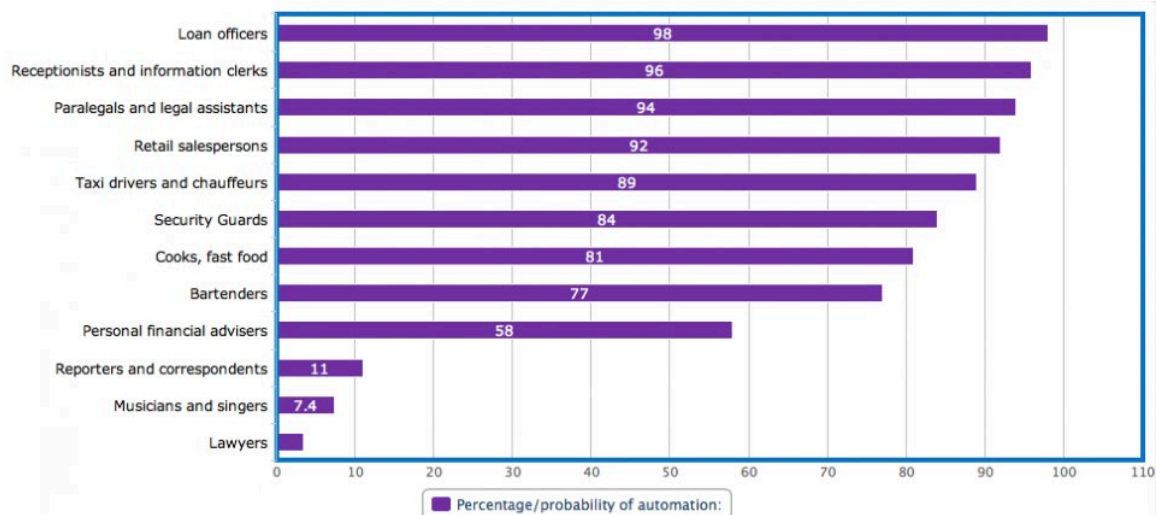

Figure 1. "The 12 Jobs Most At Risk of Being Replaced By Robots." (Peterson, 2014)

In regards to wealth concentration, recent figures have raised some red flags. A recent report in The Economist (2014) conveys the current situation very well:

Figure 2. "Income share of top 10% of earners, %." (The Economist, 2014, p.3)

Coming from a very reliable source, the risk of automation of a large chunk of middle class sectors is simply astonishing. Paired with an increasing concentration of wealth, these circumstances could spell out a dramatic hike in unemployment and potentially poverty.

2.1.1 Taxi! Taxi!

Considering the employment situation stated above, what exactly are the implications of automation? Let us take the Taxi drivers and Chauffeurs segment (89% chance of automation) and demonstrate what the real life repercussions may look like.

Drivers are an important part of the American labor force. According to the United States Department of Labor, just under a quarter of a million people worked in this industry in 2012 with a median annual wage of US$ 22,820 (Bureau of Labor Statistics, 2014a). Today, their main threat is driverless technology. As we know, prototypes have been tested successfully, and it only seems like a matter of time before driverless vehicles will be cruising through our cities and highways. Since it's a developing technology, debates amongst developers about its true costs are being held. A very conservative estimate, labeled a driverless add-on at US$ 10,000

(O'Brien, 2014). One could deduct, that for half the cost of the annual salary of a driver, a given business owner can have his truck transporting shipments practically 24/7. Factor in the extrinsic costs of a driver, such as his benefits, liabilities, etc. and it becomes obvious the business owner would dramatically increase his profitability by opting for the driverless add-on. Ultimately, according to the abovementioned study, there is 89% chance that 233,000 people lose their jobs. This sums up to 2.43% increase in American unemployment, the elimination of a middle class profession, and increase in the distribution of wealth (Bureau of Labor Statistics, 2014b) Keep in mind, this is only for one industry, in a single country; the global implications would be much more severe.

2.1.2 The milk's gone bad!

Of course one could argue that recent changes in technology have also created great opportunities for people to turn form rags to riches, but these rare exceptions are fare and wide apart on a global span. In reality, it can only serve as delusionary paths for others to follow in awe.

Many authors to be discussed have shown that our increased use and abuse of the Internet and technology has also led to a displacement of our jobs. Whether it be, by the means of our reliance on robots and machines in manufacturing, or even our obsession with social networks and open-source internet services, slowly but surely, the human being is being undervalued vis-à-vis the "machine".

One thing must be clear before further arguments and issues are presented and explained: This is NOT an anti-technology cry. Far from it. Advancements in science, medicine, communications and several other fields have made it possible today to explore the galaxy, save lives and to connect people in the most remote locations. It has revolutionized the ways we do business and created new ways of conducting it. But the perversion of these new means is being ignored and has been causing more damage to us than the average person can imagine.

As previously stated, many authors have tackled the issue of consequences of the increased use and dependence on technology, but one of the most significant and radical ideologists is renowned computer scientist Jaron Lanier. Lanier has been labeled as one of the founding fathers of virtual reality and one of the most influential individuals in the creation and emergence of Silicon Valley. As a matter of fact he has often been credited with coining the term "Virtual Reality" (Rosenbaum, 2013). Amongst the points Lanier discusses, his strongest argument comes from the fact that the Web 2.0, or "open source" World-Wide-Web has turned sour. The "freeness" it portrays, is a big fat lie. To borrow a pop culture saying: 'If you're not paying for it; you are the product" (Goodson, 2012). Meaning that through our use and abuse of open-source programs or free online services, we are unconsciously paying with unique interactions with the software or service. More on this later. Lanier also pursues to argue that crumbling down from that are many more consequences on the macro levels such as loss of employment and reduced of total jobs or professions in the market.

Lanier has written two very successful manifestos about his view respectively in 2010 and 2013, but he first created an echo amongst library circles with his 2006 essay "Digital Maoism: The Hazards of the New Online Collectivism," a cautionary tale about the problems inherent in the much-lauded wisdom of crowds' concept (West, 2010). The aforementioned concept combined with the Web 2.0 is the base for much of Lanier argumentation.

What makes Lanier such a credible individual is that he actually was part of many of the teams that are at the very foundation of Silicon Valley. Given his background, he is not afraid of criticizing what he helped build. Unlike others, he realizes and acknowledges that something went wrong along the way. At some point, technology went down the wrong path, and created the gloomy situation we are faced with today. As he mentions, he sold various companies to Google and Oracle. He states in a famous Stanford University seminar:

"I've been quite involved in technologies that can throw masses of people out of work. I think what struck me one day is I was at one meeting in Silicon Valley where we were talking

about how we can use the Internet technologies and mobile technologies to train people in under developed parts of the world so they can have jobs. And the kinds of jobs we were going to train them in were service, manufacture, some agriculture some things like this.

But in that same day I went to another meeting where we were creating robots to do all that same stuff. And if we chart the course, the expected course of the improvement of those robots it's really pretty clear that any solution we could come up with for using our network technologies to train people would be very temporary because we probably have a decade at most, probably a lot less before we made our training obsolete. So any solution would have to have a very different form." (Lanier, 2013a)

2.1.3 It's all free! Or is it really?

It is crucial to understand the following: our voices and opinions are being used as "free-data" for huge computers to process and store. The more time spent on any network linked to the web, is time spent giving away our precious personal details and thoughts to mainframe computers. When one does a web-search or clicks on a given hyperlink, he is not only accessing information, but also divulging his own information while doing so. All this information that we provide at no expense is stored in giant computers, run through clever algorithms for countless purposes. In addition to that, all services we use such as free email, cloud storage, photo editing and social network accounts also filter all the information we give them.

Through the collection, filtering and analysis of our data, they can then offer us and sell us goods, effectively owning a piece of our mind. They can propose services tailored to our needs (which were defined by our data). Pop-ups become increasingly accurate, to the point where it appears that the computer knows more about us than our own mother.

The "Freedom" brought forth by the web 2.0 is a lie. We are actually giving up valuable information when using any open source or free service. Let us take the all-

mighty Google to draw a quick example. We are gladly its "free" services to the expense of our persona. Although monetarily, we are not paying in any known currency, we are paying with our voice and actions on the web and social medias. One's elementary daily input and participation on Google's cloud servers or mega computer is beyond imagination. Google has quite cleverly made this easy. Think about it: Google Search, Google News, Google Wallet, Google Drive, Google Mail, Google Books, Google +, Google Calendar, Picasa, and the list goes on … With this incredible array of products, which we all happily adhere to since we see the extrinsic benefits as highly attractive, one firm can productively extract spending habits, social interest, information about our work, our pictures, our interests, who we speak to daily, where we were, where we are and where we will be or want be. This is just scratching the surface, because this data can be analyzed and broken-down to the finest degrees, revealing our utter-most peculiar piece of information. Consider this: Fair Isaac Corp or FICO, has actively been using social media information, whether it be Tweets or the job listed on one's LinkedIn profile, to establish one's credit scores (Macri, 2014). The complex and vast logarithms behind these huge computers can read us like a book, and that's because, unconsciously, we allow them to. Too few know of the real consequences. How many people would actively maintain their Facebook accounts and login daily, if they knew that, basically, all their personal information and actions were monitored and stored in vast databases? Surely not 1.3 billion (Statistic Brain, 2014).

2.1.4 Employment

A cyclical phenomena has occurred many times over the course of our history: jobs and trades eliminated through innovative technology, left people from extinct industries unemployed, but eventually reintegrated into the market as new jobs trickled down from newborn industries. Noticeably, the majority of the people involved in the cycle were blue-collar-type workers. A recent research run by Carl Benedikt Frey and Michael Osborne, of Oxford University, analyzed the

computerization potential of over 700 different occupations; it concluded "47% of professions in America risk being automated away over the 20 years." (Frey & Osborne, 2014) The difference between now and past innovative revolutions, is that the nature of the job targeted for automation is much broader, and includes intellectual-skill-driven professions.

If it were only manufacturing jobs and such in peril, it would not be that much of a big deal. Whoever lost their job because of a new automatized task or by new technology, would ultimately be placed somehow since the percentage of these people in the middle class workforce is somewhat negligible. The problem, as mentioned above, is the following: people with strong analytical or even great soft skills are also targeted by automation. To name a few: insurance brokers, translators, paralegals, even teacher, all these occupations are being rendered obsolete because we have been crammed detailed information about every single corner of these professions online. We tend to forget that these types of jobs also make-up the mid to upper middle class, yet never really faced a significant threat until now.

Coming back to Lanier (2010), he conceptualizes how this is happening, by the means of something called " The NOOSPHERE: a global brain formed by the sum of all human brains connected through the Internet". The concept was first discussed in his first book, "You are not a gadget: a manifesto". He argues that the more, we keep feeding this NOOSPHERE by the means of our online input, the more its power grows and overtakes us. Fantastic resources may be created as a result of this. Picture if all book were digitalized and fused into a single book available online. The common thought would characterize such an occurrence as brilliant; an unquestionable resource would be created. All written knowledge could now be harvested by whoever desires, and we would potentially witness a worldwide increase in education. But people fail to see the economic consequences of such an event. Librarians, authors, editors, and many more all would be rendered obsolete.

In fact, such an affair has been seen with the advent of music available online since the turn of the 21ˢᵗ century. In a personal inquiry of his, Lanier explains what

has happened in the music industry since the advent of the Internet. He swears to have anticipated a platform by which musicians could share and sell their unique music to a broader consumer. What happened was quite the contrary. For a select few, the Internet saw them become over night superstars. But most musicians had to put an end to their once decent carrier because they simply could no longer make ends meet. The outcome of Lanier's America-wide research revealed that in the year 2000, through copyrights to their music, approximately 300'000 musicians made over $100'000/year. This is considered a very respectable salary living in America. Since the onset of file sharing, the number of artists in the segment has dropped by 66%; the remaining 33% rely more on memorabilia or live appearances, than their music to get by (Lanier, 2013b) The explanation is simple: music is freely available online and takes seconds to download. So why bother going to the store and buy a CD if you might feel blasé of the music after a while anyway?

2.1.5 Siren Servers

This global brain or NOOSPHERE grows through the means of yet another concept established by Lanier, called "Siren Server". He goes into much more detail about these in his second book, "Who's Owns the Future?" He explains that his Siren Servers are much like the Sirens Ulysses faced as told in Greek mythology (Lanier, 2013c). The Sirens basically lured any sailor and boat to cross their path with sensual chants. Upon which, they sailor would sail to their doom. An occurrence, charmingly explained in a classic Samuel Daniel (1605) poem. Drawing from this mythical example, Siren Servers allure all Internet users that cross their path and collect and store all data about them in massive mainframe computer. Few resist their power. In the end, the users surrender themselves to the Siren Server, and divulge precious knowledge to them. Who are the Siren Servers? Google, Facebook, Amazon, and the likes...

Who is to blame? We are, of course. Unknowingly we contribute to the destruction of professions, and empowerment of the NOOSPHERE daily. By

searching and validating translations on Google Translate, by storing consulting projects on Firm Valuation on Dropbox, by sharing legal advice by email, we build a giant brain made up of the knowledge of all connected humans. Perhaps it is not done intentionally or consciously, but we are feeding these mega computers so much valuable information. The mega computer processes it, and stores it. Similar to the process of learning, is it not?

2.1.6 Utilizing "Social Data"

Eli Pariser wrote a popular book called "The Filter Bubble" a few years ago, in which he claims that big companies are syphoning our date and using it against us. We have known this for years with the tailoring of Google ads and such prompting programs. But as Pariser points out in a recent TED Talk (2011), "if this were only a advertisement issue it is not such a big deal, but it becomes a whole different ballgame if you take that same data is also used to asses the insurability or solvency of a person." Banks and insurance companies are effectively monitoring our Facebook friends, our Tweets, our interests and even our preferred activities to help decide whether or not we are eligible for a loan or home insurance.

Why would such data matter to banks or insurance firms? It is quite simple. In the case of a bank, both statistical data and soft data are taken into consideration before granting a mortgage to a given person. Traditionally, a borrower would present some financial documents regarding his income, net worth and such, to his banker and proceed to discuss the mortgage with him in an office setting. The banker (or lender) would do a exhaustive analysis of the financial documents and reflect on the meeting he had with the borrower. A decision would be taken form there. Nowadays, a typical borrower may have several social media profiles, which makes him as open as a book. Our banker can easily gain access to this data, compare it to other borrowers and hypothesize about the solvency of our borrower. Patterns may be established and help the lender in making a decision to lend or not. "Professional contacts on LinkedIn are especially revealing of an applicant's "character and capacity" to repay, says Navin Bathija, the founder of Neo, a start-up

that assesses the creditworthiness of car-loan applicants. As statistics accumulate, algorithms get better at spotting correlations in the data"(Johnson, 2013). It could be argued that what lenders are doing, by the means of statistical tools, are turning the soft data we give away about ourselves on social medias, correlate it and use it to asses our mortgage or loan applications. The Economist (2013) reveals that some firms have been very open about it and require the borrower to grant his social network information when applying for a loan. Kreditech, a online German lender, for one, relies heavily on this kind of "social data" when granting loans: "An applicant whose friends appear to have well-paid jobs and live in nice neighborhoods is more likely to secure a loan. An applicant with a friend who has defaulted on a Kreditech loan is more likely to be rejected says Alexander Graubner-Müller, one of the firm's founders, who believes much is revealed by our online friends "(The Economist, 2013)

It is too early to say if this may or may not have a negative impact on society. But, on the surface, two things can be learned from it. Firstly, the loan officer is practically rendered useless, since a computer relates and computes all necessary data in order to decide to grant the loan or not. Secondly, we are increasingly being treated like numbers and statistics. This dehumanization could prove to be costly to society.

2.1.7 Kaparov vs. Deep Blue

One of the landmark Artificial Intelligence tests, which propelled the theory that robots may outsmart humans, came in the form of a famous 1997 match chess match between Garry Kasparov and Deep Blue, a chess-playing computer (IBM, 2014). Long has chess been regarded as a mind-challenging sport. Strategy, logic and reflection are required. Deep thinking is also essential, before making a move move to triumph over the opponent. In 1997, Kasparov was World Champion of chess, and presumably the best chess player in the world. Deep Blue was developed in the laboratories of IBM in America by a team of graduate students and computer

scientist (IBM, 2014). The stage was set for the challenge. Would the machine win? Of course, Kasparov did not participate in the building of Deep Blue. Throughout the 6-game match, Kasparov became viciously angry and convinced that a human was controlling Deep Blue's moves because regardless of the fact that Kasparov was making logical moves or not, the machine always seemed to anticipate and counter him. In the end, the victory of Deep Blue marked an important page in history (Lanier, 2010). The collective intelligence crafted by data input (data harvested through the collective knowledge of chess) was effectively put into the artificial mind of a machine and proved to be cleverer than a human. The day marked an important turn point.

As Lanier puts it, Kasparov lost because he was faced with a stone-face opponent that simply did not concede an inch. It simply knew how to best counter each move, and play the next. Kasparov's emotions and human error eventually led to his downfall. It goes beyond a simple game of chess held in 1997 when computers were far less developed than they are today. In a recent article about acclaimed billionaire and entrepreneur Elon Musk's fear of the onset of killer robots (Yes, killer robots) Louis Del Monte, Artificial Intelligence expert, author and former employee of IBM and Honeywell's microelectronics units, makes the following claim:

> *"The power of computers doubles about every 18 months. If you use today as a starting point, we will have computers equivalent to human brains by approximately 2025. In addition, computers in 2025 will have the ability to learn from experience and improve their performance, similar to how humans learn from experience and improve their performance. The difference is that computers in 2025 will have most relevant facts in their memory banks."* (Cook, 2014)

As he develops his arguments, Del Monte pursues to claim that eventually, a robot's database will be as vast Wikipedia and robots will also be able learn everything and anything from one another within microseconds.

By the way, have you met Baxter?
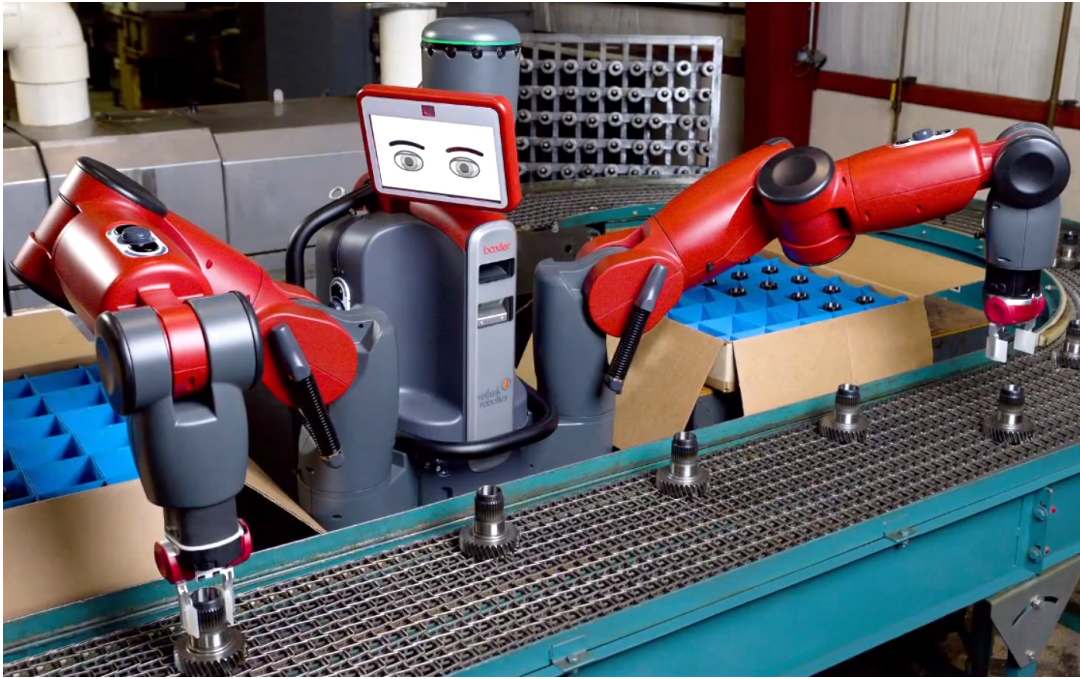
Picture 1. Baxter Robot. (Bélanger-Barette, 2014)

This is no ordinary robot. He was developed in the laboratories of Rethink Robotics and introduced in 2012 as the robot that will replace humans in many jobs. He is not the type of robot that can perform a specific task with extreme rapidity and precision like most of his predecessors. In fact his speed and accuracy are nothing to brag about, however he has the ability to learn various task easily. What makes him such an incredible machine is that he overcomes, what Rethink Robotics consider "the two largest barriers to the adoption of industrial robots: ease of use and cost" (Ackerman & Guizzo, 2012). Someone with absolutely no computer science or programing background can simply teach Baxter what to do simply by showing him and pressing a few buttons prompted on the monitor. "Furthermore the cost of this wonderful robot is only US$ 22,000 while a traditional two-armed robot, including sensors and programming, will typically set you back hundreds of thousands of dollars"(Ackerman & Guizzo, 2012).   In consideration of the abovementioned arguments, the widespread use of Baxters in factories and manufactures around the world may mean numerous people out of jobs. The visionary behind the creating of

Baxter and CTO of Rethink Robot, Rodney Brooks said his inventions features make Baxter a potential disruptive for in several industries, especially since it target small and medium size business which as we know represent the greatest chunk of the economy (Ackerman & Guizzo, 2012).

Technological Singularity is inevitable in many industries. "Some suggest that to counter this fate, future curriculums should reinforce the importance of critical thinking rather than rote learning. Jobs in more emotive fields requiring more cognitive dexterity, such as counseling and other human services, may expand as well."(Nazarian, 2014)

2.1.8 Moore's Law

Since most of the arguments of this dissertation are largely based on conceptual and exploratory research, it is essential to bring forth some proven theoretical concepts to justify the validity of its claims. According to Lanier (2013c), Moore's Law is a concept that Silicon Valley swears by. It goes as follows:

"The number of transistors incorporated in a chip, will approximately double every 24 months." (Intel, 2014)

Gordon Moore, co-founder of Intel, established this law almost 50 years ago, and it has held very accurately for the most part of its existence. As the size of the transistors decrease, more can be fit into a given computer thus giving it more speed and power. The problem is that like any exponential type of function, it one day reaches a plateau. Fear of the end of Moore's Law has been looming in the air for since quite sometime. Essentially, once the transistors become so small, that they approach the atomic levels it will be impossible to shrink them further (McMillan, 2014). What exactly are the economic implications for such and event? As Lanier puts it: "Moore's Law means that more and more things can be done practically for free, if only it weren't for those people who want to be paid" (Lanier, 2013c). Meaning that eventually, price for the most expensive and sophisticated computers,

which run on the most expensive and sophisticated microchips, will significantly drop, since their processing speeds will be mainstream and standard. To draw a parallel to economics, such a drop in the value of computers would be due to economies of scale and the effect of specialization. Some sort of collapse of the estimated $3.8 trillion industry (Atwal et al., 2014), would be fatal. In order to better conceptualize the economic loss such an occurrence would entail, allow for the following historical example:

Cray 2 at top; iPad 2 smaller than the blue notebook held by the Cray worker
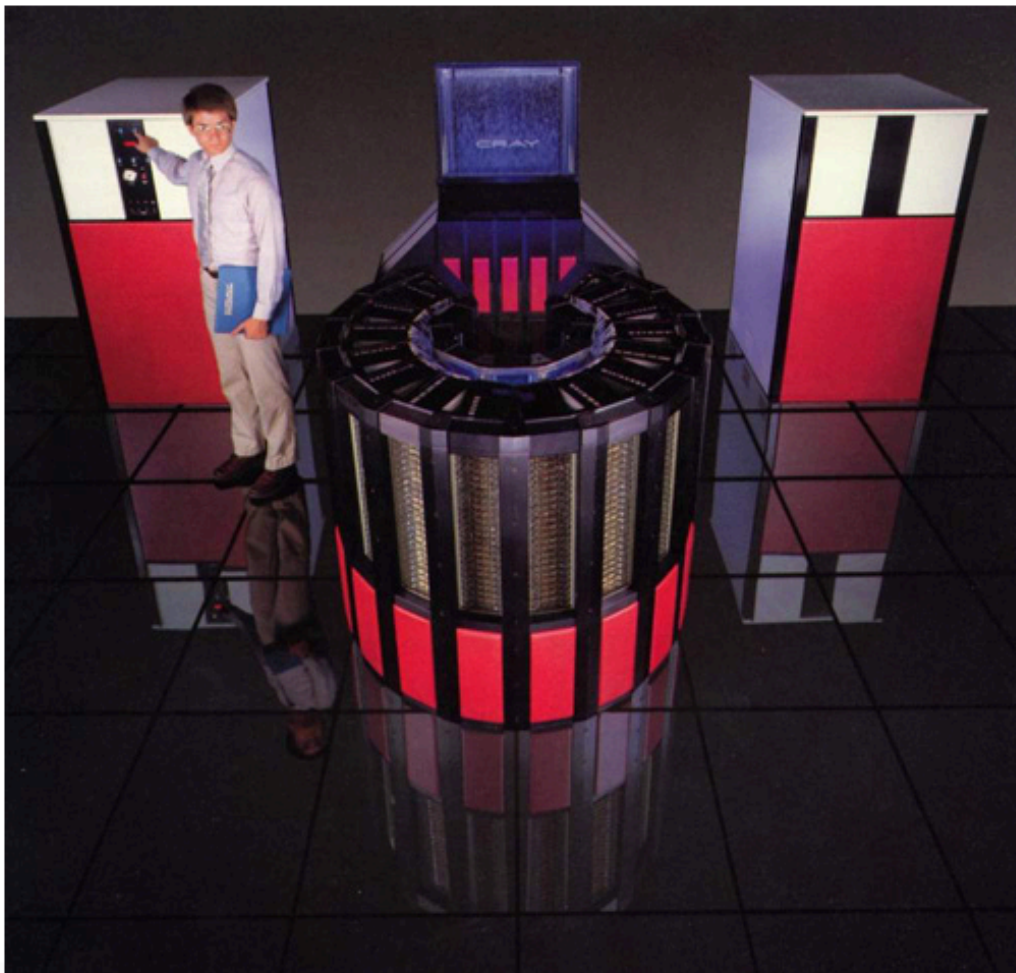
Picture 2. "iPad 2 as fast as Cray 2 supercomputer, fraction of the size." (Electronista, 2011)

In the photo above, one can see the comparison between the 1985 Cray-2 supercomputer and iPad 2. Although they were introduction is roughly 25 years

apart, they share one similar trait: the have the same processing speed, thus are equally powerful. In the computer world, these two products would be considered equals (Electronista, 2011). Here is the catch The Cray-2 cost about $17 million and was as big as a washing machine, whereas the iPad2 was selling at retail for $ 699, and is the size and weight of a notebook (Adams, 2007). The power and cost of computers are inversely correlated, and the industry is growing exponentially.

In short, the above sections concerning the economic part of the dissertation has conveyed some thought-provoking facts. The implications of our abusive and perverse use of technology raise some serious questions about our future economic welfare. Whether it involve potential threats to current employment, future opportunity or the overall health of the economy, much needs to be altered in order to avoid a deplorable fate. Let us now explore a different, but equally important, dimension in the following section.

2.2 Social Consequences

Up until now, measurable and tangible consequences have been brought forth in the dissertation. Albeit, they provide solid support, by showing important potential impacts that technology has and will have on the economy, it seems imperative to present its social impacts as well. The following readings and articles discussed will mostly centers around the impacts on our social behaviors and various effects on the brain cause by our dependence and abuse of technology. Several studies have been done and theories are beginning to be conceived about the issue, ultimately coming to the conclusion that our society is beginning to see some seeing serious sequels directly due to our abuse/misuse of technology.

2.2.1 Social Integrity

Well-being is at the core of what the human race strives for. Whenever something or someone hinders one's actions to reach a higher state of well-being, this hindrance is sought out and potentially removed from one's path. Sadly, as you will see below, we seem to willingly hinder our well-being by the use of certain means that often damage our social integrity.

Undeniably, the greatest advancement in ICT (Information Communication Technology) in our lifetime has been the Internet. It connects an estimated 2.8 billions users, roughly 39% of the population of planet Earth (Internet World Stats, 2014). It ha indisputably, become an integral part of our everyday lives. Albeit, it has improved our lives dramatically, it has faced us with some serious drawbacks that might put its utility in question.

Amongst the vast array of material available on the topic, this dissertation will present two very interesting scientific research papers from highly reliable sources, that have looked into the matter of Internet vis-à-vis one's well being, and have come to some shocking results.

The first paper is the product of the research of Eric B. Weiser, Ph.D. (2001) and takes an in-depth look at the social and psychological consequences of different functions and uses of the Internet. Through a series of different experiments and a self-designed framework, he attempts to discover significant correlations and causation between Internet use and its psychosocial repercussions. It is a two-part experiment. In the first part, Weiser (2001) establishes whether the members of the sample use the Internet for "Goods-and-Information Acquisition (GIA) or for Socio-Affective Regulation (SAR)". The part is arguably trivial to us, but nonetheless essential to the subsequent part of the research. In the second part of the experiment, he attempts to establish correlation between GIA and SAR and three known psychological well-being factors: loneliness, depression and life-satisfaction. The hypothesis tested was that the use of the Internet for SAR purposes would lead

to a decrease in well-being. More specifically, "the model hypothesizes that (a) the number of hours of professional and personal Internet use predict the extent to which the primary function of one's Internet use is either for SAR or GIA, (b) the functions of Internet use predict level of Social Integration, and (c) Social Integration predicts level of Psychological Well-Being" (Weiser, 2001). He used the means of a survey to collect his data, posing both qualitative and quantitative questions. (Appendix A.1) The hypothesis was confirmed, mainly showing that an increase use of Internet use for SAR was directly linked to negative psychological consequences. However, it is imperative to note that a when used for GIA, the Internet has proved to increase social integrity. The problem lies within the social misuse of the sophisticated ICT mean.

What is particularly interesting the results of Weiser's work is that it was conducted in the year 2000, before the advent of Facebook and the likes. Back then, it affected fewer people, and the social means of the Internet were a fairly new affair. Fourteen years later, the population of Internet users has increased 673.3% (Internet World Stats, 2014). One would assume that with the rise of social networks and colossal hike in online traffic, these worrisome effects would be seen in compelling amounts of people.

The second paper was published in 2013, therefore much more recent, and dealt directly with Facebook use vis-à-vis well-being (Kross et al., 2013). Curiously enough, it presents very similar results to the first paper analyzed, although the definition of well-being slightly differs in both studies; the later measured on how people feel moment-to-moment, and how satisfied they are with their lives. The methodological approach was also somewhat different. A sample of young adults was asked to assess their well being at different interval during the day. They received a text message with a link to a survey. This survey asked various questions about daily Facebook use and was accompanied by questions that tried to assess the participants' well being. The following was concluded: "the more the participants used Facebook, the worse they subsequently felt; the more the participants used

Facebook, the more their life-satisfaction levels declined" (Kross et al., 2013). See Appendix B for a detailed view of the theoretical model establishes by Kross et al.

As in first paper presented, the hypothesis was validated once again, with substantial correlation. In fact, since Facebook is a SAR-use network, one could merge both papers and reinforce the validity of the overall beliefs that misuse of the Internet may lead to serious social sequels in the long term, such as a comprehensive decrease in well-being. In the Methodology & Data Collection section of this dissertation, the themes of the two papers above will be revisited and discussed as interviews were conducted with two sociologists and an entrepreneur.

2.2.2 Grey Matter

Nicholas Carr is a prominent writer on the topic at hand. His book entitled "The Shallows: What the Internet is doing to our Brains" was a finalist for the Pulitzer Prize in 2011 (The Pulitzer Prizes, 2011). He presents several arguments about how our dependence on gadgets and more specifically the evolution of ICT, is changing the structure of our brain. Carr decided to look closely into the issue when he himself realized that he was getting some uncontrollable urges to check his emails or browse the net, while working. He was having extreme difficulty to focus on a single task without jumping to another in the midst of things.

Like many of the other authors presented in this dissertation, Carr looks to changes our civilizations have seen in history. "The invention of the map reduced the importance of our perceptual skills; the arrival of the clock, chopped up our days into hours and minutes, and so went our need for a sharp sense of time" (Carr, 2010a). Technology has always influenced the way we think, and our brains have seen cognitive and intellectual consequences to use of it. Carr (2010a) argues that many of the advents of the creation of the Web, are working against our brain and our mind, effectively "reducing tis potential for critical, conceptual, and creative thinking, which are all products of deep thought". So why are we loosing the potential to engage in this quintessential deep thought process? Carr (2010a) says it

has to do with the fact that we now live in World where we are constantly bombarded with interruptions and distractions. Often referred to as the "Stream of Information" (Danah, 2009): a continuous flow of notifications and information, popping up on our monitors, smartphones, tablets, and any other communication media. Any webpage has several hyperlinks in the margins, or ads popping up at any given moment. These distraction and interruptions confuse our senses and are affecting us much more than we think. As a professional writer, Carr (2010b) speaks of worrisome changes witnessed in the way we read since the advent of the Internet. Consider the findings of a 2005 scientific study about the change in the way read conducted by Ziming Liu (2005), library scientist from the San Jose State University in the USA:

> *"The screen-based reading behavior is characterized by more time spent on browsing and scanning, keyword spotting, one-time reading, non-linear reading, and reading more selectively, while less time is spent on in-depth reading, and concentrated reading. Decreasing sustained attention is also noted." (Liu, 2005)*

Carr fears that we are spiraling into a world where we might no longer be able to generate in-depth reading and reflection, which in turn generates deep and rich thinking. "All of culture is the product of critical, conceptual and deep thinking, not the artificial skimming we seem to be engaging in today" (Carr, 2010a). If one would compare advancements in ICT from the past with the one's we have today, one would notice that never before have such advancements encouraged us to be distracted, if anything they rendered it easier for us to concentrate on something (ex.: the book) Unfortunately, the Internet encourages distraction, laziness and shallowness. Carr (2010b) himself claims that as he began to write The Shallows, he struggled in vain to keep his mind fixed on his task.

The social and psychological changes presented as a result of thorough research and accurate articles. In the following section, interviewees will revisit these changes, two of which are from the social science field.

3. Methodology

In order to provide the posed hypothesis with some empirical evidence, the following sections will present the chosen methodology and elaborate on the conclusions that were made from the collected information.

Considering the dissertation deals with a topic, which is still somewhat conceptual and exploratory research is being conducted and the insight given by contributors is key to support and assess the veracity of the claims made in this paper. Three key on-field interviews have been conducted over the past months, with three very different individuals. In order to assess the possible economic consequences of technological advancements, a subject from the world of commerce was interviewed. For the social consequence part of the dissertation, two experienced sociologists were interviewed. Albeit all three were also asked some questions pertaining to both social and economical sides of the issue.

3.1 Danny Matteo

The first subject interviewed was Danny Matteo. He is the owner of MultiPlusDM, a food product distributer in the provinces of Quebec and Ontario, Canada. Basically, the company operates as an intermediary, supplying basic necessities for restaurants, hotels and firms in the food sector. A 70-minute Skype interview was carried out on November 22, 2014. Matteo is a successful self-made entrepreneur. MutliplusDM was started in 1987 with only 3 people and has now grown to multi-million dollar business, which employs over 70 people. He was selected as an ideal candidate for an interview, because he saw his firm progress from a strictly brick-and-mortar style operation, to one that is tech-dependent. This transition took place as we eased into the 21st century. The detailed interview is presented in Appendix C.

The dialog was very enriching. Matteo's knowledge of the business world drawn from experience is uncanny. Many topics were discussed and elaborated, and the key findings will be presented here. Most of the questions were structured in a way that Matteo would have to answer by explaining whether or not technology had made some of his workers idle or even counterproductive. Furthermore, some questions were aimed at assessing if the economic prosperity of the firm is highly owing to technological advancements. Much has changed since 1987, he says, and of course, technology (especially ICT), has greatly facilitated they way MultiPlusDM does business. It allowed the firm to grow beyond any imaginable expectations, but Matteo's take on employment and the consequences our age has had on employees deferred from expected. In his words, "in the industry there is a rule of thumb, so many people for so many millions, and we haven't been respecting that rule for at least 8-10 years now". He continued by claiming that he rarely found himself downsizing in a given department because the work could be done by less people or by a computer program. His underlying logic was that he did not see it fit to make an extra dollar, by depriving another human being of a salary. His words were:

> "Personally, as long as we are making money, I think there is no reason to try to make more and more, by striping another human being of a salary and the means to put food on the table for his family. I think as we see more and more advancements in technology, and our jobs are alleviated we might edge more towards a socialist-type environment with a flatter type of distribution amongst people."

Such a claim went against many of the arguments given in the dissertation. The possibility that a firm may not necessarily want to maximize profit at the expense of a human beings' salary had not been explored. Matteo expressed that he was wiling to sacrifice higher margins if it meant keeping another person employed and well. If more business owners were of the same mentality as Matteo, perhaps jobs which have the potential to be replaced by the means of automation or robotics, may not be, because as a race we prefer cutting our share of the profit pie in order to grant more people with a minimum standard of life and allowing them to reach a

minimum well-being. Matteo's statement was pleasantly surprising and revealed some hope for the generations of entrepreneurs to come. Just because we can replace a simple forklift-operator with a more efficient robot, does not mean it is necessary or desired. In fact, the consequence of firing him may create a deeper burden on society than keeping him employed[3] (Melick, 2003).

As the conversation progressed, he did speak of the elimination of certain jobs due to computer programs in his industry. However, since his firm is considered a medium-size business, he says it doesn't really affect him. As an example, he stated that currently he employs 2 full-time accountants to do payroll. Both of them are responsible for payroll for the 70 MultiPlusDM employees. If the company suddenly expanded to 700 people over night, logically 20 accountants would be needed to do the work. Yet, according to Matteo, this is where the machine comes in; whether it be 70 or 700, he claims 2 accountants can do the job thanks to computer software.

Matteo is not too concerned about automation of labor as a whole. He states that as he operates in a service industry (food and beverage) the nature of the business encourages a strong presence and a personal touch in nearly all day-to-day activities. However in terms of ICT, it is imperative to keep up with times. Certain areas of the business require changes in order to adapt to a shifting demand, and keep up with customers and suppliers. Recently, Matteo invested CDN$ 750,000 in an Oracle-developed order processing program to facilitate buying and selling. He says, nothing but an increase in stress has come front it. Things are so fast-paced now, that it leaves employees in a constant state of alert, an anxiety (an issue to be discussed in the 2nd and 3rd interviews). Much was learned from this interview, as it helped bring up some points of view that had not been discussed until now.

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[3] "Common theory in public policymaking is that higher unemployment causes higher rates" (Melwick, 2003)

3.2 Alexandro Dantas Trinidade

The second subject interviewed was Alexandro Dantas Trinidade Ph.D. He is from Brazil, but is currently a visiting professor at CES Nova in Lisbon, as well as a part-time researcher. He obtained his Ph.D. in Social Sciences at Universidade Estadual de Campinas, in São Paulo. His area of specialization is sociology. A 50-minute interview was carried out on December 3, 2014 at the CES Nova campus in Lisbon. He knew a great deal about the subject, and provided new takes on it. The detailed interview is presented in Appendix C.

From the get-go, Trinidade made it clear that there were 2 contrasting views on the topic from a sociological standpoint:

- We are the product of advancements in technology
- We produce advancements in technology

The first point states that we are becoming increasingly dependent of the machines we create and eventually becoming incapable of living without them. Technology would effectively be shaping us. The reality we live in, would be defined by the machines that make-up our world.

The second point, states that advancement in technology come from our intrinsic need for them as we evolve as a species. Any alteration in our well-being or behaviors, which may or may not be attributed to technology, happens because we want it to. We are the all-powerful creators, and thus we decide what lies ahead.

Trinidade is an advocate of this second ideology. He argues that even if, there are worrisome signs, and red flags are being raised in certain demeanors of society, it does not mean we are headed to a complete societal breakdown. In his words: "Society always finds a way to balance things out". Throughout the interview, Trinidade was eager to point the finger at technology as the "grim reaper" of the 21st century. He believes much more good than bad has come from it. What we may perceive or label as "bad", may simply be uncontrollable societal changes.

Some of the important points that Trinidade made in the interview were the following:

1. Undesirable states of permanent anxiety have been created, which he calls "Social Insomnia"
2. The human being has lost his right to privacy
3. Loss of pride, importance or relevance of previously prestigious jobs
4. Increase in wealth concentration

"Social Insomnia" is a term defining a very interesting perspective of the consequences of digitalization. Much like Carr, Trinidade spoke of a state of constant alert, in which we subconsciously enter into a state of anxiety when awaiting to receive the next news bit or instant message. We value this next piece of information or message immensely. People sleep with their phones, wake up and check it first thing in the morning, and drag it along with them all day, thus being connected 24/7. Where the opinions of Carr and Trinidade differ, is when the latter says, that such an occurrence is a response of society's desire. We live in a fast-paced world because we want to. SMS replaces conversation, a 300-word blog post replace newspaper, and 30-second user-generated videos replace a night at the cinema. As he says: "ICT evolution has significantly changed our interactions and ultimately our relationships. Everything is very fast-paced. The dynamic of relationships is accelerated, and people may go through different levels or phases of friendship or romance very fast." In terms of possible effects on one's well-being, Tinidade argues that modern-day capitalism takes advantage of this permanent connection. The economy now operates 24/7 and this it's taking its toll on u; to the point where it has begun to make us believe that rest, vacations and weekends are a privilege rather than a simple and essential part of living. We are in a state of "permanent vigilance", and big companies take advantage of this, overloading us with information about products and services they sell. Sociologists call this, the unintended consequences of social action. Meaning that these are inevitable and unpredictable effects that trickle down from our behaviors, in our case, increase use of ICT and other digital technologies.

Another example of and unintended consequence, is loss of privacy. Backtracking to the inception of the Internet will reveal that one of its key developers was the US military. Their main objective for creating such a medium, was to better spy on enemies, and keep close control on domestic security. Trinidade argues that, what one does in his own privacy is sacred, and this is something we give up when we use the Internet. To give an example, Google doesn't tell you it reads you email, but it does, and most people are not conscious about such things. Ever click and every word keyed-in, it all contributes to giving up our privacy, since it's all monitored. Privacy and uniqueness are crucial in shaping our persona, and at a larger scale, are instrumental in the creation of culture. Continuing to lose such rights may provoke undesirable results, like loss of culture, worldwide standardization and the loss of "the unique self."

Trinidade provided some economic critique when asked about his thoughts on the issue. He admits that some jobs have been marginalized, or rendered irrelevant, but it's somewhat eccentric to suggest that the whole middle class is in peril. It is too early to make such a judgment, according to him. He believes professionals will learn to co-evolve wit technology, and accommodate. However he did acknowledged the fact that there is an enormous concentration of wealth, which technology bestowed upon us. It keeps increasing, and he sees it as a potential threat to he economy. As companies grow, their power translates into political influence, and at that point, fine lines may be crossed and threat to social welfare will linger.

As Trinidade is a professor, questions were asked pertaining to behavioral changes amongst students. He lamented that the Internet has incentivized the lazy or unmotivated student, to plagiarize work available online. This is not only illegal, but also very detrimental to the learning process. Attention in class has degenerated, as many students rather play games or chat with friends on their mobile phones than listen to what the educator is teaching. The quality of writing has also been steadily on the decline since the advent of auto-correctors. But, the

true repercussions of these changes will become more evident in a few decades from now.

Overall, Trinidade did acknowledge that there was a certain degree of blasphemous use of technology; as we transition into a more automatized World, our society's sense of well-being and economic disposition will be shaken. Nonetheless, he claims that, bearing a few adjustments along the way; society will adapt to this new environment and find alternative ways to achieve economic and social prosperity. An interesting point of view, which challenges that of the dissertation.

3.3 Étienne Talbot

The third subject interviewed was Étienne Talbot, Graduate Student in Sociology at Université de Montréal, Canada. The interview was conducted on Skype on December 11, 2014 and lasted approximately 25 minutes. After being introduced to the theme of the dissertation, he immediately thought it was really fascinating that the ideology behind it was being applied from a business perspective. Although the interview was brief in comparison to the 2 previous ones, the subject brought forth some compelling points. He is younger and less experienced than the previous interviewees, however he has ben schooled in modern Sociology, which helped bring a refreshing and bracing perspective about the topic. The detailed interview is presented in Appendix C.

Talbot's overall attitude towards the dissertations standpoint, differed from the previous interviewees. In contrast with the other, he sided more with the proposed hypothesis. He too, has seen some troublesome signs cause by our increased use of technology, and strongly believes complications lay ahead, if we maintain the status quo.

He first argues that we are witnessing a dramatic change in the balance of power. The distance between the rich and poor has never been greater. His thoughts

are that capital is equal to power. He makes an interesting comparison to Feudalism in the Middle Ages; at that time, all power was in the hands of the King who ruled the land. Technology has broken the barriers, borders and frontiers, and the modern day "King" (CEO of large Multinationals) rules over much vaster grounds. Talbot believes that ICT and modernization have helped bring this new reality forward. It constrains society and affect peoples lives, often without them even knowing. "There is absolutely no way, we want to return to a social disposition similar to those of Medieval times."

He continues his argument with a critic of the current free market structure, and capitalistic economy. "What counts is money. That is the main change I see in society. Everyone is out to make a buck, to live the American dream", he says. E-commerce startups and online business surrounds us, and all hope to be the next part of the overnight millionaire firm. Medicalization of the select few, who make it big, has us convinced that it can happen to any of us. Talbot links this to the rise of a "Risk Society". A sociological term that adequately refers to the risk-oriented behavior of modern society. He claims that the fast-paced world leads to an "act now, think later" mentality. Example: "E-Cigarettes were launched in Canada, and very little reach had been done on the potential long-term consequences of the product. Millions have embraced them, even though we still know very little about the potential long-term impacts. All the risk was passed on to the consumer. […] and this goes for all other technological advancements. We don't really consider all impacts a new product may cause to society."

However, he does see technology as a vector of change in social movement. As he says:

> "Innovations push society forward, and allow us to grow in most instances. […] Yet, it is important to note that more often that not, with any large step forward or big innovation, society takes a step back. Meaning: although we gain from the arrival of a new technology or innovation, we also lose something in the process. This is very evident in ICTs."

He exemplifies by taking the modern day use of mobile phones. He says they are great because they allow us to connect with people who may be half-a-world away. Yet, they have created a vice by which user often live vicariously through the tiny screens of their handheld devices. They become oblivious to the world going on around them. There is a loss of "Social Love"; according to him, people are becoming increasingly introverted and lose a certain extent of general well-being.

Talbot provided an interesting opinion about technology's impact on well-being. He used a clever analogy to explain himself; he says we are living in a "Fast-Food World". This draws similarities with Carr's thoughts about us being constantly bombarded with information, news and hyperlinks. "It's a "Fast Food" of information" he says, you eat one information after the next, it is digested in a few seconds and then it's already old news; out of your memory, out of your system and you skip to the next one." Our societal links (family, intimate relationships, friendships) also share the "Fast Food" trait. It's in and out at lightening speed. He states, that we do not take the time to build a solid foundation to our relationships, they are short-lived, superficial and often end abruptly. These key societal links, were once valued above all. They have always been essential. It is too early to say with uttermost certainty, whether this will be ultimately detrimental to society's well-being. However, in accordance with authors and studies presented in this dissertation, it is changing our brain structure and has proved to affect our happiness.

As a concluding remark, Talbot felt somewhat relived to see such a study being carried out by a business student. He feels like these are topics that have been challenging other social sciences for some time now, and it's a relief to see this growing concern has reached the field of administration.

4. Discussion of Results and Limitations

The insight gained from the interviews was monumental. All three candidates from very different backgrounds voiced their opinions about the topics and themes of the dissertation, and each contributed to the generation of deep-thought.

On the one hand, the 2 of the 3 interviewees supported the view that although something was wrong with the way we use technology; however, they did not believe that this spelled our imminent end. Rather, they believed that society would somehow level the playing grounds, and allow for us to maintain a healthy society. The younger interviewee offered what we may consider a "New School" train of thought, which went hand-in-hand with the proposed hypothesis. He advocated that change was necessary in order to allow for a healthy society in the future, since maintaining the status quo may damage society. It was interesting to see

The chosen methodology allowed for honest opinions to be heard and harvested genuine ideas from the candidates. A survey, questionnaire or other data collection methodology would not have been as appropriate as the one chosen; they focus on quantitative data, whereas this dissertation required something qualitative. Given the nature of the topic, being much more open-ended-like and hypothetical, interviews fit-in perfectly. That being said, one may argue that the opinion of three individuals, as qualified as they may be, does not necessarily assert an undeniable truth. The arguments they brought forth when faced with the interviewer's questions required immediate answers, and thus may not have voiced an in-depth, thoroughly processed thought. Awareness about the current state of affairs in society due to our misuse of technology, be it on economic or societal levels, must be raised. This is arguably more important in this dissertation that proving cold facts about what is changing. This is because all occurrences discussed are still in the making, and it will be years before we can provided sufficient data to make *bona fide* claims.

5. Conclusion

It's impossible to predict the future. Civilization acts in precarious ways. All we can do is try to forecast and anticipate as accurately as possible. As we know, that doesn't always live-up to expectations. However, this is not a reason to simply ignore and dismiss what has been presented in this dissertation. Precautions on economic and societal levels must be taken. Labor Unions, Institution and Government bodies should work together to create incentives to keep employment levels regulated, and minimize massive automation.

In his books and several seminars, Lanier (2013a) explains that one way to overcome the challenges we are faced with would be to oblige Siren Surveys and the likes, to "pay" for our inputs. As explained in the dissertation, our digital input ultimately may spell out the elimination of a job. The problem is that, right now, we give our input for free. Monetizing it, as far fetched as it may seem, could prove to be answer to these concerns. Reducing open-source online options and cracking down on copyright infringement may also allow for a better flow of the economy online, and a more equal distribution of revenues.

Educational Institutions, should also aim at remedying to some of the behavioral damage the population has suffered. Cutting or limiting this "24/7 connection" could be a starting point. Example: reducing Social Networking access to specific Wi-Fi zones as opposed to the entire school, encourage "Disconnection" (or non-digital activities) etc.

UCP itself can do its part to nurture a healthier environment for its students and staff. Think about it: is it necessary to have access to Facebook during lectures? Of course not. Yet, students do, and too often are these young minds easily distracted or interrupted by social networks. They may be physically present, but in spirit they are not. Their wandering minds and sophisticated gadgets work in symbiosis to create a student zombie, which mindlessly browses the Internet on his mobile phone during a professor's well-prepared 70-minutes lecture. This is not

right. Carr said it, and Trinidade reaffirmed it: the quality of young minds is reducing.

Católica-Lisbon is a Business School, and is instrumental in creating the entrepreneurs of tomorrow. But it is one thing to teach a student how to maximize a firm's profits by the means of a clever equation and a Finance course. But how about maximizing employees' well-being? Let us create more entrepreneurs like Danny Matteo, who does not only focus on increasing his own personal wealth, but increasing the wealth of the people around him…the wealth of other human beings. Social Entrepreneurship is a fairly young and under-developed practice. As it is becoming increasingly relevant, it must present is the Curriculum Studies.

In conclusion, much can be done to get off this slippery slide and on the track to a prosperous future. Is there reason for concern? Yes. Have we crossed a point where there is no turning back where are world has changed for the worst? No, and it doesn't take much to put us back into line. "Politics must craft rules and institutions that harness technology to suit society's values and vision of itself." (The Economist, 2014) The advent of technology has done marvelous things for civilization, and to curse it would be wrong, but using it indecently is worse. Let us set the record straight, eliminate the mishandling of this valuable resource and nurture it only as a driving force to positive social change.

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APPENDECIES

Appendix A

Appendix A.1: "The Internet Attitudes Survey" as presented in Weiser's research (2001).

Directions. Please rate each item below. Most items ask for the extent to which each is true or not true of you. Use a response scale in which 1 = "not at all true of me" to 9 = "very true of me," where 5 would mean "neutral" or" neither true nor not true." Please choose only one response for each item.

1. One of the reasons why I use the Internet is that it helps me "keep up" with what's going on in the world.
2. One of the reasons why I use the Internet is to obtain information about the courses I am currently taking.
3. One of the reasons why I use the Internet is to chat with other individuals online.
4. One of the reasons why I use the Internet is because it helps me with my education.
5. One of the reasons why I use the Internet is to just look around at the many different and interesting sites.
6. One of the reasons why I use the Internet is to E-mail friends and/or family.
7. One of the reasons why I use the Internet is to shop for things.
8. One of the reasons why I use the Internet is to keep up with what's going on in specific places (e.g., back in my hometown, my favorite cities or vacation spots, etc.)
9. One of the reasons why I use the Internet is to meet and interact with new, exciting people.
10. One of the reasons why I use the Internet is to do research (e.g., class projects, research papers related to either school or career, etc.)
11. One of the reasons why I use the Internet is to listen to audio broadcasts (e.g., music, shows) from distant radio stations or special locations.
12. One of the reasons why I use the Internet is because I like building, creating, and working on World Wide Web (WWW) pages.
13. One of the reasons why I use the Internet is to meet and interact with others who share interests that are similar to mine.
14. One of the reasons why I use the Internet is to look for others with whom I can develop a romantic relationship.
15. One of the reasons why I use the Internet is to search for items and products that are ordinarily difficult to find.
16. One of the reasons why I use the Internet is to look for others with whom I can have a sexual relationship.
17. One of the reasons why I use the Internet is to stay informed regarding local, national, and international news and events.
18. One of the reasons why I use the Internet is to view things that some might consider pornographic.

19. One of the reasons why I use the Internet is to play interactive, online games with other users.

"Community and Social Involvement Index" as presented in Weiser's research (2001).

Directions. Please rate each item below. Each item asks for the extent to which you agree with the statement. Respond to these items using a scale in which 1="completely disagree" to 5="completely agree", where 3="neither agree nor disagree."

1. I don't feel that I belong to anything I'd call a community.
2. My behavior has some impact on other people in my community.
3. I feel like I'm an important part of my community.
4. I really don't have the time or energy to give anything to my community.

Directions. Items 5-7 below ask you to indicate how frequently you engage in various activities. Respond to the items using a scale in which 1="practically never," 2=about once every two or three weeks," 3="about once per week," 4="at least a few times per week," 5 ="everyday or nearly everyday."

How often each month would you say that you dine out with others in restaurants?
  5. How often each month would you say that you participate in recreational social activities (e.g., going to movies, going dancing, attending sporting events, etc.)?
  6. How often do you attend church each month?

"Social Support Strength Index" as presented in Weiser's research (2001).
Directions. We would like to know how close you currently feel to various other people in your life. After reading each of the 3 items directly below, please indicate your answer using a scale in which 1="not close at all" to 5="very close," where 3="neither close nor not close."

7. Recently, how "close (interpersonally, not geographically) do you think you have been to members of your family?

8. Recently, how close do you think you have been to others whom you consider your friends?
9. Recently, how close do you think you have been to others you work with or go to school with?

Directions. How often do you engage in various activities with others? Please let us know by reading each of the 9 items directly below and responding on a scale in which 5="almost always," 4="often," 3="sometimes," 2="not very often,"and1="practically never."

11. How often do you discuss personal problems with other family members?
12. How often do you ask advice from other family members?
13. How often do other family members ask for advice from you?
14. How often do you discuss personal problems with your friends?
15. How often do you ask advice from your friends?
16. How often do your friends ask advice from you?
17. How often do you discuss personal problems with others you work with or go to school with?
18. How often do you ask advice from others you work with or go to school with?

19. How often do others you work with or go to school with ask advice from you?

Directions. How often do you get together with others each week? Please let us know by typing in the number of hours after each of the three items directly below.

20. In general, how many hours do you spend with other family members each week? __(open-ended response)
21. In general, how many hours do you spend with your friends each week? __(open-ended response)
22. In general, how many hours do you spend with others you work with or go to school with OUTSIDE of school or work? __(open-ended response)

Appendix A.4: "Weiser's initial Theoretical Model" as presented in Weiser's research (2001).
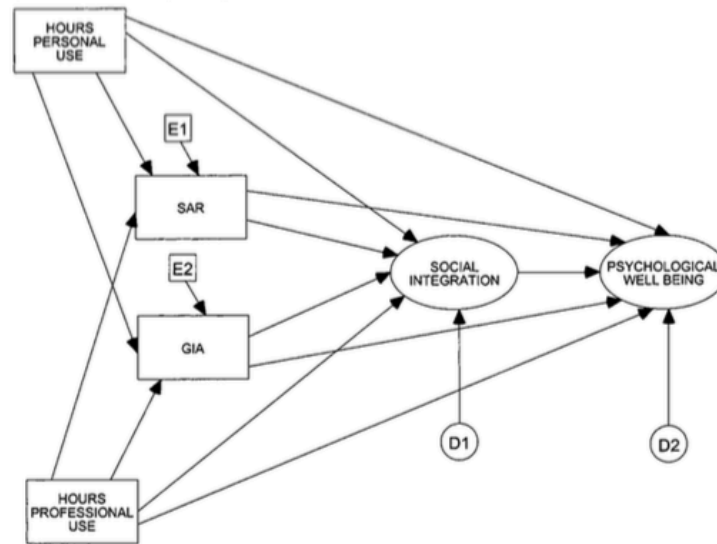

FIG. 1. Theoretical model. Community involvement and social activity are combined to form a latent construct, represented by the oval marked "Social Integration." In addition, loneliness, depression, and satisfaction with life are combined to form a latent construct, represented by the oval marked "Psychological Well-Being." E1 = error variance, Socio-Affective Regulation (SAR); E2 = error variance, Goods-and-Information acquisition (GIA); D1 = disturbance term, Social Integration; D2 = disturbance term, Psychological Well-Being.

Appendix A.5: "Weiser's Theoretical Model - REVISED" as presented in Weiser's research (2001).
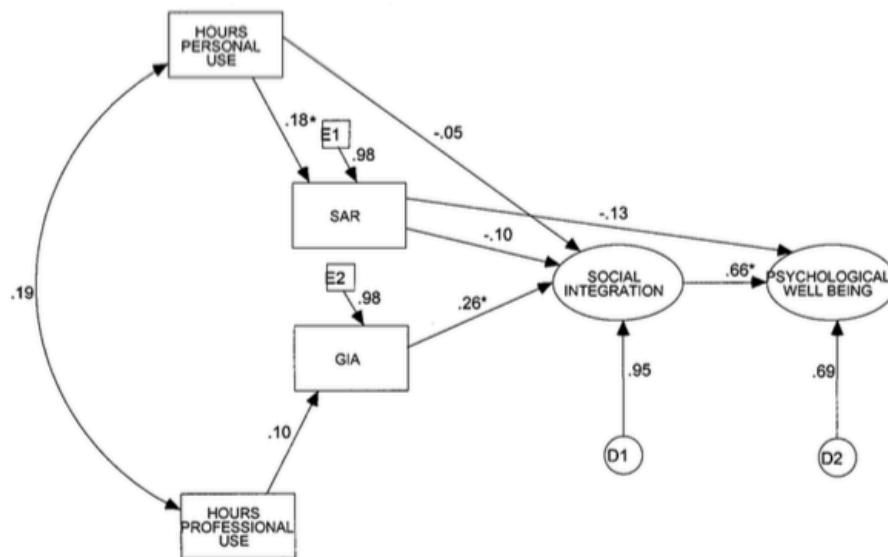

FIG. 5. Revised model, sample 4. The standardized path coefficients appear on single-headed straight arrows, and the covariance between hours of personal Internet use and hours of professional Internet use appears on the double-headed curved arrow. E1 = error variance, Socio-Affective Regulation (SAR); E2 = error variance, Goods-and-Information Acquisition (GIA); D1 = disturbance term, Social Integration; D2 = disturbance term, Psychological Well-Being. *$p < 0.05$.

Appendix B

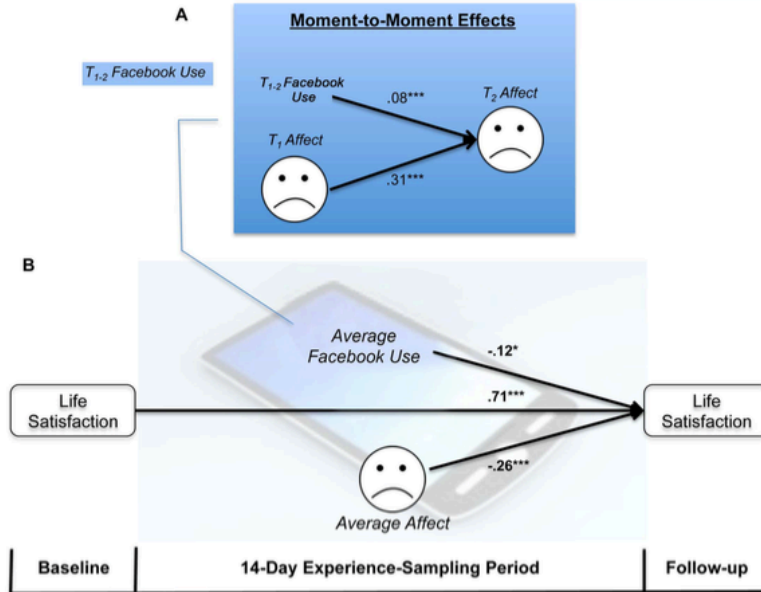Please find the framework established by Kross et al. (2013)

Figure 1. **Facebook use predicts declines in affect and life satisfaction over time.** Interacting with Facebook during one time period (Time$_{1-2}$) leads people to feel worse later on during the same day (T$_2$) controlling for how they felt initially (T$_1$); values are regression weights from multilevel analyses (Panel A). Average Facebook use over the course of the 14-day experience-sampling period predicts decreases in life satisfaction over time; values are standardized regression weights from OLS regression analysis (Panel B). *$p<.05$, ** $p<.01$, ***$p<.001$.
doi:10.1371/journal.pone.0069841.g001

Appendix C

The following Appendix presents the full interviews conducted.

Appendix C.1: Danny Matteo Interview

Interviewer: Claudio Scuralli, Graduate Student, International Msc. B.Admin
Interviewee: Danny Matteo, President and Founder of MultiplusDM inc. The company has been in business since 1987, and is in the food distribution industry. Basically the firm operates as an intermediary, supplying basic necessities for restaurants, hotels and firms in the food sector.
Interview Setting: Interview conducted by Skype™ on November 22, 2014 at 3:50 PM. The interview lasted approximately 70 minutes. A half-day observation session followed the interview at a later date.
Affiliation with interviewee: Mr. Matteo is a distant relative of the interviewer. He is a self-made successful entrepreneur. His Company, MutliplusDM was started in 1987 with only 3 people and has now grown to multi-million dollar business, which employs over 70 people.
(Start of Interview after short explanation of the dissertation)

C: Of course your field of work is not technology intensive, but how important is it for you to way run your business?

D: You see this pencil? Well back then [1987] this is how we used to take orders. With pen and paper. People would call us for an order, and it was always very basic. We wrote down the orders on paper and keyed them into a typewriter in order to record the order. From there we prepared the order in the warehouse and shipped it accordingly. The difference between back then and now, the dollar number, the number of employee, it's just huge and it would be impossible to handle without computers. It has been a great help for us, and has multiplied our business astronomically. SKU numbers now arranges all items, orders come in much faster, and all in all, computers have made things so much easier for us, here at Multi [MultiplusDM]. The fax was a big factor also in the 80s and 90s; being accepted as a legal and official document, it really speeded up orders for customers who were in different cities or provinces. Technology has revolutionized a lot of things and made the world a lot smaller in a way.
C: Let me ask you more specifically, as your business numbers are going up, are you keeping the same staff or have you found yourself eliminating position that were rendered obsolete by technology? (i.e.: accountants, secretaries, sellers, etc)

D: We are in a service-oriented industry and service for us is always a priority, and thus people are a priority. And for us, as we have grown over the years, we never found ourselves firing anyone because their task were maybe rendered easy or less essential to the business. I believe that if your bottom line business is fine, you shouldn't have to fire people and you try to keep the *status quo*.

C: Ok. That is you, as a person being humane, but imagine you are an extreme capitalist focused on maximizing you profits. Could you cut some of those jobs?

D: Absolutely. And I see it a lot; in the way people are doing business these days. But for me, as long as we are making money, there is no reason to try to make more and more, and to strip another human being of a salary and of the means to put food on the table. I think as we see more and more advancements in technology, and our jobs are alleviated we might edge more towards a socialist-type environment with a flatter type of distribution amongst people.

C: If you were to hire a head-chopper, would he tell you to eliminate certain positions at MultiPlusDMin favor of a computer?

D: Yes that is true, but the computer cannot do everything you need. Certain tasks require a human touch, even the ones you may think are most numerical such as accounting. In large companies, it may be possible to have it all computerized but in smaller to mid-size companies you will always need someone to explain taxes and payroll. For example in payroll, I employ 2 people. If from one day to the next my labor force jumps from 70 to 700, it will still be possible for these 2 people to do the task. I need them nonetheless to put that human touch on things.
That being said, the is a jobless in a way, because according to a rule of thumb I should need 20 people in payroll to oversee things, and that's where the computer comes in and eliminates the need for more people.
In my opinion we are going to learn and adapt, human kind has always found a way. My only concern is with the environment and World Hunger… with all the knowledge and means we have, we shouldn't have such problems…but people are selfish.

C: If I told you in 1998, Danny you are going to be making X Million of dollars in 2014, do you think you would have the same number of employees you have now?

D: No way! In the industry there is a rule of thumb, so many people for so many millions, and we haven't been respecting that rule for at least 8-10 years now.

C: Your clients are in the service industry. Have you seen any change in the way they have been doing business?

D: Corporate clients: yes. Smaller size businesses: not really. Email, fax, mobile phone… all kinds of evolution in communication technology have enhanced the way we do business and facilitate things and process orders more rapidly. It also brought added confidence between our customers and us. Being able to retrace mistake orders, storing orders digitally, tracking shipments, all these elements proved to be crucial in making us grow. Online payment has been great as well, it speeds a lot of things up.

C: All your products are displayed online. Do you still feel like you need sellers? Or do you see customers simply taking the need information online, and maybe calling in if they have a few questions?

D: Actually, we are in need right now of more sellers. We need to develop more street business. I do not think we would be successful without them, and even though we are strongly established now and have clients that have been with us for ever, we need sellers to cake care of them, whether it be for the sale itself, post or pre. Whatever comes in by others means such as email orders or through telemarketing, is great but we consider it extra. Strong presence is still essential in business. Take Elon Musk for example at Tesla, he is a genius, but he has the characteristics of a salesman.

C: How do you feel towards the control you have on your business? Do you feel in control or things are being done automatically/robotically?

D: For sure. Today I am less involved as in the 90s or 00s because things more or less stable and economically healthy. Recently we implemented a new computer system, which was supposed to facilitate buying mostly, it cost about $750,000 and I must say I feel completely lost when using it and feel like I have no control over things. I think we might have made a mistake. I still know the business because it's in my blood, but I am not half as sharp as I was a few years ago. The new system has been somewhat stressful to deal with, and we have thought of going back to the old system. (The system is Phoenix Operating System, an Oracle product)

C: Do you feel the workers are more stressed? And are they more or less happy than when you were less reliant on technology? The question is more related to how you think people behave socially in the workplace, in regards to the use of technology. (i.e.: mobile browsing, social media, mobile gaming, etc.)

D: Well I feel like blue-collar worker are less stressed because of the ambiance and machines that help them work. Some of the head of departments are stressed but I think it because the pressure is on them, and they're personality makes them stressed. In term of white-collar workers, I think the stress level is pretty much the same.

C: During breaks and lunch hour, do you find people socializing or glued to their email, mobile phone, tablet or such?

D: The odd employee will be rather isolated and stay on his phone, and keep to himself. But it's by choice because most of the employees join into a big discussion during breaks. Speaking of cellphones, they are kind of one of my pet peeves, I hate seeing phones on the desk. Certain employees chat with friends or play games instead of sticking to work. As long as the job is done, I don't mind, but sometimes if

they abuse I have to put my foot down. It is hard to control these things continuously.

C: Do you see a decrease in performance whiting the circle of people who spend time on their phones during work hours?

D: Definitely. We see it daily. I have one girl in account payable that does 5 days of work in 4 days. That is the ideal employee: no problem and no headaches. Others in the same department cannot achieve daily tasks and are continuously late. When I need to, I punish. But we always have some laggards and we deal with it as best we can.

(End of Interview)

Interviewer: Claudio Scuralli, Graduate Student, International Msc. B.Admin

Interviewee: Alexandro Dantas Trinidade, Ph. D.

Interview Setting: Interview conducted by the CES NOVA campus on December 3, 2014 at 3:00 PM. The interview lasted approximately 50 minutes. The interview was held in Portuguese, but is translated below in English.

Affiliation with interviewee: Dr. Trinidade is the father in-law of an acquaintance of the interviewer. He is from Brazil, and teaches at Universidade Federal do Paraná, in Curitiba. At the time of the interview, he was in Lisbon as a visiting professor, and researcher at CES NOVA. He holds a Ph. D. in Social Sciences from UNICAMP in São Paulo, Brazil.

(Start of Interview after short explanation of the dissertation)

C: Have there been any noticeable changes in he area of Sociology, related to the topic at hand? What has technology brought to the world from the sociologist point of view?

A: Well that is a pretty broad question, but I think I can narrow it down to some key points. I see where you are coming from, and I will tell you right off the bat that there are 2 adverse schools of thought about this in Sociology. They are the following:

- We are the product of advancements in technology.

- We produce advancements in technology.

The first ideology follows the path of your dissertation and states that we become increasingly dependent of the machines we create and eventually becoming incapable of living without them. Technology would effectively be shaping us. The reality we live in, would be defined by the machines that make-up our world.

The second ideology, which is the one I follow, states that advancement in technology come from our intrinsic need for them as we evolve as a species. Any

alteration in our well-being or behaviors, which may or may not be attributed to technology, happens because we want it to. We are the all-powerful creators, and thus we decide what lies ahead.

The opinions are mixed in my field. And of course sociology is not a clear cut science some there always exist some exceptions and different levels of integration of both these ideologies. I do think advancements in technology are showing some worrisome signs in certain aspects of society, but I do not think it means the end of us, or that a crisis awaits us ahead. Society always finds a way to balance things out.

C: What do you think about the coevolution of society and the Internet, one of the greatest improvement in ICT?

A: The Internet is as marvelous as it is dangerous. It allows us to connect with friends and family from remote locations, and have access to infinite information. But in many ways, it has also completely eliminated the fundamental privacy of the human being. For me this is a serious downfall of technology. We have given up most of our private freedoms, and live in a world were any information about us is practically freely available to all. When you think about it, the Internet was partially created specifically for this. It was initially a military concept to be used to be able to spy on enemies and on the public. We blindly accept to give up our freedom whenever we use the Internet. We all know that Google and Facebook monitor every single click and every letter we key in. Rumors become breaking news bulletins within minutes.

C: Do you see any alterations in people's well being?

A: Yes. I think there have been significant changes in people's well being, but also in the way we get feelings of well-being. I am seeing a lot of unnecessary anxiety created by social medias, because we rely on it for social gratification and socialization needs. ICT evolution has significantly changed our interactions and ultimately our relationships. Everything is very fast-paced. The dynamic of relationships is accelerated, and people may go through different levels or phases of friendship or romance very fast.

As I was saying, anxiety is one of the main alterations due to ICT evolution. We live in a word where we value the next bit of unnecessary information, but since it appears on our news feed, we pay great attention to it because it is addressed to us.

There are large amounts of time spent on social networks, with no return in terms of reflecting or deep thinking, this may lead to the loss of social contribution.

I think we are seeing the birth of a type of "Social Insomnia". People sleep with their mobile phones, wake up and the first thing they do is check their messages or social network notifications. Constant anxiety is created by the anticipation of this information, effectively hindering our sleep.

The same phenomenon is also seen in the labor market of modern-day capitalism. We have a 24/7 economy now that never stops, to the point where it has begun to make us believe that rest, vacations and weekends are a privilege rather than a simple and essential part of living. We are in a state of "permanent vigilance", and big companies take advantage of this, overloading us with information about products and services they sell.

When it was invented, the Internet was sought out as a means for us to reduced our work loads, and have more free-time. As you can see, it has had the complete opposite effect. In sociology, we call this the "unintended consequences" of social actions: I act, but the outcome of these acts produce unexpected or contrary consequences". Historically, this was something sociologist Max Weber believed in, and he explained that this would always follow society as it progresses. Amongst other things, Weber wrote about technology, as it was always an important aspect of Socialism, prominent topic in the early 20th century. He claimed that as technology is increasingly omnipresent, it has the potential to create, but also leaves us in a state of reduced creativity. Example: in 1920, I will take a public bus to get from point A to B, but I don't need to understand or know anything about the mechanics of the bus. Thus leaving me without any increase knowledge about engineering, even though I just rode a bus, and means of transportation, which is a mechanical work of art.

Essentially, the users and consumers of technology are left in a state of ignorance, and only a minority of people (engineers, designers, etc.) Because of this, a majority feels less worthy in the work they do, and lose a sense of pride as well, since more and more, their jobs are becoming precarious. Of course, this affects levels of well-being negatively, in a broader sense of the term.

Teachers for example, who have the skill to transmit knowledge and explain concept to students, become marginalized. Educational institutions, gain much more money by putting classed on YouTube or copying them for mass distribution. The magic and uniqueness of a class taught, is no longer preserved, but rather standardized

and redistributed massively. The teacher may feel a serious loss of the value of his work, and this may seriously affect well-being as well.

C: In a previous interview, a business owner hinted that he believed we may soon reach a point where increase socialist policies may lead us to be more equally distributed as our jobs become more an more automatized. What are your opinions on this?

A: Well, in the 19th century, the socialists point-of-view was that technology was man's salvation. Lenin spoke of this is his USSR, in fact he vouched that technology was the human emancipation for the future. The end of physical labor was one of the main promises socialists made to the people during the communists reign over the USSR. To be honest, during most of the 20th century, people viewed technology exactly in this way, as the emancipator of humanity and solution to life. But things did not turn out as predicted. Why? Because many people saw were this was going, and feared that we may become slaves, not of machines, of ourselves. Our perversion of technology would spell the end of us. Another fear related to this was concentration of wealth and power to whoever owned these machines. Example: Google. We all know that this firm is all over the world, and knows almost everything about us.

Coming back to your initial question, is it safe to say we might reach some kind of socialist reality in the future? It is a risky thing to say. I am quite pessimist usually, and believe that governments are not prepared for this kind of an event. A socialist state could not be created properly and effectively, in which maximizing well being for all would be a priority.

C: Please comment on the following affirmation: We are loosing the middle class.

A: I don't see how many middle class jobs could be severely affected by technology. It changes our jobs, but cannot eliminate them entirely. Surgeons can operate remotely and teacher can give online classes, this represents infinite new opportunities for them. Machines will never replace lawyers, judges and other legal positions, because they need a human touch. Engineers always need to supervise work, even if most of it is designed digitally, there is no way we can replace these people on the field. I named 3 typical middle class jobs (physician, lawyer, engineer) which are unlikely to be wiped out by technology. However, I must admit that many key middle class jobs some years ago, have now been severely marginalized. Take the banker for example. I remember when I graduated, being a banker was considered a respectable job, and often guaranteed lifetime employment. Today, it is

no longer the case. The salary of a banker has dropped immensely, because we all do our banking trough ATMs or online banking. What I am trying to say, is that in some fields, the excessive use of technology may in fact marginalize positions and importance (and their salary simultaneously). In the case of jobs I mentioned before that, professionals will learn to co-evolve with technology and increase of digital information.

C: As a professor, have you seen some changes in the behaviors of students, in terms of performance, attention, discipline and such? (Keeping in mind the focus of the study)

A: I have seen a difference in terms of presence. Technology has incentivized a lazy student, or undedicated student to drift off, and not make much of the class he is attending. There are much more interesting things happening on ones mobile phone, than what the professor has to say. Plagiarism is becoming a huge problem too, it happens time and time again. Students who do not have the will to write a paper, or submit and assignment, will much rather copy it from the Internet. The quality of people's writing has also suffered a lot. We trust too much in auto-correctors and such programs.

Cellphones have been a huge problem as well. Students can simply spend a whole 3 hours, sitting in class but being focused on their device and not paying a single moment of attention to what the teacher has to say. In this way, it creates indiscipline in the academic world

(End of interview)

Interviewer: Claudio Scuralli, Graduate Student, International M.Sc. B.Admin

Interviewee: Étienne Talbot, Graduate Student – MSc. Sociology.

Interview Setting: Interview conducted by Skype on December 5, 2014 at 7:00 PM. The interview lasted approximately 25 minutes. The interview was held in French, but is translated in English below.

Affiliation with interviewee: Talbot is an ex-colleague of the interviewer, currently enrolled in a Master's Degree in Sociology, at Université de Montréal, in Canada. A clever student, he has also participated in an exchange semester at the Ludwig Maximilians Universität, in Germany, where he also served as a French teaching assistant.

(Start of Interview after short explanation of the dissertation)

C: Have you seen or studied any critical changes in sociology in recent times as a direct or indirect response to technology?

E: Ok. Well that is a pretty interesting question. To answer it I would like to take a larger stance on the issue, and use the last 200 years as a standpoint, which in my opinion corresponds to the term "recent times". What strikes me as the most important change we have witnessed, as a society, has been dramatic change in the balance of power distance between the rich and poor. It has greatly increase discrepancies in income distribution and concentration of wealth. All of a sudden, one single person had the means to produce and supply for entire markets. If I take a local example, Pier-Karl Péladeau, is running to head the Parti Québecois, political party, but has absolutely no political background or anything, but is amongst the richest people in Quebec. He will surely be elected over other more suitable candidates simple because he has massive amounts of capital. Money=Power, and it this kind of mentality steers us in the wrong way. Péladeau owns a telecommunication and electricity firm. I strongly believe that ITC and modernization have helped bring this new reality forward. It constrains society and affect peoples lives, often without them even knowing.

C: Do you think society co-evolves with technology?

E: I see technology as a vector of change in social movement. Innovations push society forward, and allow us to grow in most instances. Of course I think technology co-evolves with society, they go hand-in-hand. However, it is important to note that more often that not, with any large step forward or big innovation, society takes a step beck, Meaning: although we gain from the arrival of a new technology or innovation, we also lose something in the process. This is very evident in ICTs.

More specifically, if we take mobile phones as an example, they are seriously damaging what was traditionally considered healthy social interactions. People are more interested in the tiny screen on their phone, than people around them. People are becoming increasingly introverts. There is a loss of "Social love"

C: I would like to hear you comments on any noticeable psychological effects, you may think technology has on people.

E: My field isn't psychology, but we study the psychology of society, so I can provide you with some insight. We have increasingly become money driven and risk-taking, I think this is a consequence of our faced paced world. E-Cigarettes were launched in Canada, and very little reach had been done on the potential long-term consequences of the product. All the risk was passed on to the consumer. What I mean by this is that, and it goes for all other technological advancements, is that we don't really consider whether or not the impact a new product may cause to society is good or bad, the law of the market reigns. What counts is money. That is the main change I see in society. Everyone is out to make a buck, to live the American dream. We act now and think later.

C: What do you think about the detrimental effects of technology on people's well-being?

E: I think that people have begun to believe that what is real, is what their Smartphones tells them is real, rather than what is going on around them. What is real for you senses is no longer the primary reality. People are becoming increasingly narrow minded as well. I mean, since Google and Facebook is continuously tailoring to our desires, and telling us that what we like is best, people

are going to come to believe that. They will come to believe their opinion is best.

As I said, I am not an expert in psychology, but it is quite obvious that this is detrimental in the long-wrong, it goes against what has been establish over the course of our history.

There is an increase in attention deficits disorders (A.D.D). This stems from what you were mentioning earlier, about us being constantly bombarded with information, news and links to click on. A "Fast Food" of information, you eat one information after the next, it is digested in a few seconds and then its already old news and you skip to the next one. Our society links (family, relationships, friendships) is all "Fast Food" like links. It's in and out, with crazy speed. We are loosing these key societal links, which we once valued above all. They are essential, and we are increasingly losing them.

C: Do you have any final comments?

E: Yes, I do. I just want to say, that I am really happy to see this kind of a critical thinking, which brings together the economy, free market, technology and such together is being done by a Business student. I didn't think, such a point of view may be taken, by a person who's main areas of expertise would rather push profit maximization and fast-paced economies. It's relieving actually. I mean, most of the stuff you are discussing in the dissertation, are issues that have often been tackled, be it by sociologist, psychologists and the likes, but it is truly refreshing to see someone from management also be acknowledging that there might be a problem, and that we should bring all the social sciences together to find a solution. I think it's very important.

(End of interview)