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Abstract

This paper develops the basis of a conceptual framework of the effects of the Internet and World Wide Web on entrepreneurship in the present day. As academic literature suggests Web experience and familiarity with search tools can contribute significantly to usage for beneficial purposes, and journalists credit the Internet for rising numbers of young Internet entrepreneurs due to the various types of access it enables, young adult Internet users are the focus of the paper. In July 2010, a survey of 104 18-35 year olds was conducted using the Facebook social networking platform with a follow-up qualitative questionnaire sent by e-mail. Years of usage, hours of use per day, amount of time used for work or business, and entrepreneurial intention were tested in a logistic regression analyses for their bearing on online and offline idea generation and implementation. Usage statistics, along with additional independent and control variables both Internet and non-Internet related, were also tested in a probit analysis for their contributions to entrepreneurial intention. Significant relationships were found between use of the Internet for work or business and opportunity pursuit as well as between the importance of the Internet to one's most significant business idea and entrepreneurial intention. Survey results point to the rise of a new class of young adult entrepreneurs and potential entrepreneurs as a result of the ways in which the Internet has changed the "rules of the game." Various implications for future research, educators and policymakers are suggested to further the reach of the Internet for entrepreneurial purposes, promote access and the development of digital literacy and online skills among the information poor.

Keywords: Internet entrepreneurship, young adult entrepreneurship, young adult Internet use, young adult Internet entrepreneurship, entrepreneurial potential, entrepreneurial intention, changing class of entrepreneurs, 21st century entrepreneurship

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Angela Carmina Martinez Dy

10 September 2010

1. INTRODUCTION

An investigation into entrepreneurship and value creation in the 21st century cannot ignore the effects of the Internet and World Wide Web on the global economy, the changing class of entrepreneurs, and the opportunity identification and development processes of individual actors. The mass uptake of information and communication technologies (ICT), in particular the Internet, e-mail and World Wide Web (the Web), having drastically and rapidly altered the informational and economic landscapes of the developed world and most of the globe, makes it critical to investigate how entrepreneurship has been impacted by this major paradigmatic shift. As the uptake of information and computing technologies spreads worldwide and the Internet has emerged as a primary informational source, it will doubtlessly have impacts on the knowledge, learning and information asymmetries that recent literature suggest are at the heart of entrepreneurial activity. At the same time, studies show that it is more likely than ever that young people today will have a portfolio career that includes periods of entrepreneurial self-employment. This paper posits that young adults using the Internet may in fact be shifting their information asymmetries and accessing information that stimulates entrepreneurial intention or facilitates entrepreneurial activity, in particular, idea generation and opportunity development.

Widely regarded as a catalyst for economic growth, entrepreneurship is particularly worthy of attention and analysis in the current historical moment. In a 2009 report, the World Economic Forum (WEF) stated:

Entrepreneurship has never been more important than it is today in this time of financial crisis. At the same time, society faces massive global challenges that extend well beyond the economy. Innovation and entrepreneurship provide a way forward for solving the global challenges of the 21st century, building sustainable development, creating jobs, generating renewed economic growth and advancing human welfare (WEF, 2009).

They suggest that the convergence of globalization, technological innovations, knowledge-based economies and demographic trends has led to an increased focus on the effects and importance of entrepreneurship. In the United States in particular, the number of people reporting entry into entrepreneurial activity reached its highest point in the last fourteen years (Kauffman, 2009). As entrepreneurship is seen as a driving force of economic development, structural change and job creation (WEF, 2009), scholastic inquiry into its ontology today, influenced and shaped as it is by online networks and information, is a relevant and necessary area of research.

2. LITERATURE REVIEW

2.1 Entrepreneurship in the Network Society

Although the multitude of effects of the Internet on modern society are undeniable, there is still little formal consensus among social scholars on what exactly the "Internet" is, despite agreement that it is "distributed, net-like, and web-like" (Cavanagh, 2007: 48). Most definitions struggle to contain the concept, ranging from "vast interactive network" to "the technological basis for the organizational form of the information age" (Slevin, 2000:1 and Castells, 2001:1-2, as cited by Cavanagh, 2007). It has been

characterized as a social space, a form of media, and a technology, and depending on user and use, can be all of these simultaneously or none at all (Cavanagh, 2007). Of noteworthy interest are the similarities between the Internet and biological systems highlighted by Terranova, who describes the Internet as a technical, informational space driven by the biophysical tendencies of open systems (i.e., divergences, incompatibilities, and rising entropic levels of randomness and disorganization) (2004: 3), a claim that seems tenable given the Internet's sheer number of human participants, creators and consumers. At once a concept, place, and thing, the Internet is a nebulous and dynamic noun that may be best conveyed not with a strict definition, but a metaphorical description: the Internet and its diverse range of applications are the "communication fabric of our lives" (Castells, 2010: xxvi). And if the Internet is a fabric, then the connections of the World Wide Web are its threads. Using Terranova's terminology of a hypernetwork, or meshwork potentially connecting every point to every other point (2004: 41), the Web is herein defined to be the hypernetwork over which people can access e-mail and surf the ever-growing collection of websites, documents, data and media available to the global online public, although this collection may at times find material prioritized, restricted, or censored by individuals, companies, institutions, or governmental bodies. It is a "veritable info-planet" which, when modelled topographically, is composed of major websites, peripheral "land masses," and smaller collections of information archipelagos, as well as large info-islands of high-security intranetworks of military and financial institutions (Lawrence and Giles, as cited by Terranova, 2004: 38). The areas of the Internet under consideration in this paper include all of the above save the "info-islands" of protected information contained in private networks, the proprietary information owned by businesses or corporations, and the majority of academic and scientific knowledge contained in journal collections, databases and detailed market research available to many university students. Research materials to which access can be purchased by an unaccredited member of the public on a one-time or subscription basis are still included for consideration.

Today, the Internet and Web have become potentially critical to entrepreneurship in the developed world in two central ways: 1) as marketplace, and 2) as an informational resource with the ability to influence entrepreneurial search, networks, learning and knowledge. This vast configuration of hardware and software used to communicate, in real time, information supplied and requested around the world, is arguably the most dynamic collection of human information to ever exist as well as the primary tool for 21st century social networking. It is particularly suited to facilitating the development of multiple weak ties, useful for "just-in-time" social connections as well as for providing information and opening up opportunities at a low cost (Granovetter, 1974, as cited by Cavanagh, 2007; Castells, 2010: 388). Yet despite the now-considerable proximity of these powerful tools for search and networking, both of which have been established to be vital components of entrepreneurial activity (Ardichvili et. al., 2003), until this point there has been little to no investigation into the effects of the Web on entrepreneurial value creation. While the advent of its widespread use has arguably transformed the typical process of searching for and developing novel means-ends relationships, the ways in which this occurs is an as-yet underexplored area, and interestingly so.

With modern technological advancements in computing, data processing and storage, and the emergence of "knowledge workers" as the most valuable assets of their companies (Castells, 2010: xxiii), information has clearly become central to, and inextricable from, both technology and commerce. At the same time, rapid increases in

network infrastructure and decreasing communication prices have created a culture of “real virtuality” and type of “hybridized everyday life” (2010: xxix) in which the Web and its associated routes to information (i.e. search, networking, and communication) are integrated into the daily routines of digitally connected people. Respondents to this paper’s qualitative questionnaire cited the Internet’s wealth of information, speed of delivery and low cost access as reasons it has become for them a primary source of information. Even those who cite books and journals as primary sources note that these are often still accessible via the Internet, highlighting the importance of the Net to the delivery of many types of information available today. In the late 1970s, Lyotard noted that nascent “technological transformations” such as “computers and their languages...information storage and data banks, telematics and...intelligent terminals...can be expected to have a considerable impact on knowledge,” and that these technologies were “already changing the way in which learning is acquired, classified, made available, and exploited” (1979: 3-4). Therefore, it can be assumed that the rapid technological advances in network computing of the past thirty years have continued to dramatically alter the way humans approach information and knowledge, and thus, entrepreneurial activity.

The field of entrepreneurship covers how, by whom, and with what effects opportunities to create future goods and services are discovered, evaluated, and exploited, involving the study of sources of opportunities and the processes of discovery (Venkataraman, 1997; Shane and Venkataraman, 2000). Building on Kirzner (1997), entrepreneurship is defined for the purpose of this paper to be any form of self-employment in which one exploits a new means-ends relationship that has been earlier identified as an opportunity. Opportunity is defined as a chance to meet a market need, interest or want through a creative combination of resources to deliver superior value (Schumpeter, 1934; Kirzner, 1973; Casson, 1982, as cited by Ardichvili et. al., 2003). Recent literature suggests it is those with the longest experience with the Web who are likeliest to use it for beneficial purposes, such as self-employment (Hargittai and Hinant, 2008). This paper assumes that quantitative studies of the type proposed herein should begin with those who have been most affected by the technology, in order to ascertain any initial effects. Therefore, this particular paper focuses on young adults, who due to age, high levels of ICT usage, and connection to an online networking platform would potentially be more likely to experience the integrated, “hybridized everyday life” of which Castells spoke than other age groups. However, with the obstacles to high-growth new venture creation posed by a young age and relatively little experience, the definitions of entrepreneurship and opportunity are here kept deliberately broad, including, among others, such activities as starting a business, being a paid blogger or web writer, or selling, reselling, or distributing products at a profit. The intention to engage in activities of this nature for one’s personal benefit is defined as “entrepreneurial intention.” This research aims to create a conceptual framework of the relationship between usage of the Internet, with its documented relationships to information, learning, knowledge, education, and networks (Bonafadelli, 2002, Attewell and Battle, 1999, Livingstone and Helsper, 2007 as cited by Hargitai and Hinnant, 2008; Terranova, 2004; Brabazon, 2007; Cavanagh, 2007; Hassan, 2008; Castells, 2010) and entrepreneurial intention, opportunity recognition and pursuit among young adults, specifically considering the potential impact of the Web on elements of entrepreneurial awareness and information asymmetry, factors earlier identified by Ardichvili et. al. (2003) as integral to the opportunity identification process.

2.2 Internet Impact on Information, Knowledge & Economy

Knowledge and information, as they relate to value creation, are closely tied to the mode of production on which a particular economic system is based, with transmission dependent upon a society's basic organisational and communication structures. Building upon Marxian structuralist theory (Stalder, 2006: 5), Castells asserts that as integral elements of the mode of development, whether agrarian, industrial, or informational, knowledge and information have always been critical to value creation, because economic production is always based on some level of knowledge and the processing of information. Yet what sets the current historical moment apart, he continues, is that in today's "informational" society, due to new technological conditions, information itself -- its generation, processing, and transmission-- has become the main source of productivity and power (2010: 16-21). Other recent literature concurs that this foregrounding of information was made possible by the introduction of a dynamic and expandable global communication structure: the network (Terranova, 2004; Cavanagh, 2007; Hassan, 2008). The concept of a "network society," or a society based upon systems of interconnected nodes (Castells, 2010: 501) has arguably become both the dominant metaphor (Cavanagh, 2007) and paradigm (Castells, 2010) for the modern world, the "common form that tends to define our ways of understanding the world and acting in it" (Hardt and Negri, 2004: 142 as cited by Cavanagh, 2007: 23). It is the unique potential of the network for limitless expansion that has seen the rise of the network society linked to the emergence of new geopolitical formations, in particular, to the open and unbounded space of the post-cold-war global empire (Hardt and Negri, 2000, as cited by Terranova, 2004).

And yet, "the network," as it refers to the global informational landscape, is becoming "less and less a description of a specific system, and more a catchword to describe the formation of a single and yet multidimensional informational milieu – linked by the dynamics of information propagation and segmented by diverse modes and channels of communication" (Terranova, 2004: 41). Due to the pervasiveness of new technologies in a society where information is an integral part of human activity, all processes of individual and collective existence are directly shaped by the new technological medium (Castells, 2010: 70). Indeed, the "inclusion/exclusion in networks, and the architecture of relationships between networks, enacted by information technologies" are forces so influential they are able to "configure dominant processes and functions in our societies" (2010: 501). The result is a "new economy" organized around global networks of capital, management, and information, whose access to technological know-how is at the roots of productivity and competitiveness (2010: 502) and in which "intangible assets, above all *ideas*, are 'more powerful than controlling space and physical capital'" (Hassan, 2008: 5; Rifkin, 55, as cited by Hassan, 2008: 5). In this new or "digital economy," various productive forms, from web design and multimedia to chat and mailing lists, though they may not be produced by capitalism in any direct, cause-and-effect fashion, are inherently part of a process of economic experimentations with the creation of monetary value out of knowledge/culture/affect (Terranova, 2004: 79) simply due to the information they contain, because as Castells states, in this age, it is information that has become the fundamental source of productivity and power. Young adults, ages 18-35, who are experimenting at high rates with novel modes of value creation using ICT, obviously play a predominant role in this economy of digital production. It is their entrepreneurial activity that will be investigated in this paper.

However, despite the Internet's arguably universal social and economic impact, Internet access is still far from universal (Cavanagh, 2007: 65). The communities that comprise the information poor, identified by Childers and Post in 1975, do not know which formal channels to tap into in order to solve problems, consume television in large amounts with very little news and magazines and never books. This definition can ostensibly be updated and expanded to include little to no time spent on the Internet, as the information poor are by definition not active information seekers, locked as they are into a deficient information network (Childers and Post, 1975, as cited by Case, 2002: 97 in Cavanagh, 2007: 67). In contrast, "digital natives" have grown up with web access throughout their childhoods (Prensky, 2001 as cited by Halavais, 2009: 35, 106). Yet although the digital natives are part of a generation ICT, they do not necessarily represent the cutting edge of its use. What can be inferred is a relative level of comfort and feeling of inclusion in a search-enhanced world, as one of the first generations of people who heavily utilise of searching technologies, many of whom have become skilled at finding and evaluating information online (Halavais, 2009: 106).

2.3 From Alertness to Search to Search Engines

In the past, the alertness perspective, or the presupposition that true discoveries leading to the creation of new wealth cannot be anticipated and therefore must occur accidentally, has been the attributed cause of heterogeneity among entrepreneurs and dominated the thinking about opportunity discovery (Baumol, 1993; Kirzner, 1997, as cited by Fiet, 2007). But a growing body of findings reveal patterns in the ways that repeatedly successful entrepreneurs actually search, first scanning the environment for informational cues, or signals, then consciously narrowing their search to preferred environmental sectors (Bailey, 1986; Bar-Hillel and Faulk, 1982; Baumol, 1993; Drucker, 1985; Fiet et. al., 2004, Gaglio, 1997; Gilad et. al., 1988, Hughes, 1978, Kaish and Gilad, 1991; Keren, 1984; Koller, 1988, Newell and Simon, 1972 as cited by Fiet, 2007). In the context of the network society and the pre-eminence of a hybridized lifestyle, I propose that this narrowing may typically take place via online search, where prior knowledge about a market environment can be applied, information researched and knowledge bases expanded using web-based tools for search and selection.

The ubiquitous acceptance of the search engine as the main tool used to browse the collection of information available online should, then, be considered in an analysis of the search process. A 2005 Pew and American Life study found that search engine visits were growing rapidly among American users, approaching the frequency of the most popular use of the Internet, e-mail (Rainie, 2005 as cited by Halavais, 2009: 6). Terranova characterizes the informational space of the Internet as an extended database, crossed by repeatable sequences of commands enabling the retrieval of documents located at different points in the planet (2004: 46-47). Considering this, the skill most likely to affect the success of a search is the ability to choose the appropriate keywords (Halavais, 2009: 37) so as to transform the landscape of digital information to one that is more manageable. While Brabazon argues that Google's dominant role in this arena encourages soundbite solutions without theory or research (2007: 20), Google's role in the process of Web search and discovery cannot be ignored. Forty-three percent of the respondents to this study's quantitative survey cited Google as the website that had helped the most in the development of business opportunities, and all respondents to the qualitative questionnaire noted the primacy of Google to their processes of search and/or business idea development. Respondent C stated, "It allows

me to filter vast information held on the web to a specific area that would otherwise be lost in a...maze of data and information," stressing the concept that it is the search engine that enables navigation of the masses of information contained online. At present, Google is often the initial website utilised for this purpose.

Yet despite that respondents held in common the widespread use of Google, noteworthy differences were seen the manner in which they described processing the information the search engine returns. Search engine use is now not just as an auxiliary skill, but as an important part of a new digital literacy (Labbo, Reinking, and McKenna 1998 as cited by Halavais, 2009: 36), and the ability to search for desired information online can influence the kind of material a person finds on the Web and thus, the knowledge gap (Bonfadelli, 2002 as cited by Hargittai and Hinant, 2008). Among qualitative respondents, all of whom reported more than 10 years' experience using the Internet and a high level of comfort with search, the Internet's contribution to a personal "stock of knowledge" is substantial, verging on dependence, with the Internet appearing to function as an extension of the memory stores of the brain. Respondents B and C both commented on the Internet's effect on one's memory, with Respondent B devaluing the need for innate knowledge in favour of the know-how needed to "find the knowledge...for whatever they want to do." The Internet, stated Respondent C, "has allowed me to pick up and throw away knowledge much easier – which has affected my memory... as it is always there when I need it." Due to the age group of the respondents, many appeared to fit the definition of digital natives whose search and selection skills, as expected, had evolved alongside the technological developments of the search engine.

Building on the work of Shannon, Terranova suggests that within informational cultures, communication is crucially concerned with the problem of noise and contact (2004: 9). This is particularly an issue online, where searching for advantageous information may prove more difficult than it seems, for as Brabazon notes, the Web is large, occasionally irrelevant, filled with outdated content and ghost sites as well as increasingly corporatized (2007: 16). Common selection strategies for avoiding advertisements were present in responses to the questionnaire, with participants stating things like: "I link to hits that look like they contain information rather than advertisements" and "I ignore the advertised links." However, due to expected variation in skill level and approach to information, strategies for determining the usefulness and relevance of information differed greatly. Responses ranged from reading the Google abstract, to seeking a reputable company or organisation name, to looking for well-cited sources. In the case of the Internet, a lack of skill in this process of search and selection may result in an inverse relationship between information and meaning: the more information, the less meaning (Crasson, 1967, Baudrillard, 1983, as cited by Terranova, 2004: 14). What this signifies in actuality is that while there is definitely an abundance of information available online, the right information in an appropriate place and time is still scarce (Brabazon, 2007: 36). Research suggests that its location is concurrently impacted by the factors of usage and digital literacy, differences in which appear to produce a "knowledge gap" and "usage gap" (Van Dijk, 1997, 1999, 2005) between those who use digital technology for work and education and those who use it largely for entertainment (Hargittai and Hinant, 2008). However, according to this paper's qualitative responses, the length of time required to develop the necessary search and selection skills was relatively short, with most reporting a learning period of about a year to become technically comfortable. What comes into play, then, is a combination of

endogenous and exogenous factors like motivation (Ettema & Kline, 1977; Viswanath, Kahn, Finnegan, Hertog, & Potter, 1993), education level (Brantgarde, 1983; Wanta & Elliott, 1995) and media use (Gaziano, 1983; Griffin, 1990; Kleinnijenhuis, 1991) (all as cited by Hargittai and Hinant, 2008). Considering this, this research explicitly considers the factors of education and motivation in the form of entrepreneurial intention and will test for the existence of relationships with both idea generation and opportunity pursuit.

As entrepreneurs and potential entrepreneurs in the digitally connected world increasingly turn to the Web as a primary informational resource and vital connection to networks, we can see that the entire system of information that informs learning and knowledge has changed. This will likely have secondary effects on the major factors that influence the core process of opportunity recognition and development, including:

1. entrepreneurial awareness
2. information asymmetry and prior knowledge
3. social networks
4. personality traits, including optimism and self-efficacy, and creativity
5. type of opportunity itself (Ardichvili et. al., 2003).

Ardichvili et. al. (2003) propose that any recognition of opportunity by a prospective entrepreneur is preceded by a state of heightened alertness to information, termed entrepreneurial awareness. In an "always-on" society, where multitasking between activities has become integral to everyday life (Hassan, 2008: x), it is possible that this awareness may be increased. It is also possible, however, that the increased amount of incoming information may obstruct the identification of information critical to exploiting a specific opportunity. In addition to search and selection skill, what entrepreneurs today need is the ability to integrate the information found on the Web with one's prior knowledge with one's personal "stock of knowledge" (Schutz, 1974). Minniti and Bygrave find that while general knowledge about "how to be entrepreneurial" can be acquired only through "learning-by-doing or direct observation...specific knowledge about the chosen market may be acquired through industry experience, or, indirectly, through other means" (2001). While the Internet as it exists today can never directly transfer tacit knowledge, it can help an individual with the appropriate skills to expand the stock of explicit knowledge that s/he possesses in almost any area of interest, thereby shifting previously existing information asymmetries. The everyday use of the Internet and its implication in the ordinary work of learning, working, and communicating has done much to dismantle the notion of cyberspace as virtual reality (Terranova, 2004: 40), enabling experiences online, including the processing of knowledge and information, to be regarded by participants as at least on par with, and often more real than, those in the material world (Cavanagh, 2007: 17). It is for these reasons this paper proposes that the Web has become the central "other means" by which to gain various types of specific knowledge and develop the new means-ends relationships of which Kirzner spoke.

Long before the birth of the Internet, Hayek categorized knowledge into two major groups: scientific knowledge based upon research, and "a body of very important but unorganized knowledge...the knowledge of the particular circumstances of time and place." Hayek asserted that this practical knowledge, based on the unique information possessed by every individual of which beneficial use might be made, such as knowledge

of people, of local conditions, and special circumstances, was valuable but lacked an effective method of distribution, stating: "the method by which such knowledge can be made as widely available as possible is precisely the problem to which we have to find an answer" (1945). Castells confirms that the spread of the Net in the 1990s alongside rapid scientific development in the same era contributed significantly to the formation of a global scientific system through which knowledge and information is accessed and distributed (2010: 125). But not only have the Internet and Web impacted the first major body of knowledge, that of the international scientific community -- they have also emerged as a global method of information delivery for the second. As such, this paper seeks to frame their contributions to the formation of a new modality of entrepreneurial search and opportunity development in among populations with access.

Because the production of knowledge is rooted in collaboration, states Terranova, knowledge is inherently collective, and even more so in the postmodern cultural economy, so the widely accepted notion that the Internet materializes a kind of "collective intelligence" is not completely off the mark (2004: 83). Yet an idealised concept of the Internet as "universally distributed, constantly enhanced [or] coordinated in real time" (Levy as cited by Terranova, 2004: 85), is technically incorrect, for, in reality, due to various asymmetries of information and access, it is impossible that this intelligence will be distributed universally, let alone evenly. Therefore, despite that the global network appears to offer infinite possibilities for linking supply with demand, due to pre-existing conditions beyond the scope of technology such as asymmetries of information, knowledge (Hayek, 1945; Chiles et. al. 2007), learning and experience (Minniti and Bygrave, 2001; Politis, 2005; Corbett, 2007, Ucbasaran, 2009), and human capital and resources (Haynie et.al., 2009), opportunities are still identified or recognised by some individuals and not others (Ardichvili et. al., 2003), forming the basis for a new class of entrepreneurs and entrepreneurial activity at the turn of the 21st century.

2.4 How the Net Changed the Game

According to Baumol (1990), the "rules of the game," or the macro-environmental conditions determining an economy's reward structure, strongly affect the actions of entrepreneurs and potential entrepreneurs, the level and social viability of entrepreneurship as a career, and the composition of the class of entrepreneurs in a particular society. The mutually dependent relationship that has arisen between late post-industrial capitalism and new information technologies has been articulated in the literature (Terranova, 2004: 84; Hassan, 2008: 25), though most are careful not to claim a causal relationship. Castells details the role of ICT in the expansion of global capitalism (2010: 19-21), enabled by the mechanism of the network, of which the key spatial feature is the connection between the local and the global, selectively connecting places according to their relative value (2010: xxxv). This dual characteristic of structural openness and limitless expandability (2010: 501) is particularly conducive to capitalist market expansion, which Hardt and Negri state "does not annex or destroy the other powers it faces but on the contrary opens itself to them, including them in the network" (Hardt and Negri, 2000: 166 as cited by Cavanagh, 2007: 41). Hassan concludes that the information technology revolution was "both a cause and consequence" (2008: 25) of the shift to neoliberal globalization, with the economic imperatives of an emergent globalization supercharging basic research into computers in the 1960s and 1970s and eventually introducing them to the commercial realm (2008: ix).

Technological advancements experienced from the late 1970s onward have contributed to both the visibility and viability of entrepreneurship in the developed world. Sources concur that considering the substantial liabilities of newness (Stinchcombe, 1965) involved in creating traditional brick-and-mortar businesses, it is advancements in technology that make entrepreneurship among youth increasingly attainable, enabling the acquisition of a wide-reaching portal to customers on the Web at a relatively low cost (Hannon, 2007). Jayson elaborates upon the potential of ICT to facilitate entrepreneurship:

"Entrepreneurs can be more professional with less need for capital or office space, global communication is easy and immediate. Businesses can outsource products and services and get a toll-free telephone number for nationwide access. Taking a risk isn't quite the financial leap of faith it once was" (2006).

Additionally, the likelihood that entrepreneurship will enter at some point into the career portfolios of this age group is high. US Bureau of Labor Statistics data for 2005 show that some 370,000 young people ages 16-24 were self-employed, the occupational category that includes entrepreneurs. In 1975, when the baby boom generation born in the middle of the 20th century were young adults, some 351,000 were in that category. The number of self-employed young adults in the US is projected to grow 5% from 2004 to 2014, compared with 2% growth for 1994-2004 (BLS, 2005 as cited by Jayson, 2006). Enterprising young people are getting involved, and for good reason, with one young entrepreneur noting the presence of a "frontier for possible business ideas," low barriers to entry, and the evolution of the image of the entrepreneur to one that is "cool and sexy," while Respondent D commented on the lack of "real security in other jobs. You know you're not going to fire yourself."

In many cases, entrepreneurship that relies heavily on the Internet may perhaps be the most accessible way for young people to attain self-employment. Terranova names the physical and conceptual ties between technology, information, and the economy at large, noting that "the modern concept of information is explicitly subordinated to the technical demands of communication engineering (2004: 12)," an idea scaffolded by the experiences of the qualitative questionnaire respondents, who cited Internet-based information as vital to their businesses in areas as diverse as research, networks (C, G), and sales (D, G). "The outcome of the explicit interface between capital and the Internet," Terranova later continues, "is a digital economy which manifests all the signs of an acceleration of the capitalist logic of production (2004: 89)." In this process of acceleration and expansion, young Internet entrepreneurs have emerged as co-creators of the digital economy, becoming players in the capitalist system in a manner that has never been seen before. Considering this, we can assume that the "rules of the game" have indeed changed, and with continuing advances in the development and use of ICT, they can be expected to remain in flux. Based on Baumol's observations, this will likely result in changing patterns of entrepreneurial activity, which it is the aim of this paper to begin to uncover.

2.5 Young Adult Internet Entrepreneurship

Until this point, there has been little effort to look at entrepreneurship as it relates to young people, with youth mostly treated as part of the general adult population, while their specific needs and entrepreneurial potential as well as their critical contribution to economic and social progress are underestimated. There is still a general lack of in-

depth research and concrete data on youth entrepreneurship, especially as it relates to different (entrepreneurial) framework conditions and to the creation of new firms (ILO, 2006).

Yet young adults between the ages of 18-35 in developed regions are potentially the first generation of young people whose educational and working lives have been impacted by the Web and ICT on a large scale. Literature suggests that those individuals with the longest and most frequent use of the Internet are most likely to engage in activities from which they may benefit, with the level of skill also a possible significant predictor (Hargittai and Hinnant, 2008). However, others suggest that exogenous factors (individual, such as length of experience, and situational, such as frequency of use) do not have strong explanatory power when used to model entrepreneurial activity (Krueger et. al., 2000), and that intentions models are more accurate (Howard et. al., 2001, as cited by Hargittai and Hinnant, 2008). In either case, based on the literature, this paper assumes that this 18-35 user segment may be likely to engage in activities from which they may benefit, and this includes entrepreneurship. It is for this reason that this is the user group on which this research is focused, with length of experience with the Internet, frequency and type of use identified as independent variables in a binary logistic regression analysis. However, as these are exogenous factors and may not have the explanatory power sought by the research, an ordinal probit analysis will also be used to assess their bearing on an overall score of entrepreneurial intention, along with additional independent variables centred on the importance of the Net and obstacles to idea implementation.

2.6 Research Questions and Propositions: Binary Logistic Regression Analysis

Taking into consideration the limitations posed by the relative homogeneity of the sample, which is primarily composed of educated young adults in the developed world, the central research question of the regression analysis is to determine what effects, if any, do varying levels of experience with the Internet, hours per day of usage, and percentage of time online for work or business have on the likelihood of idea generation and implementation. Future research studies are highly recommended to ascertain a more representative model of the population based on greater sample diversity. As the dependent variables of idea generation and implementation are binary and categorical, to assess this, a binary logistic regression model will be used to test the following set of propositions.

Six propositions mapping roughly to two of the opportunity identification factors defined by Ardichvili et. al (2003) were constructed to test the above research questions. The propositions focus on length, frequency, and purpose of use of the Internet and concurrent effects on the factors of entrepreneurial awareness, determined by idea generation, and information asymmetry, as seen in opportunity pursuit and the explicit/tacit knowledge acquisition it demands.

Proposition 1: Those with more years of experience using the Web will have generated entrepreneurial ideas at a greater rate than those with fewer years experience.

Proposition 2: Length of time spent using the Web per day will have little to no relevance on whether or not an individual has generated entrepreneurial ideas.

Proposition 3: Those who spend greater amounts of time online for work or business are more likely to generate entrepreneurial ideas than those who spend time online for other purposes.

Proposition 4: Those who spend greater amounts of time online for work or business are more likely to implement their entrepreneurial ideas than those who spend time online for other purposes.

Proposition 5: There is a relationship between how important the Internet is to one's most significant entrepreneurial idea and the likelihood that an entrepreneur has implemented any ideas in practice.

Proposition 6: There is a positive correlation between one's overall entrepreneurial intention level and the likelihood of online idea generation.

2.7 Internet Effect on Entrepreneurial Intentions

Yet although 18-35 year olds in the US and UK may generally have high levels of experience with the Web, they still produce the least amount of entrepreneurial activity. This holds true around the world. Research in 41 countries found that only 12% of entrepreneurs were aged between 18 and 24 (Reynolds et. al., 2003, as cited by International Labour Organization, 2004). Although entrepreneurial activity in the US is at its highest point in a decade and half, the 20-34 age group produces a substantially lower rate of entrepreneurship than other groups (Kauffman, 2009). Across the Atlantic, entrepreneurial activity is lowest among those under 25, who also consider themselves most lacking in enterprise skills (Harding & Bosma, as cited by Athayde, 2009). Some reasons why this is a global phenomenon include the liabilities of newness experienced by potential youth entrepreneurs worldwide: young people have less capital, in the form of skills, knowledge and experience, savings and credit, business networks and sources of information. Banks and financial institutions regard them as a high-risk group because of their lack of collateral and business experience (International Labour Organization, 2004). However, findings in the US suggest the desire of young people to become entrepreneurs is clearly on the rise. Consistent with Baumol's observations about the changing rules of the game affecting the makeup of the class of entrepreneurs (1990), it appears that the possibility of self-employment has come to the forefront for young people as an attractive career choice made accessible by the Internet, perhaps increasing overall entrepreneurial intentions.

2.8 Research Questions and Propositions: Ordinal Probit Analysis

Although the desire to be self-employed in no way determines if it will become a reality, entrepreneurship scholars find that intentions to be the single best predictor of planned behavior (Bagozzi et. al., 1989 as cited by Krueger et. al., 2000), and these recent figures expressing young people's intentions to become self-employed are significantly higher than the stated self-employment rates gathered from the 1979 cohort of the National Longitudinal Survey of Youth. Data from this in-depth, pre-ICT survey found only 24.8% of men and 16.5% of women in their sample report ever being self-employed, with current self-employment rates at 8.8% and 5.5% for men and women, respectively (Ferber and Waldfogel, as cited by Fairlie, 2005). Recent research shows that 4 in 10 young people in the US would like to start their own business in the future, while another 37 percent believe starting their own business is a possibility (Kauffman, 2007). A 2006 Junior Achievement survey found that 71% of middle and high school

students would like to be self-employed at some point, up from 64% in 2004. Stated intentions appear to result in a small but significant rise in actual self-employment -- from 2000-2005, the number of self-employed people in the USA under 21 rose from 142,000 to 188,000, according to the Small Business Administration's Office of Advocacy (Hannon, 2007). Thus, another set of four propositions were constructed to determine what relationship, if any, exists between varying levels of experience with the Internet, hours per day of usage, and percentage of time online for work or business and an individual's level of entrepreneurial intention. As the dependent variable of entrepreneurial intention is ordinal and continuous, an ordered probit model was used to assess the following propositions:

Proposition 7: A positive correlation exists between one's years of Internet experience and level of entrepreneurial intention.

Proposition 8: Hours per day of Internet use is not related to one's level of entrepreneurial intention.

Proposition 9: Amount of time the Internet is used for work or business is related to one's level of entrepreneurial intention.

Proposition 10: A positive correlation exists between the level of relevance of the Internet to one's most significant business idea and one's level of entrepreneurial intention.

With these ten propositions, this paper intends to develop the foundation for a conceptual framework of the ways in which the Internet influences entrepreneurial intention, opportunity identification and pursuit among young people in the hopes that it may serve as the groundwork for future research on the impact of the Internet on 21st century entrepreneurship and value creation.

3. METHOD

3.1 Sample

This paper considers data collected in an online survey conducted in July 2010. Study participants included 104 18-35 year-olds from various regions of the world, with highest representation from the United States and United Kingdom. To begin, the instrument was entered into a third-party online survey tool and promoted using the social networking website Facebook. Participants were requested to access the third-party website and complete the survey. 104 independent responses were collected in total, and the exact number of cases N for each regression analysis is specified in the results of each analysis. All respondents identified themselves within the designated age range, with the mode ages being 24 and 27. Gender balance was somewhat skewed, with 62% of respondents identifying as female and 37% as male. The most represented racial or ethnic categories were Asian, White and Mixed, comprising 29.7%, 24.2%, and 17.6% of respondents, respectively. The group was overwhelmingly educated; nearly half (49%) of respondents reported having completed at least an undergraduate degree, and nearly a quarter (24%) postgraduate. Internet familiarity was high, as more than two-thirds of respondents (68%) have over ten years' experience using the Internet. Table I is a summary table of the sample population. Frequency tables with more detailed data about the sample are included in Appendix A.

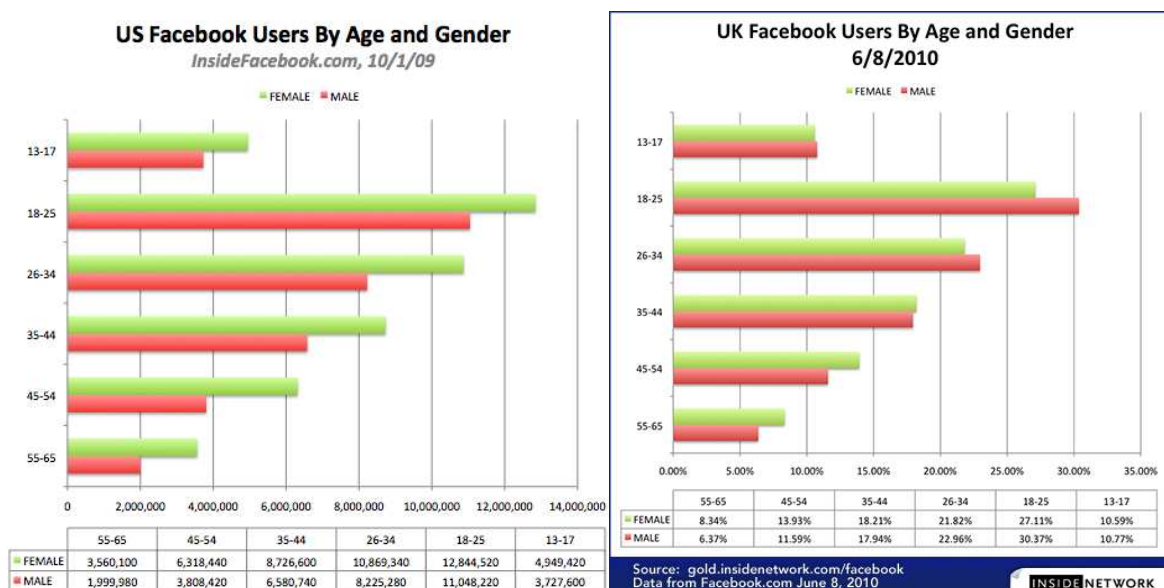
The final sample size of 104 can be considered valid as samples of approximately 100 respondents have been commonly utilised in recent entrepreneurial literature (Scholes, 2007; Kruger et. al, 2000), and more than 20 responses can be regarded as a large sample size (Hair et. al, 2005).

Table I: Sample Summary

Total Respondents	104
Gender	Men: 37%
	Women: 63%
Country of Residence	US 58%
	UK 31%
Education	Undergraduate: 49%
	Postgraduate: 24%
Net Use	7-10 yrs: 27%
	10+ yrs: 68%
Idea Generation	YES (online): 74%
	YES (offline): 67%
Implementation	YES: 34%

Figure I is a graphical representation of the user demographics of the social networking site Facebook in the US and UK by age and gender. According to self-reported statistics, nearly half of all Facebook users in the US are in this study's target age range of 18-35 (Inside Network, 2009). For this reason, and because this paper hoped to reach Internet users, this was the platform was chosen to establish contact with potential respondents. The survey was promoted to approximately 800 users; the response rate of 104 was therefore approximately 13%.

Figure I: Facebook Demographic Breakdown



A limitation of this decision is that by opting to conduct an Internet-based medium to reach the target demographic, individuals were excluded who do not have Facebook accounts. Clearly, these characteristics of the sample population prevent it from being representative of any population as a whole, either locally or globally. However, as this paper seeks more to ascertain the effects of the Internet among regular users and does not seek to comprehensively detail population-level trends, the assumption is made that by studying those "digital natives" in whose hands the Internet can be a potentially powerful asset in pursuing opportunities, what may emerge are not only trends among this demographic but also important implications for future research among groups who are not yet using the Internet to its full potential.

3.2 The Instrument

Participants were asked to complete a survey addressing their demographic background, years of experience using the Internet, entrepreneurial intention level, entrepreneurial idea generation and opportunity recognition, pursuit of recognised opportunities, the importance of the Internet to one's most significant business idea, primary obstacle to pursuing ideas, and primary obstacle to using the Internet to do so. The majority of the questions were multiple choice, with the option to select "Other" and specify an answer; however, entrepreneurial intention and Net importance to ideas were rated on a 10-point scale. Respondents were also invited to make additional comments, with some suggested areas being past entrepreneurial experience, thoughts on entrepreneurship, the Internet or the relationship between the two, as well as to participate in a follow-up qualitative questionnaire, to which 9 responses were received. There was no notable difference between the makeup of respondents to the quantitative survey and qualitative questionnaire. A summary of the quantitative survey questions and responses are included in Appendix B. Data from the qualitative questionnaire is integrated into textual analysis throughout this paper. Full results are available in Appendix C.

Preliminary content validity was established by preparing, examining, and amending the content of the test to ensure a precise fit within the testing universe or content domain. The bounds of the content domain were determined by expert consultation and a thorough review of past literature by key theorists in the topic areas of the Network Society, entrepreneurial potential in young adults, entrepreneurial intention, young adults' use of the Internet, and opportunity identification and development. Content domain was broken down into the subcategories of demographic statistics, web usage, idea generation, and pursuit of opportunities, and each test item was developed and assessed for its fit within the identified subcategories. The results of this initial inquiry as well as the collection of further detail about the content domain should provide additional information about its structure and boundaries, and more confidence about the content validity of future investigations.

3.3 Variables

Two types of statistical analysis were used to process survey results. Logistic regression analyses were conducted on the 3 binary (yes/no) dependent variables of online idea generation, offline idea generation, and practice, considering 4 independent and 4 control variables selected from an original 15. Additionally, an ordered probit analysis was conducted on entrepreneurial intention, considering 8 independent and 4 control variables. One variable, entrepreneurial intention, functions as an independent variable

in the logistic regression analysis but is analysed as a dependent variable in the ordered probit analysis. Two variables that act as dependents in the logistic regression analyses, online and offline idea generation, serve as independent variables in the ordered probit analysis of entrepreneurial intention.

3.3.1 Dependent

The binary logistic regression analysis utilized 3 categorical binary dependent variables, 2 regarding idea generation and 1 regarding implementation or practice. Two questions were asked regarding idea generation. The first inquired as to whether or not usage of the Internet had incurred any ideas for Internet entrepreneurship, defined as independent business opportunities. As a variable, this was referred to as "online" idea generation. The second was whether or not ideas had been generated that could be put into practice without the use of the Internet, considered "offline" business ideas. The third independent variable was whether or not participants if they had ever put any of their business ideas, online or offline, into practice. If participants answered "yes" to any of these questions, this was coded as 1, whereas an answer of "no" was coded as 0.

In the ordinal probit analysis, the only dependent variable is that of entrepreneurial intention.

3.3.2 Independent

In order to explore what aspects of internet usage may have an effect on entrepreneurial activity, a sizable number of independent variables and control variables were defined from survey responses. Original independent variables included the following:

- 1) yrsWeb: years of Internet use
- 2) hrsWeb: hours per day of Internet use
- 3) workuse: percentage of time used for work or business
- 4) entreintent: entrepreneurial intention
- 5) site: most helpful website or site type for business idea development
- 6) Netimportance: importance of Internet to most significant idea
- 7) Netincome: percentage of income derived from Net-related business
- 8) obstacles: general obstacles to idea implementation
- 9) Netobstacles: obstacles to using Internet to develop ideas

Control variables included the following:

- 10)age
- 11)gender
- 12)education
- 13)ethnicity
- 14)birth: country of birth
- 15)residence: country of residence

Variables considered in the final logistic regression analysis were numbers 1-4 and control variables 10-13 from the above. Numbers 5-9 and 14-15 were dropped due to calculation issues; however, 6, 8, and 9 are included in the ordinal probit analysis of entrepreneurial intention. In addition to these, other variables considered in the final probit analysis were online idea generation, offline idea generation, and control variables 10-13 from the above. Type of site most helpful to idea development and amount of income earned from one's online business idea, numbers 5 and 7, were eliminated from analyses as survey results for these variables posed unexpected calculation issues.

4. EMPIRICAL RESULTS

4.1 Univariate Testing

Using SPSS, parametric and non-parametric univariate tests, including cross-tabulation chi-square tests and independent means T-tests, were conducted in order to determine potential patterns and relationships between the variables. In these cases, entrepreneurial intention functions as an independent variable, and p-values of less than .05 indicate significant relationships. Copies of the output of these analyses are included in Appendix D.

Table II: Cross-tabulation Pearson Chi-Square Tests

	Online Idea			Offline Idea			Practice		
Independent	Value	df	Sig.	Value	df	Sig.	Value	df	Sig.
onlineideagen									
offlineideagen	6.774	1	.009*						
practice	8.799	1	.003*	2.857	1	.091#			
obstacles	8.517≈	7	.289	10.748≈	7	.150	9.897≈	7	.194
Netobstacles	20.239≈	5	.001*	5.117≈	5	.010*	16.574≈	5	.005*
Control									
gender	11.506≈	2	.003*	3.560≈	2	.169	5.697≈	2	.058#
ethnicity	4.893≈	7	.673	13.350≈	7	.064#	7.476≈	7	.381
education	4.922≈	4	.295	1.366≈	4	.850	4.412≈	4	.353

Notes:

- (a) Significance: # $p < 0.1$, * $p < .05$, ** $p < .001$
- (b) onlineideagen: the generation of Internet-based business ideas; offlineideagen: the generation of non-Internet based business ideas; practice: business idea implementation; obstacles: general business obstacles; Netobstacles: obstacles to using the Net for business idea development
- (c) ≈: Minimum expected cell frequency assumption of chi-square may be violated as less than 80% of cells have expected count less than 5. Results should be taken with caution and tests repeated with a larger sample population.

Crosstabulation chi-square tests for independence are used to explore the relationship between two categorical variables (Pallant, 2005). Therefore, the categorical dependent variables were crosstabulated with all nominal variables: gender, ethnicity, education, online and offline idea generation, business obstacles, and Net obstacles. Notable significant relationships between online and offline idea generation, online idea generation and practice, and online idea generation and Net obstacles are suggested by

the data. Entrepreneurial behaviour has been seen to be influenced by gender (Harding and Bosma, 2006; as cited by Athayde, 2009), and from these tests, gender did indeed appear as a significant factor in online idea generation, entrepreneurial intention, and practice, with 2-sided p-values of .003, .001, and .000, respectively, but not to offline idea generation. The education variable may be considered here as nominal as it is organised into subgroups by number of years.

Independent samples T-tests are used to compare the mean score on some continuous variable for two different groups of subjects (Pallant, 2005). In these tests, the variables of Web usage and education are considered continuous, and are tested for their impact on online idea generation, offline idea generation, and practice along with the other continuous variables of age, Net importance to idea and entrepreneurial intention. Entrepreneurial intention was seen to have a high level of significance to all three variables of online and offline idea generation and practice, with p-values of .000, .004, and .000 respectively. This suggests significant differences in the average level of entrepreneurial intention of those who did, and those who did not, report generating and implementing ideas.

Table III: Independent Samples T-Tests

	Online Idea			Offline Idea			Practice		
Independent	t	df	Sig.	T	df	Sig.	t	df	Sig.
yrsWeb	.164	97	.870	1.036	93	.303	.237	93	.813
hrsWeb	-.167	97	.868	.161	93	.873	.660	93	.511
workuse	2.027	42.956	.049*	1.718	93	.089#	2.050	75.006	.044*
entreintent	5.196	43.413	.000**	2.992	48.350	.004*	7.927	91.845	.000**
Netimportance	4.829	33.587	.000**	.880	93	.381	2.259	85.038	.026*
Control									
age	-.989	97	.325	2.114	60.312	.039*	1.428	93	.157
education	-1.45	97	.150	-.709	93	.480	-1.25	93	.215

Notes:

(a) Significance: # p<0.1, * p<.05, ** p<.001

(b) yrsWeb: years of experience with the Web; hrsWeb: hours per day of Web use; workuse: percentage of time the Web is used for work or business (measured in increments of 25%); entreintent: entrepreneurial intention, measured on an 10-point scale (1-10), with 10 marked if a business idea had ever been implemented; Netimportance: importance of Internet to most significant business idea, measured on a 10-point scale (1-10).

The importance of the Internet to one's most significant business idea was found to have a significance level of .000 when T-tested against online idea generation and of .026 against implementation. This indicates significant differences in the importance of the Net to ideas between those who have generated online ideas and those who have not. For those have implemented ideas, the mean importance of the Net to their ideas was higher than for those who have not put ideas into practice. As literature indicates that length of experience using the Web can have an impact on how it is used (Hargittai and Hinant, 2008), total years of Internet experience and hours per day of Internet use were T-tested against the dependent variables. No significance was noted, which is in keeping with Krueger et. al.'s assertion that modelling only exogenous factors that are individual (e.g., years of experience) or situational (e.g., total hours per day of use) often results in little explanatory power (2000). However, when the amount of time used for work or

business was tested, which arguably better reflects the endogenous factor of intention, significance was seen in the cases of all 3 dependent variables, with p-values of .049, .089, and .044 for online idea generation, offline idea generation, and implementation, respectively, suggesting that those engaged in the entrepreneurial activity of idea generation and implementation may be using the Internet more for work or business than those who are not.

The control factors of age and education did not appear to contribute significantly to online idea generation or implementation; however, for offline idea generation, a difference in the mean ages of those who have and have not generated ideas is suggested by a significant p-value of .039.

4.2 Multivariate Testing

4.2.1 Correlation Coefficients

Pearson product-moment correlations provide a numerical summary of the direction and strength of the linear relationship between two variables, and low correlation coefficients indicate autonomy of independent variables (Pallant, 2005). The strength of relationship guidelines used here are as follows: $r = \pm .10-.29$ small; $r = \pm .30-.49$ medium, $r = \pm .50-1.0$ large (Cohen, 1988 as cited by Pallant, 2005). Coefficients were calculated for all independent variables. Most were found to be suitable and sufficiently independent for further multivariate analysis; however, country of birth and country of residence had high correlation coefficients (.8+) and were therefore dropped from analyses due to multicollinearity issues. A full table of correlation coefficients for study variables is included in Appendix E.

4.2.2 Logistic Regression

A logistic regression analysis was conducted for each of the 3 binary categorical (yes/no) independent variables of online idea generation, offline idea generation, and implementation/practice. The results of the analyses are reported in Table IV. All 3 models showed significant goodness of fit. Two showed a highly significant p-value of 0.000. The models will be discussed individually below. A copy of the full results is included in Appendix F.

TABLE IV: Logistic Regression Analysis

	Model 1: Online Idea	Model 2: Offline Idea	Model 3:
Independent			
yrsWeb	.404	.247	.508
hrsWeb	-.332	.049	.206
Workuse	.356	-.053	-.899
Entreintent	.391*	.217*	1.191**
Control			
Age	-.161#	.092	.033
Gender	-1.991*	-.371	.113
Ethnicity	-.080	.020	-.069
Education	.161	-.199	-.398*
Constant	4.499	-2.865	-10.908
Model Diagnostics			
N	90	87	86
LR Chi-square	29.171	13.931	62.462
Df	8	8	10
P value	.000**	.084#	.000**
Log Likelihood	73.134	98.158	48.774
Overall Predictive	80%	73.6%	91.9%
Cox & Snell Pseudo	.277	.148	.516
Nagelkerke R ²	.408	.204	.711
Hosmer and	.240	.412	.000

Notes:

- (a) Significance: # p<0.1, * p<.05, **p<.001
- (b) Variable values in the table are the B values (regression coefficients)
- (c) yrsWeb: years of experience with the Web; hrsWeb: hours per day of Web use; workuse: percentage of time the Web is used for work or business (measured in increments of 25%); entreintent: entrepreneurial intention, measured on an 10-point scale (1-10), with 10 marked if a business idea had ever been implemented.

Model 1, Online Idea Generation, focuses on whether or not respondents found that the Internet helped them to identify independent business opportunities. The model is highly significant at the 0.000 level, with an overall predictive accuracy of 80%. Pseudo R² values suggest that between 27.7% and 40.8% of the variability is explained by this set of variables. Hosmer and Lemeshow goodness-of-fit test value is larger than 0.05, showing support for the model. Two control variables and one independent variable showed significance; age, with a weak significance, gender, with significance, and entrepreneurial intention, with high significance. These variables reflect one's perception of self-efficacy, on which opportunity recognition partially depends (Kruger et. al, 2000). Online idea generation appears to be positively correlated with entrepreneurial intention, with the odds of having generated an idea increasing by 1.478 for each increase of a point in entrepreneurial intention.

Model 2, Offline Idea Generation, considers whether or not respondents have had business ideas that are implementable without the use of the Internet. The aim of this model is to ascertain if use of the Internet is related to the generation of non-Net related

ideas in addition to Net-related ones. The model is significant at the 0.084 level, with pseudo R^2 values suggesting that between 14.8% to 20% of the variability is explained by these variables. Hosmer and Lemeshow goodness-of-fit test value is larger than 0.05, showing support for the model. Overall predictive accuracy is 73.6%. Again, the only independent variable that showed significance was entrepreneurial intention, underscoring the relationship between entrepreneurial intention and idea generation.

Model 3, Implementation, centres on whether or not respondents have actually pursued or implemented any of their business ideas. A highly significant p-value of 0.000 and overall predictive accuracy of 90.8% show strong support for the model. Pseudo R^2 values suggest that between 48.5% and 67% of the variability is explained by this set of variables. As expected, the independent variable of Entrepreneurial Intention showed extreme significance in the model: for each additional point, the chance that a particular respondent had implemented an idea was 3.292 times higher, highlighting the strong relationship between intention and implementation. Interestingly, none of the other independent variables were found to be significant. However, these variables were expected to have a substantial bearing on Entrepreneurial Intention as a whole, and thus are investigated further in the probit analysis of Entrepreneurial Intention in the following section.

4.2.3 Ordered Probit

An ordered probit analysis is appropriate in the case of an ordinal continuous dependent variable such as Entrepreneurial Intention. In this analysis, online and offline idea generation were treated as independent variables factoring into intention. Other independent variables tested included years, frequency, and type of Internet usage, as well as importance of the Net to one's most significant entrepreneurial idea, general obstacles to business development and obstacles to using the Net to develop one's business ideas. This model showed exceptional fit, with all diagnostics showing a high level of significance. Pseudo R^2 values improved by approximately .35, and Log Likelihood value decreased from 336.851 to 306.817. The amount of time the Web was used for work or business, offline idea generation, the importance of the Net to the idea, and the obstacles posed to using the Net to develop ideas were the variables found to have a significant bearing on overall intention, as was the control variable of age. Model diagnostic information is included in Table V below. A copy of the full results is included in Appendix G.

Table V: Ordered Probit Analysis

	Control Variables Only	All Variables
Independent Variables		
yrsWeb		-.091
hrsWeb		-.180
Workuse		.581**
Onlineideagen		.316
Offlineideagen		.521#
Netimportance		.093*
Obstacles		-.050
Netobstacles		.205*
Control Variables		
Age	.078*	.071*
Gender	-.493#	-.258
Ethnicity	.024	-.041
education	-.193	-.202
Model Diagnostics		
N	90	87
Chi-square	14.136	59.314
Df	4	12
p-value	.007#	.000*
Pseudo R2	Cox & Snell .145	Cox & Snell .494
Log Likelihood	336.851	306.817

Notes:

- (a) Significance: # $p < 0.1$, * $p < .05$, ** $p < .001$
- (b) Variable values in the table are the B values (regression coefficients)
- (c) The dependent variable of Entrepreneurial Intention was measured on an 10 point scale (1-10), with an option for N/A=0, and recoded 1-11 in order to eliminate 0 values and prevent calculation errors.
- (d) yrsWeb: years of experience with the Web; hrsWeb: hours per day of Web use; workuse: percentage of time the Web is used for work or business (measured in increments of 25%); Netimportance: importance of the Net to most significant business idea, measured on a 10-point scale (1-10) with an option for N/A, which was considered 0, and were re-coded 1-11 to eliminate 0 values and prevent calculation errors; obstacles: general obstacles posed to idea implementation; Netobstacles: obstacles to using the Net to develop business ideas.

5. DISCUSSION AND IMPLICATIONS

5.1 Proposition Results

Proposition 1, that those with more years of experience using the Web will have generated entrepreneurial ideas at a greater rate than those with fewer years, was not supported by the data; however, the sample population was relatively homogenous in that the majority of respondents (68%) had more than 10 years of Web experience, with approximately 94% citing more than 7 years of experience. It is highly recommended that this be re-tested with a more diverse sample population.

Proposition 2, stating that the length of time spent using the Web per day will have little to no relevance on whether or not an individual has generated entrepreneurial ideas, was formulated due to the assumption that as a result of widespread variation in purpose of use, the number of hours spent using the Internet per day would not have a significant bearing on the generation of entrepreneurial ideas. This proposition was supported by the data.

Propositions 3 and 4, which stated that those who spend greater amounts of time online for work or business are more likely to generate and implement their entrepreneurial ideas than those who spend time online for other purposes, were supported by the results of the univariate tests, particularly the t-tests of independent samples. In these tests, the percentage of Internet time used for work or business was either weakly significant or significant in the cases of all 3 dependent variables. However, in the multivariate analysis, the data failed to show significance. When control variables are introduced, particularly those demographic factors which have been found to contribute to self-efficacy and thus idea implementation, it is possible that the relevance of this factor is lessened.

Proposition 5, which presumes a relationship between how important the Internet is to one's most significant entrepreneurial idea and the likelihood that an entrepreneur has implemented any ideas in practice, was initially supported by the data of the univariate tests, which suggested that the mean importance of the Net for those have implemented their ideas was significantly higher than it was for those who have not. However, due to calculation issues, this variable could not be tested in multivariate analysis. It is therefore recommended that this proposition be investigated in more depth in future research projects.

Proposition 6, that one's level of entrepreneurial intention is related to online idea generation, was strongly supported by the data, which suggests that for each 1-point increase in entrepreneurial intention, individuals are 1.478 times more likely to have generated an idea for how to create value using the Internet.

Proposition 7, that years of Internet experience is related to one's level of entrepreneurial intention, was not supported by the data. Again, the homogeneity of the sample population on the experience variable may factor substantially into this result, so it is recommended that this Proposition be re-tested with a more diverse group of respondents and these results taken with a degree of caution.

Proposition 8 is similar to Proposition 2 in that due to variation of use, the amount of time spent on the Internet per day was not expected to have a significant bearing on

one's overall level of entrepreneurial intention. This proposition was supported by the data.

Proposition 9, which assumes that the amount of time the Internet is typically used for work or business is related to one's level of entrepreneurial intention, is strongly supported by both the univariate and multivariate analyses. It should be noted that no causal relationship is claimed between these variables; instead, the primary implication of this finding is that individuals who have made the move to actualise their ideas in practice and become entrepreneurs are indeed using the Internet for work and business purposes today, providing further rationale for continued research in this area.

Proposition 10, which posits that a positive correlation exists between the level of importance of the Internet to one's most significant business idea and level of entrepreneurial intention, is also strongly supported by the results of the ordinal probit analysis. This could be because of the ways use of the Internet seems to "naturally" facilitate entrepreneurship, appearing as it does to lower start-up costs, perceived barriers to entry and increase perceived access to markets. The Web seemingly provides an accessible means for potential entrepreneurs to tackle hurdles such as these that could otherwise be significant hindrances to overall entrepreneurial intention. This will be discussed further in the implications section below. It is interesting to note, however, that not only was the importance of the Internet found to be a significant contributor to entrepreneurial intention, but so were the main obstacles involved in using it to develop business ideas, suggesting that alongside the heightened functionality enabled by new technology emerge novel obstacles to its use, and therefore to successful Internet opportunity development.

5.2 Implications

5.2.1 General Implications

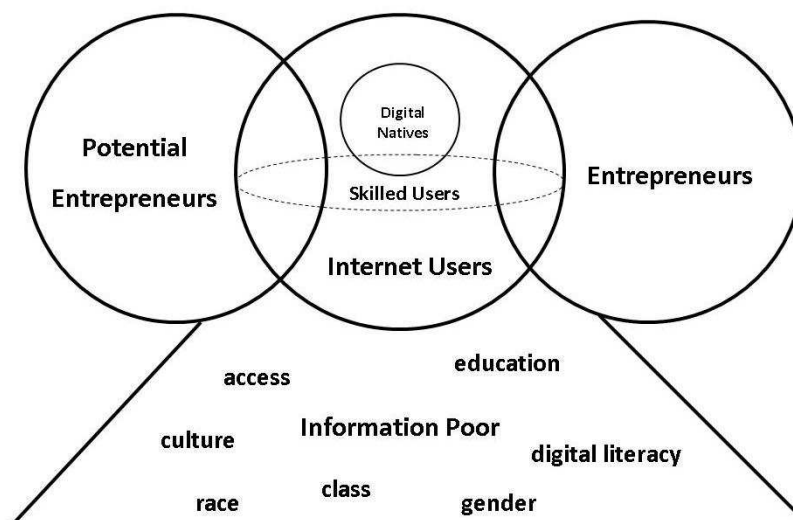
The crucial role played by the Internet in most business arenas today is undeniable, and entrepreneurship is no exception. If asymmetries of information, learning, knowledge and resources between actors (Hayek, 1945; Ardichvili et. al., 2003; Minniti and Bygrave, 2001; Haynie, 2009) and the reward structure of the economy (Baumol, 1990) are factors acknowledged to influence entrepreneurship within a society, specifically one in which information has become a central source of productivity and power (Castells 2010: 21), the Internet, with its status as a primary global informational resource impacting the aforementioned factors, can be duly expected to have a substantial effect on entrepreneurship and the type of entrepreneurs emerging today. In keeping with findings of intention literature, the exogenous factors (situational or individual) related to the Internet examined by these analyses do not appear to have a direct effect on action: specifically, years of use and hours of use per day were not found to have a bearing on either idea generation or implementation. And while work use showed initial significance in chi-squared and T-tests of independent means, differences in skill level, usage and intention may explain why statistical significance between use of the Net for business and actual implementation was limited to univariate tests, and did not extend to the multivariate analysis. Considering this, a limited, non-causal relationship between work use and practice may be assumed, but no more.

Yet although one's years of experience with the Web, hours of Web usage per day, and percentage of time used for work or business were not factors seen to contribute significantly to idea generation or implementation, the results of this research do appear

to indicate a close relationship between Web usage and entrepreneurial intention. In particular, both the amount of time the Web is used for work or business and its importance to one's most significant business idea were seen to have noteworthy bearings on one's level of entrepreneurial intention. Building on the literature, daily usage of the Net and the development of a "hybridized" lifestyle may play a role in individual's feelings of self-efficacy and overall perception of self. This is supported by the commentary of qualitative questionnaire respondents who intimated a sense of confidence that they could successfully find most information they seek (Respondents B, C, D, F, I). Additionally, the visible ways in which the Web enables sales, access to networks, and facilitates the research and evaluation of markets, suppliers, competitors, and competition likely contribute substantially to the growing perception that self-employment via the Internet is a feasible option for aspiring young entrepreneurs.

Perhaps most importantly, this paper acknowledges and considers the heterogeneity of both entrepreneurial intention and Internet skill among populations, and accounts for this in its conclusions. Not all users of the Internet will have the desire to be entrepreneurs, nor will all potential or actual entrepreneurs possess the skills necessary to use the Internet to locate relevant information, evaluate what they find, and exploit the numerous possibilities presented by the Web for market access, network connections, and more. And while it may seem appealing to conceptualise of Internet skill as a continuum bounded on one end by information poverty (Childers and Post, 1975, as cited by Case, 2002: 97 in Cavanagh, 2007: 67) and on the other by digital native status (Prensky, 2001 as cited by Halavais, 2009: 35, 106), it would be an oversimplification of network society topography to do so. Instead, the net-skill model of entrepreneurship (Figure II) is proposed as a way to map the intersections between Internet users, potential and actual entrepreneurs, including as well the information poor whose position outside of the landscape of Internet users necessarily hinders them from full participation in the modern information economy. The model, which locates digital natives as a subset of Internet users, also illustrates how the Net may be utilised by skilled users to enable potential entrepreneurs to actualise their ideas, thereby expanding the entrepreneurial landscape.

Figure II: Net-Skill Model of Entrepreneurship (Martinez Dy, 2010)



It should be stated that the components of this model are located in the context of the post-industrial capitalist economy, which relies on the hegemony of information and immaterial production, and thus necessitates the viewing of the capitalist process in a new light (Hardt and Negri, 2009: 25). Within this economic system are present numerous obstacles to practical implementation not included in the above model, barriers such as lack of time, technical knowledge, financial investment, and more. Yet although they exist, skilled Net users who are making their livings primarily via online businesses express certainty in their ability to use the information and networks facilitated by Web access to lessen perceived barriers to entrepreneurship. If these attitudes had further reach, one respondent stated, it could "lead to the demise of extreme poverty....when people are able to learn anything they want at all" (D). It is "new forms of communication," they note, that "have the potential usher in a shift in economic production relations" (G); for example, if and when enterprising individuals begin to "craft for themselves micro-economies" which can then "link with one another to exchange resources...we [could] begin losing the mega-aggregators" (D). What this implies is that the seeds of new economic ecosystems could be present in the dissemination of ICT and the ways in which it allows "almost any company in the world [to] do business with any other company...due to the near instant transfer of large volumes of information" (D). With attitudes like this providing additional evidence for the changing class of entrepreneurs resulting from the advancement and penetration of network technology, it appears that the Internet is currently ushering in the next evolution of economic relationships and systems of value exchange.

5.2.2 Implications for Future Research: Usage, Search, and Self-Efficacy

As a preliminary inquiry into the effects of the Internet on entrepreneurship, this paper identifies a number of important implications for future research. In order to obtain results of the effects of frequent Web usage, some degree of homogeneity among the sample population in the arena of Internet familiarity was expected prior to beginning the study. However, it is acknowledged that this lack of diversity limits the degree to which the results can be applied. Therefore, it will be critical to conduct future investigations with a more diverse sample population to more accurately represent wider population trends. Longitudinal, quantitative studies with control and sample populations are highly recommended to determine unexplored differences in entrepreneurial activity between Net users and non-net users. In addition, although 17 countries of birth and 7 countries of residence were included among the sample population, the majority of respondents to the survey were from the US and UK. More specific research could thus be carried out in various regions of the world among populations with differing degrees of Internet access, purpose and levels of usage.

This study's focus on young adults leaves the field of inquiry wide open for future inquiries into the use of Internet for entrepreneurial activity among other age groups, for instance, 35-55 year olds and 55+ in order to identify trends and more completely map the landscape. Also, the quantitative nature of the main portion of this research obscures from view more exact and perhaps more edifying detail regarding the specific types of entrepreneurship facilitated by the Net. Qualitative investigations may reveal these and more, such as insights into the tacit knowledge utilised in processes of navigation, search and selection, and networking. One possibility would be to map previously identified models of opportunity search and selection to a search engine-

based search process to see if noteworthy parallels exist between the two. Both qualitative and quantitative studies would be helpful to ascertain more specifically the ways in which Internet use affects entrepreneurial intention, considering in particular endogenous factors such as self-efficacy and creativity which have been identified to have an impact on both intention and implementation. Though results suggest that the amount of usage of the Net per day can be safely eliminated as a factor contributing to entrepreneurial intention or activity, years of Internet experience should not be eliminated as easily. It is possible that once a level of comfort with search and selection is established, additional improvement to search skills may be limited due to reliance upon usage patterns, a phenomenon that, if it exists, may be similar to the inverse U-shaped relationship between experience and opportunity identification found to affect repeat entrepreneurs (Ucbasaran, 2009). This may be a fruitful area for additional research that could perhaps help to uncover the processes implicit in one respondent's comment that with the Internet, "One must always keep developing one's ability to discern" (D).

5.2.3 Implications for Educators

In conjunction with the conclusions of earlier research into entrepreneurial education, youth entrepreneurship and Internet use, which suggest strongly that Internet skill can be gained by beneficial exposure, and that entrepreneurial education programmes can help to develop entrepreneurial intention and potential in young people, the results of this study provide evidence for the inclusion in these programmes of Net-related curricula that encourages potential and nascent entrepreneurs to explore ways to maximise limited resources using online avenues. Particular effort should be made to keep students at the forefront of technological development, for example, familiarising them with current trends like the new methods of service delivery found in cloud computing. As Hargittai and Hinant find that young people who are educationally advantaged generally gain more from the introduction of new technology (2008), it is important that disadvantaged young people, positioned as they are by a combination of socio-economic factors within or on the borders of the information poor, be offered ICT-infused entrepreneurial education programmes that can bring them from the fringes of the information society to the center and help to close the gap between the haves and the have-nots.

5.2.4 Implications for Public Policy

With intention identified as a main predictor of future action, and nearly a third of respondents to the quantitative survey expressing the maximum possible level of entrepreneurial intention, it becomes clear that in favourable conditions these rising rates of entrepreneurial intention could lead to substantial growth in young adult entrepreneurship. Decision-making bodies can therefore encourage entrepreneurial value creation by shaping conducive environments for it in the arenas of finance and public policy.

Firstly, since a majority of respondents cited lack of funding or investment as a primary obstacle to the development of their business ideas, it is recommended that significant funds be made available for seed funding for qualified young entrepreneurs and small businesses. Additional funding should be set aside for the types of future research recommended in Section 5.2.2. Secondly, the negative effects of information poverty could be ameliorated by holistically addressing the complex combination of factors that

lead to this severe information asymmetry, such as the inequities in access, opportunity, education, and digital literacy included in the net-skill model of entrepreneurship (Fig. II). And thirdly, as the Net becomes increasingly corporatized, retaining Net Neutrality and network openness will be a critical concept in the coming years. Large Internet and telecoms providers in the US are currently lobbying the Federal Communications Commission for permission to tier data transmission and prioritize certain online traffic, undermining the principle of an open Internet where all data is treated equally (Gross, 2010; Shiels, 2010). It is imperative for policy-makers to take immediate and lasting action to protect Net Neutrality, for if the current plans of large providers were to be implemented, one could only imagine the disastrous consequences for nascent Internet entrepreneurs, small business owners, and the rest of the Internet-using public.

5.3 Limitations

The primary limitation of this research is that the degree of the homogeneity in the sample population prevents it from accurately representing any trends in the wider population. Furthermore, the variables of country of birth and residence were eliminated from regression analysis due to calculation issues, so any differences those survey items hoped to determine should be investigated further in future studies.

It is also acknowledged that idea generation, though indicative of entrepreneurial activity, cannot be equated to opportunity identification or evaluation and is merely a first step in this often iterative process. Subsequent steps would benefit from more detailed analysis.

It was a central aim of this study to ascertain whether or not the Internet has stimulated ideas, online or offline, and if any of them, not just the online ideas, have been put into practice. Rather than subdividing the landscape at this early stage of inquiry into Internet businesses and offline businesses, the intention was to determine the ways in which the Internet is contributing to entrepreneurship as a whole. However, it has come to light that the boundaries between offline and online businesses are increasingly blurred, as most businesses today can have an online element, whether a website, mailing list, or sales arm. A qualitative respondent summarised the reasons behind this phenomena with the comment that "for services and products with a large consumer base that is regularly online," it has become "very difficult to succeed without an online presence" (G). Due to time limitations, this paper leaves it to subsequent researchers to further investigate, categorise, subcategorise, and classify the landscape of Internet, offline, and hybrid businesses that exist today.

Because extensive preliminary tests on the survey instrument were not possible due to time limitations, some shortcomings were noted that could have contributed to the results. On the entrepreneurial intention scale, actual implementation was not set apart from the highest level of intention. Upon reflection, the rating of 10 should have been limited to those who have actually pursued ideas, with 9 as the maximum for those who have intention but have not yet done so. Rather than a single-option multiple choice question, the type of site most helpful to business development, obstacles to business implementation, and obstacles to using the Net for business development could have been re-structured as ordinal scales on which multiple responses could have been rated in order of importance, or broken down into numerous Likert scale questions for each site type or obstacle. This could paint a more complete picture of the business

implementation issues individuals face. Also, the survey did not ask respondents who had implemented ideas if the significant business idea that they scored for Internet relevance was the same idea that they had attempted to implement in practice, which may be important to consider. Similarly, the finding that individuals who have attempted to actualise their ideas are indeed using the Internet for work and business purposes is complicated by the fact that no distinction was made between use for one's employment or self-employment/personal business usage, as well as the lack of information on patterns of usage or skill among those who are using the Net for business. The results of this research suggest it is these issues that should underpin future discussions of the Internet's influence on entrepreneurship, for as Respondent G stated, "The Internet is a tool that, when used properly, can help greatly...but it's only as valuable to humanity as the number of people who know how to navigate it."

6. REFERENCES

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7. APPENDICES

7.1 Appendix A: Frequency Tables

7.2 Appendix B: Summary Results

7.3 Appendix C: Qualitative Questionnaire Responses

7.4 Appendix D: Univariate Test Results

7.5 Appendix E: Correlation Coefficients Table

7.6 Appendix F: Logistic Regression Results

7.7 Appendix G: Ordered Probit Results