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**NAVAL  
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**MONTEREY, CALIFORNIA**

**THESIS**

**VIRTUAL HUMINT: CONDUCTING HUMAN  
INTELLIGENCE OPERATIONS IN THE VIRTUAL  
ENVIRONMENT**

by

Dori Koren

September 2015

Thesis Advisor:  
Second Reader:

Carolyn Halladay  
Anastasia Norton

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**VIRTUAL HUMINT: CONDUCTING HUMAN INTELLIGENCE OPERATIONS  
IN THE VIRTUAL ENVIRONMENT**

Dori Koren

Detective Sergeant, Las Vegas Metropolitan Police Department, Counter Terrorism Unit  
B.A., University of Nevada, Las Vegas, 2006

Submitted in partial fulfillment of the  
requirements for the degree of

**MASTER OF ARTS IN SECURITY STUDIES  
(HOMELAND SECURITY AND DEFENSE)**

from the

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September 2015**

Approved by: Carolyn Halladay  
Thesis Advisor

Anastasia Norton  
Second Reader

Mohammed Hafez  
Chair, Department of National Security Affairs

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## **ABSTRACT**

The present research focuses on the concept of virtual HUMINT and the potential for recruiting human sources exclusively through virtual means. Based on the systematic review of 153 sources and the meta-interpretation of 23 studies, this thesis highlights the value for augmenting traditional HUMINT operations with virtual ones. In particular, the research shows that online social networking, gaming, and dating can serve as effective mechanisms for the virtual recruitment of human sources. Furthermore, an evaluation of Internet activity worldwide shows that most of the countries and territories that are of interest for intelligence collectors can be accessed through these environments—making virtual HUMINT not only a possibility but also a relevant option. The research also indicates that virtual HUMINT offers a particular value in reducing risk. Similar to the way drones have enhanced U.S. air operations by safely extending the military’s reach, virtual intelligence officers could recruit sources from beyond the battlefield. Virtual HUMINT may also help intelligence agencies gain better access to denied areas or places where it is especially difficult to insert personnel. Ultimately, the rapid growth of the Internet and the continuous migration from the physical to the virtual world will soon make virtual HUMINT invaluable.



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## LIST OF ACRONYMS AND ABBREVIATIONS

CIA	Central Intelligence Agency
CMC	Computer Mediated Communication
DIA	Defense Intelligence Agency
GT	Georgia Institute of Technology
GPI	Global Peace Index
HUMINT	Human Intelligence
IC	Intelligence Community
MMO	Massively Multiplayer Online
MUD	Multi-User Dungeon
ODNI	Office of the Director of National Intelligence
OSINT	Open Source Intelligence
SAIC	Science Applications International Corporation
SIGINT	Signals Intelligence
SIP	Social Information Process
SIT	Social Identity Theory
SPT	Social Penetration Theory
SWG	Star War Galaxies
TECHINT	Technical Intelligence
TSO	The SIMS Online
WoW	World of Warcraft



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## EXECUTIVE SUMMARY

The online environment has grown exponentially in the last ten years, and people increasingly are turning to the Internet to develop social ties, play games, and establish intimate relationships. This wired approach to everyday life has caused significant shifts in every industry, from sales and marketing to education and governance. Surely, the world is only experiencing the beginning of the “Internet of things,” where phones, cars, watches, and houses are interconnected through the World Wide Web.

But how significant is this migration from the physical world to the virtual world, and how does the age-old practice of Human Intelligence (HUMINT) fit into this evolution? More specifically, can the virtual relationships that are developed through online social networking, gaming, and dating be used to conduct HUMINT operations? This notion of “virtual HUMINT” may offer intelligence agencies the ability to target some of the most dangerous and remote areas of world without ever leaving the safety of the keyboard. Similar to the way drones have enhanced U.S. air operations by safely extending the military’s reach, virtual HUMINT could enable intelligence collectors to recruit sources from beyond the battlefield. To pursue this theory, I research the “can” and the “should” of virtual HUMINT and ultimately establish a basic framework for supporting virtual HUMINT operations.

Following an introductory chapter, I begin by exploring the prominent virtual environments of online social networking, gaming, and dating. These specific virtual environments, which center on computer-mediated relationships, present an optimal starting point for evaluating whether virtual HUMINT is possible. Determining the popularity of these environments and evaluating whether they extend beyond the developed world provides the needed foundation. Based on a systematic review of existing literature, Internet statistics, and website traffic, I show that access to these virtual environments has become widespread.

Internet connectivity, which serves as the foundation for virtual engagement, is rapidly growing and people from all corners of the globe are becoming increasingly more

attached to their phones and computers. As a result, traditional brick-and-mortar locations for work, school, dating, entertainment, and socializing are being augmented and in some cases, replaced by the virtual equivalents for each of these activities.

This virtual takeover is limiting face-to-face interactions and by default, the opportunity to conduct traditional HUMINT operations. When people “go out” less, they become much harder to reach in person. More specifically, it becomes far more difficult to spot and recruit a potential source at a real coffee shop or college campus when the foot traffic is replaced by web traffic. Thus, the virtual environment not only signifies advancement in technology and opportunity for innovative solutions but it also signifies the inevitable evolution of HUMINT operations.

In Chapter III, I move beyond the macro level and evaluate whether the people whom intelligence agencies would be interested in recruiting can be accessed through these environments. I first establish the “who” by conducted a systematic review of seven data sets that focus on the security, stability, and hostility of foreign countries and territories. This approach is based on the assumption that intelligence priorities focus on threats and opportunities. In other words, intelligence can provide insight into issues of crime and terrorism, as well as diplomatic relations and economic growth.

Based on this approach, I identify 42 nations and territories that are of interest and then begin researching whether these nations and territories are susceptible to virtual HUMINT. My findings reveal that most of the nations and territories that are of particular interest to U.S. foreign policy and security are engaging online. With the exception of a few (i.e., North Korea), these key countries are active users of online social networking, gaming, and dating sites. More importantly, Internet access and use is rapidly increasing in nearly all of these countries and the continued migration of new technologies to the Middle East and other parts of the world is only expected to intensify this growth.

In Chapter IV, I transition to the mechanics of virtual HUMINT and evaluate whether virtual relationships can be engineered for the purpose of collecting HUMINT. A systematic review of open source literature shows that the agent acquisition cycle, which includes the identification, recruitment, and development of a human source, can be conducted virtually. HUMINT requires the ability to identify access and placement,

cultivate strong bonds, and influence an individual to take action. A fourth requirement that is specific to the notion of virtual HUMINT has to do with the ability to develop a relationship that can remain in the virtual environment. Based on this assessment, I determine that virtual HUMINT requires the ability to infer a person's real identity and personality, develop strong bonds, produce real world results, and maintain the relationship in a virtual environment.

A systematic review of existing literature supports each of these factors, ultimately revealing that virtual HUMINT is possible. To further support this finding, I conduct a meta-interpretation of twenty-three studies that relate to one or more of these factors. Thirteen of the studies support the ability to infer a person's real identity and personality and eleven support the ability to establish strong virtual bonds and trust. In comparison, the factors regarding real-world impact and the ability to maintain a virtual relationship were only supported by three studies.

In my final chapter, I summarize the findings that support the possibility for virtual HUMINT and then transition to the notion of value. In particular, I briefly evaluate whether virtual HUMINT could be effective, efficient, and potentially safer than traditional HUMINT. Returning to the systematic review model, I discover support for all three of these assumptions. First, the literature supports the notion that traditional HUMINT operations are inherently dangerous and that a virtual equivalent may be safer. Many intelligence officers operate under official cover, while others function independent from any government association. In either case, there are limitations and inherent risks. Ultimately, intelligence collectors are often interacting with sources that are connected to dangerous organizations and as such, each face-to-face encounter that can be conducted virtually reduces this risk. Additionally, virtual HUMINT also offers a financial benefit. HUMINT, while not as expensive as other intelligence collection systems, still requires a great deal of resources, some of which can be more efficiently augmented by technology. Finally, there are a number of areas that are difficult to penetrate with traditional HUMINT operations. In particular, failed states and nations with hard-lined governments can be especially resistant. HUMINT collectors operating under official cover are likely to be challenged with recruiting potential sources that are

far removed from embassy functions, and while those in a non-official capacity may have more success, there are still significant limitations. Despite the challenges though, denied areas can still be penetrated, they just require more innovative solutions that potentially include virtual HUMINT.

In conclusion, virtual HUMINT not only seems possible but it is likely to play a significant role in future intelligence operations. Nearly all nations and territories are becoming more connected to the Internet and more importantly, most of the nations and territories that would be of interest for intelligence collection are in fact wired and participating in online social networking, gaming, and dating sites. The relationship building factors that would make virtual HUMINT possible are also supported by this thesis. These factors include the ability to infer identity and personality, develop strong virtual bonds and trust, influence real-world action, and maintain a virtual relationship. Thus, virtual HUMINT is possible and it offers significant promise in augmenting and facilitating traditional HUMINT collection.

## ACKNOWLEDGMENTS

This endeavor would not have been possible without the support of the Las Vegas Metropolitan Police Department and the visionary leadership of Sheriff Joseph Lombardo, Undersheriff Kevin McMahill, and former Sheriff Douglas Gillespie. I am fortunate to work for an organization that prides itself on excellence, innovation, and the development of future leaders. I am also grateful to Lieutenant Daniel McGrath, who encouraged me to pursue this degree in the first place, as well as my management and colleagues in CTS, who helped cover my workload while I was away.

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# I. THE CASE FOR VIRTUAL HUMINT

## A. INTRODUCTION

The present research focuses on the notion of identifying, recruiting and managing human sources exclusively through virtual means. Human Intelligence (HUMINT) in its traditional form cannot entirely be replaced by technology, nor should it. There will always be a need for human sources that place themselves in harms way to access sensitive information. However, this necessary risk is only half of the equation. The other half, which is equally dangerous, requires positioning U.S. personnel overseas to identify and recruit these human sources.

Such personnel, often referred to as case officers, are inserted into foreign lands, where their mere presence creates significant risk. Although some of this risk may be offset by recruiting sources from one area in the hopes of deploying them elsewhere; there is still often an issue of limited access.<sup>1</sup> For one, this approach limits the pool of potential sources to only those that can physically travel in and out of the target area. Second, there are a number of denied areas that are especially resistant to any outsider, regardless of whether they possess the necessary background to safely assimilate.<sup>2</sup>

This issue of limited access is where technology, and more specifically the use of virtual means to recruit sources, may serve as an effective force multiplier, augmenting and facilitating traditional HUMINT collection. Similar to the way military drones have enhanced U.S. air operations by safely extending the military's reach, virtual intelligence officers could potentially recruit sources from beyond the battlefield. Thus, the present research explores the basic idea of virtual HUMINT, as well as the potential for augmenting traditional HUMINT operations with virtual ones.

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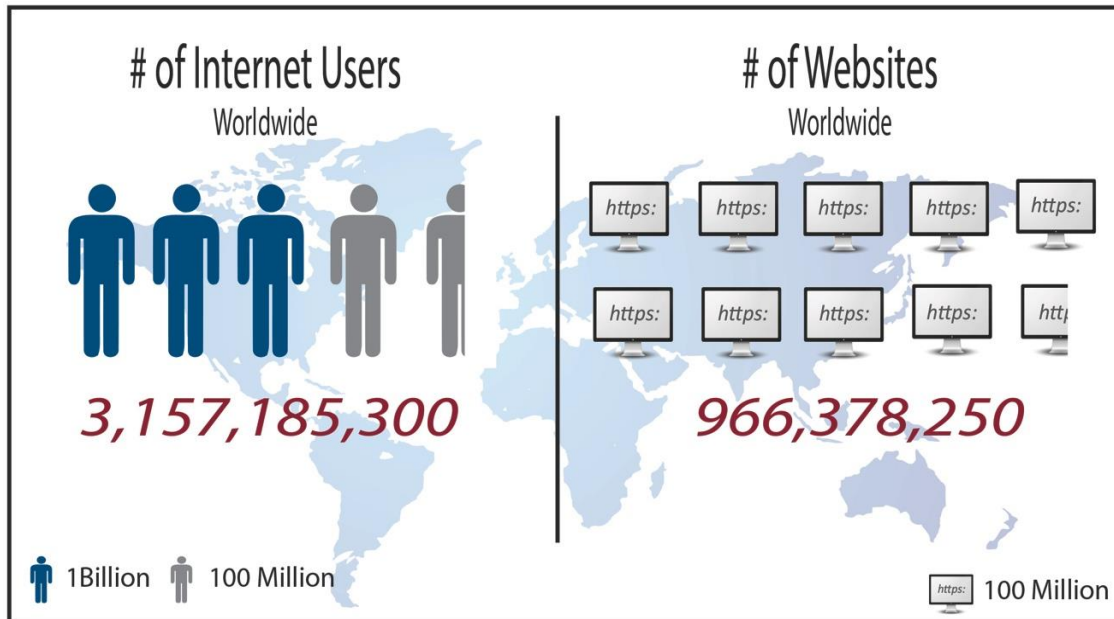
<sup>1</sup> Robert Shepherd, "The Applications of Human Intelligence in Counterterrorism" (University of Calgary, 2009), [http://dspace.ucalgary.ca/jspui/bitstream/1880/48904/1/2009\\_Shepherd\\_MSS.pdf](http://dspace.ucalgary.ca/jspui/bitstream/1880/48904/1/2009_Shepherd_MSS.pdf), 92.

<sup>2</sup> Russell D Howard, "Intelligence in Denied Areas: New Concepts for a Changing Security Environment" (Joint Special Operations University, 2007), <http://www.dtic.mil/dtic/tr/fulltext/u2/a495385.pdf>, 25.



Wide-ranging in purpose and with a broad set of users, virtual environments are becoming increasingly more prevalent and powerful. As indicated in Figure 1, Internet use has become widespread, with billions of Internet users and nearly a billion websites worldwide.

Figure 1. Number of Internet and Websites Worldwide



Original graphic, based on data from Internet Live Stats, "1 Second - Internet Live Stats," Internet Live Stats, accessed July 4, 2015, <http://www.internetlivestats.com/statistics/>.

Perhaps even more astonishing is the level of online activity taking place. As shown in Figure 2, people are spending a significant amount of time on the Internet, sending emails, watching videos, and engaging in online social relationships. These online networks are also thriving in some of the most remote areas of the globe and without physical boundaries, virtual environments are allowing people to develop strong social ties without ever meeting in person. More importantly, these virtual bonds seem to be resulting in real-world consequences.

Figure 2. Daily Internet Activity



Original graphic, based on data from Internet Live Stats, "1 Second: Internet Live Stats," *Internet Live Stats*, accessed July 4, 2015, <http://www.internetlivestats.com/statistics/>.

The growing popularity of virtual environments and the relationship building that is occurring online signifies new potential for HUMINT. Traditional HUMINT relies on the identification of a potential source with access to some needed information followed by the development of a strong relationship with the source for the purpose of obtaining the information. Dissecting these aspects of HUMINT, and comparing traditional HUMINT relationships to the relationships developed online, will help determine whether the engineering of virtual relationships for the purpose of collecting intelligence is possible and valuable.

Because the specific concept of virtual HUMINT is relatively new and lacking in literature, this thesis focuses on virtual relationships in general, as well as the virtual operating environments of online social networking, multi-player games, and Internet dating.

## **B. RESEARCH QUESTION**

How can virtual relationships, as demonstrated in the virtual environments of online social networking, multiplayer games, and dating be leveraged to conduct HUMINT operations?

## **C. LITERATURE REVIEW**

Academic research on virtual HUMINT is especially limited. There have only been a few references to the term and the definition varies widely. In most cases, the term describes the use of the Internet to target an adversary rather than to recruit a potential collaborator.<sup>3</sup> For example, one of the first uses of the term “virtual HUMINT” appeared in the book, *Countering the New Terrorism*, which was published by the RAND Corporation in 1998.<sup>4</sup> The term was primarily used in the context of “hacking into terrorist telecommunications nets” and intercepting communications from terrorist computer screens.<sup>5</sup> Unfortunately, the RAND study did not investigate the idea of recruiting human sources through virtual means.

Beyond the sporadic and inconsistent use of the term, open source literature on the concept of virtual HUMINT is scarce, largely due to security classifications, as well as the fact that the concept itself is still relatively new. To overcome these barriers, I have surveyed and synthesized publicly available literature on HUMINT, virtual relationships, and the virtual environments of online social networking, multi-player games, and dating. While each is inherently different, this combination of topics is expected to form a basis for studying virtual HUMINT or more explicitly, the notion of developing virtual relationships through virtual environments for the purpose of collecting HUMINT.

Accordingly, my literature review involves two independent sections. The first section focuses on HUMINT, which I further divide into the subcategories of definition,

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<sup>3</sup> Kristin M. Finklea and Catherine A. Theohary, “Cybercrime: Conceptual Issues for Congress and U.S. Law Enforcement,” (CRS Report No. R42547) (Congressional Research Service, January 15, 2015), <https://www.fas.org/sgp/crs/misc/R42547.pdf>, 9.

<sup>4</sup> Ian O. Lesser et al., *Countering the New Terrorism* (Santa Monica, CA: RAND Corporation, 1999), [http://www.rand.org/pubs/monograph\\_reports/MR989](http://www.rand.org/pubs/monograph_reports/MR989), 82.

<sup>5</sup> *Ibid.*, 83.

purpose, models and key principals. However, it is important to note that I deliberately exclude information regarding tradecraft or exceedingly sensitive matters—both of which are not publicly available and beyond the scope of my research. My second section explores the research on virtual relationships. Based primarily on the disciplines of psychology and sociology, this section focuses on the theories that govern social relationships, identity management, and the characteristics of computer-mediated relationships.<sup>6</sup>

## 1. Human Intelligence (HUMINT)

The use of information that derives from human sources, often referred to as HUMINT, is an age-old practice that has been in existence since the Biblical times of Moses.<sup>7</sup> HUMINT provides decision-makers with unique insight into the intentions and capabilities of an adversary or competitor. Criminal enterprises and terrorist organizations are generally tightly knit and difficult to penetrate solely with surveillance and undercover operations.<sup>8</sup> This limitation is especially true in denied areas, which are difficult to penetrate due to weak state structures, the lack of diplomatic relationships, or the presence of an inherently closed society.<sup>9</sup> Nations such as Somalia, Yemen, Afghanistan, Syria, and Iraq fit into this category and make HUMINT extraordinarily difficult.<sup>10</sup>

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<sup>6</sup> In addition to the literature review, I also include background in Chapter II that focuses on the virtual environments of online social networking, multi-player games, and dating. This chapter will help define common terms and explain what makes up these virtual environments. This material will also provide the reader with an introduction into the different types of virtual environments and participants, as well as the related trends and predictions.

<sup>7</sup> As referenced by Sayre, Moses sent human agents to the land of Canaan to spy and collect intelligence. Robert A. Sayre Jr, "Some Principles of Human Intelligence and Their Application" (DTIC Document, 2004), <http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=ADA429361>, 7.

<sup>8</sup> Wayne M. Murphy et al., *Law Enforcement Confidential Informant Practices* (U.S. Government Publishing Office, 2007), <http://www.gpo.gov/fdsys/pkg/CHRG-110hhrg36784/pdf/CHRG-110hhrg36784.pdf>, 77.

<sup>9</sup> Loch Johnson, "Evaluating 'Humint': The Role of Foreign Agents in U.S. Security," *Comparative Strategy* 29, no. 4 (October 13, 2010): 308–32, doi:10.1080/01495933.2010.509635, 325.

<sup>10</sup> Howard, "Intelligence in Denied Areas: New Concepts for a Changing Security Environment," 4.

Likewise, nation-states generally have specifically designed and complex intelligence and counterintelligence programs.<sup>11</sup> Penetrating these barriers often relies on recruiting an informant that already has access to some needed information or recruiting agents that can covertly obtain such access. By gaining access through an insider, governments can better expose an enemy's intentions, capabilities, and vulnerabilities.<sup>12</sup> An effective HUMINT program can also serve as a natural deterrent by forcing adversaries to operate more cautiously. Part of the reason the 9/11 attackers were so effective was because the fear of being infiltrated by an informant was minimal.<sup>13</sup> At the time, investing in HUMINT capabilities was diminished by an overreliance on technology and some adversaries were able to capitalize on this vulnerability. The overall value of HUMINT is common throughout the body of research. HUMINT is often suggested to be the missing piece when an intelligence failure is discussed.<sup>14</sup> It is also commonly referenced as one of the more essential aspects of the U.S. intelligence mission.<sup>15</sup>

The literature on HUMINT reveals two distinct perspectives. The first emphasizes HUMINT within U.S. law enforcement, which focuses primarily on internal operations within the U.S. The second perspective focuses on HUMINT within the national intelligence community (IC), which is usually related to external operations regarding foreign affairs. Although the concept of virtual HUMINT could be relevant in both situations, the focus of this paper is on HUMINT within the IC.

As indicated by the former Director of National Intelligence, Michael McConnell, the IC is responsible for providing the nation's leaders with a "decision advantage."<sup>16</sup>

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<sup>11</sup> Robert I. Rotberg, *Failed States, Collapsed States, Weak States: Causes and Indicators* (Washington, D.C.: The Brookings Institution Press, 2003), [http://www.brookings.edu/press/books/chapter\\_1/statefailureandstateweaknessinatimeofterror.pdf](http://www.brookings.edu/press/books/chapter_1/statefailureandstateweaknessinatimeofterror.pdf), 3.

<sup>12</sup> Shepherd, "The Applications of Human Intelligence in Counterterrorism," 77.

<sup>13</sup> *Ibid.*, 101.

<sup>14</sup> Howard, "Intelligence in Denied Areas: New Concepts for a Changing Security Environment," 1.

<sup>15</sup> *Ibid.*

<sup>16</sup> McConnell, J. Michael, *DNI Authorities* (Washington, D.C., 2008), [https://fas.org/irp/congress/2008\\_hr/021408mccconnell.pdf](https://fas.org/irp/congress/2008_hr/021408mccconnell.pdf), 1.

This term refers to the ability to provide early warning and prevent strategic surprise.<sup>17</sup> It is also most often used in the context of collecting foreign intelligence—information related to the “intentions, capabilities, and activities of foreign governments and foreign persons.”<sup>18</sup> HUMINT represents the method for collecting intelligence through the recruitment of human agents, which are people who are motivated to provide information to intelligence professionals through overt and covert means.<sup>19</sup> In comparison, signals intelligence (SIGINT) defines the method of collecting intelligence by intercepting signals and open source intelligence (OSINT) represents the collection of intelligence by researching publicly available information.<sup>20</sup>

There are two primary roles in HUMINT operations. The first is the person who is being recruited, which is commonly referred to as the agent, source, or informant. The second role is that of the person who is conducting the recruitment. The CIA and military often refer to this role as the case or intelligence officer, whereas the FBI and other law enforcement entities tend to use the term “contact agent,” “case agent,” or “handler.”<sup>21</sup>

HUMINT, and all other forms of intelligence collection, is applied to a number of topics ranging from political and diplomatic matters to military capabilities, economic developments, crime, and terrorist activities. The intended targets also vary, ranging from nation-states to terrorist cells and criminal enterprises.<sup>22</sup> Unlike many of the other collection methods, HUMINT involves an added risk to the safety of those that are

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<sup>17</sup> Michael Warner, “Wanted: A Definition of Intelligence,” *Central Intelligence Agency Library*, 2002, <https://www.cia.gov/library/center-for-the-study-of-intelligence/csi-publications/csi-studies/studies/vol46no3/article02.html>.

<sup>18</sup> Ibid.

<sup>19</sup> Johnson, “Evaluating ‘Humint’: The Role of Foreign Agents in U.S. Security,” 309.

<sup>20</sup> The Federal Bureau of Investigation, “Intelligence Collection Disciplines (INTs),” Government, *The Federal Bureau of Investigation*, accessed June 4, 2015, <http://www.fbi.gov/about-us/intelligence/disciplines>.

<sup>21</sup> U.S. Department of Justice, “The Attorney General’s Guidelines Regarding the Use of Confidential Informants,” May 30, 2002, <https://www.hsdl.org/?view&did=452204>.

<sup>22</sup> Clapper, James R., *Worldwide Threat Assessment of the US Intelligence Community* (Washington, D.C.: Office of the Director of National Intelligence, 2015), [http://www.dni.gov/files/documents/Unclassified\\_2015\\_ATA\\_SFR\\_-\\_SASC\\_FINAL.pdf](http://www.dni.gov/files/documents/Unclassified_2015_ATA_SFR_-_SASC_FINAL.pdf).

directly involved in the collection of intelligence.<sup>23</sup> Thus, the specifics regarding HUMINT tradecraft and operations are often classified at the highest levels.

While sharing some commonality, HUMINT within the IC is also different than the HUMINT operations that are conducted by U.S. law enforcement. For one, operations within the U.S. are much more crime-centric, especially on the state and local levels where organized crime and narcotics-related offenses are more common than terrorism.<sup>24</sup> Additionally, the laws, procedures, methods and risks that accompany HUMINT operations overseas are often very different than those that govern operations within the U.S.<sup>25</sup>

Whether the application is domestic or foreign, HUMINT operations are governed by a relatively standard and well-known source acquisition cycle, more commonly known in U.S. law enforcement as the source development process. There is a slight variation in the terminology used and the number of steps that make up the source acquisition cycle. For example, the FBI's former Assistant Director for intelligence, Wayne Murphy, suggested that the source development process is made up of five steps, combining the development, recruitment, and management of a source into one and adding validation as the fifth step.<sup>26</sup> In comparison, former CIA case officer Randy Burkett proposes six steps, dividing the aforementioned and excluding validation.<sup>27</sup> Nonetheless, the majority of researchers and practitioners subscribe to some variation of these components:

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<sup>23</sup> Richard A. Best Jr., "Intelligence to Counter Terrorism: Issues for Congress," (CRS Report No. RL31292) (Congressional Research Service), accessed June 4, 2015, [http://www.bits.de/public/documents/US\\_Terrorist\\_Attacks/CRS-IntelligenceTerror210202.pdf](http://www.bits.de/public/documents/US_Terrorist_Attacks/CRS-IntelligenceTerror210202.pdf), 5.

<sup>24</sup> Allison D. Redlich, Christopher Kelly, and Jeané Miller, "Systematic Survey of the Interview and Intelligence Community: Final Report to the FBI HIG" (University at Albany), accessed April 14, 2015, <http://www.reid.com/pdfs/20120324.pdf>, 1.

<sup>25</sup> James Burch, "A Domestic Intelligence Agency for the United States? A Comparative Analysis of Domestic Intelligence Agencies and Their Implications for Homeland Security," *Homeland Security Affairs* 3, no. 2 (June 2007), <https://www.hsaj.org/articles/147>, 1.

<sup>26</sup> Murphy et al., *Law Enforcement Confidential Informant Practices*, 9.

<sup>27</sup> Randy Burkett, "An Alternative Framework for Agent Recruitment: From MICE to RASCLS," *Studies in Intelligence* 57, no. 1 (March 2013): 7–17, 13.

- **Spot:** Identify individuals that may be able to provide needed information.
- **Assess:** Evaluate the spotted individual's access to needed information, as well as potential motivations, vulnerability and suitability for recruitment.
- **Develop:** Cultivate a relationship with the spotted individual to further assess the aforementioned access, motivations, vulnerability and suitability. This step may also include the planning and development of strategies for recruitment.
- **Recruit:** Conduct the actual recruitment operation.
- **Manage:** Train and handle meetings with the now-recruited human source. This may include tasking the source, conducting de-briefings, and at some point, transferring or terminating the relationship.
- **Validate:** Validate the information the source is providing. This component is likely to be present at each stage of the source acquisition cycle.

The literature on HUMINT also includes a number of principals that govern HUMINT operations. The first principal is “access and placement,” which describes the need for identifying the value of a potential source. The literature does not specifically define the difference between the two terms and they are often used interchangeably. However, the literal denotation suggests that access represents a potential source's pre-established ability to provide some needed information, whereas placement refers to a potential source's ability to be placed in a position that allows them to gain such access.

The second key principal revolves around understanding the motivations that may encourage a person to become a source. Burkett argues that understanding human motivation is essential to recruiting a source and that Dr. Robert Cialdini's six influence factors of reciprocity, authority, scarcity, commitment, liking, and social proof play a key role.<sup>28</sup> He uses the acronym “RASCLS” to represent the aforementioned five factors and proposes an alternative recruitment model to the earlier money, ideology, coercion, and ego (MICE) model.<sup>29</sup> As proposed by Burkett, the MICE model represents short-term

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<sup>28</sup> Ibid., 12.

<sup>29</sup> Ibid., 9.



and overly negative incentives that ultimately fail to “capture the complexities of human motivation.”<sup>30</sup>

The third and final key principal is specific to recruitment strategies. One suggestion proposes that the handling of modern-day sources requires a more delicate handling approach and the increased use of persuasion and manipulation tactics.<sup>31</sup> Another suggestion on strategy focuses on proactively identifying sources rather than waiting for potential sources to be identified through indirect means (i.e., a criminal investigation or walk-in to an embassy). As suggested by FBI Special Agents Robin Dreeke and Kara Sidener, intelligence officers should identify what information is needed, define what type of person could provide such information, and then proactively search and recruit persons who fit the criteria.<sup>32</sup>

The final aspect of recruitment strategies focuses on the importance of relationship building.<sup>33</sup> The recruitment of a human agent requires sound communication skills, as well as the ability to cultivate trust and a personal bond. The latter is especially true as a relationship evolves and motivations and vulnerabilities begin to change or fade.

## **2. Virtual Relationships**

The literature on virtual relationships draws from a number of psychological and sociological theories and perspectives. There are two particular threads that can be identified. The first thread has to do with how a person’s identity is formed and managed. The second thread revolves around the dynamics of relationship building. Each of these threads is further explained below.

Most of the research supports the notion that identity management is inherently a social process. People naturally present themselves through their interactions with others,

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<sup>30</sup> Ibid., 11.

<sup>31</sup> Charl Crous, “Human Intelligence Sources: Challenges in Policy Development,” *Security Challenges* 5, no. 3 (2009): 117–27.

<sup>32</sup> Robin Dreeke and Kara Sidener, “Proactive Human Source Development,” *FBI Law Enforcement Bulletin*, November 2010, 5.

<sup>33</sup> Ibid., 7.

and likewise, their interactions help define who they are. As explained by Goffman in 1956, this social aspect of identity management is analogous to a theatrical performance.<sup>34</sup> As explained by researchers, Gilly Leshed and Poppy McLeod:

An individual is like an actor performing on the stage of a theatre, with the other individuals in his or her social context acting as the audience watching the individual, and as co-actors in the drama. Individuals take on various roles, depending on the situation in which they are performing and the audience with which they are interacting. Through mundane, everyday interactions with others, they negotiate who they are: whether the audience is clapping or booing will shape their perceptions of self as well as future interactions with that audience.<sup>35</sup>

Another prominent theory that supports and builds upon the social aspect of identity management is Tajfel's Social Identity Theory (SIT). SIT suggests that a person's identity is actually a compilation of distinct identities, each of which represents a different aspect of his or her social life.<sup>36</sup>

A slightly different perspective on identity management is that of the found vs. made identity. The found identity is created by a person's circumstances, such as their age, sex, ethnicity, associations, and other external factors.<sup>37</sup> In contrast, the made identity is created internally and it represents how people see themselves.<sup>38</sup>

Another perspective on identity management is that of segmentation. Rather than viewing an individual's identity as unabridged, the segmented model suggests that people perform various roles, depending on the social setting, and to manage this variance, they construct boundaries that segment these roles.<sup>39</sup> The most common metaphor used to

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<sup>34</sup> Gilly Leshed and Poppy Laretta McLeod, "Metaphors for Social Relationships in 3D Virtual Worlds" (Ithaca, NY: Cornell University, 2012), <http://dl.acm.org/citation.cfm?id=2145295>, 2.

<sup>35</sup> Ibid.

<sup>36</sup> Ibid., 3.

<sup>37</sup> Arnold Brown, "Relationships, Community, and Identity in the New Virtual Society," *The Futurist* 45, no. 2 (April 2011): 29–34, 34.

<sup>38</sup> Ibid.

<sup>39</sup> Leshed and McLeod, "Metaphors for Social Relationships in 3D Virtual Worlds," 3.

describe this perspective is that of an onion.<sup>40</sup> In theory, each person is comprised of a number of layers, allowing them to slowly reveal parts of their identity as the relationship progresses.<sup>41</sup> Generally, the outer-most layer serves as the exterior or presented-self, where as the core represents a person's more personal matters. Segmented identity holds a particular value in computer-mediated relationships. As discussed by a number of researchers, "the Internet may allow individuals to express aspects of their identities ("the true self") that offline might be considered counter-normative."<sup>42</sup>

The second thread found in the research was specific to the development of relationships. Like the research on identity management, the literature derives from the social sciences and more often than not, it involves the application of theories that govern face-to-face communication.

One of the most common theories that surfaces in the literature on virtual relationships is called Social Penetration Theory (SPT). Founded in 1973 by psychologists Irwin Altman and Dalmas Taylor, SPT argues that relationships form and develop as information is exchanged gradually among two or more persons.<sup>43</sup> Individuals enter this exchange based on a cost vs. benefit analysis.<sup>44</sup> When the perceived benefits of entering the exchange outweigh the risk of disclosing information, a relationship will form. This particular aspect of mutual-benefits also embodies the Social Exchange Theory, which argues that rewards or positive outcomes serve as incentives for forming and maintaining relationships.<sup>45</sup>

The breadth and depth of these exchanges also plays an important and equal role in SPT. Breadth refers to the number and variance of the topics shared, while depth refers

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<sup>40</sup> Ibid., 2.

<sup>41</sup> Ibid., 3.

<sup>42</sup> Ibid.

<sup>43</sup> Ibid., 2.

<sup>44</sup> Young-ok Yum and Kazuya Hara, "Computer-Mediated Relationship Development: A Cross-Cultural Comparison," *Journal of Computer-Mediated Communication* 11 (2006): 133–52, doi:10.1111/j.1468-2958.2006.00007.x, 135.

<sup>45</sup> Ibid., 137.

to the level of intimacy of the disclosure.<sup>46</sup> Psychologist Joseph Walther adds to SPT by suggesting that the duration of the relationship will also affect the level of penetration. Walther explains that as partners communicate more personally, they “...incrementally penetrate one another’s public identities to reach their core identities, and become more intimate.”<sup>47</sup>

Another common model in the literature is the Uncertainty Reduction Theory, founded by Berger in 1986.<sup>48</sup> Berger argues that relationships depend on being able to predict the balance between certainty and uncertainty.<sup>49</sup> More specifically, “as uncertainty decreases, liking increases, and relationships are developed through being able to predict the other’s behavior.”<sup>50</sup>

There are also a number of theories on Computer Mediated Communication (CMC) that play a significant role in the development of virtual relationships. For example, the Hyperpersonal Model, developed by Walther in 1996, claims that CMC enables selective self-presentation, a strategic, controlled, and optimized version of face-to-face self presentation.<sup>51</sup> This point becomes especially important when comparing virtual and real relationships.

Critics have argued that CMC is at a disadvantage since communication is largely dependent on non-verbal cues.<sup>52</sup> However, Walther and others have challenged this notion, arguing that the weakness of CMC is balanced by the increased ability to control and edit communication, as well as the idealization of a virtual partner, which often

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<sup>46</sup> Ibid.

<sup>47</sup> Ibid., 135.

<sup>48</sup> Paul W. Ballantine and Brett AS Martin, “Forming Parasocial Relationships in Online Communities,” *Advances in Consumer Research* 32 (2005): 197–201, 199.

<sup>49</sup> Ibid.

<sup>50</sup> Ibid.

<sup>51</sup> C. L. Toma, J. T. Hancock, and N. B. Ellison, “Separating Fact From Fiction: An Examination of Deceptive Self-Presentation in Online Dating Profiles,” *Personality and Social Psychology Bulletin* 34, no. 8 (May 9, 2008): 1023–36, doi:10.1177/0146167208318067, 1025.

<sup>52</sup> Yum and Hara, “Computer-Mediated Relationship Development: A Cross-Cultural Comparison,” 136.

intensifies the relationship.<sup>53</sup> These elements are captured by what researchers have called the Social Information Process (SIP). SIP is supported by the extended duration of online relationships and the notion of expressing oneself through paralanguage (i.e., emoticons like smiley faces), which was further supported in a study conducted by Utz in 2000.<sup>54</sup>

## **D. RESEARCH DESIGN**

The primary objective of the research is to determine whether virtual relationships can be used to conduct HUMINT operations. The following assumptions fuel this question and frame the overarching research design:

- Inserting U.S. personnel into such conflict zones/denied areas as Iraq, Syria, and Somalia is extraordinarily dangerous. But without access to people on the ground in these volatile environments, it is nearly impossible to recruit human sources.
- Americans, who are of foreign descent, can effectively be deployed in foreign environments, where their ethnicity and language skills serve as a natural form of disguise. However, the availability and recruitment of such personnel remains a challenge.<sup>55</sup>
- The traditional application of HUMINT has yet to fully match the technological advances of the 21st century. In particular, the use of cyberspace and virtual relationships is an under utilized mechanism for recruiting human sources.
- Without an alternative approach that safely, efficiently, and innovatively enhances HUMINT operations, the development of anticipatory intelligence will continue to suffer.

### **1. Research Methods**

Two forms of research synthesis are used to pursue this objective. The first involves the systematic review model, which is a scientific research method that is often

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<sup>53</sup> Ibid., 137.

<sup>54</sup> Ibid.

<sup>55</sup> Richard A. Best, *Intelligence Issues for Congress* (CRS Report No. RL33539) (Congressional Research Service, Library of Congress, 2010), <http://www.dtic.mil/dtic/tr/fulltext/u2/a468537.pdf>, 5.

used to compile the best evidence for policy making. The key features of this method are objectivity, comprehensiveness, organization, and the ability to replicate the findings.

The second research method involves meta-interpretation, which is a relatively new method for synthesizing the interpretations of raw data. Unlike the more traditional meta-analysis and meta-ethnography models, this method is not exclusive to quantitative data and, it does not require pre-determined exclusion criteria. Rather, the focus is on synthesizing the implications of a selection of qualitative studies using an ideographic approach.

### **Phase One: Set the Foundation**

Before I can pursue the objective and explore my primary question, I must address the following initial questions:

**Q1. How has the virtual environment impacted social interactions writ large, and what does the future entail?** This question serves as the most formative pre-requisite to my thesis. Research regarding the purpose and mechanics of virtual HUMINT cannot be conducted without first forming a foundation that supports the notion that virtual engagement is as widespread as assumed, and that the future will only involve an even greater dependency on virtual relationships. In other words, is the rapid rise of virtual behaviors nothing more than a trend and if so, would a transition to virtual HUMINT actually be worth pursuing?

For the first question, I focus on three of the most prominent virtual environments that exist today: online social networking, multi-player games, and dating. For each environment, I provide general background, historical context and relevant information regarding who participates in these environments and why. I then systematically evaluate website traffic for each of these environments using a number of data sources. I then conclude by systematically evaluating the trends for each of these virtual environments, as well as for Internet use in general. The step-by-step process for this first question involves the following:

1. I identify the top social networking, multi-player gaming, and dating sites using Alexa rankings, as well open source articles on the most popular sites.
2. I then use an advanced subscription for Alexa, which includes access to website traffic estimates, to limit the results to the top 75 most visited websites for each category.
3. I then collect Alexa traffic estimates for each of these sites, which include the monthly number of unique visitors, total visits to the site, and total page views. I use this data to further determine the overall popularity for each category, as well as the mean and the median for each category.
4. Then, for Internet trends, I evaluate the number of websites, Internet users, and Google searches over a ten-year period.
5. Finally, for online social networking, multi-player gaming, and dating trends, I use profit estimates and forecast data from a number of sources.

Once I demonstrate that participation in the virtual environment is widespread and expected to grow, I then transition to answering my second prerequisite question:

**Q2. Who should be recruited and more importantly, are these potential candidates actually online?** It is easy to assume the participation in virtual environments is limited to developed nations and thus, this would limit who could be recruited online. For example, if the type of source that is needed lives in Iraq and Internet access or social media use is limited in Iraq, how can the sources that are needed be recruited?

I use the systematic review method to answer this second question as well. I first identify the countries that are of most interest to U.S. foreign policy and security. To this end, I identify and analyze the most prominent data sources that focus on assessing threats, risk, conflicts, hostility, and instability worldwide. Once this data set is established, I identify which countries are most frequently represented among these sources. I then systematically gather and evaluate Internet activity and website traffic estimates for each of these key counties. I begin by first measuring the number of Internet users, the level of Internet access, and the Internet ranking for each of these countries. Then, I specifically look at each country's participation in online social networking, gaming, and dating sites. I then conclude by identifying the top 100 websites visited for

each country and then analyze how many of these sites are intended for social networking, gaming, and dating. The step-by-step process and parameters for this question involved the following:

1. I identify the top 100 websites for each key country using Alexa data. The advanced subscription that I previously purchased is used and the data that is collected is dated for July 2015.
2. I then identify which of these top 100 websites per country are primarily designed for online social networking, gaming, and dating. Some of the sites are categorized without additional research due to common knowledge (i.e., Facebook is widely known as a social networking site). However, for most other sites, a combination of Webroot BrightCloud URL Lookup and CYREN URL Category Check is used to make this determination. These services are provided freely and for the most part, are consistent in their results. There are also a few sites that are not clearly categorized. For these sites, I go directly to the website and analyze the “about us” page and/or the layout of the home page. I use Google Translate to interpret the sites that are presented in a foreign language.
3. Once this analysis is completed, I count the number of sites that fit into each of these categories and also take note of the sites that are particularly unique to a specific country or region.

### **Phase Two: Establish a Framework for Virtual HUMINT**

Once this foundation is set, I pursue my primary thesis question of:

**Q3. Can virtual relationships, as demonstrated in the virtual environments of online social networking, multi-player games, and dating, be leveraged to conduct HUMINT operations?** This question is intended to identify the social factors of virtual relationships that may offer value to HUMINT operations and to more generically determine if it is even possible to recruit and manage human sources exclusively through virtual means.

I first identify the principals that drive traditional HUMINT operations. This is conducted through a systematic review of the literature that governs traditional HUMINT operations. I then evaluate the literature on virtual relationships to help identify the commonalities. For example, it is presumed that traditional HUMINT requires developing strong relationships. Thus, determining whether strong relationships can also



be developed in a virtual environment is a sought-out commonality. The step-by-step process and parameters involved the following:

1. I first gather as many sources that relate to the over arching themes of HUMINT, virtual relationships, online social networking, gaming, and dating.
2. I then use the data analysis software, NVivo to evaluate each of these sources. I create a number of “nodes,” which serve as categories and subcategories for coding and analyzing the data. Each node is defined using the questions listed in Table 1.

Table 1. Categories and Subcategories for Coding and Analysis

NODES	PARAMETERS
1. HUMINT Compatibility	<p>Can a person’s real identity and personality be inferred from their online profile and behaviors?</p> <p>Can a person’s access (ability to provide known information) and/or placement (ability to gather the needed information) be identified through a virtual relationship?</p> <p>Can a person’s motivations and vulnerabilities be identified through a virtual relationship?</p>
Strong Bonds	<p>How strong are the social ties that are developed in a virtual environment?</p> <p>Are the bonds that are developed in a virtual relationship just as strong as those that are developed face-to-face?</p>
Real World Results	<p>Can virtual relationships transcend into the real world?</p> <p>Can behaviors in the virtual world lead to real world consequences?</p>
Virtual Forever	<p>Can virtual relationships remain in the virtual environment forever?</p>

3. I then analyze the results for each node and present the data as supporting or opposing for each of the identified HUMINT principals.

### **Phase Three: Strengthen the Framework**

Following this systematic review, I then conduct a meta-interpretation for each of the principals identified in phase 1. The meta-interpretation approach involves the interpretive synthesis of qualitative research. As stated by Dr. Mike Weed the five fundamental features of this research model involves:

- An ideographic (rather than pre-determined) approach to the development of exclusion criteria.
- A focus on meaning in context.
- Interpretations as the raw data for synthesis.
- An iterative approach to the theoretical sampling of studies for synthesis.
- A transparent audit trail as a guarantor of the integrity and trustworthiness of the synthesis.

The meta-interpretation approach offers the most value for evaluating a relatively new and undeveloped topic (i.e., virtual HUMINT) in social science, without having to conduct original human research. A number of studies—spanning from predicting a person’s gender through the characteristics of their avatar to measuring a person’s aggression by evaluating their gameplay—have been conducted. Each of these studies presents insight into the social dynamics of virtual environments, and thus they may offer value into the computer-mediated recruitment of human sources. More specifically, the compilation of these studies and the re-framing of the findings may result in new knowledge regarding virtual HUMINT operations.

Using the same robust set of sources from phase 1, I identify the studies that relate to two sets of criteria. First, the source material needs to focus on the factors that are identified as relevant for virtual HUMINT operations. This material includes: identity and personality inference, online bonds and trusts, the real world impact of the virtual environment, and the possibility of maintaining virtual relationships forever.

Second, the material needs to offer findings that are based on a research study. Of the initial 98 sources, 25 meet these conditions. A careful analysis of each of these sources is conducted using the data analysis software, NVivo. Each source is analyzed

and coded using common themes that I identify during the review. The sources that are beyond the scope of the study are excluded and for the remainder, I extract the key findings and group them into categories.<sup>56</sup> I then analyze these findings as a whole to determine whether they support or oppose the principals of HUMINT.

## 2. Source Selection

Using a diverse and comprehensive set of research tools and databases, literature that relates to the aforementioned themes and factors are identified and collected for analysis. This includes academic papers, journal articles, news stories, books, and various forms of media. The selection of source material also focuses on pre-existing research studies that relate to the general area of virtual environments. For the meta-interpretation, the initial selection of source material involves the identification of four to five contrasting studies. The selection is informed by theoretical sensitivity to the concept of virtual environments. No pre-determined exclusion criterion is applied; the selection is based on “maximum variation sampling.” Thematic and context analysis is then conducted. Additionally, areas where further research is needed are identified.

This process of selecting and analyzing research studies continues until the point of theoretical saturation is reached. In addition to reflecting the parameters that are discussed in the earlier section, the selection of source material is also based on the following factors:

- **Relevancy:** The source material relates to the topics of HUMINT, virtual relationships, online multi-player games, online dating, online social networking, and the concept of virtual HUMINT.
- **Timeliness:** The source material relates to current technologies, policies, practices, and behaviors.
- **Usefulness:** The source material offers value in proving or disproving the thesis and related assumptions.
- **Credibility:** The source material derives from a credible source. Since the research topic is relatively new and lacking in literature, the use of some

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<sup>56</sup> There were only 2 of the 25 studies that were excluded. This included a study by Yum and Hara on the gender differences between Philippine and Korean players and, another by Gunter et al. on the socioeconomic and demographic factors of a specific set of online daters.

open source information including news articles is used. However, this is limited and each source is carefully evaluated to avoid biases.

### **3. Research Limitations**

By design, the scope of the research is limited to unclassified material that directly relates to the concepts of HUMINT, virtual relationships, and the potential of recruiting human sources through virtual means. Thus, there are at least two significant limitations. The first is specific to the exclusion of classified source material. The second limitation revolves around the notion of limited data. Without conducting new human research studies, I am reliant on synthesizing the data of other researchers. This is especially the case for the meta-interpretation that was conducted.

### **4. Output**

Combined, these two research methods provide insight into the concept of virtual HUMINT and the potential of augmenting traditional HUMINT with virtual means. More specifically, the meta-interpretation is expected to identify useful insights for conducting virtual HUMINT operations.

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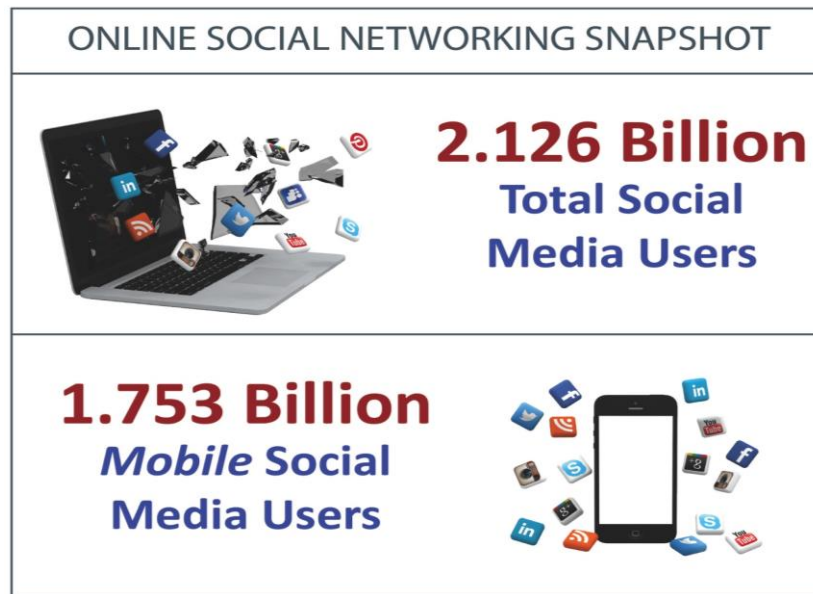
## **II. THE VIRTUAL ENVIRONMENT**

There are three virtual environments dedicated almost exclusively to computer-mediated relationships. The first and most obvious one is online social networking. Such social networking sites as Facebook and Twitter have become the centerpiece of the Internet—and of countless people’s lives all over the world. A second virtual environment that is especially popular is online multi-player games, which include Massively Multiplayer Online (MMO) games and, more specifically, virtual worlds. The realism and uniqueness of such role-playing games as World of Warcraft and Secondlife have attracted considerable attention from researchers and politicians alike. The third and final virtual environment is online dating sites, which have become more mainstream in recent years. Understanding the definition, history, purpose, and relevancy of each of these virtual environments will form a basic foundation from which the concept of virtual HUMINT can then be explored.

### **A. ONLINE SOCIAL NETWORKING**

As indicated in Figure 3, billions of people are using some form of online social networking. Additionally, the far majority of these users are also in engaging social networking through mobile devices.

Figure 3. Total Social Media Users Worldwide



Original graphic, based on data from We Are Social, “Digital, Social, and Mobile in APAC 2015,” Slideshow Presentation Report, (March 10, 2015), <http://www.slideshare.net/wearesocialsg/digital-social-mobile-in-apac-in-2015?related=4>, 4.

## 1. The Basics

The definition of “social networking sites” has changed and continues to change. Hughes et al. broadly define social networking sites as “virtual collections of user profiles which can be shared with others.”<sup>57</sup> Ellison et al. provide a bit more specificity, defining social networking sites as “web-based communication platforms that support socially relevant interactions among contacts (i.e., “Friends”) on the site.”<sup>58</sup> Boyd and Ellison define social networking sites as web-based services that allow users to do three things: “construct a profile within an organized framework, generate a list of other users with whom they share a connection, and navigate their own list of connections and view those

<sup>57</sup> David John Hughes et al., “A Tale of Two Sites: Twitter vs. Facebook and the Personality Predictors of Social Media Usage,” *Computers in Human Behavior* 28, no. 2 (March 2012): 561–69, doi:10.1016/j.chb.2011.11.001, 1.

<sup>58</sup> Nicole B. Ellison et al., “Cultivating Social Resources on Social Network Sites: Facebook Relationship Maintenance Behaviors and Their Role in Social Capital Processes,” *Journal of Computer-Mediated Communication* 19, no. 4 (July 2014): 855–70, doi:10.1111/jcc4.12078, 855.

made by others within the system.<sup>59</sup> The most popular form of social networking sites are those that are primarily intended for networking with friends and family.<sup>60</sup>

## 2. The History

As the Internet age dawned, a number of virtual communities formed, many of which included some social networking features. For example, there were a number of early websites that included profiles and/or friend lists.<sup>61</sup> On the other hand, there are also a number of modern-day social networking sites that did not actually begin as such. For example, QQ, which has become the most popular social networking site in China, initially began as an instant messaging service.<sup>62</sup>

Additionally, many, if not all of the components that make up an online social networking site existed independently in various forms prior to the first social networking site.<sup>63</sup> However, most of these early sites would not be categorized as social networking sites today. For example, 4chan.com is an image-based bulletin board that allows users to share information and network.<sup>64</sup> Although it shares some of the same functionality, it lacks the necessary profiles and friend list capabilities to be considered a social networking site. Likewise, websites today that are primarily designed as a forum for information sharing or blogging do not always qualify as social networking sites.

The main distinction between what is and what is not a social networking site has to do with the primary features and purpose. Sites that focus on the ability to create a sharable profile, develop a network, and engage in the sharing and consumption of media

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<sup>59</sup> Yair Amichai-Hamburger and Gideon Vinitzky, "Social Network Use and Personality," *Computers in Human Behavior* 26, no. 6 (November 2010): 1289–95, doi:10.1016/j.chb.2010.03.018, 1289.

<sup>60</sup> Nicole L. Muscanell and Rosanna E. Guadagno, "Make New Friends or Keep the Old: Gender and Personality Differences in Social Networking Use," *Computers in Human Behavior* 28, no. 1 (January 2012): 107–12, doi:10.1016/j.chb.2011.08.016, 107.

<sup>61</sup> Celia Romm-Livermore and Kristina Setzekorn, eds., *Social Networking Communities and E-Dating Services Concepts and Implications* (Information Science Reference, 2009), 3.

<sup>62</sup> Danah M. Boyd and Nicole B. Ellison, "Social Network Sites: Definition, History, and Scholarship," *Journal of Computer-Mediated Communication* 13, no. 1 (October 2007): 210–30, doi:10.1111/j.1083-6101.2007.00393.x, 213.

<sup>63</sup> *Ibid.*, 214.

<sup>64</sup> "4chan: Frequently Asked Questions," *4chan*, 2015, <http://www.4chan.org/faq#about>.



are social networking sites, while other sites that contain some of these features but are primarily used for video sharing or blogging are not.

Based primarily on Boyd's research, the following outlines the evolution of social networking sites from the first sites to the present day:

- **1995:** Classmates.com was launched as a directory of school affiliates. The pay-subscription site did not incorporate social networking features until five years later.<sup>65</sup>
- **1997 to 2001:** SixDegrees.com launched. The site initially only included profiles and friend lists, but in 1998, it added the ability to browse friend lists, making it the first complete social networking site. During the same time period, a number of other online communities began to incorporate social networking site features.<sup>66</sup> In 1999, the Korean virtual worlds site, CyWorld, launched; by 2001, the site added social networking site features.<sup>67</sup> Just prior to this enhancement, the Swedish online community, LunarStorm transformed itself into a social networking site.<sup>68</sup>
- **2001:** Ryze.com was launched to help people build upon their business networks. The company promotes itself as the “original social network for business” and while it preceded LinkedIn by two years it ultimately failed to keep pace, only generating 600 thousand users by 2013.<sup>69</sup>
- **2002:** Friendster launched as a “social complement” to Ryze. It was designed to compete with Match.com, a profitable online dating site that was founded in 1995.<sup>70</sup> Friendster's servers and databases were ill-equipped to handle its rapid growth, and the site faltered regularly, frustrating users who had replaced email with Friendster.
- **2003:** Numerous social networking sites formed, most of which tried to replicate Friendster or focus on unique communities. For example, sites like LinkedIn focused on the professional communities while such sites as Couchsurfing focused on connecting travelers to people that have couches.

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<sup>65</sup> Boyd and Ellison, “Social Network Sites: Definition, History, and Scholarship,” 213.

<sup>66</sup> Ibid., 214.

<sup>67</sup> Ibid., 215.

<sup>68</sup> Ibid.

<sup>69</sup> “Ryze vs. LinkedIn,” *Science Opposing Views*, 2015, <http://science.opposingviews.com/ryze-vs-linkedin-2969.html>.

<sup>70</sup> “About Match.com,” *Match*, 2015, <http://www.match.com/cp.aspx?cpp=/cphp/corp/aboutus.html>.

A second spike occurred as media sharing mixed with social networking sites to form sites such as Flickr and YouTube.<sup>71</sup>

- **2004:** Launched just one year earlier,<sup>72</sup> large numbers of teenagers began joining MySpace in 2004.<sup>73</sup> Around the same time period QQ evolved into a social networking site and became the most popular such site in terms of sheer numbers.<sup>74</sup>
- **2005:** Facebook, which began in 2004 as the online version of the introductory “field guide” to Harvard students,<sup>75</sup> expanded to “...high school students, professionals inside corporate networks, and, eventually, everyone.”<sup>76</sup>
- **Present Day:** In addition to many of the previously mentioned sites, there have been a number of other highly popular social networking sites that have surfaced in the past decade. Most notably, this includes Twitter, Instagram, WhatsApp, and SnapChat.<sup>77</sup>

### 3. The Motivations

The most frequently cited motivation for using social networking sites is to maintain offline relationships.<sup>78</sup> This maintenance includes a “social searching” element, where users engage social networking sites to find out more about their friends, classmates, and family, as well as the people they have recently met.<sup>79</sup> Another common motivation involves “social network surfing” and “social investigation,” which is when users look to find and develop new relationships based on connections to their existing

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<sup>71</sup> Boyd and Ellison, “Social Network Sites: Definition, History, and Scholarship,” 216.

<sup>72</sup> Digital Trends Staff, “The History of Social Networking,” *Digital Trends*, August 5, 2014, <http://www.digitaltrends.com/features/the-history-of-social-networking/>.

<sup>73</sup> Boyd and Ellison, “Social Network Sites: Definition, History, and Scholarship,” 217.

<sup>74</sup> *Ibid.*, 218.

<sup>75</sup> *Ibid.*

<sup>76</sup> *Ibid.*

<sup>77</sup> Digital Trends Staff, “The History of Social Networking.”

<sup>78</sup> Nicole B. Ellison et al., “Cultivating Social Resources on Social Network Sites: Facebook Relationship Maintenance Behaviors and Their Role in Social Capital Processes,” *Journal of Computer-Mediated Communication* 19, no. 4 (July 2014): 855–70, doi:10.1111/jcc4.12078, 857.

<sup>79</sup> S. Guzin Mazman and Yasemin Koçak Usluel, “Gender Differences in Using Social Networks,” *Turkish Online Journal of Educational Technology* 10, no. 2 (2011): 133–39, 137.

network.<sup>80</sup> Recent research also suggests that people are driven by the concept of “life-logging,” which involves “archiving life experiences and reflecting on identities.”<sup>81</sup>

People also turn to social networking sites because they are easy to use, provide an efficient mechanism for analyzing and sharing information, and allow for education, reflection on daily life, and the development of spontaneous relationships.<sup>82</sup> Social networking sites are also used to pass time, conduct work-related activities, express or explore interests and beliefs, share multimedia, organize events, and play games.<sup>83</sup>

Intertwined with the motivations for use, there are also a number of intrinsic benefits that come with using social networking sites. Grieve et al. argue that the social connectivity offered by social networking sites provide the psychological benefits of “lower depression, lower anxiety, and greater subjective wellbeing.”<sup>84</sup> Likewise, Pai and Arnott propose that social networking sites offer people a sense of belonging, hedonism, self-esteem, and reciprocity.<sup>85</sup> These benefits serve as additional reasons for why people engage in social networking sites and they also offer insight into how virtual relationships can be engineered for the purpose of collecting intelligence.

#### **4. The Numbers**

Table 2 shows the top 70 social networking websites, as identified through Alexa. Not only do social networking sites account for six out of the top ten websites worldwide, but the average rank for the top 70 social networking sites is 1,206—out of nearly 1

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<sup>80</sup> Ibid.

<sup>81</sup> Xuan Zhao et al., “The Many Faces of Facebook: Experiencing Social Media as Performance, Exhibition, and Personal Archive,” in *SIGCHI Conference on Human Factors in Computing Systems* (ACM, 2013), 1–10, <http://dl.acm.org/citation.cfm?id=2470656>, 1.

<sup>82</sup> Mazman and Usluel, “Gender Differences in Using Social Networks,” 133.

<sup>83</sup> Ibid., 134.

<sup>84</sup> Rachel Grieve et al., “Face-to-Face or Facebook: Can Social Connectedness Be Derived Online?,” *Computers in Human Behavior* 29, no. 3 (May 2013): 604–9, doi:10.1016/j.chb.2012.11.017, 608.

<sup>85</sup> Tharaka Ruwan Wijesundara, “Motivations and Usage Patterns of Social Networking Sites: Exploring Cultural Differences Between United States & Sri Lanka,” 2013, <http://brage.bibsys.no/xmlui/handle/11250/135837>, 177.

billion websites in the world. Clearly, a lot of people spend a lot of time on social networking sites.

Table 2. Top 70 Social Networking Sites

TOP 70 SOCIAL NETWORKING SITES BY GLOBAL RANKINGS					
GLOBAL	COMPANY	GLOBAL	COMPANY	GLOBAL	COMPANY
1	Plus.Google.com	283	WhatsApp.com	1,610	Last.fm
2	Facebook.com	305	StumbleUpon.com	1,872	Viadeo.com
3	YouTube.com	326	HootSuite.com	1,908	Plurk.com
5	Tieba.Baidu.com	345	Likes.com	1,944	MySpace.com
9	QQ.com	389	PhotoBucket.com	1,990	NextDoor.com
10	Twitter.com	392	LiveInternet.ru	2,045	Hi5.com
14	LinkedIn.com	424	Meetup.com	2,207	Ravelry.com
15	Weibo.com	442	Fiverr.com	2,210	SkyRock.com
22	VK.com	555	Taringa.net	2,344	FBSBX.com
30	Instagram.com	556	Mixi.jp	2,462	Delicious.com
33	Reddit.com	697	Twoo.com	2,745	Draugiem.lv
40	Pinterest.com	793	FaceName.com	2,848	CouchSurfing.org
42	Tumblr.com	808	Vine.co	2,928	Yammer.com
62	Odnoklassniki.ru	846	Tagged.com	3,337	Care2.com
96	Youku.com	846	VK.me	3,522	InterPals.net
103	Wikia.com	877	Renren.com*	3,550	Classmates.com
137	Flickr.com	915	Xing.com	3,798	Klout.com
143	Douban.com	1,049	FourSquare.com	3,821	FunnyorDie.com
178	DeviantArt.com	1164	Websta.me	3,900	Fiuxy.com
197	LiveJournal.com	1,221	Amoory.com	3,989	Telegram.org
241	Xuite.net	1,342	Line.me	4,099	Podio.com
274	Skype.com	1,347	WeHeartIt.com	4,203	MeetMe.com*
279	Badoo.com*	1,464	CafeMom.com		
283	Ask.fm	1,470	Ning.com		

Original analysis based on data from “Alexa,” Web Analytics Toolkit, *Alexa*, (July 2, 2015), <http://www.alexa.com/>.

Perhaps more impressive than the rankings, social networking sites produce astonishingly high levels of website traffic (See Table 3). Based on the top 70 social networking sites, the most popular site, known as Google Plus, attracts more than 164 million visitors each month. The same site produces more than 4.5 billion visits monthly, which includes more than 46 billion website pages viewed each month. Even the least popular social networking website among the top 70 attracts more than 42,000 visitors, who visit more than 500 thousand times each month. The monthly average number of website visits for the top 70 social networking websites exceeds 171 million, which includes 12 million unique visitors each month.

Table 3. Website Traffic for Identified Top 70 Social Networking Sites

	# OF UNIQUE VISITORS MONTHLY	# OF WEBSITE VISITS MONTHLY	# OF PAGES VIEWED MONTHLY
<b>SITE WITH HIGHEST TRAFFIC</b>	164,808,945	4,584,988,917	46,569,040,537
<b>SITE WITH LOWEST TRAFFIC</b>	42,474	565,114	723,683
<b>AVERAGE TRAFFIC FOR ALL SITES</b>	12,774,995	171,081,922	1,328,730,469

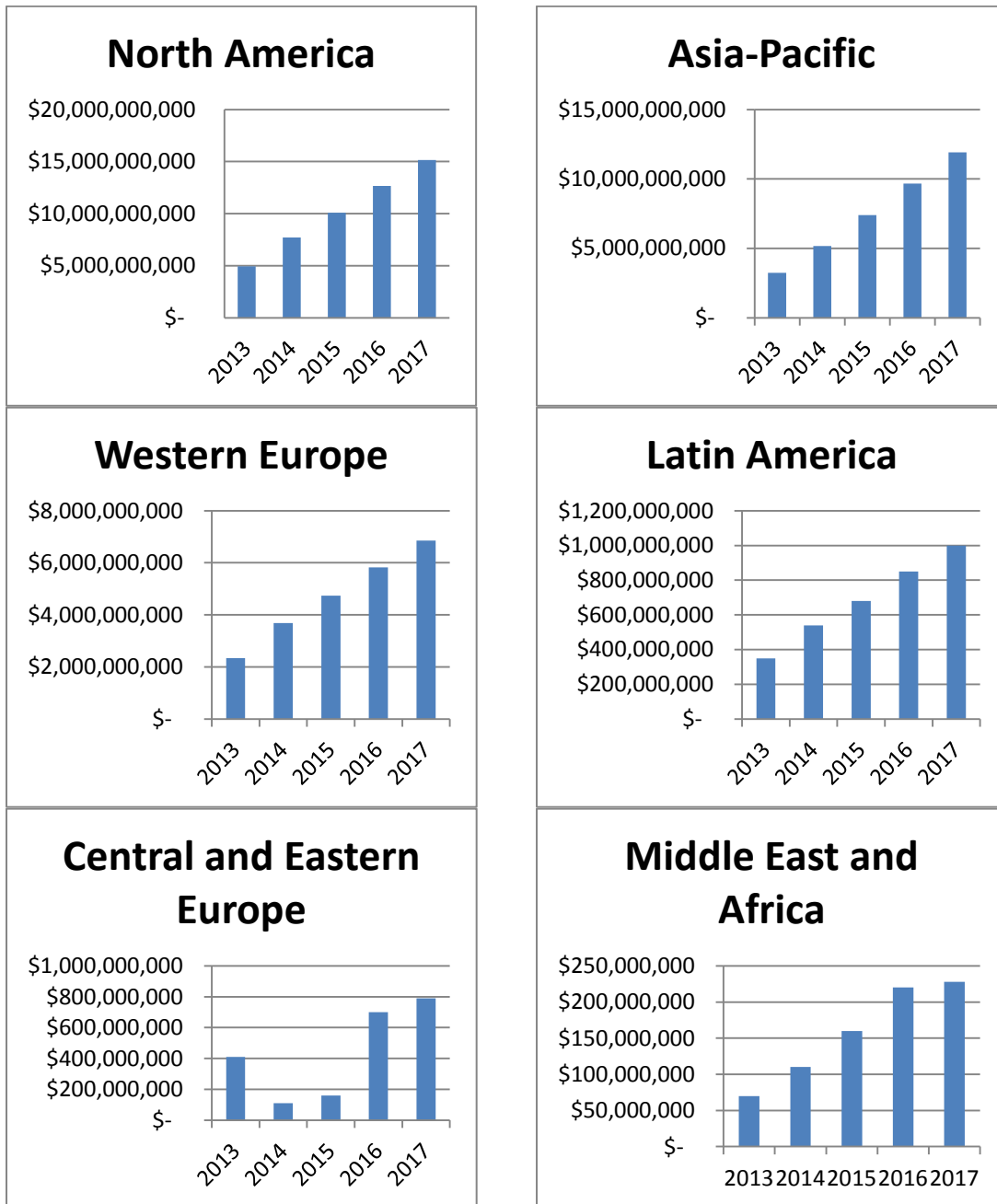
Original calculations based on data from “Alexa,” Web Analytics Toolkit, *Alexa*, (July 2, 2015), <http://www.alexa.com/>.

## 5. The Future of Online Social Networking

Considering the rapid growth in the number of websites, Internet users, and Google searches, it is safe to assume that social networking sites—which rank among the most popular websites in the world—are also experiencing positive trends. To confirm this assumption, one only has to look at the amount of money companies are expected to spend on advertising through social networking sites.

According to EMarketer, advertising through social networking sites has steadily increased since 2013 in all but Central and Eastern Europe (See Figure 6). The greatest level of spending is expected in North America, where the advertising dollars are estimated to increase from just under \$5 billion in 2013 to over \$15 billion by 2017 (207-percent increase). The Asia-Pacific region is expected to see the highest level of growth, going from \$3.25 billion in 2013 to nearly \$12 billion in 2017 (266-percent increase). Although the total amount of spending is the lowest in the Middle East and Africa, the region is expected to experience the second highest level of growth with nearly a 226-percent increase from 2013 to 2017. Western Europe is expected to grow from \$2.34 billion to \$6.85 billion (193-percent increase), while Latin America is projected to grow from \$350 million to \$1 billion (186-percent). The smallest level of growth is expected in Central and Eastern Europe, where the region is estimated to go from \$410 million in 2013 to \$790 million in 2017 (93 percent). Collectively, the forecast for all six regions suggests that online social networking sites are only expected to become even more popular in the coming years.

Figure 4. Social Media Ad Spending by Region



Original graphics based on data from eMarketer, "Social Network Ad Spending to Hit \$23.68 Billion Worldwide in 2015," *eMarketer*, April 15, 2015, <http://www.emarketer.com/Article/Social-Network-Ad-Spending-Hit-2368-Billion-Worldwide-2015/1012357>.

## B. ONLINE VIDEO GAMES

Almost as popular as social networking sites, hundreds of millions of people from across the globe participate in video and computer games, many of which are now played online. According to NewZoo, there are more than 1.9 billion gamers worldwide.<sup>86</sup> As explained in Figure 7, this sum includes nearly a billion in the Asia Pacific region, and hundreds of millions in North America, Latin America, Europe, the Middle East and Africa.

Figure 5. Online Gamers by Region.



Original graphic based on data from “Global Games Market Will Grow 9.4% to 91.5Bn in 2015,” *NewZoo Games Market Research*, April 22, 2015, <http://www.newzoo.com/insights/global-games-market-will-grow-9-4-to-91-5bn-in-2015/>.

These figures represent video games in general, which include MMOs, as well as first-person shooters and a variety of single player games. The specific portion of gamers that play MMOs is difficult to measure but the sheer volume of MMO activity makes it

<sup>86</sup> “Global Games Market Will Grow 9.4% to 91.5Bn in 2015,” *NewZoo Games Market Research*, April 22, 2015, <http://www.newzoo.com/insights/global-games-market-will-grow-9-4-to-91-5bn-in-2015/>.

reasonable to assume that the community writ large represents a significant share of MMO players. For one, the most popular MMOs are said to represent nearly 2 billion registered accounts.<sup>87</sup> Although this figure includes a number of duplicates, it does suggest that there are a large number of MMO players in the gaming community.

As previously stated, this study focuses primarily on MMOs, which involve the greatest level of social connectivity.

## 1. The Basics

A study of MMOs from 2009 to 2012 showed that the number of registered accounts for MMOs increased from 400 million to more than 1.9 billion worldwide.<sup>88</sup> Within this rapid growth—of 375 percent—the second largest age group of users was 18 to 25.<sup>89</sup> Since then, the total number of registered accounts for MMOs in 2014 has increased to an estimate of 2.723 billion.<sup>90</sup> Although the number of registered accounts is likely to include duplicates, the sheer velocity and volume suggests that participation in MMOs has certainly and drastically increased. In addition to participation, the scope and impact of MMOs has also intensified. In the MMO of SecondLife, real nations have virtual embassies, such real companies as IBM and Toyota have virtual shops,<sup>91</sup> virtual universities are providing real courses, virtual romances are resulting in real divorces,<sup>92</sup> and virtual currency is being traded for real money.<sup>93</sup>

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<sup>87</sup> “Most Popular MMORPGs in the World,” *MMOs.com*, 2015, <http://mmos.com/editorials/most-popular-mmorpgs-world>.

<sup>88</sup> KZero Worldwide, “Virtual Worlds: Industry & User Data Universe Chart for Q1 2012,” Slideshow Presentation Report, (May 30, 2012), <http://www.slideshare.net/nicmitham/kzero-universe-q1-2012?ref=http://www.kzero.co.uk/blog/category/universe-graph/>, 7.

<sup>89</sup> *Ibid.*

<sup>90</sup> KZero Worldwide, “Universe Charts Q2 2014 VWs/MMOs: Average User Age, Registered Accounts & Launch Date,” Slideshow Presentation Report, (June 10, 2014), <http://www.slideshare.net/nicmitham/kzero-universe-q2-2014>, 11.

<sup>91</sup> Paul R. Messinger, Eleni Stroulia, and Kelly Lyons, “A Typology of Virtual Worlds: Historical Overview and Future Directions,” *Journal For Virtual Worlds Research* 1, no. 1 (July 2008): 1–18, 50.

<sup>92</sup> Brown, “Relationships, Community, and Identity in the New Virtual Society,” P.29; Leshed and McLeod, “Metaphors for Social Relationships in 3D Virtual Worlds,” 1.

<sup>93</sup> Edward Castronova et al., “As Real as Real? Macroeconomic Behavior in a Large-Scale Virtual World,” *New Media & Society* 11, no. 5 (2009): 685–707, 692.



Dr. Richard Bartle, who co-invented the first computerized text-based role playing game, presents the most comprehensive definition of an MMO.<sup>94</sup> Bartle proposes that an MMO is "...an automated, shared, persistent environment with and through which people can interact in real time by means of a virtual self."<sup>95</sup> He further provides the following explanations for each of these elements:<sup>96</sup>

- **Automated:** the virtual world implements a coherent set of rules (its physics) that entirely define what changes its real-life visitors (termed players) can make to that world.
- **Shared:** more than one player can be in the exact same virtual world at once.
- **Persistent:** if you stop playing then come back later, the virtual world will have continued to exist in your absence.
- **Environment:** the virtual world manifests surroundings in which the player activities take place.
- **Interact with:** players can perform actions within the virtual world, which produce results that are relayed back to them.
- **Interact through:** players can communicate with one another under the auspices of the virtual world.
- **Real time:** the virtual world generates feedback for events pretty well the moment they occur.
- **Virtual self:** each player identifies with a unique entity within the virtual world (their character) through which all their in-world activity is channeled.

## 2. The History

As with most notable discoveries, there is some debate, albeit limited, about the origins of MMOs. Most researchers seem to agree that MMOs derive from video games but the genesis for online communities seems to differ even more.

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<sup>94</sup> Martin C. Kindsmüller, André Melzer, and Tilo Mentler, "Online Communities and Online Community Building," *Encyclopedia of Information Science and Technology*, 2009, 2899–2904, 2900.

<sup>95</sup> Richard A. Bartle, "From MUDs to MMORPGs: The History of Virtual Worlds," in *International Handbook of Internet Research* (Springer, 2010), 23–39, [http://link.springer.com/chapter/10.1007/978-1-4020-9789-8\\_2, 2](http://link.springer.com/chapter/10.1007/978-1-4020-9789-8_2, 2).

<sup>96</sup> Ibid.

According to some researchers, the first online communities date back to ARPAnet—the predecessor of the Internet.<sup>97</sup> Invented by the U.S. military, ARPAnet included computerized bulletin boards that military personnel used for communication and collaboration.<sup>98</sup> According to Howard Rheingold, the best-known bulletin boards at the time were the Whole Earth Lectronic Link, also known as “the WELL,” and FidoNet.<sup>99</sup> While not primarily designed for gaming, these early virtual communities allowed users to connect, communicate, socialize and even play games online.<sup>100</sup>

In 1979, computer science students also created a virtual community called Usenet.<sup>101</sup> Usenet was designed to enable computers to “automatically exchange information via modems at regular intervals” and ultimately led to the first Multi-User Dungeon (MUD).<sup>102</sup> MUDs were “computer-implemented versions of text-based role-playing games” where the users could adopt virtual identities and interact with one another.<sup>103</sup> Although MUDs failed to gain widespread popularity, they did pave the way for modern day video and computer games to include MMOs.

The development of MUDs from this point is best described by Dr. Bartle, who identifies the following five distinct evolutions:<sup>104</sup>

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<sup>97</sup> Kindsmüller, Melzer, and Mentler, “Online Communities and Online Community Building,” 2899.

<sup>98</sup> Ibid., 2900.

<sup>99</sup> Ibid.

<sup>100</sup> Kracht, Janis, “Terms You Should Know,” *The FidoNet Network in North America*, 2003, <http://www.z1.fidonet.org/terms.html>.

<sup>101</sup> Bonnett, Cara, “A Piece of Internet History,” *Duke Today*, May 17, 2010, <https://today.duke.edu/2010/05/usenet.html>.

<sup>102</sup> Kindsmüller, Melzer, and Mentler, “Online Communities and Online Community Building,” 2900.

<sup>103</sup> Ibid.

<sup>104</sup> Bartle, “From MUDs to MMORPGs: The History of Virtual Worlds,” 3-7.

### **The First Age: 1978–1985**

- Computer science student Roy Trubshaw creates a basic software foundation for constructing a virtual world while at the University of Essex.
- His colleague, Richard Bartle, assists with Version 2, which embodies his vision for a new form of gameplay that gives “...people freedom to be—and become—their real selves.”

### **The Second Age: 1985–1989**

- Virtual worlds beyond the University of Essex begin to form. As listed by Bartle, this included the virtual worlds, Shades, Gods, AMP, and MirrorWorld.
- Because these virtual worlds derived from MUD, they were commonly referred to as MUDs. Thus, the original MUD renamed itself as MUD1.

### **The Third Age: 1989–1995**

The virtual world AberMUD was created and quickly spread across computer science departments, creating a greater demand for virtual worlds.

### **The Fourth Age: 1995–1997**

Traditional virtual worlds (i.e., MUDs) ended due but not before revealing how profitable such games could become if a critical mass of users could be reached. In other words, MUDs were expensive to maintain for a small number of users and the needed critical mass to make them profitable was not possible because of the limited Internet access at the time.

### **The Fifth Age: 1995–Present**

- Driven by new technologies, virtual worlds transition from text to graphics, increasing the sense of immersion. Rather than just interacting through written words, users were now experiencing a more realistic environment through better graphics and functionality.
- New technologies also enabled virtual worlds to shift from relatively small structured environments to massive structured and unstructured environments, where players could be offered near-total freedom to explore, create their own content, and socially engage with millions from across the globe.
- Immensely popular worlds like Second Life and such games as World of Warcraft serve as powerhouses, influencing policy-makers and businesses.
- Browser-situated games that can be played beyond office and school firewalls are emerging and virtual world companies are shifting from subscription to micropayment business models.

### 3. The Motivations

Four models in the literature attempt to explain why people may choose to participate in MMOs.

Bartle proposes a four-player taxonomy of Achiever, Explorer, Socializer, and Killer.<sup>105</sup> The achiever role focuses on achieving in-game objectives, whereas the explorer is more focused on discovering things about the game. The socializer participates in the MMO for the purpose of developing or maintaining social ties. The killer participates in the MMO for the purpose of simply killing other players, for entertainment purposes or to express real grief.

While relatively straightforward, this model has been criticized for suggesting that these roles are independent, which has yet to be empirically tested.<sup>106</sup> This alternative perspective would suggest that some players are motivated by a combination of these factors.

Building on Bartle's model, Nick Yee proposes that MMO participants are motivated by achievement, social, and immersion components.<sup>107</sup> The achievement component encompasses the desire to advance and accumulate symbols of wealth or status, analyze the mechanics and rules of the game in order to optimize performance, and compete with others.<sup>108</sup> The social component is comprised of the desire to socialize with other players, form long-term relationships, and become part of a social group.<sup>109</sup>

Lastly, the immersion component is about discovering things about the game that most other players do not know, role-playing to generate a storyline, customizing the appearance of one's character, and escaping from reality.<sup>110</sup>

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<sup>105</sup> Ibid.

<sup>106</sup> Nick Yee, "Motivations for Play in Online Games," *CyberPsychology & Behavior* 9, no. 6 (2006): 772–75, 772.

<sup>107</sup> Ibid., 773.

<sup>108</sup> Ibid.

<sup>109</sup> Ibid.

<sup>110</sup> Ibid., 774.

Another prominent model is the Relationship-Achievement Model. This model suggests that all other motivations, including those that are identified by Bartle and Yee, can simply be classified into relationship and achievement.<sup>111</sup> In the Relationship-Achievement Model, users are motivated by either their desire to interact with other players or their need to achieve objectives within the game.<sup>112</sup> All other motivations, such as immersion, can be viewed as a subcategory of these elements.<sup>113</sup>

Ultimately, these various models suggest that people participate in MMOs primarily for entertainment, social networking, and relationship building. The latter two reasons are of particular importance since they lend themselves to the development of a virtual community, which can then be exploited for the development of human sources.

#### **4. The Numbers**

MMO-related websites are harder to measure than most other websites mainly because the method for which the player uses to access the game can vary among games. For example, nexon.net and battle.net, which house some of the most popular online games in the world use one website for all their games. Therefore, it is nearly impossible to differentiate which website traffic is intended for which game. Additionally, there are some gaming websites that are primarily used for promoting their game (i.e., CallofDuty.com) rather than accessing their game. In these cases, the game is actually accessed through an alternative online portal. Fortunately, these limitations do not impact the goal of evaluating online gaming activities more broadly.

Based on Alexa data, the top 70 online gaming websites to include MMOs are shown in figure Table 4. The websites that represent multiple games are marked with an asterix. Based on this data, the top 70 websites hold a significant share of the top websites overall but not nearly as significant as online social networking sites. The most popular gaming site within the top 70 ranks at 12, while the least popular ranks at more than 111,000.

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<sup>111</sup> You et al., “RA-Model: A Taxonomy Model of Player Activities in Mobile MMORPGs,” 705.

<sup>112</sup> Ibid.

<sup>113</sup> Ibid.

Table 4. Top 70 Online Gaming Sites

TOP 70 ONLINE GAMING SITES BY GLOBAL RANKINGS					
GLOBAL RANK	COMPANY	GLOBAL RANK	COMPANY	GLOBAL RANK	COMPANY
12	Nexon.net*	14378	DOFUS.com	41014	GuildLaunch.com
464	Battle.net*	15557	CallOfDuty.com*	43308	Plemiona.pl
781	LeagueOfLegends.com	17672	FlyorDie.com	47108	xfire.com
1043	Battlefield.com	18429	HOWRSE.com	47298	Lineage2.com
2792	FinalfantasyXIV.com	19331	Thewitcher.com	47371	Evony.com
3377	Bungie.net*	20241	IGG.com	49876	BattleOn.com
3457	Curse.com	20450	Perfectworld.com	51277	RiftGame.com
3793	SecondLife.com	20735	Paizo.com*	54068	DragonAge.com
4160	Aeriagames.com*	22241	SmallWorlds.com	54580	ConquerClub.com
4656	DOTA2.com	24585	Mmosite.com	59905	Ddo.com
4967	GuildWars2.com	25795	Z8Games.com*	72108	ONRPG.com
6047	neopets.com	28577	Counter-strike.net*	72678	SFGame.cz
6535	ElderScrollOnline.com	29097	EliteDangerous.com	75122	Saintseiya-Gold.com
6723	Runescape.com	29347	F-List.net	75440	Subeta.net
6825	SWTOR.com	29369	lotro.com	78103	Seafight.com
7191	Urban-rivals.com	30488	TribalWars.net	81571	BladeandSoul.com
8108	WorldofTanks.com	31363	Allakhazam.com	88344	Joymax.com
8200	travian.ru	31901	Wildstar-Online.com	94320	DeadFrontier.com
10342	RobertsSpaceIndustries.com*	33071	Rpg.net	96878	Nostalrius.org
10466	4223.com	33226	Terraria.org	102787	FooPets.com
11303	EveOnline.com	35028	moshimonsters.com	111407	PlayNeverWinter.com
12582	arcgames.com*	37471	NetMarble.co.id	111883	Travian.co.uk
13874	TheSims3.com	38525	RageZone.com		
13910	Enmasse.com*	40315	AionOnline.com		

Original analysis based on data from “Alexa,” Web Analytics Toolkit, *Alexa*, (July 2, 2015), <http://www.alexacom/>.

The top 70 online gaming sites attract an average of nearly 700 thousand unique visitors and more than 17 million page views each month. The most popular gaming site attracts more than 6 million unique visitors. This data is presented in Table 5 with more detail.

Table 5. Website Traffic for Identified Top 70 Online Gaming Sites

	# OF UNIQUE VISITORS MONTHLY	# OF WEBSITE VISITS MONTHLY	# OF PAGES VIEWED MONTHLY
<b>SITE WITH HIGHEST TRAFFIC</b>	6,077,189	27,940,501	117,721,611
<b>SITE WITH LOWEST TRAFFIC</b>	17,056	49,906	238,691
<b>AVERAGE TRAFFIC FOR ALL SITES</b>	678,506	3,198,416	17,026,743

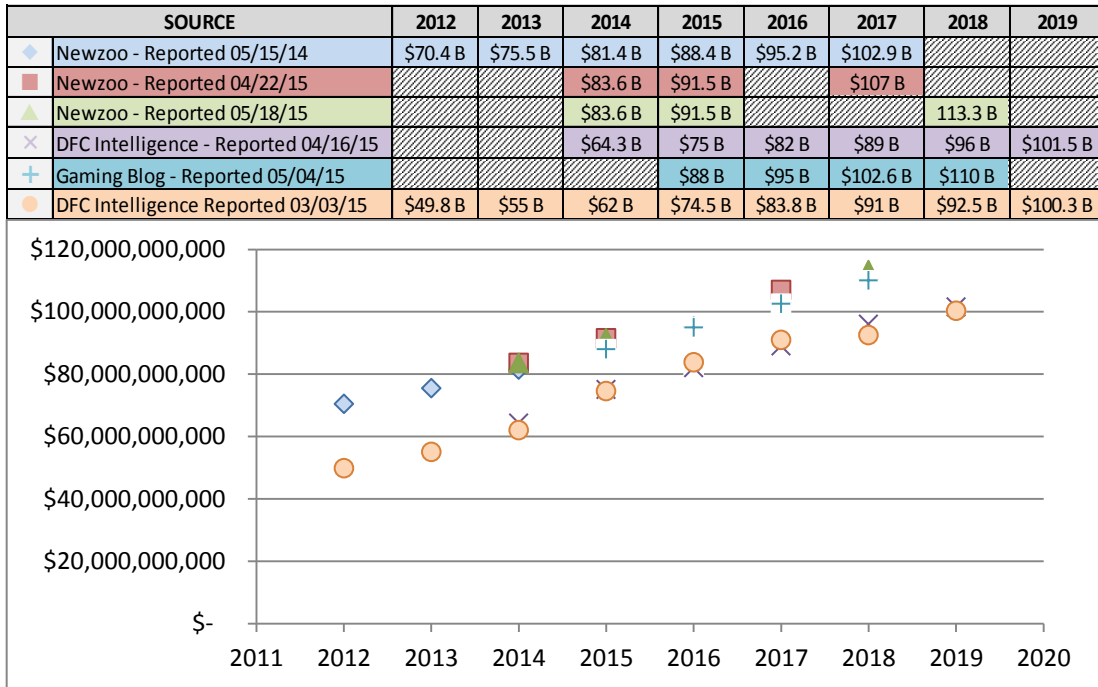
Original calculations based on data from “Alexa,” Web Analytics Toolkit, *Alexa*, (July 2, 2015), <http://www.alexacom/>.

There is an apparent disconnect between the overall number of gamers worldwide and the significant but far less impressive numbers regarding online gaming website traffic. There are two likely explanations for this. First, the overall number of gamers includes all types of gamers, to include those who do not play online. Second and more importantly, the website traffic measured by Alexa does not accurately take into account the number of people playing online games through their mobile (i.e., cell phone) and console (i.e., Xbox) devices. This deficiency owes to technical limitations in the methodology that Alexa employs, however the data that is available still reflects significant online gaming activities throughout the world.

## **5. The Future of Online Gaming**

Revenue for video games, most of which are played online or include an online component, is also trending upwards. Figure 8 presents forecast data for video game sales worldwide. The most conservative estimate shows that video game revenue will have increased from \$49.8 billion in 2012 to \$100.3 billion by 2019. The goal of reaching \$100 billion is shared by all of sources, however the year in which this is expected to occur ranges from 2017 to 2019. In any case, this consistent trend suggests that video games will continue to carry a large stake in online activities.

Figure 6. Online Gaming Revenue Forecasts.



Original graphic based on data from “Global Games Market Will Reach \$102.9 Billion in 2017,” *NewZoo Games Market Research*, May 15, 2014, <http://www.newzoo.com/insights/global-games-market-will-reach-102-9-billion-2017-2/>; Brightman, James, “DFC: Will Sony, Microsoft Remain Relevant in Games by 2019?,” *GamesIndustry.Biz*, April 16, 2015, <http://www.gamesindustry.biz/articles/2015-04-16-dfc-will-sony-microsoft-remain-relevant-in-games-by-2019>; “Global Games Market Will Grow 9.4% to 91.5Bn in 2015,” *NewZoo Games Market Research*, April 22, 2015, <http://www.newzoo.com/insights/global-games-market-will-grow-9-4-to-91-5bn-in-2015/>; Merel, Tim, “Leaders Dominate \$45 Billion Mobile Games Revenue Forecast by 2018,” *Gamesutra*, May 4, 2015, [http://www.gamasutra.com/blogs/TimMerel/20150504/242550/Leaders\\_dominat\\_45\\_billion\\_mobile\\_games\\_revenue\\_forecast\\_by\\_2018.php%20,%20http://hexus.net/gaming/news/pc/81292-pc-games-software-market-exceed-35bn-2018-says-oga/](http://www.gamasutra.com/blogs/TimMerel/20150504/242550/Leaders_dominat_45_billion_mobile_games_revenue_forecast_by_2018.php%20,%20http://hexus.net/gaming/news/pc/81292-pc-games-software-market-exceed-35bn-2018-says-oga/); “Global Report: U.S. and China Take Half of \$113Bn Games Market in 2018,” *NewZoo Games Market Research*, May 18, 2015, <http://www.newzoo.com/insights/us-and-china-take-half-of-113bn-games-market-in-2018/>.



## C. ONLINE DATING

According to TechTimes, approximately 91 million people in the world are now dating online.<sup>114</sup> There are nearly 4,000 online dating companies worldwide and more impressively, this industry rakes in about \$2 billion in annual revenue.<sup>115</sup>

### 1. The Basics

In the early 2000s, online dating accounted for more revenue than any other online service.<sup>116</sup> Although this situation radically changed when social networking and online shopping began to grow in popularity, online dating has always maintained a significant stake in online behavior. Perhaps of greater importance, the stigma that once attached to online dating—and initially limited its clientele—has since diminished.<sup>117</sup> In 2014, researchers claimed that 40 million out of 54 million single people in the U.S. have tried online dating.<sup>118</sup> Today, in 2015, that number is estimated to have reached 49.2 million within the U.S.<sup>119</sup> Although it is more difficult to estimate the number of online daters worldwide, location-based dating applications such as Tinder have claimed 91 million users globally.<sup>120</sup> In any case, the total number of people turning to the Internet for dating has increased drastically and continues to grow.

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<sup>114</sup> Plummer, Quinten, “56 Million vs. 35 Million: Number Of Men Compared To Number Of Women Using Dating Apps,” *Tech Times*, February 18, 2015, <http://www.techtimes.com/articles/33583/20150218/56-million-vs-35-million-number-of-men-compared-to-number-of-women-using-dating-apps.htm>.

<sup>115</sup> “Dating Services in the US: Market Research Report,” *IBISWorld: Where Knowledge Is Power*, April 2015, <http://www.ibisworld.com/industry/default.aspx?indid=1723>.

<sup>116</sup> Veronica M. Scott, Karen E. Mottarella, and Maria J. Lavooy, “Does Virtual Intimacy Exist? A Brief Exploration Into Reported Levels of Intimacy in Online Relationships,” *CyberPsychology & Behavior* 9, no. 6 (2006): 759–61, 759.

<sup>117</sup> Artemio Ramirez et al., “When Online Dating Partners Meet Offline: The Effect of Modality Switching on Relational Communication Between Online Daters,” *Journal of Computer-Mediated Communication*, 2014, n/a – n/a, doi:10.1111/jcc4.12101, 1.

<sup>118</sup> Peng Xia et al., “Who Is Dating Whom: Characterizing User Behaviors of a Large Online Dating Site,” *arXiv Preprint arXiv:1401.5710*, 2014, <http://arxiv.org/abs/1401.5710>, 2.

<sup>119</sup> “Statistic Brain Research Institute,” *Online Dating Statistics*, May 18, 2015, <http://www.statisticbrain.com/online-dating-statistics/>.

<sup>120</sup> Stuart Dredge, “Nearly Two Thirds of Mobile Dating App Users Are Men,” *The Guardian*, February 17, 2015, sec. Technology, <http://www.theguardian.com/technology/2015/feb/17/mobile-dating-apps-tinder-two-thirds-men>.

There are two forms of dating that occur online. The first and more mainstream version involves engaging in an online relationship with the intent of eventually meeting in-person. The second version involves a purely virtual relationship, where there is no intention among the parties to meet in real life. websites that are primarily designed for online dating are usually comprised of a front-end, which includes user profiles and the ability to find and communicate with potential matches, and a back-end, which supports computerized algorithms that analyze and identify compatible users.<sup>121</sup> Virtual dating sites include similarly constructed websites but also extend into role-playing games and virtual worlds.

Online and virtual dating also involves a significant amount of self-disclosure. Users not only reveal basic biographical information such as their age, height, and weight but they also commonly share their occupation, income, educational background, blood type, hobbies, and a number of other personal identifiers and preferences.<sup>122</sup> In some cases, the sharing of personal information far exceeds what is normally shared through social networking sites. As a result, a significant level of intimacy can be developed online.

## 2. The History

It is fair to assume that the use of the Internet to identify and develop romantic relationships began just as early as the first computerized bulletin boards and chat rooms came to be in 1978.<sup>123</sup> However, computer-based matchmaking, which uses algorithms to identify compatibility among users, started even earlier, in the 1960s.<sup>124</sup> While initially restricted to a computer program that compared personality questionnaires, the

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<sup>121</sup> Xia et al., "Who Is Dating Whom: Characterizing User Behaviors of a Large Online Dating Site," 2.

<sup>122</sup> Ibid., 4.

<sup>123</sup> Gilbertson, Scott, "Feb. 16, 1978: Bulletin Board Goes Electronic," *Wired*, February 16, 2010, <http://www.wired.com/2010/02/0216cbbs-first-bbs-bulletin-board/>.

<sup>124</sup> Xia et al., "Who Is Dating Whom: Characterizing User Behaviors of a Large Online Dating Site," 1.

technology eventually served as the backbone of early dating sites, which began to emerge in the 1990s.<sup>125</sup>

### 3. The Motivations

For some, online dating is just like any other form of dating; the medium is just different. However, for some, online dating offers a viable alternative for overcoming the task of developing intimate relationships through face-to-face encounters.<sup>126</sup> There are also a number of practical reasons for dating online. As explained by Professor Aunshul Rege, online dating is convenient, easy to access, private, and offers the real or perceived opportunity to find one's "perfect" match through science, rather than happenstance.<sup>127</sup> Some researchers also argue that individuals that struggle in establishing intimacy through face-to-face encounters, will turn to online dating as a viable alternative.

The motivations for virtual dating are a bit more complex and unique. Dr. Cynthia Jones argues that virtual dating offers a host of "perks" to include the ability to have "sexual encounters without the fear of disease or pregnancy; anonymity; and, for some, a chance to cheat on a partner without ever leaving home."<sup>128</sup> Jones also suggests that virtual dating offers users an opportunity to engage in a relationship without investing much financially or emotionally.<sup>129</sup> A final benefit that Jones highlights is the ability for virtual daters to explore fantasies more openly, take risk, and disengage from a relationship with ease.<sup>130</sup>

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<sup>125</sup> Ibid., 2.

<sup>126</sup> Scott, Mottarella, and Lavooy, "Does Virtual Intimacy Exist? A Brief Exploration Into Reported Levels of Intimacy in Online Relationships," 759.

<sup>127</sup> Aunshul Rege, "What's Love Got To Do With It? Exploring Online Dating Scams and Identity Fraud," *International Journal of Cyber Criminology* 3, no. 2 (2009): 494–512, 494.

<sup>128</sup> Cynthia Jones, "Lying, Cheating, and Virtual Relationships," *Global Virtue Ethics Review* 6, no. 1 (2010): 3–12, 4.

<sup>129</sup> Ibid., 7.

<sup>130</sup> Ibid., 8.

With that said, virtual dating is not without its downsides. For example, while the cost may be low, the level of satisfaction may be limited. Additionally, the anonymity that in one way serves as a benefit can also result in greater level of deception.<sup>131</sup>

#### 4. The Numbers

Despite the numbers, online dating websites are not nearly as popular as online social networking and gaming websites. Based on Alexa data, which is presented in Table 6, the majority of the top 70 online dating websites do not break the 10,000-mark. However, some of the most popular online dating websites (Badoo, Flirchi, OkCupid, Match, and Renren) do hold relatively high rankings, all within the top 1000 worldwide.

Table 6. Top 70 Online Dating Sites

TOP 70 ONLINE DATING SITES BY GLOBAL RANKINGS					
GLOBAL RANK	COMPANY	GLOBAL RANK	COMPANY	GLOBAL RANK	COMPANY
284	Badoo.com*	14,619	Inchallah.com	69,239	LoveAwake.com
414	Flirchi.com	14,897	24open.ru	83,204	Cupid.com
519	OkCupid.com	14,954	Vukki.com	84,443	FlirtFair.com.au
823	Match.com	16,573	Dream-Marriage.com	103,544	AdoreAsia.com
889	Renren.com*	16,888	DateHookUp.com	105,389	MetroDate.com
1,044	Shaadi.com	17,122	CHNLove.com	112,045	Mate4All.com
2,217	Zoosk.com	19,382	Parship.de	114,641	Date.com
2,625	Mamba.ru	19,385	Teamo.ru	116,192	Flirtak.pl
3,154	jiayuan.com	21,118	Chemistry.com	116,689	FlirtWiese.net
3,977	eHarmony.com	22,662	JDate.com	118,857	Latineuro.com
4,192	MeetMe.com*	22,995	BazooCam.org	127,522	FindSomeone.co.nz
4,251	Lovoo.com	24,861	DateZone.com	134,268	MeetVille.com
4,458	MeetIC.fr	24,862	charmdate.com	139,335	LoveStruck.com
4,759	lmvu.com	27,997	eDarling.de	161,519	BeHappy2Day.com
4,879	Ourtime.com	36,470	Tabor.ru	165,587	PerfectMatch.com
5,820	LovePlanet.ru	37,827	PlentyofFish.com	199,033	Spark.com
6,301	yourtango.com	39,181	ConnectingSingles.com	206,524	Love.ru
8,919	AnastasiaDate.com	43,960	FirstDate.com	217,311	LavaLife.com
10,484	Adopteunmec.com	44,099	Mate1.com	438,245	NewFriends4u.com
11,676	Draugas.lt	44,397	FriendFinder.com	481,166	Inter-Mariage.com
11,966	Christianmingle.com	47,666	Fropper.com	595,879	Tinder.com
12,397	Muslima.com	47,762	IDateAsia.com	1,697,932	UBLove.com
14,245	Amorelinea.com	62,395	LavaPlace.com		
14,294	MeetIC.es	66,103	LatamDate.com		

Original analysis based on data from “Alexa,” Web Analytics Toolkit, *Alexa*, (July 2, 2015), <http://www.alexa.com/>.

<sup>131</sup> Ibid.

As indicated in Table 7, the most popular online dating website attracts well more than 5 million unique visitors each month. The same site produces more than 53 million visits and 650 million page views monthly. The least popular online dating website within the top 70 falls well below these numbers. However, the monthly average for all of the top 70 online dating sites is more consistent with a little over 1 million unique visitors, 6 million website visits, and 49 million page views.

Table 7. Website Traffic for Identified Top 70 Online Dating Sites

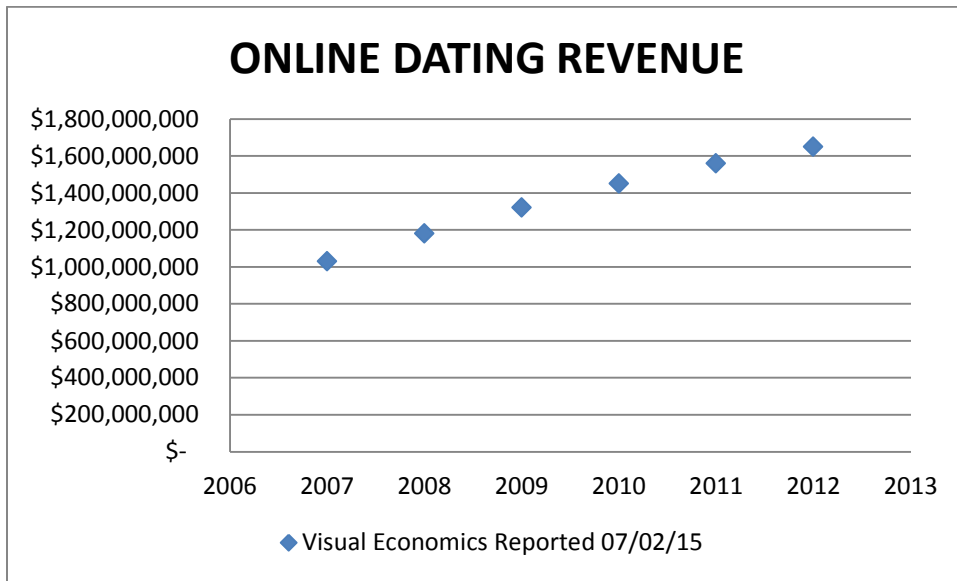
	# OF UNIQUE VISITORS MONTHLY	# OF WEBSITE VISITS MONTHLY	# OF PAGES VIEWED MONTHLY
<b>SITE WITH HIGHEST TRAFFIC</b>	5,861,111	53,816,490	650,837,462
<b>SITE WITH LOWEST TRAFFIC</b>	12,805	77,568	324,827
<b>AVERAGE TRAFFIC FOR ALL SITES</b>	1,045,599	6,114,055	49,497,635

Original calculations based on data from “Alexa,” Web Analytics Toolkit, *Alexa*, (July 2, 2015), <http://www.alexa.com/>.

## 5. The Future of Online Dating

Like social networking and gaming, online dating has also shown a consistent upward trend (See Figure 9). It is difficult to obtain reliable data on the number of online daters from year to year however, the evaluation of revenue serves as a good alternative for measuring the popularity of online dating. In July 2015, Visual Economics reported that online dating revenue has increased from \$1 billion in 2007 to \$1.7 billion in 2013. More importantly, there was a 20-percent to 25-percent increase each year.

Figure 7. Online Dating Revenue Trends



Original graphic based on data from Wesley, Daniel, "A Business of Love: Online Dating by the Numbers," *CreditLoan*, accessed September 5, 2015, <http://visualeconomics.creditloan.com/a-business-of-love-online-dating-by-the-numbers/>.

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### III. THE VIRTUAL SOURCE

Does the simple fact that people are becoming increasingly more connected to their computers mean that intelligence agencies will be effective in recruiting sources virtually? To answer this question, we first have to identify what makes a valuable source. In other words, what type of people would offer the most access to an intelligence agency, and more importantly, are these types of people online? Most if not all developed countries are using the Internet, but do these “wired” populations include individuals that would offer some sort of intelligence value? What about less developed nations? Surely intelligence requires access to these nations just as much, if not more so. This chapter examines these issues in their turn.

#### A. DEFINING THE “WHO”

The central task of an intelligence agency is to collect information regarding the capabilities and intentions of an adversary or competitor.<sup>132</sup> This collection is most commonly pursued for two reasons. First, a nation must protect itself from those who seek to cause it harm.<sup>133</sup> One aspect of providing this security involves knowing where the enemy is, what it plans to do, and how it plans to do it. Whether it is a terrorist organization, criminal enterprise, or a foreign government, the opposing intelligence agencies serve in the forefront of collecting such information.

The second part of the equation has to do with opportunity.<sup>134</sup> Beyond protecting against threats, intelligence agencies also collect information that provides decision makers with the ability to more broadly advance national interests. Examples of such information range from humanitarian and environmental issues to economics, science, and technology.<sup>135</sup> Ultimately, the intelligence agencies serve the purpose of providing

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<sup>132</sup> Johnson, “Evaluating ‘Humint’: The Role of Foreign Agents in U.S. Security,” 308.

<sup>133</sup> Ibid.

<sup>134</sup> Ibid.

<sup>135</sup> Ibid., 319.



leaders with the information necessary to make informed policy decisions.<sup>136</sup> To accomplish this objective, intelligence agencies look to collect sensitive information through a variety of means, including HUMINT. HUMINT involves identifying and recruiting an individual that can provide some needed information. This concept is most often described as “placement and access.”

There are two primary factors for determining a potential’s sources placement and access. The first and more generic factor has to do with a person’s nationality or country of residence. Because conflict often occurs between nations, the enemy or competitor that intelligence agencies must face is usually connected to a foreign nation.<sup>137</sup> Beyond a person’s nationality or country of residence, there is also a geographical component that accompanies every threat. For example, al Qaeda operatives must eat, sleep, train, and live within some national border. Although these operating areas are often ungoverned, they can still be geographically identified.<sup>138</sup> Thus, collecting intelligence based on geography will always be relevant.

The second factor has to do with a person’s affiliation with a particular group or place of employment. For example, those who affiliate with or participate in a terrorist organization or criminal enterprise likely will have access to sensitive information that could be used against the group. Likewise, persons who work within government or, more specifically, the military or security forces are also likely to have access to sensitive information about their organizations or government.

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<sup>136</sup> N. Richard Kinsman, “Openness and the Future of the Clandestine Service” (DTIC Document, 2001), <http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=ADA524042>, 55.

<sup>137</sup> Johnson, “Evaluating ‘Humint’: The Role of Foreign Agents in U.S. Security,” 312.

<sup>138</sup> Howard, “Intelligence in Denied Areas: New Concepts for a Changing Security Environment,” 3.

Because affiliation is relatively straightforward and supported by other research,<sup>139</sup> I have elected to focus mainly on nationality and country or territory of residence. I first identify the specific key countries and territories that are of interest to U.S. national security and then determine whether persons from these countries and territories are actually online.

### **1. Key Countries and Territories**

Finite resources and time—as well as operational efficacy—demand prioritization of efforts. To this end, I propose four concepts as categorization tools. The first and more obvious one involves identifying the nations and territories that pose a clear threat to U.S. national security. The second concept involves identifying the nations and territories that are experiencing high levels of terrorism or transnational crime. The third concept involves identifying the nations and territories that are experiencing significant conflict or instability. The fourth and final concept involves identifying the nations and territories that are especially dangerous or hostile. Collectively, these four factors represent both national security and national opportunity for intelligence collection.<sup>140</sup> These concepts also include a particular focus on failed states or regions, many of which serve as a breeding ground for transnational and non-state adversaries.<sup>141</sup>

To establish these criteria, I identified the below seven sources, each of which involve a global assessment on one or more of these concepts. These sources do not represent an evaluation of all of the nations and territories that exist nor do they focus exclusively on nations and territories that pose a threat. Rather, this dataset identifies the

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<sup>139</sup> Johnson, “Evaluating ‘Humint’: The Role of Foreign Agents in U.S. Security,” 53; Howard, “Intelligence in Denied Areas: New Concepts for a Changing Security Environment,” 19; George Noble Jr, “Diagnosing Distortion in Source Reporting: Lessons for HUMINT Reliability from Other Fields” (Mercyhurst College, 2009), [http://kms1.isn.ethz.ch/serviceengine/Files/ISN/99245/ipublicationdocument\\_singledocument/2ae9f25f-e1e2-431a-96b5-60c23251990d/en/Distortion\\_Source\\_Reporting.pdf](http://kms1.isn.ethz.ch/serviceengine/Files/ISN/99245/ipublicationdocument_singledocument/2ae9f25f-e1e2-431a-96b5-60c23251990d/en/Distortion_Source_Reporting.pdf), 18.

<sup>140</sup> There are nearly 200 countries and territories in the world and it would be impossible to collect intelligence actively and consistently within each of them. A number of states and territories pose an obvious threat to the United States, but as noted, the collection of intelligence is not purely about threats; for one thing, individuals and groups that pose a threat to the U.S. may be living and/or operating beyond their nation of origin. As such, U.S. intelligence agencies focus more broadly on advancing national interests by obtaining a thorough understanding of both threats and opportunities worldwide.

<sup>141</sup> Howard, “Intelligence in Denied Areas: New Concepts for a Changing Security Environment,” 4.

nations and territories that represent one or more of the previously identified factors that would suggest the need for intelligence collection.

1. **2014 Office of the Director of National Intelligence (ODNI) Worldwide Threat Assessment.** This assessment, which is presented to congress annually, discusses the foreign nations, groups, and activities that pose the greatest concern to U.S. national security.
2. **2013 Defense Intelligence Agency (DIA) Threat Assessment.** Similar to the ODNI Worldwide Threat Assessment, the DIA assessment discusses the most pressing national security concerns from a DIA perspective. 2013 is the latest DIA assessment, likely because this product has been absorbed by the ODNI assessment. However, the DIA assessment is still included as a source to offer a differing perspective.
3. **U.S. State Department’s Country Reports on Terrorism.** As required by law, the Secretary of State provides Congress with an annual report on the countries and groups that are involved or impacted by terrorism.
4. **U.S. State Department’s Travel Warnings.** Continually updated, the State Department’s travel warnings are used to caution Americans of the risks of traveling to certain countries. As indicated by the State Department website, the warnings may highlight issues of instability, civil war, violence, and terrorism.<sup>142</sup>
5. **2014 Global Peace Index (GPI).** Based on a number of qualitative and quantitative indicators, the GPI “ranks the nations of the world according to their level of peacefulness.”<sup>143</sup> The assessment covers three primary themes: safety and security, conflict, and the degree of militarization.
6. **2015 Aon Terrorism and Political Violence Risk Map.** This private sector assessment focuses on the global risks posed to businesses. It identifies trends and issues worldwide and measures the risk country-by-country.<sup>144</sup>
7. **2012 PEW Religious Hostility Report.** As part of a larger study on global restrictions on religion, this assessment analyzes religious change

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<sup>142</sup> U.S. Department of State, “Alerts and Warnings,” *U.S. Passports & International Travel*, accessed September 5, 2015, <http://travel.state.gov/content/passports/english/alertswarnings.html>.

<sup>143</sup> “Global Peace Index 2015: Measuring Peace, Its Causes and Its Economic Value” (Institute for Economics & Peace), accessed September 5, 2015, [http://www.visionofhumanity.org/sites/default/files/Global%20Peace%20Index%20Report%202015\\_0.pdf](http://www.visionofhumanity.org/sites/default/files/Global%20Peace%20Index%20Report%202015_0.pdf), 2.

<sup>144</sup> Aon Risk Solutions, “2015 Terrorism & Political Violence Risk Map: A Guide,” 2015, <http://www.aon.com/terrorismmap/2015-guide-terrorism-political-violence-risk-map.pdf>, 4.

and its impact on societies worldwide.<sup>145</sup> For the purpose of this thesis, the assessment measures social and government hostilities by nation or region.

From these resources, I notated the countries and territories that were identified in four or more of these sources, that is, the majority of sources. Based on this methodology, 42 nations and territories made this first cut. Table 8 highlights these 42 key nations and territories in red text. All other nations and territories that are listed in the table were identified in at least one source and they are shown for comparison.

Table 8. List of Key Countries and Territories

KEY COUNTRIES AND TERRITORIES							
1	<b>Afghanistan</b>	38	<b>Egypt</b>	75	<b>Libya</b>	112	Senegal
2	Albania	39	<b>El Salvador</b>	76	Lithuania	113	Serbia
3	<b>Algeria</b>	40	<b>Eritrea</b>	77	Luxembourg	114	Sierra Leone
4	Angola	41	Estonia	78	Macau	115	Singapore
5	Argentina	42	Ethiopia	79	Macedonia	116	Slovakia
6	Armenia	43	Finland	80	Madagascar	117	Slovenia
7	Australia	44	France	81	Malaysia	118	<b>Somalia</b>
8	Austria	45	Georgia	82	Maldives	119	South Africa
9	<b>Azerbaijan</b>	46	Germany	83	<b>Mali</b>	120	South Korea
10	Bahrain	47	Greece	84	Malta	121	<b>South Sudan</b>
11	Bangladesh	48	Guatemala	85	<b>Mauritania</b>	122	Spain
12	Belarus	49	Guinea	86	<b>Mexico</b>	123	Sri Lanka
13	Belgium	50	Guinea-Bissau	87	Moldova	124	<b>Sudan</b>
14	Bolivia	51	Haiti	88	Morocco	125	Sweden
15	Bosnia	52	Herzegovina	89	Myanmar	126	Switzerland
16	Brazil	53	<b>Honduras</b>	90	Nepal	127	<b>Syria</b>
17	Brunei	54	Hong Kong	91	Netherlands	128	Taiwan
18	Bulgaria	55	Hungary	92	New Zealand	129	Tajikistan
19	Burkina Faso	56	Iceland	93	Netherlands	130	Tanzania
20	<b>Burundi</b>	57	<b>India</b>	94	<b>Niger</b>	131	<b>Thailand</b>
21	<b>Cameroon</b>	58	Indonesia	95	<b>Nigeria</b>	132	Tunisia
22	Canada	59	<b>Iran</b>	96	<b>North Korea</b>	133	<b>Turkey</b>
23	<b>Central African Rep.</b>	60	<b>Iraq</b>	97	Norway	134	Turkmenistan
24	<b>Chad</b>	61	Ireland	98	Oman	135	Uganda
25	Chile	62	<b>Israel</b>	99	<b>Pakistan</b>	136	<b>Ukraine</b>
26	<b>China</b>	63	Italy	100	Panama	137	United Arab Emirates
27	<b>Colombia</b>	64	Ivory Coast	101	Paraguay	138	United Kingdom
28	<b>Congo, Dem. Rep.</b>	65	Japan	102	Peru	139	United States
29	Costa Rica	66	Jordan	103	<b>Philippines</b>	140	Uzbekistan
30	Croatia	67	Kazakhstan	104	Poland	141	<b>Venezuela</b>
31	<b>Cuba</b>	68	<b>Kenya</b>	105	Portugal	142	Vietnam
32	Cyprus	69	Kosovo	106	Puerto Rico	143	West Africa
33	Czech Republic	70	Kuwait	107	Qatar	144	<b>West Bank &amp; Gaza</b>
34	Denmark	71	Kyrgyzstan	108	Romania	145	<b>Yemen</b>
35	Djibouti	72	Latvia	109	<b>Russia</b>	146	Zimbabwe
36	Dominican Republic	73	<b>Lebanon</b>	110	Rwanda		
37	Ecuador	74	Liberia	111	<b>Saudi Arabia</b>		

<sup>145</sup> Grim, Brian J., "Religious Hostilities Reach Six-Year High" (PEW Research Center, January 14, 2014), <http://www.pewforum.org/files/2014/01/RestrictionsV-full-report.pdf>, 1.

Of the 42 nations and territories, 8 were identified in all 7 sources. This included Afghanistan, Iraq, Nigeria, Pakistan, Somalia, Syria, the West Bank and Gaza, and Yemen. On the other end of the spectrum, 11 of the nations and territories identified were only in four out of the seven sources. This included Algeria, Azerbaijan, Cameroon, Chad, Democratic Republic of Congo, Cuba, Honduras, Mexico, Saudi Arabia, Thailand, and Ukraine. The remaining countries were identified in five or six of the sources. Table 9 provides details on how each nation and territory was identified and which sources they were represented by.

This identification is of importance, as it provides broad insight into whether the nation or territory identified is more related to national security, terrorism and crime, conflict and instability, or hostility. For example, the DNI threat assessment includes nations and territories that pose a threat, as well as an intelligence opportunity (i.e., China). In comparison, the State Department Reports on Terrorism primarily identify the nations or territories that pose a national security threat. More importantly, this dataset as a whole helps identify the nations and territories where intelligence collection would prove useful for U.S. national interests.

Table 9. Key Country and Territory Analysis

KEY COUNTRY AND TERRITORY ANALYSIS							
COUNTRY / TERRITORY	2015 DNI Threat Assessment	2014 DIA Threat Assessmet	2013 DOS Reports on Terrorism	2015 DOS Travel Warnings	2015 Global Peace Index	2015 AON Risk Map	2013 PEW Religious Hostility Study
Afghanistan	✓	✓	✓	✓	✓	✓	✓
Algeria			✓	✓		✓	✓
Azerbaijan	✓		✓		✓		✓
Burundi			✓	✓	✓	✓	✓
Cameroon	✓		✓	✓	✓	✓	
Central African Rep.	✓	✓	✓	✓	✓	✓	✓
Chad	✓		✓	✓	✓	✓	
China	✓	✓	✓		✓		✓
Colombia		✓	✓	✓	✓	✓	
Congo, Dem. Rep.			✓	✓	✓	✓	
Cuba	✓	✓	✓			✓	
Egypt	✓	✓	✓		✓	✓	✓
El Salvador	✓	✓	✓	✓	✓		
Eritrea			✓	✓	✓	✓	✓
Honduras	✓	✓		✓	✓		
India	✓	✓	✓		✓	✓	✓
Iran	✓	✓	✓	✓	✓	✓	
Iraq	✓	✓	✓	✓	✓	✓	✓
Israel			✓	✓	✓	✓	✓
Kenya			✓	✓	✓	✓	✓
Lebanon	✓		✓	✓	✓	✓	✓
Libya	✓	✓	✓	✓	✓	✓	
Mali	✓		✓	✓	✓	✓	
Mauritania	✓		✓	✓	✓	✓	
Mexico		✓	✓	✓	✓		
Niger	✓		✓	✓	✓	✓	
Nigeria	✓	✓	✓	✓	✓	✓	✓
North Korea	✓	✓	✓	✓	✓	✓	
Pakistan	✓	✓	✓	✓	✓	✓	✓
Philippines			✓	✓	✓	✓	
Russia	✓	✓	✓		✓		✓
Saudi Arabia			✓	✓		✓	✓
Somalia	✓	✓	✓	✓	✓	✓	✓
South Sudan	✓		✓	✓	✓	✓	
Sudan	✓		✓	✓	✓	✓	✓
Syria	✓	✓	✓	✓	✓	✓	✓
Thailand			✓		✓	✓	✓
Turkey	✓		✓		✓	✓	✓
Ukraine	✓			✓	✓	✓	
Venezuela	✓	✓	✓	✓	✓	✓	
West Bank & Gaza			✓	✓	✓	✓	✓
Yemen	✓	✓	✓	✓	✓	✓	✓

## **B. ARE “THEY” ONLINE?**

Having identified the “who,” we now must determine whether these types of persons are actually online. I conduct four steps to accomplish this task. First, I begin by evaluating the level of Internet use within these key countries and territories. This evaluation includes identifying the Internet trends and number of Internet users per country, as well as overall Internet rankings. The next two steps involve analyzing the number of social media users and the amount of video game sales for each key country and territory. I then conclude by analyzing website traffic for each country and territory. This final evaluation includes identifying the top 100 websites for each key country and territory and assessing which of these sites are used for social networking, gaming, and dating.

### **1. Internet Use by Key Country and Territory**

As shown in Table 10, nearly all 42 nations and territories show a steady increase in Internet users from 2003 to 2013. Aside from the five nations which the sources show insufficient data, North Korea is the only country that shows zero growth across the board. (North Korea is known to have at least some level of Internet use however it is highly restricted and therefore, the lack of growth is expected.) The countries and territories that show the most significant growth in Internet users are Azerbaijan, China, Columbia, Egypt, Iran, Israel, Kenya, Lebanon, Mexico, Nigeria, Philippines, Russia, Saudi Arabia, Turkey, Ukraine, Venezuela, and the West Bank and Gaza. The countries and territories that show growth but still remain relatively low in the amount of Internet users per 100 people are Central African Republic (3.50), Chad (2.30), Eritrea (0.90), Mali (2.30), Niger (1.70), and Somalia (1.50).

Table 10. Internet Users Per 100 for Key Countries and Territories

INTERNET USERS PER 100 PEOPLE												
#	COUNTRY/TERRITORY	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1	Afghanistan	0.09	0.11	1.22	2.11	1.90	1.84	3.55	4.00	5.00	5.45	5.90
2	Algeria	..	..	..	..	..	..	..	..	..	..	..
3	Azerbaijan	..	..	8.03	11.99	14.54	17.08	27.40	46.00	50.00	54.20	58.70
4	Burundi	0.20	0.35	0.54	0.66	0.70	0.81	0.90	1.00	1.11	1.22	1.30
5	Cameroon	0.59	0.98	1.40	2.03	2.93	3.40	3.84	4.30	5.00	5.70	6.40
6	Central African Rep.	0.15	0.22	0.27	0.31	0.38	1.00	1.80	2.00	2.20	3.00	3.50
7	Chad	0.32	0.36	0.40	0.58	0.85	1.19	1.50	1.70	1.90	2.10	2.30
8	China	6.20	7.30	8.52	10.52	16.00	22.60	28.90	34.30	38.30	42.30	45.80
9	Colombia	7.39	9.12	11.01	15.34	21.80	25.60	30.00	36.50	40.35	48.98	51.70
#	Congo, Dem. Rep.	..	..	..	..	..	..	..	..	..	..	..
#	Cuba	..	..	..	..	..	..	..	..	..	..	..
#	Egypt	4.04	11.92	12.75	13.66	16.03	18.01	25.69	31.42	39.83	44.00	49.56
#	El Salvador	2.50	3.20	4.20	5.50	6.11	10.08	12.11	15.90	18.90	20.32	23.11
#	Eritrea	..	..	..	..	0.41	0.47	0.54	0.61	0.70	0.80	0.90
#	Honduras	4.80	5.60	6.50	7.80	9.40	9.60	9.80	11.09	15.90	18.12	17.80
#	India	1.69	1.98	2.39	2.81	3.95	4.38	5.12	7.50	10.07	12.58	15.10
#	Iran	6.93	7.49	8.10	8.76	9.47	10.24	11.07	14.70	21.00	27.50	31.40
#	Iraq	0.60	0.90	0.90	0.95	0.93	1.00	1.06	2.50	5.00	7.10	9.20
#	Israel	19.59	22.77	25.19	27.88	48.13	59.39	63.12	67.50	68.87	70.80	70.80
#	Kenya	2.94	3.02	3.10	7.53	7.95	8.67	10.04	14.00	28.00	32.10	39.00
#	Lebanon	8.00	9.00	10.14	15.00	18.74	22.53	30.14	43.68	52.00	61.25	70.50
#	Libya	2.81	3.53	3.92	4.30	4.72	9.00	10.80	14.00	14.00	..	16.50
#	Mali	0.31	0.43	0.51	0.73	0.81	1.57	1.80	1.90	2.00	2.17	2.30
#	Mauritania	0.42	0.48	0.67	0.98	1.43	1.87	2.28	4.00	4.50	5.37	6.20
#	Mexico	12.90	14.10	17.21	19.52	20.81	21.71	26.34	31.05	37.18	39.75	43.46
#	Niger	0.16	0.19	0.22	0.29	0.39	0.70	0.76	0.83	1.30	1.41	1.70
#	Nigeria	0.56	1.29	3.55	5.55	6.77	15.86	20.00	24.00	28.43	32.80	38.00
#	North Korea	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	..
#	Pakistan	5.04	6.16	6.33	6.50	6.80	7.00	7.50	8.00	9.00	9.96	10.90
#	Philippines	4.86	5.24	5.40	5.74	5.97	6.22	9.00	25.00	29.00	36.24	37.00
#	Russia	8.30	12.86	15.23	18.02	24.66	26.83	29.00	43.00	49.00	63.80	61.40
#	Saudi Arabia	8.00	10.23	12.71	19.46	30.00	36.00	38.00	41.00	47.50	54.00	60.50
#	Somalia	0.38	1.05	1.08	1.10	1.12	1.14	1.16	..	1.25	1.38	1.50
#	South Sudan	..	..	..	..	..	..	..	..	..	..	..
#	Sudan	0.54	0.79	1.29	..	8.66	..	..	16.70	17.30	21.00	22.70
#	Syria	3.40	4.32	5.65	7.83	11.50	14.00	17.30	20.70	22.50	24.30	26.20
#	Thailand	..	..	..	..	..	..	..	..	..	..	..
#	Turkey	12.33	14.58	15.46	18.24	28.63	34.37	36.40	39.82	43.07	45.13	46.25
#	Ukraine	3.15	3.49	3.75	4.51	6.55	11.00	17.90	23.30	28.71	35.27	41.80
#	Venezuela	7.50	8.40	12.55	15.22	20.83	25.88	32.70	37.37	40.22	49.05	54.90
#	West Bank & Gaza	4.13	4.40	16.01	18.41	21.18	24.36	32.23	37.40	41.08	43.40	46.60
#	Yemen	0.60	0.88	1.05	1.25	5.01	6.89	9.96	12.35	14.91	17.45	20.00

Original graphic based on data from “The World Bank Data,” *The World Bank*, 2015, <http://data.worldbank.org/indicator/IT.NET.USER.P2>.

As indicated in Table 11, the current state of Internet use is also widespread among the 42 key countries and territories. Current data was not existent for North Korea, South Sudan, and the West Bank and Gaza. Excluding these three nations/territories, the remaining 39 nations all show an increase in the number of Internet users from 2013 to 2014. Twenty-three of the key countries and territories showed at least a 10 percent growth in the last year. Burundi and Niger show the highest percentage of growth (17 percent) in one year; however, they still rank among the lowest in the number of Internet



users compared to their total population. In comparison, Israel and Turkey show the lowest growth (3 percent) but the percentage of Internet users among their total population is very high, leaving less room for growth.

Table 11. Internet Access for Key Countries and Territories

2014 INTERNET ACCESS					
#	COUNTRY/TERRITORY	TOTAL POPULATION	INTERNET USERS	1 YR GROWTH	% OF POPULATION ON INTERNET
1	Afghanistan	21,280,518	1,856,781	10%	5.94%
2	Algeria	39,928,947	6,669,927	10%	56.47%
3	Azerbaijan	9,514,887	1,737,223	11%	60.30%
4	Burundi	10,482,752	146,219	17%	1.39%
5	Cameroon	22,818,632	1,486,815	16%	6.52%
6	Central African Rep.	12,709,203	161,524	15%	3.43%
7	Chad	13,211,146	17,197	16%	2.40%
8	China	1,393,783,836	41,601,070	4%	46.03%
9	Colombia	48,929,706	5,660,725	7%	52.44%
10	Congo, Dem. Rep.	7,558,594	177,559	16%	1.92%
11	Cuba	11,258,597	3,090,796	6%	27.45%
12	Egypt	83,386,739	10,311,562	10%	48.34%
13	El Salvador	6,383,752	1,742,832	7%	27.30%
14	Eritrea	6,536,176	179,784	17%	0.91%
15	Honduras	7,260,749	1,602,558	8%	19.40%
16	India	1,267,401,849	243,198,922	14%	19.19%
17	Iran	78,470,222	12,200,708	9%	28.29%
18	Iraq	34,768,761	2,707,708	12%	7.79%
19	Israel	7,822,107	1,929,772	3%	75.80%
20	Kenya	45,545,980	6,713,219	16%	36.70%
21	Lebanon	4,965,914	1,336,517	12%	67.19%
22	Libya	6,253,452	1,362,604	9%	21.79%
23	Mali	17,984,457	255,553	16%	11.43%
24	Mauritania	3,799,215	1,923,060	7%	41.13%
25	Mexico	123,799,215	10,923,060	7%	41.13%
26	Niger	18,534,802	298,310	17%	1.61%
27	Nigeria	178,516,904	7,101,452	16%	37.59%
28	North Korea	..	..	..	..
29	Pakistan	185,132,926	20,073,929	9%	10.84%
30	Philippines	100,096,496	9,470,845	10%	38.43%
31	Russia	142,467,651	14,437,793	10%	59.27%
32	Saudi Arabia	31,548,171	7,397,190	16%	21.96%
33	Somalia	10,805,651	163,185	12%	1.51%
34	South Sudan	..	..	..	..
35	Sudan	38,764,090	1,307,189	15%	24.01%
36	Syria	21,986,615	1,860,788	9%	26.66%
37	Thailand	67,222,972	9,386,154	8%	28.84%
38	Turkey	75,837,020	5,358,888	3%	46.62%
39	Ukraine	4,941,303	1,649,008	9%	37.49%
40	Venezuela	30,851,343	4,548,421	7%	47.16%
41	West Bank & Gaza	..	..	..	..
42	Yemen	24,968,508	4,778,488	11%	19.14%

Data from “The World Bank Data,” *The World Bank*, 2015, <http://data.worldbank.org/indicator/IT.NET.USER.P2>.

Table 12 presents the Internet rankings and share for key countries and territories. Based on the level of Internet use and penetration, eight of the 42 key countries and territories rank among the top 20 in Internet use worldwide. This ranking includes the following from highest to lowest use: China (1), India (3), Russia (6), Nigeria (8), Mexico (11), Egypt (14), Philippines (16), and Turkey (18). In comparison, the U.S. ranks at number two with well over 279 million users or nearly 10 percent of the worldwide Internet population.<sup>146</sup> Also of interest, Afghanistan only accounts for 0.43 percent of the world population, however, the data shows they account for 6 percent of world Internet users.

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<sup>146</sup> Internet Live Stats, “Trends & More (Statistics).”

Table 12. Internet Rankings and Share for Key Countries and Territories

INTERNET RANKING AND GLOBAL SHARE				
#	COUNTRY/TERRITORY	RANK	SHARE OF WORLD POPULATION	SHARE OF WORLD INTERNET USERS
1	Afghanistan	100	0.43%	6.00%
2	Algeria	54	0.55%	0.23%
3	Azerbaijan	61	0.13%	0.20%
4	Burundi	159	0.14%	0.01%
5	Cameroon	108	3.20%	0.05%
6	Central African Rep.	157	0.07%	0.01%
7	Chad	137	0.18%	0.01%
8	China	1	19.24%	21.97%
9	Colombia	22	0.68%	0.88%
10	Congo, Dem. Rep.	166	6.00%	0.00%
11	Cuba	83	0.16%	0.11%
12	Egypt	14	1.15%	1.38%
13	El Salvador	102	0.09%	0.06%
14	Eritrea	173	0.09%	0.00%
15	Honduras	104	0.11%	0.05%
16	India	3	17.50%	8.33%
17	Iran	25	1.08%	0.76%
18	Iraq	88	0.48%	0.09%
19	Israel	58	0.11%	0.20%
20	Kenya	33	0.63%	0.57%
21	Lebanon	81	0.07%	0.11%
22	Libya	111	0.09%	0.05%
23	Mali	39	0.22%	0.41%
24	Mauritania	130	0.06%	0.02%
25	Mexico	11	1.71%	1.74%
26	Niger	140	0.26%	0.01%
27	Nigeria	8	2.46%	2.30%
28	North Korea	..	..	..
29	Pakistan	28	2.56%	0.69%
30	Philippines	16	1.38%	1.35%
31	Russia	6	1.97%	2.89%
32	Saudi Arabia	30	0.20%	0.11%
33	Somalia	156	0.15%	0.01%
34	South Sudan	..	..	..
35	Sudan	45	0.54%	0.32%
36	Syria	59	0.30%	0.20%
37	Thailand	29	0.93%	0.66%
38	Turkey	18	1.05%	1.21%
39	Ukraine	32	0.62%	0.58%
40	Venezuela	35	0.43%	0.50%
41	West Bank & Gaza	..	..	..
42	Yemen	69	0.34%	0.16%

Data from "The World Bank Data," *The World Bank*, 2015, <http://data.worldbank.org/indicator/IT.NET.USER.P2>.

## 2. Social Media Use by Key Country

A company called We Are Social has conducted a number of studies on the use of social media worldwide. Their dataset presented in Table 13 only includes 20 of the 42 key countries and territories identified. Of these countries and territories, all but North Korea show an increase in the total number of social media users from 2014 to 2015. In particular, the greatest increases were seen in Pakistan (up 72 percent), Thailand (up 42 percent), India (up 38 percent) and Egypt (up 33 percent). The lowest increases were seen in China (up 1 percent) and Turkey (up 11 percent). Beyond growth, the key countries and territories that have the highest numbers of social media users are China (629 million), India (124 million), the Philippines (42 million), Turkey (40 million), Thailand (39 million), and Egypt (22 million). The key countries with the lowest number of social media users are North Korea (8 thousand), West Bank and Gaza (1.5 million), Yemen (1.6 million), Libya (1.9 million) and Lebanon (2 million).

Table 13. Social Media Users and Trends for Key Countries and Territories

2015 SOCIAL MEDIA (SM) USERS AND TRENDS									
#	COUNTRY/TERRITORY	TOTAL POPULATION	TOTAL SOCIAL MEDIA USERS			MOBILE SOCIAL MEDIA USERS			DATED
			# OF USERS	1 YR CHANGE	% OF POPULATION	# OF USERS	1 YR CHANGE	% OF POPULATION	
2	Algeria	38.8M	7M	..	18%	..	..	9%	Jan-15
8	China	1.4B	629M	1%	46%	506M	26%	37%	Mar-15
12	Egypt	87.8M	22M	33%	25%	16.6M	32%	19%	Jan-15
16	India	1.3B	124M	38%	10%	108M	50%	9%	Mar-15
17	Iran	80.8M	..	..	..	..	..	..	Jan-15
18	Iraq	32.6M	7.4M	..	23%	..	..	17%	Jan-15
19	Israel	78.2M	4.2M	..	54%	..	..	43%	Jan-15
21	Lebanon	4.1M	2M	..	48%	..	..	42%	Jan-15
22	Libya	6.2M	1.9M	..	30%	..	..	23%	Jan-15
27	Nigeria	183.5M	13.6M	21%	7%	12.4M	..	7%	Jan-15
28	North Korea	25.2M	8T	minus 2%	0,03%	520T	13%	0,02%	Mar-15
29	Pakistan	189.1M	19.6M	72%	10%	16.2M	113%	9%	Mar-15
30	Philippines	101.1M	42M	24%	42%	36M	50%	36%	Mar-15
31	Russia	146.3M	67M	10%	46%	38.2M	..	26%	Jan-15
32	Saudi Arabia	31.5M	9.2M	21%	29%	8M	14%	25%	Jan-15
36	Syria	22.6M	..	..	..	..	..	..	Jan-15
37	Thailand	64.9M	34M	42%	52%	30M	36%	46%	Mar-15
38	Turkey	76.7M	40M	11%	52%	32M	14%	42%	Jan-15
41	West Bank & Gaza	4.4M	1.5M	..	33%	..	..	20%	Jan-15
42	Yemen	26.1M	1.6M	..	6%	..	..	4%	Jan-15

Data from We Are Social, "Digital, Social, and Mobile in APAC 2015," Slideshow Presentation Report, (March 10, 2015), <http://www.slideshare.net/wearesocialsg/digital-social-mobile-in-apac-in-2015?related=4>.

### 3. Video Game Use by Key Country

In addition to high levels of social media, the majority of key countries and territories also show high levels of video game sales (See Table 14). Data was found on 32 of the 42 countries and territories. Table 14 shows a ranked list of video game sales by country among 32 of the 42 key countries and territories. Based on this data, the top sales were seen in China and Russia. The lowest number of sales was seen in Iraq, Kenya, and Sudan.

Table 14. Video Game Sales for Key Countries and Territories

VIDEO GAME SALES								
1	Algeria	8,870,748	9	Iraq	10,091,724	17	Russia	225,475,934
2	Azerbaijan	2,946,641	10	Israel	5,699,985	18	Saudi Arabia	3,779,609
3	China	8,046,647,006	11	Kenya	7,818,723	19	Sudan	10,143,158
4	Colombia	94,138,512	12	Lebanon	9,708,012	20	Syria	8,885,190
5	Cuba	2,197,550	13	Mexico	97,100,456	21	Thailand	37,816,150
6	Egypt	7,095,066	14	Nigeria	0,781,704	22	Turkey	72,493,221
7	India	9,909,659	15	Pakistan	5,534,372	23	Ukraine	51,926,741
8	Iran	23,876,709	16	Philippines	10,266,453	24	Venezuela	38,315,988

Data from "Top 100 Countries by Game Revenues," *NewZoo Games Market Research*, 2015, <http://www.newzoo.com/free/rankings/top-100-countries-by-game-revenues/>.

### 4. Website Traffic Analysis by Key Country

The final method for determining whether virtual HUMINT would work against these key countries and territories involves analyzing which websites are most visited within each of these countries and territories. To accomplish this task, I identified and analyzed the top 100 most visited websites for 30 out of the 42 key countries and territories. website traffic for the remaining 12 key countries and territories could not be obtained. This data was then used to identify how many of the top 100 websites for each key country were intended for online social networking, multi-player gaming, and online dating.

As indicated in Table 15, all of the countries and territories for which data was available showed at least three social networking websites within the top 100. The countries with the highest number of social networking sites in the top 100 were

Honduras (10), Russia (10), and Ukraine (10). In comparison the countries with the lowest number of social networking sites within the top 100 were Algeria (4), China (4), and Yemen (3). The average number of social networking sites within the top 100 for all of the key countries is seven.

Online gaming and dating websites were far less popular. Half of the key countries analyzed had one or more online gaming website within their top 100 websites visited and just under half have at least one online dating website with their top 100. The country with the highest number of online gaming websites was Algeria (5) and the country with the highest number of online dating websites was China (5). Although the number of websites for dating and gaming is significantly lower than that of online social networking, it is important to note that even one website within the top 100 is substantial. There are nearly 1 billion websites in the world and therefore any website that makes it within the top 100 for any country is receiving significant traffic.

As expected, this data suggests that online social networking, gaming, and dating is fairly common for all of the nations and territories analyzed. There are nearly one billion websites in the world and therefore, the presence of even one of these sites with the top 100 for any nation or territory is significant. Granted, the level of social networking, gaming, and dating does vary. Social networking seems widespread for nearly all of the nations and territories analyzed. Even Yemen, which has the least amount of social networking sites, still has three. Online dating and gaming on the other hand seem far less popular. However, they too, still represent a significant amount of web traffic. Although there are a number of nations and territories that do not have a gaming or dating website within their top 100, the activity is still likely to exist. In other words, gaming and dating sites are just not popular enough to break the top 100 threshold for each nation and territory but in most cases, they are still likely to be well represented within a greater sample (i.e., top 500 websites).

From a virtual HUMINT perspective, the data suggests that nearly all of the key nations and territories can be targeted through social networking, gaming, and/or dating sites. Granted, data was not available for all of the key nations and territories and it is possible that there are some nations and territories that may have minimal access to

online social networking, gaming, and dating sites. This however, is likely to be the minority. Ultimately, the growth of new technologies and the continued expansion of the Internet will likely result in every nation and territory participating in online social networking, gaming, and dating. In the meantime though, the majority of the key countries and territories are online and therefore susceptible to virtual HUMINT.

Table 15. Analysis of Top 100 Websites for Key Countries and Territories

ANALYSIS OF TOP 100 WEBSITES				
#	COUNTRY/TERRITORY	# of SNS Sites	# of Gaming Sites	# of Dating Sites
1	Afghanistan	8	1	1
2	Algeria	4	5	1
3	Azerbaijan	7	2	1
4	Burundi	..	..	..
5	Cameroon	..	..	..
6	Central African Rep.	..	..	..
7	Chad	..	..	..
8	China	4	0	0
9	Colombia	8	2	1
10	Congo Dem. Rep.	..	..	..
11	Cuba	..	..	..
12	Egypt	5	1	1
13	El Salvador	8	0	0
14	Eritrea	..	..	..
15	Honduras	10	2	0
16	India	8	0	1
17	Iran	6	0	0
18	Iraq	5	0	1
19	Israel	9	0	0
20	Kenya	9	0	1
21	Lebanon	8	1	0
22	Libya	..	..	..
23	Mali	..	..	..
24	Mauritania	..	..	..
25	Mexico	8	1	0
26	Niger	..	..	..
27	Nigeria	6	0	0
28	North Korea	..	..	..
29	Pakistan	7	0	1
30	Philippines	8	1	1
31	Russia	10	0	2
32	Saudi Arabia	8	0	0
33	Somalia	..	..	..
34	South Sudan	..	..	..
35	Sudan	6	1	0
36	Syria	6	2	0
37	Thailand	7	0	0
38	Turkey	7	2	0
39	Ukraine	10	0	2
40	Venezuela	8	1	1
41	West Bank and Gaza	5	2	0
42	Yemen	3	0	0

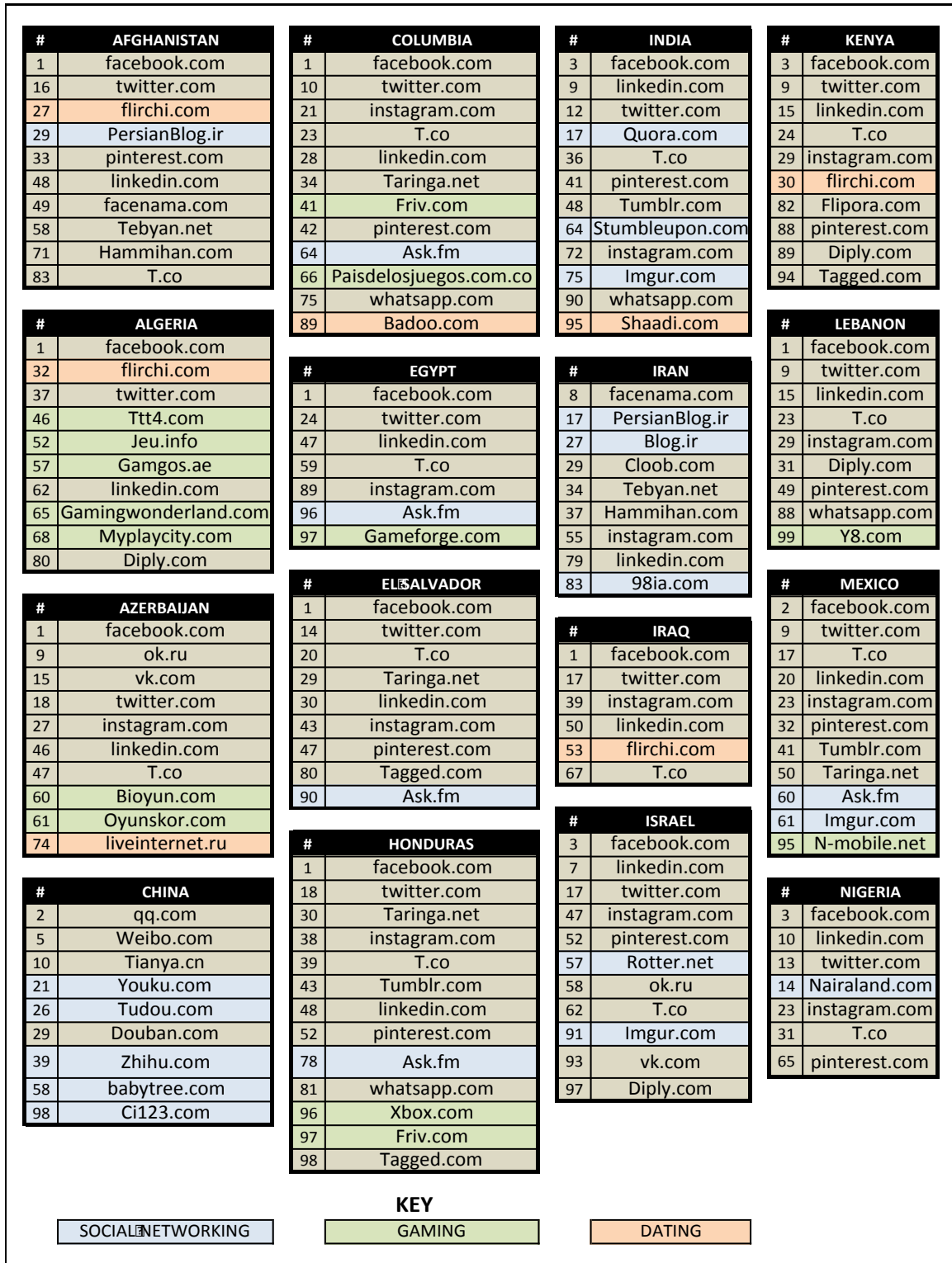
Original analysis based on data from “Alexa,” Web Analytics Toolkit, *Alexa*, (July 2, 2015), <http://www.alexa.com/>.

In addition to identifying the number of social networking, gaming, and dating websites within the top 100 for each key country and territory, I also identified the specific websites. This information, which is reflected in Figures 10 and 11, provides insight into the type of website visited and its popularity. For example, the majority of countries and territories use more mainstream sites such as Facebook, twitter, and LinkedIn. However, there are also a number of nations and territories where facenama, QQ, Taringa, Hammihan, and VK are just as popular, if not more popular. Additionally, the dating website flirchi was particularly popular in Afghanistan, Kenya, Algeria, Iraq, Pakistan, and the Philippines.

This data suggests virtual HUMINT through social networking, gaming, and dating sites should be tailored to the specific nation and territory that is being targeted. For example, if China or Chinese nationals are to be recruited, a site like QQ may be a better starting point than Facebook or LinkedIn. Ultimately, the identification of the specific social networking, gaming, and dating sites that are most popular within a given nation or territory could serve as a roadmap for virtual HUMINT.

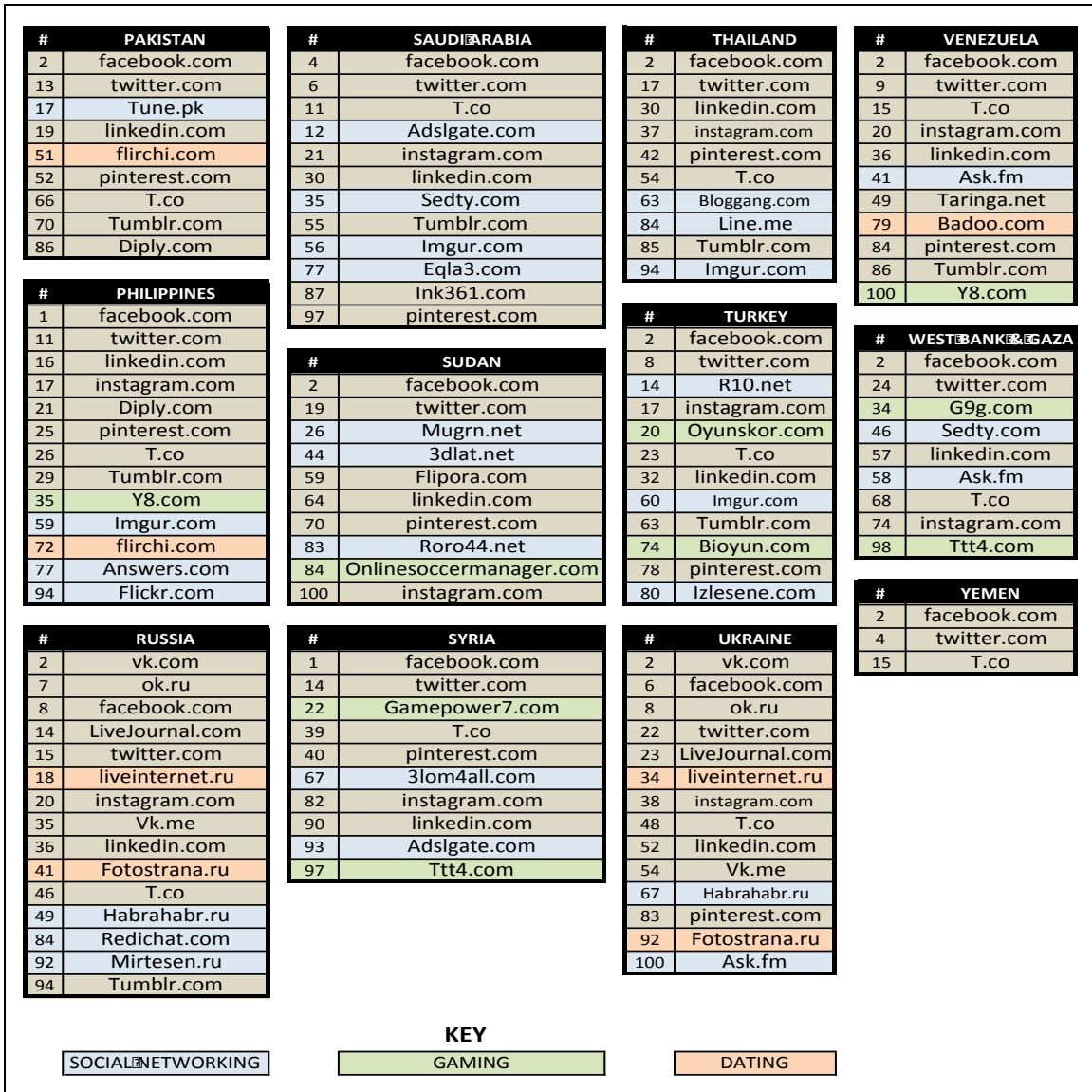


Figure 8. Identified Websites for Key Countries and Territories (1 of 2)



Original graphic based on data from “Alexa,” Web Analytics Toolkit, *Alexa*, (July 2, 2015), <http://www.alexa.com/>.

Figure 9. Identified Websites for Key Countries and Territories (2 of 2)



Original graphic based on data from “Alexa,” Web Analytics Toolkit, *Alexa*, (July 2, 2015), <http://www.alexa.com/>.

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#### IV. VIRTUAL RECRUITMENT

According to retired CIA intelligence analyst, Mark Lowenthal, the source acquisition cycle is made up of four stages: identification, development, recruitment, and termination.<sup>147</sup> The identification stage involves identifying a potential human source that has placement or access to some needed information. Due to limited time and resources, this screening stage allows intelligence agencies to focus resources on the sources that can provide the most “credible” and “pertinent” information.<sup>148</sup> Identification often requires knowing biographical information such as nationality, employer, and associations. Identification also involves assessing motivations and vulnerabilities. This data mining may include knowing about a person’s financial situation, immigration status, upbringing, and personal interests. Ultimately, knowing as much about the potential source as possible enables collectors to establish recruitment strategies and eventually persuade the source to provide information.<sup>149</sup> This concept, which is primarily related to effective interviewing techniques, also helps with rapport building.<sup>150</sup>

The last aspect of identification involves learning about an individual’s personality traits and behaviors. For example, is the person an extrovert or introvert, aggressive or submissive, and so on? This information not only allows HUMINT collectors to evaluate the value of a potential source but it also helps the collector develop the best strategy for making contact and ultimately inducing the source to provide information.<sup>151</sup> Knowing that a potential source is greedy or narcissistic can help a collector manipulate and control the relationship by focusing on money or feeding the source’s the ego.<sup>152</sup> Collectively, these factors not only assist the handler in identifying

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<sup>147</sup> Lowenthal, Mark M, *Intelligence: From Secrets to Policy, Part 14* (CQ Press, 2011, 2011).

<sup>148</sup> John Patrick Sullivan, “Redefining Human Intelligence for the Modern Age” (American Military University, 2012), <http://www.apus.edu/content/dam/online-library/masters-theses/Sullivan-2012.pdf>, 19.

<sup>149</sup> Shepherd, “The Applications of Human Intelligence in Counterterrorism,” 53.

<sup>150</sup> Redlich, Kelly, and Miller, “Systematic Survey of the Interview and Intelligence Community: Final Report to the FBI HIG,” 7.

<sup>151</sup> Sayre Jr, “Some Principles of Human Intelligence and Their Application,” 10

<sup>152</sup> Ibid.

the right source but they also serve as the foundation for the development and recruitment stages.

In addition to identity and personality inference, the source acquisition cycle also involves developing a strong relationship with the potential source. This “development” stage includes building rapport, establishing trust, and manipulating social interactions.<sup>153</sup> In some cases, the collector must befriend the potential source and develop a relationship based on real or perceived trust.<sup>154</sup> Strong interpersonal communication skills and the ability to socialize and form a bond are a must for effective HUMINT collection.<sup>155</sup> Depending on the motivation or vulnerability, the collector is trying to win the confidence of the potential source or at least his or her participation in a relationship.<sup>156</sup>

Once a relationship is developed, the recruitment stage involves persuading the source to take an action on behalf of the handler. This persuasion is accomplished by building on the information collected in the first two stages and then influencing the source through a number of motivations such as financial compensation, immigration benefits, patriotism, revenge, and the fear of imprisonment.<sup>157</sup> A potential source may also be motivated to provide intelligence because of a familial rivalry or a difference in religious beliefs.<sup>158</sup> For some, the motivation may be a sense of patriotism or need to help others.<sup>159</sup> Whatever the motivation may be, the recruitment stage is based on identifying and using the factor that would entice a source to collaborate.

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<sup>153</sup> Walter A. Gonzales, “Does US Army Humint Doctrine Achieve Its Objectives? What Have Iraq and Afghanistan Taught Us?,” 2013, <http://calhoun.nps.edu/handle/10945/32827>, 52.

<sup>154</sup> Johnson, “Evaluating ‘Humint’: The Role of Foreign Agents in U.S. Security,” 312.

<sup>155</sup> Kevin R. Wilkinson, “Unparalleled Need: Human Intelligence Collectors in the United States Army” (United States Army War College, 2013), <http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=ADA498593>, 5.

<sup>156</sup> Johnson, “Evaluating ‘Humint’: The Role of Foreign Agents in U.S. Security,” 313.

<sup>157</sup> *Ibid.*, 326.

<sup>158</sup> Shepherd, “The Applications of Human Intelligence in Counterterrorism,” 66.

<sup>159</sup> Noble Jr, “Diagnosing Distortion in Source Reporting,” 23.

The final stage of the cycle involves terminating the relationship. Once the source becomes unreliable or undesirable for any reason (i.e., the source no longer provides value), the relationship is discontinued.

Based on this assessment, the following four principals would be needed to support the notion of virtual HUMINT: the ability to infer a person's real identity and personality, develop strong bonds, produce real world results, and maintain the relationship.

## **A. IDENTITY AND PERSONALITY INFERENCE**

The first question has to do with the possibility of inferring a person's real identity and personality from their online profile and behaviors. Support for this notion would suggest the targeting and development of virtual sources is possible.

### **1. Supporting Research**

The notion of personality inference, which suggests that a person's personality traits can be identified through behavioral cues, has recently been extended to computer-mediated communication.<sup>160</sup> A person's social media profile, email messages, and other online behaviors provide insight into his or her character and temperament just as their face-to-face interactions do.<sup>161</sup> As stated by MMO researcher Nicholas Yee, "one could think of MMO environments as a gold-mine of personality data as well as a platform to develop unobtrusive personality assessment tools."<sup>162</sup> Unlike traditional personality assessments, which Yee argues are relatively transparent, MMOs provide a mechanism for discreetly evaluating a user's behaviors. This information, which correlates to a person's real personality and attitude, can then be used to identify motivations and vulnerabilities for engineering a virtual relationship.

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<sup>160</sup> Nick Yee et al., "Introverted Elves & Conscientious Gnomes: The Expression of Personality in World of Warcraft," in *SIGCHI Conference on Human Factors in Computing Systems* (ACM, 2011), 753–62, <http://dl.acm.org/citation.cfm?id=1979052>, 1.

<sup>161</sup> *Ibid.*, 2.

<sup>162</sup> Nick Yee, "The Psychology of Massively Multi-User Online Role-Playing Games: Motivations, Emotional Investment, Relationships and Problematic Usage," in *Avatars at Work and Play* (Springer, 2006), 187–207, [http://link.springer.com/content/pdf/10.1007/1-4020-3898-4\\_9.pdf](http://link.springer.com/content/pdf/10.1007/1-4020-3898-4_9.pdf), 25.

Supporting research argues that despite the elements of anonymity and fantasy, online gaming behaviors are also not separate from a person's real identity. Researchers that studied the virtual and physical aspects of online gaming concluded that MMO activity is not "analogous to offline contexts" and that instead the virtual and real worlds are entangled.<sup>163</sup> A recent study of Chinese and Korean gamers also supports this connection, arguing that a gamer's character selection, virtual clothing, gaming style, and online chats were more related to their actual cultural background than the structure of the game.<sup>164</sup> Ultimately, a significant amount of research suggests that the virtual representation of a person is just as valid as the "utterances, actions, thoughts and emotions" of a person that communicates via any other forum.<sup>165</sup> Or as participants of a study on Second Life stated, "We are all as real as the person at the keyboard."<sup>166</sup>

Perhaps Science Applications International Corporation (SAIC) and Georgia Institute of Technology (GT) provide the most convincing evidence regarding identity and personality inference. In a joint study that focused on virtual worlds, researchers from SAIC and GT developed a set of models for predicting a person's real gender, age, extraversion level, and aggressive and submissive ideologies.<sup>167</sup> The models were reported to have an average overall accuracy rating of 73 percent.<sup>168</sup> Granted, this model was specific to virtual worlds and only included five factors, but the result does suggest that inferring identity and personality is feasible.

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<sup>163</sup> Nicholas Taylor et al., "Public Displays of Play: Studying Online Games in Physical Settings," *Journal of Computer-Mediated Communication* 19, no. 4 (July 2014): 763–79, doi:10.1111/jcc4.12054, 775.

<sup>164</sup> Tae-Jin Yoon and Hyejung Cheon, "Game Playing as Transnational Cultural Practice: A Case Study of Chinese Gamers and Korean MMORPGs," *International Journal of Cultural Studies*, 2013, 1367877913505172, 10.

<sup>165</sup> Diana Constantinescu and Andrei Decu, "Social Cooperation within Virtual Worlds: Old Social Phenomena Emerging in New Environments," 2008, [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2000872](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2000872), 6.

<sup>166</sup> Leshed and McLeod, "Metaphors for Social Relationships in 3D Virtual Worlds," 1.

<sup>167</sup> Carl Symborski et al., "Fusing Quantitative and Qualitative Methods in Virtual Worlds Behavioral Research," 2013, [http://www.digra.org/wp-content/uploads/digital-library/paper\\_291.pdf](http://www.digra.org/wp-content/uploads/digital-library/paper_291.pdf), 18.

<sup>168</sup> Ibid.

## 2. Opposing Research

Research regarding the availability of information is fairly consistent. The only opposing factors that were identified were related to self-disclosure. For example, in World of Warcraft, some users may reveal their real age and gender, while others may choose not to.<sup>169</sup> This silence however, does not suggest that the information is not available through other means and that limitations of self-disclosure are exclusive to online environments.

While there is near uniformity among researchers on the availability of information, there is a significant amount of conflicting research regarding the accuracy and real life relevancy of the information. Opposing research suggests that there is a distinction between online and offline identity. For some researchers, there is no connection between a person's real identity and his or her online gaming identity.<sup>170</sup> This argument is based on the notion that virtual environments allow people to reinvent themselves, experiment with online personas, and/or idealize their real selves.<sup>171</sup> Other researchers posit a connection between the real and virtual; however, when identity cues conflict, users will conform to their virtual identity.<sup>172</sup>

While limited, there is also some literature that argues it is far more difficult if not impossible to discern real identity from virtual characteristics. The virtual environment offers users a greater level of anonymity, which in turn can be used to deceive. As stated

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<sup>169</sup> Vivian Hsueh-hua Chen and Henry Been-Lirn Duh, "Understanding Social Interaction in World of Warcraft," in *International Conference on Advances in Computer Entertainment Technology* (ACM, 2007), 21–24, <http://dl.acm.org/citation.cfm?id=1255052>, 23.

<sup>170</sup> Erin Rusaw, "Language and Social Interaction in the Virtual Space of World of Warcraft," 2011, <https://www.ideals.illinois.edu/handle/2142/25514>, 66.

<sup>171</sup> Yee et al., "Introverted Elves & Conscientious Gnomes: The Expression of Personality in World of Warcraft," 2.

<sup>172</sup> Nick Yee et al., "Do Men Heal More When in Drag?: Conflicting Identity Cues Between User and Avatar," in *SIGCHI Conference on Human Factors in Computing Systems* (ACM, 2011), 773–76, <http://dl.acm.org/citation.cfm?id=1979054>, 3.



by researchers from the University of Bucharest, “there is no way of telling how much the avatar you see on your screen is a representation of the user behind it.”<sup>173</sup>

Another factor that some researchers argue can limit personality and behavior inference is the “absence of nonverbal displays.”<sup>174</sup> This argument however, contradicts the majority of recent research, which argues the lack of traditional nonverbal cues have been replaced by other forms of communication such as emoticons. For example, the MMO *Star War Galaxies* supports a robust interaction system of at least 340 social commands that include making an avatar smile, wave, and bow.<sup>175</sup> This range of options allows players to represent a variety of emotions and behaviors through their avatar.

## **B. DEVELOPING VIRTUAL BONDS/TRUST**

The second question focuses on the possibility of developing strong bonds and trust within a virtual relationship. HUMINT requires the development of strong social ties and trust. Therefore, if the relationships developed online are just as strong, if not stronger, than those developed face-to-face, virtual HUMINT would be possible.

### **1. Supporting Research**

While not unanimous, most of the literature and available data supports the notion that virtual relationships involve strong emotional bonds. The primary distinction is whether virtual bonds are as strong as those that are developed in the real world. For many researchers, the answer is yes. Facebook, for example, has served as an effective means for social bonding, allowing users to develop relationships that are similar to those developed offline.<sup>176</sup> An earlier study on Internet chat rooms revealed the same.<sup>177</sup> As it

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<sup>173</sup> Diana Constantinescu and Andrei Decu, “Social Cooperation within Virtual Worlds: Old Social Phenomena Emerging in New Environments,” 2008, [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2000872](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2000872), 7.

<sup>174</sup> Yum and Hara, “Computer-Mediated Relationship Development: A Cross-Cultural Comparison,” 145.

<sup>175</sup> Ducheneaut and Moore, “The Social Side of Gaming: A Study of Interaction Patterns in a Massively Multiplayer Online Game,” 3.

<sup>176</sup> Grieve et al., “Face-to-Face or Facebook: Can Social Connectedness Be Derived Online?” 608.

<sup>177</sup> Rosa Peris et al., “Online Chat Rooms: Virtual Spaces of Interaction for Socially Oriented People,” *CyberPsychology & Behavior* 5, no. 1 (2002): 43–51, 49.

relates to the online gaming world, Yee argues that hyperpersonal interactions, which are caused by communication that involves greater levels of intimacy and intensity, are prevalent in MMOs.<sup>178</sup> He also suggests that the trust building that occurs in MMOs is similar to that which occurs in military boot camps and fraternity initiations.

Another example of strong virtual bonds was seen in a study of the MMO Lineage, where Korean players reported that their virtual friends were just as important as their real-world friends.<sup>179</sup> The same position has been argued for virtual dating. As stated by Dr. Cynthia Jones, "...many virtual relationships can be just as intense as [in real life]."<sup>180</sup> In a 2011 study of the virtual world Second Life, researchers found that the majority of participants experienced intimate relationships that were just as real and serious as those beyond the fantasy environment.<sup>181</sup>

There is also a decent amount of research that argues that virtual bonds are even stronger than those developed in the real world. This claim is primarily based on the concept that online interactions can lower social inhibitions and lead to greater levels of self-disclosure.<sup>182</sup> For example, one study of MMOs showed that "disinhibition" caused players to reveal more personal information, which resulted in greater levels of trust.<sup>183</sup>

## 2. Opposing Research

The majority of the opposing research regarding the strength of virtual bonds involves comparing virtual and face-to-face relationships. For some researchers, the latter provides stronger levels of intimacy. For example, a 2006 study on virtual relationships

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<sup>178</sup> Yee, "The Psychology of Massively Multi-User Online Role-Playing Games: Motivations, Emotional Investment, Relationships and Problematic Usage," 16.

<sup>179</sup> Yoon and Cheon, "Game Playing as Transnational Cultural Practice," 8.

<sup>180</sup> Jones, "Lying, Cheating, and Virtual Relationships," 11.

<sup>181</sup> Richard L. Gilbert, Nora A. Murphy, and Clementina, M. Ávalos, "Realism, Idealization, and Potential Negative Impact of 3D Virtual Relationships," *Computers in Human Behavior* 27, no. 5 (September 2011): 2039–46, doi:10.1016/j.chb.2011.05.011, 2044.

<sup>182</sup> Rabindra A. Ratan et al., "Schmoozing and Smiting: Trust, Social Institutions, and Communication Patterns in an MMOG," *Journal of Computer-Mediated Communication* 16, no. 1 (October 2010): 93–114, doi:10.1111/j.1083-6101.2010.01534.x, 99.

<sup>183</sup> Cole and Griffiths, "Social Interactions in Massively Multiplayer Online Role-Playing Gamers," 582.

showed that participants experienced intimacy but not to the same degree as their face-to-face relationships.<sup>184</sup> As for dating websites, some researchers have argued that the matchmaking algorithms have yet to prove better results than offline dating.<sup>185</sup>

To some, online social networking is far less social than the term suggests. Rather, some researchers have argued that online social networks, as well as other virtual environments, are comprised of brief and shallow exchanges, therefore limiting the strength of the bonds developed.<sup>186</sup> A level of social connectivity is formed but each independent user remains relatively isolated. This notion of “collective solitude” has also been found in research regarding the MMOs.<sup>187</sup> Other researchers have suggested that MMOs in particular are not suited for the development of strong social bonds due to the “geographic dispersion” of players and the “playful” context of the games.<sup>188</sup>

## C. PRODUCING REAL-WORLD RESULTS

The third question focuses on the notion that virtual relationships can transcend into the real world and online behaviors can lead to real-world consequences. If virtual HUMINT relationships are expected to produce real-world results, the real and virtual world must possess some level of interconnectivity. In other words, actions taken in the virtual world must have the possibility of leading to actions taken in the real world.

### 1. Supporting Research

Although there are a number of “fake profiles” and “bots,” online social networking and dating sites are primarily comprised of real people and real relationships.

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<sup>184</sup> Scott, Mottarella, and Lavooy, “Does Virtual Intimacy Exist? A Brief Exploration Into Reported Levels of Intimacy in Online Relationships,” 759.

<sup>185</sup> Xia et al., “Who Is Dating Whom: Characterizing User Behaviors of a Large Online Dating Site,” 4.

<sup>186</sup> Ducheneaut and Moore, “The Social Side of Gaming: A Study of Interaction Patterns in a Massively Multiplayer Online Game,” 8.

<sup>187</sup> Nicolas Ducheneaut and Nicholas Yee, “Collective Solitude and Social Networks in World of Warcraft,” *Social Networking Communities and E-Dating Services: Concepts and Implications*, 2008, 81–103, 97.

<sup>188</sup> Constance A. Steinkuehler and Dmitri Williams, “Where Everybody Knows Your (Screen) Name: Online Games as ‘Third Places,’” *Journal of Computer-Mediated Communication* 11, no. 4 (July 2006): 885–909, doi:10.1111/j.1083-6101.2006.00300.x, 902.

In the social networking sphere, the relationships developed are mostly an extension of a user's face-to-face network. Most users engage in online social networking to maintain relationships that originated offline or to establish new relationships based on mutual friends and interests. In either case, the social relationships formed online are not restricted to the Internet and more often than not, they transcend into the real world.

In some cases, users will introduce members of their online network to members of their offline network.<sup>189</sup> Even in situations where a social relationship remains online, the interaction can still have an impact on a user's real-world behaviors. Unlike social networking sites, the relationships developed through online dating sites are typically new and based at least initially, on a virtual relationship. In such situations, the goal of both parties often involves an eventual date in their real world. Thus, the online dating relationship is also not restricted to the virtual environment.

The related literature and data reveal two particular areas where online social networking and dating can lead to real-world results. The first has to do with social engineering and reverse social engineering, both terms that most often relate to computer security. Social engineering describes "...a non-technical kind of intrusion that relies heavily on human interaction and often involves tricking other people to break normal security procedures."<sup>190</sup>

Similar to the source acquisition cycle that is used in HUMINT, an attacker will identify a user that has access to some needed information and then use a number of recruitment techniques to obtain this information. As indicated by the Office of the National Counter Intelligence Executive, individuals residing in China conducted a number of social engineering attacks to obtain sensitive and proprietary information from U.S. companies and organizations.<sup>191</sup>

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<sup>189</sup> Yum and Hara, "Computer-Mediated Relationship Development: A Cross-Cultural Comparison," 145.

<sup>190</sup> Ying- Chieh Chen et al., "An Analysis of Online Gaming Crime Characteristics," *Internet Research* 15, no. 3 (July 2005): 246–61, doi:10.1108/10662240510602672, 250.

<sup>191</sup> Office of the National Counterintelligence Executive, "Foreign Spies Stealing US Economic Secrets in Cyberspace," October 2011, <http://s3.documentcloud.org/documents/627635/tade-secrets-022013.pdf>, 5.

Likewise, such “hackers for hire” groups as the Iranian Cyber Army have conducted social engineering attacks for political gains.<sup>192</sup> A “reverse social engineering” attack shares the same purpose of social engineering but rather than the attacker initiating the contact, the victim is tricked into being the first to make contact.<sup>193</sup> This dynamic helps establish a higher degree of trust, which can then be used to conduct even more severe and wide-ranging attacks to include blackmailing and identity theft.<sup>194</sup>

Online romance scams are another example of where virtual relationships can result in real world consequences. As explained by the FBI Internet Crimes Unit, “victims [of online romance scams] believe they are ‘dating’ a good and honest person without ever physically meeting them.”<sup>195</sup> They are often targeted based on a real or perceived vulnerability (i.e., divorced or widowed) and the scammers will use a number of rapport-building techniques (i.e., buying flowers) to establish an emotional bond.<sup>196</sup> Ultimately, the scammers will persuade their victims to send them real money or reveal a piece of sensitive information that can later be exploited.

With online social networking and dating aside, there are a number of virtual environments that are far less connected to the real world by design. In particular virtual worlds, which encompass virtual gaming and role-playing sites, are often based on fantasy. However, even virtual worlds are more connected to reality than one would initially expect.

The research into existing literature and data reveals three particular aspects that interconnect virtual and real worlds. The first revolves around the people, businesses, and organizations that participate. For example, nearly every element of society has transcended into the virtual world of Second Life. Such real-life brands as Mercedes and

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<sup>192</sup> Ibid., 10.

<sup>193</sup> Danesh Irani et al., “Reverse Social Engineering Attacks in Online Social Networks,” in *Detection of Intrusions and Malware, and Vulnerability Assessment* (Springer, 2011), 55–74, [http://link.springer.com/chapter/10.1007/978-3-642-22424-9\\_4](http://link.springer.com/chapter/10.1007/978-3-642-22424-9_4), 2.

<sup>194</sup> Ibid.

<sup>195</sup> FBI Internet Crime Complaint Center, “FBI 2013 Internet Crime Report,” 2013, [http://www.ic3.gov/media/annualreport/2013\\_ic3report.pdf](http://www.ic3.gov/media/annualreport/2013_ic3report.pdf), 8.

<sup>196</sup> Ibid.

IBM have developed entities within the virtual world. Universities, public organizations, media outlets, and government embassies have opened up virtual facilities that offer real services.<sup>197</sup> Crime has also seeped into Second Life, ranging from virtual playgrounds that function as child sex rings to virtual rape, harassment, and assault.<sup>198</sup>

The relationships within a virtual world can also extend outside of the game context. For example, users of Ever Quest will interact in and out of the game for a number of different purposes, to include reasons that exceed the design of the game.<sup>199</sup> Virtual worlds possess such a connection to reality that they have also been used to stimulate real-world presidential campaigns, conduct protests of real-world social issues, and promote religious beliefs.<sup>200</sup> This connection to reality has at least one researcher suggesting that, “commercialized virtual venues such as upscale bars and coffeehouses could even be looked to as testing grounds to develop the social skills necessary to form meaningful human relationships.”<sup>201</sup>

Beyond this connectivity to reality, virtual worlds also lend themselves to a variety of relationships, ranging from acquaintances and professional contacts to friendships and lovers.<sup>202</sup> Furthermore, some users will develop and maintain relationships that are exclusive to the virtual world, while others will engage both on and offline.<sup>203</sup>

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<sup>197</sup> Constantinescu and Decu, “Social Cooperation within Virtual Worlds: Old Social Phenomena Emerging in New Environments,” 13.

<sup>198</sup> Matthew M. White and Mann, Bruce L., “Blurring Our Real and Virtual Worlds: Canadian and Worldwide Legal Issues Arising from MMORPGs,” June 14, 2009, 9-10.

<sup>199</sup> Shafiz Mohd Affendi, “Understanding the Virtual Community of Gamers,” 2008, <http://ro.uow.edu.au/dubaipapers/162/>, 2.

<sup>200</sup> Betsy Book, “Moving Beyond the Game: Social Virtual Worlds,” *State of Play* 2, no. 1–13 (2004), <http://deby.net/FILES/3d/ARTICLES/moving%20beyond%20the%20game%20-%20social%20virtual%20worlds.pdf>, 10.

<sup>201</sup> Brown, “Relationships, Community, and Identity in the New Virtual Society,” 30.

<sup>202</sup> Yusof, Shafiz Affendi Mohd, “Building Social Relationships in a Virtual Community of Gamers,” *Encyclopedia of Multimedia Technology and Networking*, n.d., 171–77, doi:10.4018/978-1-60566-014-1.ch024, 1448.

<sup>203</sup> *Ibid.*, 1449.

The second aspect that blurs the line between real and virtual is money. Virtual currency is another example of how the virtual environment can lead to actions in the real world. For example, in the virtual world, Second Life, users can buy, sell, and trade virtual goods for real money.<sup>204</sup> Like in the real world, this opportunity for real financial gain has attracted both legitimate and illegitimate entrepreneurs. Some users have become virtual real estate brokers, selling virtual properties for real money.<sup>205</sup> Likewise, some users have taken to “gold-farming,” which involves gathering virtual goods for the purpose of selling them on the real market place.<sup>206</sup>

Castronova et al. argue the concept of assigning value to an object that is not in and of itself valuable, is no different than the representational value that the U.S. dollar offers those that believe in it. In other words, a virtual house or car can represent value so long as someone is willing to pay for it.<sup>207</sup> Ultimately, the concept of virtual currency offers yet another example of how the virtual environment can be used to achieve outcomes in the real world. As stated by Castronova et al., “the conditions may be virtual, but the players in them are very real and apparently quite rational in the aggregate—at least in their economics.”<sup>208</sup>

The third, and perhaps, most compelling aspect of realism within virtual worlds is that of virtual marriages. One of the first and more prominent virtual marriages that led to a real divorce occurred in United Kingdom a number of years ago.<sup>209</sup> In this case, a woman filed for divorce after she discovered that her husband was role-playing in what

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<sup>204</sup> Constantinescu and Decu, “Social Cooperation within Virtual Worlds: Old Social Phenomena Emerging in New Environments,” 3.

<sup>205</sup> Yee, “The Psychology of Massively Multi-User Online Role-Playing Games: Motivations, Emotional Investment, Relationships and Problematic Usage,” 28.

<sup>206</sup> Brian Keegan et al., “What Can Gold Farmers Teach Us About Criminal Networks?,” *XRDS: Crossroads, The ACM Magazine for Students* 17, no. 3 (March 1, 2011): 11, doi:10.1145/1925041.1925043, 12.

<sup>207</sup> Castronova et al., “As Real as Real? Macroeconomic Behavior in a Large-Scale Virtual World,” 686.

<sup>208</sup> *Ibid.*, 704

<sup>209</sup> Jones, “Lying, Cheating, and Virtual Relationships,” 6.

she described as a “real” relationship with an American woman.<sup>210</sup> In the Chinese gaming site, Wang Hun, users engage in virtual marriages, some of which also lead to real world divorces.<sup>211</sup> Despite never actually meeting, some users then end up divorcing their real world spouses based on the grounds of adultery.<sup>212</sup> The Sims Online (TSO), which is a virtual world that focuses on role-playing, extends this concept of virtual marriage beyond just two users. Instead, users in TSO form complete family systems that resemble real life and that in some cases, serve as a substitute to those that lack a family structure in the real world.<sup>213</sup>

The realism involved in these virtual marriages have caused some researchers to question whether the line between what is real and fake may soon become irrelevant. For example, Brown suggests that a “virtual spouse” that performs nearly all of the functions that a real spouse performs may someday be considered eligible for the same legal benefits.<sup>214</sup> Likewise, Jones poses the question of whether the real stories of virtual adultery and infidelity could also suggest that a virtual marriage could constitute polygamy.<sup>215</sup>

## 2. Opposing Research

The only opposing research focuses on physical pain and death, which is obviously limited to the real world. For example, although emotional discomfort may be experienced among MMO players, there is no actual physical discomfort that can be directly related to a virtual action.<sup>216</sup> The same can be presumed for all virtual environments.

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<sup>210</sup> Ashley John Craft, “Love 2.0: A Quantitative Exploration of Sex and Relationships in the Virtual World Second Life,” *Archives of Sexual Behavior* 41, no. 4 (August 2012): 939–47, doi:10.1007/s10508-012-9933-7, 939.

<sup>211</sup> Brown, “Relationships, Community, and Identity in the New Virtual Society,” 29.

<sup>212</sup> Ibid.

<sup>213</sup> Constantinescu and Decu, “Social Cooperation within Virtual Worlds: Old Social Phenomena Emerging in New Environments,” 11.

<sup>214</sup> Brown, “Relationships, Community, and Identity in the New Virtual Society,” 31.

<sup>215</sup> Jones, “Lying, Cheating, and Virtual Relationships,” 8.

<sup>216</sup> Williams, “The Mapping Principle, and a Research Framework for Virtual Worlds,” 5.



## D. KEEPING IT “VIRTUAL”

The final question focuses on whether virtual relationships can remain in the virtual environment forever. Supporting this notion suggests that recruitment, as well as the management of a virtual source may be possible.

### 1. Supporting Research

As suggested by Young-ok Yum and Kazuya Hara, the Internet “...is becoming simply another social context in which people meet their prospective relationship partners, as well as forming, developing, ending relationships, and starting over, sometimes without ever experiencing actual physical contact.”<sup>217</sup> One of the most compelling examples of relationships that remain virtual are those of virtual marriages.

There have been a number of cases where two people meet online, get married virtually, and maintain a serious relationship without ever meeting.<sup>218</sup> In most of these cases, the couple never meets and the marriage remains “in-game” forever.<sup>219</sup> In some cases, researchers have found these virtual marriages have actually led to people divorcing their real life partners. Beyond virtual marriages, online dating sites are also providing members with the ability to “go on” dates virtually, a behavior that is expected to increase over time.<sup>220</sup>

Jones summarizes this phenomenon by stating, “a large number of people choose to not only flirt and date virtually but to become sexually and emotionally involved in a purely virtual manner.”<sup>221</sup> Romance scams also shed light on how virtual relationships can remain virtual. The IC3, which tracks Internet fraud and identity theft, reports that

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<sup>217</sup> Yum and Hara, “Computer-Mediated Relationship Development: A Cross-Cultural Comparison,” 145.

<sup>218</sup> Yee, “The Psychology of Massively Multi-User Online Role-Playing Games: Motivations, Emotional Investment, Relationships and Problematic Usage,” 29.

<sup>219</sup> Yusof, Shafiz Affendi Mohd, “Building Social Relationships in a Virtual Community of Gamers,” 1448.

<sup>220</sup> Brown, “Relationships, Community, and Identity in the New Virtual Society,” 30.

<sup>221</sup> Jones, “Lying, Cheating, and Virtual Relationships,” 7.

victims, who are targeted through chat rooms, dating sites, and social networking sites, are duped into serious relationships without ever physically meeting.<sup>222</sup>

## **2. Opposing Research**

Opposing literature was limited and specific to online dating. More specifically, some researchers have argued that online dating is inherently different than most other online settings since users usually anticipate face-to-face interactions.<sup>223</sup> As a result, the virtual component for at least part of the online dating community is limited and temporary.

## **E. META INTERPRETATION**

I began this chapter by conducting a systematic review of supporting and opposing research on four key themes: 1) identity and personality inference, 2) virtual bonds and trust, 3) the real world impact of virtual relationships, and 4) the ability to maintain a relationship in the virtual environment. I now build upon these findings by also conducting a meta-interpretation of the research studies that relate to one or more of these four concepts. A meta-interpretation involves the interpretive synthesis of qualitative research. It is intended to measure a relatively understudied concept by piecing together the findings of relevant studies.

In this particular case, I identify and evaluate 23 studies that relate to my research.<sup>224</sup> Although each study is not specific to virtual HUMINT, the collective dataset provides a starting point from which some early assumptions can be made. For example, by synthesizing and interpreting the research on the characteristics of gaming avatars or online dating activities, I can further support or oppose the possibility of inferring one's real identity, which would be needed for the development of a HUMINT relationship. The below sections present a summary of my meta-interpretation findings.

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<sup>222</sup> FBI Internet Crime Complaint Center, "FBI 2013 Internet Crime Report," 8.

<sup>223</sup> Christina Kalinowski, "Goffman Meets Online Dating" (Purdue University, 2009), <http://matei.org/ithink/wp-content/uploads/2010/07/kalinowskigoffmanabridgedmastersthesis.pdf>, 4.

<sup>224</sup> As indicated in Chapter I, I began with 25 studies, however after a more thorough evaluation I determined that two of the studies exceeded the scope of my research.

## 1. Summary of Interpretation Results

As shown in Table 16, my interpretation of the collective dataset supports the four themes that relate to virtual HUMINT. Thirteen of the studies suggest that it is possible to infer a person's real identity and personality from online activities. Eleven of the studies suggest that virtual relationships can be just as strong as real bonds, while one study opposes this interpretation. Three of the studies support the notion that virtual relationships can result in an impact on the real world. One of these and two other studies also support the notion that a virtual relationship can remain virtual; however, one opposes this idea.

Table 16. Summary of Meta-Interpretation Results

<b>META-INTERPRETATION RESULTS</b>					
<b>#</b>	<b>STUDY</b>	<b>INFER IDENTITY</b>	<b>STRONG BONDS</b>	<b>KEEPING IT VIRTUAL</b>	<b>REAL IMPACT</b>
1	Love 2.0: A Quantitative Exploration of Sex and Relationships in the Virtual World Second Life	+	+	+	
2	Building Social Relationships in a Virtual Community of Gamers		+	+	
3	If You Build It They Might Stay: Retention Mechanisms in World of Warcraft		+		
4	Schmoozing and Smiting: Trust, Social Institutions, and Communication Patterns in an MMOG		+		
5	Social Interactions in Massively Multiplayer Online Role-Playing Gamers	+	+		+
6	The Psychology of Massively Multi-User Online Role-Playing Games: Motivations, Emotional Investment, Relationships and Problematic Usage		+		+
7	Computer-Mediated Relationship Development: A Cross-Cultural Comparison		+		
8	Making friends in cyberspace		+		
9	Online Chat Rooms: Virtual Spaces of Interaction for Socially Oriented People		+	-	
10	Realism, idealization, and potential negative impact of 3D virtual relationships		+	+	+
11	The social side of gaming: a study of interaction		-		

	patterns in a massively multiplayer online game				
12	Introverted Elves & Conscientious Gnomes: The Expression of Personality in World of Warcraft	+			
13	The priming effects of avatars in virtual settings	+			
14	Fusing Quantitative and Qualitative Methods in Virtual Worlds Behavioral Research	+			
15	Manifestations of Personality in Online Social Networks: Self-Reported Facebook-Related Behaviors and Observable Profile Information	+			
16	Make new friends or keep the old: Gender and personality differences in social networking use	+			
17	Personality and motivations associated with Facebook use	+			
18	Social network use and personality	+			
19	The influence of personality on Facebook usage, wall postings, and regret	+			
20	The Proteus effect: The effect of transformed self representation on behavior	+			
21	Who uses Facebook? An investigation into the relationship between the Big Five, shyness, narcissism, loneliness, and Facebook usage	+			
22	Identifying User Demographic Traits through Virtual-World Language Use	+			
23	Game playing as transnational cultural practice: A case study of Chinese gamers and Korean MMORPGs		+		

In Appendix A, I list the title, author, sample, method and relevant key findings for each of the studies represented above. I use this information to make assumptions that further support or oppose the virtual HUMINT themes that are identified in the beginning of this chapter. For example, Study 1 argues that most users in Second Life are fairly representative of their real selves, they are not looking for an offline relationship, and they perceive their virtual bonds to be as strong as the bonds they develop in the real world. As indicated in Table 16, these findings suggest that the study supports the themes of identity and personality inference, virtual bonds and trust, and the ability to maintain a relationship in the virtual environment. Although this study is specific to users in the MMO, Second Life, it is reasonable to assume that its findings could apply to other

MMOs or virtual environments. To help support this assumption, the findings of this study are presented as a part of 23 total studies that are evaluated in this section.

In another example, the users of the MMO Ever Quest are more trusting of fellow gamers than they are of people in general, which further supports the notion of virtual bonds and trust. In study 13, the findings suggest that users who are assigned avatars dressed in black are more aggressive and anti-social. Likewise, in study 20, the findings suggest that taller avatars are more confident and attractive avatars behave more intimately. The findings of these two studies seem to support the concept of identity and personality inference.

As a final example, the findings of Study 5 suggest that online relationships involve revealing sensitive personal information and Study 10 proposes that some online relationships lead to real-life problems to include divorce from a real world partner. While not exhaustive, these findings suggest that virtual relationships can result in real world behaviors.

Overall the findings of the systemic review and meta-interpretation strengthen the framework that I set in Chapter III. Not only are most of the key countries and territories accessible through online activities but the four themes that would make a virtual HUMINT relationship possible are also found in my research. A person's real identity and personality can be inferred from their online identity and behaviors and the strong bonds and trust that are needed to form a virtual relationship can be accomplished. Furthermore, virtual relationships can lead to actions that impact the real world, without ever taking the relationship offline. There are limitations to my interpretations and any generalizations would need to be further researched however, for the purpose of this thesis, the data does support the feasibility of virtual HUMINT.

## V. CONCLUSION

I began this thesis by asking how virtual relationships could be used for conducting HUMINT operations. This overarching question was based on the assumption that the relationships developed through online social networking, gaming, and dating could be engineered for the purpose of collecting intelligence. I ultimately proposed that this concept, more commonly referred to as “virtual HUMINT,” was not only possible but also effective, efficient, and potentially safer than traditional HUMINT. To pursue this theory, I researched the “can” and “should” of virtual HUMINT, with a particular emphasis on the former.

### A. CAN VIRTUAL HUMINT BE DONE?

As demonstrated in Chapter II, the virtual environment, which includes online social networking, gaming, and dating, has become widespread. Worldwide Internet access is rapidly growing and people from all corners of the globe are becoming increasingly more attached to their phones and computers. Three specific types of virtual environments that have grown exponentially are online social networking, dating, and gaming sites. These virtual environments have become an essential part of everyday life.

They have also triggered a migration from the physical world to the virtual world. Traditional brick-and-mortar locations for work, school, dating, entertainment, and socializing are being augmented and in some cases, replaced by the virtual equivalents for each of these activities. This virtual takeover is limiting face-to-face interactions and by default, the opportunity to conduct traditional HUMINT operations. When people “go out” less, they become much harder to reach in person. More specifically, it becomes far more difficult to spot and recruit a source at a real coffee shop or college campus when the foot traffic is replaced by web traffic.

Chapter III revealed that most of the countries and territories that are of particular interest to U.S. foreign policy and security are engaging online. With the exception of a few (i.e., North Korea), these key countries and territories are active users of online social networking, dating, and gaming sites. More importantly, Internet access and use is

rapidly increasing in nearly all of these countries and territories and the continued migration of new technologies to the Middle East and other parts of the world is only expected to intensify this growth.

In Chapter IV, the research showed that virtual relationships, which include those that are developed through online social networking, dating, and gaming sites, could be engineered for the purpose of collecting HUMINT. As demonstrated in the research, the source acquisition cycle, which includes the identification, recruitment, and development of a human source can be conducted virtually. HUMINT requires the ability to identify access and placement, cultivate strong bonds, and influence an individual to take action. All three of these requirements can be accomplished within the virtual environment. Additionally, the relationships developed online never have to extend beyond the virtual environment. Based on these factors, virtual HUMINT is conceivable. The online environments of social networking, dating, and gaming can serve as effective mechanisms for the virtual recruitment of human sources. Furthermore, most of the countries and territories that are of interest for intelligence collectors can be accessed through these environments—making virtual HUMINT not only a possibility but also a realistic option.

## **B. SHOULD VIRTUAL HUMINT BE DONE?**

The possibility of virtual HUMINT does not automatically equate to value. Thus, asking whether virtual HUMINT offers value must follow my primary thesis question. However, I pose this question not for the purpose of measuring the exact worth (i.e., cost vs. benefit analysis) of virtual HUMINT, but rather simply to determine whether virtual HUMINT would or would not offer some form of value to current practices.

The nature of recruiting a source virtually is likely to be efficient, effective, and in some cases, safer. Although my research does not sufficiently offer a comparison between the traditional and the proposed virtual operations, the data collected does offer some support for the assumptions made in Chapter I. First, the literature does support the notion that traditional HUMINT operations are inherently dangerous. Operating under “official cover” from within a U.S. embassy alleviates some of this danger but this is not

always an option.<sup>225</sup> In many cases, intelligence officers must accept an extraordinary level of danger to be effective in identifying and recruiting sources.<sup>226</sup> HUMINT often requires clandestine meetings that are inherently dangerous.<sup>227</sup> As an example, in 1973 an Israeli intelligence officer was killed in Madrid while waiting for a source meeting.<sup>228</sup> Ultimately, traditional HUMINT collectors are interacting with sources that are connected to dangerous organizations and as such, each face-to-face engagement is especially dangerous.<sup>229</sup>

Conducting HUMINT operations virtually also offer a financial benefit. HUMINT is generally cheaper than other forms of intelligence collection (i.e., techint) and it only makes up a small portion of the total intelligence budget.<sup>230</sup> Nonetheless, HUMINT operations still require a great deal of resources to include extensive training and supplies.<sup>231</sup> However, like many industries, some of these resources can be augmented by technology. Just as MMO users can interact and develop serious relationships from the comfort of their own home, an intelligence officer can do the same from his or her office. This modality would eliminate or at least reduce the need for surveillance personnel or the time needed to set up an in-person meeting. Such cost savings has already been experienced in the world of economic espionage. The “near instantaneous transfer of enormous quantities of economic and other information” via cyberspace has, in some cases replaced what once required a physical transfer of documents between a source and his or her handler.<sup>232</sup>

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<sup>225</sup> Johnson, “Evaluating ‘Humint’: The Role of Foreign Agents in U.S. Security,” 310.

<sup>226</sup> Best, *Intelligence Issues for Congress*, 5.

<sup>227</sup> Noble Jr, “Diagnosing Distortion in Source Reporting,” 30.

<sup>228</sup> Shepherd, “The Applications of Human Intelligence in Counterterrorism,” 89.

<sup>229</sup> *Ibid.*, 92.

<sup>230</sup> Johnson, “Evaluating ‘Humint’: The Role of Foreign Agents in U.S. Security,” 315.

<sup>231</sup> Shepherd, “The Applications of Human Intelligence in Counterterrorism,” 92.

<sup>232</sup> Office of the National Counterintelligence Executive, “Foreign Spies Stealing US Economic Secrets in Cyberspace,” 2.



Finally, there are a number of areas that are difficult to penetrate with traditional HUMINT operations. Generally, HUMINT collectors operate under official cover, which provides some level of protection from a foreign government or adversary. Unfortunately, this type of HUMINT collection is significantly limiting. For one, HUMINT collectors are “unlikely to meet members of al Qaeda on the diplomatic cocktail circuit.”<sup>233</sup> The same would apply to any other potential source that is far removed from embassy functions or official activities.<sup>234</sup> There are a number of HUMINT collectors that function under non-official cover, without any association to a government, however this too can be challenging.<sup>235</sup> From one perspective, it is difficult for intelligence officers to even obtain “believable non-official covers.”<sup>236</sup> Second, a non-official cover requires placing personnel in serious danger.

Regardless of official or unofficial cover, there are also a number of situations that are still difficult to navigate. Gaining access to some of the most secretive activities can only be accomplished by recruiting an insider, and even then, it is not always possible.<sup>237</sup> There are also a number nations or territories that are especially resistant to HUMINT collectors, to include failed states and nations with hard-lined governments.<sup>238</sup>

Despite the challenges, denied areas are not entirely off limits to HUMINT, they just require more innovative solutions. For example, there were a number of areas that were difficult to penetrate during the cold war but once the challenges were identified, the U.S. IC was able to use new technologies to overcome the issue.<sup>239</sup> The same can be done today with virtual HUMINT.

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<sup>233</sup> Johnson, “Evaluating ‘Humint’: The Role of Foreign Agents in U.S. Security,” 327.

<sup>234</sup> Best, *Intelligence Issues for Congress*, 14.

<sup>235</sup> *Ibid.*, 5.

<sup>236</sup> Johnson, “Evaluating ‘Humint’: The Role of Foreign Agents in U.S. Security,” 310.

<sup>237</sup> *Ibid.*, 312.

<sup>238</sup> Shepherd, “The Applications of Human Intelligence in Counterterrorism,” 86.

<sup>239</sup> Howard, “Intelligence in Denied Areas: New Concepts for a Changing Security Environment,” 2.

However, as previously noted, the research supporting these ideas is limited. Further research comparing the cost between traditional and virtual HUMINT operations would help solidify the notion that the latter would be cheaper. The cost-benefit analysis also needs to account for the related ethical implications and the difference in source management. In other words, can the virtual recruitment and management of a source also lessen the moral dilemmas that normally accompany HUMINT operations? Additionally, more research on the difficulty and ability to penetrate denied areas through virtual HUMINT would also help highlight the value.

### **C. LOOKING FORWARD**

There are a number of other areas that warrant further research. For one, there is room to expand on the data that I used to support some of my conclusions. For example, there were a number of datasets that lacked information on specific countries (i.e., North Korea). Also, there was some limitation on the accuracy of the website traffic estimates provided by Alexa. Future research could help gather supporting data from competing companies such as SimilarWeb or perhaps, more importantly, from original human research (i.e., Surveys or sampling).

A second area worth exploring has to do with the specific tradecraft that would be used in virtual HUMINT. This would serve as the natural progression for the results that are presented in this thesis. The conclusions highlighted in this chapter set a foundation that not only supports the possibility of virtual HUMINT but also provides insight into the types of sources that could be recruited as well as the value of recruiting sources online. However, this thesis did not address how such relationships would be managed or terminated. For example, how would a virtual source be compensated if the motivation involved monetary benefits? Could such transactions occur discreetly online or would the payments trace back to the originating source? Beyond providing compensation, can a virtual relationship be terminated just as easily as a face-to-face relationship?

Finally, an area for future research that would be worth pursuing is the domestic application of virtual HUMINT. There are a number of legal questions that would need to

be addressed for such an application and it would also be interesting to explore the value of virtual HUMINT in the context of crime fighting.

In conclusion, virtual HUMINT not only seems possible but it is likely to play a significant role in future intelligence operations. The “Internet of things,” which has connected nearly everything to include phones, watches, clothing, and cars to the World Wide Web has become a reality and Internet access and use is rapidly increasing across the globe. People are becoming increasingly more virtual, turning to the Internet to develop social networks, play games, and establish intimate relationships. This reality is also not exclusive to developed countries as nearly all nations and territories are becoming more connected to the Internet.

More importantly, most of the nations and territories that would be of interest for intelligence collection are in fact wired and participating in online social networking, gaming, and dating sites. These key countries and territories are only becoming more connected with time and soon enough, there will not be a place in the world that is not accessible through these online activities. However, the possibility of virtual HUMINT is not just about making sure the nations and territories that are of interest are actually susceptible to online communication.

Rather, the theory also requires identifying the factors that would make a virtual HUMINT relationship possible and then determining whether these factors actually exist. While not exhaustive, it is apparent that these factors would include the ability to infer a person’s real identity and personality, develop strong virtual bonds, influence real world actions, and maintain the relationship in a virtual environment. The systematic review of literature and the meta-interpretation of a number of related studies suggest that all of these factors are at least possible. While not equal in support and without generalizing too much, these factors help form a framework for virtual HUMINT.

For thousands of years, HUMINT rightfully represented the human side of intelligence collection but today, as cyberspace becomes more dominant and people become increasingly more virtual, HUMINT will need to include an even greater technological component. This cyborg-like approach, which combines a human element

with technology to virtually recruit sources, will allow intelligence agencies to target some of the most dangerous and remote areas of world without ever leaving the safety of the keyboard.

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## APPENDIX. META INTERPRETATION TABLES

<b>1. Love 2.0: A Quantitative Exploration of Sex and Relationships in the Virtual World Second Life (Craft)</b>
235 Second Life residents. Survey and comparative analysis to U.S. General Social Survey data.
<ul style="list-style-type: none"><li>▪ The majority represented their real race, age, and gender and around 80% indicated they “always” or “often” represent themselves the same as they do offline.</li><li>▪ Most are not looking for an “offline relationship or sexual partner”</li><li>▪ Most “strongly agreed” that their emotional bonds are as strong as they are in the real world.</li></ul>
<b>Interpretation:</b> Since most users tend to represent their real selves, it is possible that someone’s real identity could be inferred from their online identity. Additionally, since most users are not looking for an offline relationship and considering most users view their virtual bonds to be as strong as their real bonds, it is possible that strong ties can be developed and maintained virtually.
<b>2. Building Social Relationships in a Virtual Community of Gamers (Yusof)</b>
157 respondents. Multiple modes of collection including questionnaires and interviews.
<ul style="list-style-type: none"><li>▪ 34% viewed their relationships in EQ as “friendships.” Definitions of what this means included elements of duration, trust, liking, common interests, support and enjoyment.</li><li>▪ The second highest (16.5%) meaning of EQ relationships was marriage, most of which remained “in-game.”</li></ul>
<b>Interpretation:</b> The description of what EQ members viewed as friends suggests that strong virtual bonds and trust are possible. This is also supported by the findings that the second highest number of users also reported marriages. Furthermore, the findings that most EQ marriages remained in-game suggests that virtual relationships can remain in the virtual environment.
<b>3. If You Build It They Might Stay: Retention Mechanisms in World of Warcraft (Debeauvais et al.)</b>
2865 World of Warcraft players from North America, Europe, Taiwan, and Hong-Kong. Survey.
<ul style="list-style-type: none"><li>• 54% said they became real life friends with someone they met online.</li><li>• 13% said they entered a virtual romantic relationship or marriage with someone from WoW</li></ul>
<b>Interpretation:</b> WoW players becoming real life friends and in some cases entering virtual marriages suggests that strong virtual bonds and trust are possible.
<b>4. Schmoozing and Smiting: Trust, Social Institutions, and Communication Patterns in an MMOG (Ratan et al.)</b>
Approximately 3,500 EQII players. Survey.

- Trust for “guild members” was 50% higher than non-guild members and 30% higher than others in general.

**Interpretation:** If Ever Quest players are more trusting of fellow guild members and in some sense, more trusting of others in general, then the development of virtual bonds and trust in the online environment should be possible.

### **5. Social Interactions in Massively Multiplayer Online Role-Playing Gamers (Cole & Griffiths)**

912 MMORPG players from 45 countries. Survey.

- Over 74.7% of respondents said they have “made good friends within the game” and 31.3% had been attracted to another player.
- 45.6% believed their online friends to be comparable to their real-life friends.
- 39.3% discussed “sensitive issues” that they would not discuss with real life friends.
- 36.7% trust their online friends as much as their real life friends and 4.8% trust their online friends more than their real life friends.
- 34.6% “reported they could be more themselves in the game than in real life.”
- 20.3% believed that MMO games resulted in a negative effect on their MMO relationships.
- 42.8% “met with online friends in real-life situations.”

**Interpretation:** The findings that show MMO players developed good friendships that were comparable to real life relationships support the possibility of strong virtual bonds. Likewise, the trust developed also supports this notion. The findings that show MMO players shared sensitive information and in some cases, met face-to-face, also supports the possibility of virtual relationships causing a real word impact.

### **6. The Psychology of Massively Multi-User Online Role-Playing Games: Motivations, Emotional Investment, Relationships and Problematic Usage (Yee)**

30,000 respondents over 4 years. Targeted users of EverQuest, Dark Age of Camelot, Ultima Online, and Star Wars Galaxies.

- 27% had their “most satisfying experience over the past 7 days” within the game and 18% reported the same for “the past 30 days.”
- 33% had their “most negative experience over the past 7 days” in the game and 23% reported the same “for the past 30 days.”
- 15.7% of male and 5.1% of female respondents dated someone they first met in an MMO.

**Interpretation:** The findings that highlight the impact of MMO experiences and the results that show that some MMO players date people they first met online suggest that strong virtual bonds and trust are possible and that the relationships can result in real world consequences.

### **7. Computer-Mediated Relationship Development: A Cross-Cultural Comparison (Yum & Hara)**

126 Japanese, 112 U.S. Americans, and 123 South Koreans College Students. Survey.

- The majority (39%) labeled their online relationships “as same-sex friendships (39%), followed by romance (20%) and opposite-sex friendship (18%).” The rest

were “acquaintances or other.”

**Interpretation:** The findings that show most online relationships are pursued for friendship and romance suggest that the development of strong virtual bonds and trust are possible.

### **8. Making friends in cyberspace** (Parks & Floyd)

Evaluation of 24 newsgroups and surveying of 176 Internet users.

- 61% “felt intimate with their online partners.”
- Respondents labeled their online relationships as “close friendships” (41%), friendships (26%), and romantic relationships (26%).

**Interpretation:** The intimacy described in this study supports the notion that strong virtual bonds and trust are possible.

### **9. Online Chat Rooms: Virtual Spaces of Interaction for Socially Oriented People** (Eris et al.)

66 online users in first sample. 149 psychology students in second survey.

- 41.9% of the 43 subjects considered their relationships as “friendly” while 58.1% considered them to be “romantic.”
- 43.3% “simultaneously had a real life partner”
- 74% met offline while 25.6% did not.
- 70.6% of friendly and 55.6% of romantic relationships were considered “just as important as face-to-face relations.”

**Interpretation:** The findings that show online relationships are based on friendship or romance and that they are often considered just as important as real relationships suggests that virtual bonds and trust are possible. However, the findings that show most people actually met in person opposed the possibility of maintaining a relationship in a virtual environment. This is one of the few studies that showed this kind of finding.

### **10. Realism, idealization, and potential negative impact of 3D virtual relationships** (Gilbert et al.)

199 participants that were currently involved in an intimate relationship within Second Life.

- 49% had a dating relationship, while 38% reported long-term commitments, and 14% reported marriages.
- 67% “cohabitated in the virtual world with their Second Life partner” and 65% met their partner at least once a day.
- 99% indicated they “talked and spent time with their partner”; 96% “socialized with others”; 91% “shopped together”; 89% “spent time together in a virtual home”; 86% “went dancing and to clubs”; 82% “had sex with each other”; 78% “attended concerts and listened to music”; 49% “built virtual objects and structures together”; and 44% “worked together.”
- 72% “communicated with their partner outside of Second Life” and the majority believed their intimate relationships were just as real as those in the “physical world.”
- 71% compared their virtual relationship to a “long-distance relationship in real life.”



- Over half believe falling in love as the same in real life.
- 40% agreed and 40% disagreed that love in Second Life and real life are different.
- “Over one-third of the concurrent-partner participants whose real life partners were aware of their Second Life relationship were uncomfortable with the existence of this relationship.”
- About a quarter “indicated that they had problems or thought of leaving their real life relationship due to their Second Life relationship” but less than 10% actually did.
- About a quarter indicated they “loved their Second Life partners as much as their real life partners,” more than a third had a “stronger connection with their virtual partner,” and nearly half “could be more open with their Second Life partner than their real life partner.”

**Interpretation:** The findings that suggest users were engaging in real world like behaviors and establishing serious relationships supports the notion of strong virtual bonds and trust. Furthermore, the findings also suggest the relationships impacted the user’s real life, which partially supports the notion of real world impact.

### **11. The social side of gaming: a study of interaction patterns in a massively multiplayer online game (Ducheneaut & Moore)**

Analysis of interaction logs and video recordings from the MMO Star War Galaxies, as well as a 3-month ethnography of the same environment.

- “An overwhelming majority of players are not very interactive...”

**Interpretation:** The findings in this study suggest that MMO players may be less interactive as assumed and if this is the case, then the data opposes the notion of developing strong virtual bonds and trust.

### **12. Introverted Elves & Conscientious Gnomes: The Expression of Personality in World of Warcraft (Yee et al.)**

1,040 World of Warcraft. Comparison of demographic and personality variables with behavioral metrics over a four-month period.

- “...players who score high on Extraversion prefer group-oriented activities” and “players who score high on Agreeableness use more positive emotes and prefer non-combat activities.”
- “... individuals who score high on Extraversion tend to prefer group activities” such as Dungeon Achievements. They also complete “a higher number of end-game 25-man raid dungeons.”
- “... players who score low on Extraversion prefer solo activities” to include questing, cooking, and fishing. They are also “more likely to have more vanity pets.”
- “... players who score low on Extraversion have a preference and higher win ratios for some PvP activities...”
- “... individuals who score high on Agreeableness give out more positive emotes” such as hugs, cheers, and waves. They also “prefer noncombat activities such as exploration, crafting, world events, cooking, and fishing.”
- “... players who score low on Agreeableness prefer the more competitive and antagonistic aspects of game-play.” They also “enjoy killing other players” and

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have “more deaths,” “focus more on getting better equipment,” and engage in more “PvP activities.”

- “... players who are low on Agreeableness often insist on being given higher priority over others by rolling “Need.”
- “... individuals who score high on Conscientiousness seem to enjoy disciplined collections in non-combat settings.” This is shown in a “large number of vanity pets” and “high cooking,” “fishing scores,” and “world event achievements.”
- “... individuals who score low on Conscientiousness seem to be more careless and are more likely to die from falling from high places.”
- “Individuals who score low on Emotional Stability prefer PvP related activities and those who score higher “are more likely to have characters of the opposite gender.”
- “... individuals who score higher on Openness have more characters,” “have characters on more realms, “spend more of their playtime exploring the world,” and “spend more time participating in non-combat activities.”
- “... individuals who score low on Openness prefer the more traditional, combat-oriented aspects of game-play, spending more time in dungeons and raids.”

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**Interpretation:** The activities and decisions made inside of a game indicate whether a person may be more agreeable, conscientiousness, emotionally stable, open to new experiences.

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### **13. The priming effects of avatars in virtual settings (Peña et al.)**

An experiment involving 51 students from a large Northeastern university and a second experiment involving 100 students from the same university.

- “...users assigned to avatars dressed in black were more aggressive and more likely to endorse anti-social behavior than those dressed in white.”

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**Interpretation:** The findings that users that are assigned a particular type of avatar behave in a certain way, suggests that it may be possible to infer a person’s user’s real world identity and personality.

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### **14. Fusing Quantitative and Qualitative Methods in Virtual Worlds Behavioral Research (Symborski et al.)**

80 participants that were at least 18 years old and with 50 hours of experience in Guild Wars or Aion. Quantitative-qualitative mixed methods research technique.

- “... the appearance of a male avatar strongly predicted a RW gender of male. Female avatars required the support of additional IVs to distinguish between female avatars operated by RW females and female avatars operated by RW males.”
- “If the avatar does not strategize, inflicts melee damage in combat, and/or checks the quest log, then it is likely that the individual has an aggressive ideology.”
- “...the presence of this theme was a predictor of RW male gender. Because male avatar gender is such a strong predictor of RW male gender, the remaining variables in the discriminant function above primarily indicate the remaining RW males who were “gender-bending.”
- “... RW male players playing female characters in the sample were less likely to expose their hair and hair accessories than RW female players were.”
- “If the avatar spends more time stationary, is not a Mage, and/or does not actively

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traverse the environment, then it is likely that the player's age is 30 or over.”

- “... an avatar that spent more time stationary was more likely to be older (age 30 or over).”
- “... those who played a Mage class avatar were less likely to be age 30 or over.”
- “... an avatar that did not actively traverse the environment was more likely to be age 30 or older.”
- “If the avatar does not backtrack, does not heal party members, and/or does not follow commands issued by others, then it is likely that the individual has high extraversion.”
- “... an avatar that did not turn around or go back was more likely to be operated by a highly extraverted individual.”
- “... not being involved with healing other party members helped predict high extraversion in the RW.”
- “... an avatar who did not spend time following others' commands was more likely to be highly extraverted in the RW.”
- “If the avatar does not go to pieces under stress, is not cynical and skeptical of others' intentions, and/or does not actively traverse the environment, then it is likely that the individual has a submissive ideology.”
- “... players who did not actively traverse the environment were more often those with a submissive ideology.”
- “If the avatar does not strategize, inflicts melee damage in combat, and/or checks the quest log, then it is likely that the individual has an aggressive ideology.”
- “In the study sample, not strategizing helped predict an aggressive ideology.”
- “In the study sample, checking the quest log helped predict an aggressive ideology.”

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**Interpretation:** The characteristics and activities of an avatar can help predict a user's real gender, age, and some personality traits such as extraversion and aggressiveness.

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### **15. Manifestations of Personality in Online Social Networks: Self-Reported Facebook-Related Behaviors and Observable Profile Information (Gosling et al.)**

159 participants from a psychology student subject pool at Washington University in St. Louis.

- “... extraversion was correlated with a large number of self-reported Facebook behaviors, especially those related to maintaining an up-to-date presence and tending to social bonds (e.g., number of Facebook friends and commenting on another's page).”
- “... those higher in agreeableness viewed all pages (i.e., any, others, and their own pages) more often than those low in agreeableness.”
- “... participants low on conscientiousness spent more time viewing pages and more time on Facebook than did those high in conscientiousness.”
- “... openness was related to adding and replacing photographs...”
- “... extraversion was related to the observable information associated with maintaining social connections with others; for example, extraversion was strongly correlated with the number of friends overall and the number of friends in the local network.”

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- Openness “was correlated with the number of friends overall, the number of friends in the local network, and the number of networks.”
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**Interpretation:** The findings that suggest the number of Facebook friends, messages, and overall use can indicate whether a user is more extraverted, agreeable, conscientious, and open to new experiences supports the possibility of inferring a user’s real identity and personality.

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**16. Make new friends or keep the old: Gender and personality differences in social networking use** (Muscanell & Guadagno)

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238 undergraduate psychology students. Survey.

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- “Individuals high in extraversion were more likely to report posting photographs.”
  - “... individuals high in conscientiousness were more likely to report sending private message.”
  - “... men who were low in agreeableness posted blog entries more often than men who were high in agreeableness.”
  - “... women low in agreeableness reported engaging in IM more often than women who were high in agreeableness.”
  - “... men low in openness to new experience reported playing games on social networking sites more often than men who were high in openness to new experiences.”
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**Interpretation:** The findings that suggest the number of private messages, photographs, blog entries, and instant messaging activity can indicate whether a user is more extraverted, agreeable, conscientious, and open to new experiences supports the possibility of inferring a user’s real identity and personality.

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**17. Personality and motivations associated with Facebook use** (Ross et al.)

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97 students at a university in Southwestern Ontario.

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- “... individuals in the high Extraversion group reported membership in significantly more groups than individuals in the low Extraversion group.”
  - “Contrary to our expectation, however, Extraversion was not significantly related to number of “Facebook Friends,” time spent online or use of the communicative Facebook features.”
  - “Neuroticism was unrelated to the posting of personally-identifying information such as mailing address or phone number, nor was it related to the use of communicative features of Facebook. Exploratory analyses revealed that this trait was associated with preferred Facebook application such that individuals high in Neuroticism preferred using the Facebook Wall, whereas those low in Neuroticism preferred posting photos on their Facebook profile.”
  - “... those in the high Motivation group typically spent 31–60 min per day on Facebook, while those in the low Motivation group typically spent 10 min per day or less on Facebook.”
  - “People in the highest third on the CMC Motivation scale checked their Wall more frequently than those low on CMC Motivation.”
  - “... higher levels of Openness to Experience were associated with a greater tendency to be sociable through Facebook.”
-

**Interpretation:** The findings that suggest the number of online friends, group memberships, public posts, and overall activity can indicate whether a user is more extraverted, neurotic, motivated and open to new experiences supports the possibility of inferring a user's real identity and personality.

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### **18. Social network use and personality (Amichai-Hamburger & Vinitzky)**

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237 students at an Israeli university.

- "... individuals in the highly extroverted group have a significantly higher number of friends than individuals in the least extroverted group."
- "Individuals in the highly neurotic group were found to prefer posting their photos on their Facebook profile more than individuals in the least neurotic group."
- "Individuals in the highly neurotic group were less inclined to use the feature of upload other pictures than individuals in the least neurotic group."  
"... people with a low or high level of neuroticism prefer to share more basic information than people with a moderate level of neuroticism."
- "... individuals who scored higher on the trait of agreeableness were found to have used less page features than individuals who scored lower on the trait of agreeableness."
- "... people with low and high levels of agreeableness are inclined to upload more pictures than people with a moderate level of agreeableness."
- "... individuals who scored higher on the trait of openness to experience used more features from the personal information section than individuals who scored lower on the trait of openness to experience."
- "Individuals who scored higher on the trait of conscientiousness were found to have a higher number of friends than individuals who scored lower on the trait of conscientiousness."
- "... individuals who scored higher on the trait of conscientiousness were found to demonstrate less use of the picture upload feature than individuals who scored lower on the trait of conscientiousness."

**Interpretation:** The findings that suggest the number of online friends, photographs, and overall social networking activity can indicate whether a user is more extraverted, neurotic, conscientious, and open to new experiences supports the possibility of inferring a user's real identity and personality.

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### **19. The influence of personality on Facebook usage, wall postings, and regret (Moore & McElroy)**

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219 undergraduate students / survey and comparative analysis of Facebook data

- "... more extraverted people have more Facebook friends..."
- "... people higher in agreeableness did make a greater number of postings about themselves than did less agreeable people."
- "People high in conscientiousness made significantly fewer wall postings, about either self or others..."

**Interpretation:** The findings that suggest the amount of Facebook friends or posts indicate whether a user is more extraverted or agreeable supports the possibility of inferring a user's real identity and personality.

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**20. The Proteus effect: The effect of transformed self representation on behavior**  
(Yee & Bailenson)

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Experiment involving 32 Stanford undergraduate students.

- "... participants using taller avatars were more confident and those with more attractive avatars behaved more intimately with others in chat."
- "...users given taller avatars negotiate more aggressively in a bargaining task than users given shorter avatars."

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**Interpretation:** The findings that suggest an avatar's characteristics indicate confidence levels or intimacy, supports the possibility of inferring a user's real identity and personality.

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**21. Who uses Facebook? An investigation into the relationship between the Big Five, shyness, narcissism, loneliness, and Facebook usage** (Ryan & Xenos)

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1158 Australian Facebook users and 166 Australian Facebook nonusers between ages of 18 and 44.

- "Extraversion was significantly positively correlated with preferences for all of the communicative features of Facebook."
- "There was a significant correlation between neuroticism and preference for the Wall, but not for Messages, Comments, or Chat."
- "There were significant positive correlations between preference for Photos and narcissism, as well as the sub-factor of exhibitionism."
- "There was also a significant positive correlation between preference for the Status Update feature and exhibitionism, however this relationship was not significant for total narcissism."

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**Interpretation:** The findings that show Facebook usage can indicate whether a user is extraverted, narcissistic, or an exhibitionist, support the possibility of inferring a user's identity and personality.

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**22. Identifying User Demographic Traits through Virtual-World Language Use**  
(Lawson & Murray)

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Datasets from Sherwood, Guardian Academy, Second Life, and World of Warcraft.

- "Very young participants tend to use a 'telegraphic' chat style with low use of articles and other grammatical particles; low use of overt pronouns (when the meaning is understandable); and frequent use of 'shouting' (all CAPS) in both names and chat."
- "The highest precision sound-based rules deal with word endings, with those words ending in a fricative consonant being strongly male, and words ending in the central vowel schwa (represented orthographically with "a") being strongly female."
- "..., the discourse acts of greeting (especially being the first greeter) and addressing someone directly by name are associated with high real-world leadership scores."

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**Interpretation:** The findings that show that the language used online can indicate whether a user age, gender and leadership ability, support the possibility of inferring identity and personality.

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**23. Game playing as transnational cultural practice: A case study of Chinese**

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**gamers and Korean MMORPGs (Yoon & Cheon)**

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24 Chinese gamers. Autobiographical sketch about gaming.

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- “Friendship was most important for most participants.”
  - “...about half of Korean gamers consider friends whom they meet within the Lineage world to be as important as their real-life friends...”
  - “The most significant factor in game playing for Chinese gamers was sociality...”
- 

**Interpretation:** The findings that suggest Lineage players viewed their online friends as important as their real life friends, supports the possibility of developing strong bonds and trust in a virtual environment.

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