ARGUING THE VALUE OF VIRTUAL WORLDS: PATTERNS OF DISCURSIVE SENSEMAKING OF AN INNOVATIVE TECHNOLOGY

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With the rapid pace of technological development, individuals are frequently challenged to make sense of equivocal innovative technology while being given limited information. Virtual worlds are a prime example of such an equivocal innovative technology, and this affords researchers an opportunity to study sensemaking and the construction of perspectives about the organizational value of virtual worlds. This study reports on an analysis of the written assessments of 59 business professionals who spent an extended period of time in Second Life, a popular virtual world, and discursively made sense of the organizational value of virtual worlds. Through a Toulminian analysis of the claims, grounds, and warrants used in the texts they generated, we identify 12 common patterns of sensemaking and indicate that themes of confirmation, open-ended rhetoric, demographics, and control are evident in the different types of claims that were addressed. Further, we assert that the Toulminian approach we employ is a useful methodology for the study of sensemaking and one that is not bound to any particular theoretical perspective.

Keywords: Virtual worlds, Second Life, sensemaking, discourse, argument, Toulmin, organizational value

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1 Robin Teigland was the accepting senior editor for this paper. Cathy Urquhart served as the associate editor.
Introduction

Developed initially as social places for personal enjoyment and relaxation, virtual worlds are now being “colonized” by organizations looking to understand the value these environments may offer (Ives and Junglas 2008). Given the rapidly changing technological landscape driven by continuous increases in computing power and unprecedented Internet-based innovation (Lyytinen and Rose 2003), organizations are eager to capitalize on emerging technologies, but are cautious of falling prey to unfounded hype (Ramiller 2001). At this early juncture, the way these organizations, and the individuals that comprise them, make sense of virtual worlds will directly impact the evolution of these novel digital environments, because virtual worlds are being co-constructed by their creators and residents (Whitton 2003). Virtual worlds have been described as a “blank slate” within which individuals and organizations can bring about novel, custom situations (Davis et al. 2009). Thus the study of sensemaking is important to the study of virtual worlds, particularly in this formative period.

A distinguishing feature of the particular technological innovations commonly referred to as new media is that they can be described as equivocal, since they are accompanied by multiple, conflicting interpretations that “require hunches, discussion and social support” for individuals to deal with them (Daft et al. 1987 p. 357). Such equivocal technologies are marked by information that is incomplete, hyperbolic, or highly ambiguous (Rosenberg 1994; Swanson and Ramiller 1997). Even where it is anticipated that equivocal IT innovations will make new organizational activities possible, the specific applications are not well articulated or understood (Swanson and Ramiller 1997), since these technologies often allow for a range of possibilities (Weick 1990). In making sense of innovations, individuals discursively present, negotiate, and argue for a range of perspectives on the value of the emergent technology (Weick 1995); thus they initially understand new technologies through sensemaking processes (Griffith 1999). It is these individually constructed arguments about the organizational potential of emergent technologies that organizations draw upon to guide strategic action (Maitlis 2005; Weick 1979; Weick et al. 2005), ultimately influencing the adoption and evolution of a technology. Therefore, individuals construct the future of equivocal technologies rather than simply apply them (Daft et al. 1987; Weick 1990).

To understand the sensemaking of individuals about the potential organizational value of the equivocal technology of virtual worlds, this paper reports on a study of the 288 arguments used by 59 professionals in assessing the organizational value of virtual worlds. These professionals spent an average of over 13 hours in-world and wrote essays that detailed their experiences and evaluated virtual worlds with respect to the potential these technologies may offer “real-world” organizations. In analyzing the data, we ask the following questions:

1. How do individuals discursively make sense of the potential organizational value of Second Life?
2. What forms of arguments might they advance to justify their evaluation of that potential organizational value?
3. Finally, what patterns exist in those arguments for, or against, the potential organizational value?

We adapt Toulmin’s (2003) framework for deconstructing practical reasoning to capture, analyze, and elicit patterns within the arguments these professionals made about the organizational value of virtual worlds. Using this framework, 12 patterns of argumentation underlying claims on the organizational value of virtual worlds emerge from the analysis of the data. Further, we identify five broad types of sensemaking about virtual worlds, and link these sensemaking types with major, often conflicting, traditions in organizational theory. Based on these findings, we assert that the Toulminian lens is a useful and theoretically neutral tool for rigorously examining sensemaking activity.

The paper is organized as follows. First we briefly establish virtual worlds as equivocal technology and describe how individuals respond to such new technologies discursively. Then we present a Toulminian lens for studying sensemaking and describe our research and findings. We conclude with a discussion of these findings, focusing on the implications for practice and for the study of virtual worlds, as well as for sensemaking research in general.

The Equivocality of Virtual Worlds

Many organizational actors are intrigued by the burgeoning phenomenon of virtual worlds, yet they desire guidance on the possible applications, business value, and implications of use that accompany these environments (Ives and Junglas 2008). One source of insight on these issues is the business press, which abounds with expositions on the untapped value of virtual worlds (e.g., Anderson 2006; Hemp 2006; Hof 2006), but also with stern warnings against the hype of an untested marketplace (Rose 2007). Some leading opinion-makers urge organizations to take virtual worlds seriously (Richards 2008), while Gartner, Inc. (2008) and others emphasize the high rate of failure for business ventures in virtual worlds. If the
ambivalence of the press proves unsatisfying, one might turn to the academic research that focuses on virtual worlds. In this effort, one would find relevant research to be in a nascent stage and spread across many academic disciplines (Sairamesh et al. 2004). What research there is can be characterized as cautiously optimistic with respect to the practical value of virtual environments to organizations (e.g., Davis et al. 2009; Mennecke et al. 2007), but also discussing a wide array of caveats relating to issues of trust, privacy, security, reputation, and the quality of content and applications (Boulos et al. 2007; Hansen et al. 2009; Sairamesh et al. 2004). Indeed, Second Life and other virtual worlds have largely been designed as open systems in which many modes of experience are possible, rendering it impossible to foresee all applications and situations that will emerge as users pursue a variety of tasks (Galimberti et al. 2001).

Given the impossibility of predicting the future of this evolving technology, one might turn to the broader IS literature. This literature has long acknowledged the importance of sensemaking in the evolution of novel technologies. The way social actors perceive new technologies is directly related to the outcomes those technologies engender (Kling 1980). After adoption, individuals dynamically appropriate, change, and reproduce technologies through their use (Orlikowski 1992). Individuals and organizations must build up the requisite sets of complementary shared cognitive schemas, skills, and practices to begin to make sense of IT innovations (Attewell 1992), particularly those open-ended technologies that have been described as base innovations that enable the generation of subsequent forms of innovation (Lyytinen and Rose 2003; Swanson 1994).

A key component of these shared cognitive schemas that render new IT innovations more tractable has been called an “organizing vision” (Swanson and Ramiller 1997). Organizing visions are articulated representations of IT innovations through which communities of individuals form perspectives, express these perspectives, and guide action. An organizing vision is a reciprocal dynamic that forms a central mechanism of sensemaking around inchoate information technologies (Swanson and Ramiller 2004). While collectively shared, organizing visions are in their essence produced by individuals as they seek to guide the perspectives of others and, in turn, afford a ready-made interpretation of IT innovations upon which organizational actors can draw. Core to this sensemaking process is that individuals respond to, and make sense of, new information technologies through some form of oral or written communication (Griffith 1999; Orlikowski and Gash 1994; Ramiller 2001; Swanson and Ramiller 1997, 2004). In other words, individuals make sense of new information technologies through discourse. Accordingly, the study of sensemaking is particularly relevant at this point in the emergence of virtual worlds, as the foundation of these technologies is now being constructed by the creators of these environments, their residents, and by commentators in organizations, academia, and media. Virtual worlds are an exemplar of equivocality, and the ultimate value of the innovation remains uncertain, yet the basis for any potential long-term value is being established through an ongoing sensemaking process.

### Sensemaking, Discourse, and Argument

Equivocal new phenomena engender a process of sensemaking whereby humans meet ambiguous situations with action, such as speech, and then retrospectively construct their understandings of these phenomena (Weick 1979). While the concept defies simple definition, sensemaking is a social process where individuals and groups fashion an understanding of a new phenomena through the iterative testing of plausible explanations (Weick et al. 2005). Weick (1995) articulates six key characteristics of the sensemaking process: (1) the recognition of a discrepant set of cues in the ongoing flow of events; (2) the retrospective consideration of experiences; (3) the generation of plausible explanatory speculations; (4) enactment through written and oral communication; (5) social contact with other individuals and their ideas; and (6) the involvement of issues about identity and reputation. Through this sensemaking process, novel meanings come into being:

> When we say that meanings materialize, we mean that sensemaking is, importantly, an issue of language, talk, and communication. Situations, organizations, and environments are talked into existence. (Weick et al. 2005, p. 409).

While Weick is perhaps the leading articulator of the sensemaking concept, the perspective has been fruitfully applied across a wide range of organizational contexts, including executive decision making (Starbuck and Milliken 1988), strategy formulation (Westley 1990), employee socialization (Louis 1980), IT innovation (Griffith 1999), organizational creativity (Drazin et al. 1999), and changes in higher education (Gioia and Chittipeddi 1991; Gioia and Thomas 1996). Across these distinct domains, sensemaking has been treated as both an individual (e.g., Gioia and Chittipeddi 1991; Louis 1980) and an organization-level (e.g., Westley 1990) phenomenon.
Regardless of the domain to which it is applied, sensemaking processes are understood to be embodied in discourse. Weick (1979) famously posed the question: “How can I know what I think until I see what I say?” (p. 207), emphasizing the notion that individuals make sense of the world discursively. His contention is that the individual and social facets of sensemaking are effectively inextricable (Weick 1995). Drawing upon sources as diverse as the Greek rhetorician Isocrates and the English philosopher Francis Bacon, Billig (1996) observes that thinking is in practice an internalized form of argumentation: “we think to ourselves as if addressing someone else” (p. 142). This insight is mirrored in Mead’s concepts of role-taking and the “generalized other,” in which all thought takes the form of an internalized debate in which the thinker adopts the role of another (Dodds et al. 1997). Indeed, several researchers have drawn upon this thread to develop the field of discursive psychology as a counterpoint to a prevailing cognitive science approach to social psychology (Billig 1997; Edwards and Potter 1992; Potter and Edwards 2001). In this view, sensemaking is always discursive, and therefore in some respect social, even if occurring within a lone individual (Weick 1995).

The discursive emphasis in sensemaking is also consistent with a wide range of social theory that argues for the ongoing dynamic construction of human understanding through communication (Boden 1994; Boland et al. 1994; Czarniawska 2004; Taylor and Van Every 2000). The study of discourse typically involves detailed research into communication and language known as discourse analysis (Grant et al. 2004; Johnstone 2002). Discourse analysis has become increasingly relevant with the recent “discursive turn” in management research (Czarniawska 2004) and represents a diverse and emerging tradition2 (Fairclough 2003; Grant et al. 2004). In this tradition, a discourse is generally understood to be an aggregating term describing multiple related “instances of communication in the medium of language” (Johnstone 2002 p. 2). Discourses are comprised of texts, each of which is an instance of discourse (Johnstone 2002). Texts can take many forms, common examples of which include a book, an essay, a speech, or a conversation.

Individuals draw upon discourses to make sense of new phenomena, and then generate novel texts that, in turn, recreate the discourse (Heracleous 2004; Phillips et al. 2004). While the generation of texts is essential for sensemaking, it is important to note that the form in which this sensemaking occurs has a direct relationship to the content of human interpretation (Maitlis 2005). This content of a given interpretation can be called an argument following the literature on practical reasoning (Habermas 1981; Toulmin 2003; Weick 1995). An argument is a mode of communication whereby an individual makes an explicit claim and then supports, or thematicizes, this claim to persuade others to accept it while anticipating criticism (Habermas 1981). In this view, an argument does not require disagreement, rather the assertion itself puts forth the requisite evidence and logic in an effort to withstand anticipated scrutiny. Proactively supported thematicized claims are particularly important to the study of sensemaking because they indicate a certain amount of reflection, anticipation, and interest critical to sensemaking. Figure 1 locates the study of arguments as a stream in the discursive sensemaking literature, which, in turn, represents a perspective in the fields of social psychology and organizational research.

### Toulmin’s Structure of Arguments

One of the most extensive contemporary approaches to the study of argumentation is that developed by Toulmin (2003, original 1958). Toulmin developed his model of argumentation in an effort to overcome the limitations of the predominant structure of formal logic: the syllogism. While the syllogism presents the application of deductive inference from axiomatic presumptions as the standard for the judgment of claim validity, Toulmin suggests that in everyday discourse there are a wide variety of means by which individuals establish the validity of their arguments. Further, Toulmin points out that arguments that can be deductively validated are mere “analytic” argument—trivial arguments that necessarily flow from premises. “Substantive” claims, such as those assessing the organizational value of virtual worlds, cannot be validated deductively, but must be supported through inductive justification intended to convince others. Highly disciplined explicit logic in communication is rare in practical application. Rather, humans generally apply a range of common sense justifications to support their arguments.
Toulmin’s model of an argument has three key components: claim, grounds, and warrants (Fairclough 2003). The **claim** is the central assertion of the argument, the “conclusion whose merits we are seeking to establish” (Toulmin 2003, p. 90). The **grounds**, also known as data or evidence, are statements offered in support of that claim. The grounds are intended to answer the question: “What do you have to go on?” **Warrants**, in turn, reflect the principles or rules of inference which suggest that the movement from the grounds to the claim is appropriate. Warrants answer the question: “How did you get there?”

While claims and grounds represent explicit statements, warrants are often implicit assumptions reflected in a line of argumentation. Building upon Toulmin’s model, Brockriede and Ehninger (1960) identify different types of warrants encountered in practical argumentation: cause, sign, generalization, analogy, parallel case, authority, and principle. The types of warrants, and the inferential action that they entail, are summarized in Table 1.

In this work, we employ the concept of an argument as a thematized claim and the Toulmin model of argumentation. We suggest that the sensemaking around the organizational value of virtual worlds occurs through the discursive arguments that individuals develop. We contend that the analysis of warrants is particularly applicable to the evaluation of sensemaking, because warrants establish the validity of claims based on practical reasoning and assume away the necessity of holding the validity to the unrealistic standard of formal logic (Kock 2006). Further, it is through the warrants that one can characterize the **form** of a given argument (Toulmin 2003). Across contexts one can expect regularities to stem from the use of certain forms of argument. Based on this insight, we look to elicit the type of claims, the types of warrants, and the content of the grounds supporting the argument in relation to the organizational value of virtual worlds in our data.

### Research Methodology

One of the most visible and widely noted examples of a contemporary virtual world is the online platform Second Life. As of September 2009, Second Life boasts 126 million residents, or uniquely named avatars, with almost 600,000 residents that log into the platform weekly. Second Life is now a self-sustaining economy within which users can buy and sell goods and services—in many cases translating into the generation of substantial real-world revenue (Hobson 2006; Noam 2007). Second Life was chosen because it is an exemplar of the virtual worlds of which organizations are attempting to make sense.

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3We focus on the core model of claims, grounds, and warrants. While Toulmin describes a number of secondary elements of an argument (e.g., qualifiers, rebuttals, backing), such structures would not add substantively to the research objectives that we have outlined. This limited Toulminian approach is consistent with recent analysis of argumentation in organizational research (see Green et al. 2009), and addresses the important structural aspects of argument (Fairclough 2003).

4According to Linden Labs, the creators of Second Life; see http://lindenlab.com/pressroom/releases/22_09_09, accessed on October 13, 2009.

Table 1. Warrant Types in the Toulmin Model (Adapted from Brockriede and Ehninger 1960)

<table>
<thead>
<tr>
<th>Warrant Types (Arguments from)</th>
<th>Actions of the Warrant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cause</td>
<td>Attributes a generative power to the grounds (i.e., the grounds cause the claim)</td>
</tr>
<tr>
<td>Sign</td>
<td>Interprets the meaning or significance of the facts provided in the grounds; inference based on symptomatic indications</td>
</tr>
<tr>
<td>Generalization</td>
<td>Assumes that what is true of the items in the sample will be true for related phenomena; the inference from a sample to a population</td>
</tr>
<tr>
<td>Analogy</td>
<td>Grounds assert a relationship between two familiar items or events and this relationship is assumed by the warrant to hold for the distinct items or events reflected in the claim</td>
</tr>
<tr>
<td>Parallel Case</td>
<td>Assumes an essential similarity between an event or condition in the grounds and that of the claim</td>
</tr>
<tr>
<td>Authority</td>
<td>Asserts the reliability or validity of a presumed expert source and their statements (i.e., grounds) expressed. Classification warrants are implicitly rooted in authority</td>
</tr>
<tr>
<td>Principle</td>
<td>Inference based on values, ideals, or an assumed moral common ground</td>
</tr>
</tbody>
</table>

Data Collection

To explore the sensemaking process used to assess the potential value of virtual worlds, we enlisted 59 executives and business professionals to act as informants. These informants were selected based on their enrollment in graduate-level management courses and were asked to provide written assessments. For the assessments, the informants were instructed to conduct background research on Second Life and create a Second Life avatar to explore the virtual world firsthand. To guide their in-world exploration and narrow the area of inquiry, informants were asked to think about such issues as the relevance of the platform to organizations, the possibility of internal or external applications of Second Life within firms, and the opportunities and challenges that the innovation would pose to organizations. Informants were asked to share their opinions and evaluations of the technology after experiencing it. Informants were directed to write about the technology based on their experiences and research, noting how they see this technology being used or not used in organizations and why. Thus, the deliverable was a reflective assessment through which informants articulated their thinking about the technology and its application in real-world organizations. Furthermore, it was stressed to informants, both in the written project guidelines and verbally by course instructors, that there are no right answers and that their honest assessment of the technology as a business professional was of utmost importance. The project represented between 10 and 15 percent of the participant’s overall course assessment.

Descriptive Characteristics of Informants

Informants were enrolled in graduate-level management courses at one of two Midwestern universities. Although a number of researchers have argued that students in a course do not represent practitioners (e.g., Huang et al. 2008), Gordon et al. (1986) recommend a technique for improving the external validity of student subjects that involves using students with demographic and interest profiles similar to the non-student subjects that ideally would be used. In this respect, the informants involved in this study were, in fact, also practitioners, working in various industries with a variety of professional backgrounds and many with extensive professional experience. One group of informants came from an Executive MBA course consisting of 25 managers employed full-time professionally, and another from a part-time MBA course that had 34 full-time professionals enrolled. The opportunity to have access to experienced informants from two different management-oriented programs allowed us to obtain a pool of informants that worked in a wide range of industries (see Table 2), possessed diverse professional backgrounds (see Table 3), and were at various stages of their career (see Table 4). Students who had not worked or were currently not working in industry were not part of this study, although there were some enrolled in the courses.

It has also been argued that students can be used as surrogates for businesspeople when there is evidence that the students have adequate background for the research task (Khera 1970). For this study, professional experience (as discussed), no or
Table 2. Industries

<table>
<thead>
<tr>
<th>Industry</th>
<th>No. of Informants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>2</td>
</tr>
<tr>
<td>Consumer Products</td>
<td>7</td>
</tr>
<tr>
<td>Education</td>
<td>4</td>
</tr>
<tr>
<td>Information Technology</td>
<td>9</td>
</tr>
<tr>
<td>Environmental</td>
<td>1</td>
</tr>
<tr>
<td>Financial Services</td>
<td>8</td>
</tr>
<tr>
<td>Healthcare</td>
<td>8</td>
</tr>
<tr>
<td>Industrial Products</td>
<td>11</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>1</td>
</tr>
<tr>
<td>Military</td>
<td>1</td>
</tr>
<tr>
<td>Public Relations</td>
<td>1</td>
</tr>
<tr>
<td>Retail</td>
<td>1</td>
</tr>
<tr>
<td>Transportation/Distribution</td>
<td>3</td>
</tr>
<tr>
<td>Utilities</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 3. Professional Backgrounds

<table>
<thead>
<tr>
<th>Background</th>
<th>No. of Informants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting</td>
<td>5</td>
</tr>
<tr>
<td>Business Development</td>
<td>3</td>
</tr>
<tr>
<td>Engineering</td>
<td>6</td>
</tr>
<tr>
<td>Finance</td>
<td>2</td>
</tr>
<tr>
<td>General Management</td>
<td>8</td>
</tr>
<tr>
<td>Human Resources</td>
<td>3</td>
</tr>
<tr>
<td>Information Technology</td>
<td>9</td>
</tr>
<tr>
<td>Marketing</td>
<td>7</td>
</tr>
<tr>
<td>Medical</td>
<td>6</td>
</tr>
<tr>
<td>Non-disclosed</td>
<td>3</td>
</tr>
<tr>
<td>Operations</td>
<td>4</td>
</tr>
<tr>
<td>Physical Science</td>
<td>1</td>
</tr>
<tr>
<td>Product Management</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 4. Organizational Position Held by Informants

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>No. of Informants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executives</td>
<td>C-level, president, VP, director</td>
<td>18</td>
</tr>
<tr>
<td>Managers</td>
<td>Middle managers</td>
<td>33</td>
</tr>
<tr>
<td>Professional</td>
<td>Non-managerial professional</td>
<td>8</td>
</tr>
</tbody>
</table>

limited knowledge of Second Life, and the ability to use Second Life were determined to be the prerequisite background for the research task. As presented above, the informants used in this study have sufficient professional experience. Informants were also asked to report information about their background research and time spent in-world using Second Life. Informants had access to publicly available data sources (almost all of it electronic), and many drew upon the same or similar resources. Second Life was entirely new to all but one of the informants. Each informant experienced the virtual world first-hand. The average time spent in-world by the informants was 13.64 hours (range: 1 to 100 hours), and the average number of resources consulted during the background research was 4.35 sources (range: 0 to 19 references; 49 assessments had at least one reference). The informants’ assessments averaged 2,230 words (range: 901 to 3,508 words), which equates to about 4.5 pages of single-spaced text.

**Coding and Analysis Procedure**

Grounded theory methodology is increasingly used, and debated, in studies of information systems (e.g., Bryant et al. 2004; Howcroft and Hughes 1999; Urquhart 2001) and involves an intensely data-driven process in the pursuit of theoretical findings (Strauss and Corbin 1998). In this sense, our methodology reflected a grounded approach. However, strict interpretations of grounded theory insist that theoretical sampling be a key component of any true application of the methodology (e.g., Morse 2007), and by this interpretation, our research may not strictly be considered grounded theory by some. Nevertheless, Strauss and Corbin (1998) indicate that their guidance for qualitative data analysis can be useful for a variety of research activities and can readily be adapted.
to answering specific questions. Toward this end, we engaged in three cycles of coding following Strauss and Corbin’s process of (1) open coding, (2) axial coding, and (3) selective coding (see Figure 2).

The first cycle was open coding, involving notetaking associated with a microanalytical unit of analysis including sentences and groups of sentences from the informants’ assessments (Corbin and Strauss 1990; Glazer and Strauss 1967). First, each coder, individually, immersed themself in the data, circling, highlighting, bolding, or underlining, significant participant quotes (Layder 1998). To become more intimate with the data, each identified what Boyatzis (1998) refers to as “codable moments.” Here coders coded the data by identifying sentences where the assessments discussed the potential value of virtual worlds.

![Figure 2. Process of Coding of Claims](Image)
In the second cycle,\(^7\) coders axially coded the data (Strauss and Corbin 1998), and sought to identify assertions of potential value, support for the assertions, and relationships between pairs of value and support. It has been advocated that for research projects involving multiple researchers, coding can, and should, be a collaborative effort (Erickson and Stull 1998; Guest and MacQueen 2008). As such, to start the second cycle, the coding procedure was defined among the four coders. Next, five assessments that were coded separately by the four coders were compared and discussed collectively to refine the process. Following this refinement, an additional four assessments were coded together to ensure understanding of the process and coding consistency. In contrast to quantitative measures of intercoder reliability, the primary objective of these steps was intensive group discussion and consensus (Harry et al. 2005 p. 6; Saldana 2009).

Upon completion of this collective step, the remaining 50 assessments were divided into two groups and assigned to pairs of coders. Then each coder in each pair individually coded the assessments, employing the Toulmin (2003) framework (claim–ground–warrant). Coding was focused on the argument as the level of analysis (operationalized specifically as thematized claims). Arguments on the value of virtual worlds that contained explicit evidence for the argument were coded as claims, building on the perspective that only claims supported by evidence, or thematized, are intended to serve as arguments (Habermas 1981). For each claim, the grounds were coded and the type of warrant based on Brockriede and Ehninger’s (1960) categorization (see Table 1) was noted. Claims and grounds represent explicit statements in the data. Most warrants were not explicitly detailed in the data; rather, warrants are the coders’ interpretation based on assumptions reflected in a line of argumentation presented in the data. This is consistent with Toulmin’s characterization of practical reasoning. Following is an example (also diagramed in Figure 2) of a situation that required an explicitly constructed warrant. Note that while the coders varied in the way they constructed implicit warrants, the category of warrant was consistently coded.

\footnotetext{\(7\)The process through which qualitative researchers seek to understand the richness of their data can be rather complex. The data analysis procedure actually undertaken in qualitative research is frequently messier than described in finished manuscripts, often for the benefit of the reader (Saldana 2009). In the spirit of sharing a more realistic and accurate depiction of actual coding procedures, an additional cycle of axial coding preceded our second cycle described in this manuscript. In this cycle, relationships between the coding and a set of tensions (i.e., pros and cons related to a claim of value) that appeared inherent in the assessment of the value of virtual worlds were identified. However, strong patterns between the tensions and claims did not emerge, and the notion of central claims was perceived as a weakness.}

\begin{tabular}{|l|l|}
\hline
\textbf{Claim} & “[Virtual worlds] could be extremely valuable for corporations or businesses that want to reach a wide demographic...” \\
\textbf{Ground} & “Wells Fargo Bank, Sun Microsystems, Coca-Cola, and Toyota have all started building stuff and doing stuff in Second Life as a method for marketing themselves online.” \\
\textbf{Warrant} & [sign] Reputable companies marketing in Second Life indicates that Second Life could be valuable for reaching a wide demographic. \\
\hline
\end{tabular}

After each coder pair coded their assessments individually, each pair discussed their coding. Instances where the coders did not agree were negotiated and resolved. The purpose of this step was not to establish intercoder reliability measures, but rather to provide what Saldana (2009, p. 27) refers to as a “reality check” for coders involved in a collaborative project.

Once these arguments were amassed, the third cycle of coding, rooted in the paradigm of selective coding (Strauss and Corbin 1998) commenced. In this cycle, the type of claim and the content of the ground were coded. The types of claims were not predetermined, but coded based on a given argument’s core assertion regarding the value of Second Life. These assertions indicated that virtual worlds offer current value, future value, contingent value, or no value. The categories used to code the content emerged from the data and included organizational experience, personal experience, virtual worlds experience, convention, expert opinion, digitization, games, Internet experience, demographic, desirability of control, and appropriateness. The type of claim, type of warrant, and the content of the grounds were coded to discern patterns and themes across the arguments employed by the informants. The assessments, types of claims, types of warrants, and content of the grounds were loaded into ATLAS.ti, which facilitated the identification of patterns. A pattern is a frequent combination of three things: (1) a particular type of warrant, (2) a type of ground, and (3) a particular type of claim as the result of the first two.

The study of sensemaking involves the way in which individuals make meaning, and tactics for studying sensemaking should focus more on such patterns of meaning-making rather than “frequency counts” (Weick 1995, p. 173) or upon any questionable assumptions that argue for human consistency (James 1987; Simon 1956; Weick 1979). As a result, the procedure did not focus on merely counting the number of arguments and presenting the empirical results. Instead, the codes and arguments were examined in search of meaningful patterns.
Findings

The analysis of the data revealed that claims about the organizational value of virtual worlds clustered around one of four general value categories: (1) current value—claims that virtual worlds are currently valuable to organizations; (2) future value—claims that there is potential for value to organizations; (3) contingent value—claims that any realization of organizational value is contingent on certain factors; and (4) no value—claims that virtual worlds do not offer organizational value, either due to their very nature or that any conceivable value would never be able to be realized due to factors that prohibit adoption within organizations.

The analysis of the data identified 12 patterns about the organizational value of virtual worlds (summarized in Table 5). What is referred to as a pattern is a combination of three things: (1) a particular type of warrant and (2) a general type of ground resulting in (3) a particular type of claim. In the remainder of this section, descriptions and illustrative examples of each of the patterns of argumentation, grouped according to their claims of organizational value, are presented.

Current Value

With respect to claims categorized as current value, four broad patterns of argumentation claiming that virtual worlds are currently valuable to organizations emerged from the data. These arguments leveraged several warrants types and were supported by various grounds, including analogy, generalization (two different types of grounds), and sign.

Analogy–Conventional: One pattern of argumentation around claims of current value was based on grounds suggesting that aspects of Second Life were similar to conventional physical objects and environments, such as billboards, conventions, and retail stores. For example, an informant’s claim argued that the virtual environment was quite similar to the physical world in that there were varied options for advertising media [Informant 9].

Claim [Current value] “One important aspect of SL is the ability to advertise.”

Ground “Just like in the non-digital counterpart, this can be done in various ways: Classic billboards…as well sponsored areas, vending machines and especially virtual stores.”

Warrant [Analogy] Advertising in Second Life works like in real life

This pattern argued that because Second Life shared attributes with conventional offline objects (e.g., billboards), these objects would behave like those conventional phenomena in-world. In addition to offline analogies, other arguments were based on grounds stating that aspects of Second Life were similar to other established online technologies. For example, one informant argued for instant messaging (IM) as a parallel case to virtual worlds, and that it would be of value [Informant 17].

Claim [Current value] “Second Life provides an outlet for members of organizations to communicate without having to meet face to face.”

Ground “In today’s economy, especially with rising gas prices, members of businesses need to frequently interact while keeping costs down. This means communicating without having to meet face to face. Technologies such as webcams, instant messaging, and email have enabled businesses to thrive in the global environment.”

Warrant [Parallel case] Second Life enables communication like webcams, IM, and email.

Overall, claims based on an analogy–conventional argumentation pattern were generally positive in their assessment of the current organizational value of virtual worlds. This was particularly true when the object on which the analogy was based successfully demonstrated value to organizations, such as various conventional advertising media, e-mail, websites, or social networking sites.

Generalization–Organizational Experience: A number of claims of current value were based upon generalization types of warrant. These generalization warrants made use of examples related to organizations, their efforts, and related outcomes as the grounds of the arguments. These claims oftentimes were based on stories of how specific organizations received value from Second Life. These stories leveraged organizations as the key actors (first claim below...
### Table 5. Patterns of Argumentation about the Organizational Value of Virtual Worlds

<table>
<thead>
<tr>
<th>Claim</th>
<th>Type of Warrant</th>
<th>Type of Ground</th>
<th>Example of Organizational Value</th>
</tr>
</thead>
</table>
| **Current Value**

\( (n = 122) \)

- **Analogy**
  - Conventional Media
  - *Like retail stores, billboards, etc., Second Life has value.*
- **Generalization**
  - Organizational Experience
  - *Organization successfully meeting or training in-world.*
- **Generalization**
  - Personal Experience
  - *Organization ads were effective and presence had impact.*
- **Sign**
  - Organizational Exemplars
  - *Business press identifying business participation.*

| **Future Value**

\( (n = 23) \)

- **Authority**
  - Expert Opinion
  - *Organizations should evaluate the value of virtual worlds based on authoritative experts.*
- **Causal**
  - Digitalization
  - *Synchronous collaboration and training; broad marketing.*
- **Parallel case**
  - Internet
  - *Second Life will mirror the good and bad of Internet, IM, etc.*

| **Contingent Value**

\( (n = 39) \)

- **Analogy**
  - Games
  - *Just as games are an unproductive distraction, so is Second Life.*
- **Causal**
  - Control
  - *Control of activity and technology; pornography; employee time.*
- **Generalization**
  - Personal Experience
  - *Technological problems; pornography.*
- **Principle**
  - Appropriateness
  - *Organizations should avoid virtual worlds based on standards.*

| **No Value**

\( (n = 104) \)

- **Analogy**
  - Games
  - *Just as games are an unproductive distraction, so is Second Life.*
- **Causal**
  - Control
  - *Control of activity and technology; pornography; employee time.*
- **Generalization**
  - Personal Experience
  - *Technological problems; pornography.*
- **Principle**
  - Appropriateness
  - *Organizations should avoid virtual worlds based on standards.*

Claim **[Current value]** “business [value] of Second Life…a company to hold meetings on the platform.”

Ground “ArcelorMittal, which is the largest steel company in the world…recently had an investor meeting, and held it concurrently live, in Luxembourg, as well as virtual, on Second Life.”

Warrant **[Generalization]** If ArcelorMittal gets value from virtual meetings, other organizations will as well.

Claim **[Current value]** “[Second Life can] greatly enhanced distance learning.”

Ground “Ms. Smith (a pseudonym), a Ph.D. candidate of the Harvard Extension School who brought her computer science class to Second Life last semester. ‘Things pop up in a less linear fashion than they do in a regular classroom.

Still, even when 10 students chime in, the threads of a discussion are easy to follow.’”

Warrant **[Generalization]** Smith’s experience with distance learning in Second Life is similar to experiences of others.

Arguments that leveraged secondhand narratives from either the organizational or individual perspectives were overwhelmingly positive about the organizational value of virtual worlds. The core of the warrants suggested that if the subject highlighted in the example (e.g., company, individual) can currently realize value, then the value realization can generalize to other entities as well.

**Generalization–Personal Experience:** Another common argumentation pattern involving the generalization warrant relied upon examples drawn from an informant’s personal experience with Second Life as the grounds. Worthy of note is that these experiences were typically viewed from a marketing perspective that offered potential organizational value [Informant 24].
With this argumentation pattern, informants described encounters with in-world advertising or an organization’s virtual location. The detail of the arguments ranged from stories being quite involved, such as when one informant described his/her “amazing experience” with a virtual car test drive [Informant 43], to informants simply indicating that since they noticed certain ads others are likely to as well. Essentially, informants generalized that if they noticed certain things or had pleasurable experiences in-world, others users would also, which would ultimately equate to there being value in these worlds for organizations.

**Sign–Organizational Exemplars:** Informants dedicated a considerable amount of space in their assessments listing the various exemplar organizations that have a presence in Second Life, without necessarily detailing their stories. Rather, the participation of certain companies was seen as evidence in itself of the organizational value of virtual worlds. Technology organizations such as Dell [Informant 41] and IBM were particularly common exemplars, but a variety of other organizations were also used as evidence, ranging from Barack Obama’s campaign [Informant 13] to religious organizations [Informant 4] to CNN [Informants 38 and 52]. Often the informants just listed organizations as evidence [Informant 28].

**Future Value**

With respect to claims categorized as future value, three broad patterns of argumentation claiming there is potential for future organizational value emerged from the data. These arguments leveraged several warrants types, and were supported by various grounds, including causal, authority, and parallel.

**Authority–Expert Opinion:** Resulting largely from their Internet-based research used to support their argument, informants made claims that built upon the claims of experts and opinion leaders, predominantly for asserting the future organizational value of virtual worlds. These opinion leaders ranged Linden Labs (the creator of Second Life) to industry analysts [Informant 57].

Claim  [Future value]  “Clearly there is some benefit from a business perspective to…evaluate economic viability within the virtual setting.”

Ground  “In a recent Businessweek.com article (November 2006 by Reena Jana) the article stated that “big brands are increasingly turning to a new demographic to market their goods” [and that] as reported in an article titled “The Coming Second Life Business Cycle” [by Matthew Beller, August 2, 2007 on Mises.org], “Second Life has attracted attention from Wired Magazine, The Economist, and other media with stories of a burgeoning economy and entrepreneurs earning their sole incomes by selling virtual goods and services. Accordingly, real-world economists and Second Life’s residents alike could benefit from a closer look into the actual workings of its economy.”

Warrant  [Authority]  The business press offers sound advice.

Most commonly, this form of claim was grounded in the business press and argued for the emerging, or future, value of virtual worlds. In one case, an argument cited business
press that, in turn, cited business press as evidence. What was evident in the data was that for claims that utilized this form of argumentation, there was not a question of whether there will be organizational value, but rather when. Additionally, the argumentation for these claims tended to be tentative, suggesting critical evaluation and an experimental attitude, rather than outright advocacy.

**Causal–Digitization:** Claims utilizing this warrant-ground pattern involved the causal warrant type, with informants argueing that team meetings, classroom learning, market research, and many other common physical world activities can be simply moved over to a virtual world (i.e., digitization). Furthermore, organizational value would take the form of monetary savings. Most typically it was argued that savings would occur around activities associated with communication or social interaction [Informant 4].

- **Claim** [Future value] “Second Life technology can be used effectively for training purposes by corporations who have multiple locations.... Efficiencies are gained by the savings in travel time and travel expense.”
- **Ground** “By using Second life technology, all employees can effectively meet online, provided that they have an appropriate internet connection and computer.”
- **Warrant** [Cause] If all employees can meet online, that will save the organization expense.

While argument for the value of digitizing social interaction and thus saving money was quite common in the data, saving money was not the only way informants argued for future value brought about by digitization in the virtual world. Informants also argued that virtual worlds would one day offer value to organizations through the digitization of experiential marketing initiatives. This marketing focus associated with causal–digitization arguments included themes such as ease of product testing, surveying, and awareness. The concept of awareness was a particularly common way to characterize future value [Informant 37].

- **Claim** [Future value] “I think virtual worlds...can be very beneficial for corporate organizations, nonprofits and educational institutions...brand awareness.”
- **Ground** “A person can experience the brand [campus/training] without having to go to a brick and mortar store.”
- **Warrant** [Cause] If people can experience a brand virtually, this will increase the organization’s brand awareness.

In both synchronous collaboration and marketing-oriented arguments that focused on digitization, there was an implied emphasis on abstract possibilities and the future. Claims suggested that synchronous collaboration would help, but at some point in the future as organizations became more familiar with virtual worlds. Further it was argued that broad-based marketing would indeed be valuable one day, but at some point in the future. These claims emphasized future potential value, not necessarily current value.

**Parallel Case–Internet:** The most common form of a parallel case (i.e., anchoring) argument involved comparing virtual worlds to other Internet-based technologies, or to the Internet itself. Virtual worlds were described as a parallel to the Internet, both being large-scale technological environments. In addition, argument focused on virtual worlds having additional functionality that the Internet did not, so virtual worlds were seen essentially as an upgrade of the Internet. As such, it was argued that virtual worlds would likely follow diffusion patterns similar to what the Internet experienced. For example, it was suggested that real estate in Second Life is parallel to domain names, but richer and more immersive. One informant summed up this perspective in his advocative claim encouraging organizations to pursue virtual worlds [Informant 51].

- **Claim** [Future value] “In the longer term no enterprise could afford to ignore this exciting new development.”
- **Ground** “It is possible to see parallels with the early development of the World Wide Web in the mid-1990s.”
- **Warrant** [Parallel case] The development of virtual worlds will be similar to the development of the Internet.

When arguments utilized the parallel case–Internet argumentation pattern, the claims were advocative (i.e., suggesting what should be), encouraging companies to pursue the technology of virtual worlds or else be left behind and miss out on the organizational value they will provide in the future.

**Contingent Value**

With respect to claims categorized as *contingent value*, one broad pattern of argumentation claiming that any realization of organizational value is contingent on certain factors was present in the data. This argumentation pattern leveraged one type of warrant: causal.
Causal–Demographic: In this argumentation pattern, it was argued that whether an organization can gain value from virtual worlds was contingent upon whether the organization’s desired audience fits specific demographic criteria. Informants based many of their claims on their assumptions of the demographic characteristics of participants in virtual worlds. Informants tended to believe, but not necessarily support with statistics, that the demographic of users of Second Life were younger and often highly technical [Informant 51].

Claim [Contingent value] “Getting access to a small group of creators…is worth the investment for leading-edge companies, large and small.”

Ground “Virtual worlds today are almost totally populated by creators….Many active residents in Second Life are content creators and game changers that have creative ideas to offer companies.”

Warrant [Cause] Organizational participation in virtual worlds provides valuable access to creative types.

Informants perceived this demographic as an exciting opportunity, as it represents a somewhat elusive demographic for marketers to reach effectively. What was particularly apparent in the data, as illustrated in this claim, is the argument that some (e.g., leading-edge companies) but not all companies can benefit from access to the people within Second Life. For example, organizations that primarily serve markets that are characterized as older or more serious—manufacturers [Informant 2], business-to-business companies [Informant 9], and local companies [Informants 9, 18]—were seen as not desiring to reach this demographic contingency. Other informants [e.g., Informant 2] went further, arguing that virtual worlds were only useful for those organizations wishing to access specific demographic markets, such as gamers or teens.

In taking the form of causal-demographic arguments, many of the claims emphasize there was value to organizations, but this value was contingent on factors related to the demographics of virtual world users. To a large degree, it was believed the users currently participating in virtual worlds fit a particular profile (e.g., younger and technologically inclined). While the demographics of virtual worlds represent a market that is valuable, the value is only valuable to organizations looking to access certain populations.

No Value

The final claim classification identified was no value. Four broad patterns of argumentation claiming that virtual worlds do not offer organizations any value, due to their inherent nature or issues that would lead to non-adoption, emerged from the data for this classification. These arguments leveraged several warrants types, which were supported on various grounds, including analogy, causal, generalization, and principle.

Analogy–Games: As perhaps might be expected due to Second Life’s immersive user interface, many of the informants made analogous arguments likening Second Life to a game and classifying Second Life as a form of computer game [Informant 20].

Claim [No value] “I’m not so sure that is the appropriate environment to bring into a real world business.”

Ground “To me Second Life is an online, interactive video game. It appears to have been designed by gamers for gamers. It has all of the marking of a game in that there are hidden things to do (such as find the kissing parrot) and tasks that must be performed (such as dancing the hula in front of an idol).”

Warrant [Parallel case] If Second Life is a game, it does not have business value.

Claims of this warrant-ground argumentation pattern largely dismissed the organizational value of virtual worlds from the onset based on the argument that games offered no value to organizations. Further, in the assessments of some informants, games simply had no place in organizations. Because Second Life was seen as being analogous to a game, it was stated that it should not be brought into a real world organization. While there were some informants that utilized the analogy–game argument, but acknowledged that Second Life was not solely a game and did pose some potential for organizational value, they too ultimately claimed value would be minimal, or non-achievable, due to issues related to games. For example, one claim focused on the tendency for game-like technologies to be faddish [Informant 3].

Claim [No value] “Programs like Second Life tend to be fads.”

Ground “I draw a parallel to online video games, such as Warcraft, that may see incredible popularity for a short period of time, say several years,
but traffic will tail off as new technologies emerge and people lose interest in the specific program.”

**Warrant** [Analogy] Games come and go in popularity, so will SL.

Whether the ground took the stronger analogous form and classified Second Life as a game, or the weaker form that drew analogies to games, the anchoring of virtual worlds to the phenomenon of any sort of game was simply viewed as detrimental for organizational value. The core argument of those imploping the analogy–game argument type was that organizations simply should not waste time in Second Life if as it is just a game.

**Causal–Control**: The issue of control was a frequently cited ground in the arguments of informants. When issues of control served as the grounds of the argument, claims generally stated there was no (or minimal) organizational value. The issue of control manifested in two broad ways: (1) control of organizational activity with respect to the virtual world and (2) control of in-world phenomena. For example, a number of claims focused on an organization’s inability to control its image or to control activity at an in-world function [Informant 11].

**Claim** [No value] “The anarchistic society of users making content and social structure has negative effects on marketing campaigns and user enjoyment.”

**Ground** “The atmosphere has an inherently underworld feeling and could easily be mixed with your company’s culture”; “There are thieves among the ‘lifers’ and the anonymity of your second self makes bad behavior more prevalent”; “Commercial pranks ranging from thrown virtual feces to a rogue helicopter crashing into the digital Nissan building have cost avatar lives and made certain brands look twice at their involvement with Second Life.”

**Warrant** [Cause] The anarchistic society of users making content and social structure has negative effects on marketing campaigns and user enjoyment.

Further, rampant pornography was often cited as grounds for arguments against the organizational value of virtual worlds. In one situation, a claim focused on liability issues associated with a hypothetical causal chain [Informant 3].

**Claim** [No value] “I do not see a lasting place for Second Life in mainstream business.”

**Ground** “The material in the world is far too risqué… the potential for sexual harassment lawsuits opens on several fronts. If colleagues are offended by the material, and repeatedly see images of smut on a fellow coworker’s screen….The potential liability of the program is too great to risk.”

**Warrant** [Cause] If the material is highly risqué, the risk will outweigh any lasting organizational value.

Claims utilizing the causal-control argumentation pattern largely argued that the anonymity and relative freedom afforded to users of Second Life would provide nihilist pranksters with the ability to disrupt events, paint graffiti on walls, and generally destroy the environment. Due to this lack of control, and the problems it would then cause for organizations, virtual worlds were claimed to be of no value to organizations.

**Generalization–Personal Experience**: Many of the arguments involving first-person narratives were quite negative about the organizational value of virtual worlds. These negative claims were often supported by narratives describing problematic interactions with the Second Life technology itself, including slow response time, crashes, and problems navigating, but also described issues with Second Life residents. Not only were some avatars reportedly unfriendly, many were quite offensive and led informants to question any real value [Informant 47].

**Claim** [No value] “The security and ethical challenges [that organizations face]…are considerable.”

**Ground** “During my SL journeys, performance crashes plagued my computer and the reality of the harassment crimes that appear on SL Police blotter became clear when I was harassed by a male avatar who teleported on top of me and violated me with gestures left best for the imagination. I was offended and taken back by the experience, feeling violated.”

**Warrant** [Generalization] My personal experience will be shared by others and will reflect the challenges associated with the organizational use of virtual worlds.

Essentially, informants using the generalization–personal experience argumentation form based their arguments on the belief that their negative personal experience with Second Life would generalize to other users, and as such virtual worlds are of no value to organizations.
Principle–Appropriateness: Informants occasionally made claims that were supported by a moral standard, or imperative, rather than any external evidence. Most often these claims indicated that virtual worlds should not be seriously entertained on grounds of ethics, appropriateness, or practicality. For example, one claim about the future organizational value was based on what employees could do in Second Life that is not appropriate in organizational contexts [Informant 15].

**Claim**  [No value] “There are some hazards associated with Second Life that may deter businesses from using the technology.”

**Ground**  “In the virtual world that Second life offers, people may feel more free to do things or express themselves more inappropriately in the virtual world than they would at work.”

**Warrant**  [Principle] Inappropriate behavior should inhibit business adoption.

Claims based on the principle–appropriateness argumentation made the case for organizational avoidance of Second Life in order to steer clear of the potentially objectionable aspects, including bad behavior, pornography, and idle activity associated with Second Life.

Discussion

In the very early stages of a technological innovation, the organizational value exists nowhere except in rhetoric (Latour 1996). Like other early nascent technologies, virtual worlds do not come ready-made with the necessary institutional resources for organizations to draw upon (Attewell 1992; Ramiller 2001; Swanson and Ramiller 1997). Further, these environments represent technology that is arguably more equivocal than other early-stage innovations, since they were not created for organizational purposes at all, and any business applications were little more than an afterthought (Ives and Junglas 2008). Virtual worlds do not present themselves to organizations complete with well-packaged value propositions and vendors seeking to justify their relevance. Instead, a handful of organizational actors proactively explore such worlds to determine how they might appropriate this technology for organizational gain.

Weick (1995) contends that all sensemaking is individual, but it is socially applied in that individuals make projections about their identities in the context of social groups or organizations. Sensemaking—even if it is the work of a single person reflecting alone—is necessarily social (Billig 1996; Dodds et al. 1997). As individuals make sense of any novel situation, such as that posed by an innovative technology, they draw upon preexisting organizational and institutional resources to form the relevant discursive practices. These discursive practices, in turn, shape the contours of emergent organizations (Boden 1994; Maitlis 2005; Taylor and Van Every 2000), and eventually become reproduced across fields, thereby reproducing the discourse concerning those innovative technologies (Boczkowski and Orlikowski 2004; Heracleous and Barrett 2001). Individuals draw upon and elaborate these discourses, thus continually reinforcing them while simultaneously engendering new institutional structures and practices (Phillips et al. 2004). Institutionalization is not an outcome, but a process (Powell and DiMaggio 1991), and IT innovations are continuously undergoing a process of institutionalization throughout their adaptation in organizational contexts (Ramiller 2001). However, as the patterns of action become institutionalized, the initial arguments justifying them disappear as the claims become taken-for-granted (Green et al. 2009).

The study of virtual worlds at this juncture provides a unique opportunity to study the very early stages of sensemaking, organizing, and institutionalization with respect to this novel and sweeping technological genre, and affords an analysis of the reasoning that will contribute to subsequent path-dependent outcomes. In this study we looked at the patterns of sensemaking individuals exhibit when reflecting upon the organizational value of virtual worlds, identifying 12 patterns in the arguments put forth by our informants and eliciting four broad themes of arguments. Next we will present these themes, followed by a reflection on the methodological implications of using Toulmin’s model as a methodological device.

Themes Across Patterns of Sensemaking

Informants in this study were engaged in perspective making (Boland and Tenkasi 1995) through the production of texts in an effort to arrive at explanations of the organizational value of virtual worlds. The assessments they generated documented sensemaking by individuals as they made ideas explicit in text, and developed their own understandings in combination with this text (Weick 1979). By focusing on only thematized claims (Habermas 1981), or those claims that informants explicitly supported with grounds (i.e., evidence), we were able to isolate and address only those claims that informants considered in a fundamental way (i.e., not those addressed superficially) and that were likely to be important and relevant to the individuals.

The 12 patterns of argument associated with these thematized claims represent a primary contribution of this research. These
patterns offer insight not only for the champions (and opponents) of virtual world technology in organizations as they look to influence others, but also for those tasked with assessing the rhetorical statements of others. This research identifies patterns that illustrate the way that certain forms of argument are brought to bear in arriving at specific conclusions. The ability to identify and interpret these patterns can provide managers with additional guidance when assessing new technologies. Furthermore, our patterns of argumentation represent a set of potentially testable relationships that can guide future research in the area of virtual worlds, as well as the exploration of organizational value for other equivocal technologies.

In addition to identifying the patterns of argumentation within our data, we elicited four broad themes that ran across multiple patterns (see Table 6).

1. Positive assessments of the current value of virtual worlds contained elements of confirmation bias.

2. Contingent value assessments consistently involved issues associated with demographic assumptions.

3. For no value assessments, the salient themes focused on issues of control, both in-world and in real-world contexts.

4. The rhetorical choices associated with the future value assessments of virtual worlds were open-ended.

Next we discuss each of these in turn.

### Confirmation

Based on the analysis, claims of current value of virtual worlds were often made through some form of modeling upon existing exemplars. Modeling is a common mechanism by which individuals make sense of uncertain situations (Cyert and March 1963), such as equivocal technologies. This modeling takes the form of success stories or simply uses the presence of well-known organizations as success signals (Feldman and March 1981). Modeling is the root of the notion of mimetic isomorphism, or the tendency of individuals to imitate the practices of other individuals without necessarily subjecting these practices to rational scrutiny (DiMaggio and Powell 1983), which is foundational to the contemporary institutional tradition.

A noteworthy observation associated with modeling, particularly as it relates to the claims of current value of virtual worlds, involves the possibility of confirmation bias. Confirmation bias describes a non-intentional, “unwitting selectivity” of only positive evidence as grounds for a certain claim (Nickerson 1998). It is one of the most commonly documented issues associated with the human condition and holds a long-lasting tradition in both psychological and philosophical traditions (Nickerson 1998). Therefore, it should not be surprising to find evidence of confirmation bias in our data.

However, we must be careful to avoid regarding the selection of only positive exemplars as an unintended bias. Rather than causing informant interpretations, the positive models could represent ex post justification or rationalizations of opinions.
about the current value of virtual worlds. Such retrospective sensemaking is altogether consistent with Weickian social psychology (Weick 1979). Either way, all of the patterns we identified claiming current value in virtual worlds emphasized positive cases as grounds. For instance, claims that used the “sign” warrant listed companies in Second Life and then claimed value based on the presence of these exemplars. Following the same reasoning, one could list many more organizations not in Second Life and therefore make an equally compelling, or perhaps more compelling, claim using the same logic. Similarly those who generalized from the experience of a single organization, or their own personal experience with an organization within Second Life, often argued that as the experience was positive, there must be value. This is particularly interesting, since many of the informants offered quite negative experiences, but these were often as caveats and qualifiers to their argument. Interestingly, these negative models or examples were rarely used for dismissing the current organizational value of virtual worlds. Oftentimes, however, they did result in a contingent assessment of the value of virtual worlds—based on certain demographic characteristics.

Demographics

When informants chose to focus on their assumptions about the demographic characteristics of participants (i.e., avatars) in Second Life, they tended to conclude with some form of contingent explanation of the organizational value of virtual worlds. The informants suggested that virtual worlds will be valuable for companies seeking to market to a specific type of individual or to recruit a specific type of individual. The type of individual that informants described largely reflected the stereotypes of young, anti-social “techies.” Thus, it was suggested that organizations could benefit if they were high-tech firms, and the value was limited for firms with older workforces.

While many of these claims are certainly defensible, a focus on demographic concerns draws attention away from more general potential organizational applications. When informants focus on marketing demographics, they may be inadvertently discounting the potential for virtual team collaboration (Davis et al. 2009). Similarly, arguments that focus on the “old industry” context of a particular organization may ignore possible opportunities to innovate and reinvent aspects of their organizations. Demographic-based arguments focused the informants’ attention on what is, according to their assumptions, and not on the possibilities of what can be. Many of the negative assessments of organizational value also emphasized present limitations rather than long-term opportunities, and a theme that ran through many of these critical arguments involved issues of control.

Control

While the warrants employed vary, the concept of control underlies several of the discursive patterns that we have outlined. Indeed, informants perceived the absence of sufficient control over virtual worlds to be a primary impediment to organizational adoption. This is quite consistent with findings from other areas of IS research where the management of traditional organization-based systems (i.e., those that have been planned, implemented, and maintained within organizations) has been aimed at the ability to clearly define system capabilities and control users (Kirsch 1997). However, virtual worlds are unique systems, as they have been designed to allow users the freedom to express themselves, which makes the limitation of capabilities, uses, and issues related to these equivocal technologies challenging. Further, issues with thrown feces and crashing helicopters do not involve the control of employees by organizational systems. Rather, they are simply inappropriate for business applications—such behavior is not “natural, rightful, expected, and legitimate” (March and Olsen 2004, p. 3) in an organizational context. The logic of appropriateness that businesspeople draw upon to express issues with control reflect the relatively stable set of rules and resources that they collectively draw upon to pattern their behavior, and these actors will habitually work to reinforce this logic (Giddens 1984; March and Olsen 2004). Therefore, it is clear that for organizations to see significant benefit in virtual worlds, it will likely make more sense to continue to portion off and segment organizational elements of virtual worlds from the general population. Although issues of control were described by virtually all of the informants, many chose not to root their assessments in these issues, but in others.

Open-Ended

Individuals make choices about the way they frame and anchor their arguments. The issue of framing was particularly evident in the arguments that employ warrants of analogy and parallel case, “anchoring” (Moscovici 1984) the novel environment of virtual worlds to an existing phenomenon. Rhetorical choices of the informant were particularly salient to claims about the future value of virtual worlds, but not restricted to that perspective. For instance, when the analogy to a game was employed, claims of value are consistently negative. The informants in this study clearly conceive of games as trivial, unproductive, and not deserving of serious
business consideration. However, not all anchoring efforts render a negative result. When the virtual world is viewed as analogous to a virtual version of a prevailing business practice, perceptions of value are positive. Similarly, informants have a favorable perception of virtual worlds when they understand them as similar to the World Wide Web, in terms of their potential for adoption and growth.

It is important to note that this anchoring is not a random choice, but is inexorably linked to the informant’s view of self, history, and personal and social experiences (Moscovici 1984). Sensemaking in general is largely about continuity; it is a process aimed at creating and maintaining a consistent, positive sense of self vis-à-vis the phenomenon or cues encountered (Weick 1995). Therefore the way in which an individual anchors a new technology not only offers insight into the referent history and social context, but may also become rigid, or objectified, and thus impact the future appropriation significantly (Gal and Berente 2008). For example, if social actors are uncomfortable with video games and three-dimensional graphics label virtual worlds as “video games,” this would have significantly different implications than if they labeled them as electronic “billboards.”

Arguing Across Sensemaking Traditions

Humans do not act like the omniscient rational actors in classical models of homo economicus (Henrich et al. 2001). Rather, individual rationality is necessarily bounded by the limits on cognitive ability, access to information, attention, and varying preferences (Simon 1956). Various modes of sensemaking have been discussed at length in a variety of contexts across multiple domains and disciplines, and in this study we provide findings that offer insight for the study of modes of rationality involved with sensemaking about the organizational value of virtual worlds. Functional, rational explanations dominate much of the discussion around technological dynamics in organizations (e.g., Chandler 1977; Rogers 1995; Yates 1989), and we found such logic in causal arguments of the organizational value of virtual worlds (e.g., demographics will drive the applicability of virtual worlds; lack of control will limit an organization’s willingness to pursue virtual worlds). However, there are a variety of other traditions in social psychology and organizational research that characterize the process of human sensemaking. It was not our intention to tackle this topic from the social representations perspective, but this perspective was apparent through the warrants of analogy and parallel case used in arguments by our informants. We also identified a number of other theoretical traditions that could be implied by other warrants, and came to the conclusion that our methodology and use of Toulmin’s model enabled us to get at sensemaking while accommodating a diverse set of sensemaking perspectives.

One set of such traditions includes socio-cognitive perspectives that focus on particular notions of cognitive frames or social representations (Moscovici 1984; Orlikowski and Gash 1994; Pinch and Bijker 1987; Ramiller 2001). From these perspectives, individuals come to terms with novel phenomena by relating, or anchoring, them to familiar phenomena. In our study, this anchoring process was evident in analogy-based modes of argumentation (e.g., virtual worlds will develop like the Internet, or like video games). Another perspective on human sensemaking can be described as a narrative lens that highlights the power of stories in making sense of ambiguous situations (Boje 1991; Boland 2001; Bruner 1990; Pentland 1999). This narrative approach is directly related to generalization arguments in our study. By generalizing from particular experiences, informants narrate examples of organizational value (e.g., virtual worlds are valuable because I had a really great experience with an in-world organization). Finally, institutional theory is often held up as an alternative to the rational perspective (Powell and DiMaggio 1991) as it emphasizes taken-for-granted assumptions and highlights forces associated with legitimacy and the relevance of cultural embeddedness in sensemaking (DiMaggio and Powell 1983; Granovetter 1985; Uzzi 1997). In their seminal work, DiMaggio and Powell (1983) indicate that there are three types of legitimizing institutional forces that act in lieu of purely “rational” action, which they describe as normative, coercive, and mimetic. Normative and coercive forces are essentially referring to propriety, that is, appropriate behaviors often encouraged by authorities in a given social context. Mimetic forces encourage organizational actors to follow exemplars as a way of taking legitimate action (DiMaggio and Powell 1983).

Toulmin (2003) indicated that the type of argument is determined fundamentally by the warrant brought to bear. As presented in Table 7, the forms of sensemaking-oriented traditions match well with the warrants we identified in the reflections of our informants. While we make no claims about the exhaustiveness of our study, it is apparent that different modes of cognition can be observed within a single assessment and across assessments. Based on our account, we assert that the Toulminian lens offers a methodological tool that is theoretically neutral, or “agnostic” (Nord and Connell 1993), in that it avoids committing to a particular tradition about human sensemaking ex ante. Since, as we assert, different combinations of warrants and grounds have a relationship to the nature of the claims themselves, this leads to an important implication to the practice for researchers: if an investigator were to limit the
Table 7. Types of Arguments and Sensemaking Traditions

<table>
<thead>
<tr>
<th>Warrant/Type of Argument</th>
<th>Sensemaking Traditions</th>
<th>Theoretical Foundations</th>
<th>Selected Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Causal</td>
<td>Rational: sensemaking through mechanistic</td>
<td>• Functionalist theory</td>
<td>Chandler 1977; Galbraith 1977; Lawrence and Lorsch 1967; Rogers 1995; Yates 1989</td>
</tr>
<tr>
<td></td>
<td>processes</td>
<td>• Information processing</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Contingency theory</td>
<td></td>
</tr>
<tr>
<td>Analogy/Parallel</td>
<td>Anchored: sensemaking relation to other</td>
<td>• Frames of reference</td>
<td>Gal and Berente 2008; Moscovici 1984; Pinch and Bijker 1987; Orlikowski and Gash 1994; Starbuck and Millikin 1988</td>
</tr>
<tr>
<td></td>
<td>Case</td>
<td>• Social representations</td>
<td></td>
</tr>
<tr>
<td>Generalization</td>
<td>Narrative: sensemaking through storytelling</td>
<td>• Narrative cognition</td>
<td>Boje 1991; Boland 2001; Boland and Tenkasi 1995; Bruner 1990; Pentland 1999</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Storytelling</td>
<td></td>
</tr>
<tr>
<td>Authority/Principle</td>
<td>Normative: sensemaking based on standards</td>
<td>• Cultural norms</td>
<td></td>
</tr>
</tbody>
</table>

mode of inquiry to a particular set of assumptions about human understanding, and use a particular lens, that investigator may only capture a portion of the forms of sensemaking. For example, a focus on narrative (i.e., generalization warrant) as a form of sensemaking would focus on the experiences of organizations, and likely yield some interesting insight; but this would likely result in only positive, confirming conclusions about the organizational value of virtual worlds. The Toulmin model allows researchers to address multiple sensemaking perspectives.

**Toulmin Model as Methodological Tool**

Individuals rarely argue from fully formed, valid, and internally consistent positions, but rather from a smattering of perceptions, experiences, and motivations. Such a pragmatic form of reasoning allows for a variety of methods in supporting claims. In the data, we found a set of claims based on a variety of arguments of different forms and different content. The structure of practical reasoning (Toulmin’s claim–ground–warrant) provided us with a tool whereby we could rigorously capture and code the sensemaking activity, without stripping it of its richness and without fitting the results into preformed assumptions about human rationality. Avoiding such assumptions and characterizing different forms of arguments proved to be one of the key contributions of the study.

Various adaptations of the Toulmin model have been used in the IS discipline, although not as an analytical device to understand the different forms of human sensemaking. Instead, the Toulmin model is often used to better understand the impact of explanations on issues such as trust and acceptance technology (Kim and Benbasat 2006; Ye and Johnson 1995), and how to support the design of explanations in various IS domains, including expert systems, knowledge management, and e-commerce (Gregor and Benbasat 1999; Kim and Benbasat 2006; Ye and Johnson 1995). Further, various commentators have used the Toulmin model as a way to frame IS-related arguments and navigate different IS-related perspectives (King and Lyytinen 2004; Klein and Hirschheim 2001). In this research we go beyond prior work in the discipline and use Toulmin’s model as a methodological device for assessing patterns in practical discourse (Fairclough 2003). In doing so, we find that this perspective enables us to capture dynamics of sensemaking across a variety of intellectual traditions.

It has been established elsewhere that discursive practice significantly impacts the adoption of information technologies (Boczkowski and Orlikowski 2004; Heracleous and Barrett 2001; Swanson and Ramiller 1997). Toulmin’s model offers a way to capture IT-related discourses and link these discursive forms to claims about the technology. This is a powerful tool for use in the early stages of a technology where no
single discourse has yet been institutionalized (Green et al. 2009) or “black boxed” (Latour 1996). The discourses remain fluid enough to be readily influenced.

**Limitations and Future Research**

Although we present implications for IS research and practice, these implications must be qualified by a number of limitations of this study. First, the source of our data can be viewed as a limitation because informants were students completing a course assignment. Student data is never ideal; however, there are some practices that help validate the use of student informants in certain situations, which we addressed in the methodology section. Further, the study was an assignment within a course, and as such may not reflect the context this study seeks to generalize (i.e., the assessments do not represent sensemaking of the informants in the capacity of business professionals). In order to address the future role of an emerging technology and how individuals go about making sense of the technology and its potential for organizations, we need to have access to a group of individuals with business experience that have engaged the technology before the technology becomes widespread and used by every firm. Fortunately, to gather appropriate data, we found a unique opportunity involving management classes that allowed us to find informants that (1) are real businesspersons, (2) have engaged the technology, and (3) do not work for organizations that have employed the technology previously. For these reasons, we believe the informants’ assessments provide insights into individual sensemaking of equivocal technologies and their potential for organizations. However, these assessments may not reflect the arguments the informants might make in organizational contexts where they are held accountable for the content. Future research should seek to understand similar dynamics within organizational environments, and it would be interesting to incorporate social networks as well.

A related limitation involves the framing of both the assignment and this manuscript. We asked students to assess the organizational value of virtual worlds in general and required some experience with Second Life as an example of a virtual world. Instead of focusing solely upon virtual worlds in general, on a number of occasions informants conflated Second Life and the broader domain of virtual worlds. This is perhaps an artifact of the novelty of the environment to many of them, but still may materially affect their claims. Further, since there is an ever-increasing variety of virtual worlds continually emerging, and since we cannot possibly foresee all future virtual worlds, future research must acknowledge this variety and attend to the potential organizational value of differentiated virtual environments.

An area where the data was quite rich was that of individual reflections upon their identities in relation to the virtual world. Identity formulation is fundamental to studies of individual sensemaking (Moscovici 1984; Weick 1995), and yet in this paper we looked solely at the argument structure in relation to the nature of the claim. Since informants made numerous, often inconsistent claims, we concluded that we could not properly link a given assessment of identity with any or all arguments, since the reflections on identity were typically removed from the documents on discussions of the organizational value of virtual worlds. Attention to issues relating to identity would be in order for future studies.

**Conclusion**

The emergence of virtual worlds offers an opportunity to study the sensemaking—and resulting appropriation and evolution—of an entirely open-ended technology. At this point, the organizational value of this technology resides largely within the discourse, but this discourse will contribute to the shaping of future reality. Our findings suggest that patterns of argumentation can be consistent with particular perspectives of novel phenomena, while they also illustrate the diversity of such patterns that individuals bring to bear. From rational argumentation around conceptual capabilities to the metaphorical association with earlier waves of innovation, individuals draw upon a rich tapestry of sensemaking strategies to confront the equivocality that they encounter.

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