

# Chapter 7

## Toward an Infrastructural Approach to Understanding Participation in Virtual Communities

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### **ABSTRACT**

*This chapter outlines an infrastructural approach to understanding virtual communities (VCs) and applies it to a novel set of VCs. The infrastructural approach explicitly links logics embodied in technical, social, and information systems to opportunities and motives for participation. This chapter first outlines how the infrastructure approach is synthesised from current approaches to understanding VCs. Second, it uses the infrastructural approach to analyse three related meatspace communities' progress toward collaborating through specific data-sharing VCs. Third, it highlights merits and shortcomings of the infrastructural approach to understanding participation in virtual communities. Finally, it offers potential avenues of further VC research using the infrastructural approach.*

### **INTRODUCTION**

One reason virtual communities (VCs) are broadly interesting is because they may incorporate and reflect dynamics of meatspace communities. In addition, their ICT-mediated nature may enable new large-scale socially and economically important behaviours and relationships. Efforts to replicate and apply findings from meatspace communities to VCs have experienced mixed success, but the “virtual” aspect of VCs has received less attention.

Simultaneously, the increasingly interdependent, intermediated, and invisible qualities of pieces that compose technical, social, and information components of individual VCs, and suites of related VCs increase the difficulty of conducting and generalizing piecemeal analysis (Kraut et al., 2010). Therefore, a new position must be adopted that respects and understands the particular qualities of each VC, but which also leverages and informs studies and ongoing practices in relation to other VCs.

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The proposed infrastructural VC approach (IVCA) recognises that the qualities that make a virtual community “virtual” are the sets of generally assumed technologies and knowledges that enable individuals to share information online. Every online action engages ICTs to transmit and receive information. To consider “virtual communities” of interacting humans therefore requires us to consider the information infrastructures that underpin their distinctly “virtual” existence. While trace ethnography of the virtual yields insights about the ‘what’ questions about broadly distributed online phenomena (e.g., Geiger and Ribes, 2011), questions of ‘how’ and ‘why’ must be considered from the underpinning information infrastructures.

The virtual characteristic may impart dynamics difficult to reconcile with each other, let alone with knowledge about meatspace communities. Specifically, VC participants have fundamentally new or different possibilities, such as:

- The ability to search and discover communities and information through vast online search engines in addition to personal or local networks;
- Nearly instant storage and retrieval of remote information through high-speed data networks;
- Rapid responses from many interchangeable sources of information and assistance;
- Concurrency and parallelization of individual and group participation;
- Tools to rapidly entrench, retrench, and replicate/fork a community at low material cost; and
- The ability to take concurrent risks by participating in concurrent communities.

This chapter presents and investigates the IVCA by applying it to three related scientific communities in long-term ecological research (LTER) as they attempt to add VC components to share metadata. The LTER metadata VCs (LMVCs)

share some typical characteristics and dynamics of other VCs, yet are distinct in motivations, barriers to entry, and expectations of value. If the IVCA is worthwhile, it should reveal major conclusions about the LMVCs agreeing with conventional VC approaches (CVCAs) it incorporates, while also providing new kinds of questions and insights about unmet challenges of instantiating LMVCs. The IVCA also yields some testable predictions about kinds of infrastructural changes that may bring LMVCs closer to their goals.

The objective of this chapter is to address the basic scientific research question: How can we understand participation through data sharing in LTER VCs? Moving toward an answer requires understanding what a current state means to dynamic LMVCs, and the logics that govern their extensions into virtual realms.

This chapter proceeds as follows. First it outlines the infrastructural VC approach. Second, it traces how the IVCA arises from CVCAs to understanding VCs. Third, it uses the IVCA to analyse three LTER communities’ work toward incorporating VCs. Fourth, it highlights the merits and shortcomings of the IVCA to understanding participation motives in virtual communities. Finally, it concludes that the IVCA provides many benefits of the CVCAs it incorporates, while leveraging their inconsistencies to explain some potential misunderstandings of VCs.

## **BACKGROUND**

### **The Infrastructural VC Approach in Brief**

Briefly stated, the IVCA assumes that concurrent logics both enable and restrict possible interactions in a community. It echoes ideas linking requisite variety to responses to environmental threats developed by Ashby (1958). IVCA is an infrastructural approach because it considers long-term assumed patterns of interactions (e.g.,

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