Argumentative Design and Polylogue

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A key challenge for argumentation theory is to engage the immense capacity humans have developed to design contexts for communication across scale. Recent theoretical developments regarding argumentative polylogues have challenged prevailing dyadic presumptions by advancing the proposition that human communication is typically complex with regard to the status of its participants, the content at stake, and the definition of the situation. The design stance highlights the intentional interventions for augmenting human interaction and reasoning to manage differences and disagreement in complex communication. The ever present possibility of designing for polylogue calls for scaling argumentation theory to attend to the arguments about argument in the design of products, devices, and services in the built environment for communication and activity. This point is developed here by incorporating the concept of infrastructure, and its institutionality, into argumentation analysis.

KEYWORDS: argument, design, polylogue, institution, infrastructure, platform, blockchain, social media

1. INTRODUCTION

All-around us, everyday, choices are made about managing difference and disagreement in the conduct of activities. Argumentation studies typically attend to these choices in terms of individual actors making and criticizing the reasons of others, which is taken as the essence of argument. As such, much effort has gone towards means for describing, evaluating, and prescribing individual choices in making arguments and the arguments produced. These are not the only choices about argument, however, that argumentation theory ought to engage. Choices made in the design of our built environments for large-scale activity are responsive to, and consequential for, how difference and disagreement are managed in the conduct of activities.

The new realities of emerging technologies expand the scope of choices in designing communication. Consider the quantification of self and nudging that purportedly helps individuals make behavioral choices; the digital platforms that bring two or more sides together around an economic or social transaction through the auspices of algorithms attuned to further tailoring the experience of the transaction; the Internet of Things that coordinates large scale activity through digitization of multiple human and non-human agents as a data-coordinated system; blockchains that seek to establish means for exchanging value not just information. These new technologies are not simply devices for individuals or applications for small groups but platforms and infrastructures that entangle people and the digital and natural world around them in ever new ways. Importantly, core to these services and environments that organize many actors, across many places, and over many matters is the management of difference and disagreement .

The general concern here is with scaling argumentation theory to engage the immense capacity humans have developed to design contexts for communication across scale (Aakhus, 2017). Argumentation theory can engage these choices by expanding its conception of design (Aakhus, 2013; Jackson, 2015). In particular, to recognize that much of contemporary communication experience is by design. Not just in the sense that, in order to communicate, humans adapt to others and situations, as documented in rhetorical and discourse studies, but that there is design for communicative and argumentative conduct that gives form, content, and direction to human activity (Aakhus, 2013; Aakhus and Jackson, 2005; Jackson, 2015). To continue expanding the conception of design in argumentation theory, it is here argued that emerging media should be seen as a contest of ideas about argumentation carried out in the design, development, and implementation of emerging media and the products and services these offer for communication in society. Like the transformations in other fields of design from the design of physical structures to actions and activities and then to the design of environments and experiences, argumentation theory must also expand its sense of what is designable in terms of argumentation. Toward this end, insights from the field of design theory about design-as-argument are introduced and then developed with concepts from information systems theory about infrastructure and institutions to better see emerging media products and services in society as *arguments about argument*.

2. SOME POINTS OF ORDER

With the ongoing transformations of communication, it might reasonably be asked, following Brockreide's (1975) classic question, *where is argument*? At the time, Brockreide was advocating a search for argument in walks of life other than law and policy, such as in interpersonal and group relations. The call distilled aspects of an emerging trend in argument studies to look for argument across a wide array of human activity where people were dealing with something problematic and making decisions. The point was to overcome the bias of status quo approaches that only looked for logical forms in messages. The interest was to understand argument in context. The dizzying array of fora that have developed with emerging media invite more than just understanding arguments in context but to understanding the construction of context for argument.

The recent ferment over the role of social media platforms in society offers an important point of entry into the question. Consider, for instance, the May 2017 lament by Evan Williams, one of the founders of the social media platform *Twitter*, when reflecting on the role of the platform in societal discourse: "I thought once everybody could speak freely and exchange information and ideas, the world is automatically going to be a better place," And, significantly, he adds: "I was wrong about that" (Streitfeld, 2017). Williams apparently regrets his prior naive perspective that framed the choices about communication facilitated by the social media platform. More recently, as reported by Wiener (2019), the current CEO of *Twitter* Jack Dorsey was on a media tour promoting "healthy conversation" in response to the mounting complaints about the platform's role in society when he said:

> "If I had to start the service again, I would not emphasize the follower count as much," he said. "I would not emphasize the 'like' count as much. I don't think I would even create 'like' in the first place, because it doesn't actually push what we believe now to be the most important thing, which is healthy contribution back to the network and conversation to the network, participation within conversation, learning something from the conversation."

Dorsey offers a general corrective orientation to the one lamented by Williams by highlighting specific choices about platform features for expressing attitudes and opinions. Interestingly, while Dorsey made his point at the media event, there were large screens behind him displaying a live stream of tweets with the hashtag #askJackatTED. The stream carried a series of questions from people watching the event that went unanswered such as (Wiener, 2019):

> "Why haven't you banned white supremacists on this platform, despite legally having to hide them in Germany?"
> "Why wasn't Trump suspended on Friday for inciting hate and violence against Rep. Ilhan Omar?"
> "Are you willing to materially reduce the number of active users and engagement, the metrics that Wall Street uses to value the company, in order to 'improve the health of the conversation'?"

The *Twitter* scenes are emblematic of current communicative conditions. The laments and proclamations made in these *Twitter* scenes point to the detailed design choices made in the social media platform's features that were laden with communicative assumptions, and ideas about argumentation. The complaints called-out yet deeper concerns about the collective communicative experience afforded by the platform for expressing opinions and managing differences. Interestingly, with regard to complaints about social media, there has been some attempt at redesign, or at least constructing a discourse about design, that counters prevailing ideas and assumptions about supporting communication and argumentation. One example is the work of Tristan Harris on "time well spent" and his argument that social media design is "downgrading" humanity by fostering shortened attention spans and heightened polarization, outrage, and vanity (Thompson, 2019). Another example is the work by Evan Williams to counter the short form contributions of the *Twitter* platform he originally championed by developing *Medium* as a platform that supports participation in long form contributions and deeper reading.

What we see in these responses are contemporary forms of raising a *point of order* directed not so much at the arguments made in a communicative context but at the construction of communicative context for argument. In particular, these points of order expose issues about design and polylogue.

First, there is a need to recognize that analysis misses something about argument when looking at argument as though it is only a verbal exchange (written or oral) of claims and premises. This reduction can miss or deliberately discount that argument happens through an ever evolving variety of techniques and practices embedded in, and tailored to, the communication that enables human activities (Aakhus, 2013; Jackson, 2015). There is considerable design in society organized around giving shape to and even disciplining argument with invented practices, techniques, and devices (Aakhus, 2002, 2013; Jackson, 2015). Attending to such designs, and the design work, for argument is not meant to diminish concern with evaluating individual arguments but instead recognizes and

opens up the built environment as a focus of evaluation and invention in terms of argument. A design stance is concerned with how argument practices expand, scale, and adjust to the demands of human activity such that the inventions for managing differences and disagreement scaffold new possibilities for human activity that can advance or diminish human understanding and capacity for action.

Second, there is a need to recognize that analysis misses something about argument when looking at argument as though it is principally dyadic. Analytic moves to reduce circumstances, where differences, disagreements, and controversy are relevant, to a dyadic base of two parties taking up one side or another in one place misses or deliberately discounts the polylogical reality of many players, positions, and places in argument and communication (Aakhus and Lewinski, 2017; Lewinski and Aakhus, 2014). The reduction seeks to see circumstances in a particular way: as a patient-doctor deciding about receiving treatment or not, the buyer-seller engaging over whether the buyer should buy or not, the leader and the audience over whether to follow or not, the advocate and the audience about accepting a proposal or not, and so on until it only seems natural that controversies are constituted as dyadic encounters of left-right, capital-labor, or pro-vaccine-anti-vaccine. It is always possible to reduce circumstances in this way and there is significant theoretical and methodological apparatus for doing so (Lewinski and Aakhus, 2014). While the dyadic reduction is not without merit, it is not inherently desirable to make this move to reduce differences, disagreements, and controversies for the sake of a particular, though predominant, understanding argument (Aakhus, 1999; Aakhus and Lewinski, 2017; Lewinksi, 2014).

The *points of order* order highlight a risk in looking for argument primarily at the discursive surface of activity without concomitant attention to the choices about argument in the construction of communicative situations. Indeed, determining what counts as an argument made, and whether an argument is happening, is itself an indefinitely contestable matter (ie., O'Keefe, 1982). This subtle but important point is at the core of the sometimes nuanced and other times dramatic differences in the technical languages for describing and evaluating arguments found across argument theories. This theoretical problem is actually a practical puzzle in most any human activity including the environment for enabling large scale human activity. Built environments involve choices made (and not made) about managing differences such as illustrated in the *Twitter* scenes and the calling-out of the choices about the design and implementation of the platform. That design, as will be discussed, is an argument about argument.

3. DESIGN AS ARGUMENT

Rhetorical theorist Richard McKeon differentiates contemporary rhetoric from classical and renaissance rhetoric because it is a rhetoric of invention rather than expression. The commonplaces of contemporary rhetoric are found in technology not in fine arts and literature like the Humanists or in practical arts and jurisprudence like the Romans (McKeon, 1973/1987). Building on this, design theorist Richard Buchanan (1985, p. 6-7) argues that technology should be understood as "concerned with the probable rather than the necessary," and once seen in this way, design is recognizable as "an art of thought directed to practical action through the persuasiveness of objects" where the objects are "competing ideas about social life." The persuasion in design happens through "arguments presented in things rather than words" where ideas are presented in the "manipulation of the materials and processes of nature, not language" (p. 7) involving technological reasoning to "solve practical problem[s] of human activity" (p. 9). Persuasion also involves ethos and pathos in the character of the design and the emotion it evokes.

Design is an art of communication that seeks to persuade on two levels: one about usefulness and the other about the appropriate attitude and values about practical life taken up with the design. "[T]he designed object declares it is fit for use" and, while linked to the past and suggestive of the future, that argument is concerned with the present and focused on the demonstrative, or epideictic, matters of praise and blame and judgments of value and worth are at stake (Buchanan, 1985, p. 19-20). Proof is demonstrated in the product. The product is, in this sense, a standpoint while the premises include the understanding of the natural-scientific principles, physical conditions, and human circumstances of use. Technological reasoning does not reduce to mechanical principles or deduction from scientific principles alone because it involves premises about audiences, human conditions, and the prospect of use in action. Design objects can range from "a city or town, a building, a vehicle, a tool or any other object, a book, an advertisement or a stage set," according to John Pile (Buchanen, 1985, p. 22). As products become more complex, it may not be possible for the user to fully participate in the technological reasoning and so the design of complex systems requires presenting features that enable users to appreciate the reasoning without seeing its details.

A rhetoric of technology invites attention to a "pluralistic expression of diverse and often conflicting ideas" in our product culture with a "turn to a closer examination of the variety and implications of such ideas" about what is useful and appropriate in practical life (Buchanan, 1985, p. 22). From this perspective, design is no mere result of a tension between

economic conditions and technological advances since products make arguments and those very products participate in verbal rhetoric during the making and use of the product regarding its uptake, lack of uptake, or particular uptake. As Halstrøm (2016, p. 50) sums it up: "what designers are creating, then, is not merely a solution to a problem but an argument to the effect that this is how the human-made world is and should be, and this is the value to be celebrated in such situations." Design is thus an "art of deliberation essential for making in all phases of human activity" including the making of theories, policies, institutions, and objects (Buchanan, 2001, p. 46). As such, design "shap[es] arguments about the artificial or human-made world" that "may be carried forward in the concrete activities of production … with objective results ultimately judged by individuals, groups, and society."

By attending to products-as-arguments, the rhetoric of technology highlight's design's focus on invention for action over expression in two ways. On one hand, invention involves the art and craft of making products for particular uses. Such *poetics* cultivates knowledge of materials and occasions for well-crafted products. Design is also *architectonic* when 'those that organize the efforts of other arts and crafts, giv[e] order and purpose to production' (Buchanan, 1985, p. 21; see also McKeon, 1973). This type of invention, which focuses on the arrangement of multiple designs for action, is less technical and more about principles of organizing (McKeon, 1973). Buchanan (2001) highlights important transformations in the fields of design with shift from a focus on physical artifacts in industrial design to contemporary attention to actions and environments. Design problems have been increasingly defined in terms of the planning and execution of human activities. This includes the design of actions and activities, such as in the design of interaction, services, and strategic plans, but also in the design of environments, organizations, and systems that bring together many other productive activities.

4. DESIGN AS ARGUMENT ABOUT ARGUMENT

The design-as-argument position advanced by Buchanan is built on the assumption that design makes arguments with things not words but, with advanced information technology and digitization, this is no longer tenable. With advanced information technology and emerging media, the artifact is largely composed with words, specialized languages, and other signs and symbols. As Goldkuhl and Lyytinen (1982) astutely observed, information systems should be understood as linguistic systems technically realized. Their point is that information systems are typically built by taking the routine or professionalized language people use in conducting an activity

and translating that into language machines understand so that some or all aspects of the activity can be automated or supported with computing. This language-action perspective on communication, cognition, and computing recognizes that technical systems are formalized, implemented language about practice and its conduct (Aakhus, Ageralk, Lyytinen, and Te'eni, 2014; Winograd and Flores, 1987). From this vantage point, the features of advanced information technology and emerging media are made possible and organized around particular design languages for communication (Aakhus and Jackson, 2005; see also Craig, 1999). The features of designed products, services, and systems intended to support interaction and communication, and their inner machinery are organized around ideas about communication and argument (Aakhus, 2013). How reflective and intentional designers are about the design language for argument in these systems varies of course but their design contributes to the determinations about what counts as an argument, the making of an argument, and even having an argument -- that is, the design is an argument about argument.

For instance, early applications to support argumentation were often developed by drawing heavily from extant argumentation theory for the design language. A recent review of research papers from 1945 to 2011 by Schneider, Groza, and Poissant (2013), for instance, identified 14 semantic web models of argumentation and 37 tools for representing argumentation on the web. For the most part, these argument technologies were developed for representing argument in discourse in terms logic and informal logic. The design language of these systems optimize the representation of argument as a dyadic phenomenon. Aakhus (2002) analyzed technologies to support group decision making from the perspective that the technologies are tools for reconstructing the disagreement space among parties. The analysis found that the design language of these products and services defined distinct design logics for orchestrating participation to manage differences. These logics included: funneling toward consensus, mapping an issue network, and orchestrating expert opinion by reputation. These tools were created for supporting how multiple parties could co-create particular representations of their differences that would in turn facilitate particular ways to conduct argumentative communication to manage disagreement in particular ways. The tools specified ways to form and sequence contributions to a discussion while offering particular capacities for the group to curate and use contributions in the aggregate. As such, the reconstruction tools stood in contrast to most of the tools identified by Schneider et al.

The applications reviewed by Schneider et al (2013) and Aakhus (2002) are oriented toward actions and activities of groups rather than

organizing large-scale environments through an infrastructure. While these analysis help show the various design languages grounded in theories of argument and decision-making, such analysis has to be taken further to engage the contest of ideas about designing for argumentation at the scale of communicative environments not just applications. To articulate this scale of argumentative design involves seeing infrastructure for argumentation and design language as institutional design.

4.1 Infrastructure Design

The concept of infrastructure from information systems theory can help articulate the polylogical reality in the order of architectonic design. Infrastructure does not simply consider the hardware of pipes, roadways, and wires but highlights how infrastructure is relational because, as it sinks into the background, it ties together different parties and aspects of the world together but not always in the same way (Star and Ruhledher, 1996). For instance, when the cook at the restaurant makes use of the tap water in cooking, the city's waterworks are folded into the cook's practice of cooking. By comparison, when the urban planner considers the waterworks that delivers tap water, the infrastructure becomes a variable in a complex equation about building up the city. Like the waterworks, infrastructure for argument puts people, positions, and places into relation with each other. Emerging media platforms, and blockchains, facilitate and mediate activities with many players, many positions, and many places that afford particular ways to manage differences. A review site, for instance, orchestrates how argument among many contributors who make evaluations of consumer products and services by providing a specified format for formulating a stance (eg., typically a rating with numbers or stars) and the reasons for it (eg., typically a text input box). Contributors are also given a way to criticize the reviews made by others and to respond to criticism of their reviews. As the platform's design sinks into the background, its solution to the practical puzzles of argument become part of an infrastructure for having and managing differences.

But infrastructure it is not equally in the background for all. Pushing the concept of infrastructure further, Hanseth and Lyytinen (2010, p. 2) explain that with information technology there is an evolving socio-technical system, or installed base, composed of "IT capabilities and their user, operations, and design communities." They add that IT capabilities are the rights, or possibility, for the user or community to perform some set of actions on a computational object that are designed into applications that make up platforms that are built on the installed based of legacy and emerging technology. So, for instance, the participants making and

criticizing reasons via the platform are like the cooks with respect to the waterworks while the social media organization is like the urban planner. While it is interesting that individuals make and respond to arguments on review sites, what is crucial to see is how the platform orchestrates argumentative interaction into a particular kind of knowledge production. The consumer's are one prime user community whose main application on such sites is for contributing reviews.

The primary design and operations communities are composed of members from the social media company, and its affiliates, running the platform. Theirs is the architectonic work that links together the variety of applications into a functioning platform. The platform is part of the Internet, which is also the installed information infrastructure base, on which the platform and its applications are built. Information infrastructure is never designed from scratch as there is always an installed base from which design and redesign must proceed, which includes the ideas that the operations and design communities value about the conduct of arguments and the use of argumentation. The format delimits argument with capabilities for giving a rating with supporting commentary. The content is aggregated to produce a body of knowledge and insight that can be used for a variety of additional applications such as comparing providers, making reservations or ordering products, and serving advertising. In this way, the platform's applications bring together multiple kinds of parties (eg., consumers, service provider, advertisers) together over the primary argumentative relevant activity of reviewing.

Even so, platforms such as review sites are developed around particular design languages for argumentation. The IT capabilities define who can speak to the issue, what counts as a relevant contribution, and the methods of proof. The capabilities expressed in features, labels, and the rules associated with the features and labels are not simply descriptive or representative, they are prescriptive and constituting of communication and argumentative possibilities.

4.2 Institutional Design

The design language for argument carries a social ontology of argumentation that defines a range of obligations and commitments for all actors and agents assembled via the infrastructure (Aakhus, 2013). Moreover, the users of the infrastructure delegate some of the responsibility for governing the management of their differences to the collection of rules designed for the purpose of achieving action. Here the design for argument in blockchain technologies can be considered to see how an infrastructure provides a machinery for argumentation. It is a

seemingly exotic environment in which to find argument but its uniqueness can help bring into relief the architectonic order of the design of environments.

Distributed ledgers enable an interacting system of participants, that may not know each other and may not trust each other, to mutually transact value (Nakamoto, 2008; Ethereum, 2016; Stratumn, 2016). A blockchain is an infrastructure of users, miners, cryptographic technology, and distributed ledgers organized around open, collective verification of transactions using tokens. What those involved in developing distributed ledgers technologies are doing, from an argumentative point of view, is developing new ways to construct institutional facts in digital contexts -- that is, to produce something that is epistemologically objective but about ontologically subjective matters (ie., Searle, 2010). Each blockchain offers a different method for generating institutional facts (coin, contracts, processes) with methods for constructing the proof necessary to accept the validity of transactions. The technologies of blockchain are means for producing an open consensus to attest that the transactions recorded in a distributed ledger actually occurred. In this way, the transaction becomes an immutable fact on which other transactions and joint actions among multiple parties can reliably take place.

In the case of Bitcoin, this arrangement is referred to as *proof-of-work* where miners win ongoing competitions to verify that a block of transactions are secure and that the bitcoin involved is thus genuine -- that is, the coin has not been double-spent. Bitcoins, for instance, exist because of the work that some actors (miners) do to verify that all transactions in a block of transactions using bitcoin have cleared - that is, any bitcoin used in a transaction is not also used in another transaction (Nakamoto, 2008). Bitcoin, and other kinds of blockchain tokens, mimic certain features of physical money but without the specific role of a central bank or credit agency clearing transactions.

Ethereum is a company building distributed ledger technology that provides common ground through *proof-of-stake* that establishes a kind of currency for exchange (e.g., ether). Ethereum focuses on enabling the digitization of the means and terms of a transaction by offering users a common way to script *smart contracts* and *digital autonomous agents* so that value (money, products, and services) can be exchanged with the blockchain. What Ethereum illustrates is a method for digitizing performances of orders, requests, promises and for a computational approach to working out the conditions of acceptability so that the relevant subsequent action is performed. Stratumn, another company, provides common ground through *proof-of-process*. The Stratumn approach

combines several technologies that when combined validate that the parties to an activity performed their actions without requiring that the substance of any action is disclosed. The Stratumn blockchain makes visible that the what (data integrity), the who (non-repudiation of source), the when (a step in the process was performed), and the where (a step was performed at the right place in the process) are all valid (Stratumn, 2016). The full life cycle of activity can thus be verified to resolve (or prevent) any differences about the required conduct of the participants in an activity without necessarily disclosing identities or proprietary content.

Whether services that realize these new digital practices come about as envisioned, what is noteworthy is how the services aim to provide methods for managing difference and disagreement. Importantly, the blockchain platforms involve something more than the exchange of information and opinions but technically enable actions like requests, promises, and orders that require uptake and carrying out by the other actors. For any of these new digital services to work, requires collective recognition of institutional facts, such as whether a digital transaction is valid and reliable. The work of these specialists is meta-argumentative as they construct a design language that draws people, symbols, words, technology, and activities into a particular relation that produces an output. This differs from the representational and reconstructive technologies discussed earlier. These blockchain services enable the realization of collective intentions into a framework of rights and deontic power for producing institutional facts (ie., Searle, 2005, 2010). Fundamental to distributed ledger technology are methods for managing differences and disagreements about what constitutes a valid transaction. These methods for producing institutional facts another contested domain of ideas about argument.

5. CONCLUSION

The general concern addressed here is focused on responding to the immense capacity humans have developed to design contexts for argumentation. It is increasingly important for argumentation studies to find its way into the design arenas that create various products and services for managing disagreement in society. This requires going past the discursive surface of making and criticizing reasons to examine the construction of contexts for argumentation. The main point developed here is that emerging media should be seen as a contest of ideas about argumentation carried out through the design, development, and implementation of emerging media and the role of argument in the design of these products and services for communication in society. This can be

accomplished in part by incorporating infrastructure, and its institutionality, into argumentation analysis.

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