

Pragmatic Web as Communication Design Practice

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Abstract: The *Pragmatic Web* is seen as a direction for realizing the vision of the *Semantic Web*. Realizing the vision of the Pragmatic Web, however, requires a shift in thinking about technology as a means for designing communication (which is making forms of interactivity possible that may otherwise be difficult or impossible). Some lessons from theory and research on Pragmatics provide grounds for understanding how technology plays a role in constructing contexts of interactivity. Similar to ordinary interaction strategies and the intervention practices of communication professionals, technologies provide ways to solve the practical puzzles of action, meaning, and coherence in interaction. Technologies are hypotheses about solving interactional problems that are built on assumptions about how interaction works and ought to work. To better understand the Pragmatic Web it is necessary to articulate and assess these assumptions. Two plausible, complementary approaches are suggested.

1 Introduction

The early calls for the *Pragmatic Web* portray it as a direction for solving practical and conceptual problems that have emerged in designing and implementing *Semantic Web* applications. Singh highlights the need to emphasize process and context over data, for example, so that services are understood as agents participating in a rich system of interaction not as distributed objects [Si02]. de Moor highlights the need to support grass roots meaning negotiation among community members so that they can address the inevitable evolution of meaning that takes place as communities get better at what they do or shift their attention to other matters [Mo05, MKR02]. Schoop, de Moor, and Dietz draw attention to the chimera of context-independent knowledge to refocus attention on human negotiation of commitments and meaning so that technology design focuses on collaborative, goal-oriented discourse in communities [SMD06]. As Singh points out, the vision of the Semantic Web will be realized via the Pragmatic Web. But then, how will the vision of the Pragmatic Web be realized?

To begin sketching a plausible answer to this question, the observations of monkeys playing at a zoo made by the famous anthropologist Gregory Bateson will be useful. Bateson [Be72] noticed that the playing was an interactive sequence made up of actions or signals that were similar too but not the same as combat and yet it was clear that the monkeys understood they were not in combat but in play. This suggested that the monkeys were exchanging signals and signals about signals to coordinate a joint line of action and to collaborate in the activity of play. For this to happen, they appeared to have some sense of what the actions in the sequence meant and to convey that the sequence itself had meaning that in turn framed their actions. This observation led to an insight for Bateson: it is one thing to be interested in whether a nip denotes a bite and quite another to be interested in how the monkeys understood their interactivity and continuously sustained it as playing and not fighting. One orientation emphasizes the meaning of action and the other emphasizes the meaning of interaction. While inseparable, each orientation represents a different order of understanding with a different focal object and a different way of reasoning about it.

The Pragmatic Web, in setting out to solve problems of the Semantic Web, has paved the way for a fundamental shift in understanding the web much like the shift that took place for Bateson. Realizing the vision of the Pragmatic Web will rely in part on Pragmatics as a means for improving Semantics, but more importantly it will rely on finding ways to make Pragmatics the object rather than the means. This is happening in that the *Pragmatic Web* movement signals that the object of design is changing from information to communication and the mode of reasoning in design from reasoning about the meaning of information objects to reasoning about artefacts as facilitators of interactivity among actors. In such a shift, what is of practical interest is *communication design* – that is, how to shape interaction and communication into preferred forms. What requires further understanding is the relationship between communication processes (e.g., planning, inquiring, designing, informing, negotiating, disputing) and communication products (e.g., plans, knowledge, designs, information, contracts, agreements). The overriding questions caused by this shift are whether communication can be designed so that processes lead to desired products and what the prospects are for an enterprise of communication design. However, this shift in understanding has not been fully realized even though it is fundamental to realizing the vision of the Pragmatic Web apparent in the early calls for the Pragmatic Web.

The aim of this paper is to contribute to realizing the vision of the Pragmatic Web by exploring how Pragmatics provides grounding for the Pragmatic Web and how the Pragmatic Web is an arena of *Communication Design Practice*.

2 Pragmatics as grounding for the Pragmatic Web

Underpinning early conceptualizations of the Pragmatic Web is a distinction between syntactics, semantics, and pragmatics, taken from the fields of philosophy and linguistics. The distinction is primarily a metaphor that highlights changes and potential directions for making the web usable and useful. But, the question remains as to the relationship between Pragmatics and the Pragmatic Web. It is here suggested that the Pragmatic Web may be usefully understood as *Applied Pragmatics* where Pragmatics theory and research grounds the invention of solutions to problems of communication. At the same time, explicit attempts to solve communication problems contribute to a deeper understanding of Pragmatics. To pursue this, there is a need to articulate where technology fits within Pragmatics.

While the definition of pragmatics is not resolved, as is often the case for a research field, a useful starting point is the distinction by Morris (1938): Syntactics is the study of formal relations of signs to one another, semantics is the relations of signs to the objects to which the signs are applicable, and pragmatics is the relation of signs to interpreters. Contemporary shorthand often makes the distinction as syntactics, the study of the combinatorial properties of words and their parts, semantics as the study of meaning, and pragmatics as the study of language use (see [Le83]). The topics or phenomena of interest in pragmatics, as described by Levinson [Le83] are:

- (1) Deixis: The way the relationship between language and context is reflected in the structures of languages (e.g., the meaning of ‘this’).
- (2) Conversational Implicature: Pragmatic inference based on assumptions about the cooperativeness of the conversational participants not the semantic inferences drawn from the meanings of words phrases, or sentences (e.g., how it is possible to mean more than what is said).
- (3) Presupposition: Pragmatic inferences that depend in part on semantics but that interact with contextual factors.
- (4) Speech acts: Inferences about the meaning of actions performed with words and how people convey and understand that meaning using content and rules about actions (e.g., using words to make promises, requests, bets, invitations).
- (5) Discourse structure: The relationship between the organization of conversation and utterance meaning. The sequential order of an utterance plays a role in what that utterance means.

2.1 Lessons from Pragmatics

The first lesson for the Pragmatic Web from theory and research on Pragmatics is that language is a natural system designed around the assumptions of face-to-face communication. That is, language structure is a set of solutions to the problem of communication and coordination in face-to-face settings. These solutions are grounded in a set of recurring puzzles and the knowledge that enables people to coordinate and communicate.

Jacobs [Ja94], for example, describes three puzzles for communicators (and discourse analysts): meaning, action, and coherence:

- (1) Meaning: Somehow people refer to events, describe states of affairs, convey attitudes, beliefs and desires, express relationships to situations and others, speak plainly and explicitly as well as indirectly and figuratively, and say just enough for the hearer to fill in what is unsaid.
- (2) Action: Somehow people do things with words, they decide what makes sense and what does not, and they take into account the consequentiality of their messages when constructing a message.
- (3) Coherence: Somehow people can see in a series of sentences a story, how to reply to questions and offers, make relevant contributions, organize arguments, and open up and close down conversations.

People routinely solve these puzzles and this suggests some principles or knowledge that ordinary language users know in order to communicate. Jacobs outlines this knowledge as follows: linguistic communication requires shared principles for inference beyond information given, requires generative principles, is context determined, is multifunctional, and has functional design [Ja94]. The knowledge is not so much a set of conventions to be followed but is a set of abstract principles that people employ to devise communication strategies and practices that solve the puzzles of meaning, action, and coherence in face-to-face interaction. The observable structure of ordinary language use and discourse is an expression of these deeper principles.

A second lesson from Pragmatics for the Pragmatic Web is that design of messages and interaction is a natural fact about communication [AJ04]. We can see this in the way people do not simply follow the conventions of discourse but instead use the conventions of discourse to make contributions that shape meaning, action, and coherence. Consider the following example (from [Ja94]):

Example 1

Customer: What's the chicken marsala like?

Waiter: I'm sorry, we're all out of that tonight.

In Example 1, the question is not answered in so many words but the sequence is meaningful and coherent. The waiter has recognized the informational question as a pre-order. Rather than producing an answer to the question, the waiter anticipates an order for food in the question and provides a reason for not being able to complete that order. There is little in the semantics here but much in pragmatic inference as the waiter exploits the social context and the structures and conventions of discourse. In so doing, the waiter has closed down some opportunities for further interaction and opened up others. This example helps convey communication design as a natural fact about communication. In interaction with others, people are not only trying to make sense of what is said and meant but in saying something one is building the grounds for going forward and proposing, accepting, or rejecting bids about how to proceed in going forward [AA02, AJ04]. People exploit principles of language to shape what is possible and impossible in interaction.

The web has emerged because of practical interests in making communication happen through distance in space or time. Such communication is mediated by technologies of writing, recording, or some mechanical transmission device. Given that language has evolved as an adaptation to the puzzles of face-to-face interaction, questions about technological intervention arise. For example, what happens when interaction takes place at a distance in either time or space and is mediated by written or recorded interaction? Or, what happens when the ordinary rules of turn-taking are suspended because of the medium of communication or distances in time or space? There is considerable research that bears on these two questions. The emerging picture is that the introduction of media, writing, and recording to communicate at a distance alters the routine ways in which people solve the puzzles of meaning, action, and coherence (e.g., [Hu01]). Moreover, technologies appear to work because people are able to exploit the deep principles of ordinary communication to invent new strategies and to appropriate old ones to solve the puzzles of meaning, action, and coherence (e.g., [BD00]). Clearly the Pragmatic Web will contribute to further understanding of how this happens.

In terms of advancing the Pragmatic Web, however, web-based applications might be usefully understood as attempts to solve problems of communication generally, and specifically the problems associated with communicating via mediated means at a distance in space or time. Web-based applications are interventions on interaction – explicit attempts to design communication – that have consequences for the ways that people ordinarily make sense of what others are saying and doing (e.g., deixis, implicature, presupposition, speech acts, and discourse structure) as well as for the content, direction, and outcomes interaction. So, it is one thing to recognize that technologies can disrupt and that people can work around the disruptions but the Pragmatic Web invites consideration of technologies as intentional interventions aiming to enable new or alternative forms of interaction. This emphasis on the designability of communication requires further clarification, which can be accomplished by considering the design work performed by professionals.

2.2 Constructing context of interactivity

While communication design is a natural feature of ordinary, everyday interaction, it has also been elevated into a professional practice such as found in the work of dispute mediators and meeting facilitators [AJ04]. Mediators and facilitators exploit the naturally occurring pragmatic aspects of language use to enable preferred contexts of interactivity to emerge. The conduct of communication design by dispute mediators exemplifies the object of design and various modes of reasoning in crafting interaction and facilitating discourse.

Examination of what dispute mediators do with their words reveals that mediators use the ordinary communication practices of summaries and questions to shape the way disputing parties pursue their disagreement with each other [JA03]. They pay attention to discernable features of communication such as participant roles, turns, turn-taking, preferred acts, preferred sequences of acts, and topics. These features of communication are objects of design. Thus, by manipulating these features they attempt to influence the quality, the content, the direction, and outcomes of interaction. They build up know-how including ways of reasoning about the relationship between the arrangement of features and the quality and outcomes of the interaction.

Dispute-mediators uses of questions and summaries reveal distinct ways of reasoning about the relationship between communication process and communication products. Three models of rational discussion are evident in mediation practice: bargaining, therapy, and critical discussion. Each approach articulates a different form of interactivity from the available social context. Bargaining encourages participants to make contributions in the form of offers and concessions that work towards a contract that meets the interest or needs of the other party. Therapy encourages participants to make contributions in the form of self-disclosures, explanations, and definitions that work towards reciprocal affirmation that repair failures of mutual respect or understanding. Critical discussion encourages participants to make contributions in the form of arguments and refutations that work toward agreements consistent with available facts and values. Each form of interactivity promoted treats the conflict differently and produces a different interactional remedy (see Table 1, taken from [JA02]).

	Critical Discussion	Bargaining	Therapeutic Discussion
Source of Conflict	Disagreement over facts and public values	Conflict between competing wants and interests	Misunderstandings and failures of respect
Optimal Solution	Claim that is most consistent with available facts and values	Proposal that maximizes gain and minimizes costs to both parties	Definition of the situation that acknowledges and affirms each party's point of view
Principle of Resolution	Public Justifiability	Mutual Acceptability	Sincerity and Openness
Process of Resolution	Argumentation and Refutation	Offers and Concessions	Self Disclosure, Explanations, and Definitions
Mode of Resolution	Agreement	Contract	Reciprocal Affirmation

Table 1: Models of Rational Discussion from Mediation Practice

The two lessons from Pragmatics described earlier seemingly leave technology out of the picture but actually provide genuine theoretical grounding for realizing the vision of the *Pragmatic Web*. Combined with the research on dispute mediators, a way to understand the role of technology in communication design is established. First, it is possible to describe communication as an object of design and articulate modes of reasoning about the design of communication. Second, just as in ordinary interaction the deep principles of language are relied upon and exploited by communication designers such as dispute mediators to make things happen. Third, in a manner similar to both dispute mediators and to ordinary-interaction strategies and practices, technologies make forms of interactivity possible that may otherwise be difficult or impossible to realize. (Of course, technologies can fail in ways similar to ordinary interactional strategies and practices or dispute mediators.)

3 Pragmatic Web as Communication Design Practice

Pragmatics and the *Pragmatic Web* can be further linked by exploring how web-applications might be created or analyzed as tools for communication design – that is, tools used to facilitate forms of discourse once impossible or difficult for communities to achieve. The lessons discussed above are drawn primarily from interpersonal settings where individuals deal with the puzzles of communication. The challenge the *Pragmatic Web* embraces, however, lies in understanding and intervening on how communities manage the puzzles of communication and improvise communication practices to communicate through space and time via technological mediation.

Aakhus & Jackson describe seven broadly accepted findings about language and social interaction that matter when designing technology to facilitate particular forms of communication [AJ04].

- (1) Turn-taking formats vary in the methods provided for generating and displaying relevant contributions.
- (2) Participant identity and face concerns affect participation in any interaction format.
- (3) Speech is a kind of action with collateral commitments.
- (4) Speech act sequences are indefinitely expandable.
- (5) Coordinated action depends on repair.
- (6) The consequences of design for practice are interactionally emergent.
- (7) Communication is subject to culturally shared assumptions about communication.

These seven important matters of interaction, coupled with the topics of pragmatics, further clarify how communication is an object of design and the potential for consequences in the attempt to shape interaction and facilitate discourse. Web-based applications may be part of an effort to design discourse and these technological mediations should be understood as hypotheses about how communication works and how it ought to work. It is thus important to understand what a technology proposes for interaction and for creating contexts of interactivity.

A next step in connecting Pragmatics to the *Pragmatic Web* through the idea of communication design is to develop ways to talk about and reflect on the designability of communication via technology. On one hand there is a need to articulate how an application relates communication processes and products and on the other hand to assess the relationship between the technology and its community of users. This section puts forward to plausible devices for reflecting on the pragmatic layer of the web. One is for articulating ontologies of interactivity and another for interpreting the interactional consequences of web applications. Both contribute to realizing the vision of the Pragmatic Web by taking a step toward making Pragmatics something to be considered as designable not just a means for improving problems of Semantics.

3.1 Ontologies for interaction

Web-based applications provide affordances for making contributions to some ongoing activity. The affordances explicitly advance and sometimes presuppose how contributions ought to be made and managed by the participants and thus, like dispute mediators, web-based applications are interventions on ordinary forms of interaction that aim to ground a preferred form of interaction. Web-based applications represent ways of reasoning about the relationship between communication process and product. This reasoning is often implicit and sometimes incoherent in web-applications, which can lead to difficulties in use and problems in meaning-making for the users. Three general models have been identified from the affordances groupware products provide their users: funnelling, issue-networking, and reputation management (Table 2, taken from [Aa02]). These models are inspired by the models of rational discussion identified in mediation practice [JA03] but focus on the technologies as tools for facilitating particular forms of discourse in a community for making sense of a decision or problem. Each general model makes explicit the purpose of the technology, the affordances for orchestrating interaction, and the underlying rationale warranting the effectiveness and legitimacy of the intervention.

Type	Purpose	Orchestration	Systemic Rationality	Examples
Issue-Networking	Form a web of issues and relevant positions on issues	Clash of claims	Self-correction of claims and lines of argument	gIBIS, Compendium
Funneling	Consensus Formation	Flow of argumentation toward an acceptable conclusion	Activity establishes commitment to put proposals into action	GroupSystems, FacilitatePro, SAMM, Meeting-Works
Reputation	Create a knowledge base for action	Pooling and refining expertise	The best available expertise competes to answer questions posed by those who need an answer	Experts Exchange,

Table 2: Models of Communication in GroupWare Applications

This schema illustrates the possibility for articulating ontologies of interaction that further understanding of communication as an object of design. The table illustrates how the technologies to aid decision-making communication differ from each other, thus it is possible to assess the conditions under which a particular type of technology might be most suited. For example, funnelling technologies are well suited for moving a group of people divided over differences of opinion toward a particular course of action. Issue-networking technologies are well suited for promoting sense-making and developing rational commitments. Moreover, it is possible to explain how these technologies differ from ideals for decision-making discourse. For example, relative to the ideal of the rational resolution of differences, issue-networking is the closest procedure to that ideal while funnelling and reputation management each deviate from that ideal. The schema represented in Table 2 has been used by de Moor and Aakhus [MA06] to assess how a community appropriates, rejects, and repurposes technologies to achieve forms of discourse suited to a community's circumstances and their goals for producing desirable intellectual products.

3.2 Criteria for interpreting interactional consequences

Describing how technological affordances offer particular tools for shaping communication is important step in understanding communication design and in realizing the Pragmatic Web. Another important step is to develop criteria for understanding and assessing the usability and usefulness of technologies for communication in facilitating particular types of discourse for communities of users. Four criteria are proposed here:

- (1) Fit: Does the technological intervention match current practice?
- (2) Instrumentality: Does the technological intervention enable the community to achieve its goals and produce relevant outcomes?
- (3) Legitimacy: Does the intervention promote a kind of interactivity commensurate with the values of the community?
- (4) Visibilization: Does the intervention enable a community to recognize existing capacity for action not being used or does the intervention enable the participants to realize new possibilities for action? (The term and idea of visibilization are drawn from [En03]).

These criteria are briefly illustrated by drawing upon a case study of a web-based discussion board implemented by a news organization to support community sense-making of a public policy issue [Aa01]. A threaded discussion application was the key technology provided on a news organization's website. Close examination of the use of threaded discussion revealed that while this usage provided the sponsor with apparent neutrality in the discussion, the neutrality had negative consequences for the discussion quality. The implementation did not *fit* with current practice of the participants. The participants typically engaged in question-answer dialogues but could not get any representative of the news organization to engage them on the key questions the participants had about a news story published by the news organization. The implementation had minimal *instrumentality*, at least from the perspective of the online participants because the interaction did not enable them to verify important assumptions in the news story or to ascertain the implications of the news reported. Moreover, the online discussion focused on the credibility of the news report. That focus was based on potentially mistaken conclusions formulated by the participants that could have easily been explained by the news organization. The *legitimacy* of the implementation was also in doubt since the participants were expecting something more like a debate that would test the merits of the news story but all they were able to do was to vent their frustrations and rant about their complaints. Finally, in terms of *visiblization*, the implementation failed to contribute to the formulation of grounds for collective action but instead generated a cynical discussion among the participants that diffused any possibility for further examination of the very issue raised by the news organization.

The potential for developing ontologies of interaction and criteria for interpreting interactional consequences illustrated in this section is an important next step in understanding the design of communication with web-based technologies. The emphasis is on understanding interactivity and how people craft and sustain particular types of activity with technological tools.

4 Conclusion

Pragmatics is a metaphor for conceptualizing the *Pragmatic Web*. The metaphor makes good sense, especially if one takes language to be the ultimate "technology" yet to emerge for communicating. The metaphor usefully highlights important matters in understanding the web and making the web useful. The distinction highlights how web artefacts, like documents and links, are instruments embedded in broader systems of action and interaction and how web artefacts are related to each other in ways that convey meaning beyond the artefact itself.

The metaphor highlights how the pragmatic web is an evolutionary step that progresses from the successes and limitations of the syntactic and semantic web much like the way linguistic pragmatics arose from the success and limitations of linguistic semantics. Moreover, the metaphor projects an agenda for discovery, theory and practice. This agenda lies in making the metaphor real by developing meta-language for talking about the pragmatic layer of the web and in applying that meta-language to describe the relationship among people, their tools, and the activities in which they engage. In so doing, the *Pragmatic Web* contributes to a better understanding of and a more useful web but will also contribute to the broad understanding of Pragmatics as the study of sign systems.

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