Collaborative Reflection: Long-Term Sensemaking in Health Services

Abstract
Fieldwork in health service settings has mainly explored collaborative sensemaking as a short-term activity. However, not all providers perform sensemaking in order to make time-critical decisions that could be the difference between life and death. In this paper we present fieldwork that reveals long-term sensemaking. We use the term collaborative reflection to distinguish this type of sensemaking. We discuss how (1) the features of an organization, and (2) the long-term nature of services, affect sensemaking activities and make collaborative reflection a new and unique concept. The goal of this theoretical framework is to inform the design of different classes of systems for different types of sensemaking activities.

Introduction
Sensemaking is the process of constructing an understanding by piecing together information, and “making sense” of the aggregated information. The outcome of sensemaking is generally decision-making based on the understanding gained, and action based on that decision. Sensemaking has been discussed in the literature of various disciplines, especially since Weick’s seminal work Sensemaking in Organizations [18]. In this paper, we take a similar organizational perspective (rather than cognitive or individual) and thus refer to collaborative sensemaking.

Gabriela Marcu
HCI Institute
Carnegie Mellon University
Pittsburgh, PA 15213
gmarcu@cs.cmu.edu

Anind K. Dey
HCI Institute
Carnegie Mellon University
Pittsburgh, PA 15213
anind@cs.cmu.edu

Sara Kiesler
HCI Institute
Carnegie Mellon University
Pittsburgh, PA 15213
kiesler@cs.cmu.edu

Madhu C. Reddy
College of Information Sciences and Technology
Penn State University
University Park, PA 16802
mreddy@ist.psu.edu
In health services, collaborative sensemaking has typically been viewed as a short-term process. Health service organizations are often required to make time-critical decisions (e.g., scheduling and coordination of resources [1], handoffs [3]), and some can have life-threatening consequences (e.g., surgery [2], trauma resuscitation [5]). Much of the literature has focused on the need to provide sensemaking support for this type of short-term sensemaking, when quick decisions can mean the difference between life and death.

Our fieldwork in behavioral and mental health organizations revealed a need to support a different type of collaborative sensemaking, which is long-term.

**Fieldwork**

The first kind of organization we studied was a psychiatric clinic. Our focus was on the long-term relationship between a psychiatrist and a patient receiving outpatient treatment for bipolar disorder. We studied three psychiatrists and seven of their patients. Bipolar disorder requires lifelong monitoring and treatment in order to manage and prevent critical episodes of depression and mania. Treatment is also highly individualized. An effective and satisfactory combination and dosages of psychiatric medications for each individual can take years to get right. In addition, psychotherapy and coaching over time can help an individual learn personal warning signs and reduce or avoid critical incidents and hospitalizations.

We also studied seven organizations providing behavioral and mental health services for children with special needs in a special education setting. Children received support—in the form of added structure and integrated behavioral therapy—for developmental, emotional, or behavioral issues including autism spectrum disorders, attention deficit hyperactivity disorder, oppositional defiant disorder, and anxiety. Their treatment can be considered long-term because it will take a minimum of several years for progress to be made with treatment. Treatment teams were individualized to the needs of each child, and consisted of a subset of the following: psychiatrists, clinical supervisors, speech therapists, occupational therapists, and behavioral specialists.

Due to the long-term nature of treatment at the organizations we studied, sensemaking was ongoing and informed frequent decisions about the course of treatment. In the following section, we describe the qualities of the organizations, and how the long-term sensemaking we observed differed from short-term sensemaking in the literature.

**Loosely vs. Tightly Coupled**

The organizations we studied were loosely coupled in order to provide individualized and long-term services. A loosely coupled organization lacks rigidly defined roles and formal ties, so collaboration occurs informally as needed to serve the needs of its clients (see Table 1). As a result of these qualities, technology tends to be unavailable or problematic for supporting services. Indeed, we observed a lack of technology adoption due to a need for flexibility and adaptability which only paper has been able to provide.
In contrast, a tightly coupled organization involves formal ties that prescribe coordination and collaboration. Due to the qualities outlined in Table 1, technology can be well defined for this kind of organization, including decision support systems for deductive logic, and electronic medical records for standardization.

Tightly coupled organizations are by nature more suited for information technology. Although loosely coupled organizations involve variation and complexity that make problems and technology difficult to define, we argue that it is possible to design systems to fit sensemaking in these organizations, and there is a potential for high impact.

<table>
<thead>
<tr>
<th></th>
<th>Loosely coupled</th>
<th>Tightly coupled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptable</td>
<td>Adaptive to individual and environmental needs</td>
<td>Less adaptive</td>
</tr>
<tr>
<td>Logic of service delivery</td>
<td>Inductive; services are customized for individual needs and malleable over time</td>
<td>Deductive; deduces individual needs based on an assessment and delivers services according to protocol</td>
</tr>
<tr>
<td>Innovation</td>
<td>Promoted because small and relatively powerless units of the system must respond in new and better ways to environmental pressures</td>
<td>Rigidly defined roles can stifle innovation; high potential for developing and diffusing innovation once it is standardized</td>
</tr>
<tr>
<td>Technology</td>
<td>Problems are difficult to define and standardization is avoided, so technology is unavailable or problematic</td>
<td>Problems and technologies are well defined</td>
</tr>
</tbody>
</table>

Table 1. Comparison of relevant qualities of loosely and tightly coupled organizations, adapted from O’Looney [1].

**Effects on Sensemaking**

We found that the long-term nature of treatment in loosely coupled organizations had significant effects on sensemaking. We use the term collaborative reflection to distinguish the sensemaking we observed, which was characterized by the factors described below.

**Inclusion of many perspectives**
The complexity of individualized long-term treatment requires many perspectives from providers with different expertise and knowledge. In addition, with more time available there is increased opportunity to include more perspectives as needed.

**Potential to identify broader trends**
Long-term sensemaking also enables providers to explore large amounts of data and identify trends. For example, psychiatrists were working with patients with bipolar disorder to identify personal warning signs that can help them predict, and therefore prevent, the recurrence of critical episodes of depression or mania. In schools, psychiatrists and clinicians wanted to compare behaviors of students in the same classroom, behaviors of siblings in different classrooms, and behaviors based on period in order to identify behavioral patterns that could inform intervention.
Unfortunately, none of these providers had the tools to support such sensemaking. The only tools available to them were paper data sheets and software that lacked scalability for their client caseloads. They expressed many ideas for how they might look for informative patterns in the data, and noted the limitations of their existing tools, but they knew of no other options.

Challenges of introducing standardization
Standardization in tightly coupled organizations supports sensemaking activities. In loosely coupled organizations, introducing standardization is challenging and can be frustrating for providers, since their focus is long-term. We observed that a long-term focus on services meant that providers were concerned with larger goals, and frustrated with minor tasks that were not, to them, directly connected to those goals. Without defined work roles and protocols, it appeared supervisors and agencies determining new requirements were not realistically taking into account the workload of providers meeting the individual needs of clients based on long-term goals.

Conclusion
This paper defined the concept of collaborative reflection, a type of collaborative sensemaking that is a long-term activity. Table 2 situates the collaborative reflection we observed in behavioral and mental health services among other types of collaborative sensemaking. Collaborative reflection is found in loosely coupled organizations that perform long-term sensemaking. A lack of defined roles within an organization provides opportunities for collaborative sensemaking, as well as unique challenges. In addition, the ability to focus on long-term treatment goals gives providers flexibility to explore data in sensemaking and identify broader trends. Future goals of this work are to develop a deeper understanding of how sensemaking activities are affected by organizational features and a focus on long-term treatment goals.

<table>
<thead>
<tr>
<th></th>
<th>Loosely coupled organization</th>
<th>Tightly coupled organization</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time-critical sensemaking</strong></td>
<td>Social services (child protective services)</td>
<td>Emergency medicine (emergency department)</td>
</tr>
<tr>
<td><strong>Long-term sensemaking</strong></td>
<td>Behavioral &amp; mental health (special education)</td>
<td>Medicine (general practice clinic)</td>
</tr>
</tbody>
</table>

Table 2. Examples of services and organizations based on coupling of organization and temporality of sensemaking.

References