Developing Requirements for Software Design Meeting Support

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Motivation

Meetings are central to software development, thus creating a need for effective support tools. A common meeting type is the repeating, or a **cadence meeting**, which is held on a regular basis and that may continue discussion of topics from earlier meetings.

Problems that participants may experience while participating in cadence meetings:

- Falling out-of-date on key information regarding an issue as new details arise between the initial conversation and subsequent meetings.
- Forgetting important prior-decisions, or make decisions based on incorrect information
- Underreporting updates, making it more difficult for other teams to recreate solutions
- Working with a team that has different understandings of the issue due to lack of, or outdated, information, making them ill-prepared to address problems as a group in a timely and efficient manner.

Important information from a prior cadence meeting **may not be easily accessible** to meeting participants in the future. Meeting participants are at risk of making ill-informed decisions due to the lack of recorded information, disorganized information, the inability to effectively search through archived meeting material, or oversaturation of irrelevant information.

Objective

Information that meeting participants believe is important, and may want to reference later, is called an **Important Design Bit** (IDB). Last summer, we began our study by tracking the flow of information in a series of design meetings, analyzing the tool usage, missing and requested information, updates, new or recurring issues, and more.

Our partners at UC Irvine developed a prototype for the capture of IDBs during meetings called **KnoCap** (Knowledge Capture). Just as vital as information capture is information retrieval, and we began to explore how we could extend KnoCap to retrieve captured information in future meetings.

The full helpfulness of IDB capture can only be realized if there is an effective way for participants to review previously recorded IDBs. The need to review information can arise in a variety of different scenarios, and with different levels of urgency, such as an in-meeting information request, or a preemptive review.

Competitive Analysis

In order to make an educated approach before creating the requirements for an information retrieval program to compliment KnoCap, we created a competitive analysis report of 15 different products to brainstorm system requirements.

Commercial Meeting Software:	7 companies
Commercial Note Taking Software:	3 companies
Research Projects:	5 projects

The report details the functionality, scope, and usability of each approach. After becoming more familiar with knowledge retrieval tools, it became possible to identify general meeting support tools and create a list of features. The features can be used to compare different programs against each other, or against KnoCap, encompassing as full of a range of actions as possible.

Main Features Generated from the Competitive Analysis Report:

(1) Pre Meeting:
- **Pre-Requested**
  - Pre-Meeting Request
- **Meeting Set-up:**
  - Pre-set Agenda Items
  - Participants Invite
  - Create Host Status
  - Planned Host Change
- **Previous Meeting Review**
  - Prepared Review

(2) During Meeting:
- **During - Pre Recorded**
  - Topic Revisit from Specific Meeting
- **Live**
  - Live Tagging
  - Personal Notes
  - Collaborative Notes
  - Live Meeting Notes
  - Live Host Change
- **Live Information Search**
  - Quick Filter Search
  - Live Catch-up
- **During - After**
  - Follow-up Request in Meeting

(3) Post Meeting:
- **Revision**
  - Revise Old Notes
  - Add Content Post Meeting
  - Group Messaging
  - Personal Notes- post meeting
- **Review**
  - Short Meeting Recap
  - Whole Meeting Recap
  - Browse by Topic in Time Frame
  - Search by Topic in Time Frame
  - Previous Participants
  - Meeting Note Access
  - Idea origin
- **Follow-Up**
  - Post Meeting Tag

Requirements

After becoming familiar with the domain, we created a **set of user stories**, a method used to express the actions available to users in the final product during software development, without having to build them out to completion, and that may not have just one strict solution. Stories are separated by time of action.

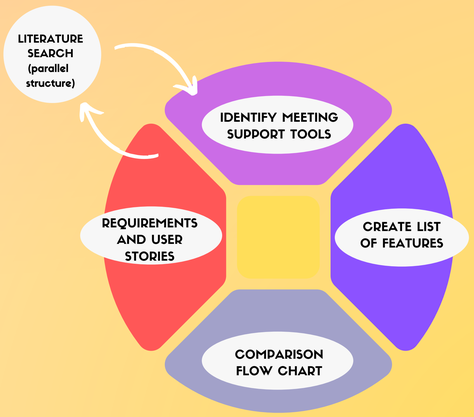
Pre-Meeting:	• Pre-Requested (1 story) • Meeting Setup (9 stories) • Previous Meeting Review (1 story)
During Meeting:	• Accessing Pre-Recorded Information (1 story) • Live Action (15 stories) • Live Information Search (9 stories) • Information Recorded Live to be Used After the Meeting (2 stories)
After Meeting:	• Revision (1 story) • Review (8 stories) • Follow up (1 story)

Total: 48 Stories

User Stories have the same sentence structure describing role, action, and intent, with the format:

"As a __, I want to __, so that __."

For Example: "**As a** meeting participant **I want to** easily add photos and annotations taken during a meeting, or under review, **so that** I can share any additional meeting notes or visual cues holding information. "

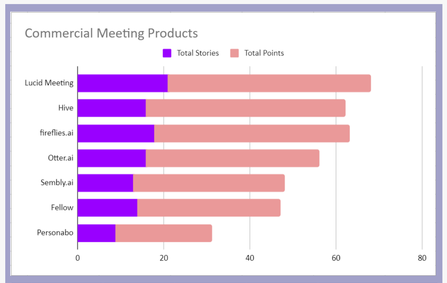


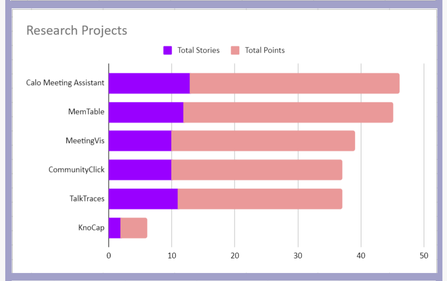
The user stories will serve as the **initial software requirements for a new meeting support tool that will extend KnoCap** so that it can manage both the capture and use of IDBs in software design meetings.

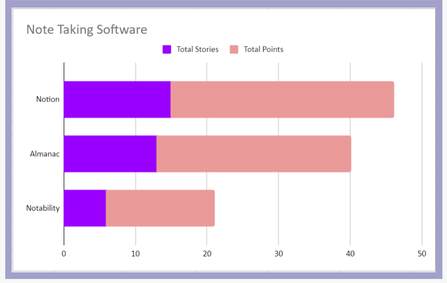
The process for creating the full set of user stories was neither linear nor circular, but rather a continuous process with multiple phases. The first step was to identify meeting support tools, which originated in the competitive analysis report. From the competitive analysis, a list of features was created to help brainstorm requirements. User stories were created from the gaps and trends in the competitive analysis, detailed in the comparison flow chart. As more applications were identified, the process 'restarted' as the tools in the program are documented, new user stories were created, new requirements formed, and more comparisons are made.

Information regarding meeting types, cadence meetings in particular, and other literature on information retrieval, following a similar process, helped provide additional context, and was used to develop a Glossary.

Results







A competitive flow chart created from the user stories, KnoCap prototype, and competitive analysis, was made in order to evaluate the strengths and weaknesses of the different programs compared to each other. **Each general user story was listed as a category for each program, with a rating from 0-3,** with 0 meaning the program lacks that feature, and a 3 for when it fully meets the user story's required function. For missing information regarding a system's available tools, a filler symbol was added so not to confuse a program not having a tool, and our team not having access to whether or not it exists.

The total number of stories present (given a score 1 or above) were tallied into the purple, **Total Stories**. The total number of points, where the scores for each story are added together, is shown in pink as **Total Points**.

The highest scoring programs from their perspective categories were Lucid Meeting (21 stories, 47 points), CALO Meeting Assistant (13 stories, 33 points) and Notion (15 stories, 31 points). The Commercial Meeting Tools on average scored much higher than the other two categories, with the second and third highest scores overall as well as the first, Hive (16 stories, 46 points) and fireflies.ai (18 stories, 45 points) also in the same group.

Conclusion

In the end, there were 26 different requirements in the competitive flow chart, and 48 user stories generated overall. While the Commercial Products on average scored the highest based on the number of user story's met to some degree and the 0-3 point system, the Research Projects and Commercial Notetaking Software provided totally different approaches to information capture and retrieval, contributing to features that may not have been identified from the Commercial Meeting Products alone. While many programs focused on managerial task allocation and employee accountability, there is a lot of potential in the creation of a meeting support tool that focuses on the use and collection of collaborative information, especially for software design teams both in person and remote.

Future Work

Based on this research, the next steps for the project as a whole would be to create a prototype for the information retrieval extension of KnoCap, based on the user stories and requirements. After the new prototype has been made, it can then tested for usability, and more meetings can be analyzed.

Research Questions for Further Exploration on this topic include:

- What are the differences in individual and group note taking?
- How might a viewer might react differently when they can see IDBs recorded by others, and when they can only see their own?

Acknowledgements

This work was supported by the National Science Foundation under Grant No. CCF-2210813 and the Colorado College Student Collaborative Research Grant

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Special thanks to our contributors at the University of California, Irvine: André van der Hoek, and Adriana Meza Soria.