



Knowledge Depot is a system for capturing, organizing and redistributing information generated in software development. It captures important project information, much of which may otherwise be lost. The system has two aspects: Group Memory and Project Awareness.

Group Memory: Project information in software development is often lost soon after it is generated. This information could be used at a later time to support design decisions. For example, discussions carried out over email contain important design rationale that are easily lost. Knowledge Depot provides a group memory that stores and organizes this information for later retrieval.

Group Awareness and Coordination: Project members need to be aware of changes in aspects of the project that affect their work. Knowledge Depot automatically redistributes project information as appropriate to concerned parties. This helps insure that all decisions and design changes are propagated to affected project members.

① **Topic Browser:** Hierarchical topics are used to cross reference the message database. Users select a topic from the topic browser to view a message list. This example shows mail captured from various mailing lists including the edcs mailing lists.



② **Subscriptions:** Users who want to remain aware of the new information which arrives in certain categories can select the category followed by the "Subscription" command. They then specify how frequently they want to be sent reports of new information. They can also specify whether those reports will be sent as HTML or plain text. HTML reports link summaries to the information being summarized.

Benefits

Knowledge Depot can be used to obtain the following benefits:

- Capture, organize and archive project information
 - Design rationale
 - Project history
 - Documentation
 - Change notification
 - Status reports
 - Source code
- Improve coordination between project groups
 - Automated notification of change to affected parties
 - Controlled access to information via web interface
- Help users process information
 - Reduce junk mail broadcast to entire project
 - Increase quantity of relevant mail
 - Eliminate need for users to organize project mail

③ **Message List:** Category names are used to calculate which messages belong in the category. These messages are displayed in the Message List. The list currently includes standard header information, with additional comments added by users after the message is sent. This added information can be used to change how the message is categorized or to tell users more about the contents.



Information Organization

Information is organized around a topic hierarchy and categorized based on the message header (subject, author and recipient). The name of a topic is used in most cases to determine which messages enter that topic.

On the previous page, any message containing "edcs" in the To or Cc lines enters the "(To)edcs" topic. If the message also has either "Quarterly Report", "QR" or just "Report" in the subject, then it can enter the sub-topic "Quarterly Report, QR, Report". A message will be found in all of the categories it matches, allowing it to be found in whatever topic the user happens to be thinking in terms of. A user can find the message on Accomplishment Reports (shown on the previous page) by looking under either "(From)Taylor" or in "Quarterly Report" depending on how the user is approaching the problem, and what the person already knows about the information being sought.

The topic hierarchy can evolve over time as the nature of the group's work evolves. New topics can be added, old topics removed, and existing topics can search for new keywords. The words people use to describe specific concepts can change over time, and the system needs to adjust to this. Therefore, messages are automatically reorganized to match the new hierarchy.

Information Redistribution

Automatic message categorization allows us to automate information redistribution. Users subscribe to topics that are of interest to them and are sent summaries of all information that these topics capture. Technical writers and managers may subscribe to the "Quarterly Report" category to stay aware of the progress of each quarterly report and of which researchers have submitted information for that report. A PI might subscribe to "Meeting, Agenda" to keep aware of meetings that may be planned and that may be relevant. A researcher may subscribe to "Paper, Flyer, Present, Talk" to stay aware of papers, presentations and talks that might be worth attending.

The subscription causes the user to be sent periodic summaries of all new information to arrive in the topic of interest. For information important to the user, the user can subscribe to receive daily or weekly reports, while other information they may choose to receive only once every few months.

Project Awareness

Users can subscribe to many different topics, and can set the frequency and detail of information within the subscription. This can therefore be used to maintain a general awareness of many things taking place within their project, a capability that we call "Project Awareness".

Scenarios

Distributed Projects: For distributed projects (whether large such as the EDCS collaboration, or small) the Knowledge Depot provides a central information repository for capturing information, and allowing project members to retain an awareness of project events that are of interest to them.

Change Notification: Software developers often depend on components developed by other development groups. These developers need to remain aware of changes to these components, particularly to the interfaces to these components. Knowledge Depot can do better than that: it can help developers remain aware of plans to make changes before the changes are implemented, and aware of discussions on what kinds of changes are under consideration. This advance notice can allow developers to prepare for changes, and possibly contribute to discussions of what changes are reasonable and needed.

Design Rationale: The Knowledge Depot provides a rich source of design rationale by archiving the emailed communications of developers, as well as their documents, meeting minutes, etc... If properly organized, this information can allow future developers to understand the issues faced by designers, and the context within which various decisions were made.

User Feedback: EDEM is a UCI system that monitors a software application and sends email to its developers reporting various types of failures. Knowledge Depot can be used to capture system generated reports and send summaries of them to the people who need to be aware of them. EDEM users can receive summaries of all reports sent out by all instances of the system being monitored, rather than receive all reports directly.

Work-flow Management: Endeavors is a UCI system for managing workflow. Certain stages of this workflow system involve filling out forms online. Endeavors emails a copy of these completed forms to Knowledge Depot which captures and organizes these forms for later retrieval. The depot can also send out summaries of forms received to administrators who need to monitor progress in the workflow process.

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For Demos, Trial accounts, and
information about Knowledge Depot and
other software of the UCI Evolutionary
Design Environments group, go to:

<http://kdepot.ics.uci.edu/users/kdepot>
<http://www.ics.uci.edu/pub/eden/>
<ftp://www.ics.uci.edu/pub/eden/>

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