# Puget Sound's MARS (Media Asset Retrieval System) Digital Library

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◆ Introduction

The MARS (Media Asset Retrieval System) Project is a collaboration between public broadcasters, libraries and schools in the Puget Sound region to assess the needs of their constituents and pool resources to develop solutions to meet those needs. The Project's ultimate goal is to create a digital online resource that will provide access to content produced by public broadcasters and libraries. The MARS Project is funded by a grant from the Corporation for Public Broadcasting (CPB) Television Future Fund.
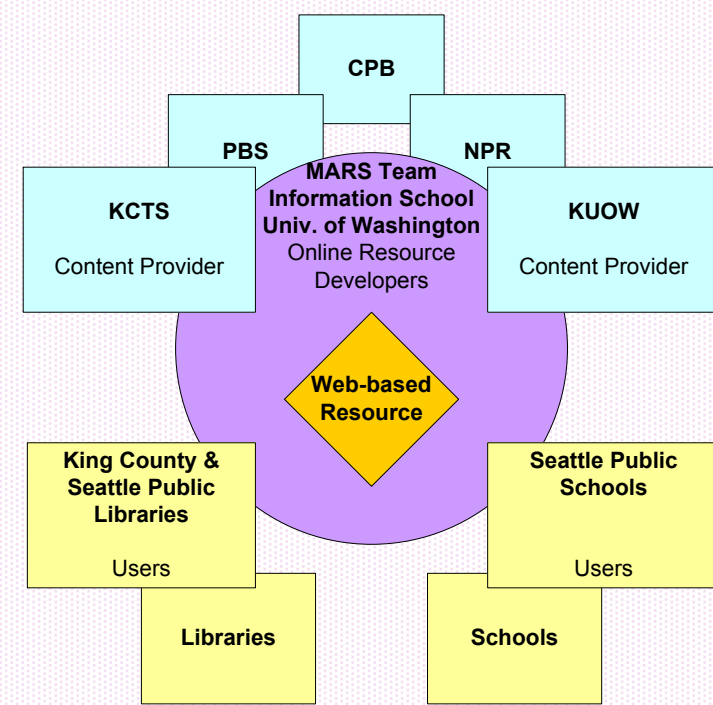
Convergence Consortium

The Convergence Consortium is a model for community collaboration, including representatives from public broadcasting, libraries and schools in the Puget Sound region. They meet regularly to consider collaborative efforts that will be mutually beneficial to their institutions and constituents. Specifically, the archives of public broadcasters have been identified as significant resources that can be accessed through libraries and used by schools, and integrated with text and photographic archives from other partners.

Using the work-centered framework, we collected data through interviews with nine engineers and observation of their searching while they performed their regular, job-related searches on the Web. The framework was used to analyze the data on two levels: 1) the activities and organizational relationships and constrains of work domains, and 2) users' cognitive and social activities and their subjective preferences during searching.
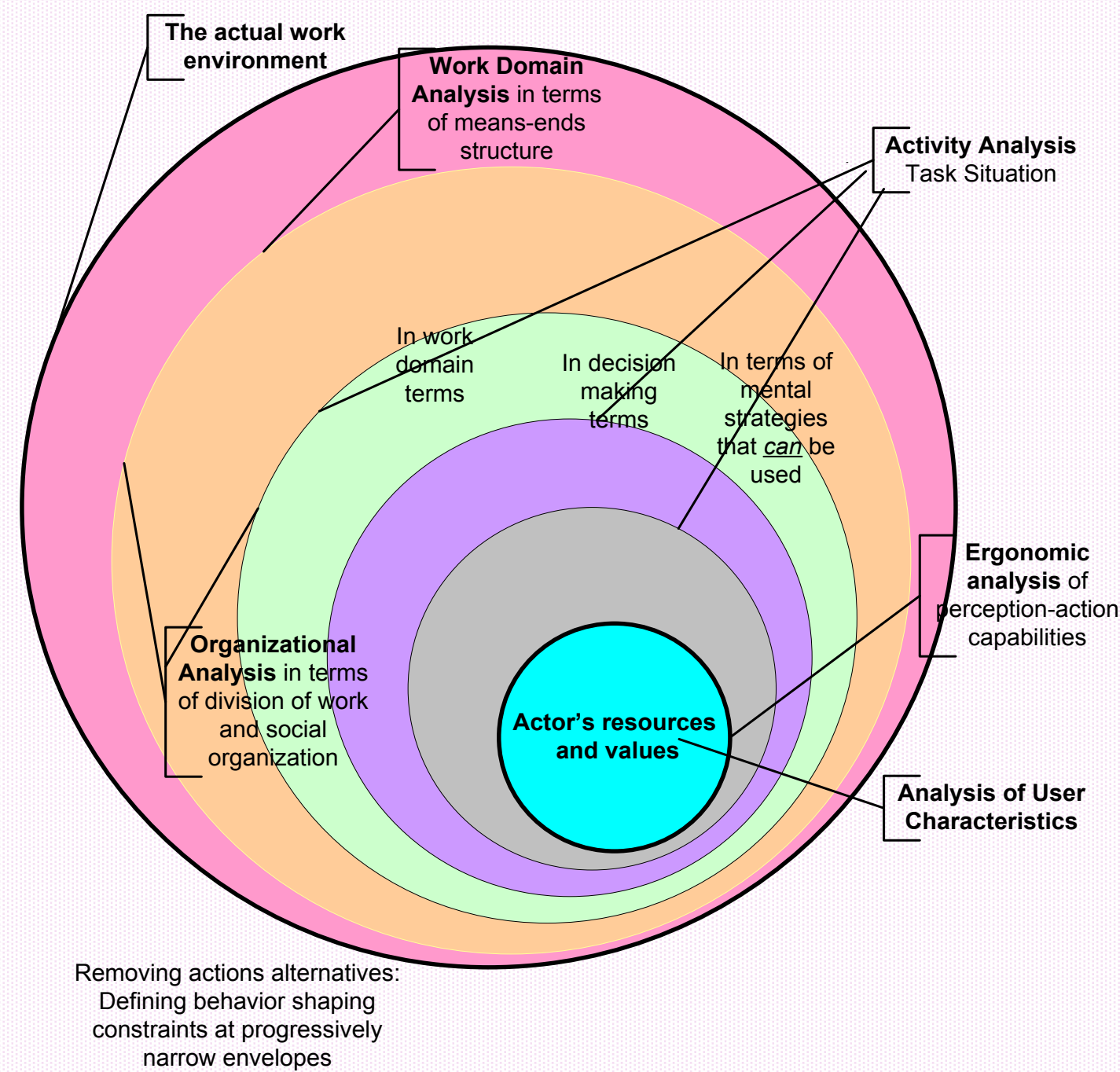
◆ Methodology

The methodology we are using is the work-centered conceptual framework that has been developed by Rasmussen & Pejtersen [1] as a general approach to help information system designers analyze and understand the complex interaction between (a) the activities and organizational relationships and constraints of work domains, and (b) users' cognitive and social activities and their subjective preferences during task performance [1]. The framework is the result of generalizations of experiences from field studies that led to the design of support systems for a variety of modern work domains, such as process plants, manufacturing, hospitals, and libraries.

This work-centered approach to the evaluation and design of information systems assumes that information interaction is determined by a number of dimensions. To facilitate an evaluation, a framework for *cognitive work analysis* is constructed first. This *analysis* addresses dimensions such as:

- the actual work environment
- the work domain
- task situation in terms of (a) work domain, (b) decision making, and (c) mental strategies that can be used the organization in terms of division of work and social organization
- user characteristics, resources and values

Each dimension is analyzed according to four abstraction levels: goals and constraints, priorities, work process, and physical resources.

Conceptual Framework for Cognitive Work Analysis

Removing actions alternatives: Defining behavior shaping constraints at progressively narrow envelopes

The framework for *system evaluation*, which is based on the *cognitive work analysis*, answers questions such as: Does system support cooperative work and coordination? Does system support task repertoire of a work situation? Does system support relevant decision task? Are all relevant strategies supported? Does presentation match sensory characteristics? The answers to these questions are based on the data collected during the *cognitive work analysis*, which is primarily descriptive. Thus, *cognitive work analysis* is the framework for data collection, and the *system evaluation* is the framework for data analysis.

◆ Data Collection

Web-based Questionnaire

To gain an understanding of the current state of art in public radio and TV stations with regard to systems for the organization and retrieval of media assets, the Information School MARS team developed a web-based questionnaire that was sent to public broadcasting stations across the country.

Walkthroughs

In order to understand both the structure of a broadcast and the *lifecycle of a broadcast*, the MARS team visited KCTS and KUOW on multiple occasions. The objective of these meetings was to map out the steps that a media asset takes from production to broadcast to archiving, and thereby create an understanding of the lifecycle of a broadcast. These meetings provided insights into the complexity of modern broadcasting stations. They gave context to the proposed system, and prepared us for the individual interviews with KCTS and KUOW personnel.

KCTS Lifecycle of a Broadcast
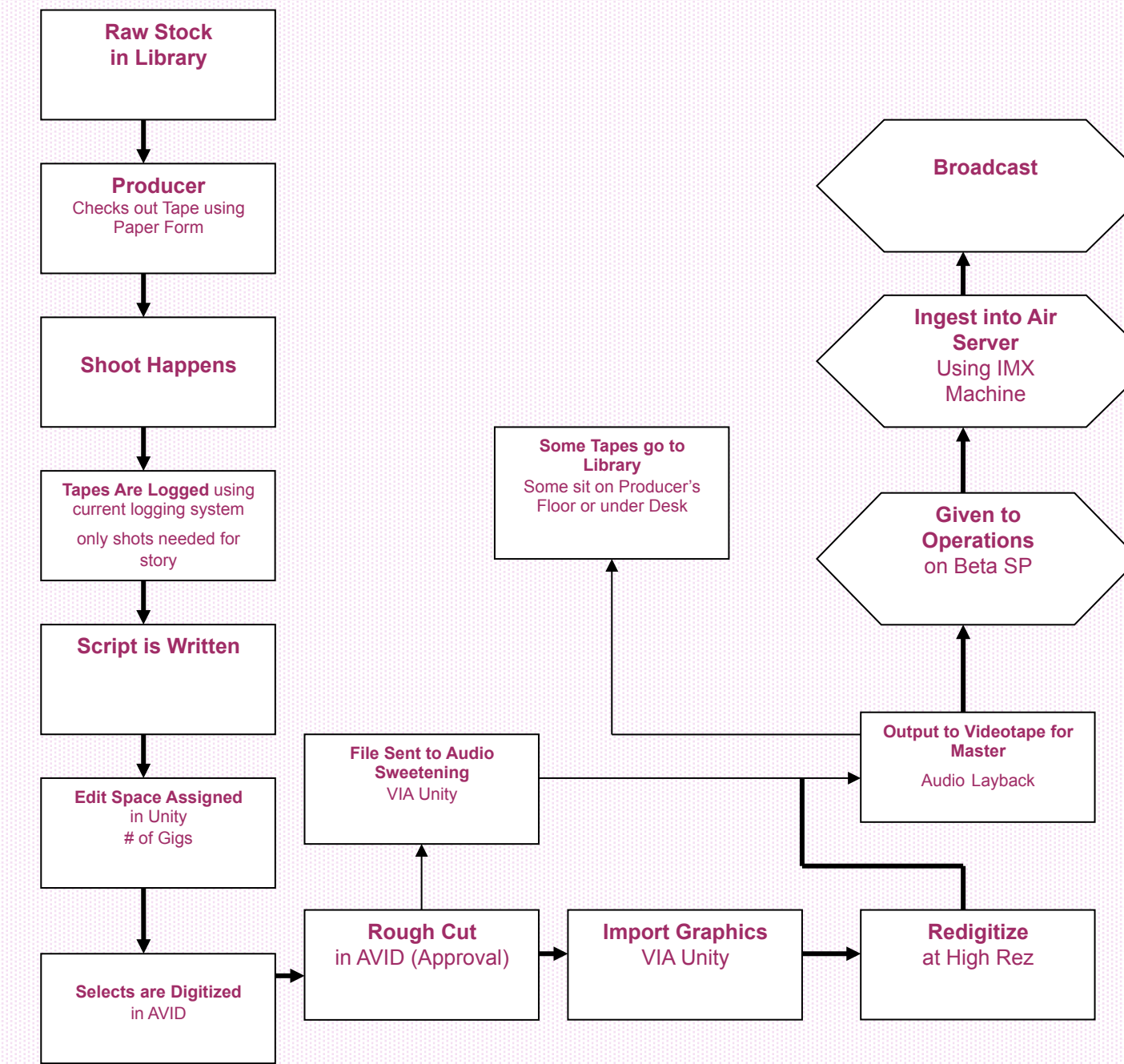
Interviews at KCTS and KUOW

We identified thirteen key people at KCTS and KUOW to interview for the project. The interviews were open-ended using an interview guide developed according to the *cognitive work analysis* framework. All interviews were audio taped and transcribed for subsequent analysis.

Teachers

One of the primary user groups identified for the proposed system is teachers in public schools. To understand the needs and requirements that teachers would have of the system, we conducted a focus group interview with six teachers. These teachers are experts in Information Technology and in a subject area, e.g., science, and their main job is to work with teachers in schools and train/help them with the use of technology in instruction. The purpose of the interview was to understand:

- the level of technology used in public schools
- how technology is used to support classroom instruction
- how broadcast media is presently incorporated into the learning environment
- how broadcasts could be used in the future when the proposed system becomes available.

Further information about the MARS project is available at: http://www.ischool.washington.edu/mars/

◆ Next Steps

We are currently in the process of analyzing the collected data from the KCTS, KUOW, and teacher interviews using the *cognitive work analysis* framework. The framework is used to analyze the data on two levels:

1) The activities and organizational relationships and constraints of work domains.
2) Users' cognitive and social activities and their subjective preferences during searching.

Categories for Data Analysis

- User Characteristics
- Task Situation
- Organizational issues
- Improvements suggested by participants
- Problems identified by participants
- Cognitive decisions
- Mental Strategies
- Preferences

Based on our analyses, we will design a digital online resource that will be interoperable with the future MAM systems of KCTS and KUOW. The system will be built with the funding of phase-II of the MARS project.

Overview of System Architecture
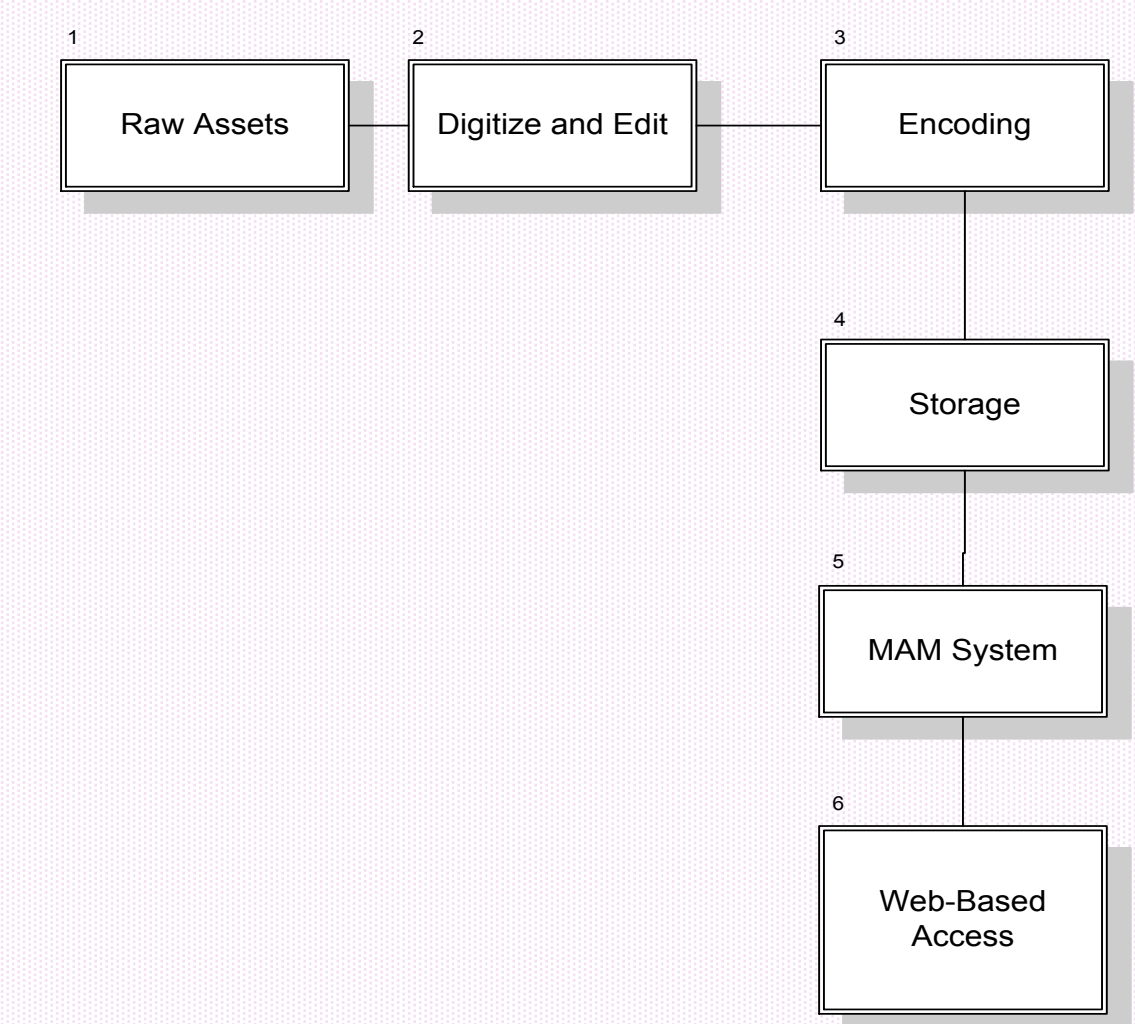
◆ References

1. Rasmussen, J., Pejtersen, A.M. & Goodstein, L.P. 1994. *Cognitive Systems Engineering*. New York: Wiley.