CHIMES-2: A Tool for Automated HCI Analysis

Space Network Control Conference on
Resource Allocation Concepts and Approaches

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OVERVIEW OF PRESENTATION

- COMPUTER-HUMAN INTERACTION MODELS (CHIMES) METHODOLOGY
- CHIMES-2 PROTOTYPE
- CHIMES FUTURE DEVELOPMENT

PURPOSES OF CHIMES METHODOLOGY AND TOOLSET

- FOR FIELDED COMPUTER-HUMAN INTERFACES
  - EVALUATE DEMANDS
  - PINPOINT TROUBLE SPOTS
- FOR PLANNED CHI DESIGNS
  - PREDICT IMPACTS OF DESIGN CHANGES
  - SELECT FROM DESIGN ALTERNATIVES

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CHI-2

CHIMES: A THEORETICAL MODEL OF HUMAN PERFORMANCE

BASIC PREMISES:

- SYSTEMS IMPOSE DEMANDS ON PERSONNEL RESOURCES
  - COGNITIVE
  - SENSORY
  - MOTOR
- OPERATIONAL FUNCTIONS CAN BE MODELED IN TERMS OF A HIERARCHY OF FUNCTIONAL LEVELS AND ATTRIBUTES
- EVALUATION OF DEMANDS ON OPERATORS IS A BASIS FOR IMPROVING HUMAN-COMPUTER INTERACTION

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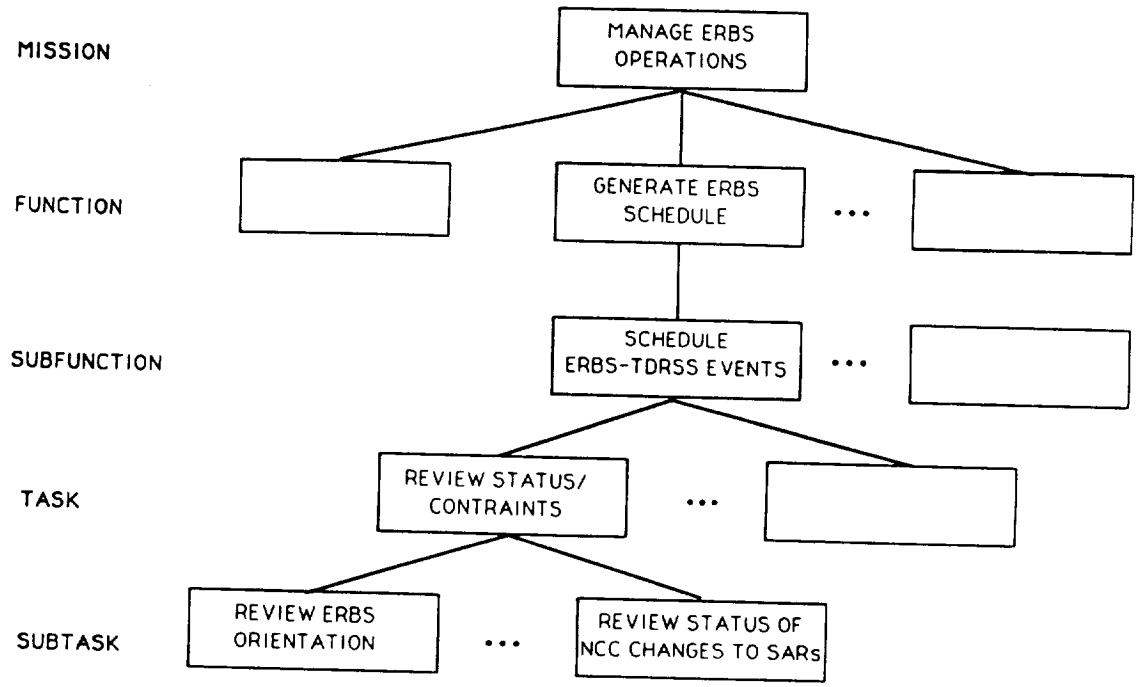
CHIMES: SAMPLE FUNCTIONAL HIERARCHY



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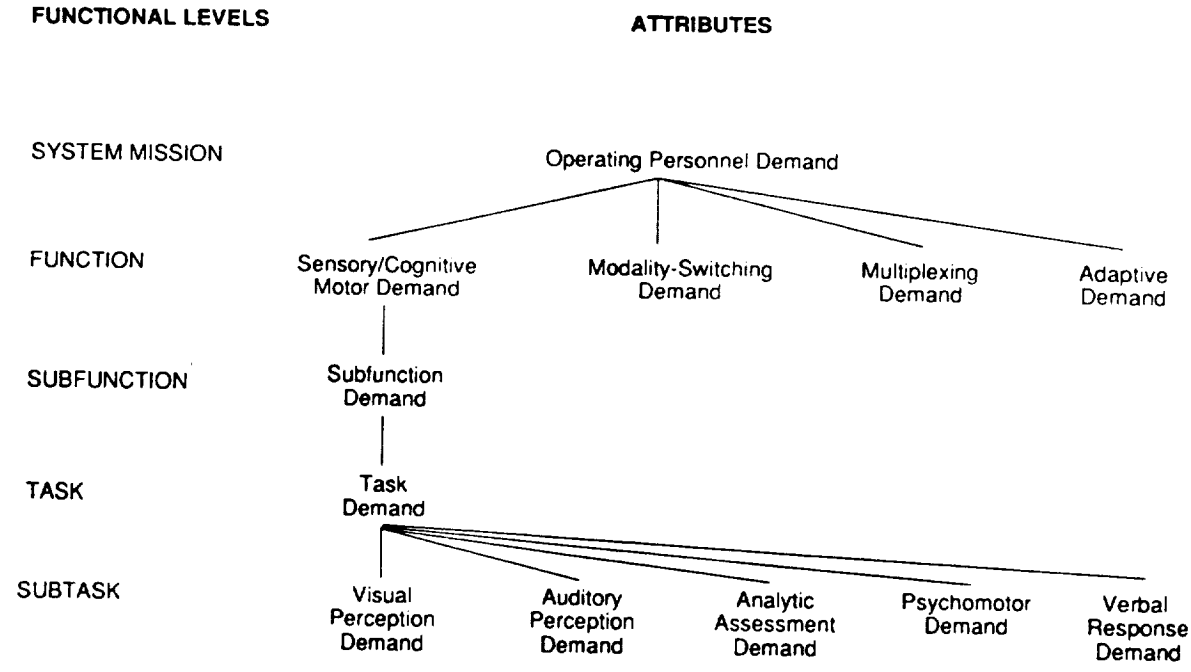
CHI-4

CHIMES DEMAND MODEL: HIERARCHY OF ATTRIBUTES



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CHIMES PROCESS

- MODEL THE OPERATOR'S JOB
- RATE DESIGN-BASED DEMANDS ON OPERATOR RESOURCES: VISUAL, AUDITORY, ANALYTIC, VERBAL, AND MANUAL
- EVALUATE OR PREDICT OVERALL OPERATOR WORKLOAD AND PERFORMANCE)
- IDENTIFY ACTUAL OR POTENTIAL TROUBLE SPOTS (HIGHS AND LOWS FOR WORKLOAD, LOWS FOR PERFORMANCE
- DEVELOP RECOMMENDATIONS TO IMPROVE THE QUALITY OF HUMAN-COMPUTER INTERACTIONS

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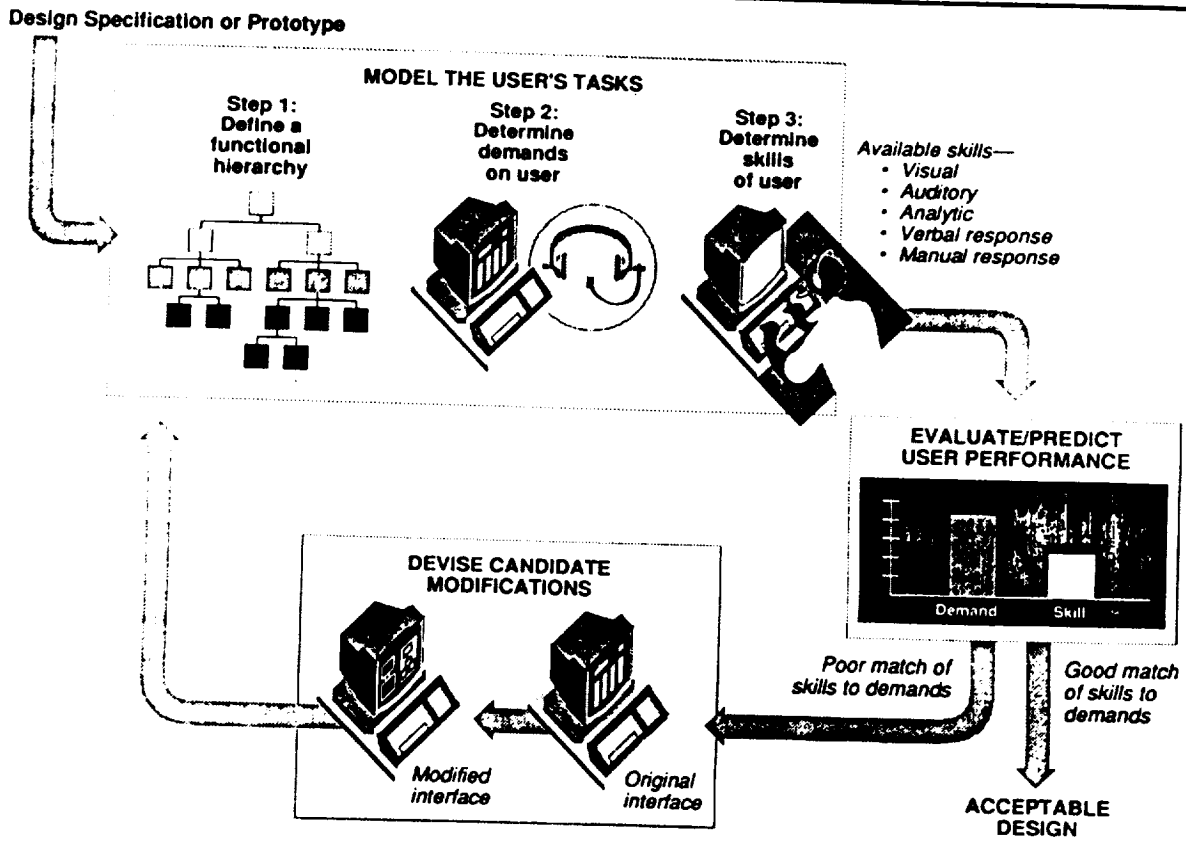
OVERVIEW OF CHIMES METHODOLOGY



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CHIMES-2 PROTOTYPE

- PROVIDE PROOF-OF-CONCEPT FOR CHIMES-2 CAPABILITIES
  - USER-SYSTEM INTERFACE
  - KNOWLEDGE BASES
  - DISPLAY ANALYSIS
  - MODIFICATION ADVICE
  - EXPLANATION FACILITY
- FOCUS ON EVALUATION OF A SINGLE ALPHANUMERIC DISPLAY SCREEN
  - VISUAL DEMAND
  - ANALYTIC DEMAND

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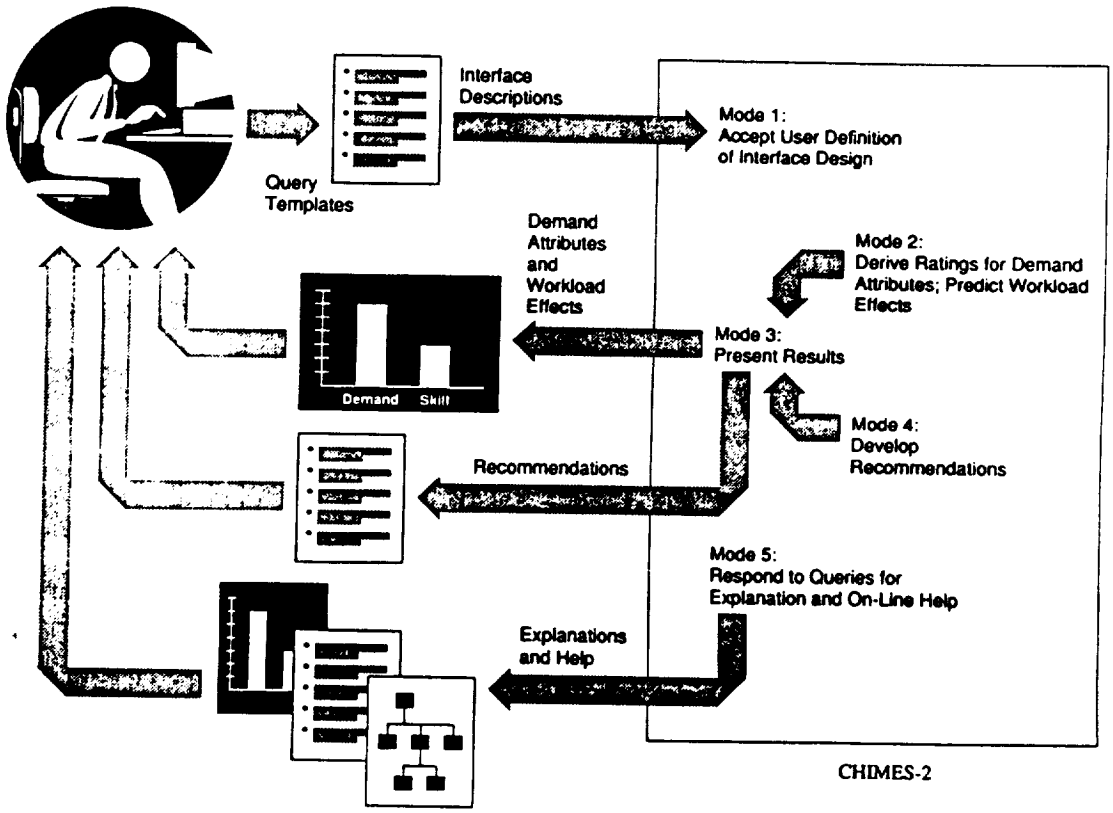
CHIMES-2 PROTOTYPE: SYSTEM MODES



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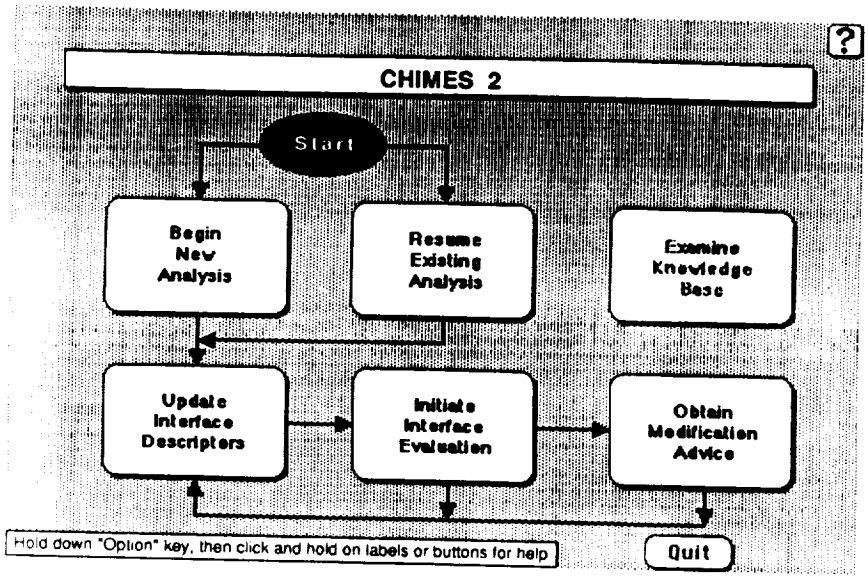
TOP-LEVEL CHIMES-2 SCREEN



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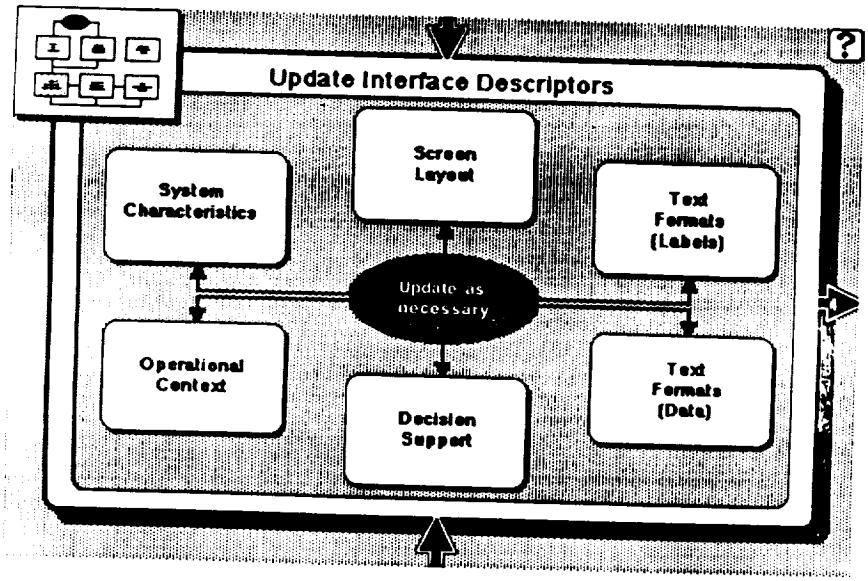
INTERFACE SPECIFICATION SCREEN



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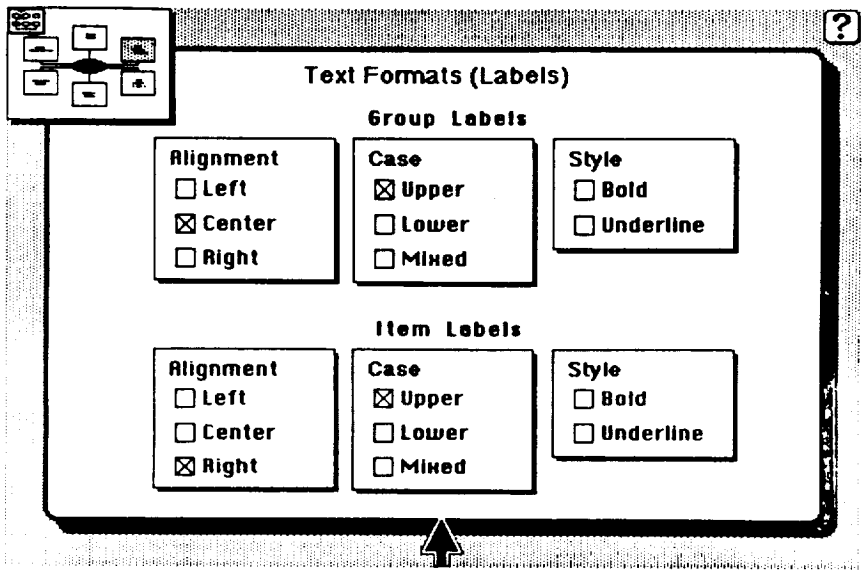
SAMPLE LOW-LEVEL DESCRIPTION SCREEN



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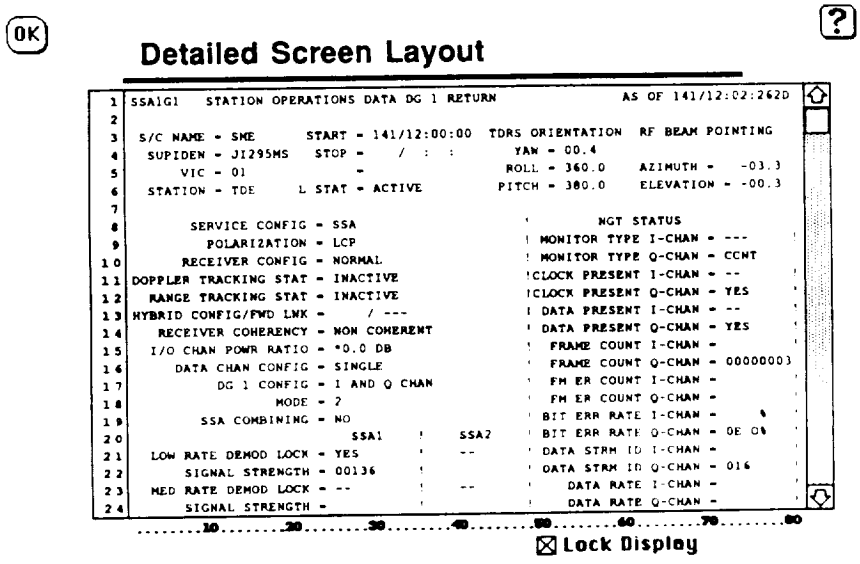
ALTERNATE LOW-LEVEL DESCRIPTION SCREEN



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CHIMES FUTURE DEVELOPMENT

- GRAPHICS/COLOR ANALYSIS CAPABILITY
- REFINEMENT OF CHIMES MODEL
- INTEGRATION WITH INTERFACE PROTOTYPING TOOL
- INTEGRATION WITH REQUIREMENTS ANALYSIS TOOL

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