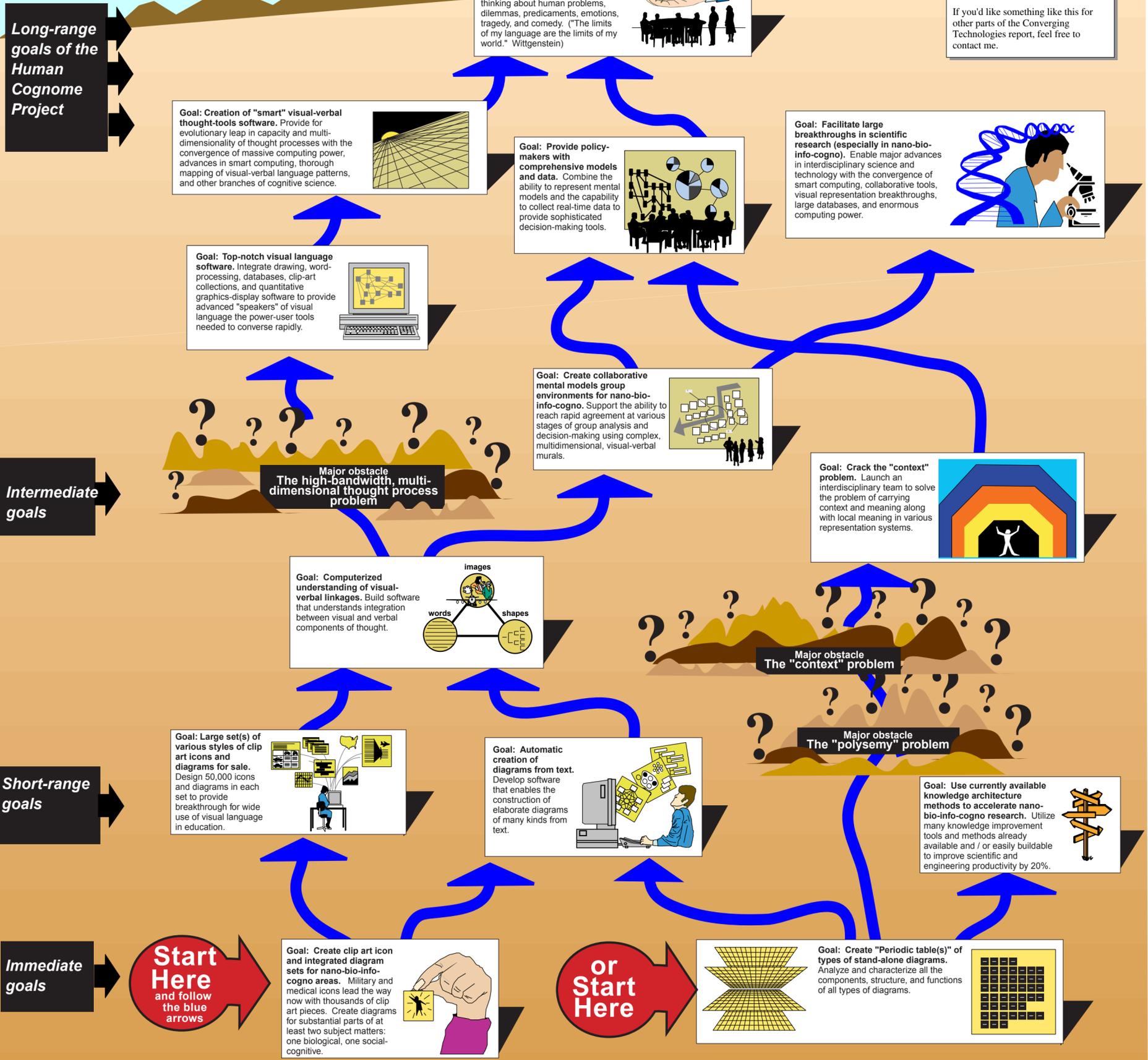# Visual Language Path for the Human Cognome Project (Preliminary Scenario)

(Prepared for the National Science Foundation Workshop on Converging Technologies for Improving Human Performance (Nano-Bio-Info-Cogno) Dec. 3-4, 2001 by Robert E. Horn, Stanford University

Long-range goals of the Human Cognome Project

Goal: Open wide the doors of creativity. Facilitate visual-verbal expression through new ways of thinking about human problems, dilemma, predicaments, emotions, tragedy, and comedy. ("The limits of my language are the limits of my world." Wittgenstein)

Goal: Creation of "smart" visual-verbal thought-tools software. Provide for evolutionary leap in capacity and multi-dimensionality of thought processes with the convergence of massive computing power, advances in smart computing, thorough mapping of visual-verbal language patterns, and other branches of cognitive science.

Goal: Provide policy-makers with comprehensive models and data. Combine the ability to represent mental models and the capability to collect real-time data to provide sophisticated decision-making tools.

Goal: Facilitate large breakthroughs in scientific research (especially in nano-bio-info-cogno). Enable major advances in interdisciplinary science and technology with the convergence of smart computing, collaborative tools, visual representation breakthroughs, large databases, and enormous computing power.

Goal: Top-notch visual language software. Integrate drawing, word-processing, databases, clip-art collections, and quantitative graphics-display software to provide advanced "speakers" of visual language the power-user tools needed to converse rapidly.

Intermediate goals

Major obstacle: The high-bandwidth, multi-dimensional thought process problem

Goal: Create collaborative mental models group environments for nano-bio-info-cogno. Support the ability to reach rapid agreement at various stages of group analysis and decision-making using complex, multidimensional, visual-verbal murals.

Goal: Crack the "context" problem. Launch an interdisciplinary team to solve the problem of carrying context and meaning along with local meaning in various representation systems.

Goal: Computerized understanding of visual-verbal linkages. Build software that understands integration between visual and verbal components of thought.

images
words
shapes

Major obstacle: The "context" problem

Major obstacle: The "polysemy" problem

Short-range goals

Goal: Large set(s) of various styles of clip art icons and diagrams for sale. Design 50,000 icons and diagrams in each set to provide breakthrough for wide use of visual language in education.

Goal: Automatic creation of diagrams from text. Develop software that enables the construction of elaborate diagrams of many kinds from text.

Goal: Use currently available knowledge architecture methods to accelerate nano-bio-info-cogno research. Utilize many knowledge improvement tools and methods already available and / or easily buildable to improve scientific and engineering productivity by 20%.

Immediate goals

Start Here and follow the blue arrows

Goal: Create clip art icon and integrated diagram sets for nano-bio-info-cogno areas. Military and medical icons lead the way now with thousands of clip art pieces. Create diagrams for substantial parts of at least two subject matters: one biological, one social-cognitive.

or Start Here

Goal: Create "Periodic table(s)" of types of stand-alone diagrams. Analyze and characterize all the components, structure, and functions of all types of diagrams.

Components	Visual language	Knowledge architecture and management	Not Mapped: Convergences from Neuro-cognomics	Not Mapped: Convergences from Advances in Computing
Intermediate goals of components	*Provide the thinking and communication templates and tools*	*Provide order out of info-noise*		

Human Cognomics

Note: This scenario map is for illustrative purposes only. Not all convergences, causalities, and synergies have been shown.