GEO 309 – Intro to GIS

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Topics

- Project Planning
- Critical Thinking
- Structured Thinking
- Analytical Thinking

Project Planning

- 85% of GIS Projects FAIL:
  - 87% go more than 50% over budget
  - 45% don’t produce expected benefits
  - 90% go over schedule

Source: KPMG Information Technology, 2007

Project Planning

- Project Definition
  - “Who, What, When, Where, Why, How?”
- Management Plan
  - What are “you” going to do?
  - How are “you” going to do it?

Project Planning

- Project Definitions
  - Detail to level of complexity
  - Set the scope of objectives
  - Delegate tasks and Scheduling
  - Performance benchmarks

- What do you need?
  - Objectives?
  - Partners?
  - Data (Store)?
  - Tools?
  - Skills?
  - Outputs?

Project Planning

- Management Plans
  - Costs
  - Risk management
  - Operations planning
    - Resources
    - Communications
    - Safety planning
    - Contingency planning
  - Quality assurance
- Risk Management
  - Identify
  - Evaluate
  - Estimate
  - Control
- Risk ≠ Contingency

Project Planning

- Quality assurance
  - Part of quality management
  - Evaluation of performance/standardization
  - Ensure quality acceptance
  - Corrective actions
  - CI (Continuous Improvement)
  - Works with operations

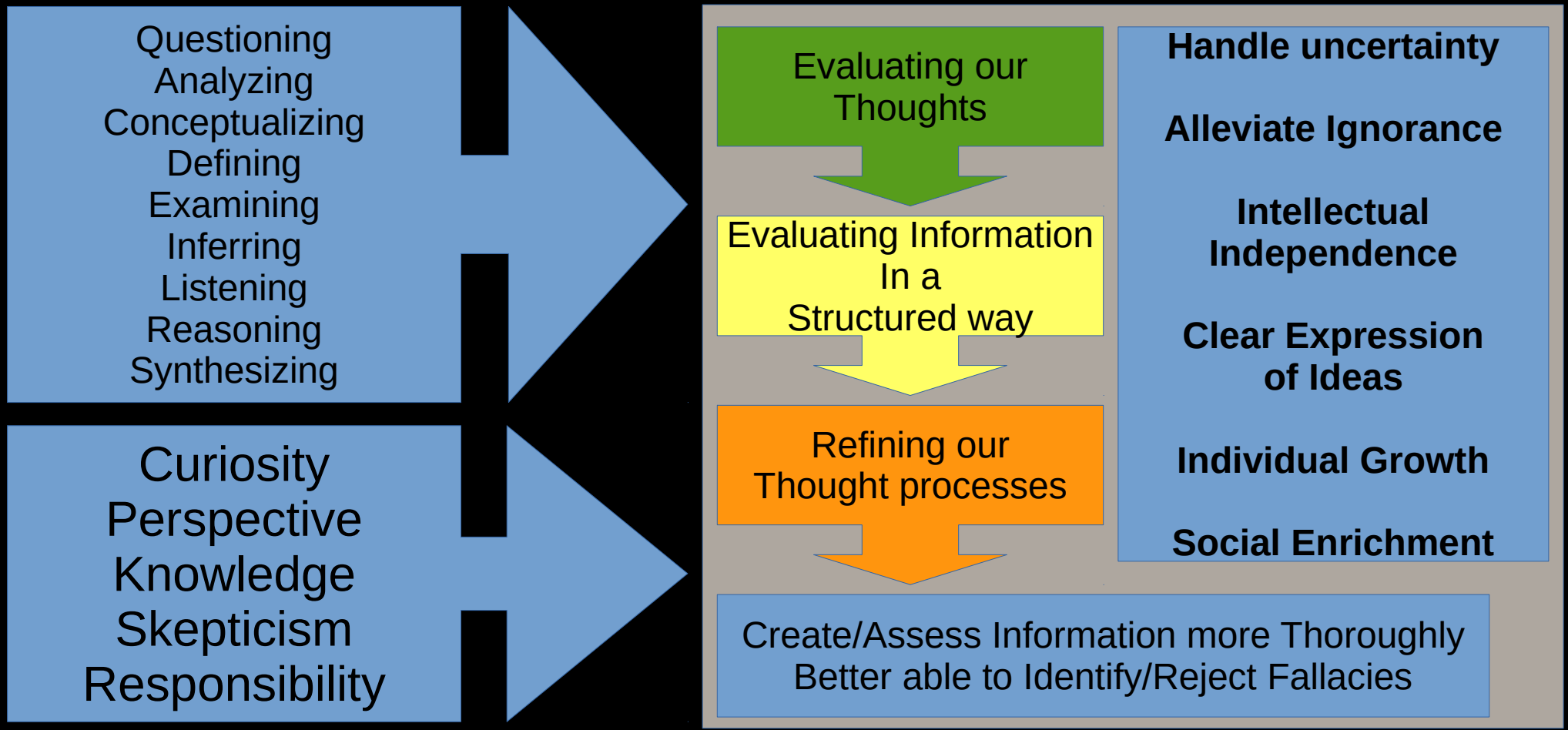
Project Planning

- Communication
  - Very important!
  - Set by operations
    - GIS Manager/Senior GIS Analyst
    - Project Manager
  - Take copious notes
  - Share and share often (when possible)

Project Planning

Questions?

Critical Thinking



Critical Thinking

- Why?
  - Taking time to “think critically” saves you time
  - Facilitates praxis in daily life
  - Skepticism
  - Falsification
  - Fallacy

Critical Thinking

- Deductive reasoning
  - Establish a hypothesis
  - Premises (statements) form an argument
  - A good argument supports the conclusion
    - Solid reasoning
- Inductive reasoning
  - Drawing conclusions from existing data

Critical Thinking

- Necessary Conditions
- Sufficient Conditions
- Backed by research
- Implicit Premises
  - Need examination/explanation
  - Embedded in culture, region, other geographies

Critical Thinking

- Descriptive Claims
  - Expressing an understanding or describing
  - Without a following evaluation
- Normative Claims
  - Statement of an evaluation
  - Without presentation of the rational (usually implicit)

Critical Thinking

- Must be aware of **Fallacy!**
  - …the use of **poor reasoning** in order to **build an argument**
  - **Does not** necessarily mean the conclusion is **false**!
- Many types
  - Formal or informal (poor form or content in systemic logic)
  - Presumptive (conclusion is the proof)
  - Ambiguity (vague support)
  - And on and on...

Critical Thinking

- Considerations
  - Cognitive bias
  - Knowledge & evidence
  - Reasoning and assumptions
  - False dichotomy
  - Embodied metaphors

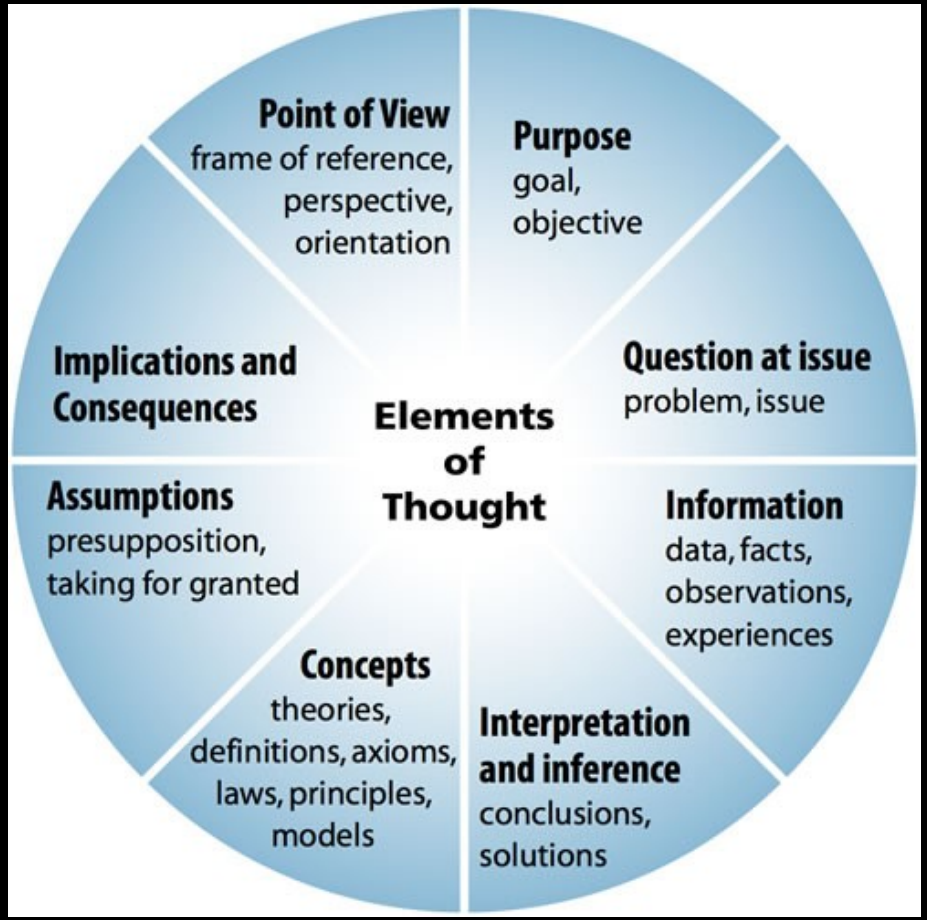
Critical Thinking

Questions?

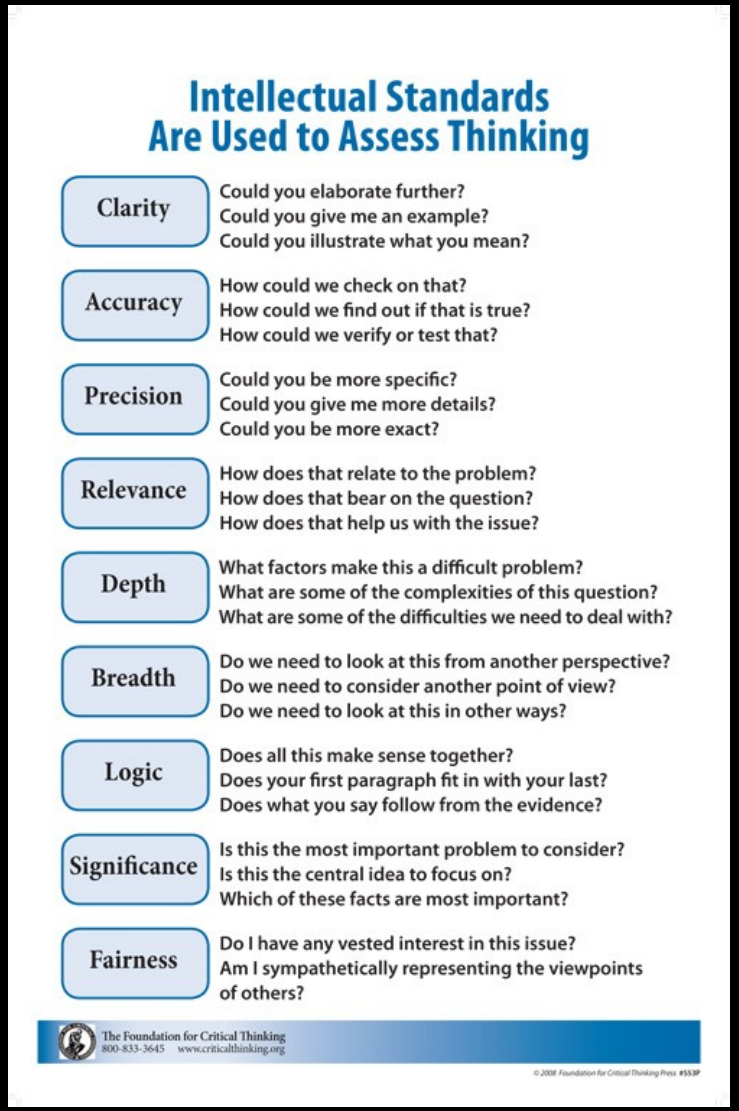
Structured Thinking

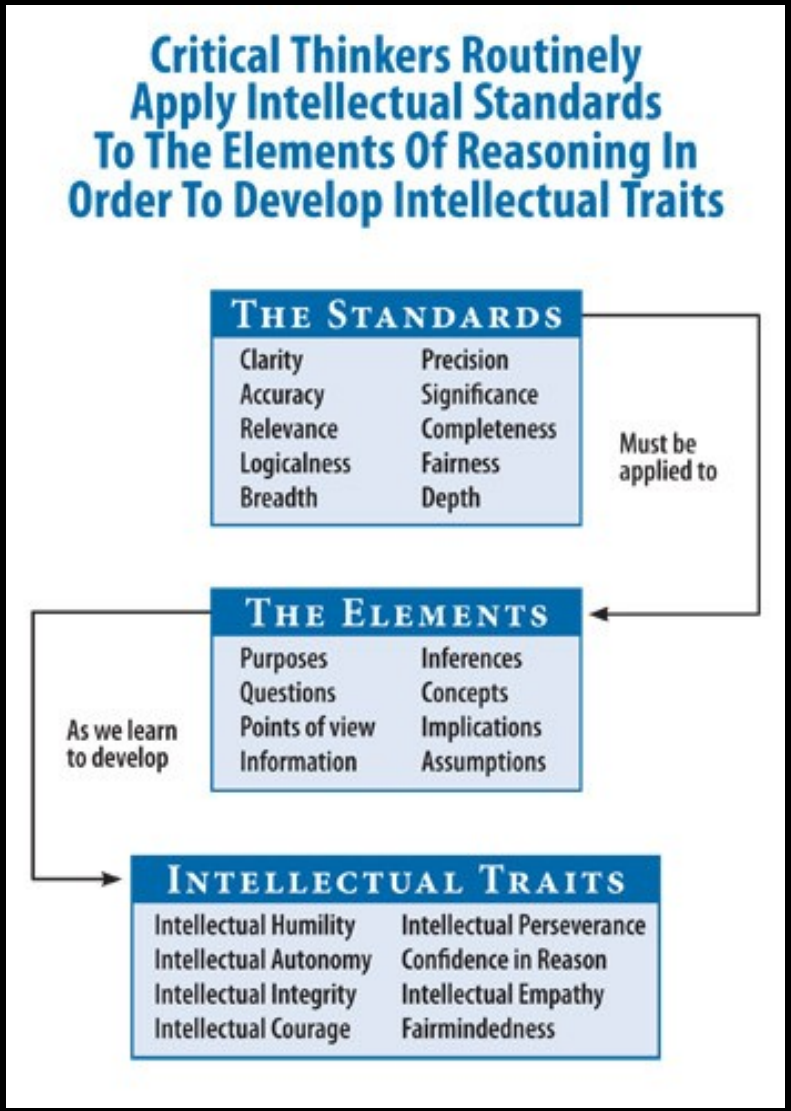
- Deciding to think critically is the beginning
  - In order to make that process better
  - We have to find ways to analyze our thoughts
  - While eliminating/observing biases
- In order to analyze thought
  - We have to look at what composes thought
  - Understand the processes behind our reasoning
  - Establish ways by which to test and reassess thought
  - Find and Include newer data with each iteration
- Question everything

Structured Thinking



Source: Analytic Thinking by The Foundation for Critical Thinking





Source: Analytic Thinking by The Foundation for Critical Thinking

Structured Thinking

- We do this to
  - Structure the problem
  - Overcome subconscious processes
    - Biases, perception, memory, processing
  - Prepare for paradigm shifts
    - The most knowledgeable of us have the most to unlearn
  - Keep you fresh
    - Over time, we become entrenched in daily activity
  - Memory changes over time
  - Fill the information gaps
    - Backed by strong logic and empirical data

Structured Thinking

Questions?

Analytic Thinking

- **Caution!**
  - Don't start with your conclusion; end with it
  - Look at alternate solutions
  - Let the analysis favor the solution; not you
  - Thinking is not analysis
  - Focus on the process of analysis
    - Not the substance
  - When in doubt, ask and ask again
  - Work hard to prove yourself wrong
    - Allow others to do the same
    - Your argument will become stronger

Analytic Thinking

- Problem Restatement
- Pros/Cons/Fixes
- Divergent/Convergent
- Sorting & Time Lines
- Causal Flow Diagram
- Matrix
- Decision Tree

- Weighted Ranking
- Hypothesis Testing
- Devil's Advocate
- Probability Tree
- Utility Tree
- Utility Matrix
- Advanced Utility Analysis