



# Knowledge Representation in Intelligence Applications

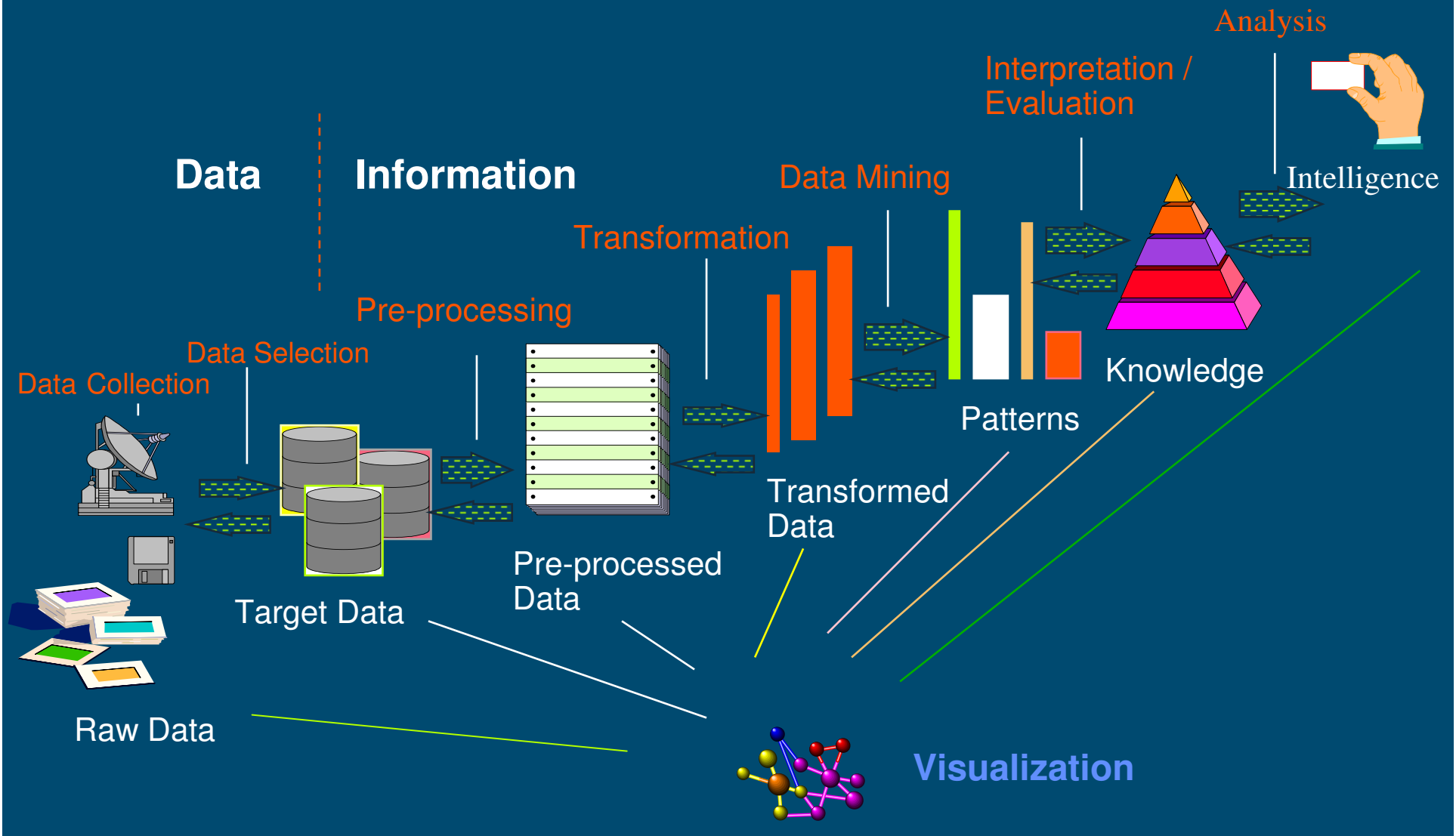
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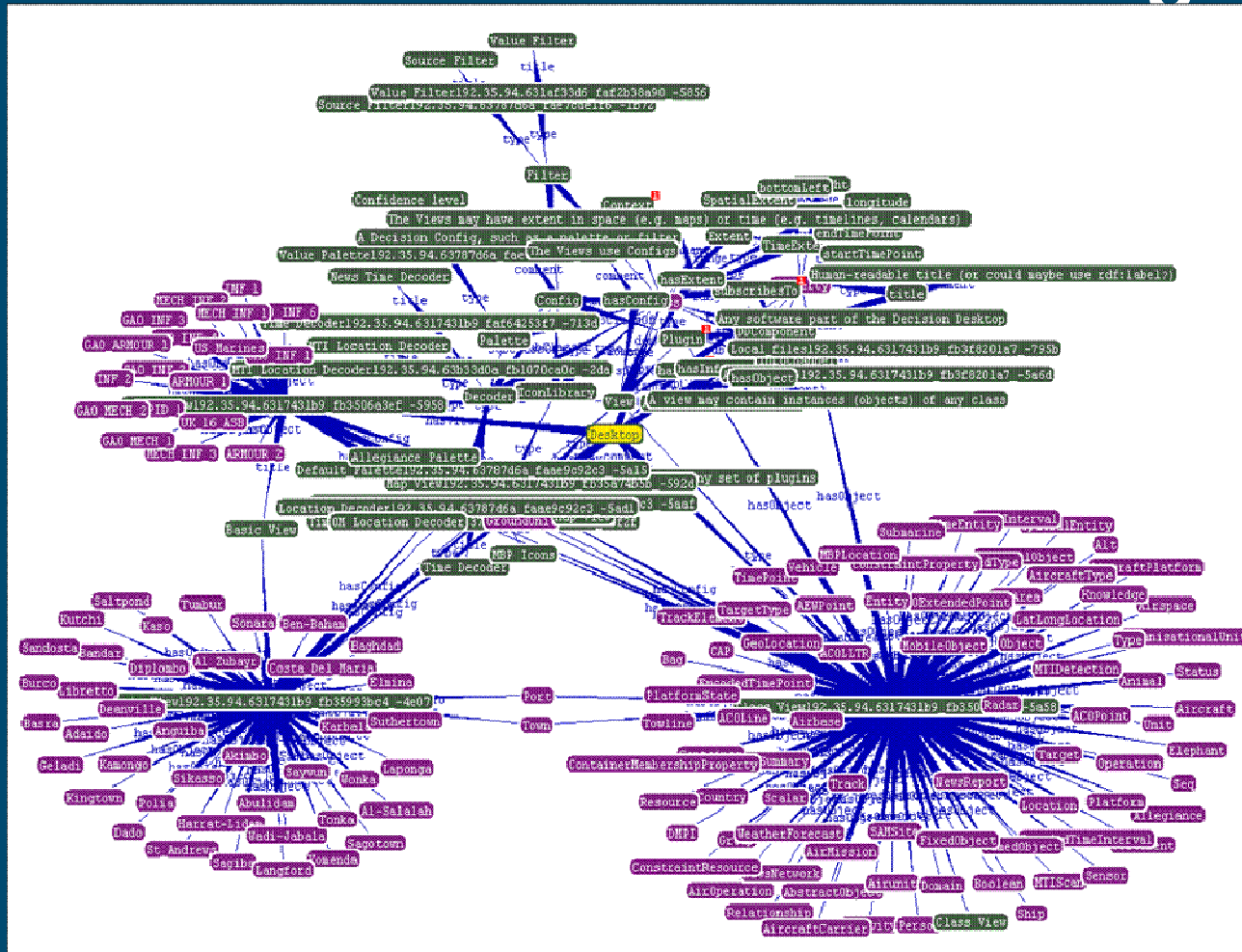
# Introduction

- A problem/data/information can be visualised if it is machine readable
- There are various knowledge representations techniques available for Intelligence applications
- However it is not clear how effectively such techniques or their hybrids:
  - are able to manage an intelligence problem (IP) featuring the fusion of information contained within disparate datasets
  - how to evaluate this

# An Overview of a Information Management Process

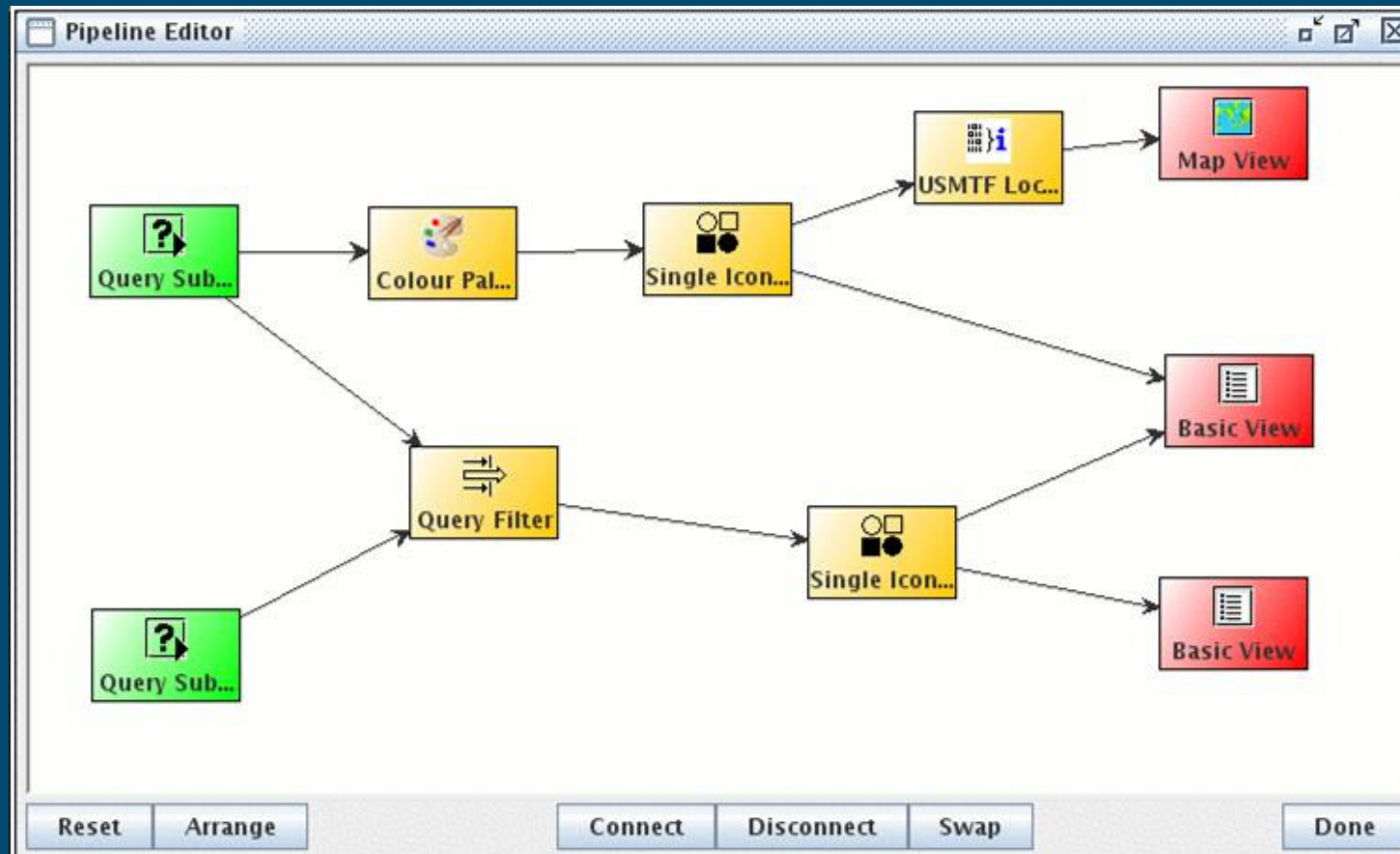


# Multi-source Information Management



*Information from multiple sources can be collected and examined as a unified, interlinked pool*

# Pipeline Editor



The Pipeline Editor allows the user to dynamically configure how information is selected, processed and displayed

# Aim of provocation session

- To investigate:
  - (1) What can be implemented with practical resources now in terms of knowledge representation (KR)
  - (2) If it is possible to handle the amount and variability of data in the form in which it is presently available

# Can an IP be readily mapped onto a knowledge representation?

- Are there formal mappings of the KR techniques and algorithms onto intelligence problem and tasks?
- Is there an a-priori way to know the optimum representation for a particular problem?

# Are Knowledge Representations reusable?

- The complex nature of the intelligence problem implies
  - the need for usability in related but different problems

BUT to what extent can this be achieved



# How to compensate for lack of completeness ?

- For any problem the full truth is unlikely to be known for a variety of reasons which range from errors in observations through to the use of an incomplete model
- It is not clear what is the practical effect and extent of:
  - uncertainty
  - ignorance
  - data incest and
  - data deluge
- How able are current techniques managing imprecise scaling when observations are out of sequence or incomplete

# What benefits can be accrued

For example:

- what can be automatically discovered in intelligence data?
- can automated alerts be generated identifying events and activities together with confidence and priority measures?
- can significant but sparse information be identified from large data sets?
- can discovered data be:
  - effectively presented to and
  - easily interrogated by the analyst,
  - and in what form?



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