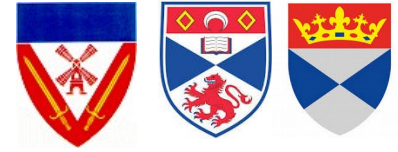


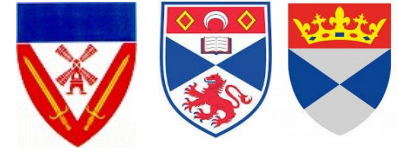
# Synaptic Assimilator

Andreas F. Vermeulen



# Research Question:

What happens when exascale computing executes data processing and computing solutions uses commodity building block and heterogeneous computing processes to convert data into information?



# Exascale Computing:

Exascale computing is systems capable to support over one exaFLOPS of data processing.



# Synaptic Assimilator

The solution is a one million processor ecosystem that processes data sets in the exabyte ( $10^{18}$ ) range and the system uses embedded heterogeneous computing that is assembled by an artificial control system from a range of pre-optimised processing building blocks.



# Rapid Information Factory

The concept of a factory is well known to the world of mass production in manufacturing.

The RIF uses the same principals that is used in mass production in the commodity market to guide the processing of the data into information.





# Rapid Information Factory

The factory consists of two halves:

## Rapid Information Factory Framework

The framework guides the processing of data into information using pre-optimised processes.

## Rapid Information Factory Cluster

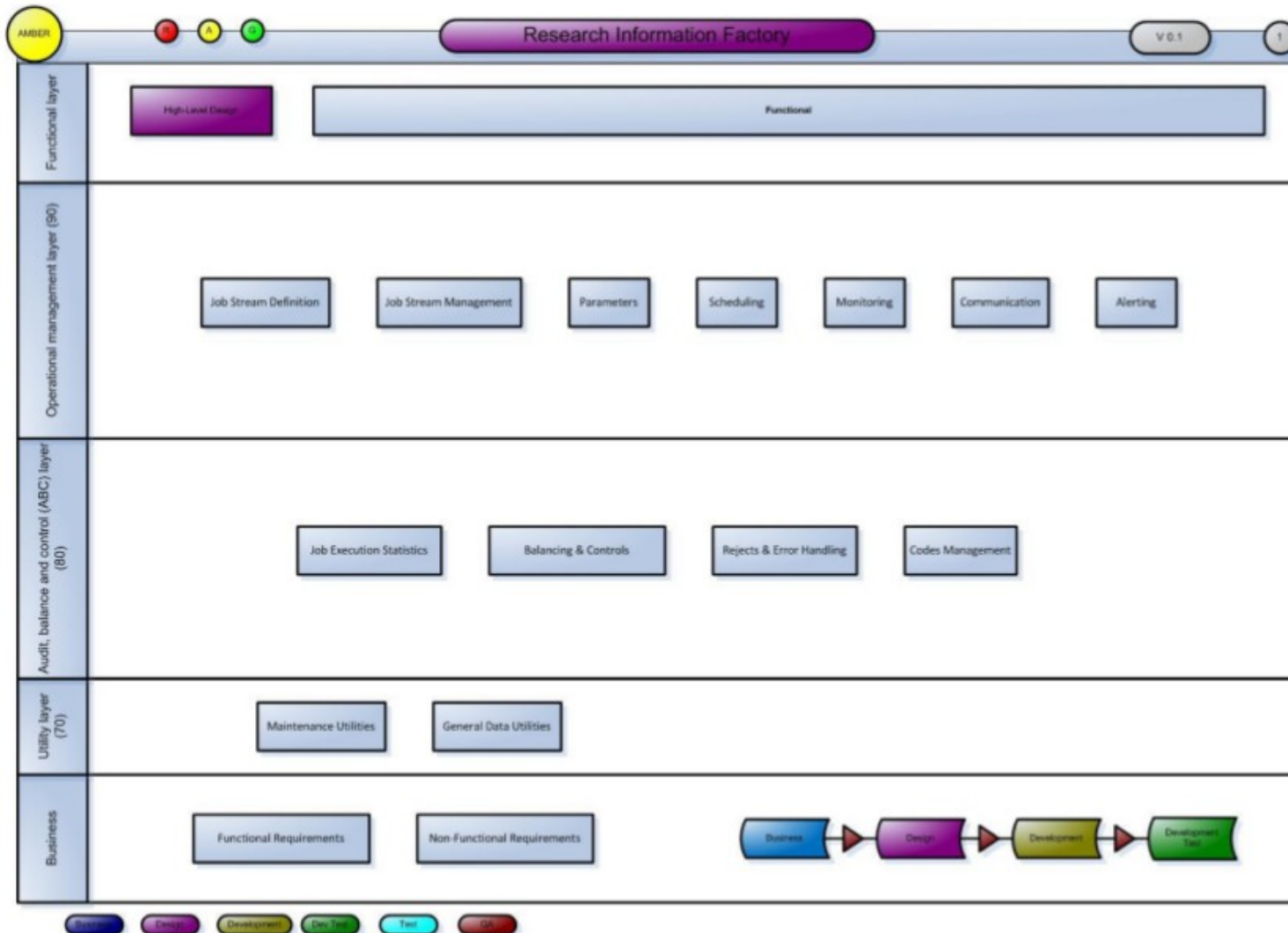
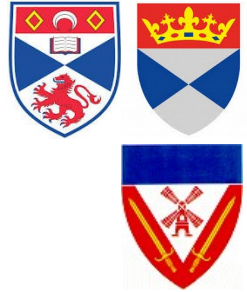
The cluster is a pre-optimised processing solution that is processing the data into information.



# Rapid Information Factory Framework

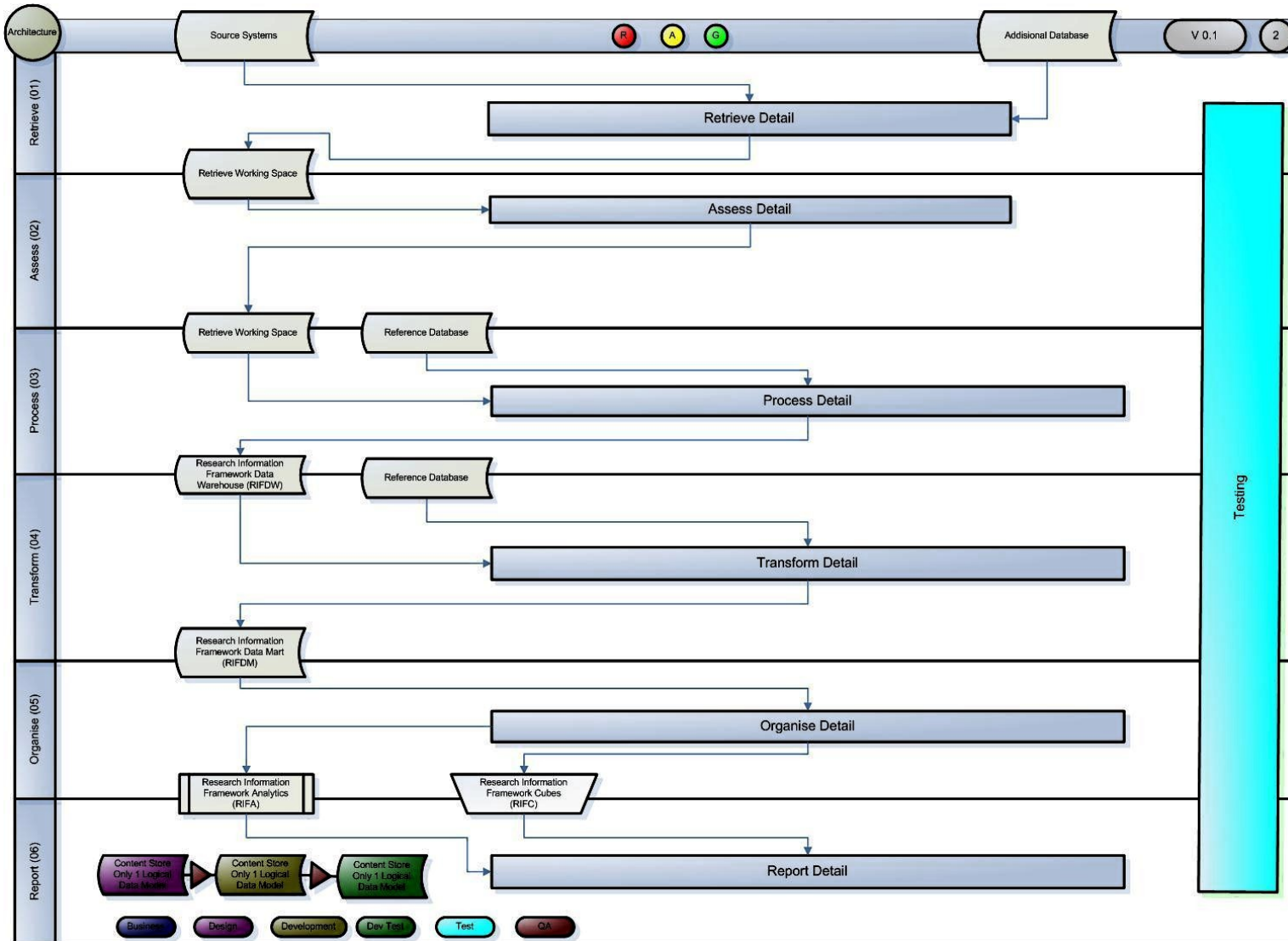
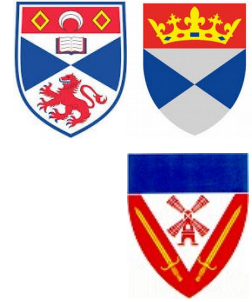
The framework guides the processing of data into information using pre-optimised processes.

# Rapid Information Factory Framework

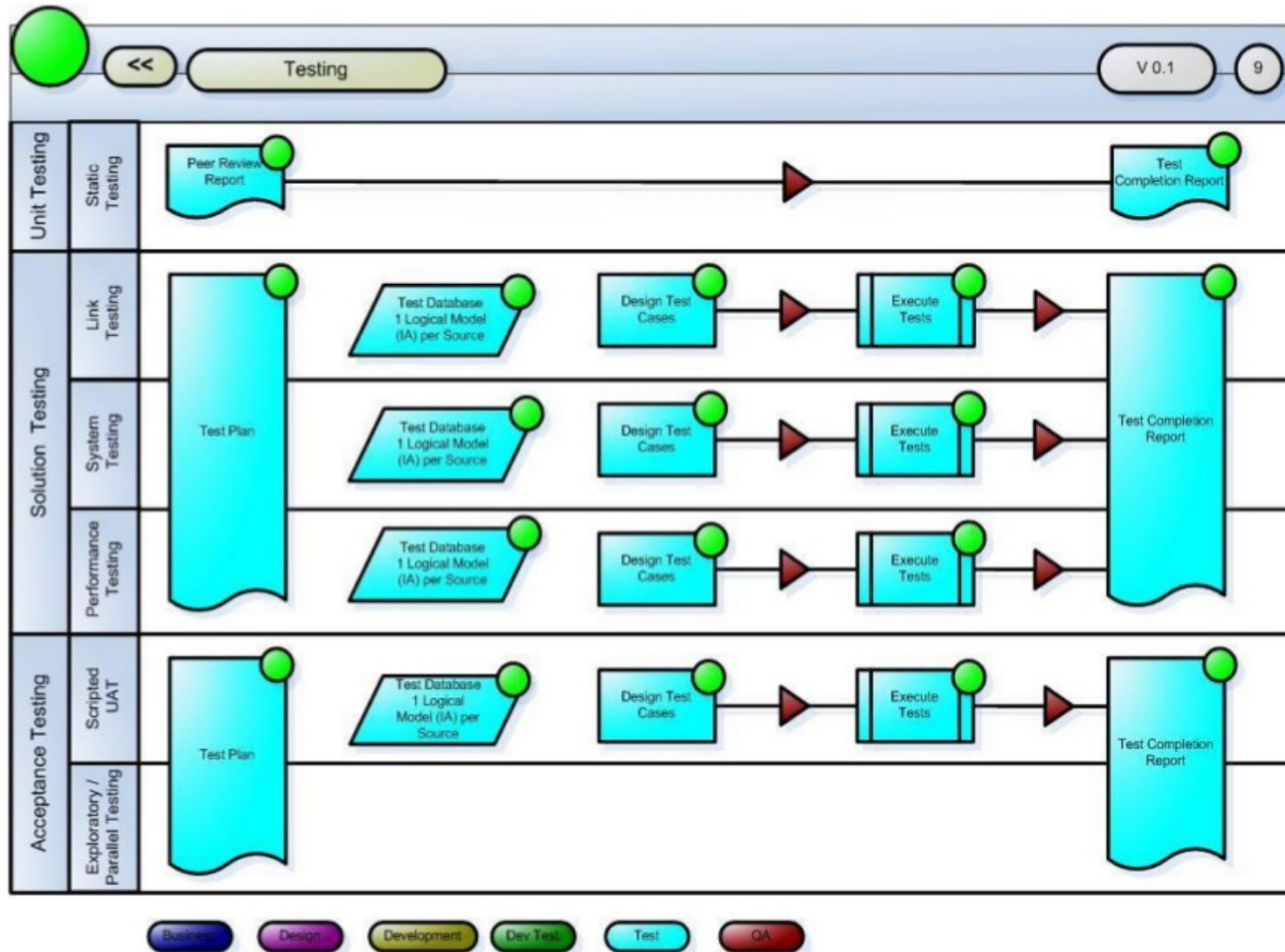
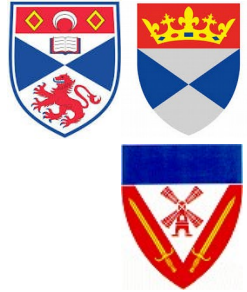




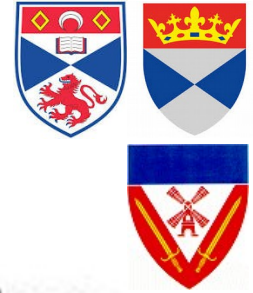
# Rapid Information Factory Framework



# Rapid Information Factory Framework



# Rapid Information Factory Framework



**5S is a workplace organization technique composed for five primary phases:  
Sort, Set In Order, Shine, Standardize, and Systematize.**



**SORT**

**Keep only  
necessary items  
in the workplace.**



**SET IN ORDER**

**Arrange items  
to promote  
efficient workflow.**



**SHINE**

**Clean the work  
area so it is  
neat and tidy.**



**STANDARDIZE**

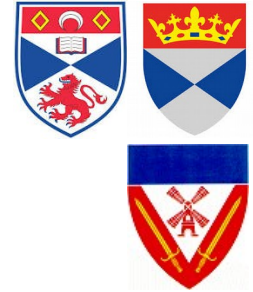
**Set standards  
for a consistently  
organized workplace.**



**SYSTEMATIZE**

**Maintain  
and review  
standards.**

# Rapid Information Factory Framework



|          |                            |
|----------|----------------------------|
| <b>D</b> | <b>Defects</b>             |
| <b>O</b> | <b>Overproduction</b>      |
| <b>W</b> | <b>Waiting</b>             |
| <b>N</b> | <b>Non-Utilized Talent</b> |
| <b>T</b> | <b>Transportation</b>      |
| <b>I</b> | <b>Inventory</b>           |
| <b>M</b> | <b>Motion</b>              |
| <b>E</b> | <b>Extra-Processing</b>    |



Defects

Efforts caused by rework, scrap, and incorrect information.



Overproduction

Production that is more than needed or before it is needed.



Waiting

Wasted time waiting for the next step in a process.



Non-Utilized Talent

Underutilizing people's talents, skills, & knowledge.



Transportation

Unnecessary movements of products & materials.



Inventory

Excess products and materials not being processed.



Motion

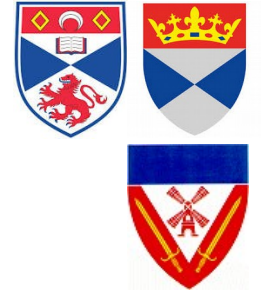
Unnecessary movements by people (e.g., walking).



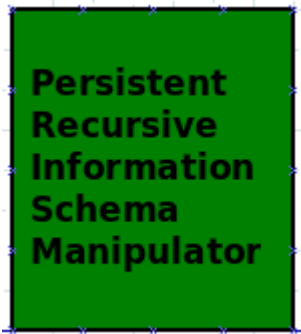
Extra-Processing

More work or higher quality than is required by the customer.

# Rapid Information Factory Framework

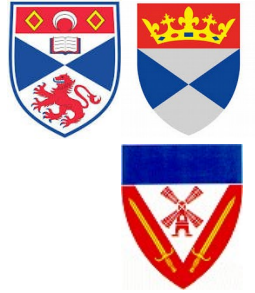


## Persistent Recursive Information Schema Manipulator



The PRISM is the main process that drives a specific chain of processes that together forms the required work cells to convert the data into information by applying the RIFF rules of processing.

# Rapid Information Factory Framework



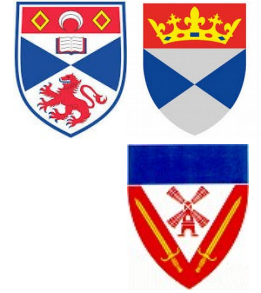
## Remote Assessment Yoke

**Remote Assessment Yoke**

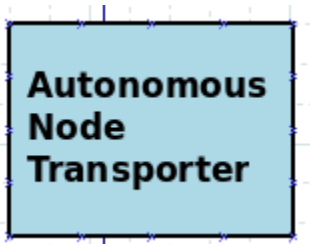
The RAY is a “Poka-yoke” from Lean manufacturing to avoid mistakes in the work cells while conversion of the data into information by applying the RIFF rules of processing.



# Rapid Information Factory Framework

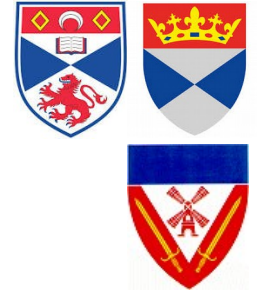


## Autonomous Node Transporter



The ANT is the software stack required to run any predefined hardware process and software combination from the RIFF library of processing configurations.

# Rapid Information Factory Framework



## Persistent Uniform Protocol Agreement



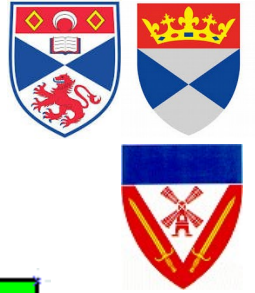
The PUPA is the software stack required to run any predefined Algorithms that is formed from self-contained step-by-step set of operations to be performed.

PUPA performs calculation, data processing, and automated reasoning using uniform processes from the RIFF library of processing configurations.

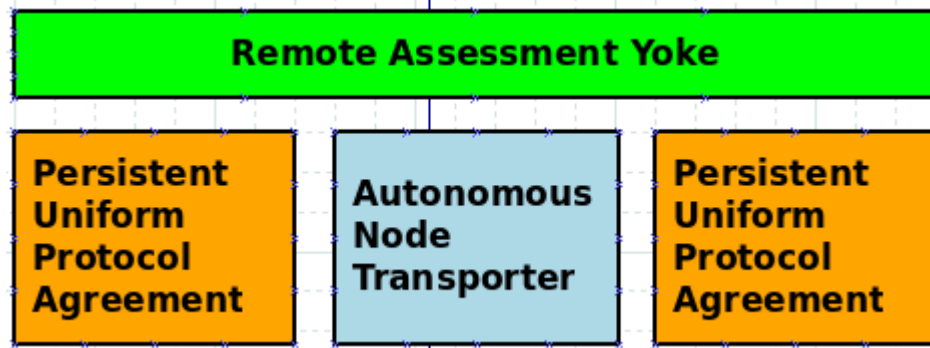
PUPA can consist of other PUPA to form processing chains.



# Rapid Information Factory Framework



## Remote Work Cell

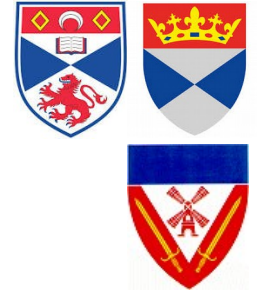


The RWC is a group of processes that has a singular purpose of work in the same manner than a Lean Work Cell.

The cell consists of four parts:

- RAY
- PUPA (inbound)
- ANT
- PUPA (Outbound)

# Rapid Information Factory Framework



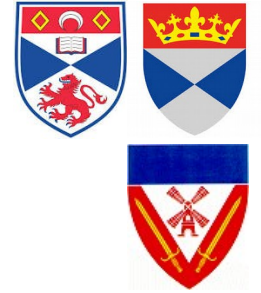
## Node Extractor and Schema Transformer

### Node Extractor and Schema Transformer

The NEST is a specialised software stack required to enable a ANT to communicate with a specific type of data source.

NEST will be designed for data sources and published in as uniform processes in the RIFF library.

# Rapid Information Factory Framework

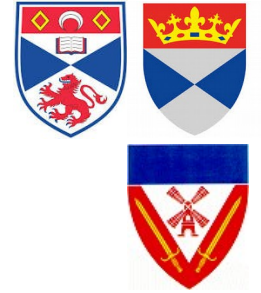


## Autonomous Logical Agreement Transport Executor

Autonomous  
Logical  
Agreement  
Transport  
Executor

The ALATE is a specialised software stack required to enable a ANT to discover which PUPAs will be required to perform the R-A-P-T-O-R process for a new NEST.

# Rapid Information Factory Framework

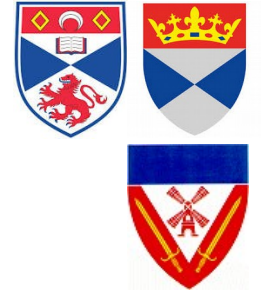


## Sequential Converter into Ontology for Uniform Transport

Sequential  
Converter into  
Ontology for  
Uniform  
Transport

The SCOUT is a specialised software stack required to enable a ANT to convert meta data from a NEST into HORUS PUPA for R-A-P-T-O-R process to use.

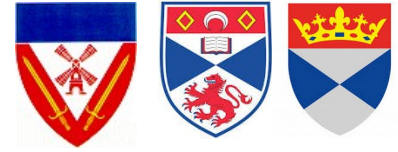
# Rapid Information Factory Framework



## Rapid Artificial Intelligence Data Extract Routine



The RAIDER is a specialised software stack required to enable a ANT to mine data from a NEST into HORUS PUPA procedures for R-A-P-T-O-R process to use.



# Rapid Information Factory Cluster

The cluster is a pre-optimised processing solution that is processing the data into information.



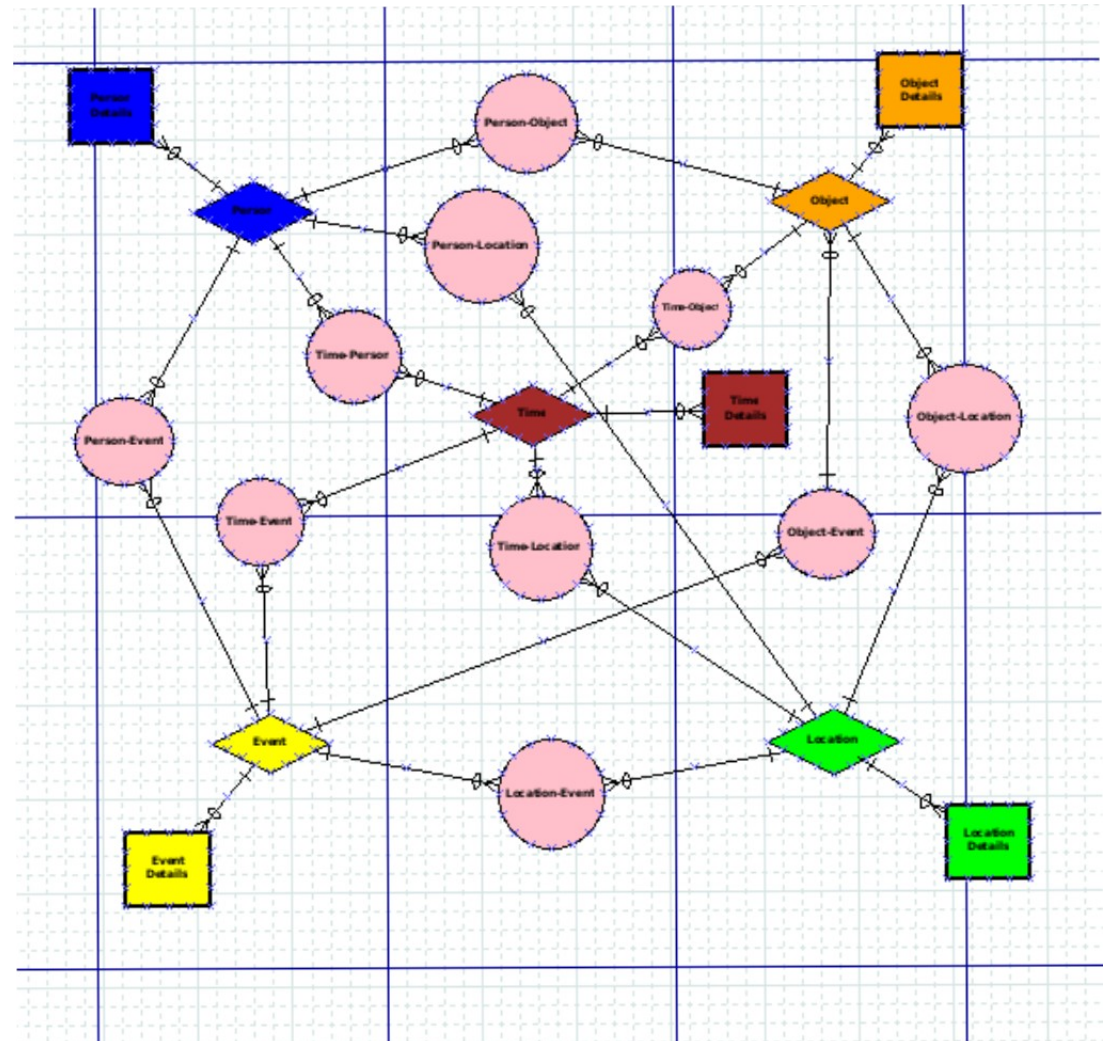
# Rapid Information Factory Cluster



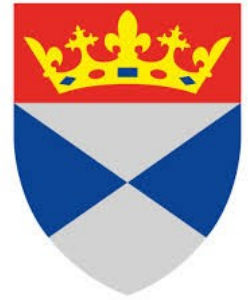




**T**ime  
**P**eople  
**O**rganisation  
**L**ocation  
**E**vent







# Thank you

## Synaptic Assimilator

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