

**VERIFICATION AND VALIDATION IN COMPLEX  
WARSHIP SYSTEMS DESIGN PROCESS**  
FEBRUARY 2021  
Adebowale Odukoya, Alex Duffy, Ian Whitfield

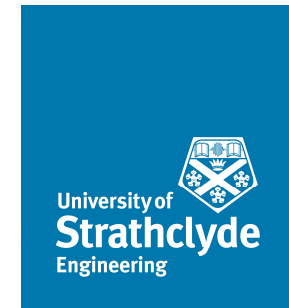
**DMEM**

Design, Manufacture and Engineering Management

**BAE SYSTEMS**

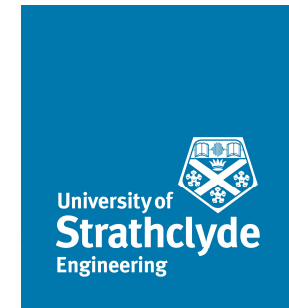
Delivering Total Engineering

# Presentation structure



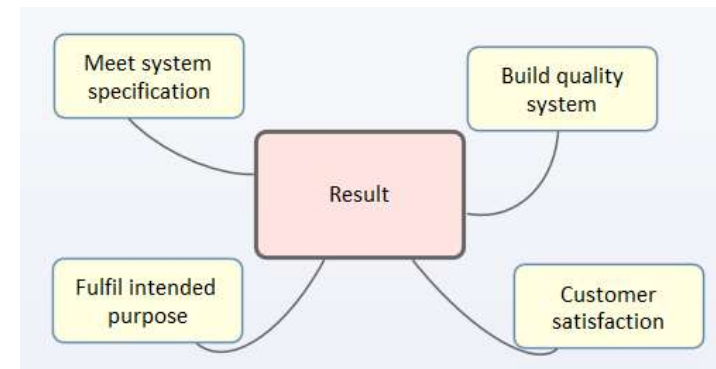
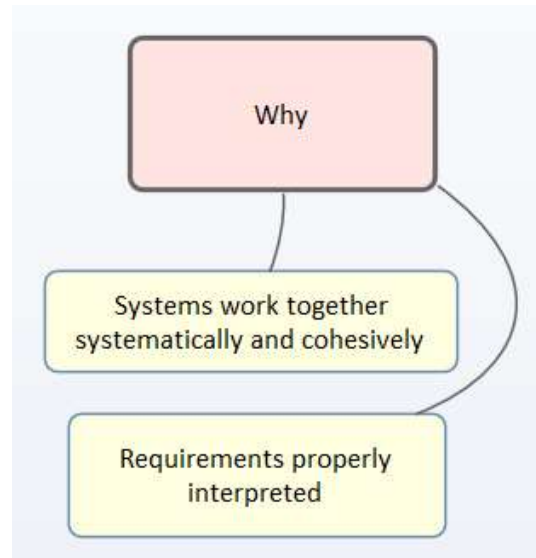
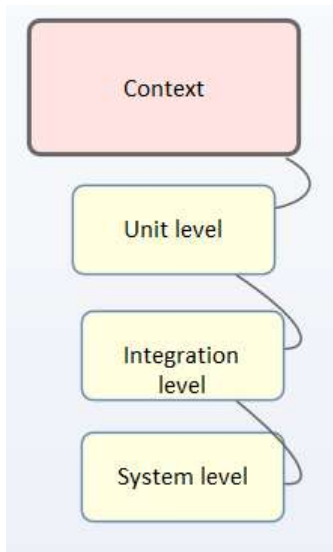
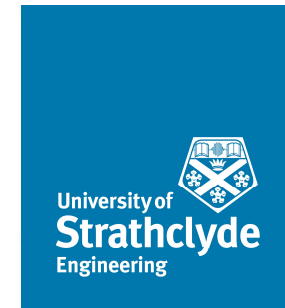
- Research Aim
- Verification and Validation in Complex System
- Emergent behaviour in Systems of Systems
- Current V&V Models
- Proposed V&V Model
- Anticipated research results

# Research Aim:

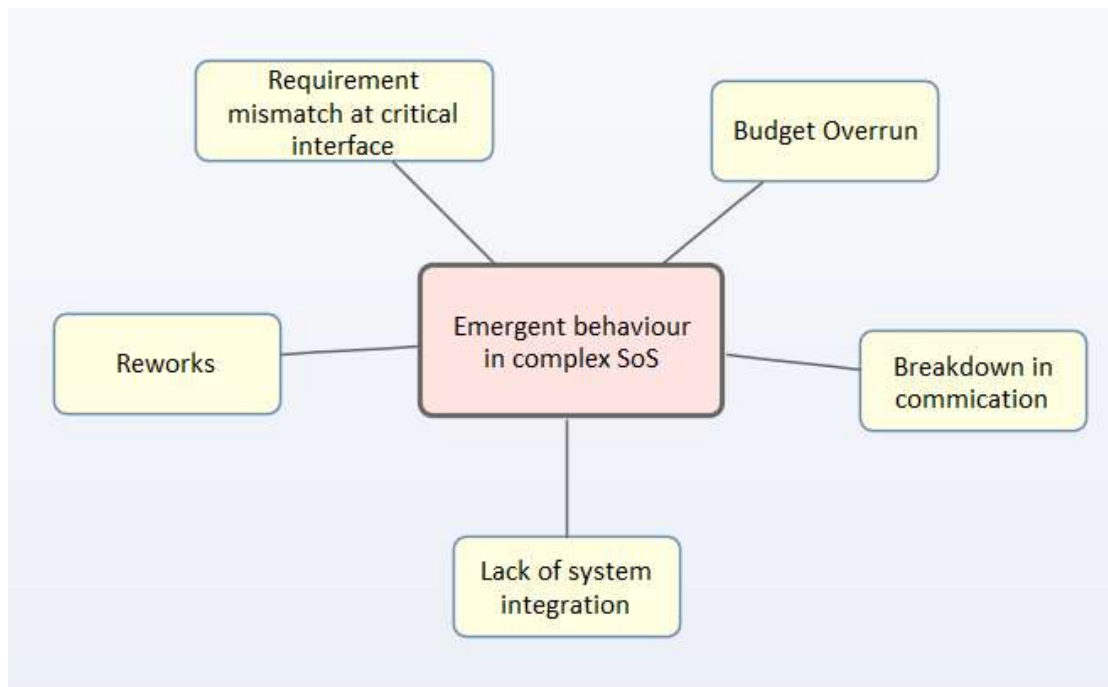
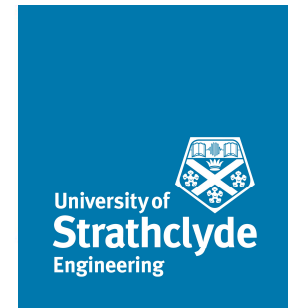


The aim of this research is to develop a Verification and validation model to mitigate emergent behaviour during the conceptual design stage of a Complex System of system (SoS)

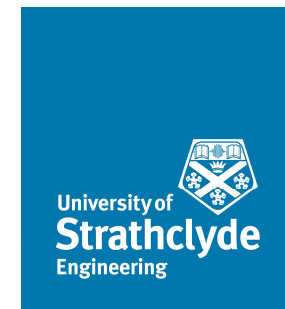
# Verification and Validation in Complex systems



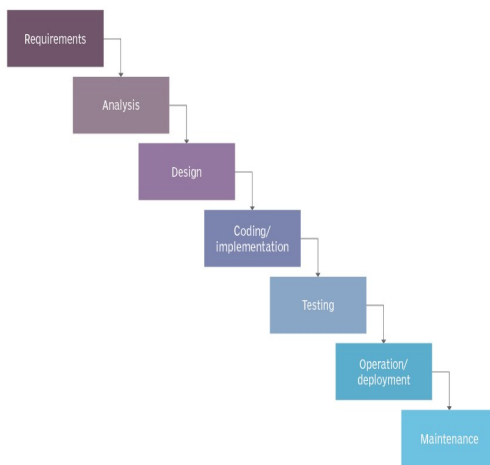
# Emergent behaviour in an SoS



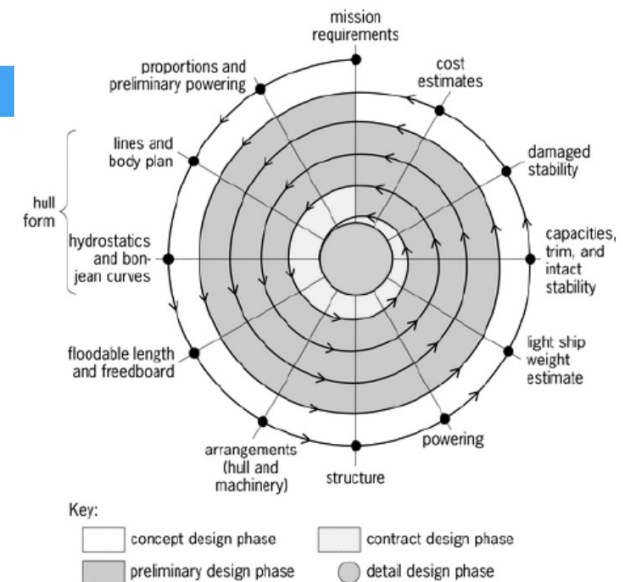
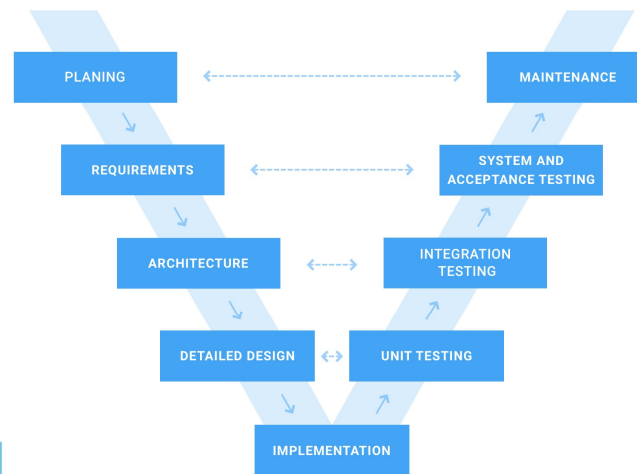
# Waterfall model, Vee Model, Design Spiral



Waterfall model

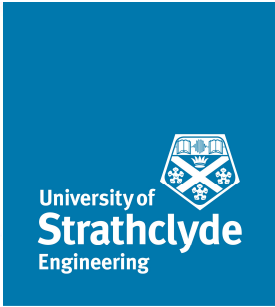


V-Model

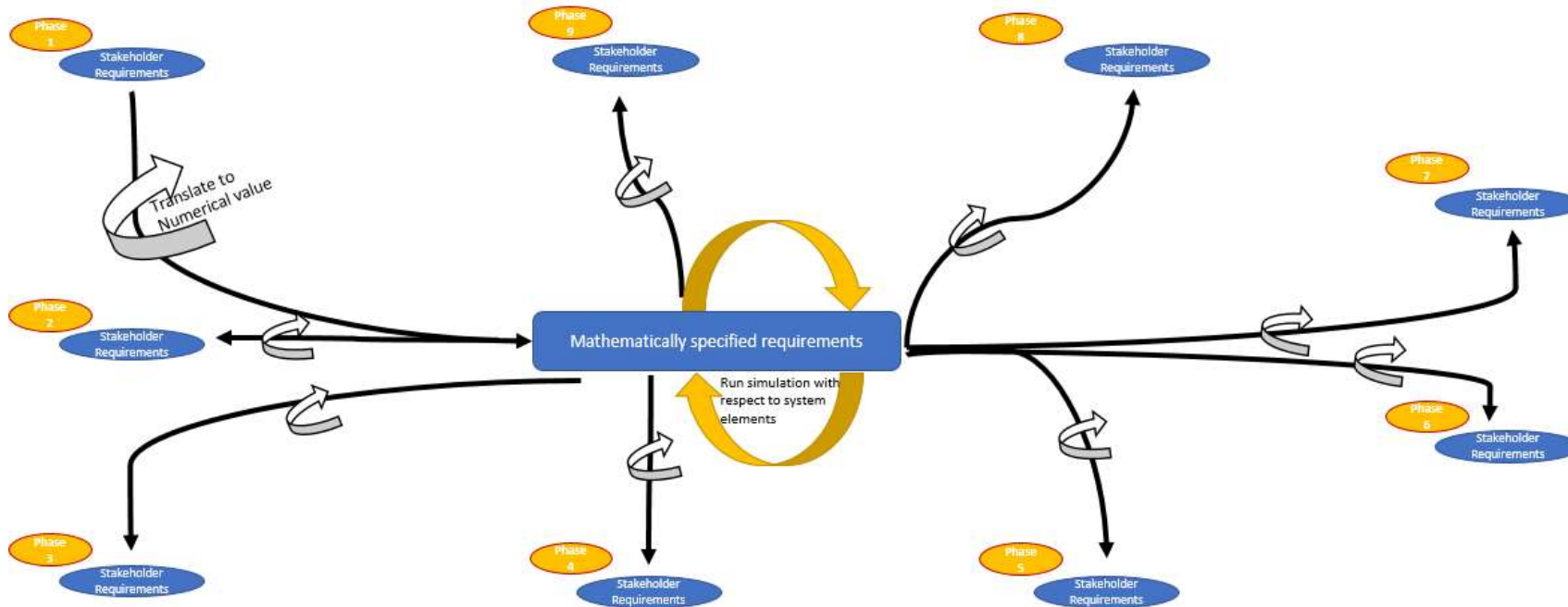


Ship Design Spiral (Evans, 1959)

# Proposed Verification and Validation Process Model

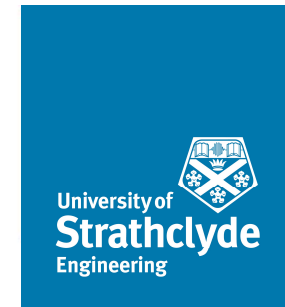


# Proposed Verification and Validation Process Model

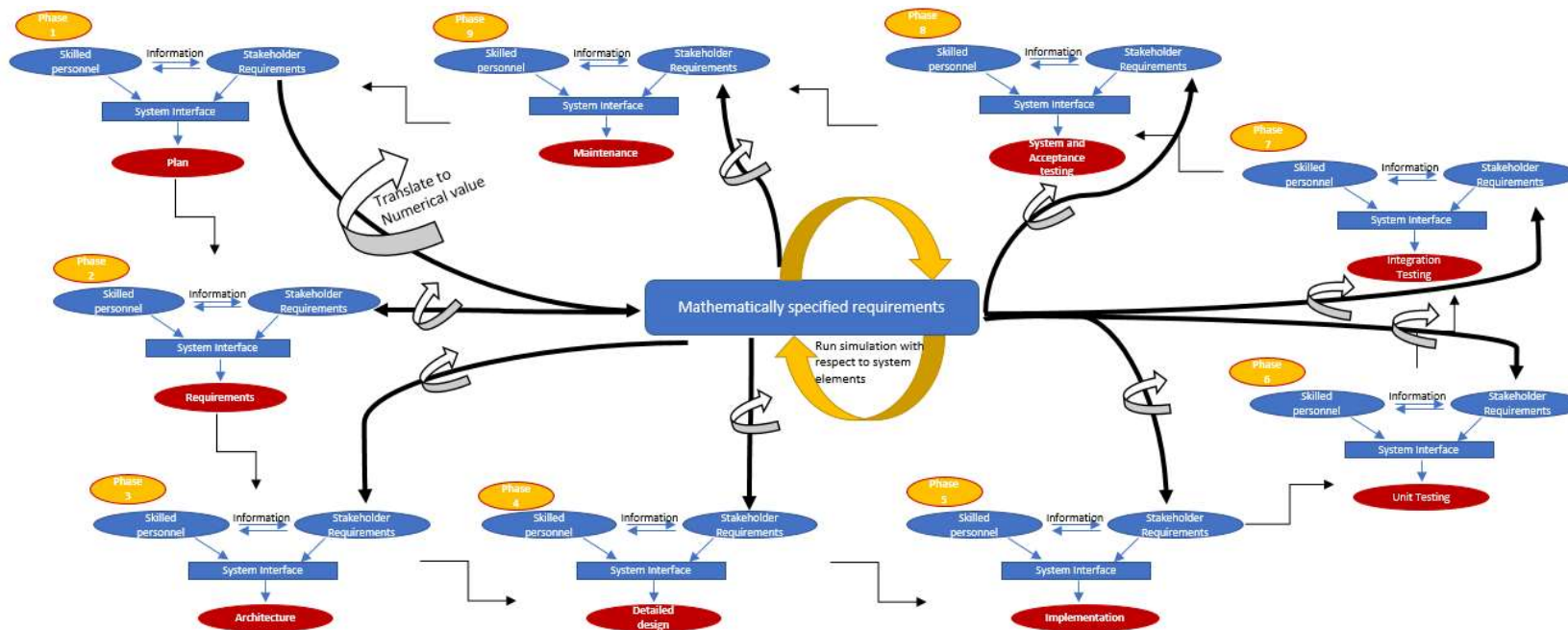
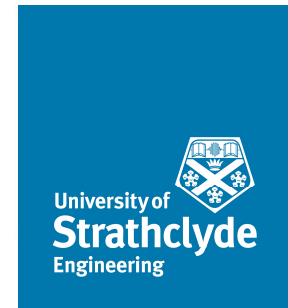




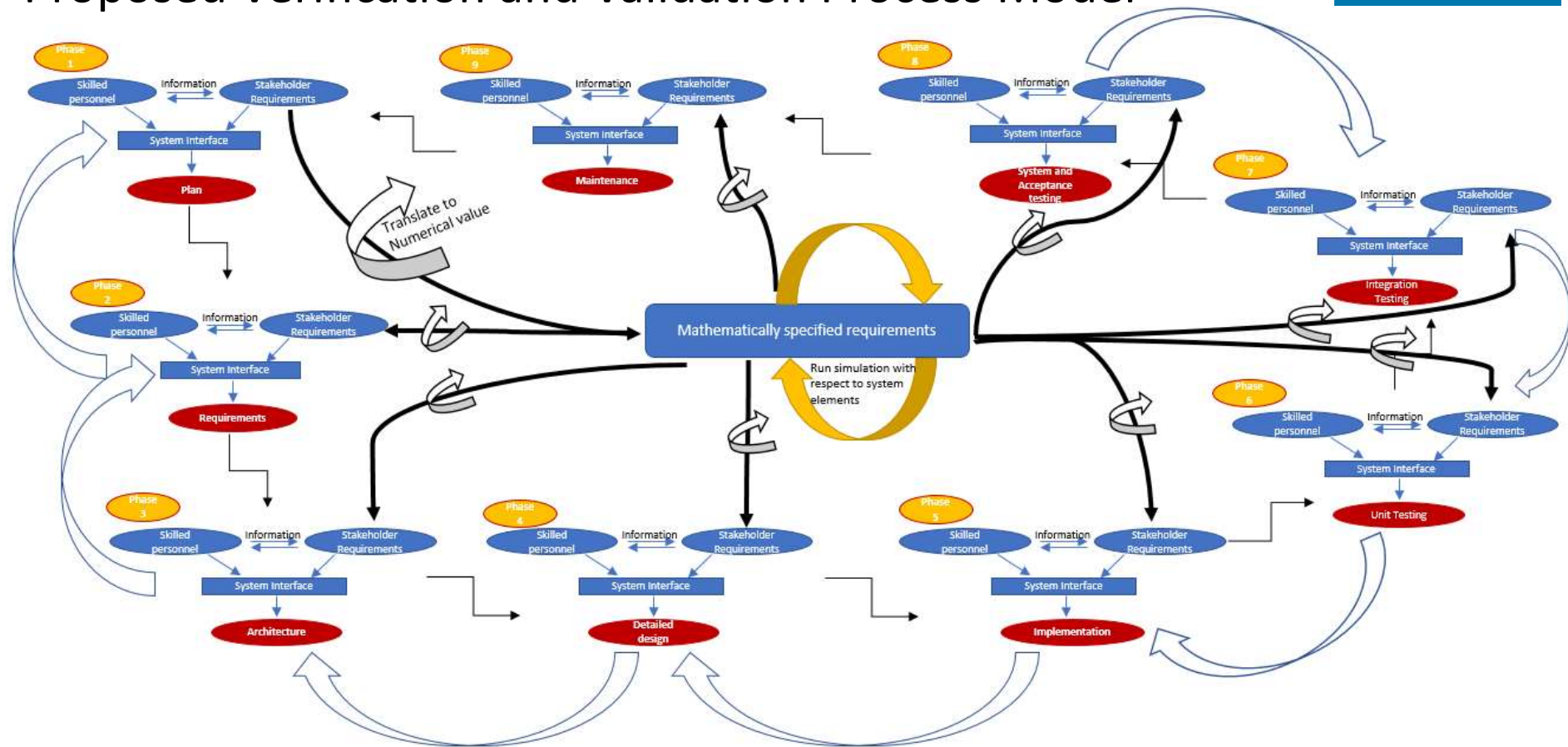
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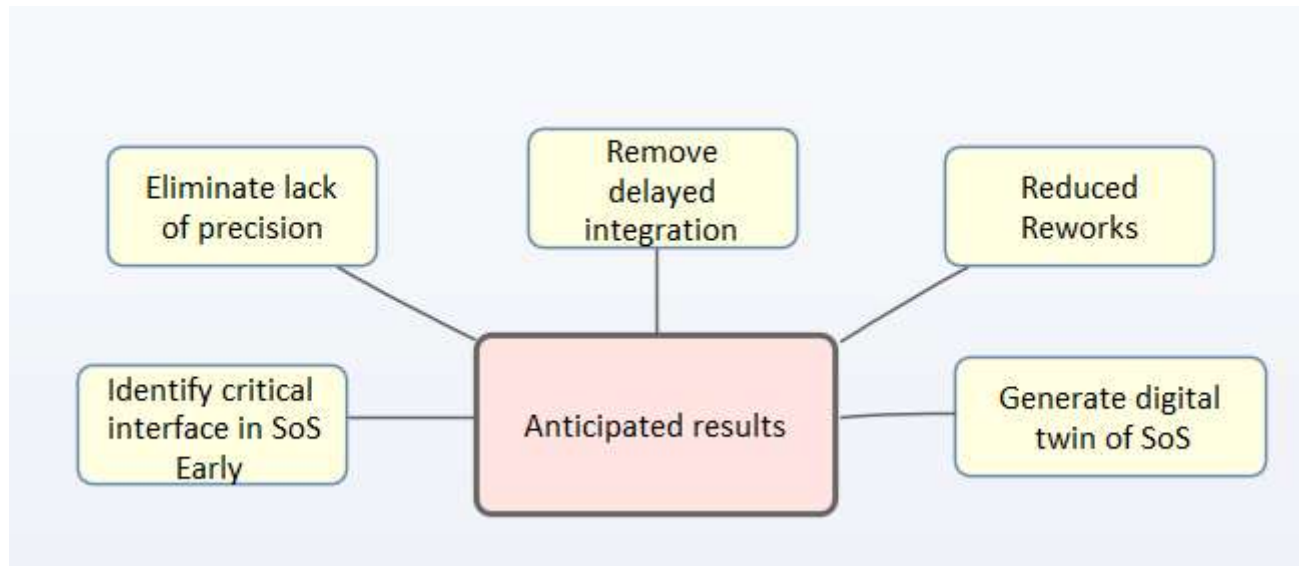
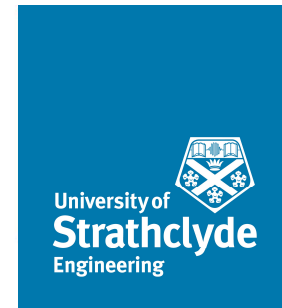
# Proposed Verification and Validation Process Model



# Proposed Verification and Validation Process Model



# Anticipated Results





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