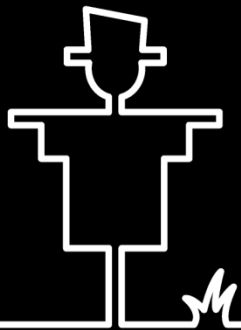


WELCOME

**SCARECROW**  
CONSULTANTS



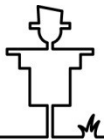
**SCARECROW**  
CONSULTANTS

# The Evidence Pattern

Simon A. Perry

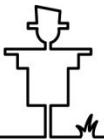
INCOSE UK MBSE WG

Derby – 2016-03-03



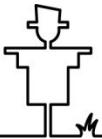
# Overview

1. Introduction
2. A (Brief) Overview of the FAF
3. The Evidence Pattern
4. Summary
5. Questions



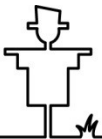
# 1. Introduction

- The Evidence Pattern came out of idea suggested by Colin Wood at MBSE WG Meeting
  - Transport Catapult – 2014-05-12
- Developed by Simon Perry & Scarecrow
- Presented below as a set of FAF Views



## 2. A (Brief) Overview of the FAF

- The FAF (Framework for Architectural Frameworks) was developed to improve the definition of Architectural Frameworks (AFs)
  - Also used to define Patterns
- The FAF is designed to force anyone defining an AF or Pattern to consider the following six questions:
  - What is the purpose of the AF/Pattern?
  - What domain concepts must the AF/Pattern support?
  - What viewpoints are required?
  - What is the purpose of each viewpoint?
  - What is the definition of each viewpoint in terms of the identified domain concepts?
  - What rules constrain the use of the AF/Pattern?



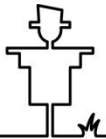
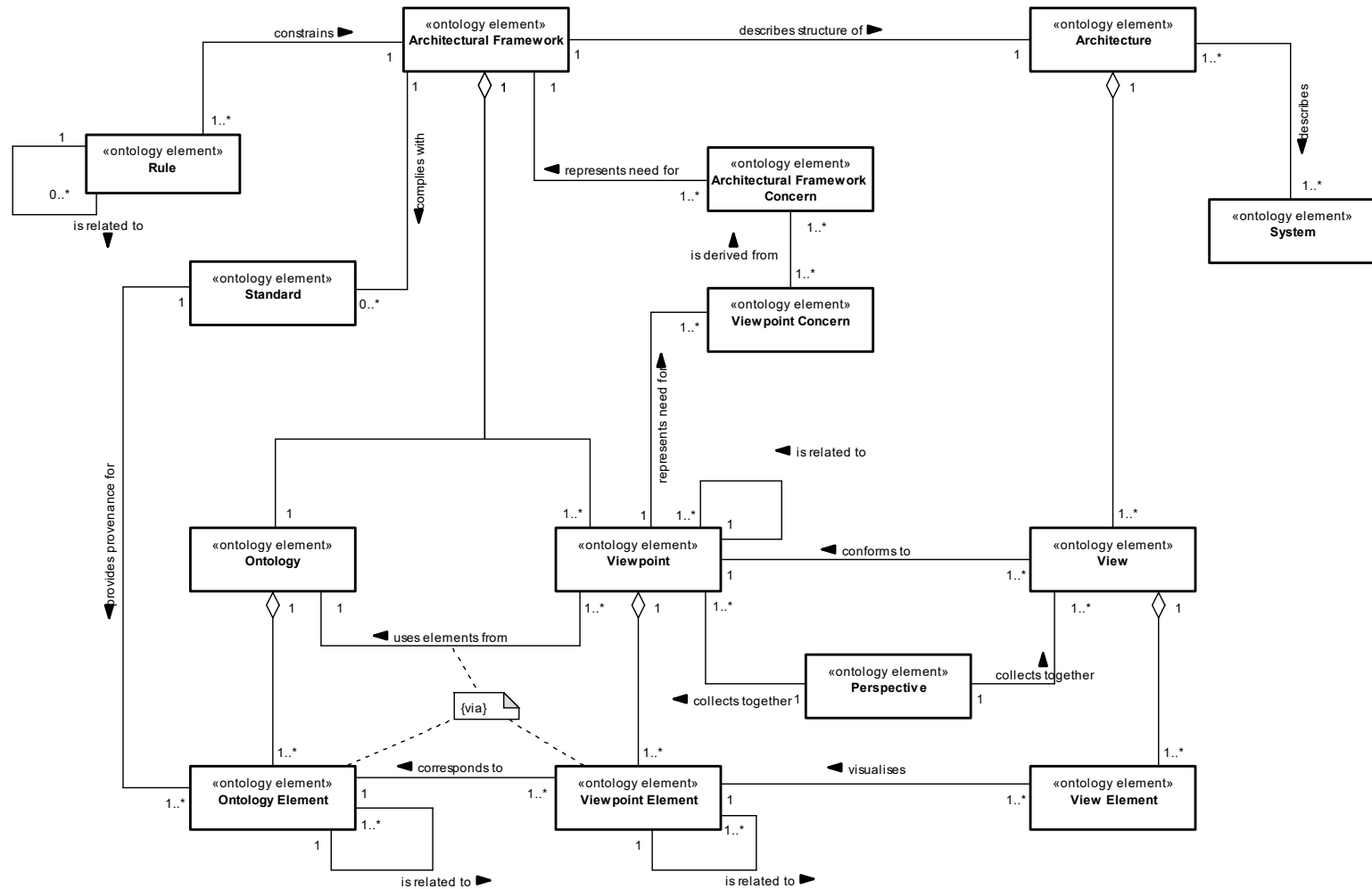
# The Framework for Architectural Frameworks (FAF)

- The FAF addresses the six questions through an MBSE approach based around the ideas of ontology, viewpoints and framework
- Ontology
  - Define concepts and relationships between them
- Viewpoints and Framework
  - Define viewpoints organised into a framework
  - Viewpoints can only use concepts from the ontology
- FAF consists of:
  - An ontology
  - Six viewpoints
  - Supporting processes

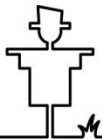
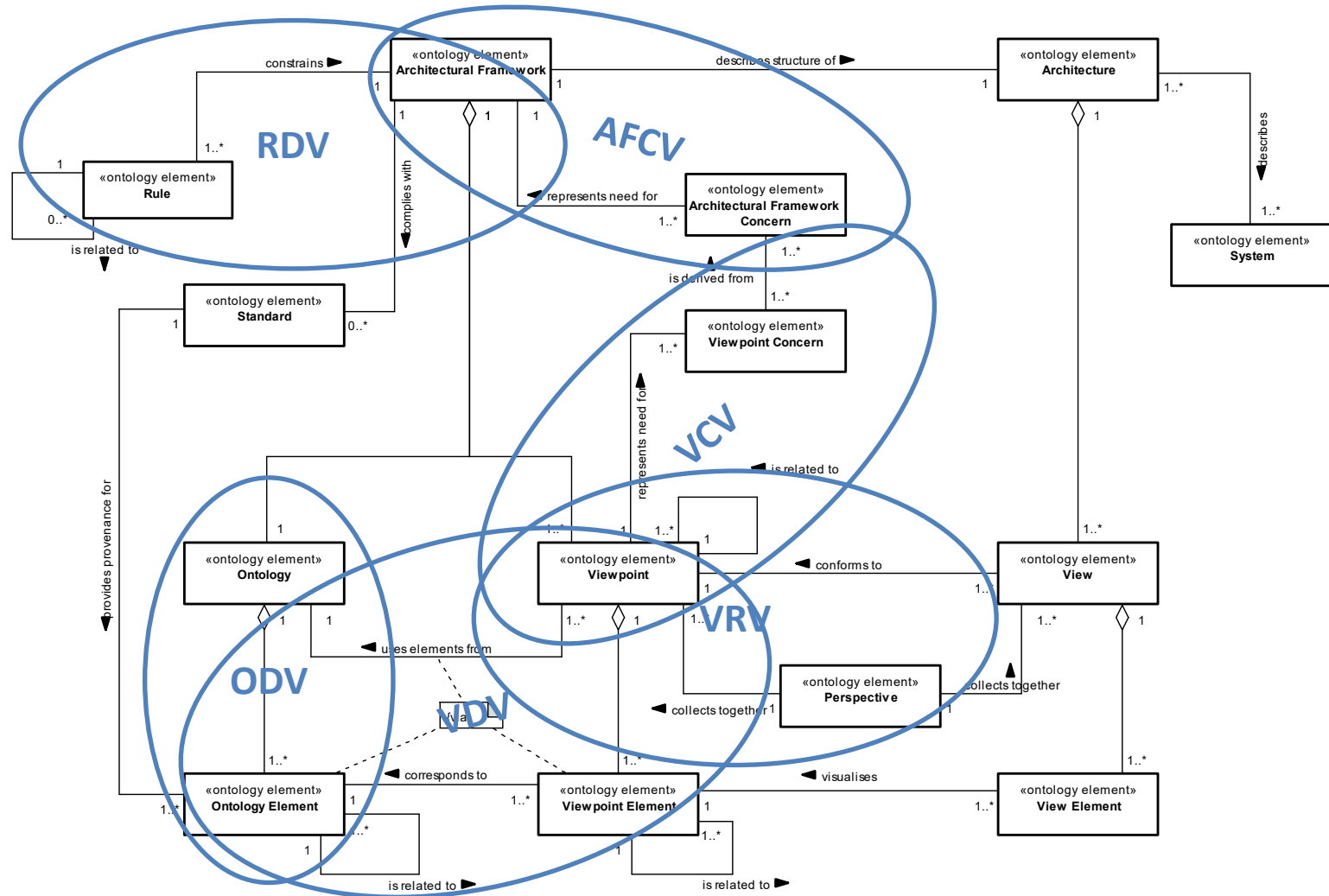


The FAF is defined using the FAF

# The FAF Ontology



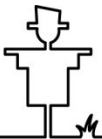
# The FAF Viewpoints – Ontology Areas





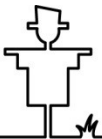
# The FAF Viewpoints

- AF Context Viewpoint (AFCV)
  - What is the purpose of the AF?
    - Defines the context for the AF
    - Represents the AF concerns in context, establishing why the AF is needed
- Ontology Definition Viewpoint (ODV)
  - What domain concepts must the AF support?
    - Defines the ontology for the AF
    - Derived from the AF Context Viewpoint & and defines concepts that can appear on a Viewpoint
- Viewpoint Relationships Viewpoint (VRV)
  - What viewpoints are required?
    - Shows the relationships between the Viewpoints that make up an AF
    - Groups them into perspectives. It is derived from the Ontology Definition Viewpoint

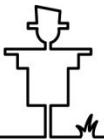
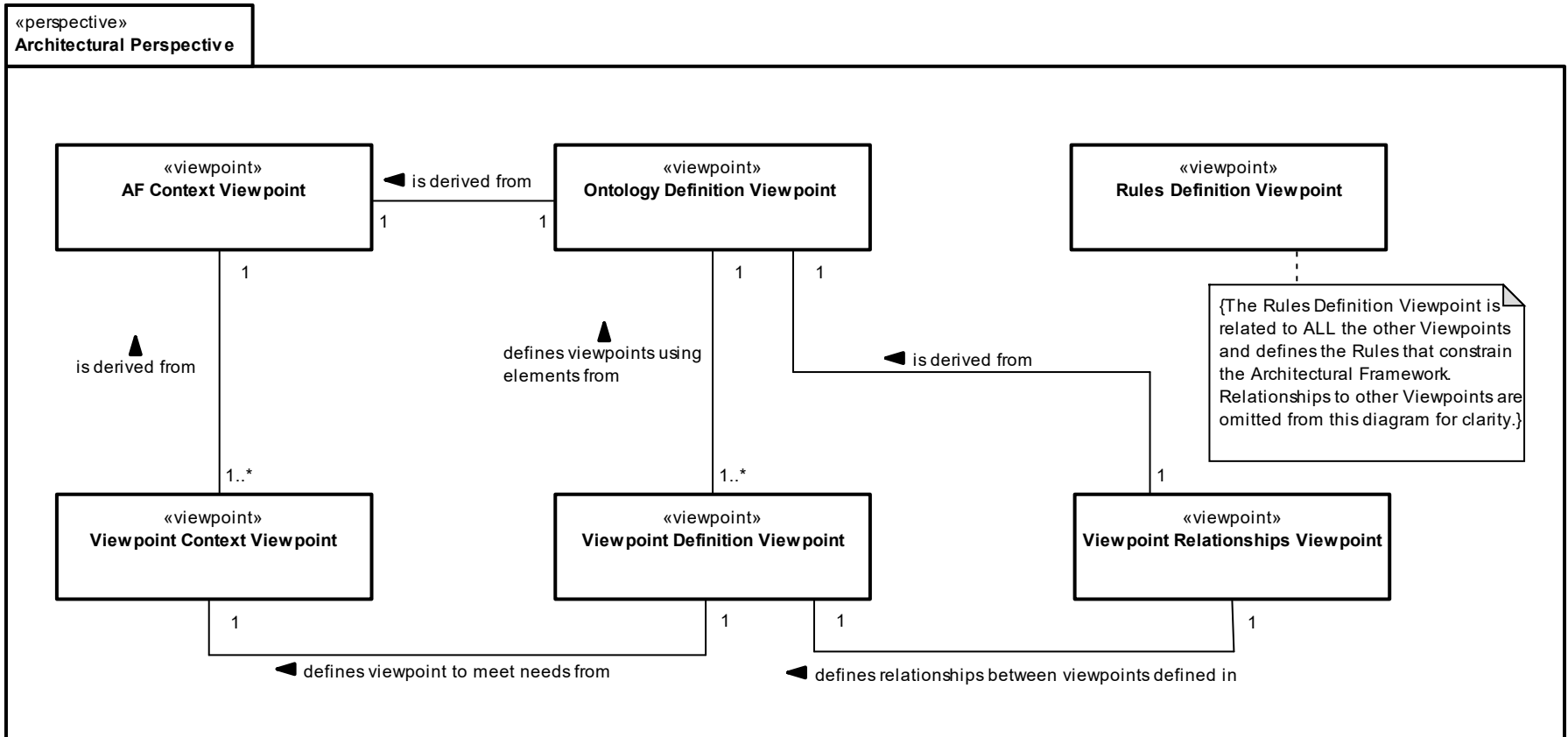


# The FAF Viewpoints continued

- Viewpoint Context Viewpoint (VCV)
  - What is the purpose of each viewpoint?
    - Defines the context for a particular Viewpoint
    - Represents the Viewpoint concerns in context for a particular Viewpoint, establishing why the Viewpoint is needed. It is derived from the AF Context Viewpoint
- Viewpoint Definition Viewpoint (VDV)
  - What is the definition of each viewpoint in terms of the identified domain concepts?
    - Defines a particular Viewpoint
    - Shows the Viewpoint Elements (and hence the Ontology Elements) that appear on the Viewpoint
- Rules Definition Viewpoint (RDV)
  - What rules constrain the use of the AF?
    - Defines the various rules that constrain the AF

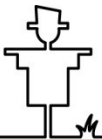


# The FAF Viewpoints

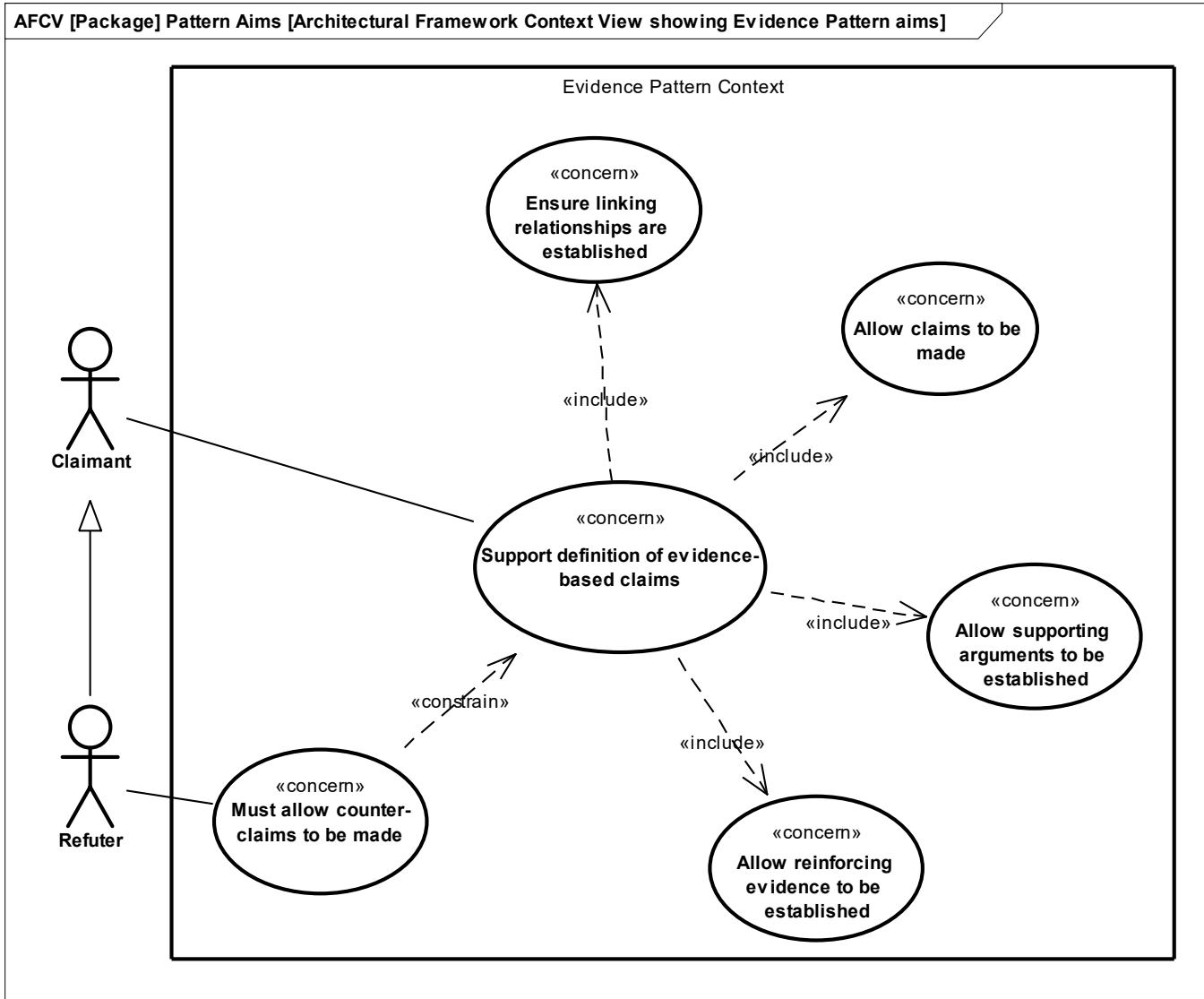


# 3. The Evidence Pattern

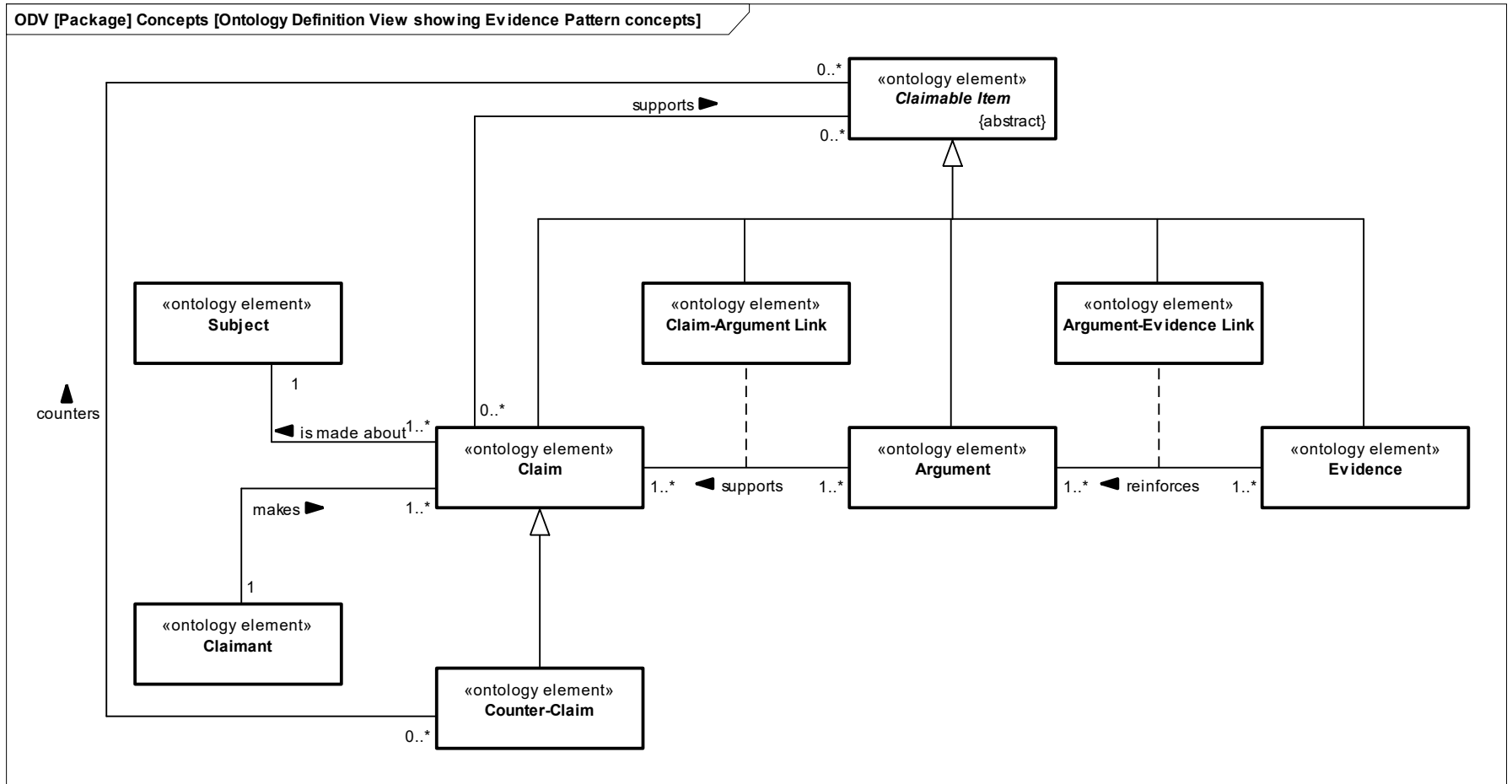
- Will be presented using FAF Views
  - AFCV
  - ODV
  - VRV
  - RDV
  - VCV, VDV & example for each of the Pattern's four Viewpoints:
    - Claim Definition Viewpoint
    - Argument Viewpoint
    - Evidence Viewpoint
    - Counter-Claim Viewpoint



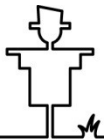
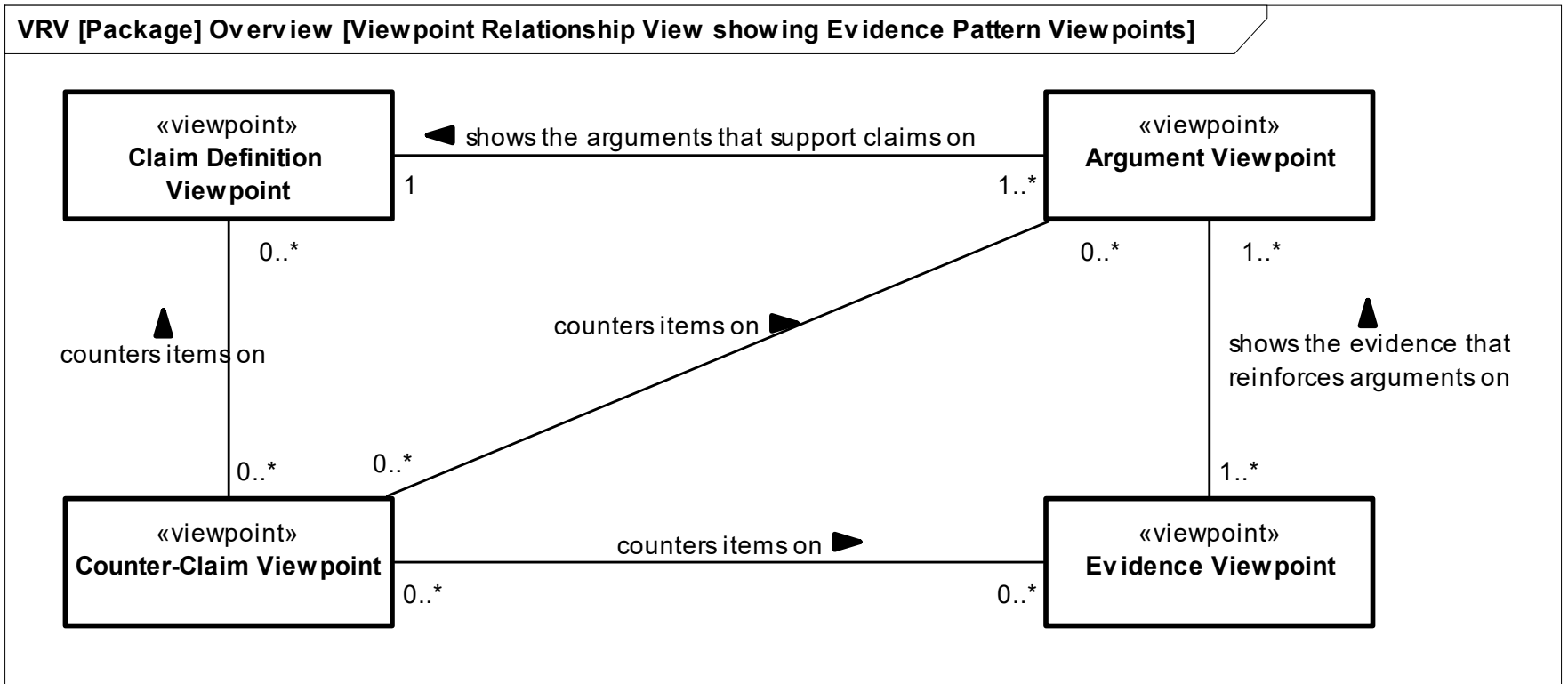
# 3.1 AFCV showing Evidence Pattern aims



# 3.2 ODV showing Evidence Pattern concepts

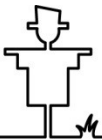


# 3.3 VRV showing Evidence Pattern Viewpoints



# Evidence Pattern Viewpoints

- Claim Definition Viewpoint
  - Used to define Claims for a particular Subject and to show who made the Claims
- Argument Viewpoint
  - Used to show the Arguments that support a Claim
- Evidence Viewpoint
  - Used to show the Evidence that reinforces Arguments
- Counter-Claim Viewpoint
  - Used to make Counter-Claims (or supporting Claims) about Claimable Items

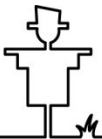




# 3.4 RDV showing Evidence Pattern Rules

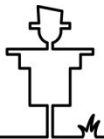
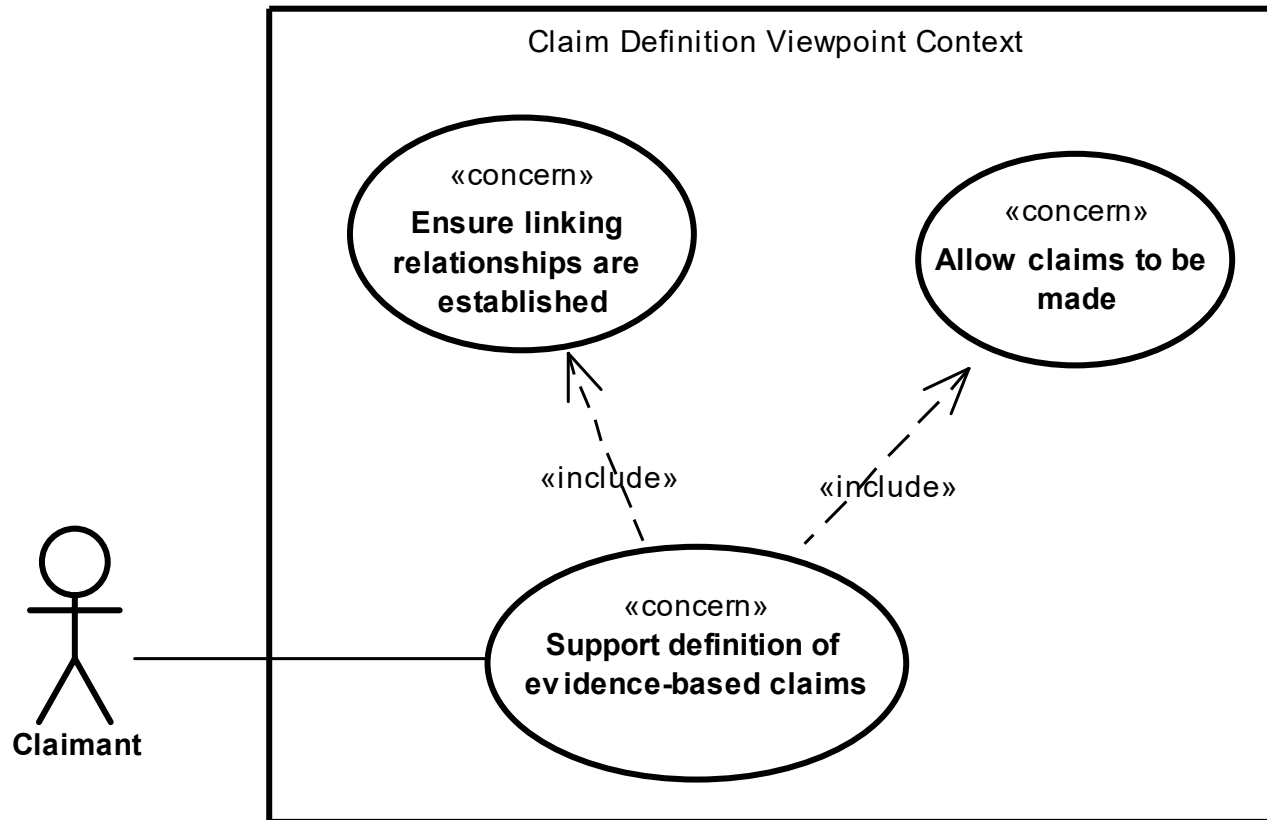
RDV [Package] Rules [Rules Definition View showing Evidence Pattern Rules]

<p>«rule» <b>Rule EP01</b></p> <p>notes <i>Every Claim must be supported by at least one Argument.</i></p>	<p>«rule» <b>Rule EP02</b></p> <p>notes <i>Every Argument must be reinforced by at least one Evidence.</i></p>	<p>«rule» <b>Rule EP03</b></p> <p>notes <i>Every Claim must be made by a defined Claimant.</i></p>
<p>«rule» <b>Rule EP04</b></p> <p>notes <i>Every Claim must be made about an identified Subject.</i></p>	<p>«rule» <b>Rule EP05</b></p> <p>notes <i>As a minimum one Claim Definition View, one Argument View and one Evidence View must be produced.</i></p>	<p>«rule» <b>Rule EP06</b></p> <p>notes <i>A Counter-Claim View must have EITHER one Claim OR one Counter-Claim and at least one Claimable Item (Claim, Counter-Claim, Argument, Claim-Argument Link, Evidence or Argument-Evidence Link) that the Claim or Counter-Claim supports or counters.</i></p>
<p>«rule» <b>Rule EP07</b></p> <p>notes <i>The Claimable Items that appear on a Counter-Claim View must appear on another relevant View. E.g. an Argument that appears on a Counter-Claim View must also appear on an Argument View etc.</i></p>		

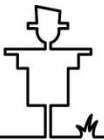
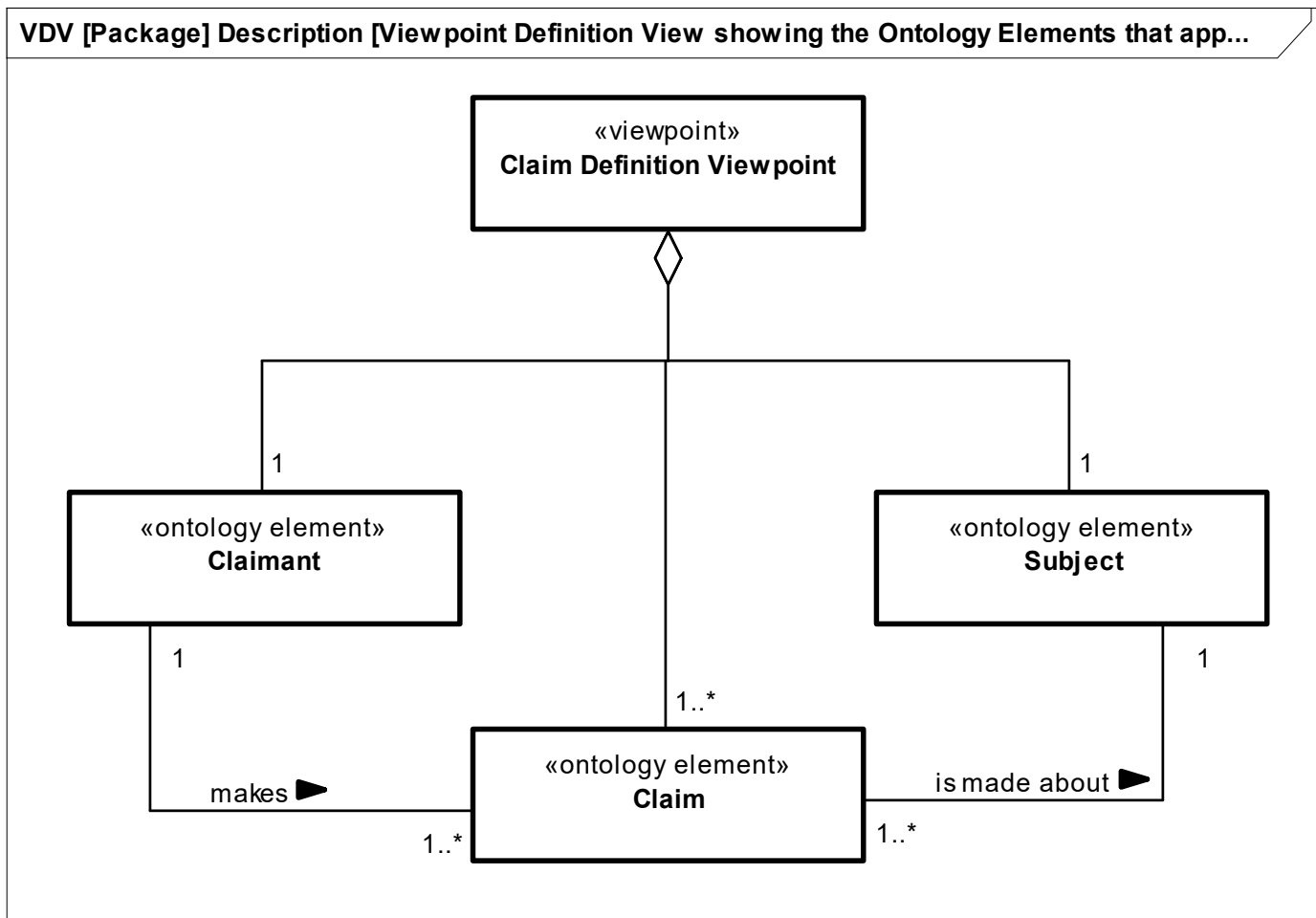


# 3.5 VCV showing Claim Definition Viewpoint aims

VCV [Package] Claim Definition Viewpoint (CDVp) [Viewpoint Context View showing Clai...

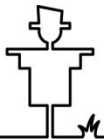
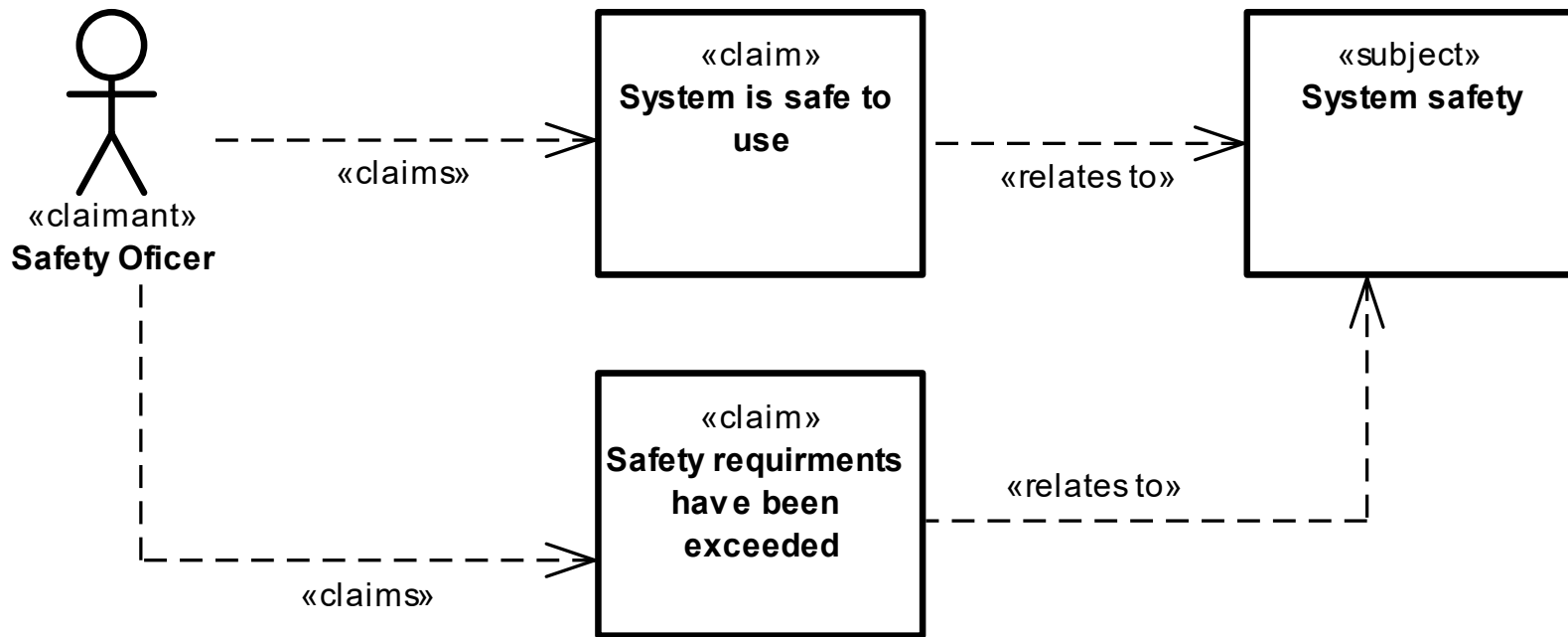


# VDV showing the Ontology Elements that appear on the Claim Definition Viewpoint



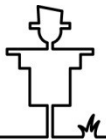
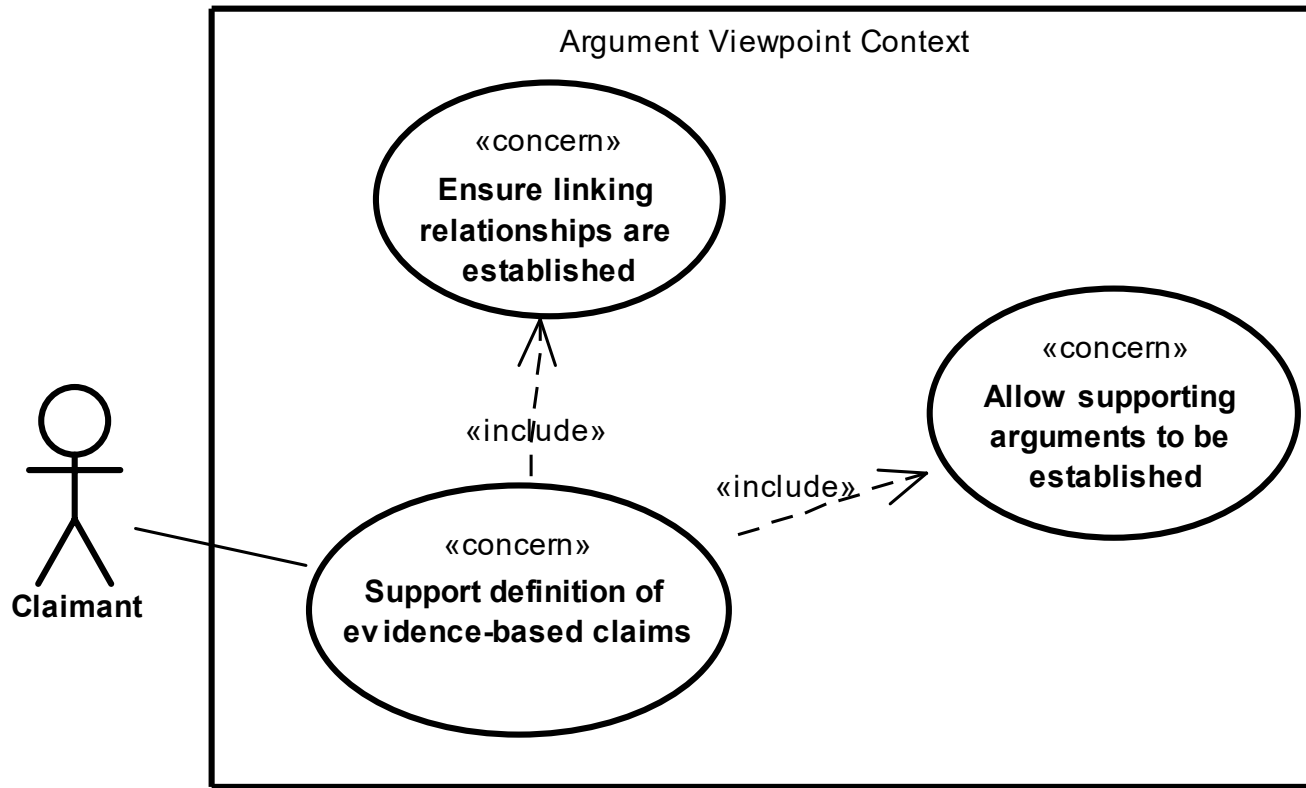
# Example CDV - Definition of Claims by Safety Officer about System safety

bdd [package] Example [CDV - Definition of Claims by Safety Officer about System safety]

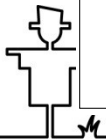
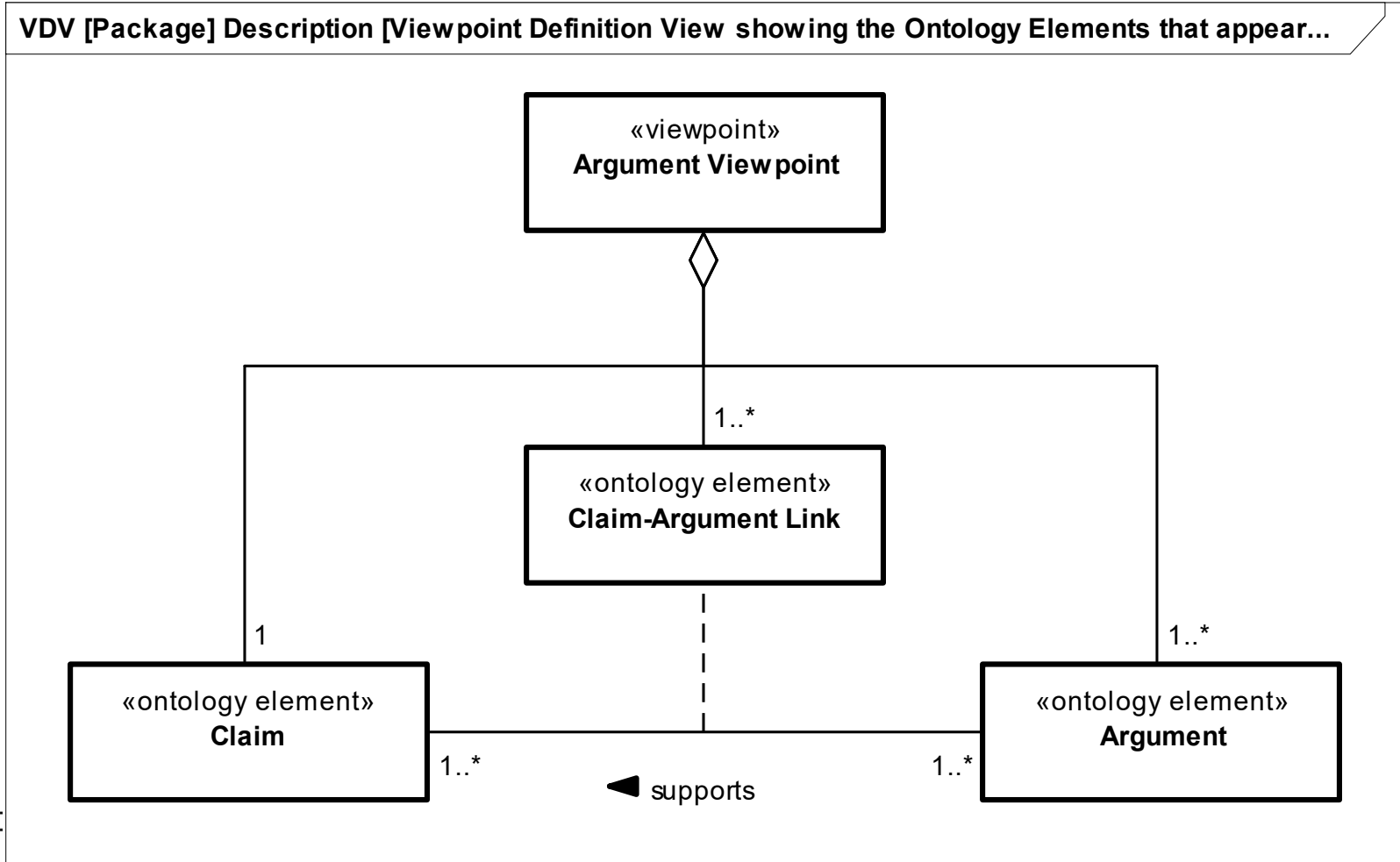


# 3.6 VCV showing Argument Viewpoint aims

VCV [Package] Argument View point (AVp) [Viewpoint Context View showing Argument Vi...

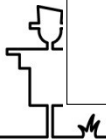
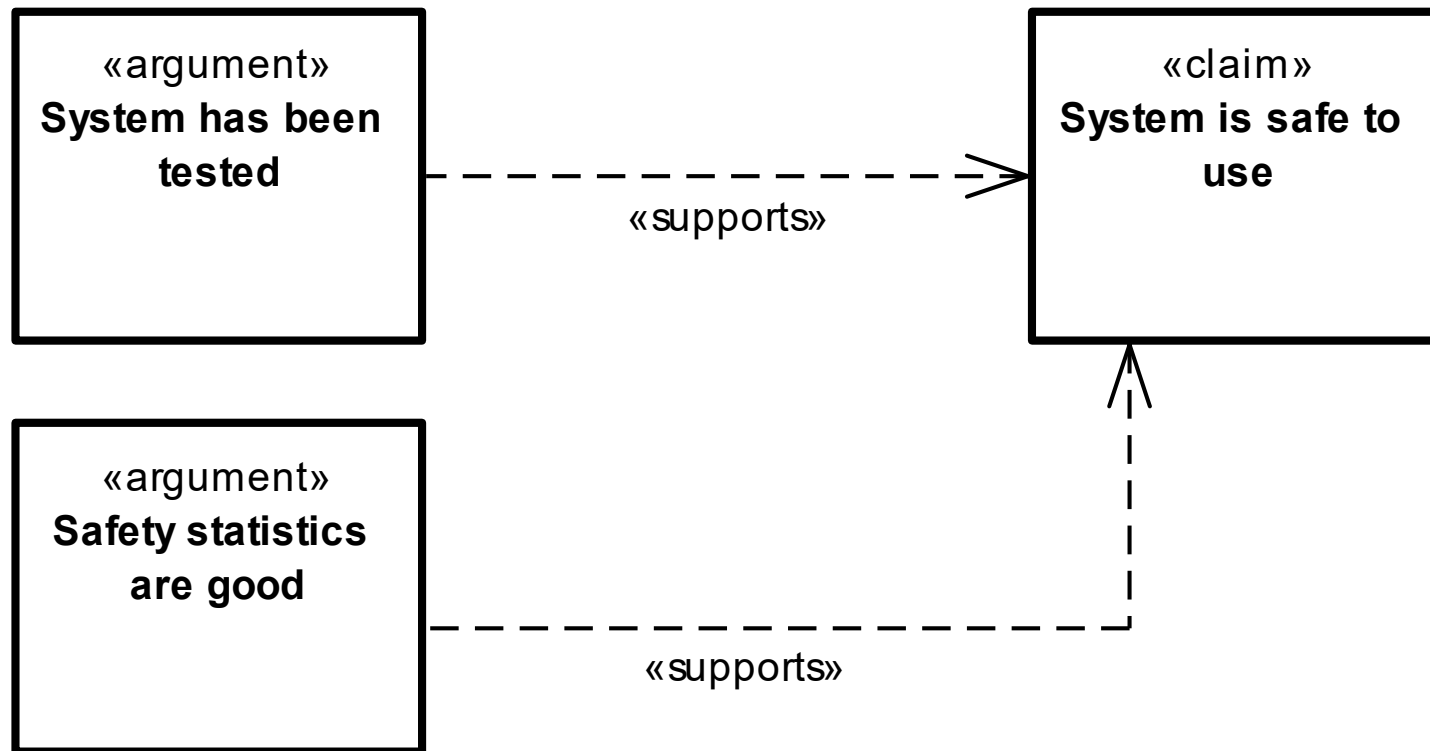


# VDV showing the Ontology Elements that appear on the Argument Viewpoint

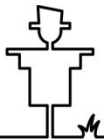
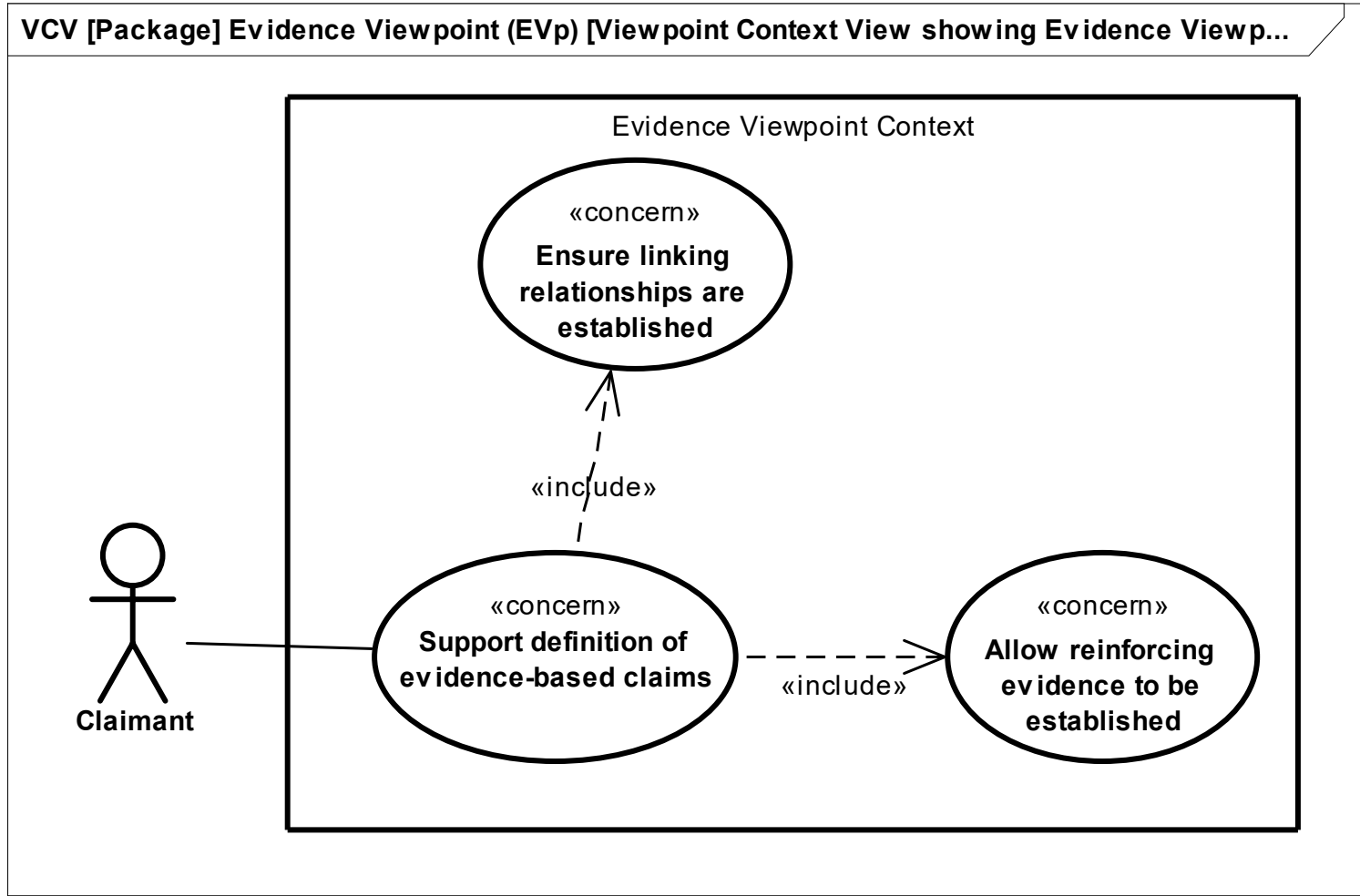


# Example AV - Arguments supporting "System is safe to use" Claim

bdd [package] Example [AV - Example showing Arguments supporting "S...

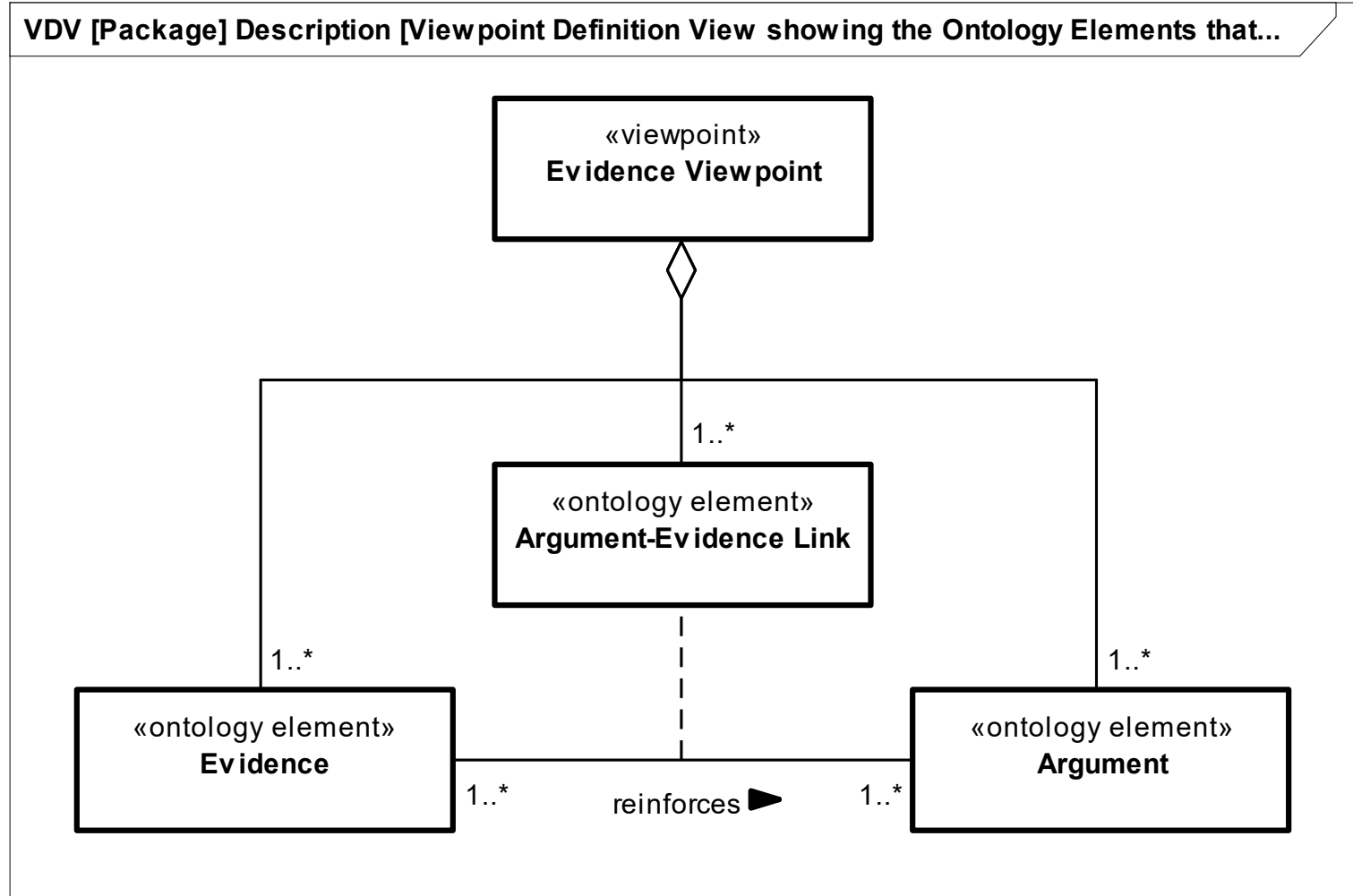


# 3.7 VCV showing Evidence Viewpoint aims

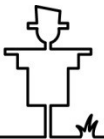
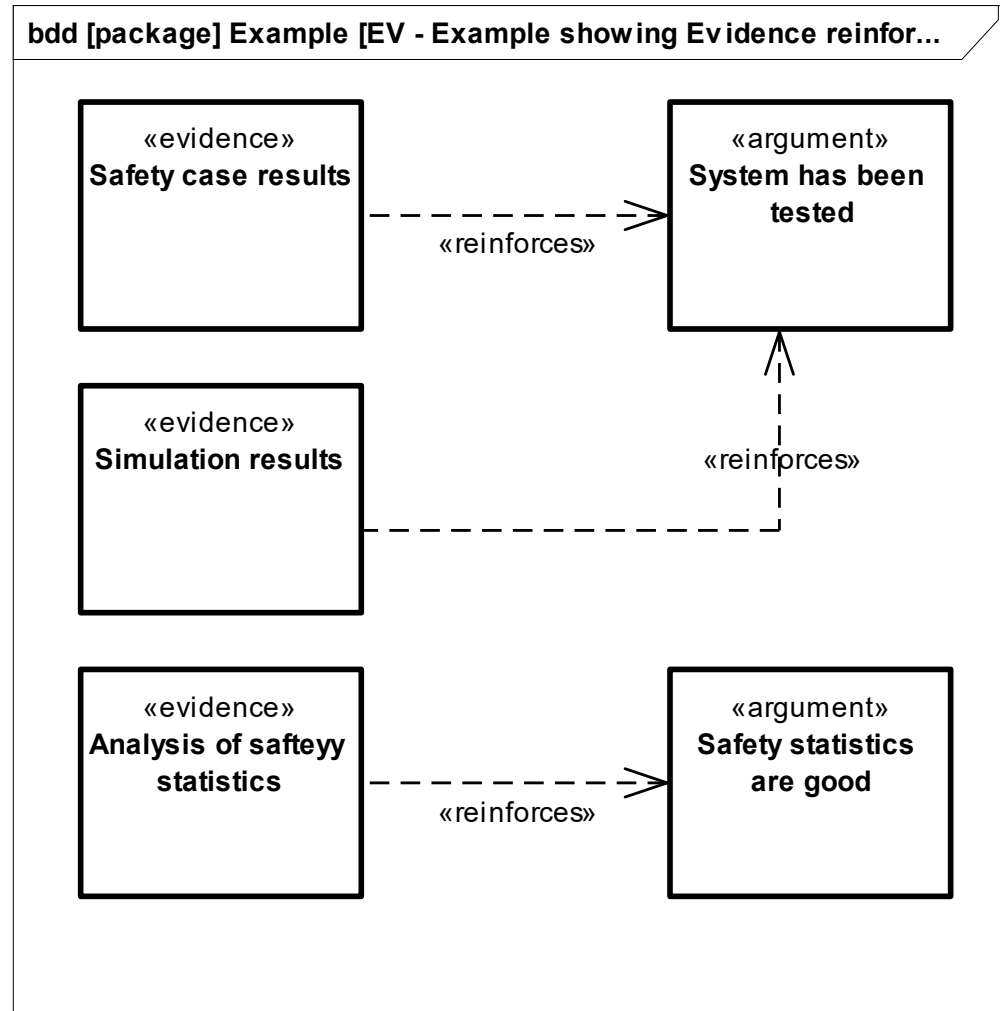




# VDV showing the Ontology Elements that appear on the Evidence Viewpoint

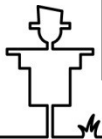
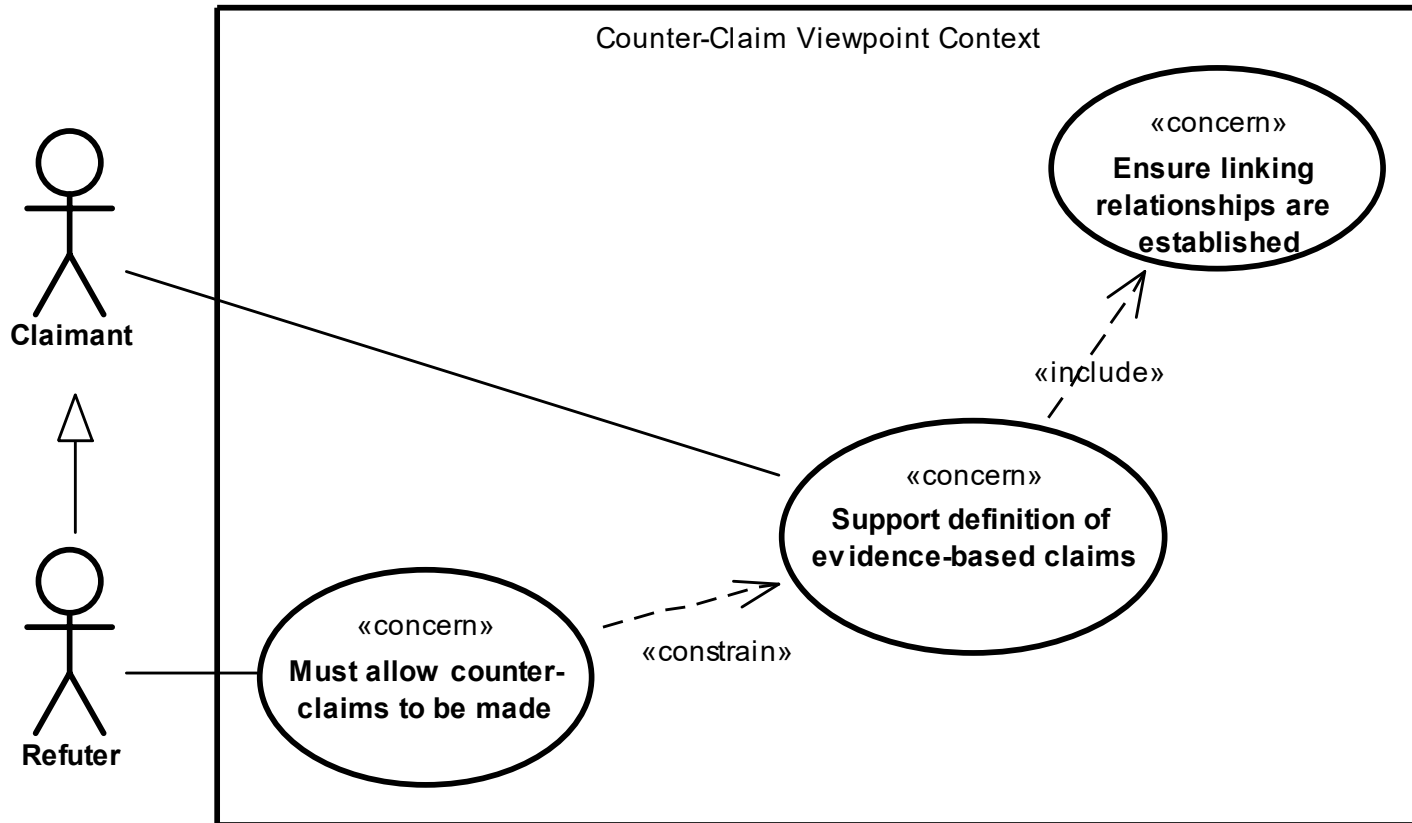


# Example EV - Evidence reinforcing the Arguments 'System has been tested' and 'Safety statistics are good'

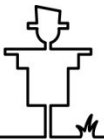
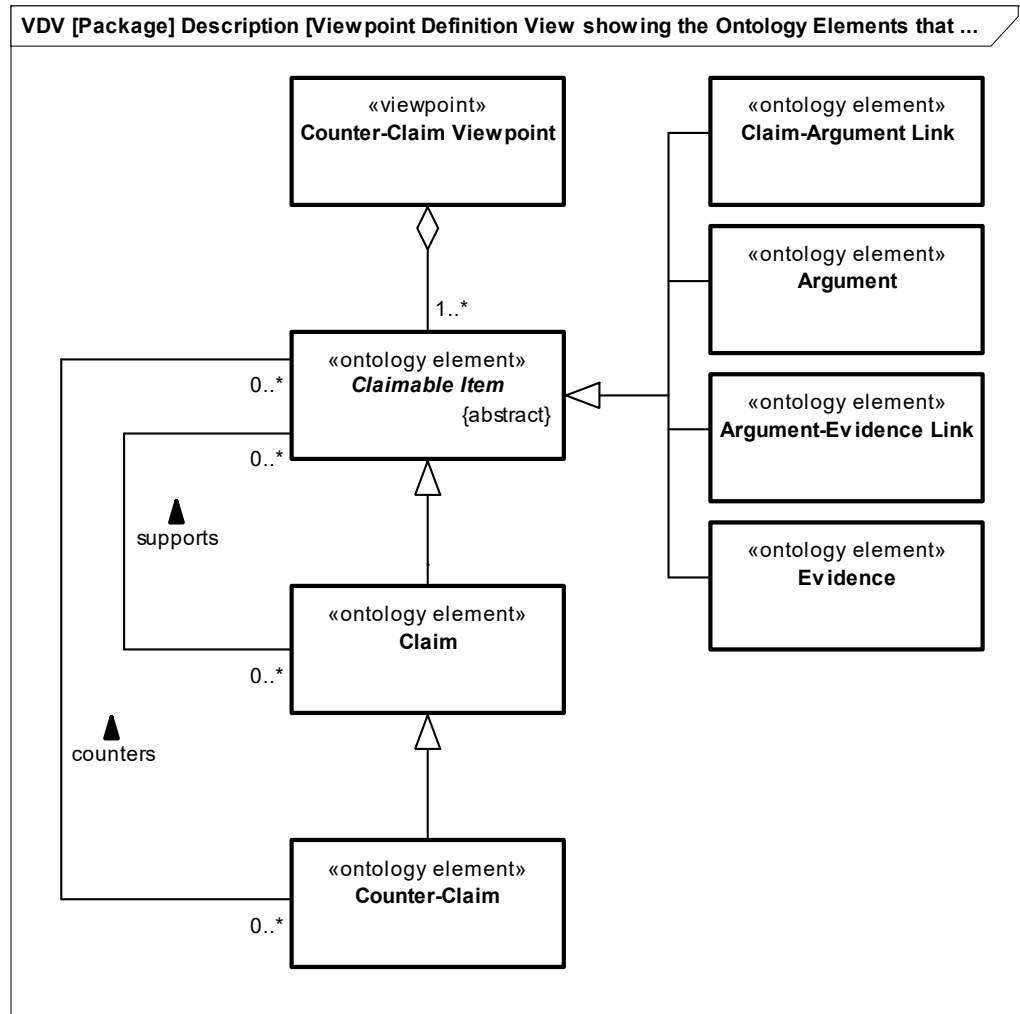


# 3.8 VCV showing Counter-Claim Viewpoint aims

VCV [Package] Counter-Claim Viewpoint (CCVp) [Viewpoint Context View showing Counter-Claim Viewp...

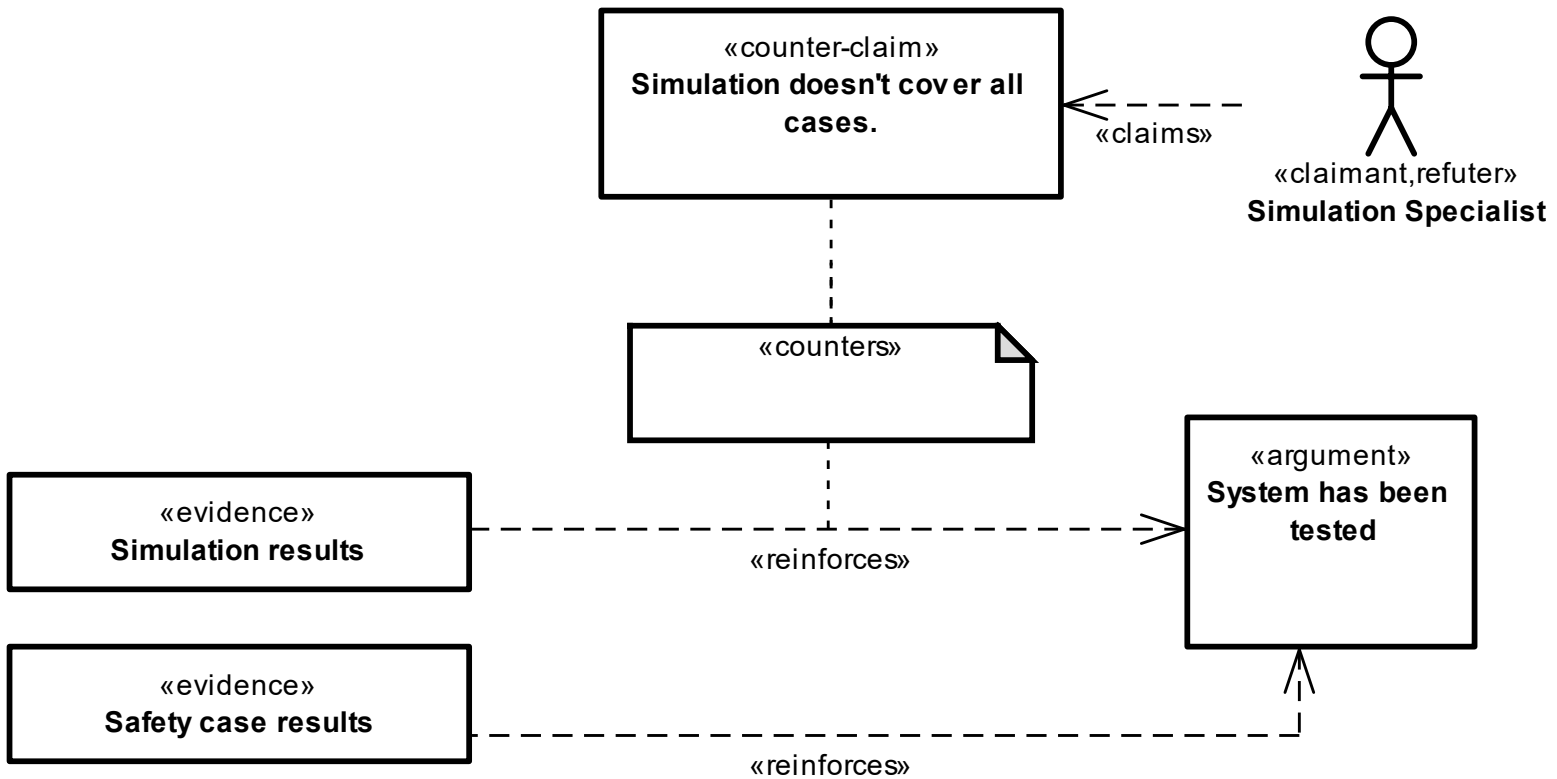


# VDV showing the Ontology Elements that appear on Counter-Claim Viewpoint



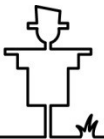
# Example CCV - Counter-Claim made against an Argument-Evidence Link

bdd [Package] Example [CCV - Example showing Counter-Claim made against an Argument-Evidence Link]



# 4. Summary

- The Evidence Pattern defines four Viewpoints for the definition of Evidence-Argument-Claim chains:
  - Claim Definition Viewpoint allows Claims to be defined for a particular Subject to show who made the Claims
  - Argument Viewpoint allows the Arguments that support a Claim to be identified
  - Evidence Viewpoint allows any supporting Evidence that reinforces Arguments to be identified.
  - Counter-Claim Viewpoint allows Counter-Claims (or supporting Claims) to be made about any type of Claimable Item



# 5. Questions

