HoliDes
HOLISTIC HUMAN FACTORS AND SYSTEM DESIGN OF ADAPTIVE COOPERATIVE HUMAN-MACHINE SYSTEMS

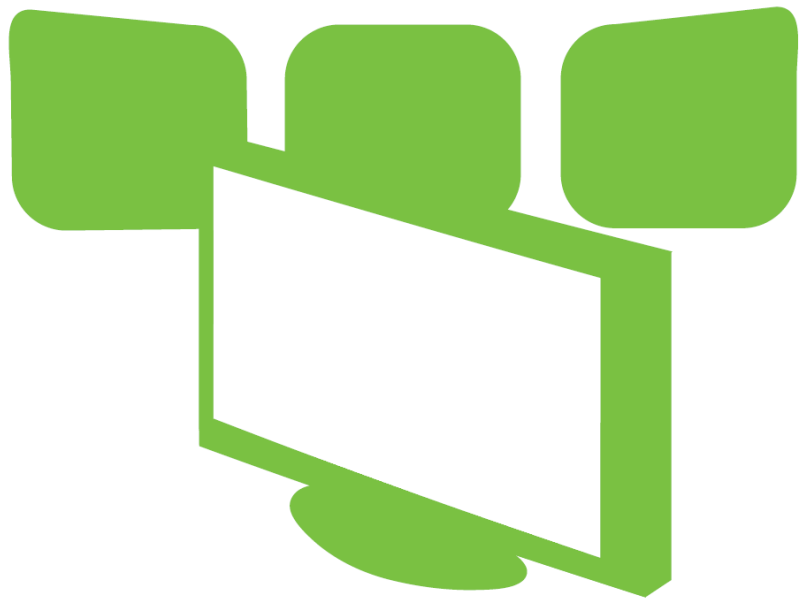# WP8: Control Room Domain Command and Control Room

ARTEMIS

Domain

Motivation

Make use of **novel user interaction** technol-ogies like presence detection and eye tracking

- to **in-creas-e** the **effectiveness** and **safety** of control rooms
- to ensure operators presence and effectiveness by monitoring the opera-tors' **physical and mental states**
- to **identify** exploitable operator **behav-ioural patterns** that can jeopardise the safety of con-trol room oper-ation
- to **balance** the individual **workload** by computing the subjective workload on the basis of variables such as
  - the oper-ator's level of expe-rience
  - his/her level of fatigue and stress
  - the number and criti-cal-ity of items he/she is currently deal-ing with.

Applied MTTs
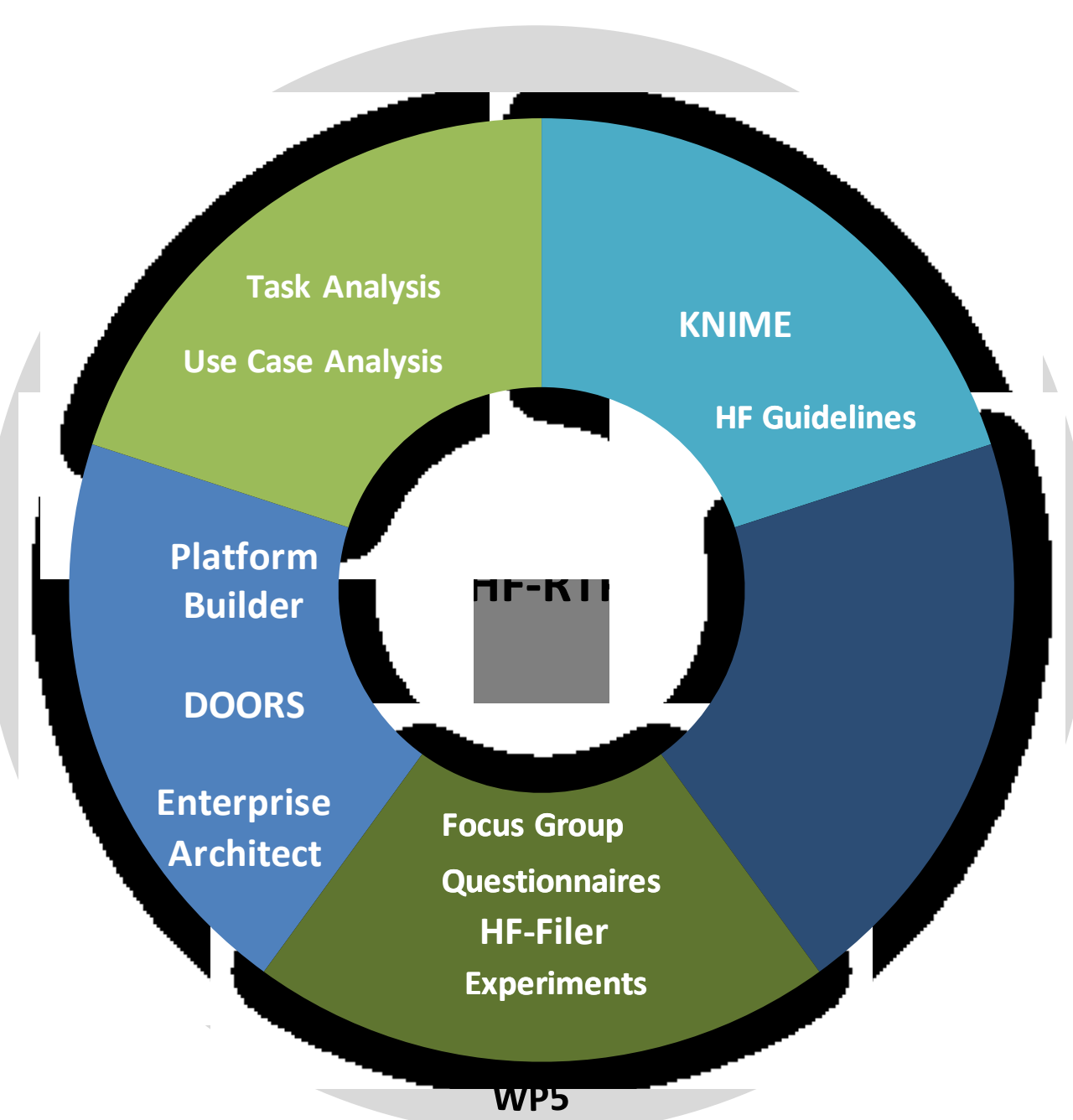
Current State: Tailored HF-RTP

The diagram below shows the **Tailored RTP** so far for the control room. MDG technology is being built to allow the architect to create **Human Views**.
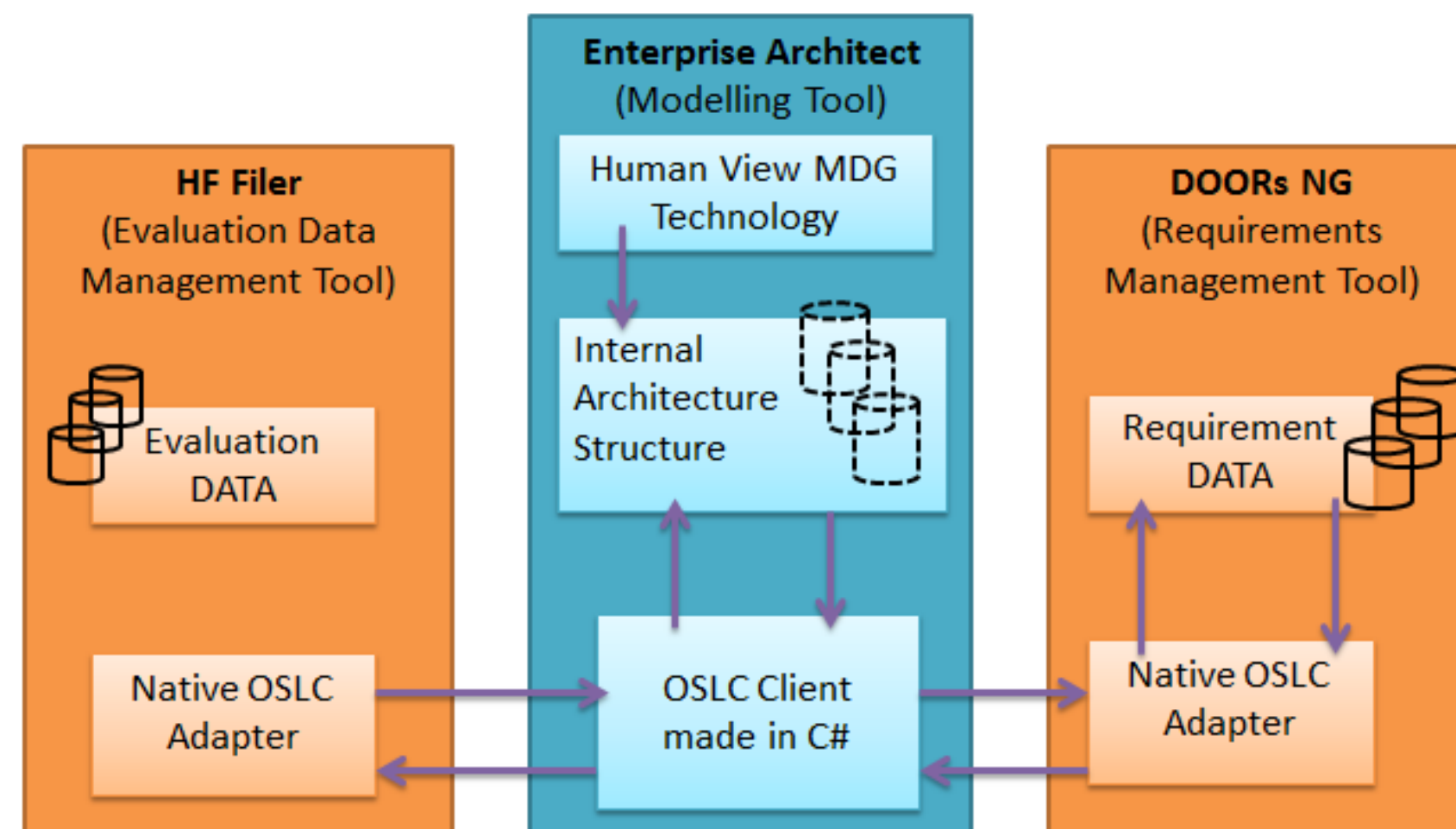
1) The add-in for Enterprise Architect allows the user to request a requirement or evaluation item over **OSLC**.
2) The **OSLC** interface retrieves the requirement artefact from the internal databases of DOORS or HF-Filer.
3) The XML-RDF representation of the resource is posted via HTTP back to the add-in.
4) Finally, the link to the resource is stored inside the architecture model.
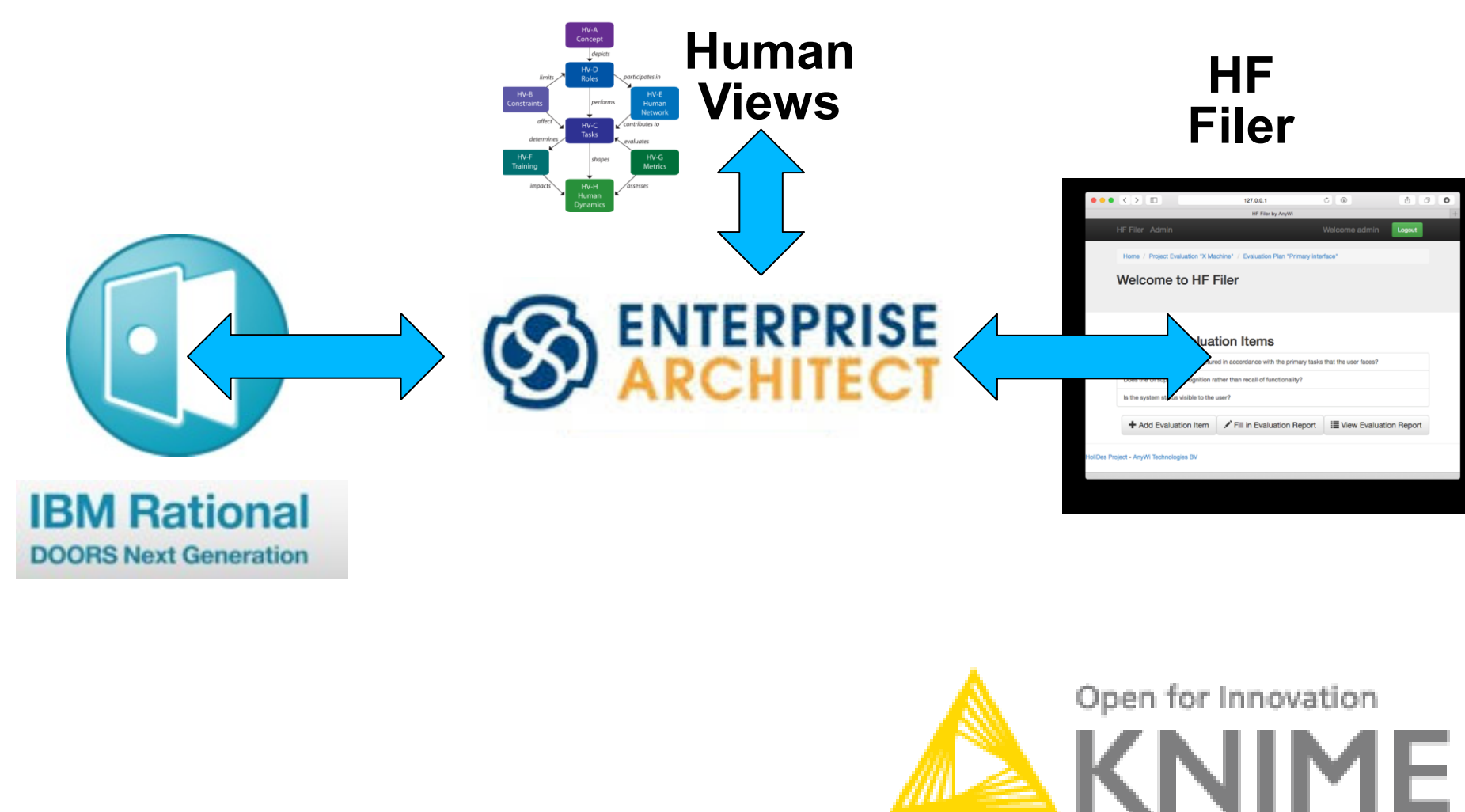
The **RTP Instance** for the Control Room comprises the **MTTs** KNIME, HF-Filer, Enterprise Architect and DOORS. DOORS and the HF-Filer were integrated into Enterprise Architect with an OSLC client plug-in written in C#. This allowed the resources of both tools to be selected and linked to modelling elements via linked data.

Results

Availability: Near-perfect (> 95%) detection of operator presence and absence achieved in the user tests; encouraging results for the fatigue detection with eye-tracking HW and SW.

Work Balancing: Based on an informal evaluation, a dynamic database of individual workload variables and a more attractive user interface have been developed.

Facilitating Human Machine Interaction (HMI): The user tests resulted in many actionable feedbacks, leading to the redesign of the user interface for Use Case 4.

Security: Use Case 4 has been redesigned, the previously hard-coded solution has been replaced by MTT KNIME.

Assigned Human Views: 85% of the Human Views making up the standard set (11 out of 13, 2 not applicable)

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