



TIMBUS Architecture for the Digital Preservation of Business Processes

- iPRES 2012

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Presented by
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Outline

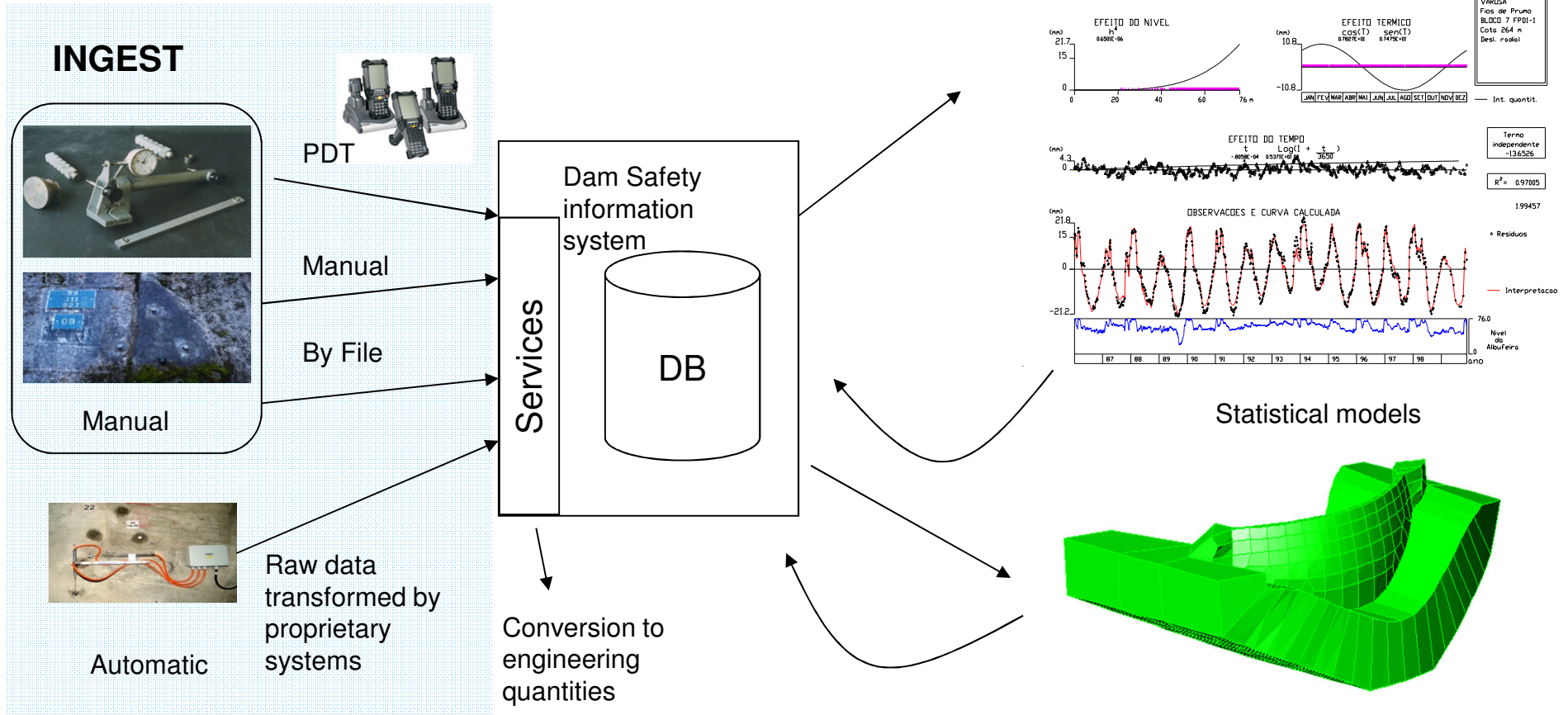
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- Motivation
- Objective
- DP Architecture
 - DP Agent Module
 - DP Acquisition Module
 - iERM Module
 - LLM Module
 - DP Engine Module
- Conclusion

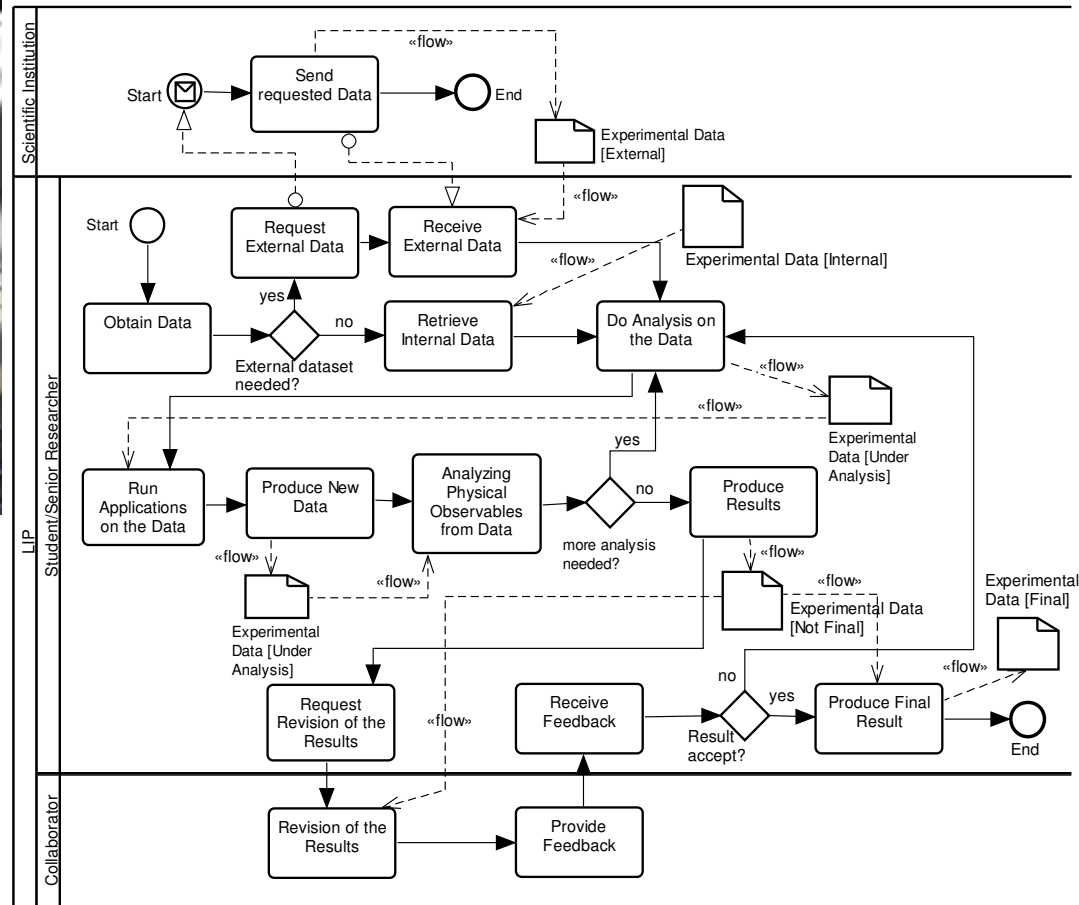
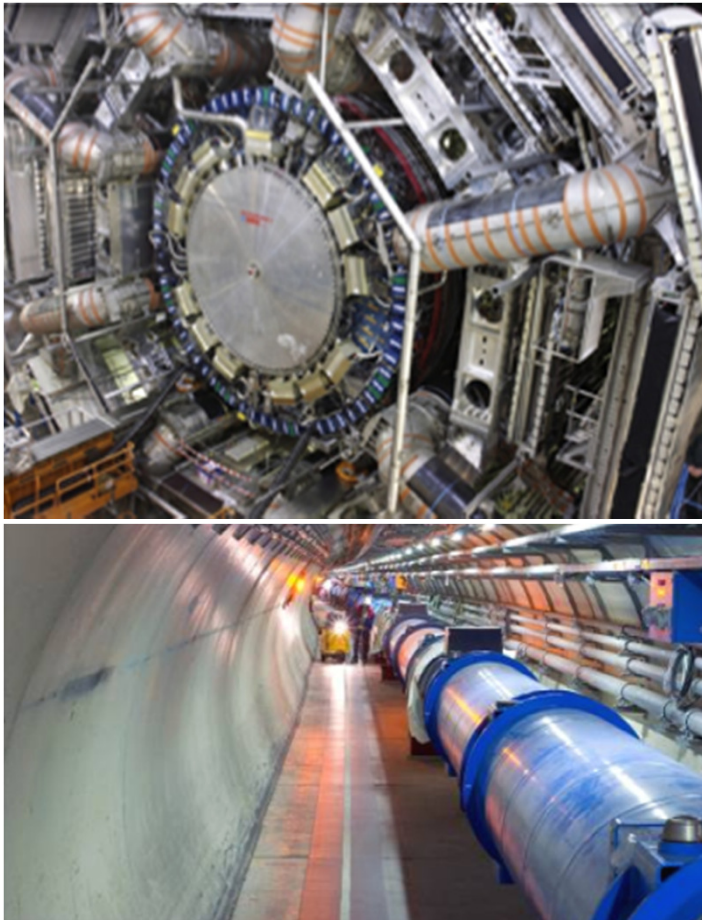
Motivations #1: Civil Engineering Infrastructures

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Preserving Business Processes

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Architecture Objectives

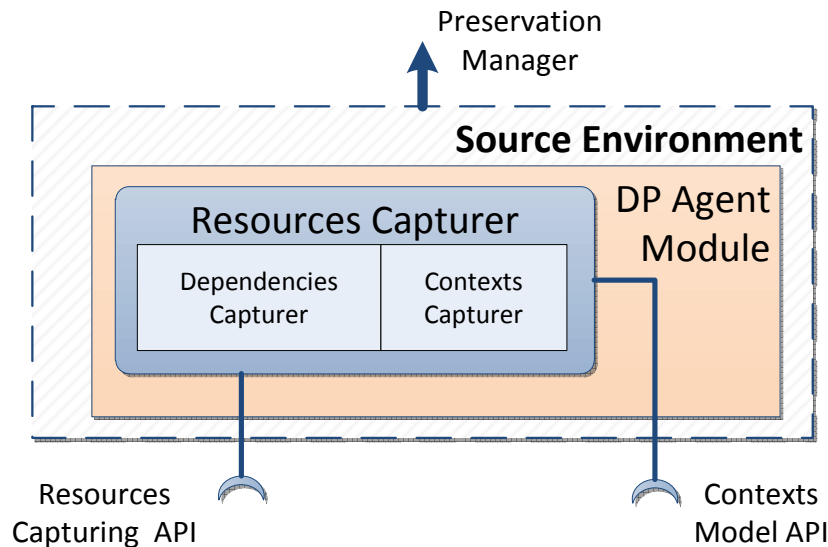
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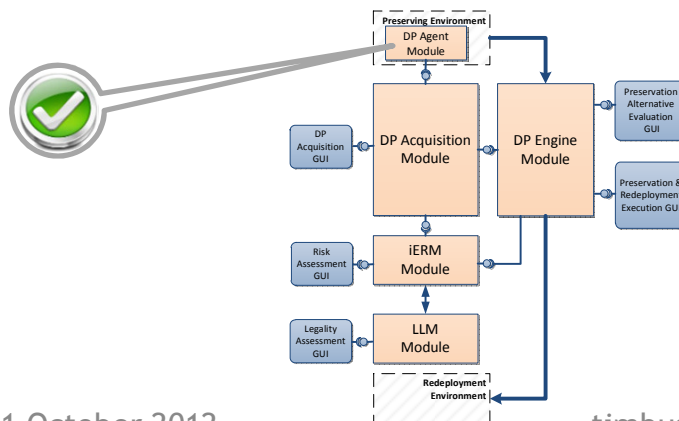
- To define the **main modules** of the DP architecture;
- To define the **key software components** in each module and describe their **input**, **output** and core **functionality**;
- To define the **key storage components** and describe their **usage** and **type** of handling data;
- To define the **key APIs** and **GUI** components for external interactions with the DP system;

DP Agent Module

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- The **Resources Capturer** collects data, which are relevant for performing DP of an IT entity such as:
 - Static software/hardware dependencies;
 - Dynamic software/hardware dependencies;
 - Contexts information relevant to DP process;
 - Different types of event-logs suitable for discovering BPs.



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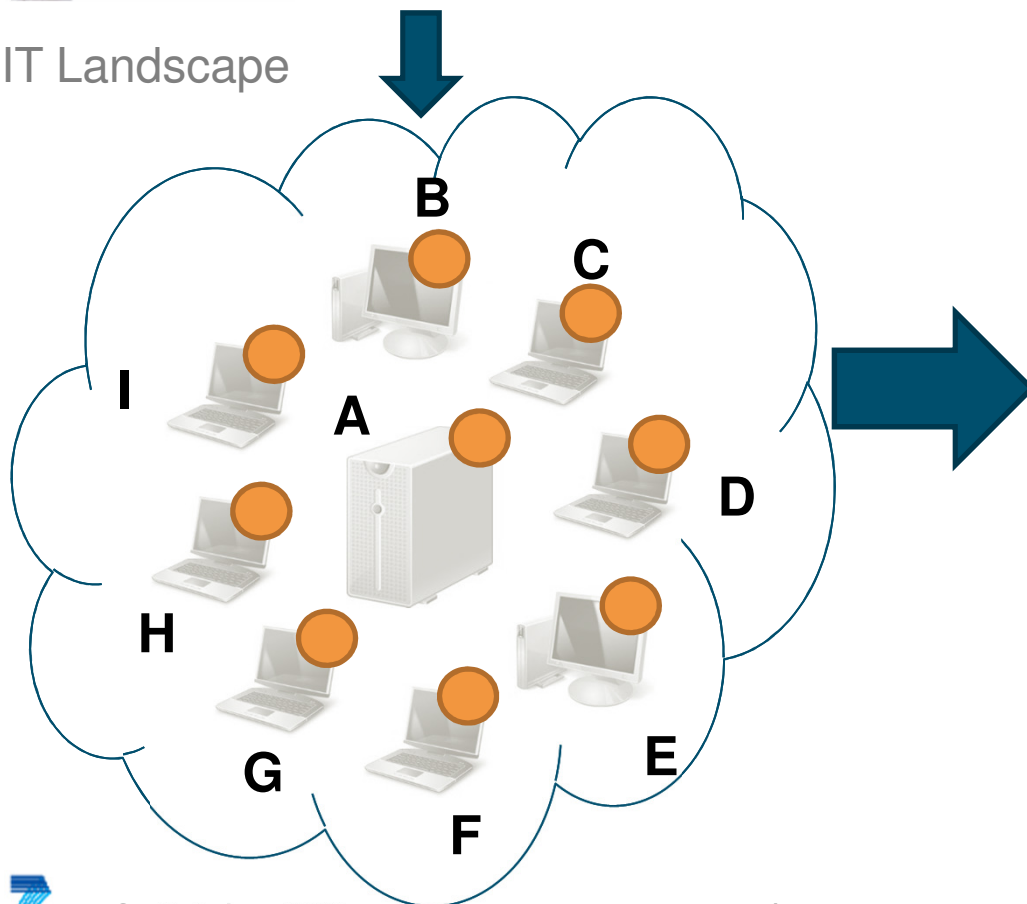
DP Agent Module

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Some Business Processes

IT Landscape

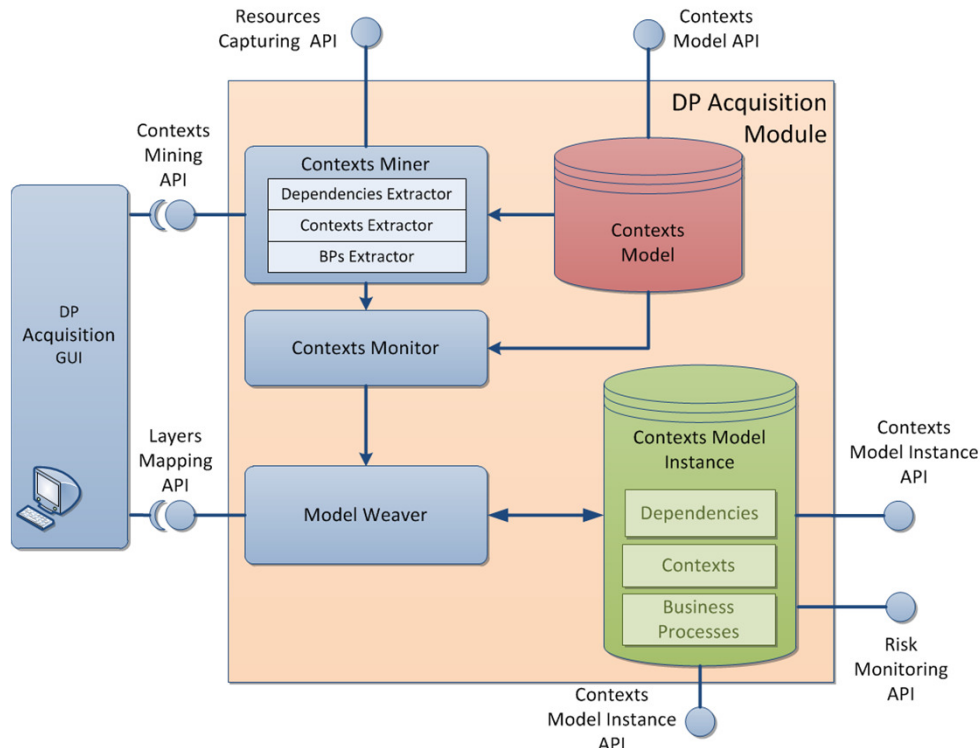


Captured Resources

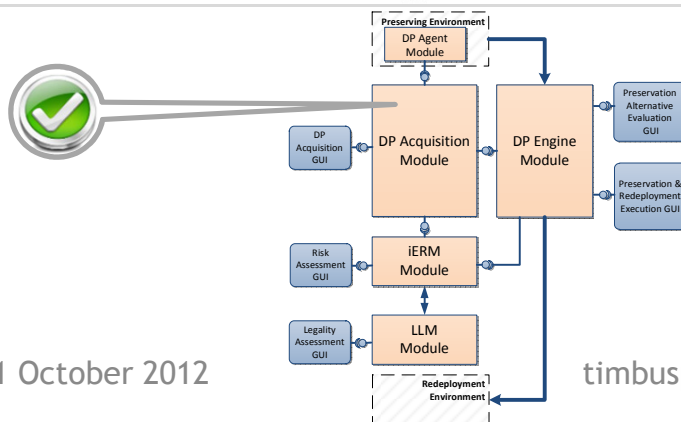
A		1	2	3	
B		4	5		
E		6	7		
C		8		G	11
D		9		H	12
F		10		I	13

DP Acquisition Module

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- The **Context Miner** analyses data collected from the multiple DP agents and performs extraction of the static/dynamic software/hardware dependencies, context information and BPs by utilising Context Model;
- The **Context Monitor** performs monitoring of the discovered information and triggers creation of the Context Model Instance if the sufficient amount of data is discovered;
- The **Model Weaver** combines together dependencies, contexts and BPs discovered components into the Context Model Instance;



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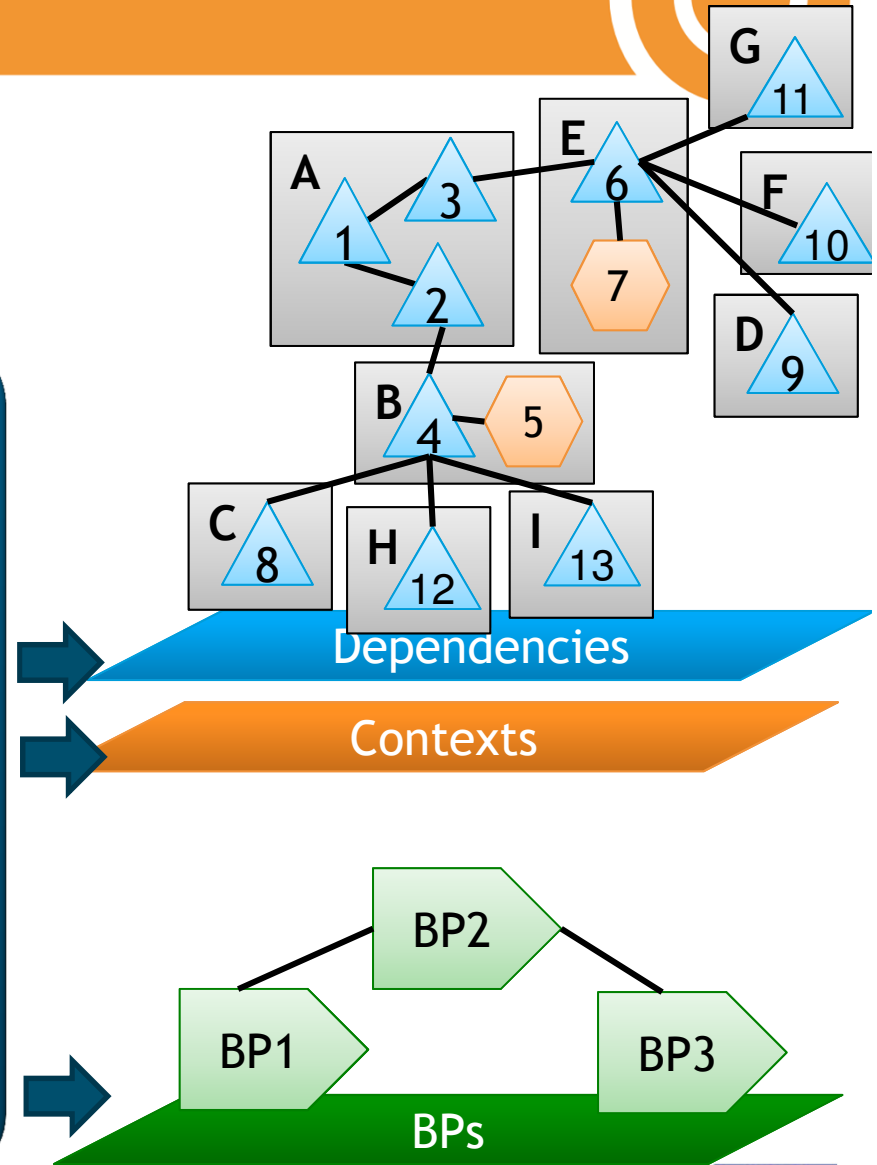
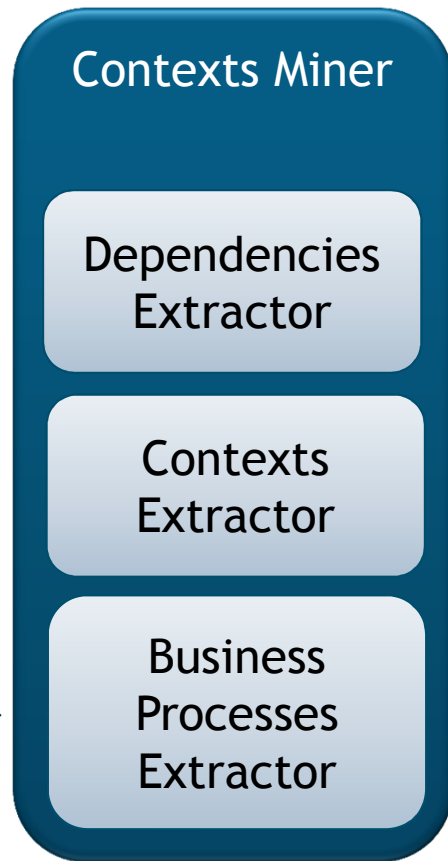
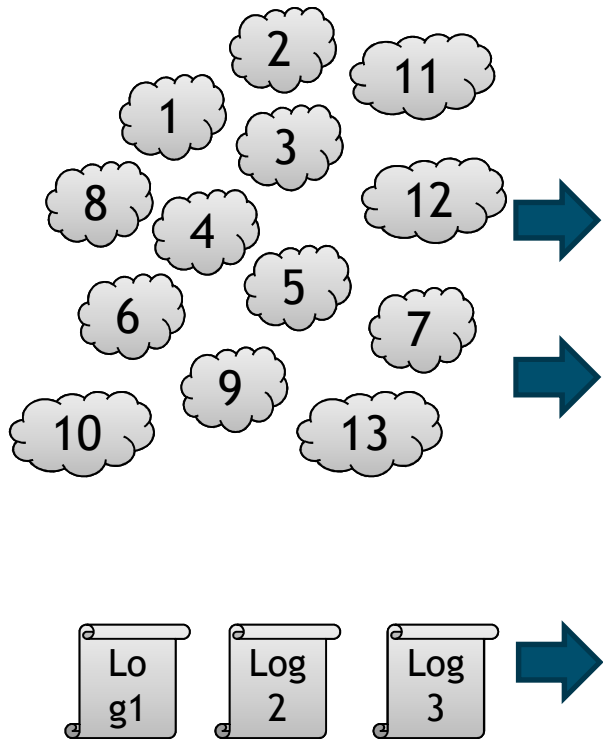


DP Acquisition: Mining

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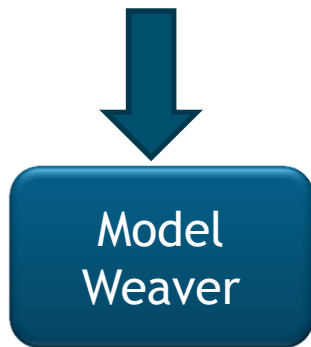


Captured Resources

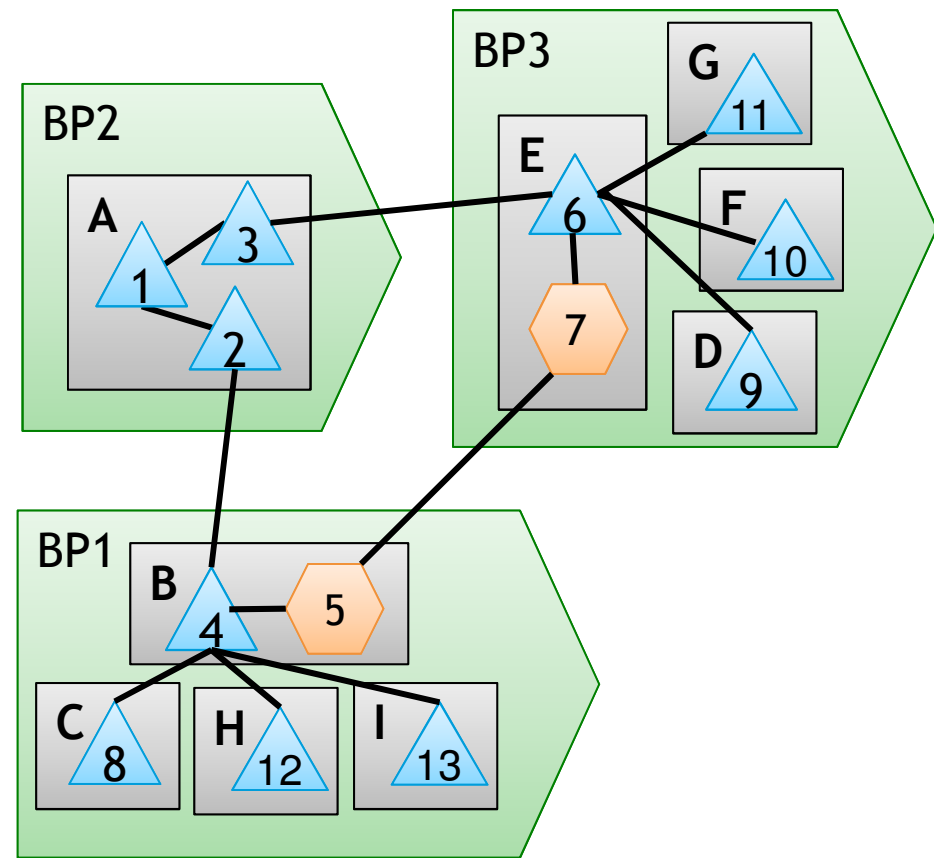


DP Acquisition: Weaver

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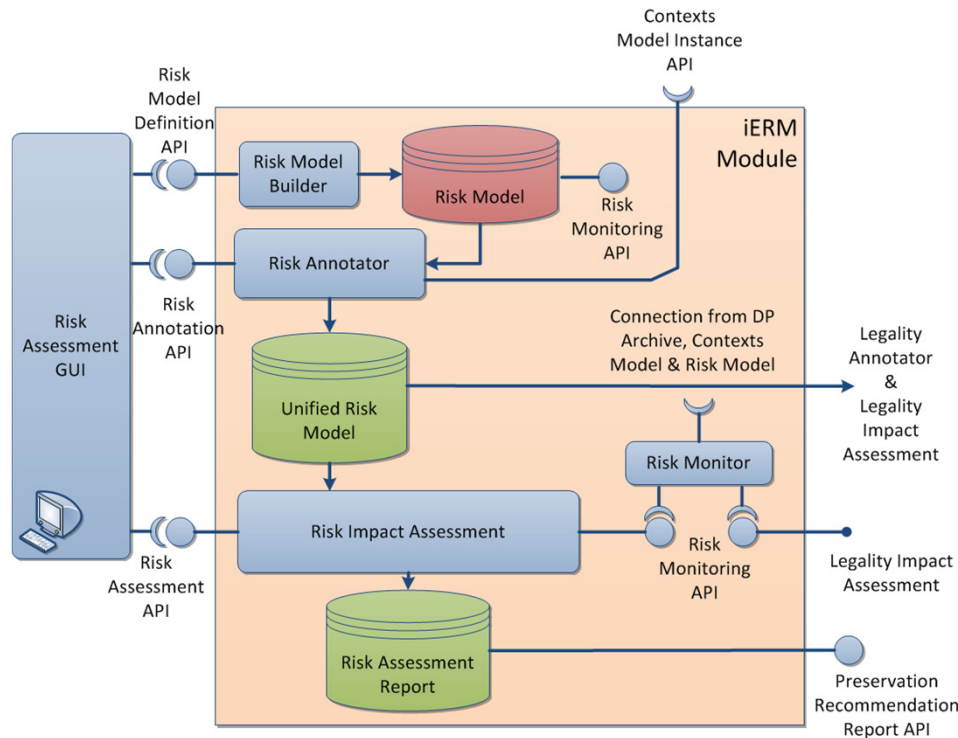
Three layers combined into the Contexts Model Instance



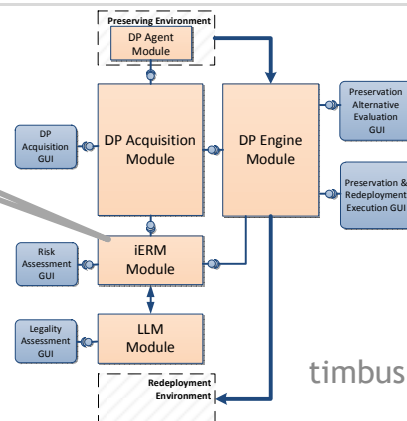
Contexts Model Instance

iERM Module

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- The **Risk Model Builder** enables modification of the Risk Model.
- The **Risk Annotator** annotates the Context Model Instance with risk information and generates URM.
- The **Risk Impact Assessment** component uses URM to assess the impact of different risk factors on business processes, business objectives and KPIs.
- The **Risk Monitor** monitors the DP System Archive, Risk & Contexts Models to detect risk events and triggers an execution of Legality & Risk Impact Assessment Components.



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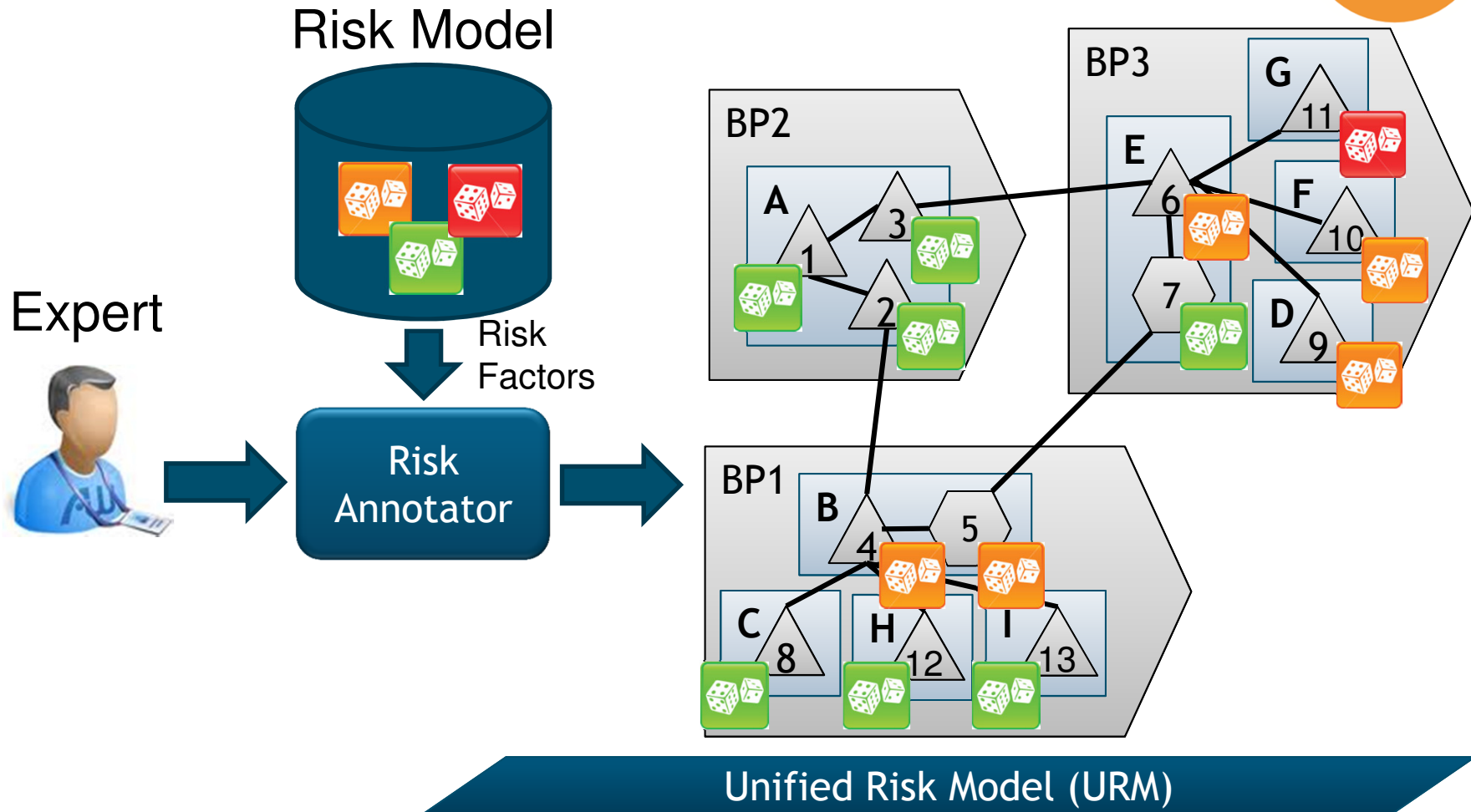
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iERM Module

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Contexts Model Instance

+ Risk Factors



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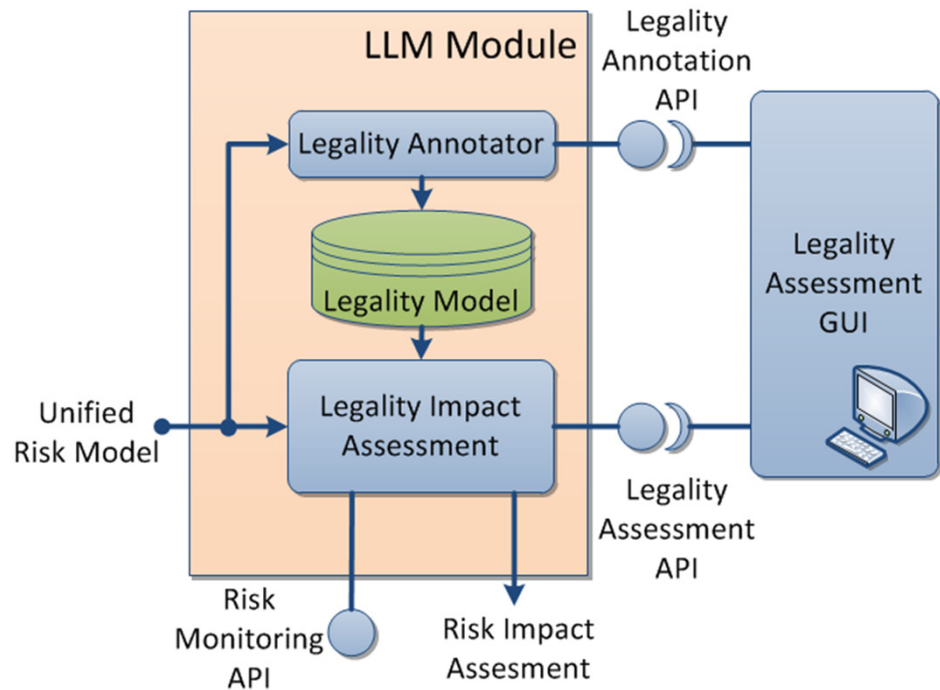
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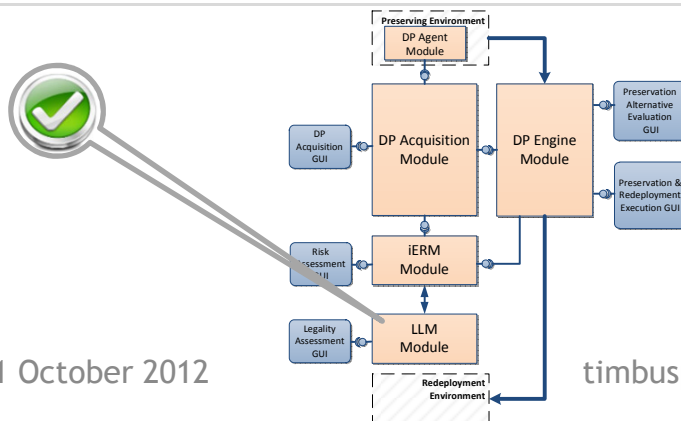


LLM Module

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- The **Legalities Annotator** allows a user to define legal and contractual issues relevant for a particular organisation, project or specific to BPs from the URM and stores these rules in the Legality Store.
- The **Legalities Impact Assessment** component checks whether or not rules from the Legalities Store are enforced for the discovered set of BPs and resources defined in the URM model.



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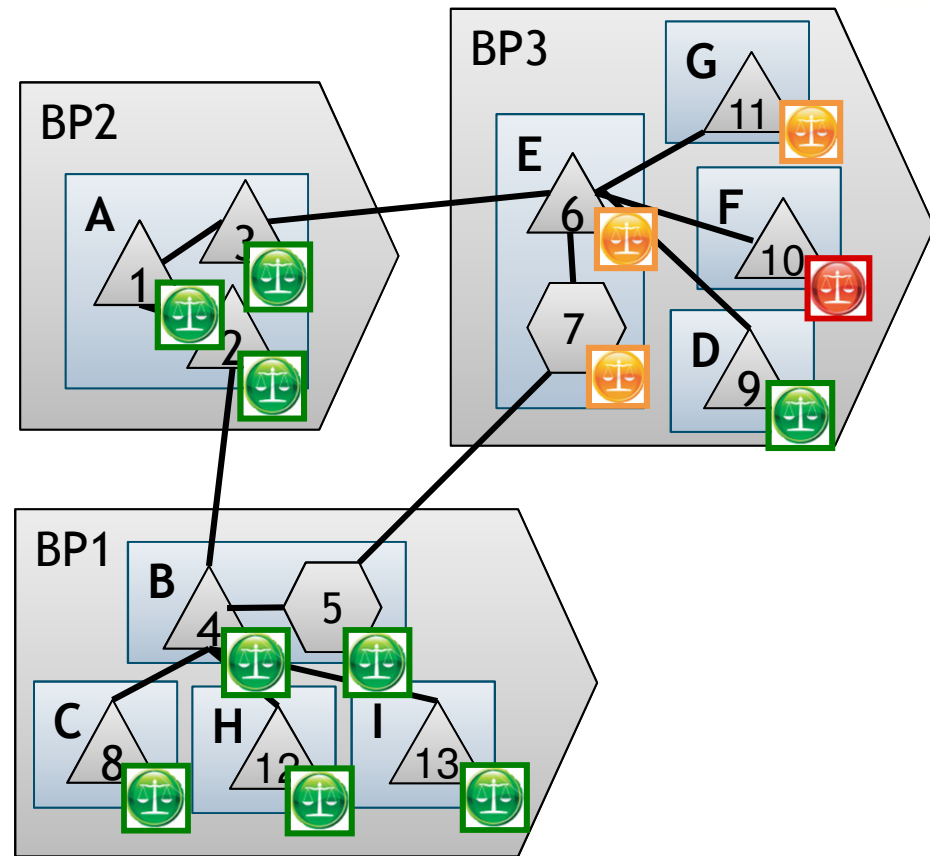
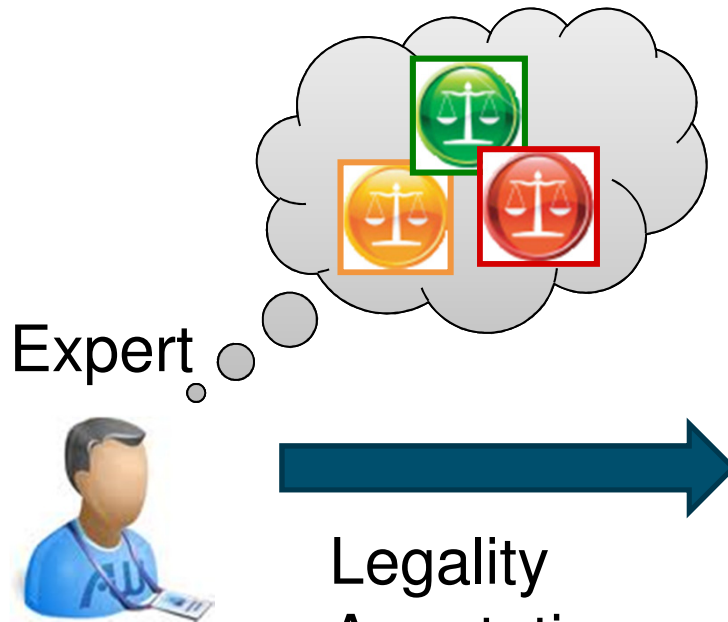


LLM Module: Annotation

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Legality Factors



Legality Model

URM

+ Legality Factors



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iERM & LLM Modules: Impact Assessment

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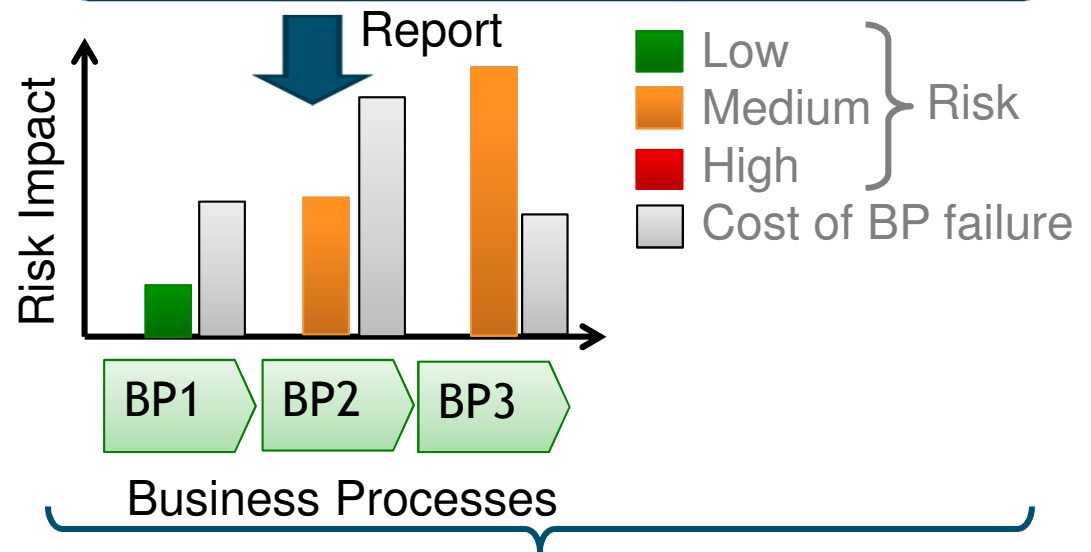
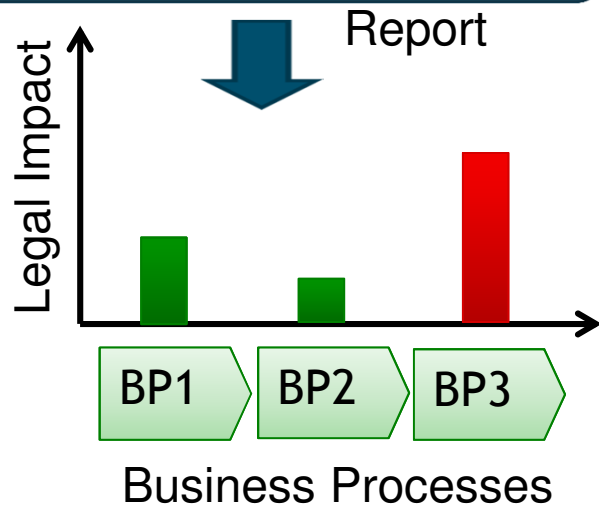
Legality Model

Unified Risk Model



Legality Impact Assessment

Risk Impact Assessment



Risk Assessment Report



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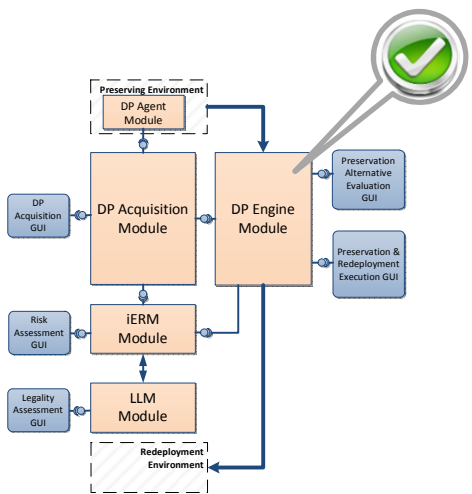
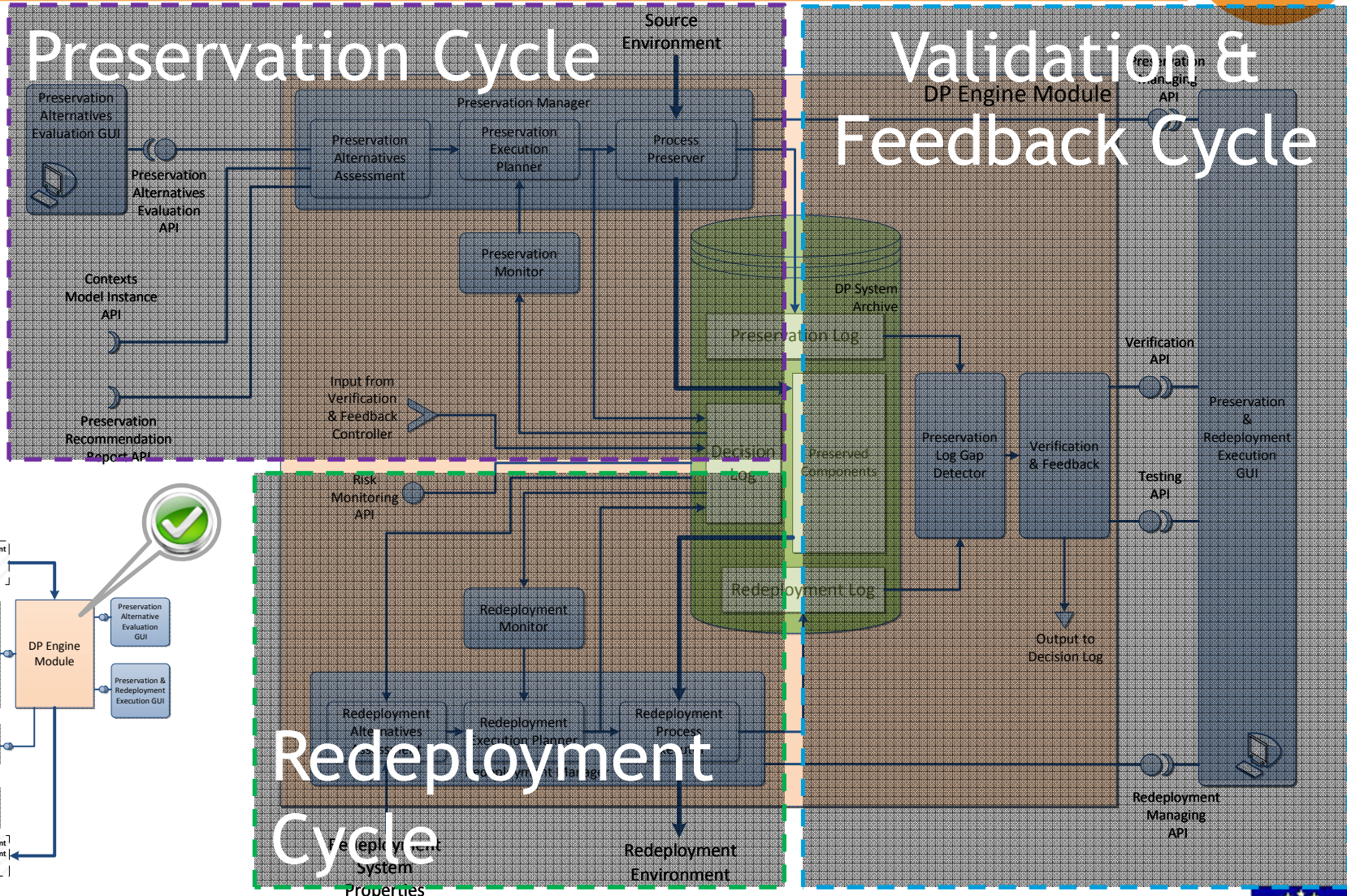
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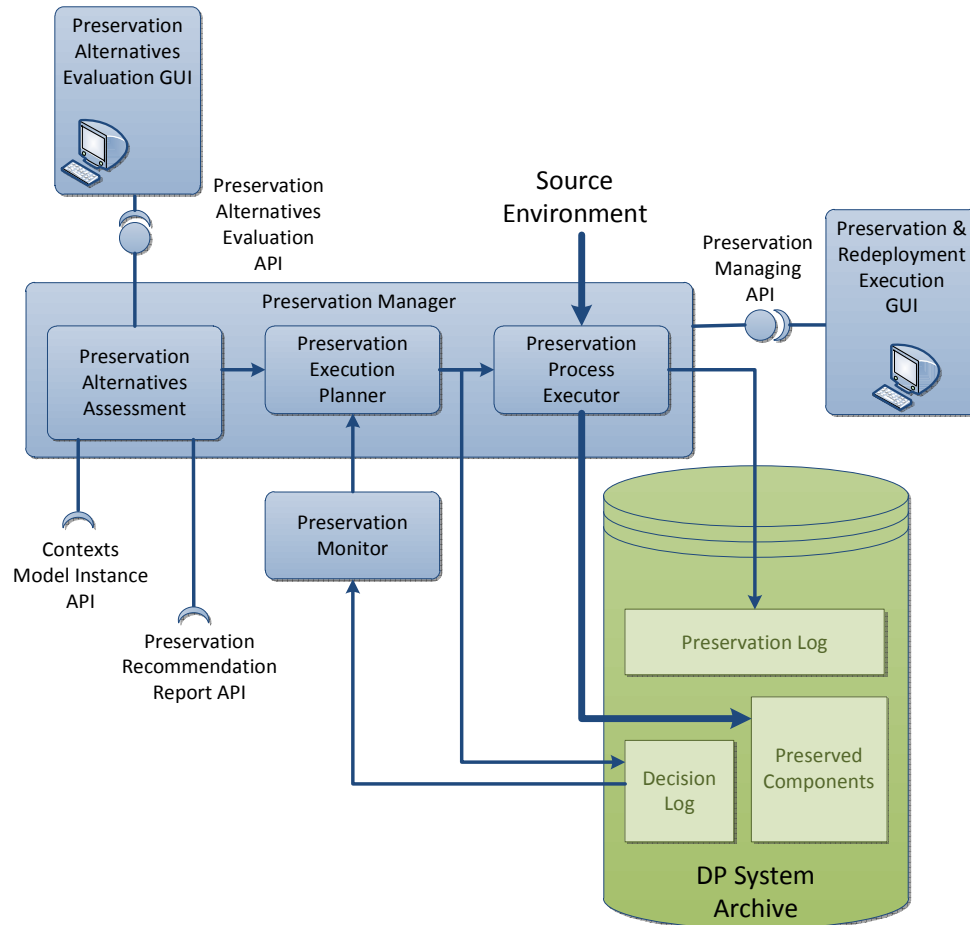
DP Engine Module

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DP Engine: Preservation Cycle

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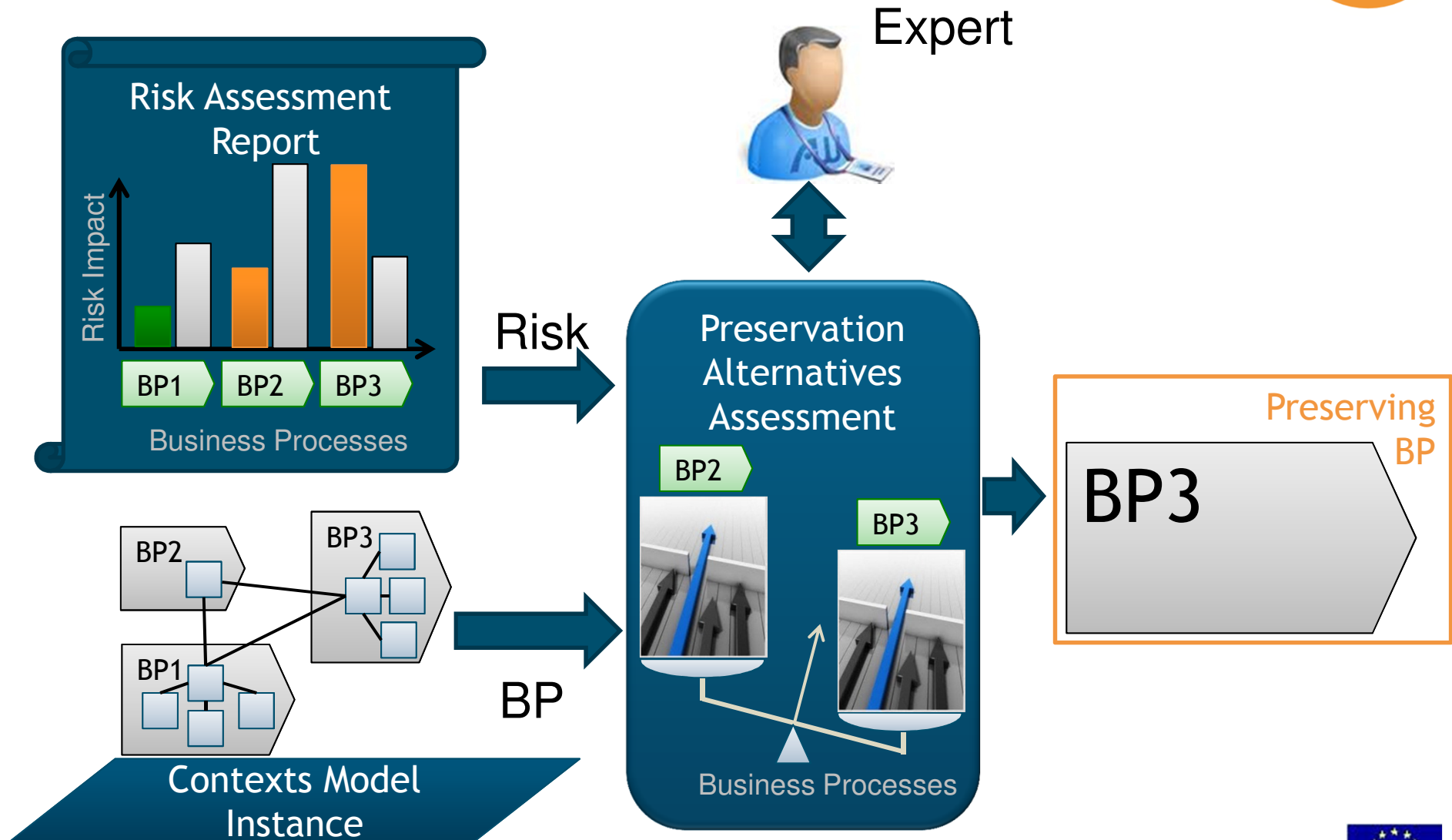


Preservation Cycle

- The **Preservation Manager** performs preservation planning and execution.
 - **Preservation Alternatives Assessment** evaluates different preservations strategies;
 - **Preservation Execution Planner** creates a script which defines the preservation flow;
 - **Process Preserver** executes the preservation process according to the prepared plan;
- The **Preservation Monitor** analyses decisions logged in the DP System Archive in order to amend the preservation plan.

DP Engine: Alternatives Assessment

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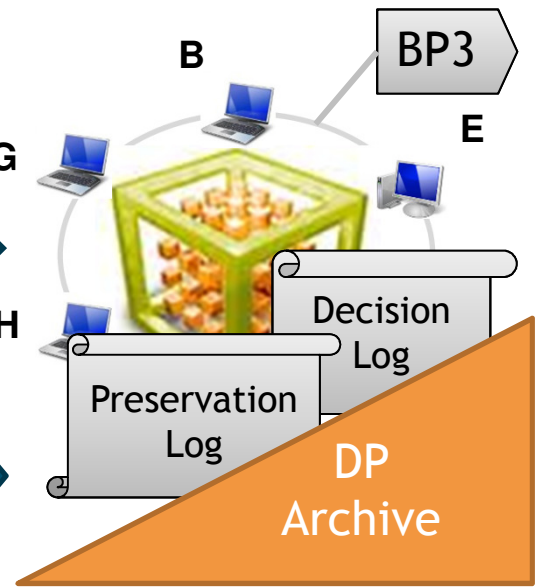
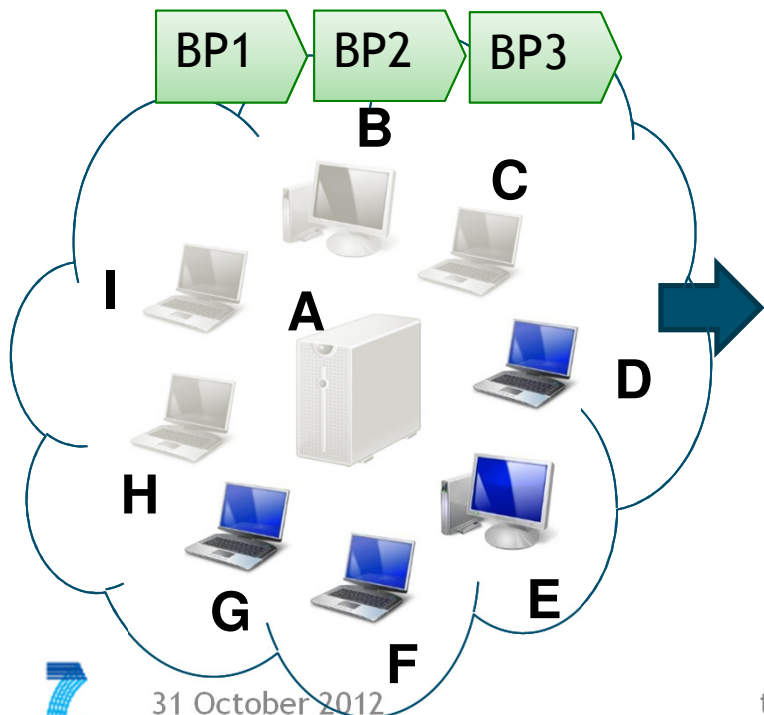
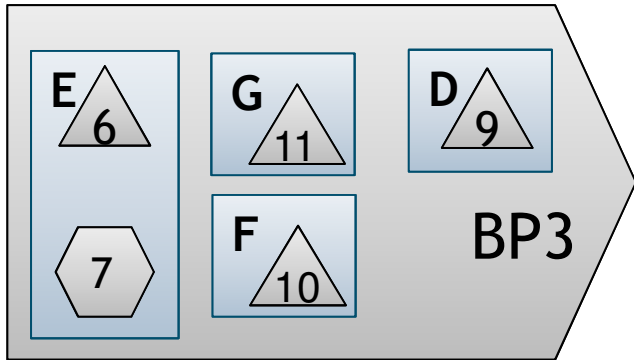
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DP Engine: Preservation

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Preservation & Decision Logs



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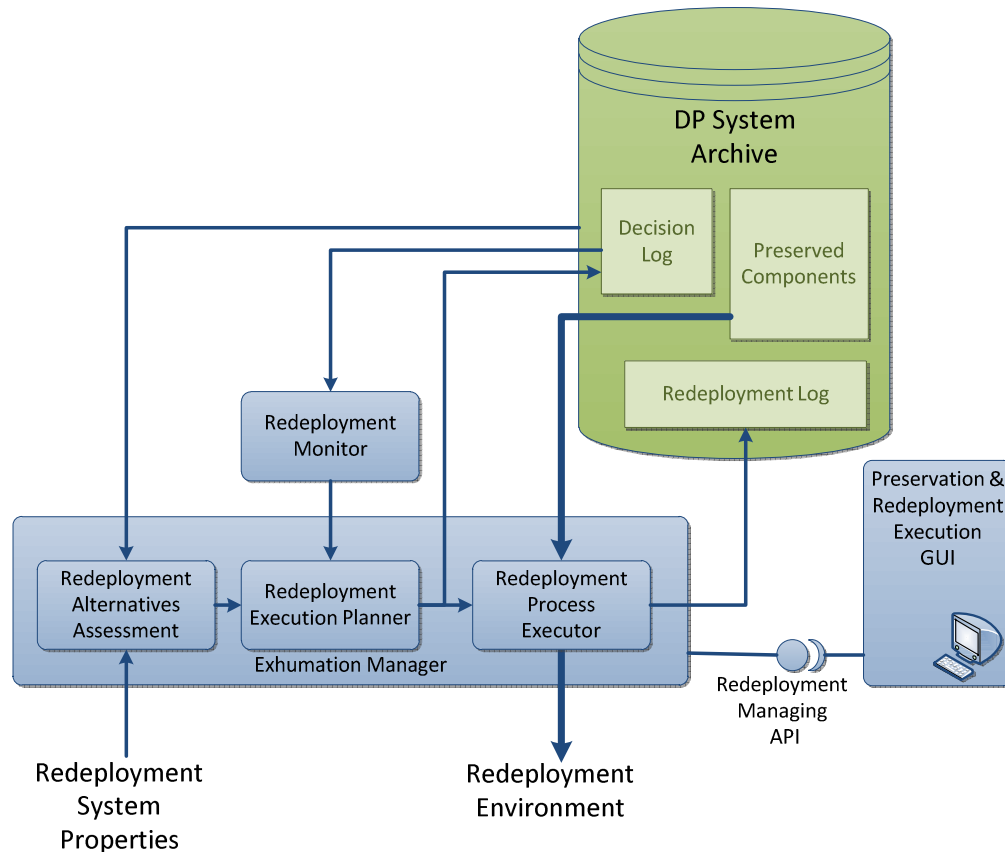
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DP Engine: Redeployment

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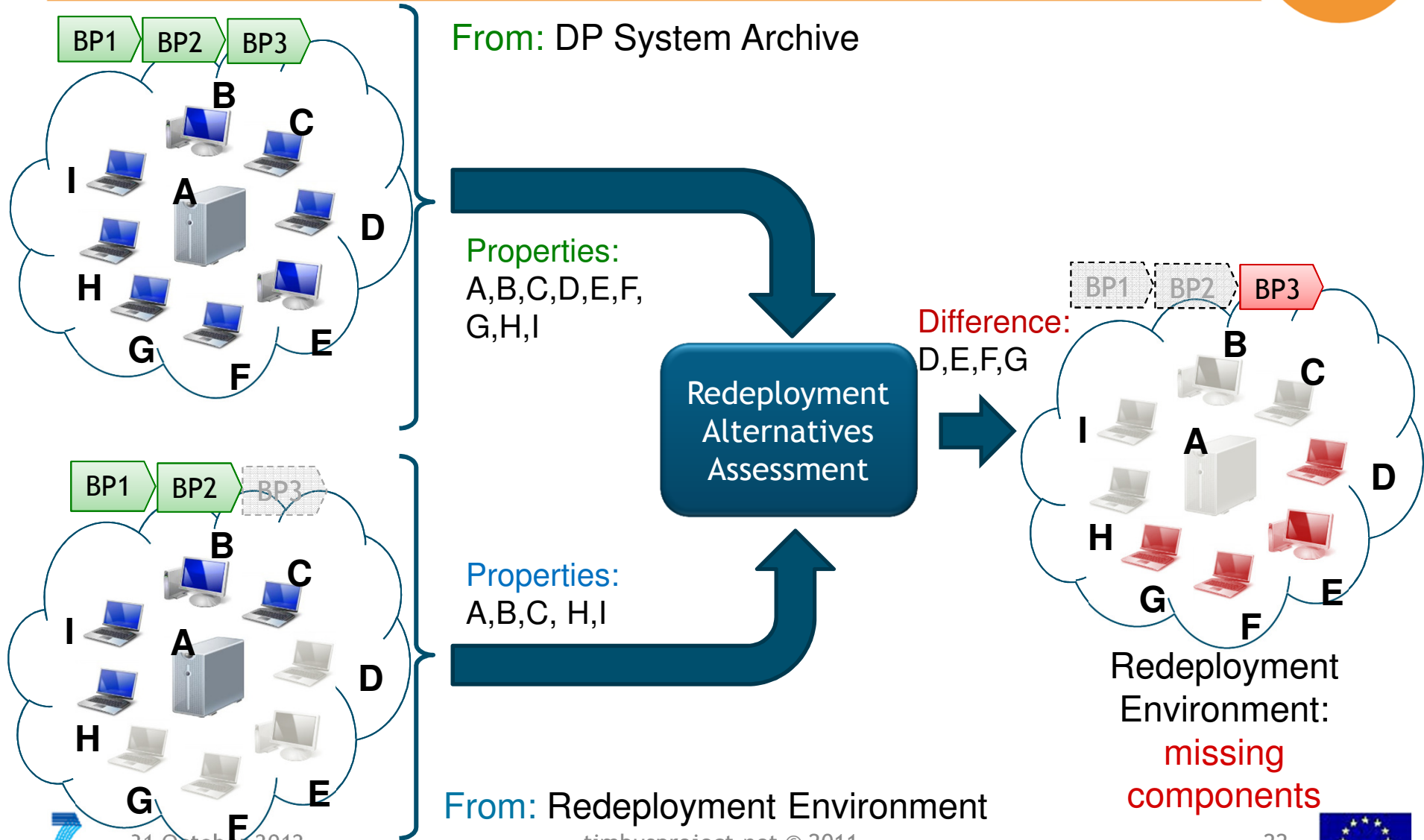
Redeployment Cycle

- The **Redeployment Manager** performs exhumation planning and execution.
 - **Redeployment Alternatives Assessment** evaluates different redeployment strategies;
 - **Redeployment Execution Planner** creates a script which defines the redeployment flow;
 - **Redeployment Process Executor** executes the redeployment process according to the prepared plan;
- The **Redeployment Monitor** analyses decisions logged in the DP System Archive in order to amend the redeployment plan.

DP Engine: Alternatives Assessment



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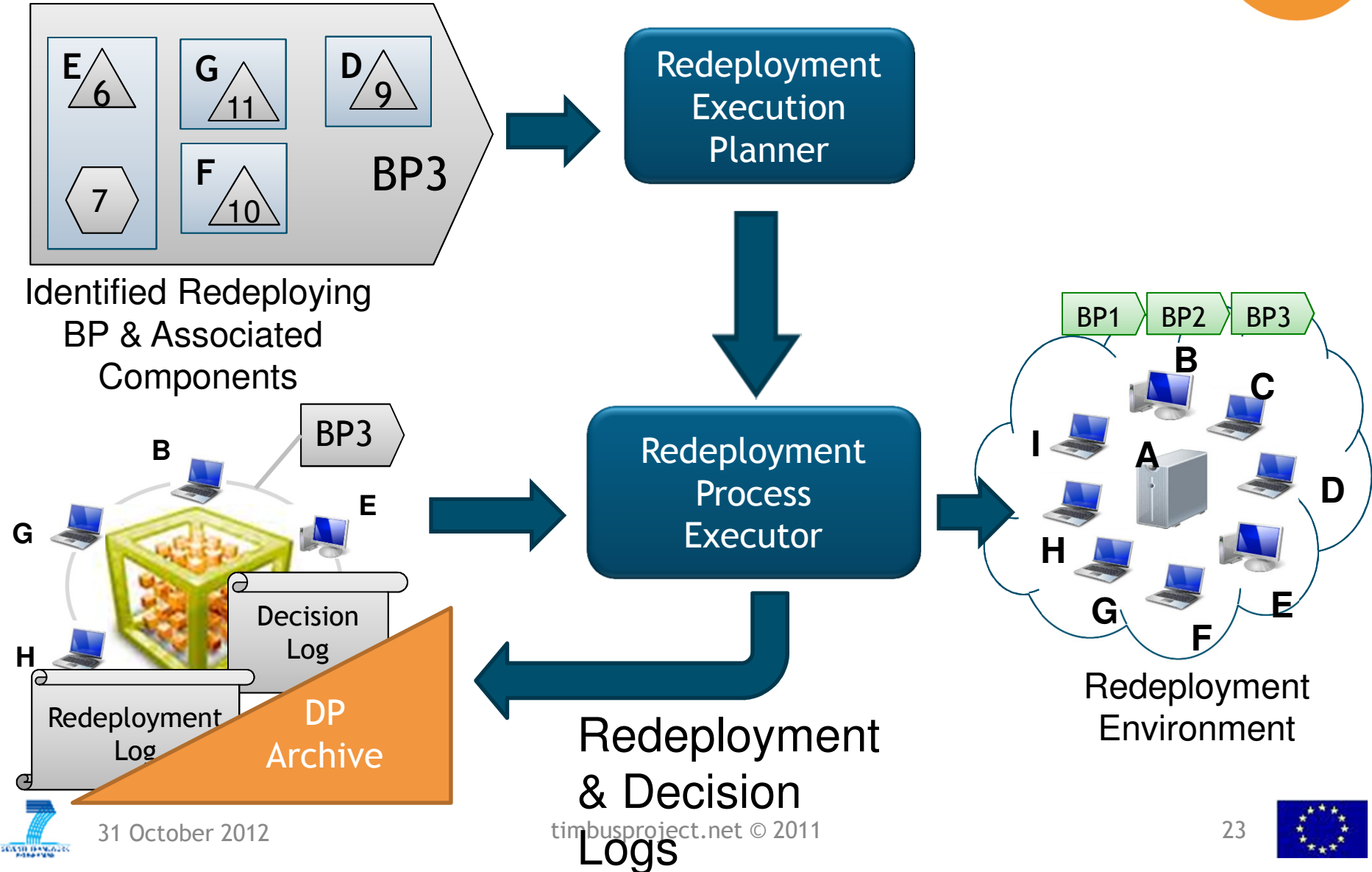
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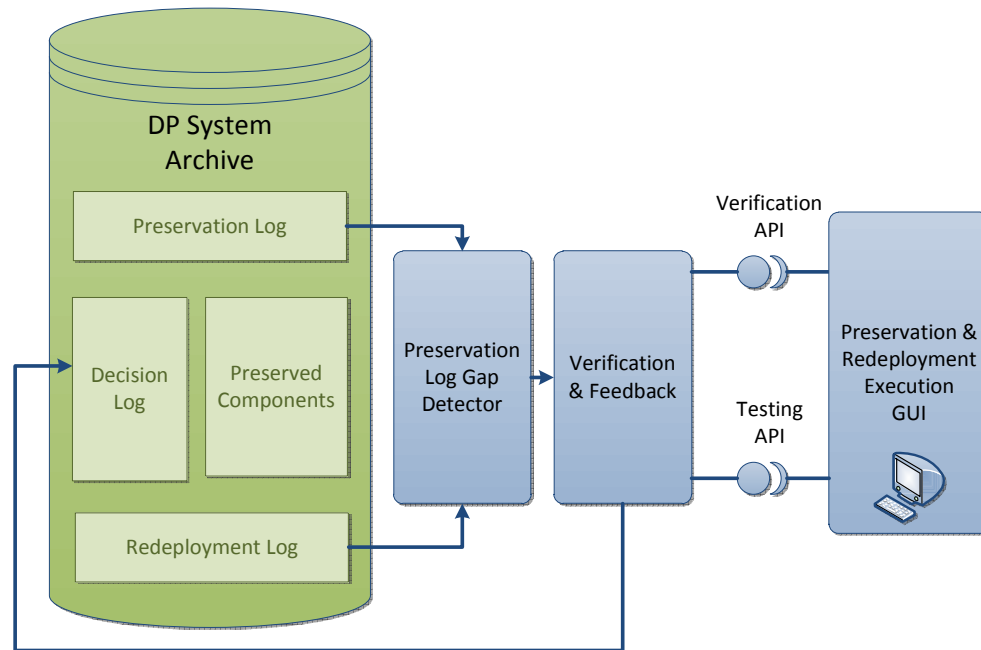
DP Engine: Redeployment

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DP Engine: Validation and Feedback

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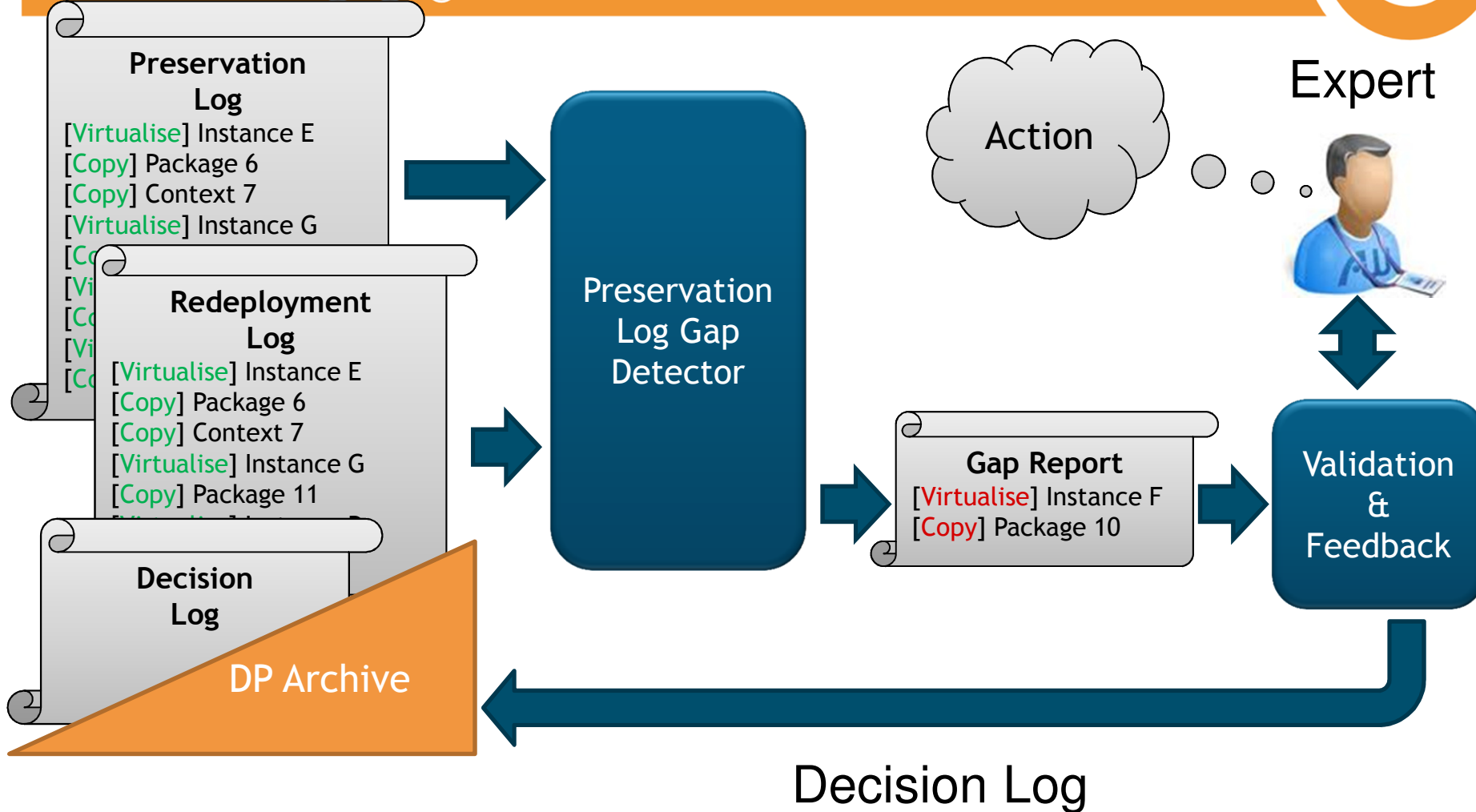
Validation and Feedback Cycle

- The **Preservation Log Gap Detector**
 - compares preservation and redeployment logs on potential inconsistencies
 - notifies the validation and feedback controller.
- **Validation & Feedback** provides the infrastructure
 - for verifying preservation and redeployment results
 - for performing test operations.

DP Engine: Validation & Feedback



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Summary #1

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- The TIMBUS Architecture satisfies all requirements in the 3 driving use cases;
- The TIMBUS Architecture consists of five main modules:
 - **DP Agent Module**
 - for capturing resources;
 - **DP Acquisition Module**
 - for collecting resources into unified BP model;
 - **iERM Module**
 - for assessing risk associated with resources;
 - **Legalities Lifecycle Management Module**
 - for assessing risk associated with legalities;
 - **DP Engine Module**
 - for planning end execution of BP.

Summary #2

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- The TIMBUS DP Architecture consists of five GUI modules:
 - **DP Acquisition GUI**
is used for controlling resource collection process;
 - **Risk Assessment GUI**
is used for controlling total risk assessment associated with BPs;
 - **Legality Assessment GUI**
is used for controlling legality risk assessment associated with BPs;
 - **Preservation Alternatives Evaluation GUI**
is used for controlling BPs preservation & exhumation planning;
 - **Preservation & Redeployment Execution GUI**
is used for controlling BPs preservation & exhumation planning.

Conclusions #3

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- TIMBUS DP Architecture consists of two storage groups:
 - *Predefined*: for handling (mostly “static”) models:
 - Contexts Model*
 - Risk Model*
 - *Populated*: for handling model instances, reports and supporting objects generated during different stages of DP:
 - Contexts Model Instance,*
 - Unified Risk Model,*
 - Risk Assessment Report,*
 - Legality Model*
 - DP System Archive.*

Conclusions #4

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- The proposed architecture
 - represents the **complete solution** for performing **preservation** of modern **BPs**,
 - reflects the state of the art in the area of digital preservation
 - **combines the unique set of knowledge and expertise of the TIMBUS partners.**

Q&A Session

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Questions ...

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Thank You



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