



Demonstrator Setup

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Axel Simroth



○ Demonstrator scenarios

- Overview
- Road use case
- Rail use case



○ Purpose / objective of demonstration

- Baseline and optimised solution

○ eIMS setup

- Baseline
- Optimised solution



Overview / comparison



Road network	Rail line
Pavement	Cross-asset (track geometry, S&C, other repair and inspection)
Tactical (5 year)	Operational (weekly, rolling horizon)
Preventive	Predictive & corrective & preventive
Cost & quality	Reliability

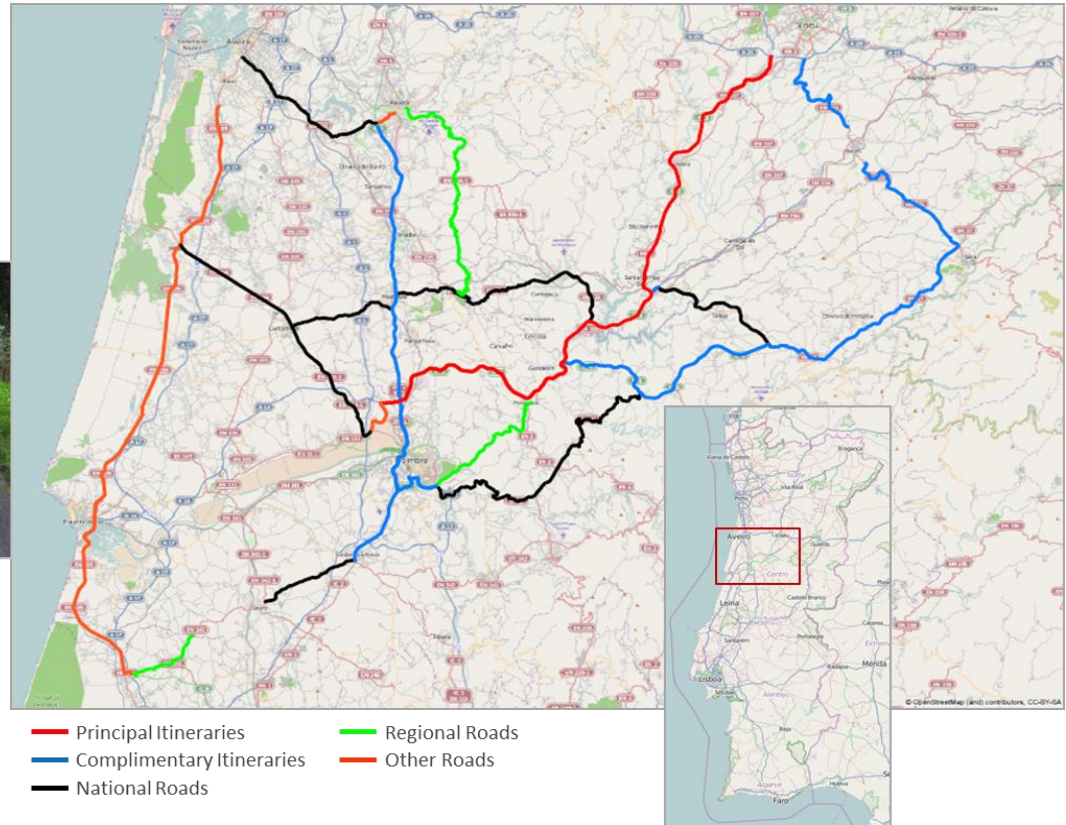


Road demonstration network

Meshed road network in Portugal
under the management of
Infraestruturas de Portugal
541 km



Heterogeneous network in terms
of traffic demand, road hierarchy
and age



	IP network	INFRALEERT network	
Network length (km)	13 577	541	4%

Asset register

- Main features and GIS database

Condition data provided

- Inspection data covering the period from 2011 to 2016
- Overall quality, longitudinal and transverse unevenness, cracked area, etc., with 10 m resolution

Maintenance data

- Historic record of all pavement interventions (start and end km, materials, layer thicknesses, etc.) from 1936 to 2016

Traffic data

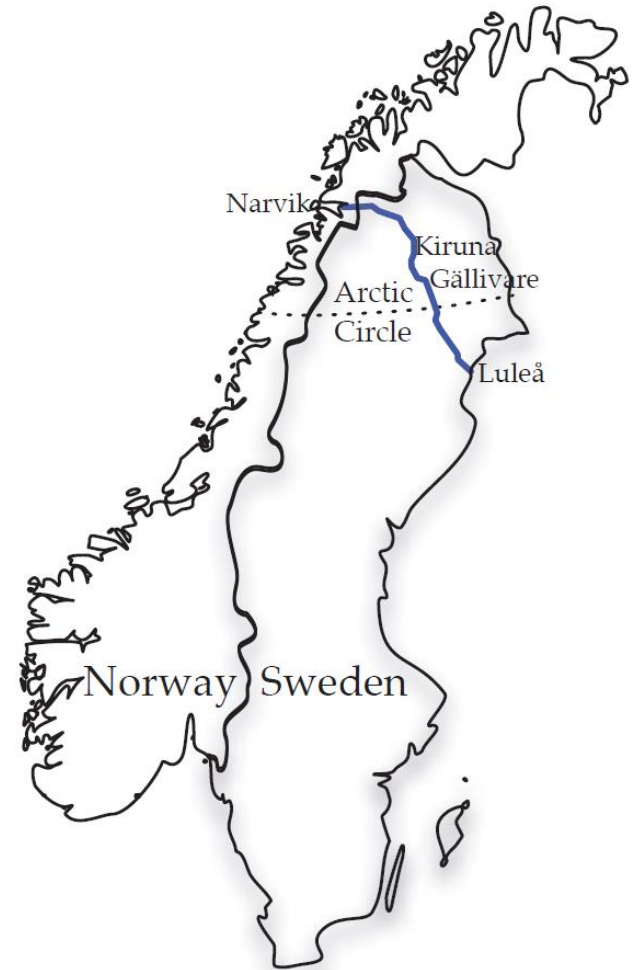
Asset Management Plan 2018-2022 (for baseline definition)

- Current 5-year planning for the demo road network
- Applicable constraints (budget, resources, etc.)



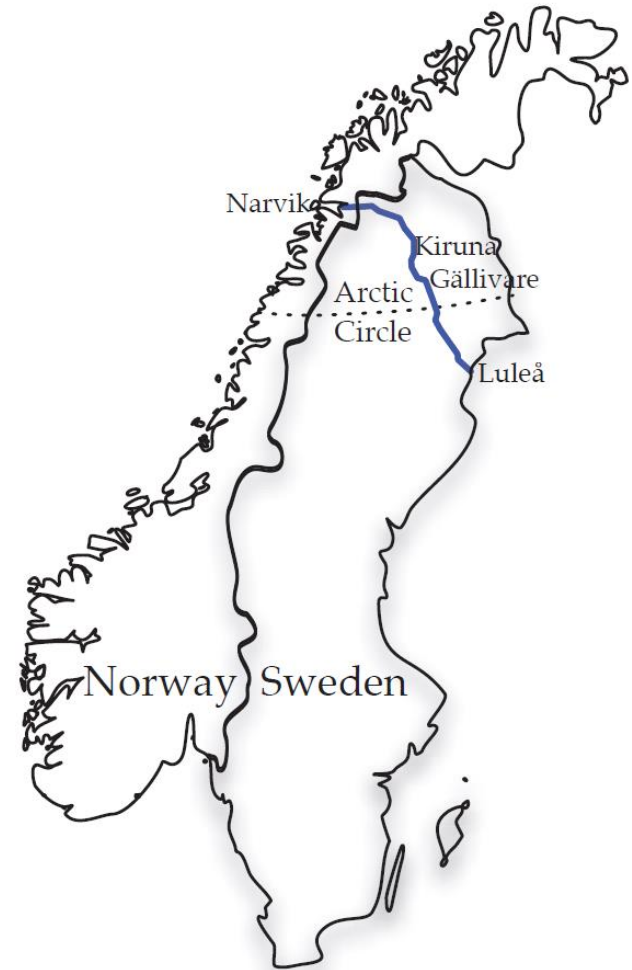
Malmbanan - Iron ore line

- 500 km railway single line corridor with mixed traffic consisting of both passengers and freight trains.
- Annual traffic is between 22.5-30 MGT and it belongs to the speed class 80-120km/h.
- The traffic consists primarily of iron ore heavy-haul trains with maximum axle load of 30 tonnes.
- The area along this line has varied geomorphology, topography, geology, and climate
- Running heavy-haul railway traffic in an area north of the Arctic Circle is a challenging task
 - Harsh climate conditions, e.g. snow in the winter and extreme temperatures (-45°C to +25°C).



INFRA ALERT demonstrator

- Line section 1
 - 160 km of track with 71 S&C
- Line section 2
 - 125 km of track with 58 S&C
- Asset register
- Geometry data
 - Longitudinal level, alignment and gauge
- Maintenance data
 - Inspections intervals and remarks
 - Preventive maintenance work orders
 - Corrective maintenance work orders
- Train windows

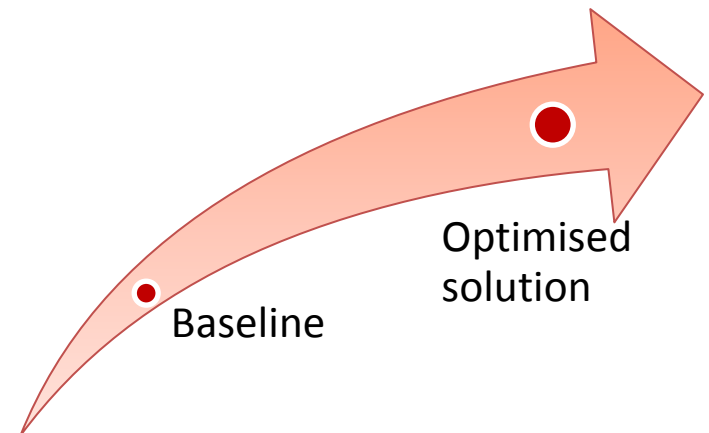


- Technical validation of the eIMS implementation
- Applicability in operational practice
 - qualitative impact from user perspective (IMs)
- Efficiency of the toolkit functionalities
 - quantitative impact by evaluating results

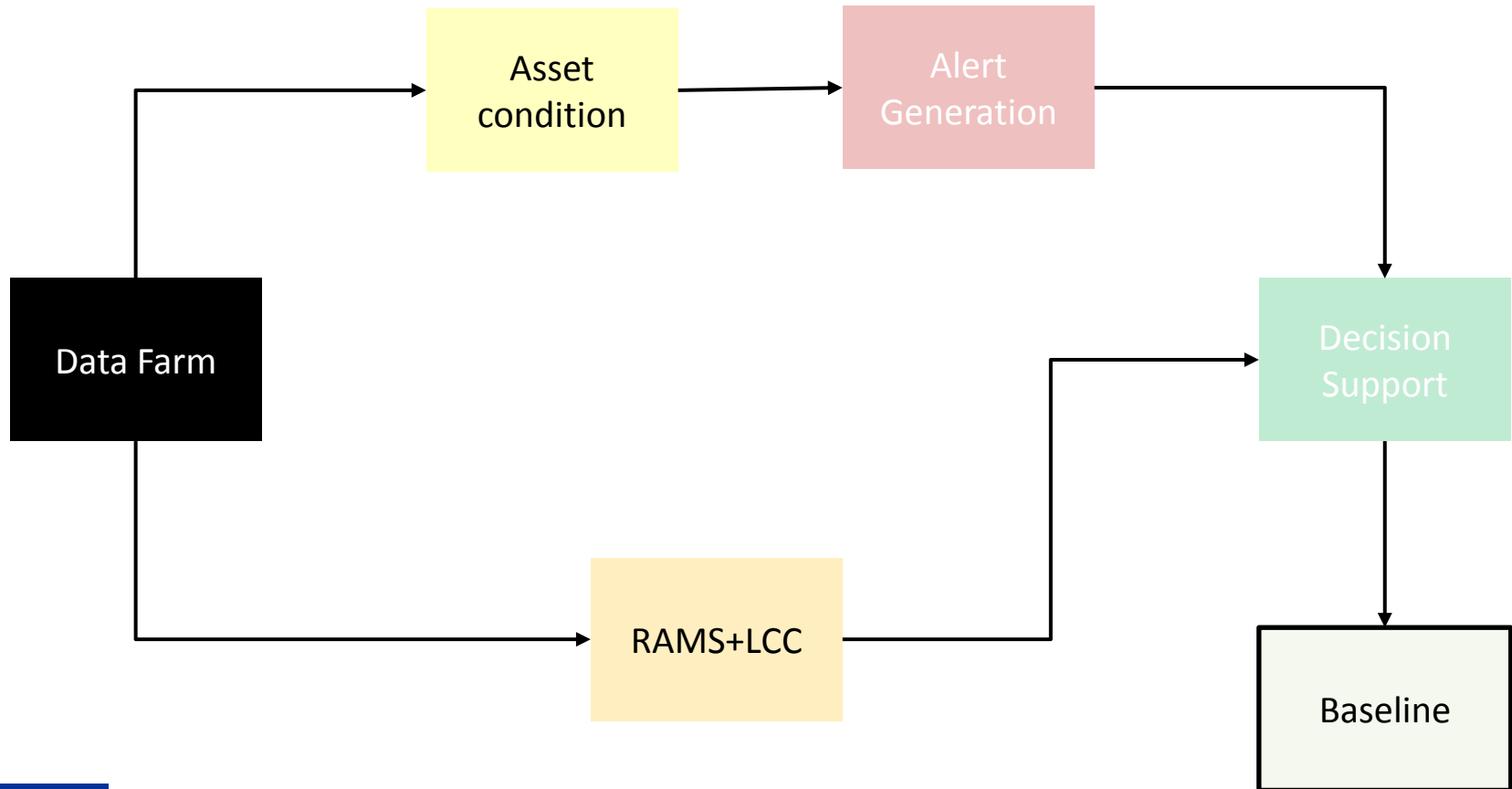


Comparison of solutions (i.e. maintenance plans) “before” and “after” INFRAALERT

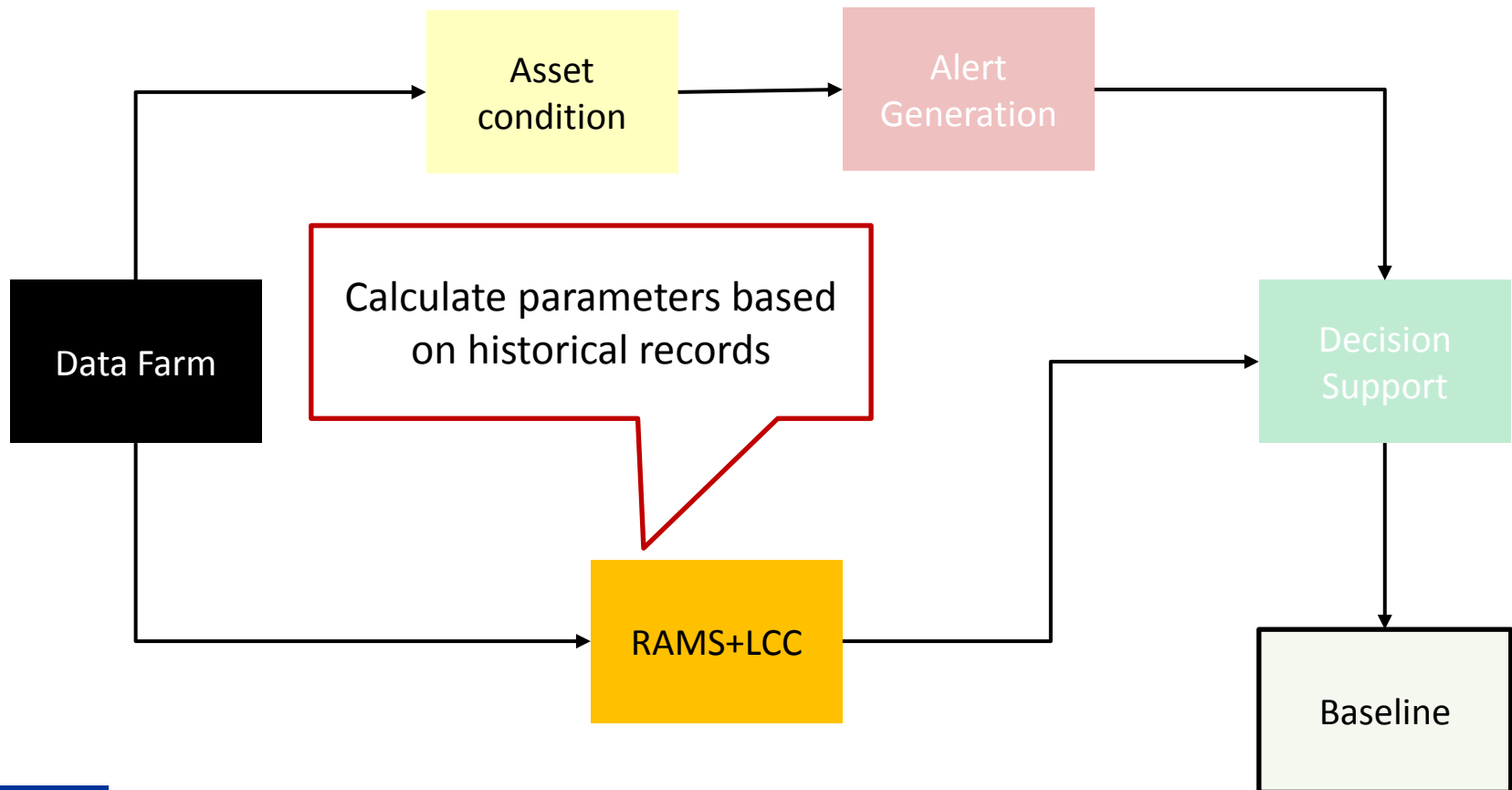
- **Baseline**
 - solution that can be achieved by current practice, without using eIMS toolkits functionalities
- **Optimised solution**
 - exploiting the potential of eIMS



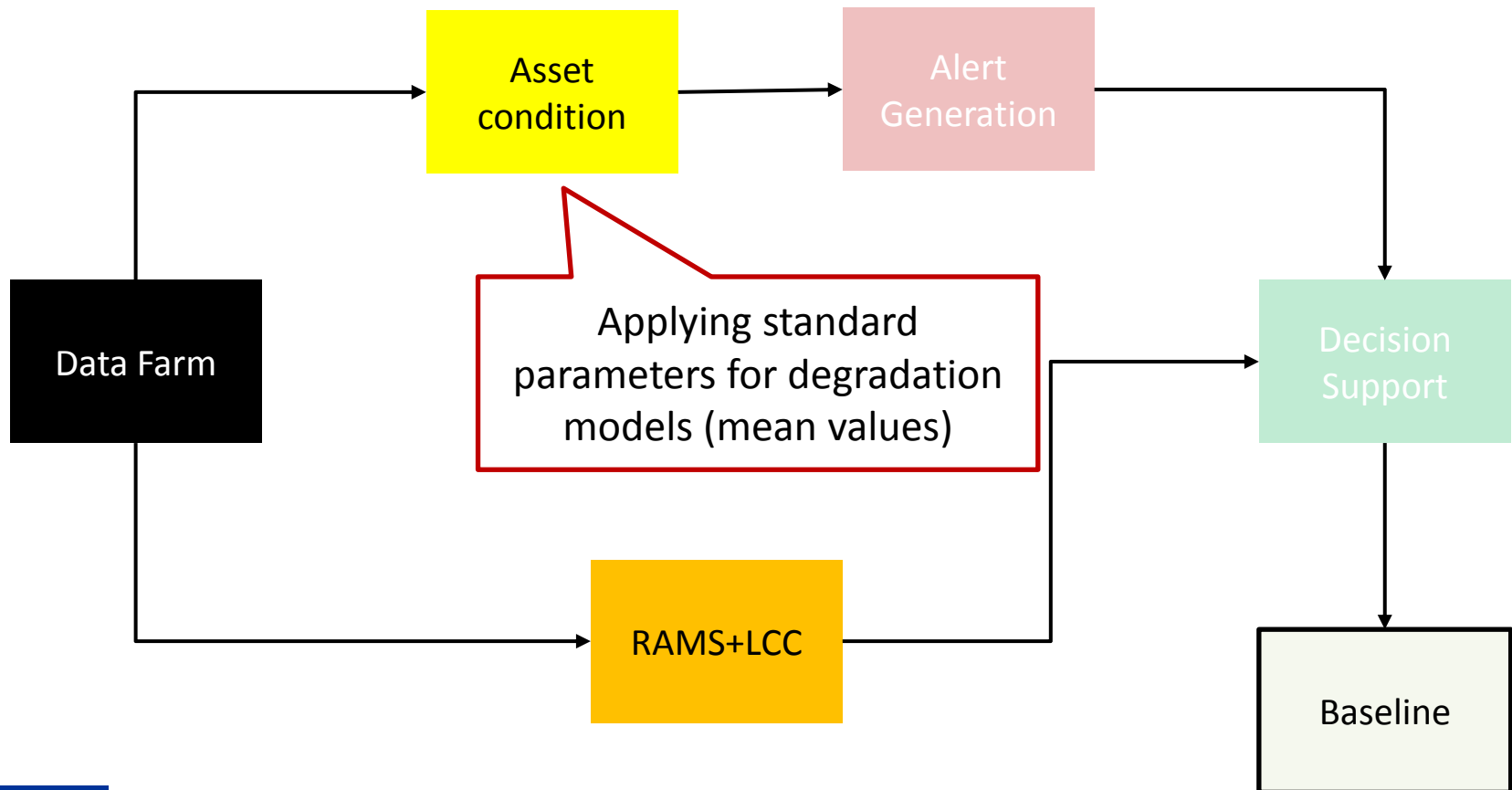
Setup for baseline calculation



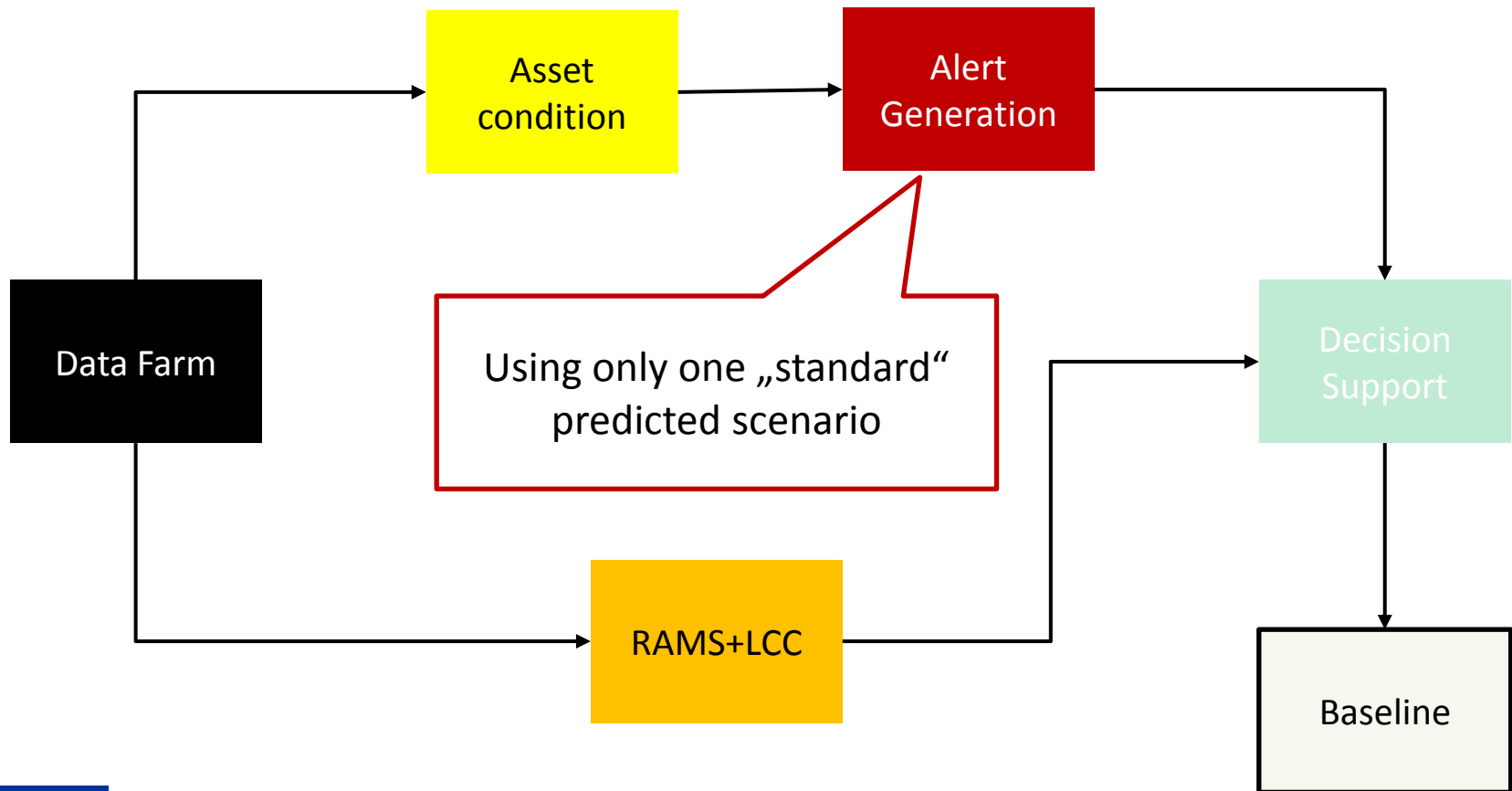
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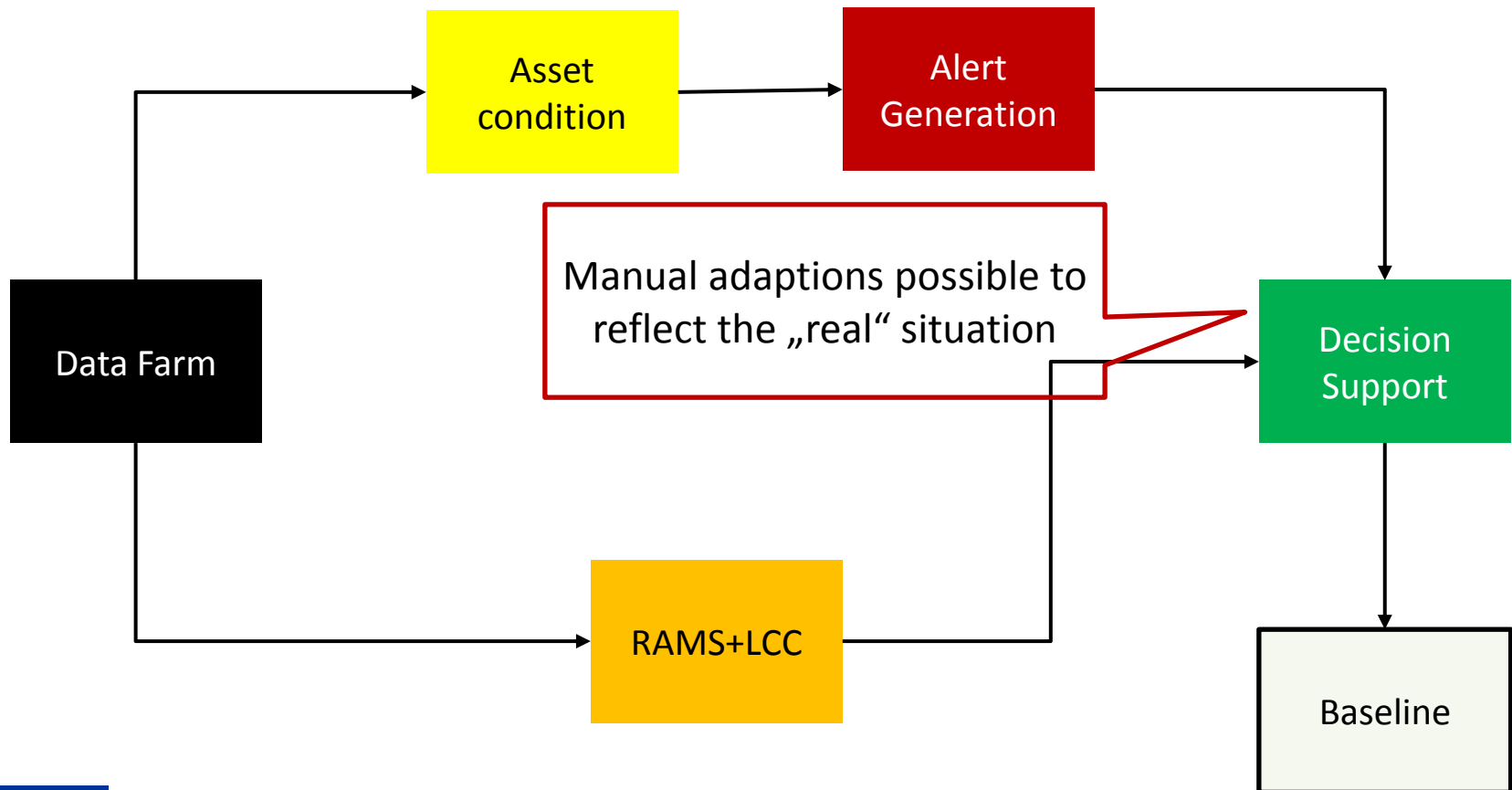
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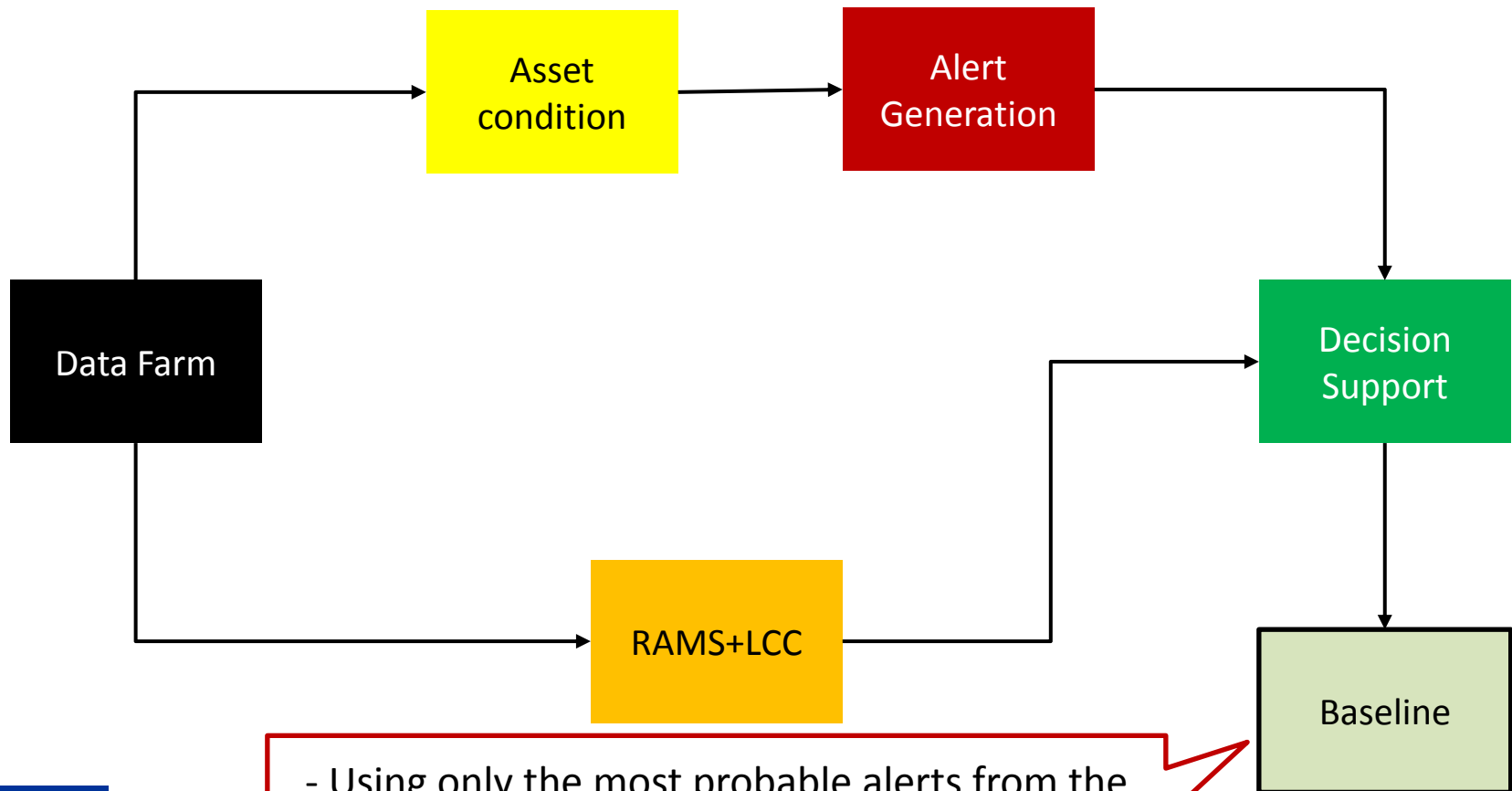
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Setup for baseline calculation



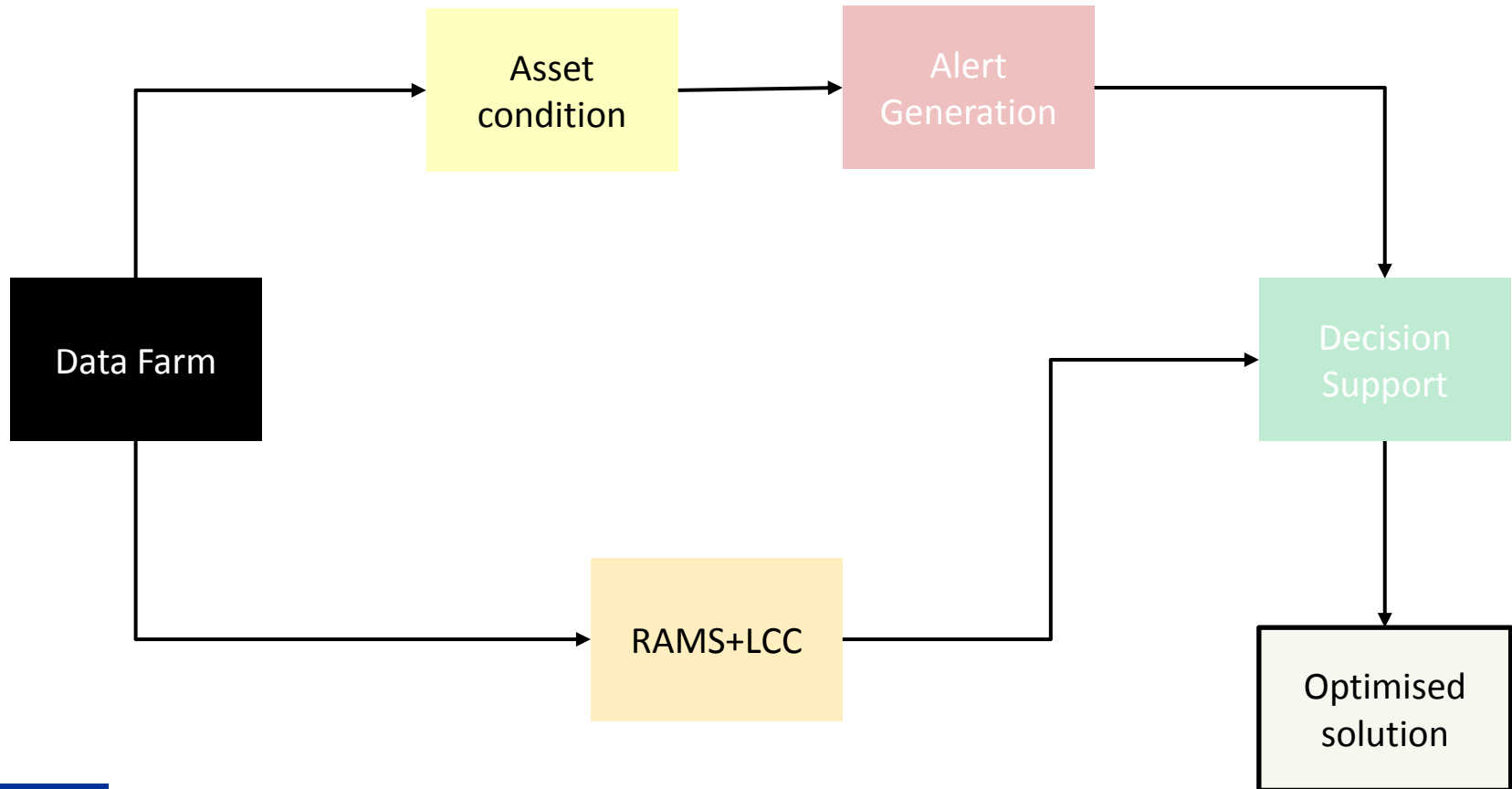
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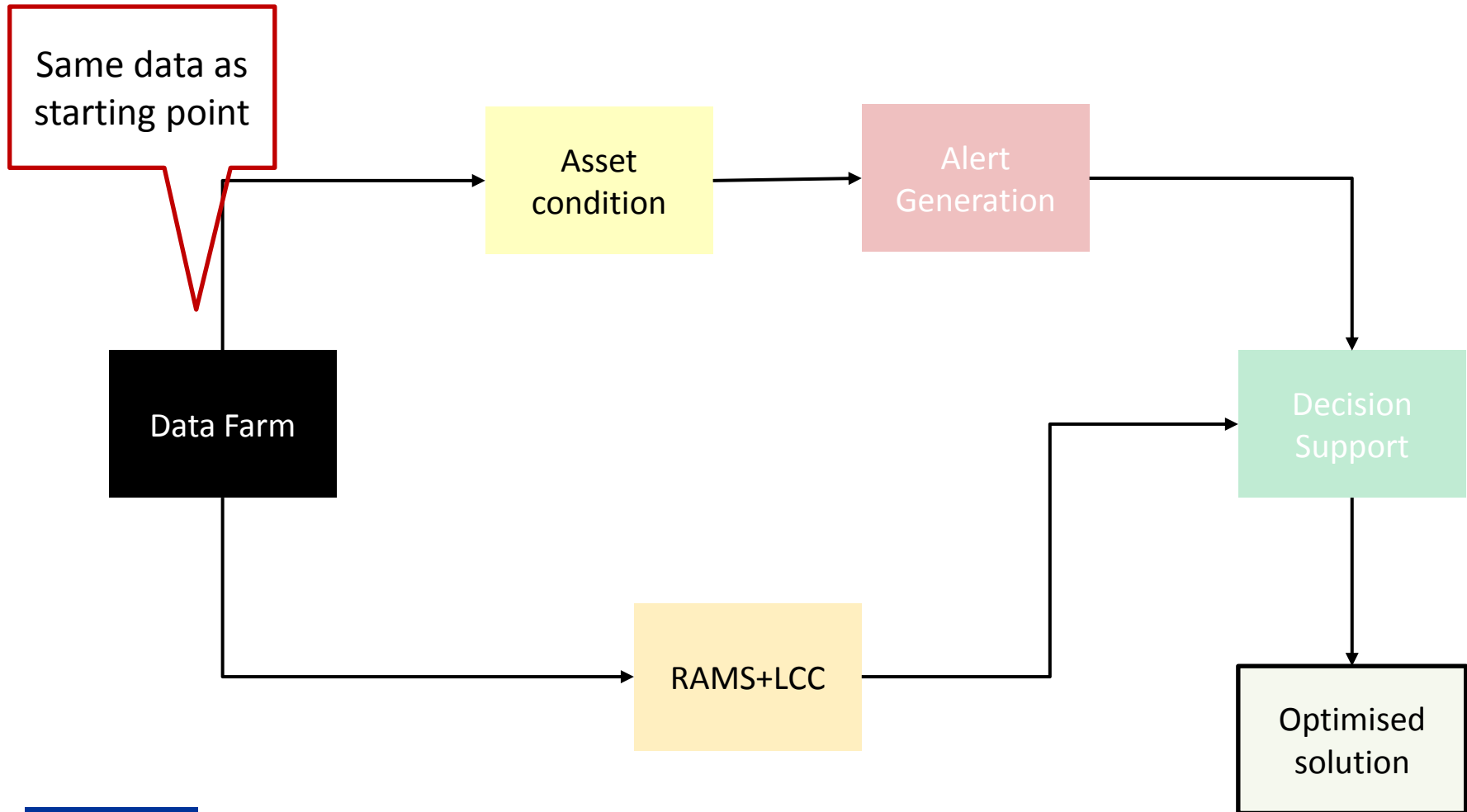
- Using only the most probable alerts from the standard scenario
- Applying a simple allocation rule (First Fit)



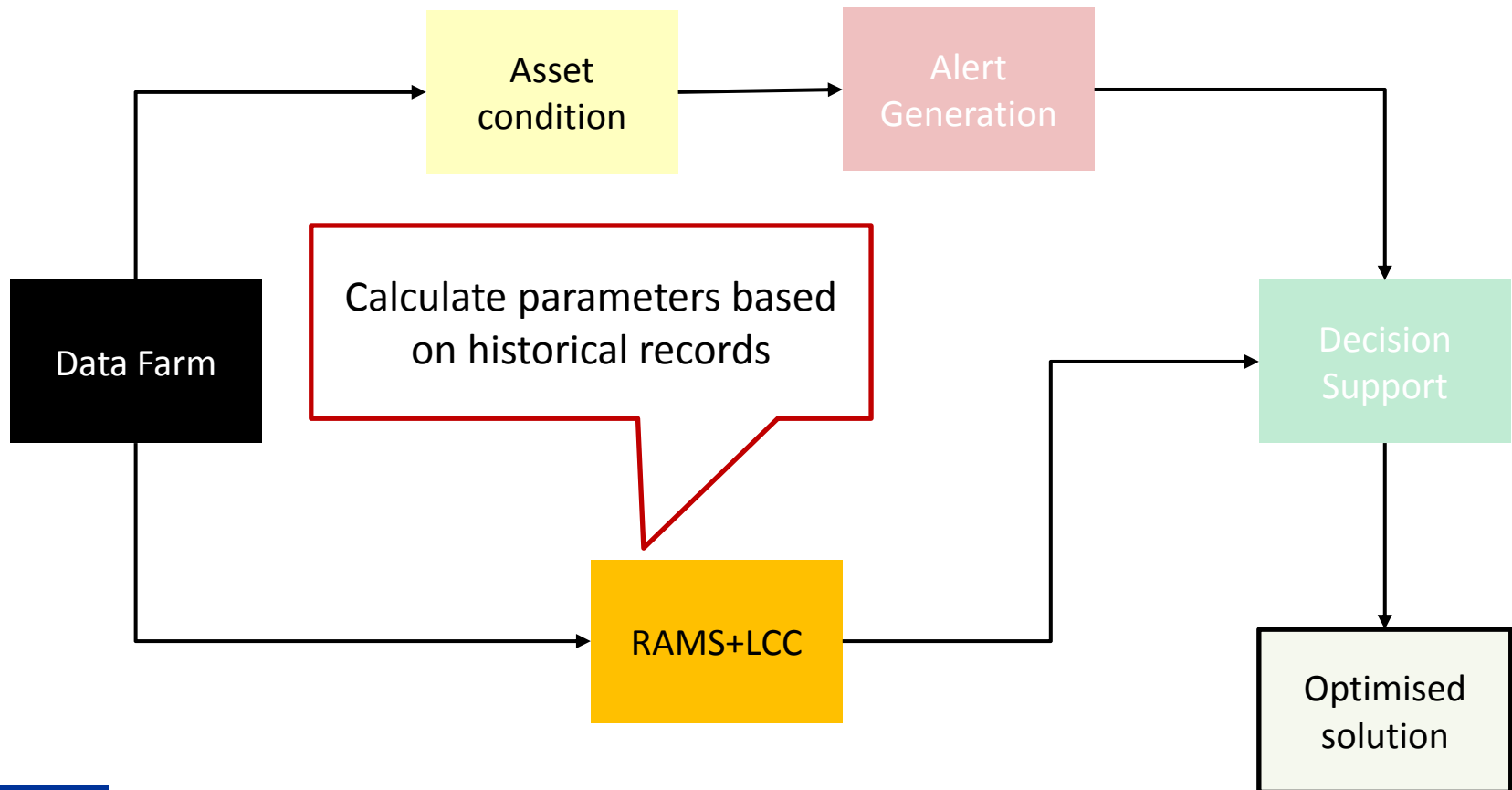
Setup for optimised solution



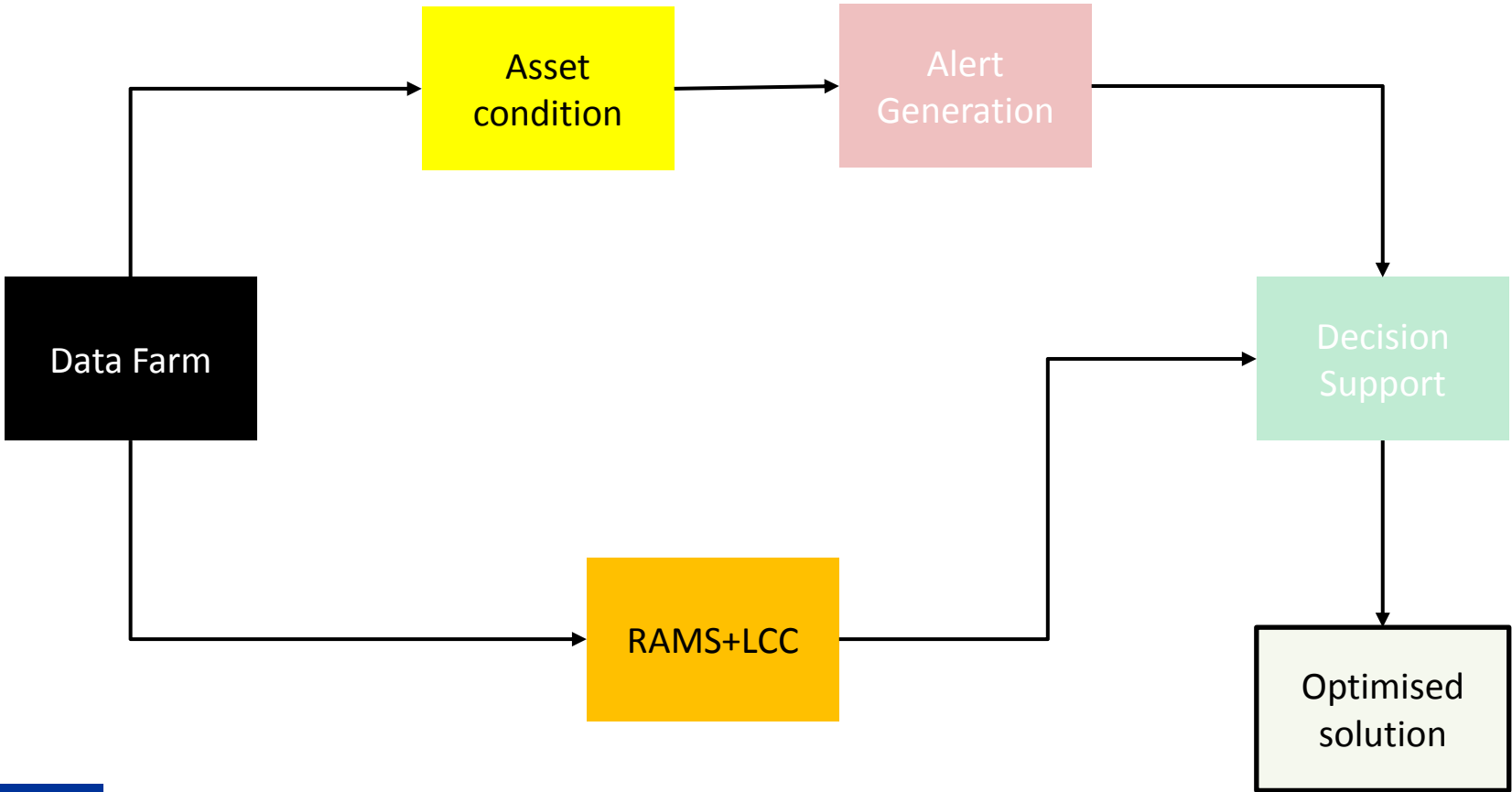
Setup for optimised solution



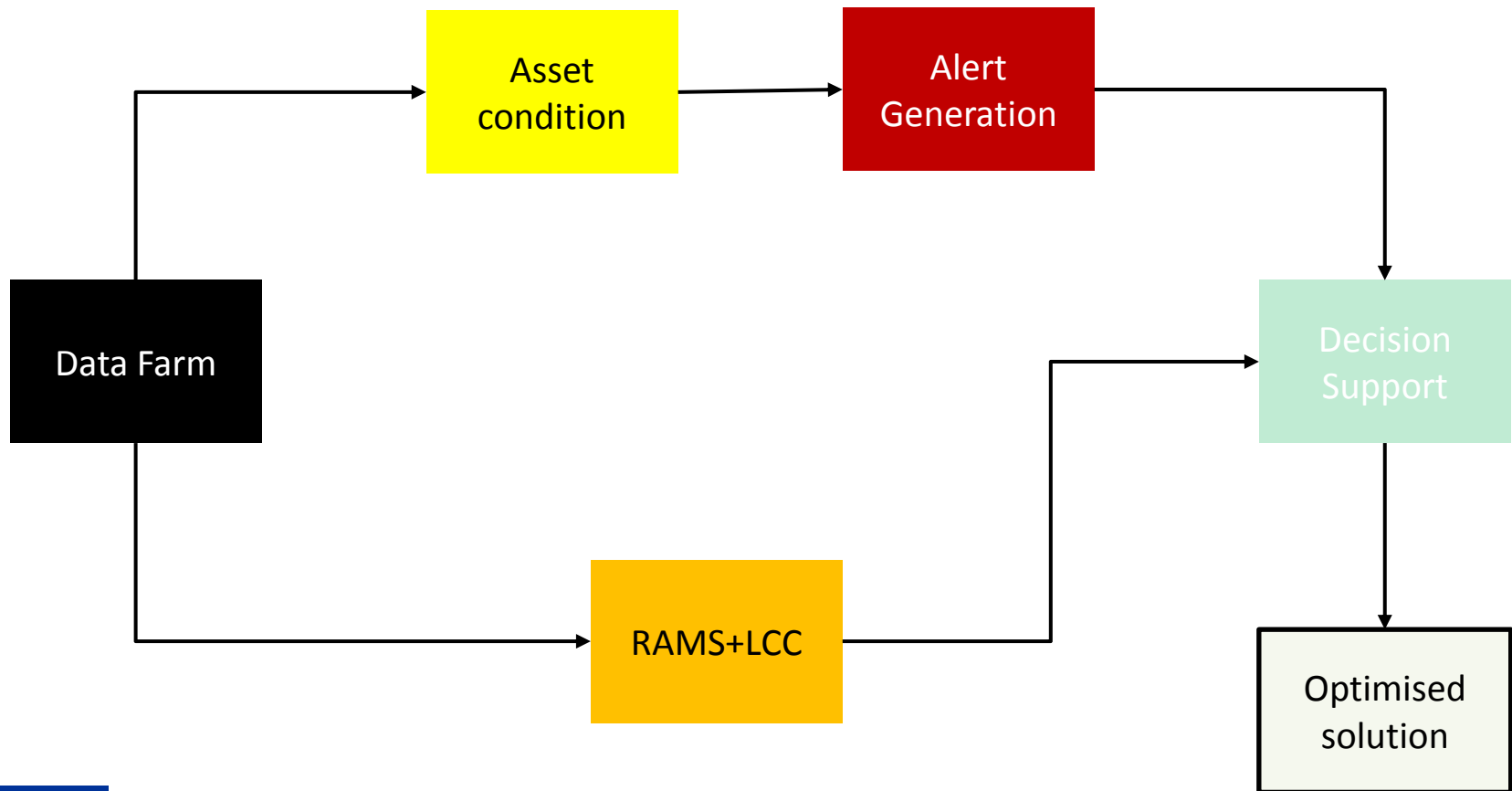
Setup for optimised solution



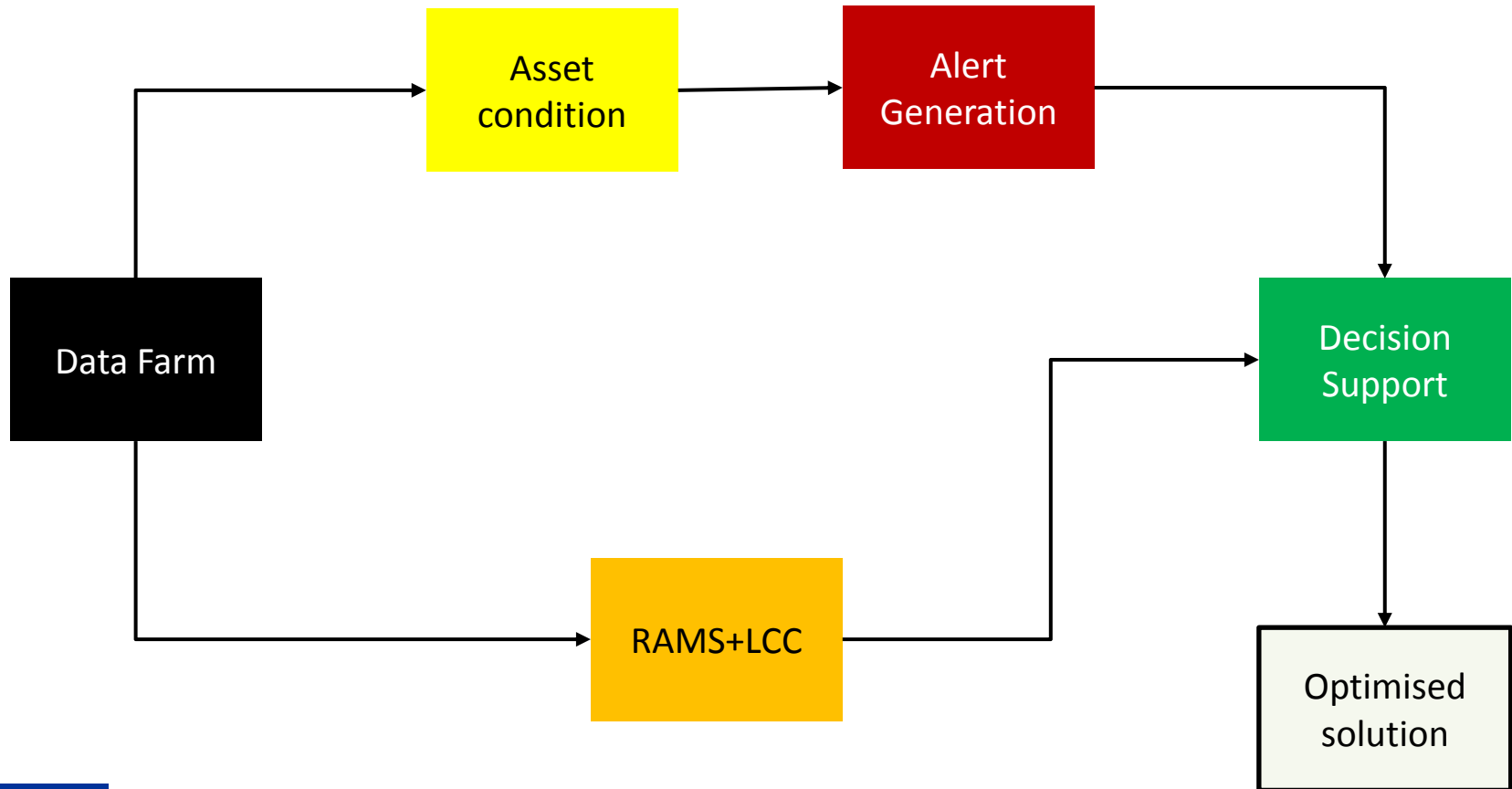
Setup for optimised solution



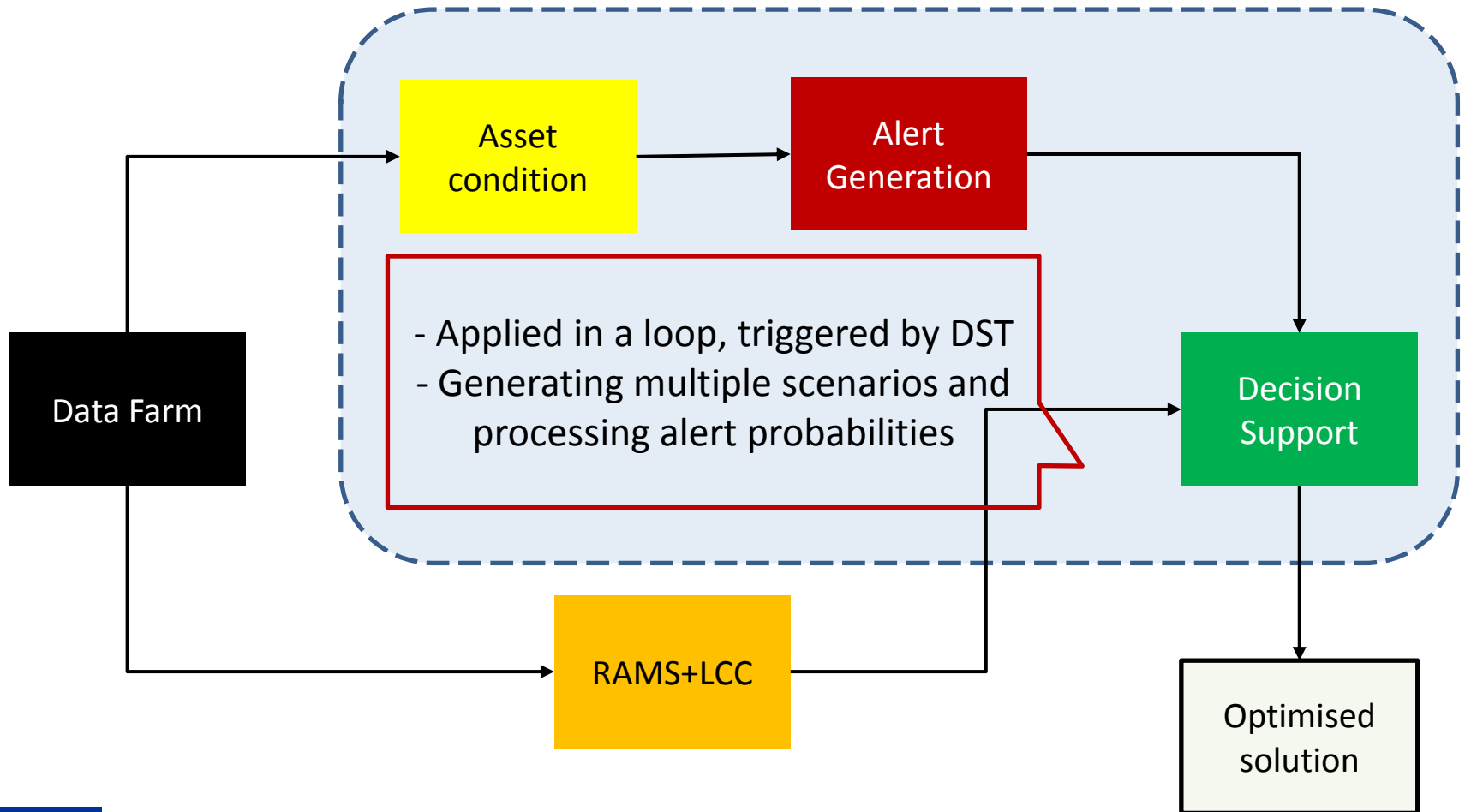
Setup for optimised solution



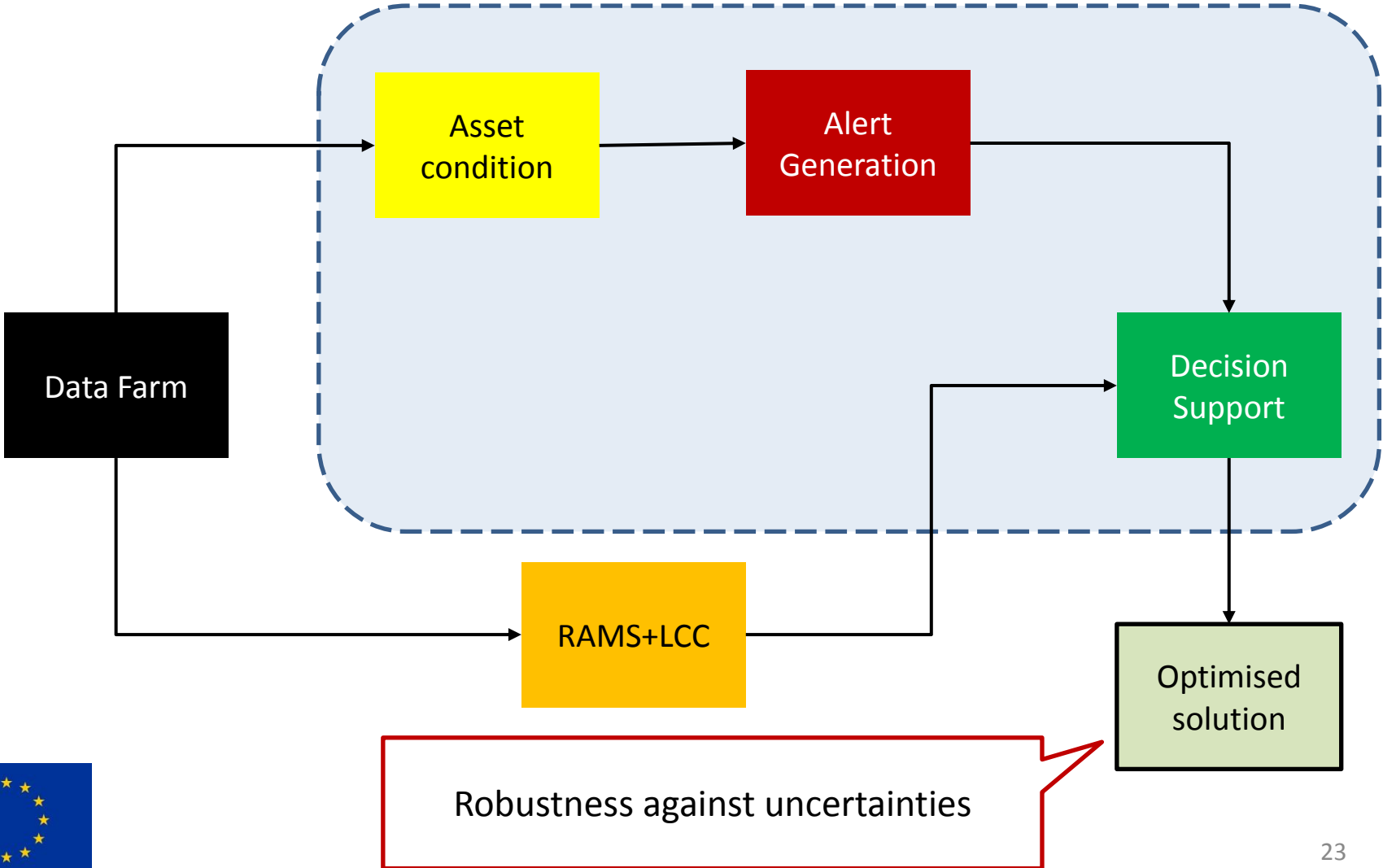
Setup for optimised solution



Setup for optimised solution



Setup for optimised solution





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Fraunhofer

IVI

Axel Simroth

Dipl.-Math. oec.

axel.simroth@ivi.fraunhofer.de