



**ENOLA**

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**Impact on Automotive  
Innovation**

April 2024



# INTRODUCTION TO ENOLA

● **Training, Mentorship, and Consultancy firm specializing in Digital Evolution and advanced system, enterprise, and software architecture**

● **4x revenue growth every year since incorporation**

● **Mix of commercial & defense clientele in the following domains:**

- Defense
- Automotive
- Hi-Tech
- Transportation
- Insurance
- Medical Devices
- ... and more





**BAE SYSTEMS**



**RIVIAN**



**BLUE ORIGIN**



**Davidson**



**LOCKHEED MARTIN**



**AEROSPACE**



**JAGUAR**



Ministry of Defence



# CLIENTS

Our client list is a mix of mid-size and large clients from both defense and commercial sectors.

Contracts range from training to large digital evolution engagements (>\$1M).

*Clients listed include current, previous, and active opportunities.*



**JOHN DEERE**

**TORC**



**GD**

Mission Systems



**Los Alamos**  
NATIONAL LABORATORY



**Insulet**

**EAT•N**

**CHRISTIE**

**ExxonMobil**

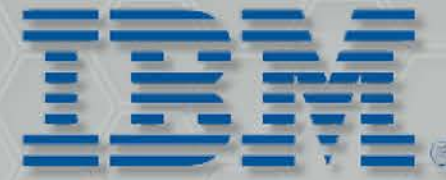


**leidos**

*wisk*

**H** Huntington Ingalls Industries





# PARTNERS

Enola has 18 active partners and brings on partners on a weekly basis.

We form MOUs with each partner to hold one another accountable and categorize our partners into five distinct categories, though sometimes they blend:

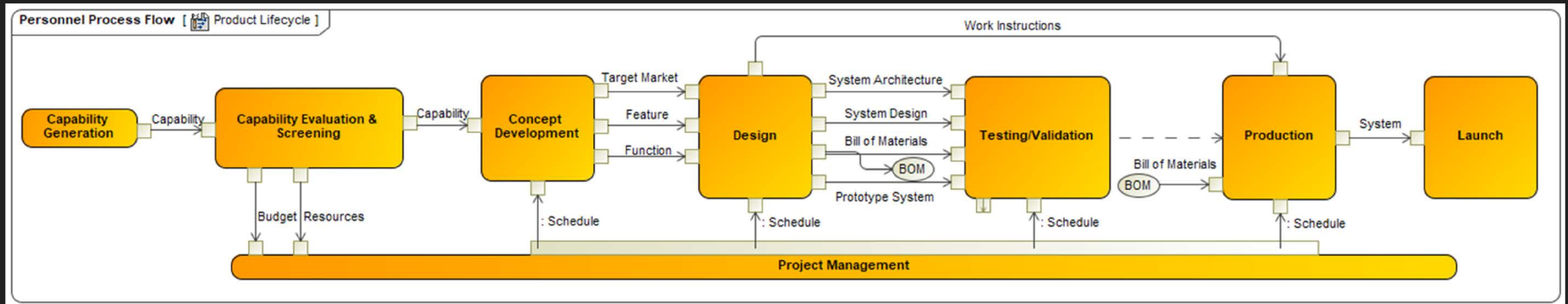
- Tool Vendors
- Academic Partners
- Subcontractors (Hired by Enola)
- Prime Contractors (Sell on behalf of Enola)
- Value Added Resellers (Sub + Prime Contractors)

*Only tool vendors and VARs are showcased.*





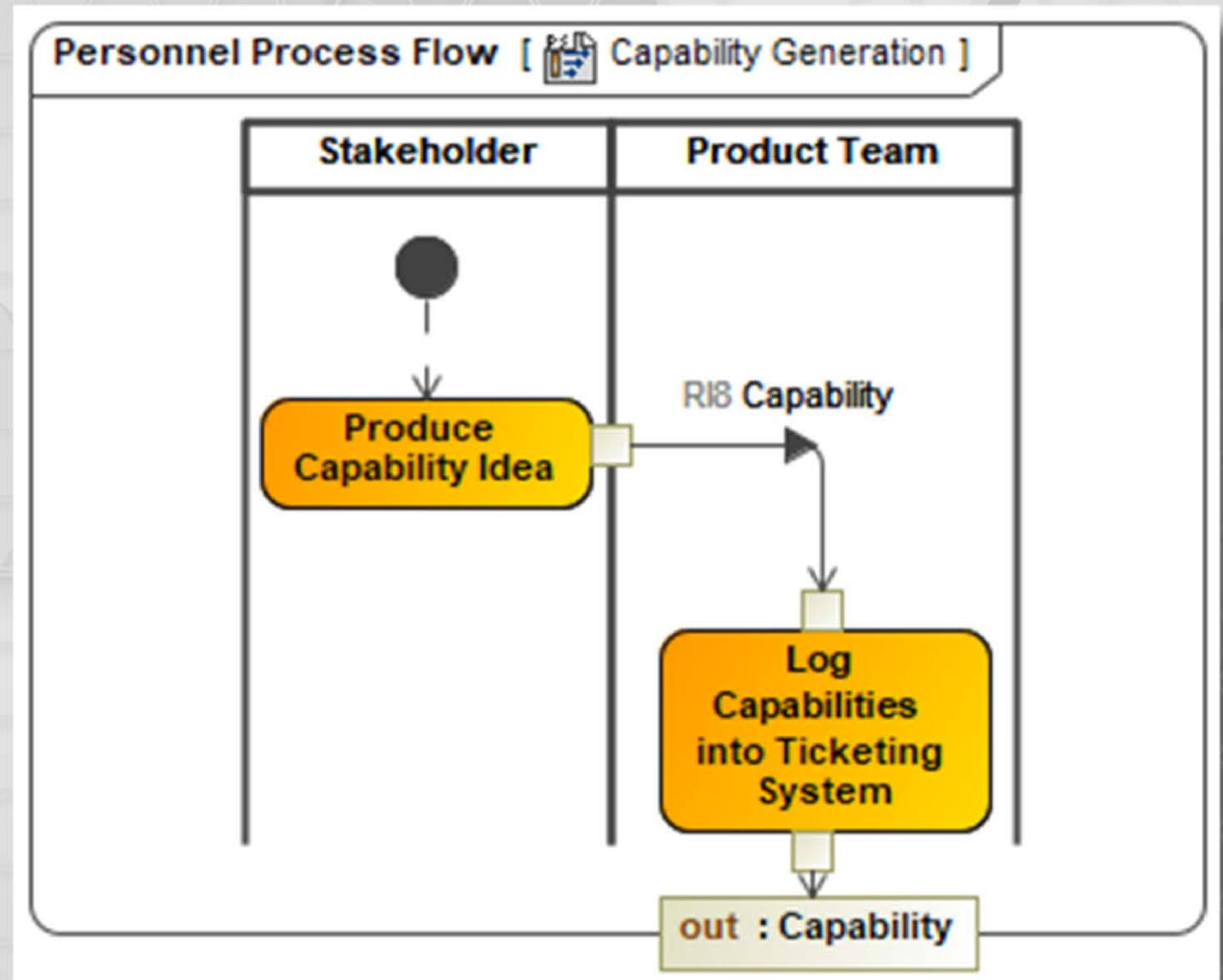
# FUTURE PROCESS (DIGITAL PRODUCT)



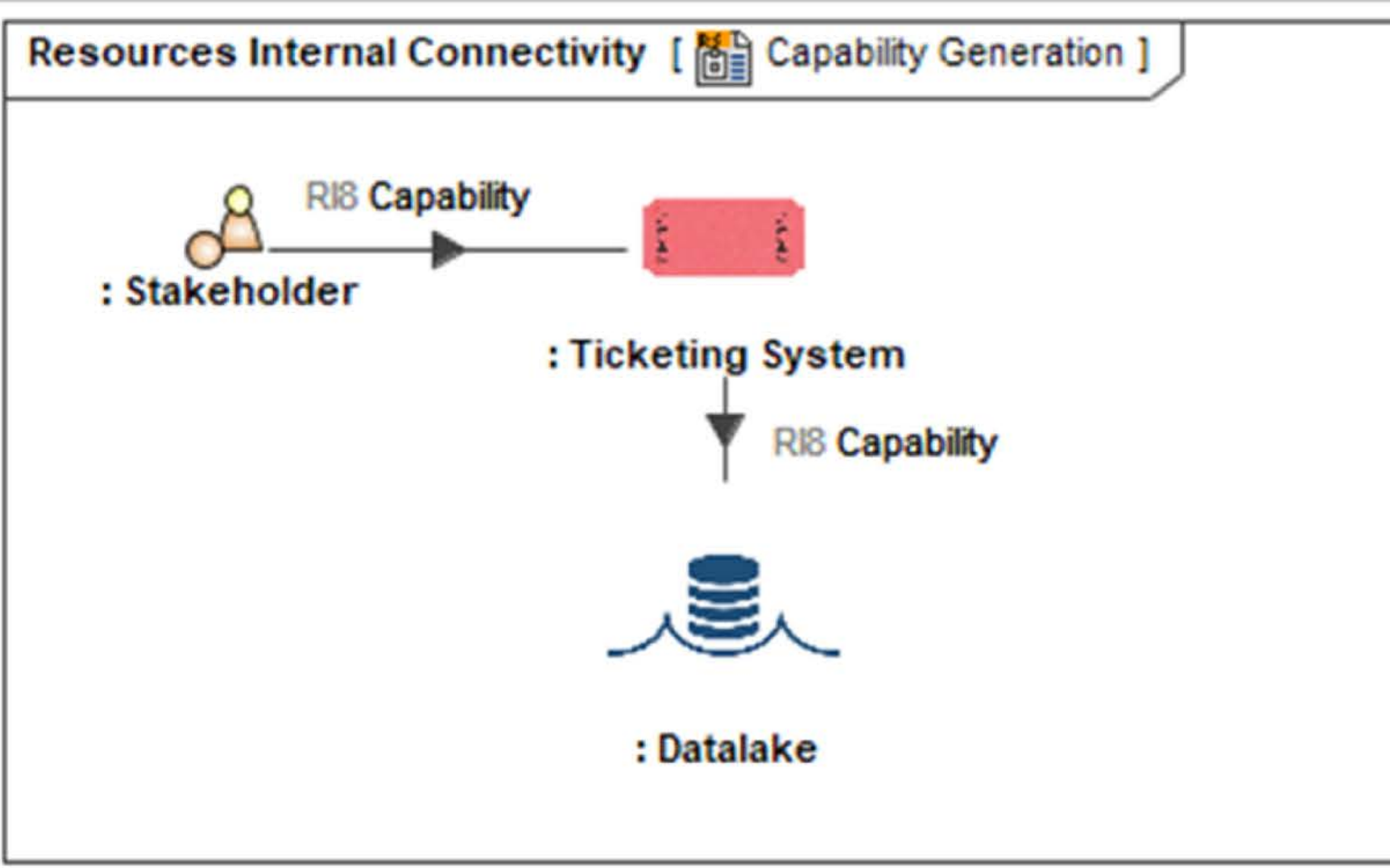


# Capability Generation AS-IS

- Stakeholders generate new capabilities and flow to the product team to log the capability in the ticketing system
- Traditionally through meetings and flow downs via email until reaching product team
- Optimization of the business process may fix this almost entirely



# Digitized Capability GENERATION



Minor change, having stakeholders have access to a dashboard to auto-populate ticketing system

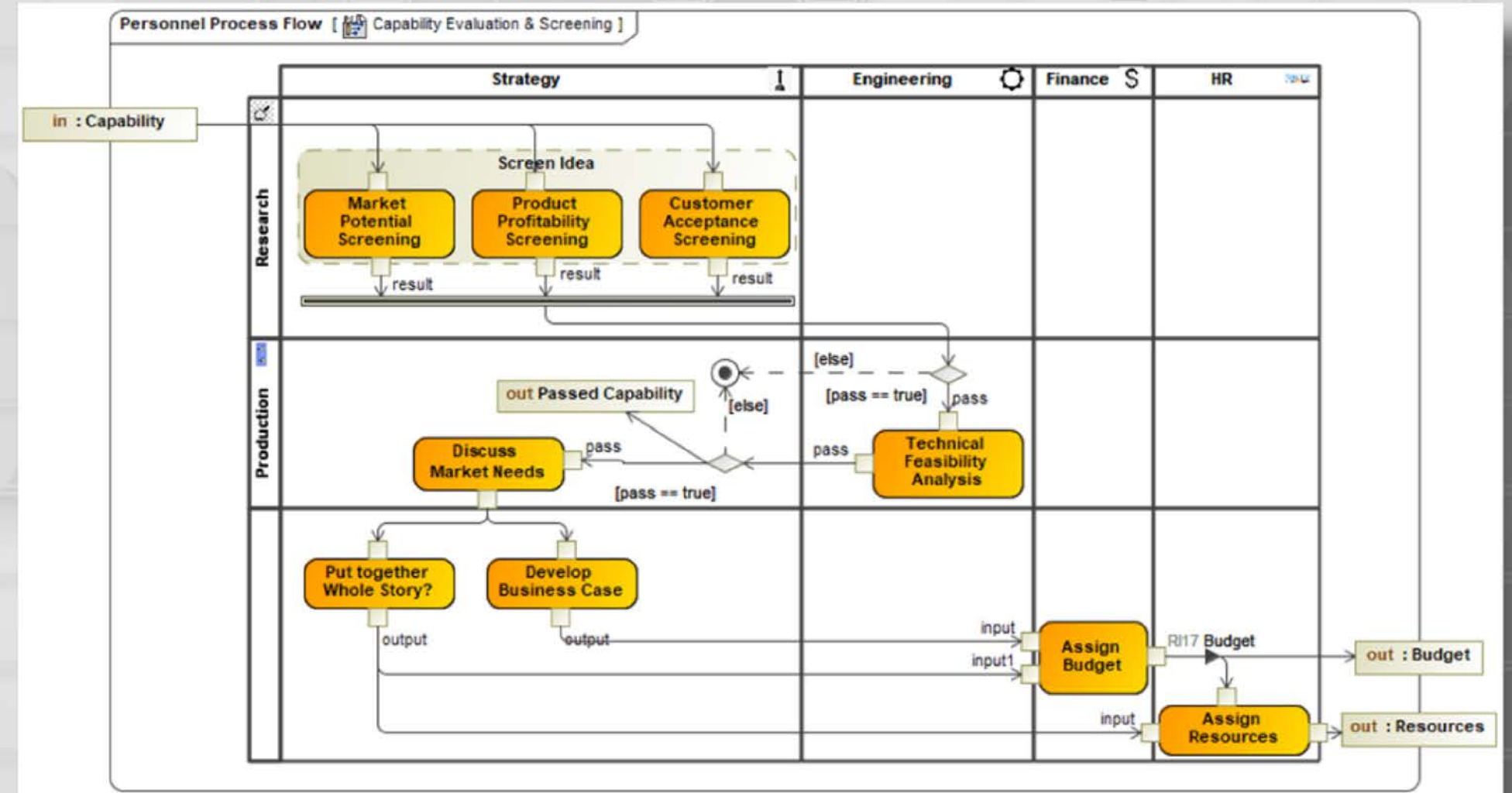
Capabilities passed from Ticketing System to Datalake for downstream flow

Minimal TOI, the value is reaped once the Datalake passes capabilities downstream, keeping the information traced to one another



# As-Is Capability EVALUATION

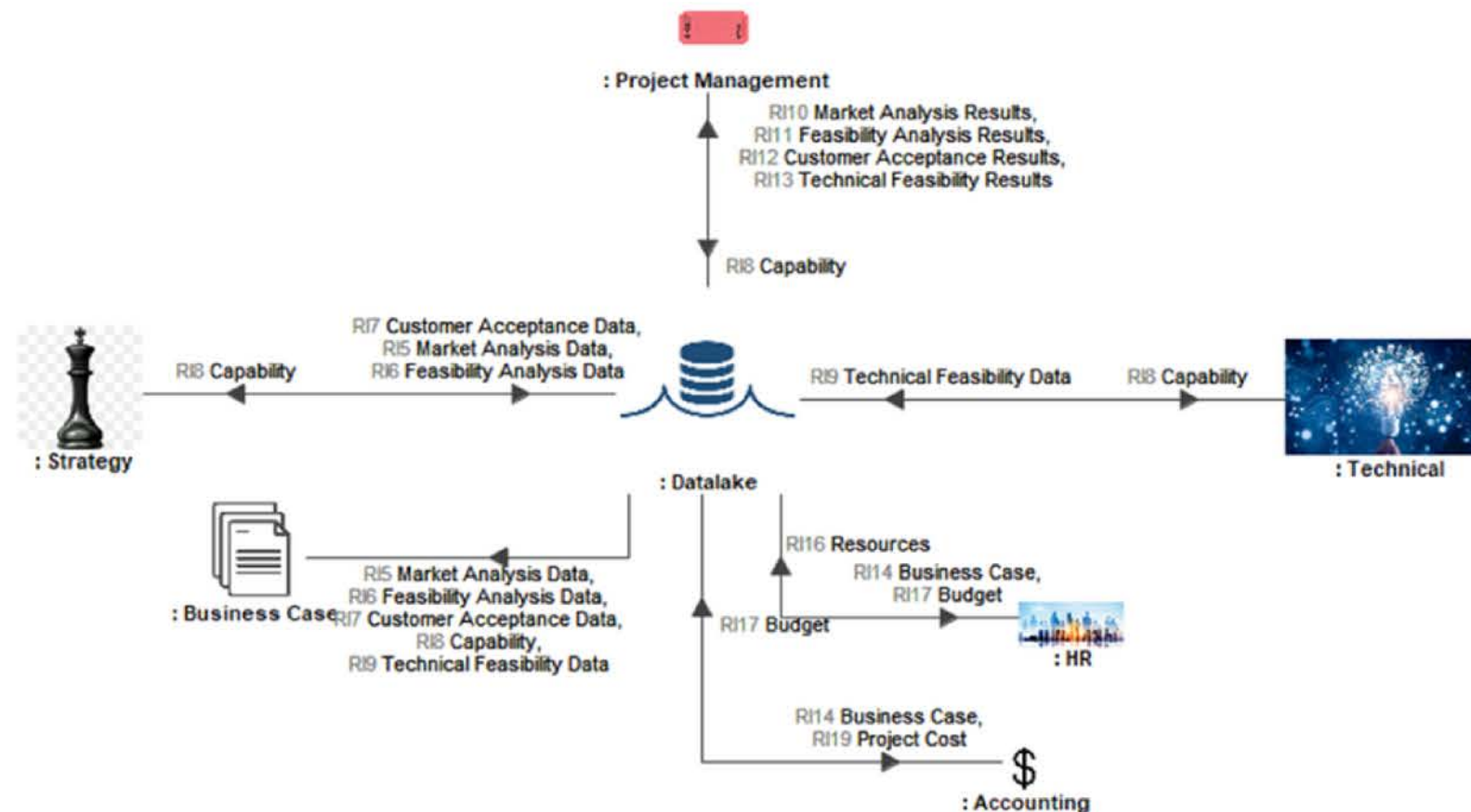
- Traditionally slow manual process
- Most communication done through email, presentations, etc.
- No continuation or synchronization of the data through to the engineering, accounting, and/or HR systems, so changes must be manually propagated



**WASTED TIME = WASTED \$**



# Digitized Idea EVALUATION

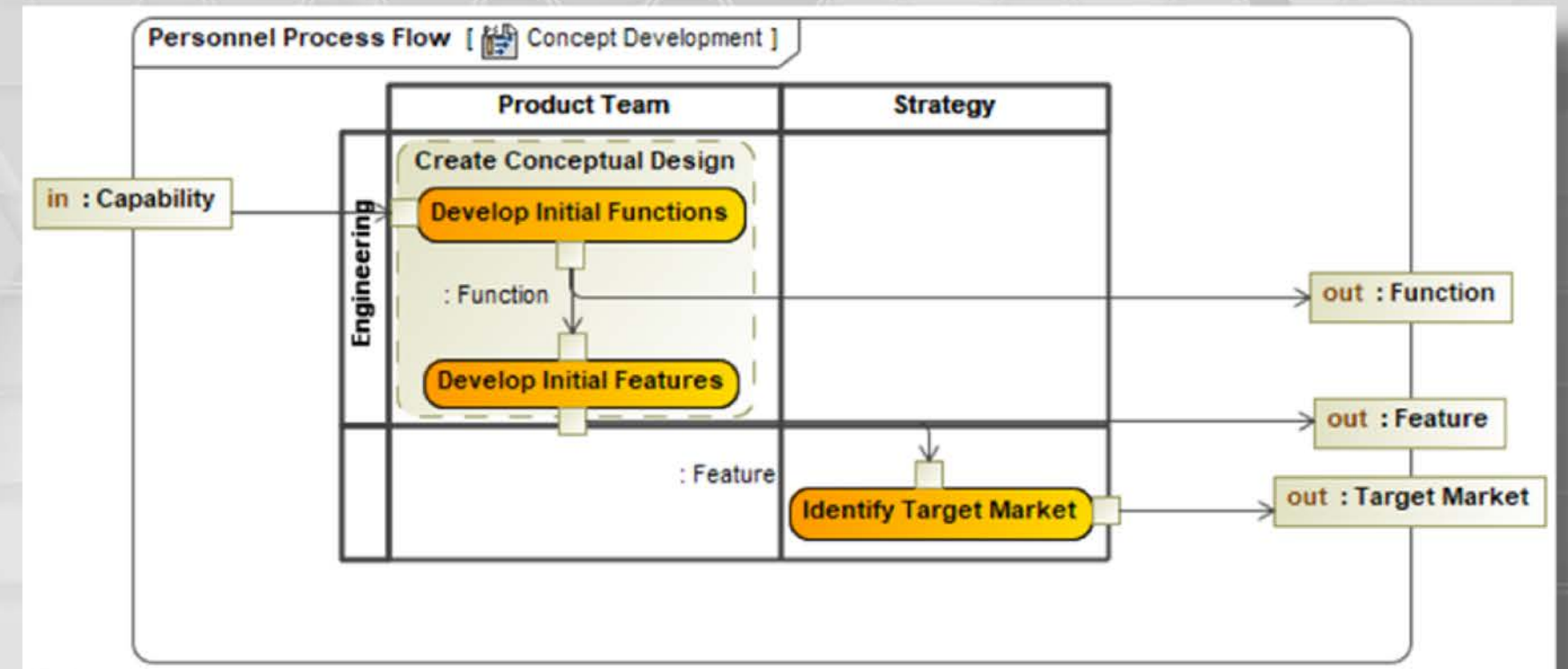


- Datalake orchestrates data through enterprise
- Manual processes moved to integrated tools
- Synchronized flow of data between the systems
- (Interim) auto-generation of needed reporting (i.e. business case)
- (End-State) dashboards around the Datalake where employees do their work which auto-propagates needed information
- **Expected ROI**
  - 80% reduction in time required to generate documentation; 20% remains for analysis/corrections
  - 100% removal of time needed for manual re-entry of information
  - Archival of past capability attempts so that if technology advances improve feasibility of past attempts, minimal rework to reopen efforts



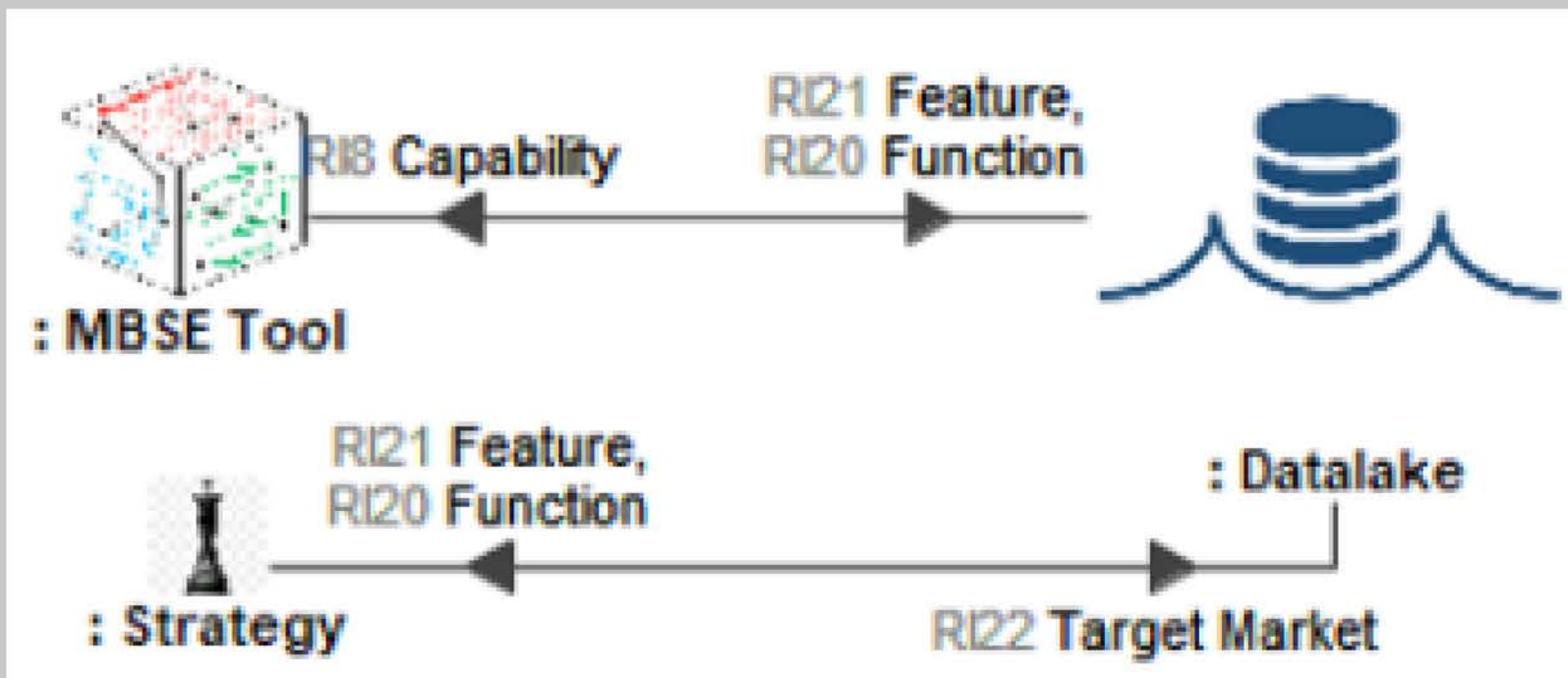
# As-Is Concept Development

- Use of MBSE to capture conceptual architecture
  - Capability Requirements
  - Use Cases
  - High-Level Functions
  - System Context Views
  - Metrics





# Digitized Concept DEVELOPMENT



## ROI:

Using a system model has shown reductions within systems engineering process up to 80% of architectural development time (if using data reuse techniques).

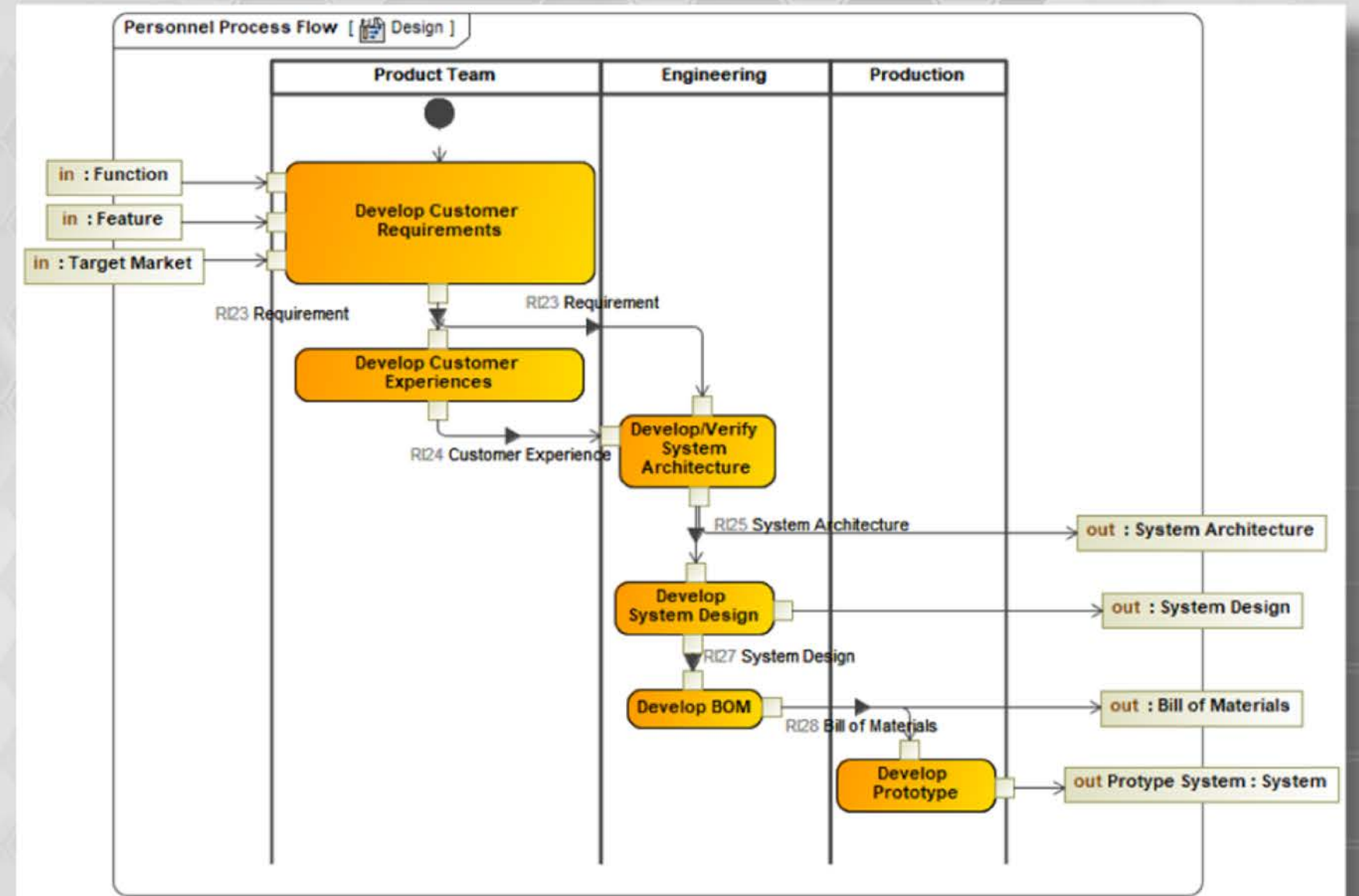
Systems Engineering teams have been growing significantly in size to manage the advanced complexity of the systems, and traditionally going from concept through to physical implementation of an advanced systems can take significant time (years).

**80% time reduction means reducing the SE process down by ~10 months again when the organization is mature, so either reduce cost by early completion of SE process, or reduction in SE staff needed.**



# AS-IS DESIGN

- Traditional tools like Excel, Word, and PowerPoint cannot handle growing complexity of systems
- MBSE provides database of accessible, fully traced, reusable, and simulateable system architecture data
- Many transform MBSE exports into CAD imports to form skeleton of the design





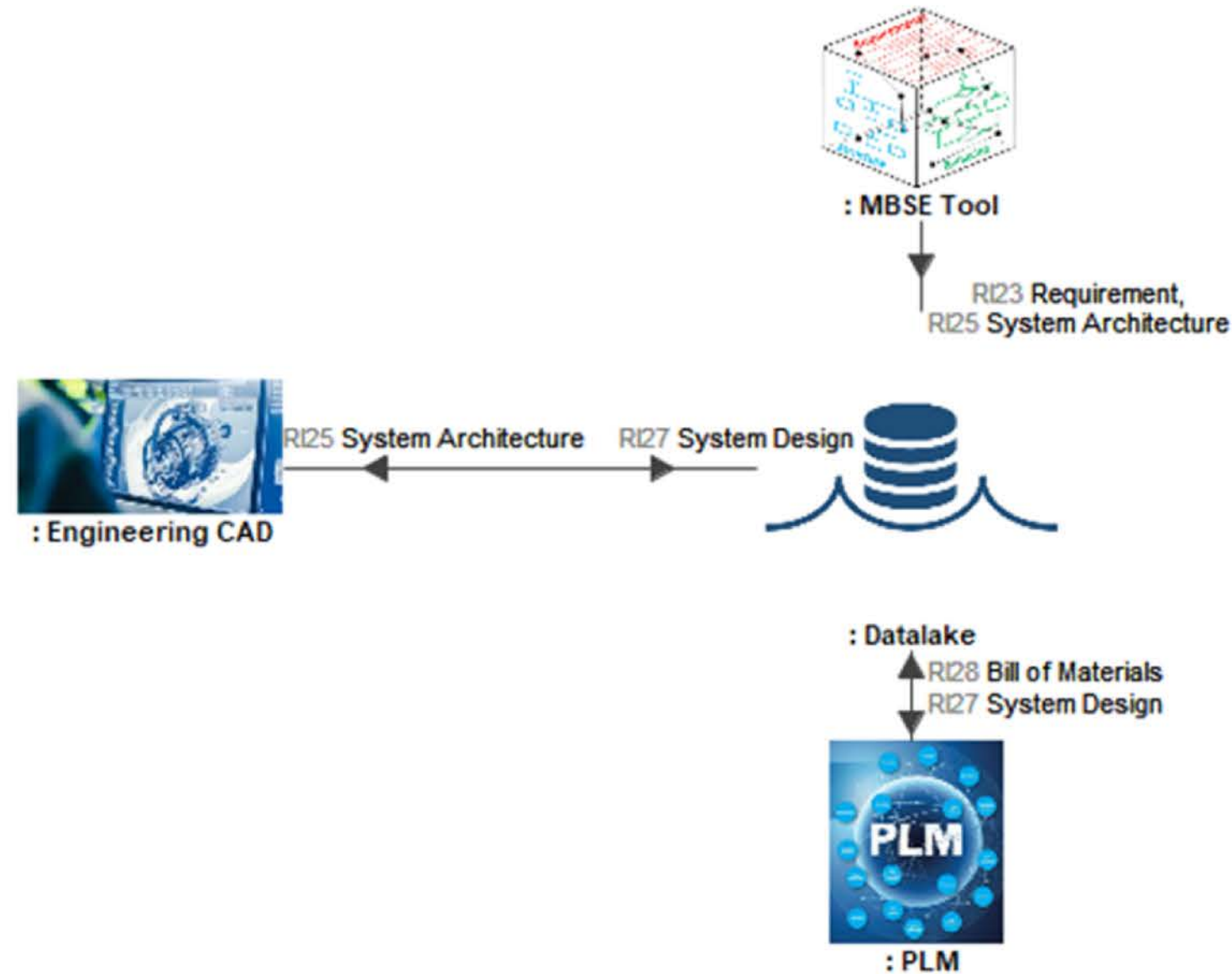
# Digitized DESIGN

## Expected ROI:

In an optimized MBSE world with maximum reuse, up to an 80% architectural development time reduction.

In a CAD environment, complete removal of the initial skeletal structure (~10% reduction in time across engineering teams).

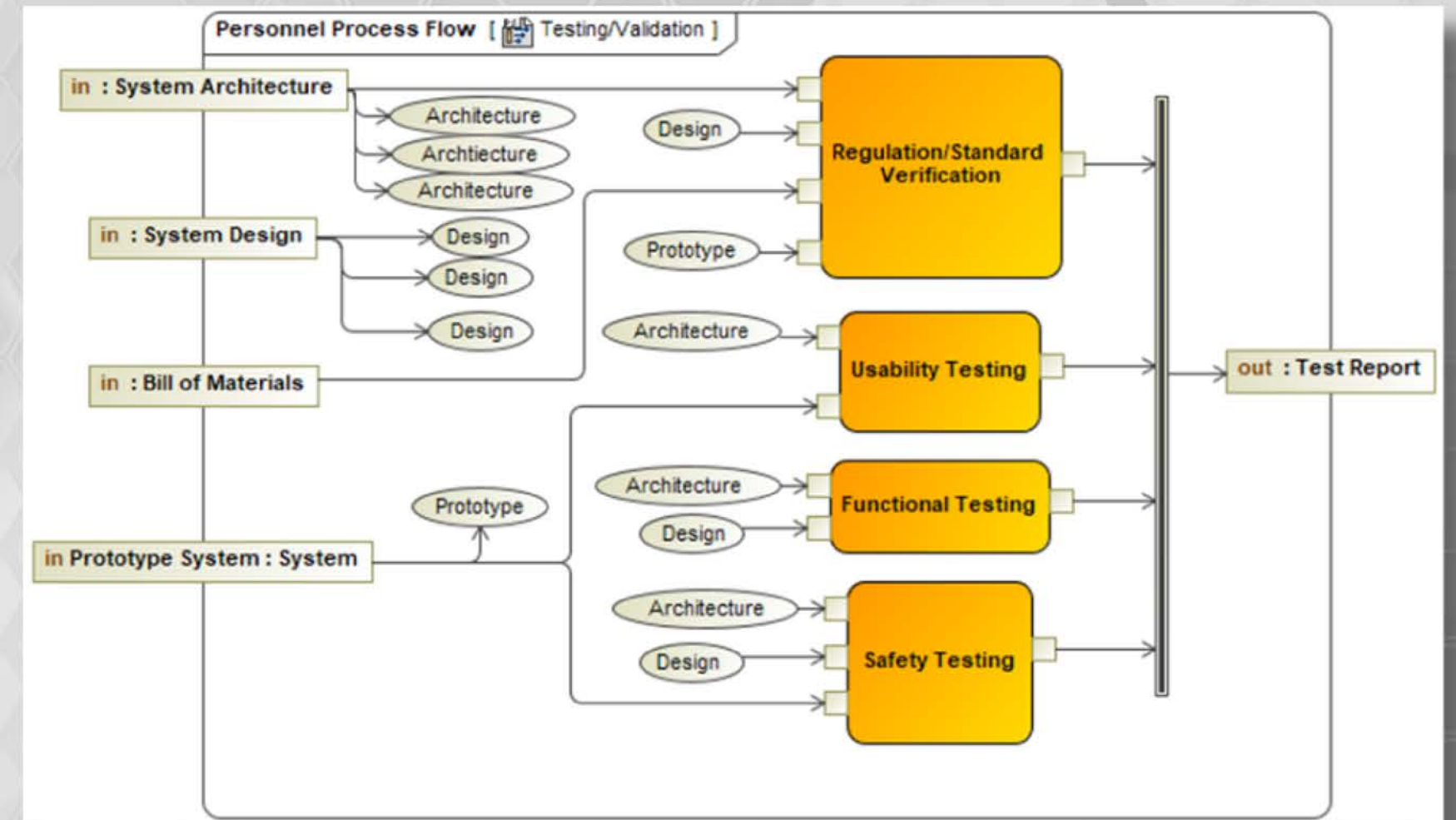
Within the PLM, up to 100% removal of time of BOM generation.





# As-Is Testing & VALIDATION

- Many forms of testing occur on the digital information and on physical prototypes that are built
- Some organizations have their testing systems well integrated into their PLM or other digital tool sets
- Others, manually rebuild the information to cascade downstream leading to significant wasted time on retyping requirements and hand-jamming test results





# Digitized Testing & VALIDATION

Key information, i.e. requirements, passed from Datalake to test devices

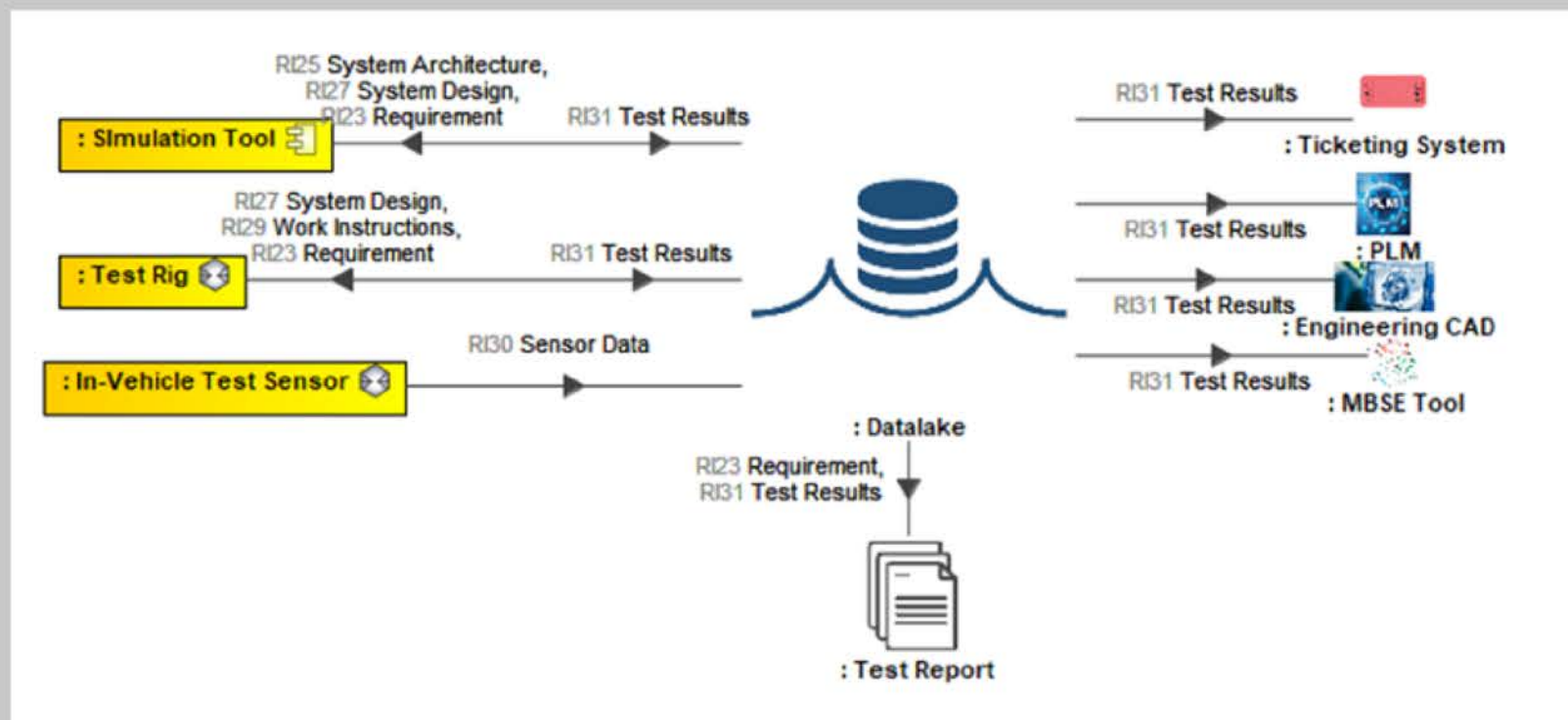
Test results stashed in Datalake

Test reports generated from the Datalake

If errors manifest in test, automatic flag up the digital thread through the engineering up through the ticketing system to highlight which feature/component/subsystem fails automatically.

## Expected ROI:

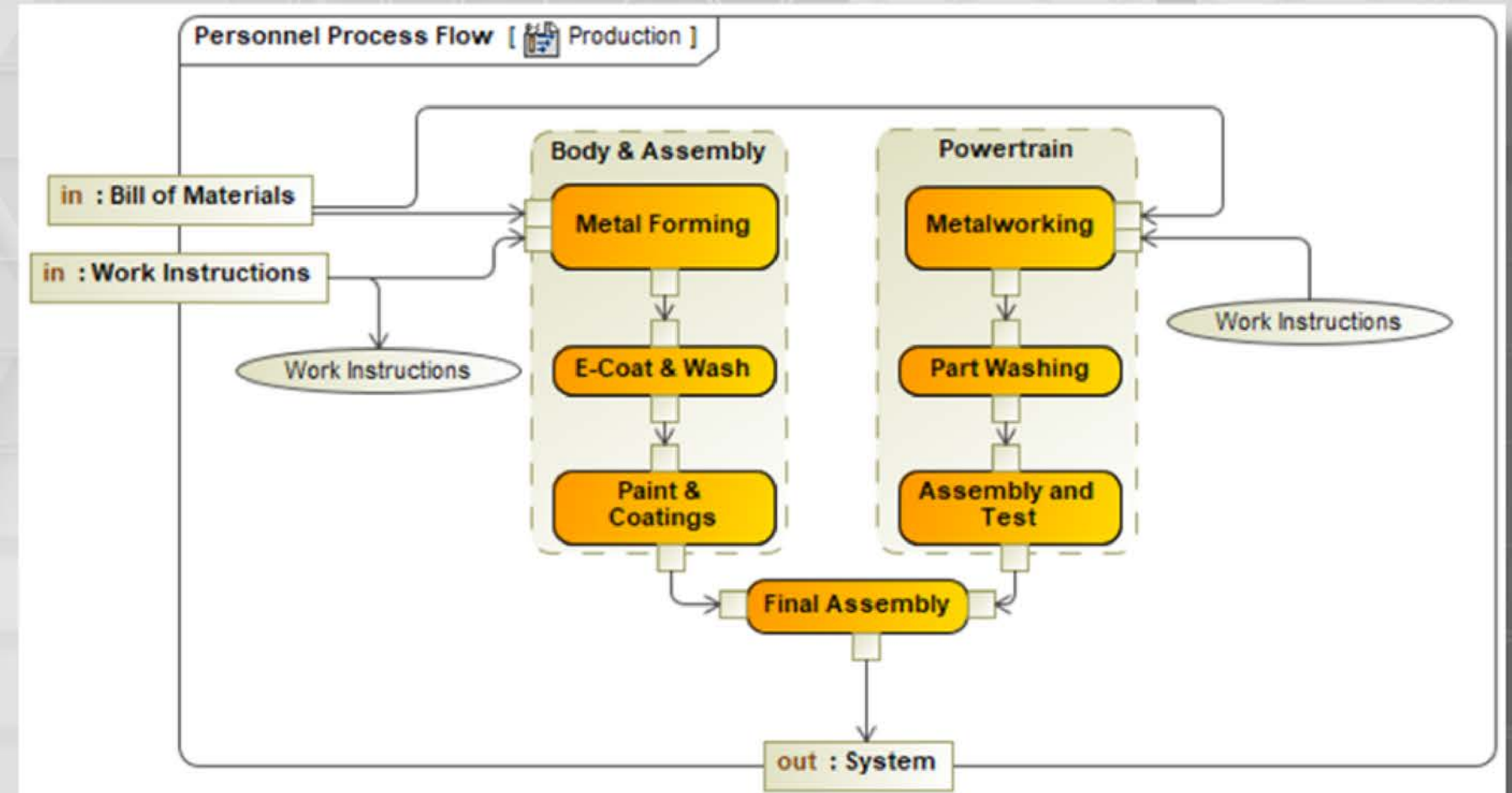
- Hours to Days of effort in finding the impacted artifacts in the data chain for each failed requirement
- Weeks of saved work making surgical updates and propagating through the thread
- The entire time required to manually generate a test report





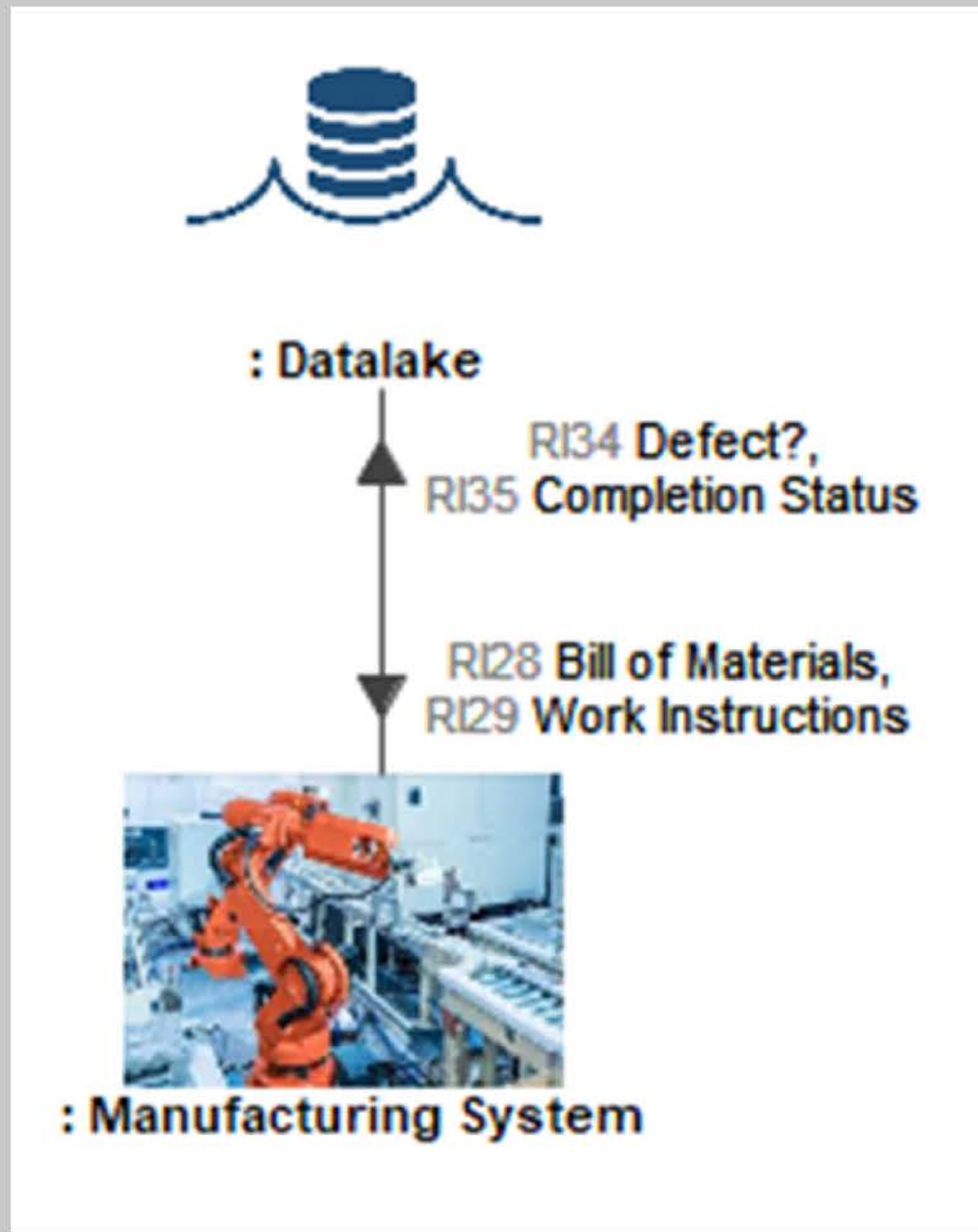
# AS-IS PRODUCTION

- Less insight currently
- Several automotive firms have a high percentage of their manufacturing floor already automated
- Value through to this level is exporting the bill of materials and work instructions in a machine-readable form, and automatically importing to the machines
- Total ROI is currently lacking in research and may be specific per factory location





# Digitized PRODUCTION



This may already be integrated to the ERP for most automotive firms.

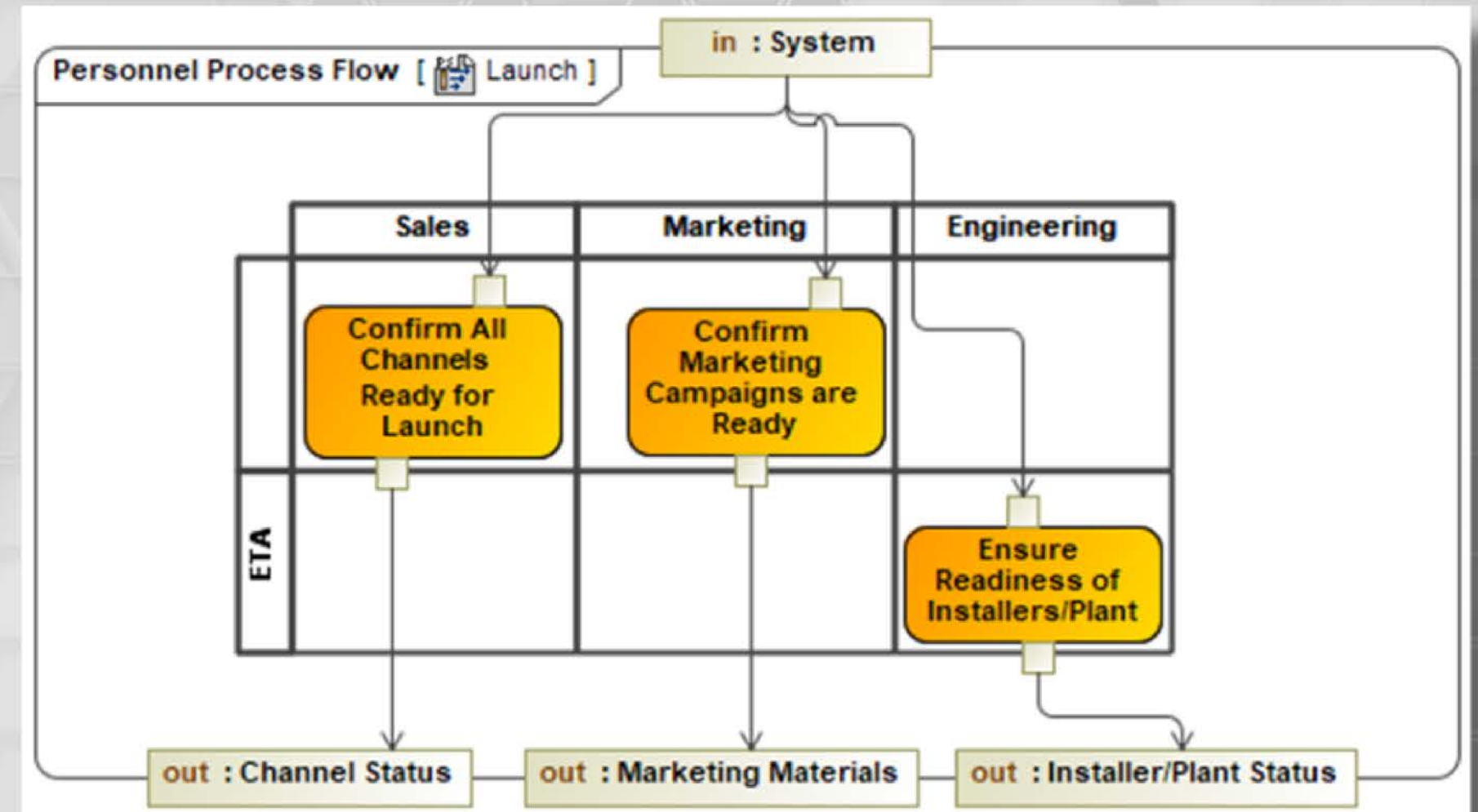
However, in an ideal state the data from the manufacturing floor regarding quality inspection results and completion statuses should be traced back through the Datalake to the design elements to further round-out the digital thread.

If a significant number of defects are found to be tied to the design/architecture, having this integration will reduce a lot of time spent in forensics.



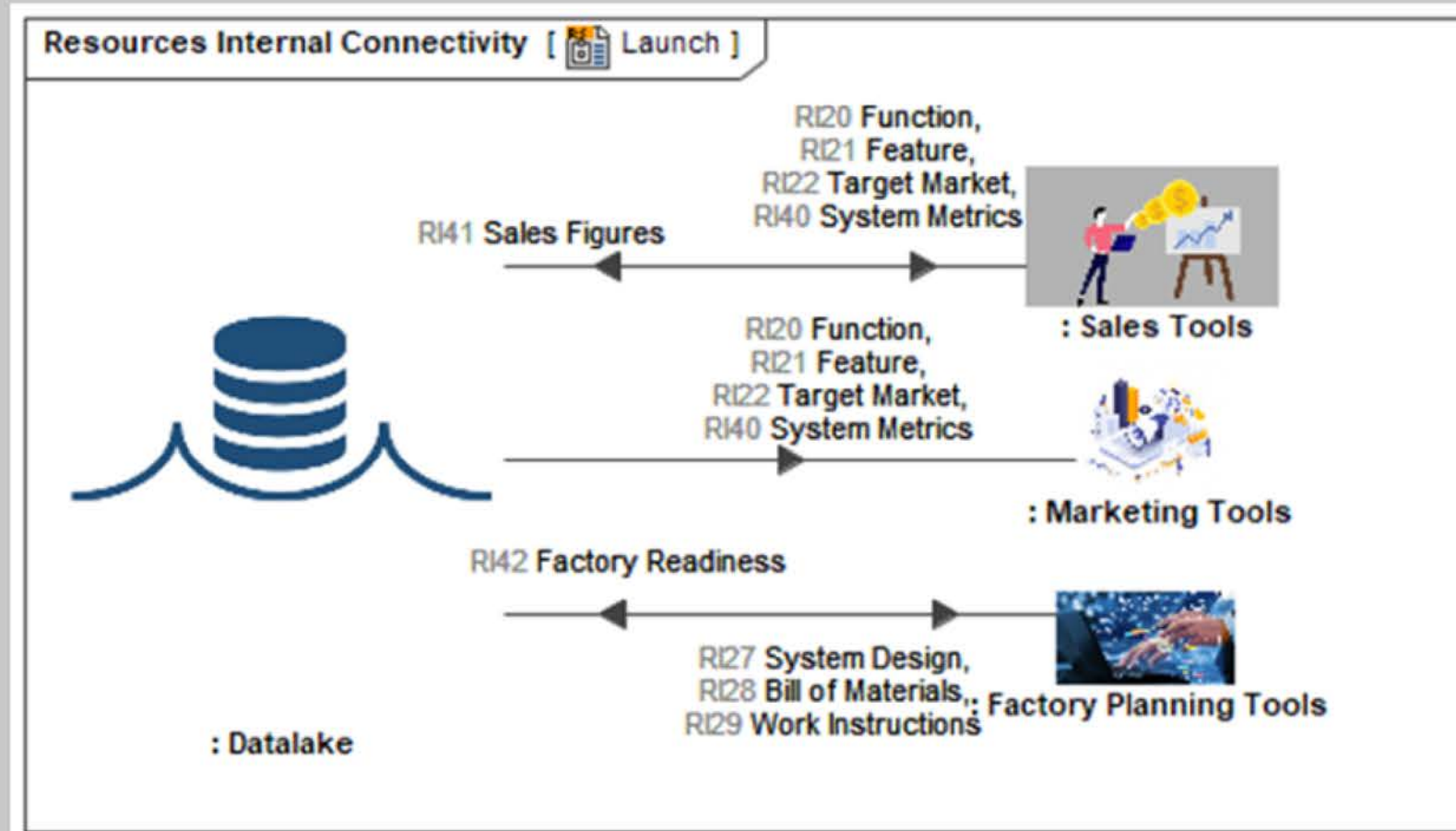
# AS-IS LAUNCH

- From conversations with automotive SMEs, it appears this is the least process-oriented step within the Product Lifecycle Management
- From those discussions, most state that marketing is almost completely disassociated from the data, needing emails and presentations to regurgitate information
- In addition, readiness projects should have already been integrated through project management planning earlier down the line, versus the common meetings/email format as-is today





# Digitized LAUNCH



Digitization for launch should be fairly simple and mainly pulls from the vast amounts of information previously captured.

A dashboard for sales, marketing, and factory management should be setup around the Datalake.

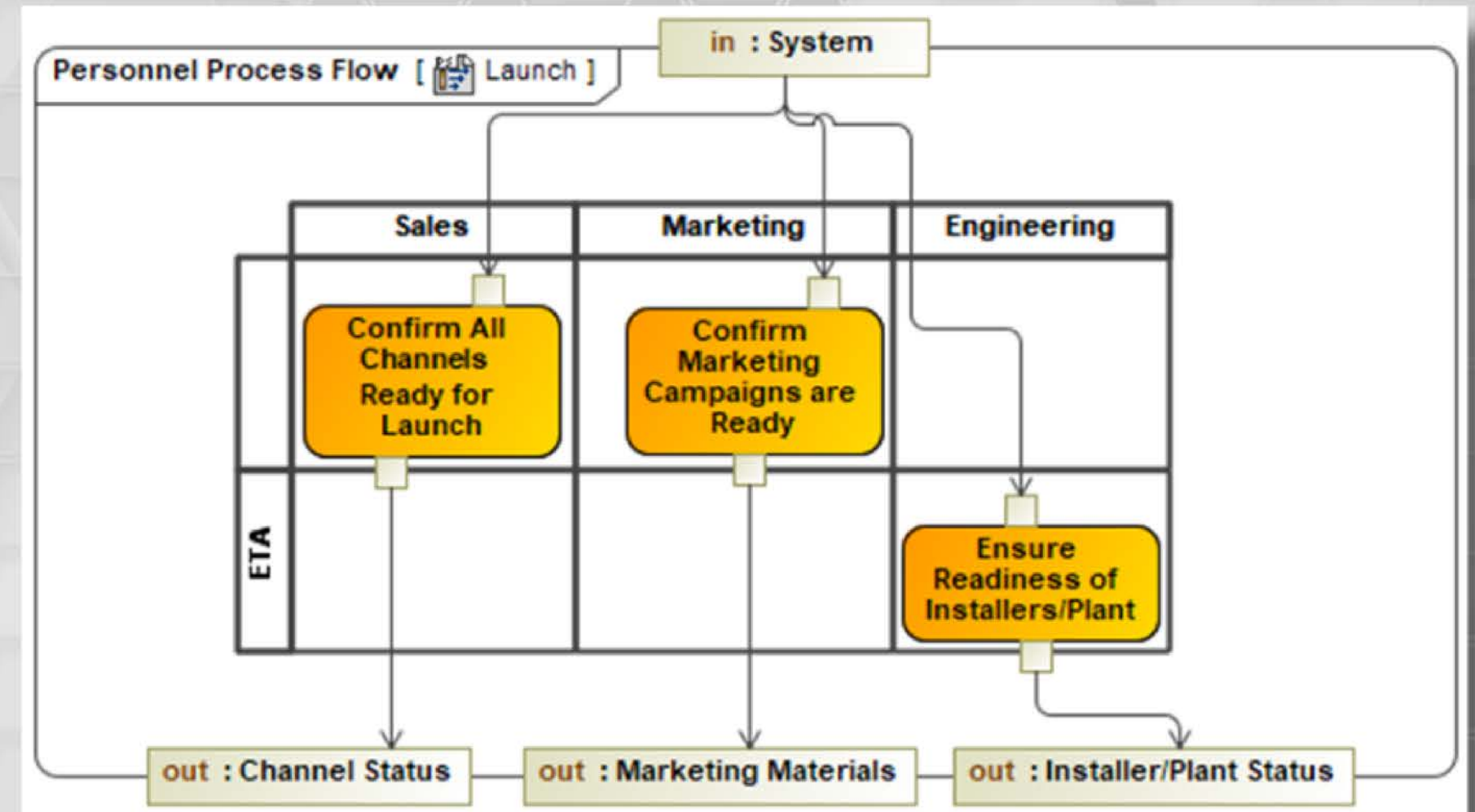
That dashboard should provide pre-populated metrics that feed into integrations with the tools these teams use, i.e. a CRM for sales.

In doing so, the traceability back from sales to the digital thread enables the success metrics to be directly tracked for all systems.



# Digital Automotive ENTERPRISE

- The robust Datalake as the hub of enterprise enables the synchronization and traceability of information from initial design through the development and delivery
- What is not captured in this brief is post-launch activities, which the digital threads would simplify, i.e. recalls, where if a component is affected, an automated impact assessment can be performed within seconds
- Further coupling the digital enterprise with advanced techniques like component libraries and artificial intelligence, new research is proving that optimal car designs are being grown from information captured from previous designs.





# VALUE STATEMENT

- **Significant reduction in wasted costs, i.e. manual transcription of spreadsheet/reports/charts into various tool formats.**
- **Automated impact assessment flagging through the digital threads.**
- **Reuse of data from platform to platform for optimization of feature (either reduction in cost to design/deliver new vehicle/function, or ability to pack more features into a given release).**
- **E2E integration of the data through the organization, originating at the leadership level through to the delivery of the system to drivers.**
- **Ease of assessing recall impact and isolating "bad-threads".**





# CONTACT US

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