Qualification of Digital Twins

Increased efficiency and robustness in developing and operating digital twins

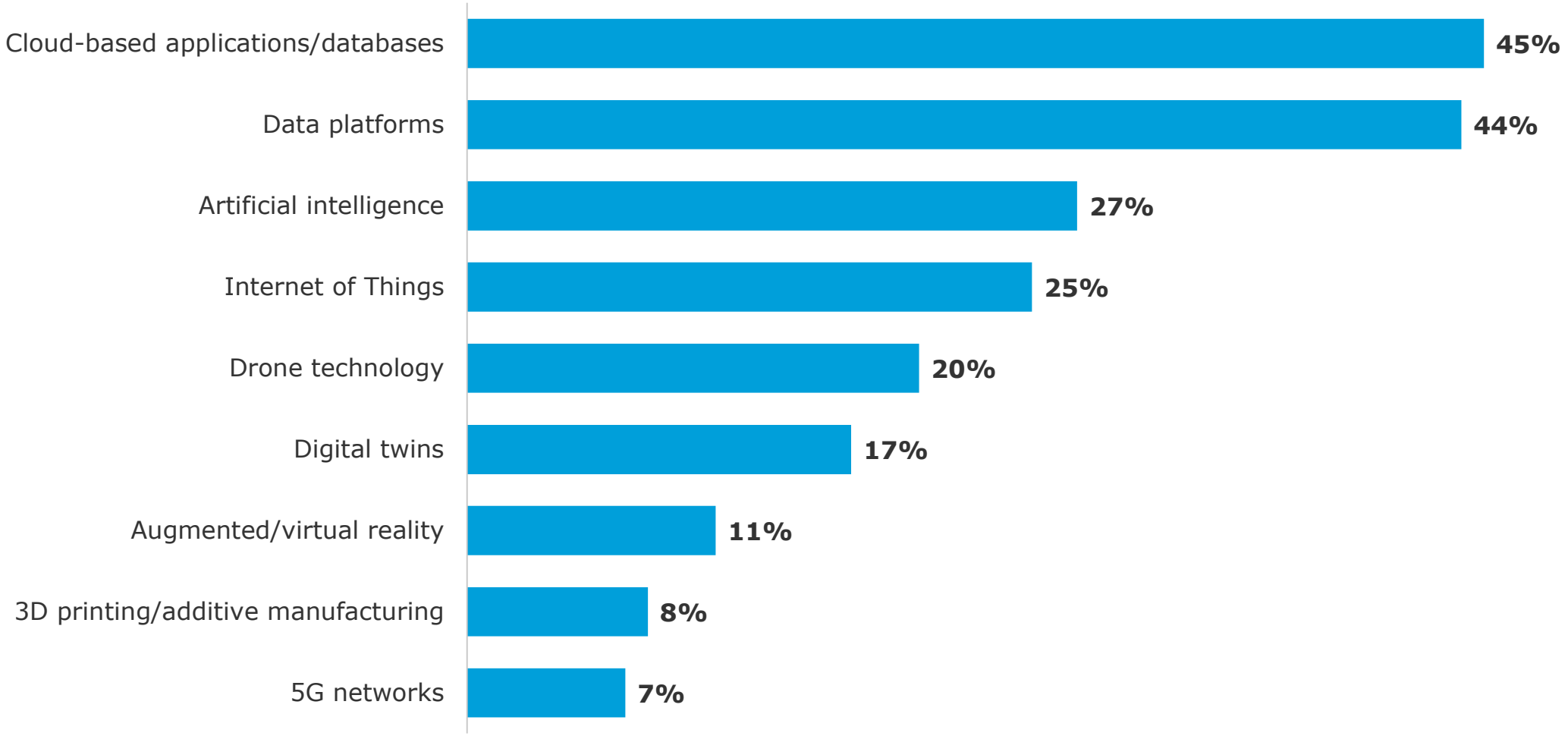
Kjell Eriksson
27 February 2020

Interest in digital twins has grown significantly

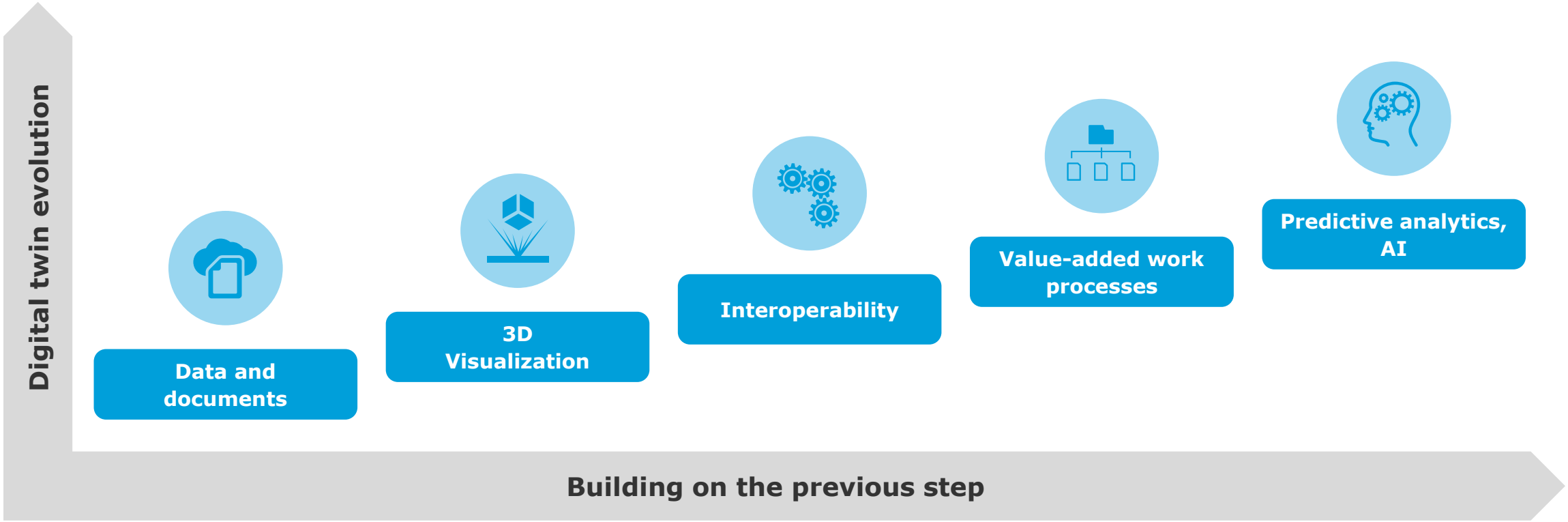
Interest over time

Google

Highest priorities for investment in digital technologies in 2020



Evolution – Getting the basics right



Avoid the most common pitfalls

Base the use case on value not function

Ensure end user buy-in

Fully realize the disruption to the way of working

A new Recommended Practice for qualifying digital twins

Enable an agile and systematic approach to the development process

Scalable methodology as digital twins matures

Document the relationship between supplier and buyer

Qualification of digital twins is the process of providing evidence that the model will:

- provide valid system information and/or,
- predict system performance,

within well-defined limits and to a stated level of confidence, over time.

Building on competence, experience and partnerships

TechnipFMC

20 years' experience in qualifying hardware technology

Applying state-of-the-art digital knowledge

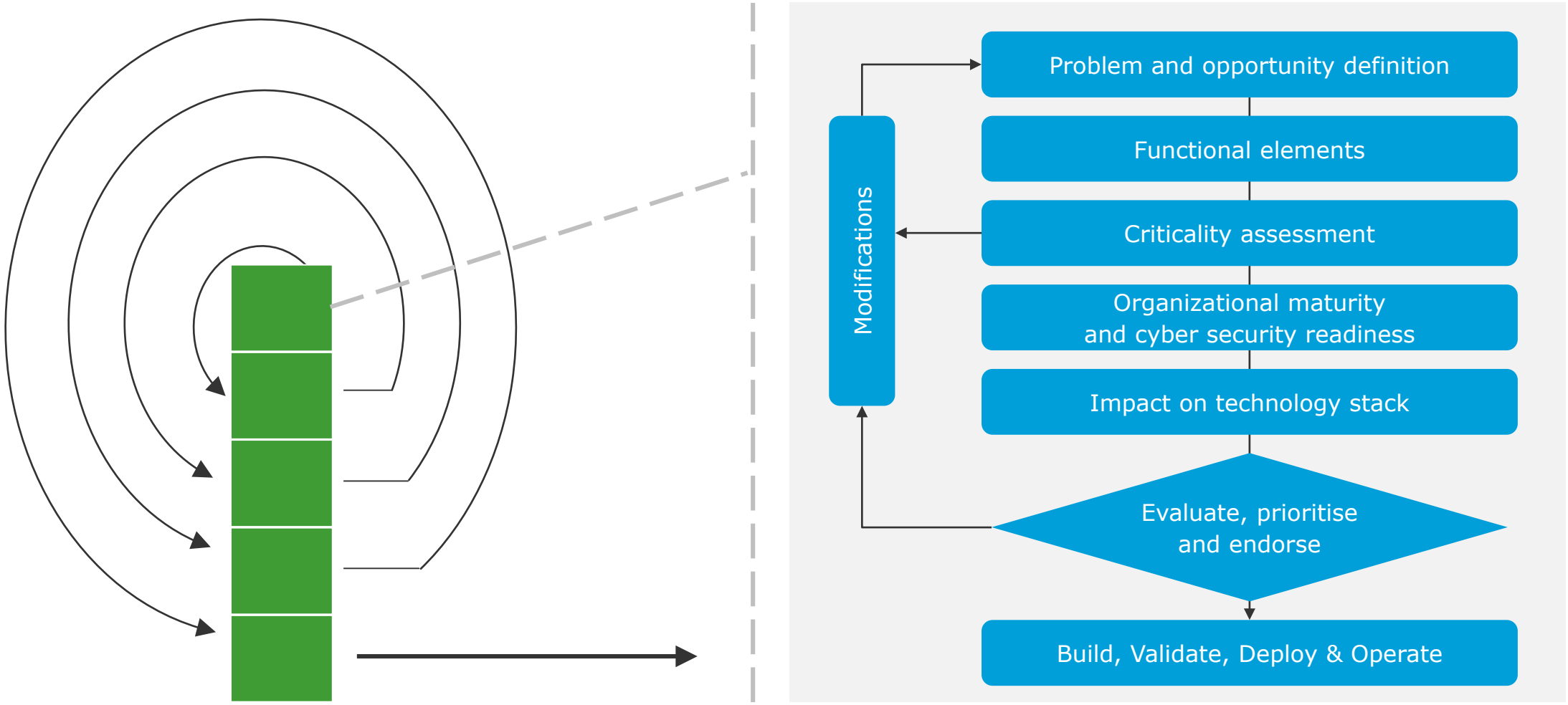
Collaboration and dialogue with the industry

Breaking down a digital twin into manageable elements

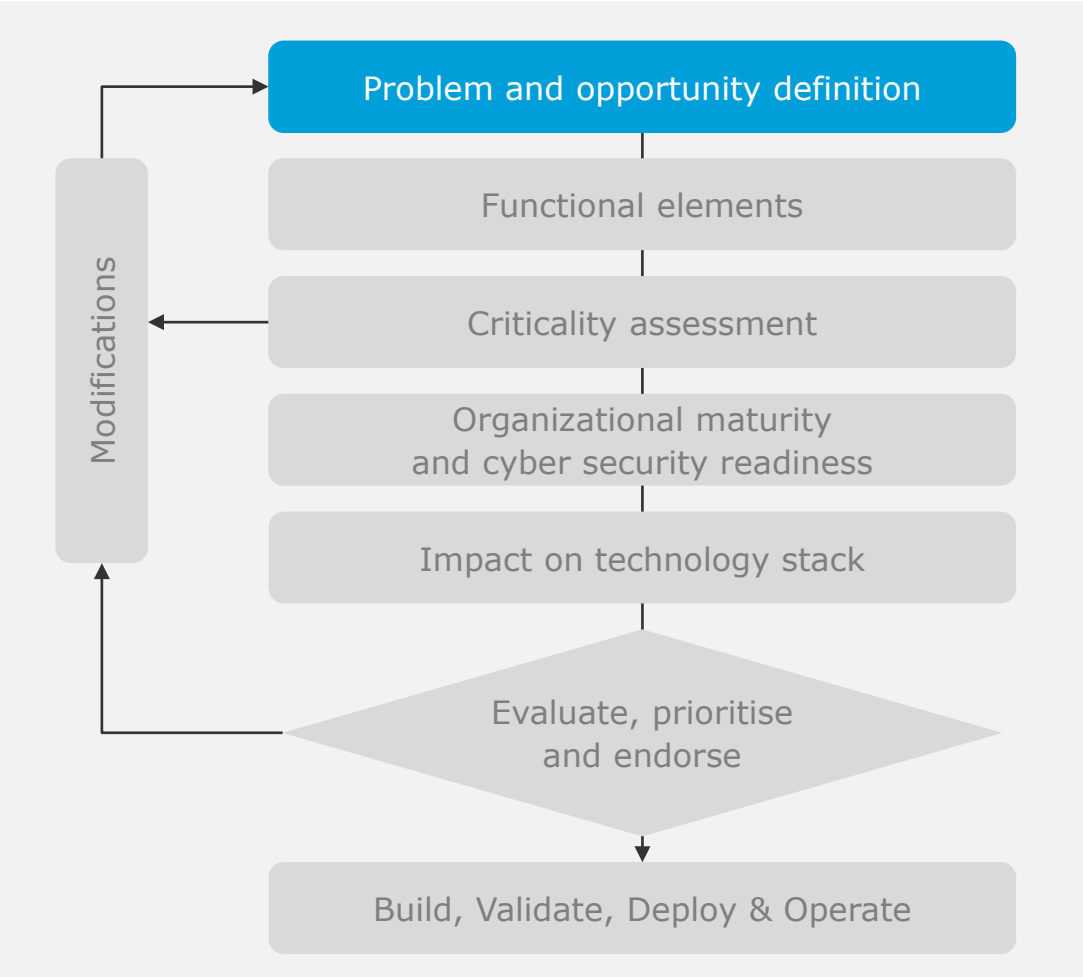
Functional element

A Functional Element (FE) is the part of a Digital Twin's capabilities that supports the user in making a specific decision.

Agile and systematic at the same time



Problem and opportunity definition



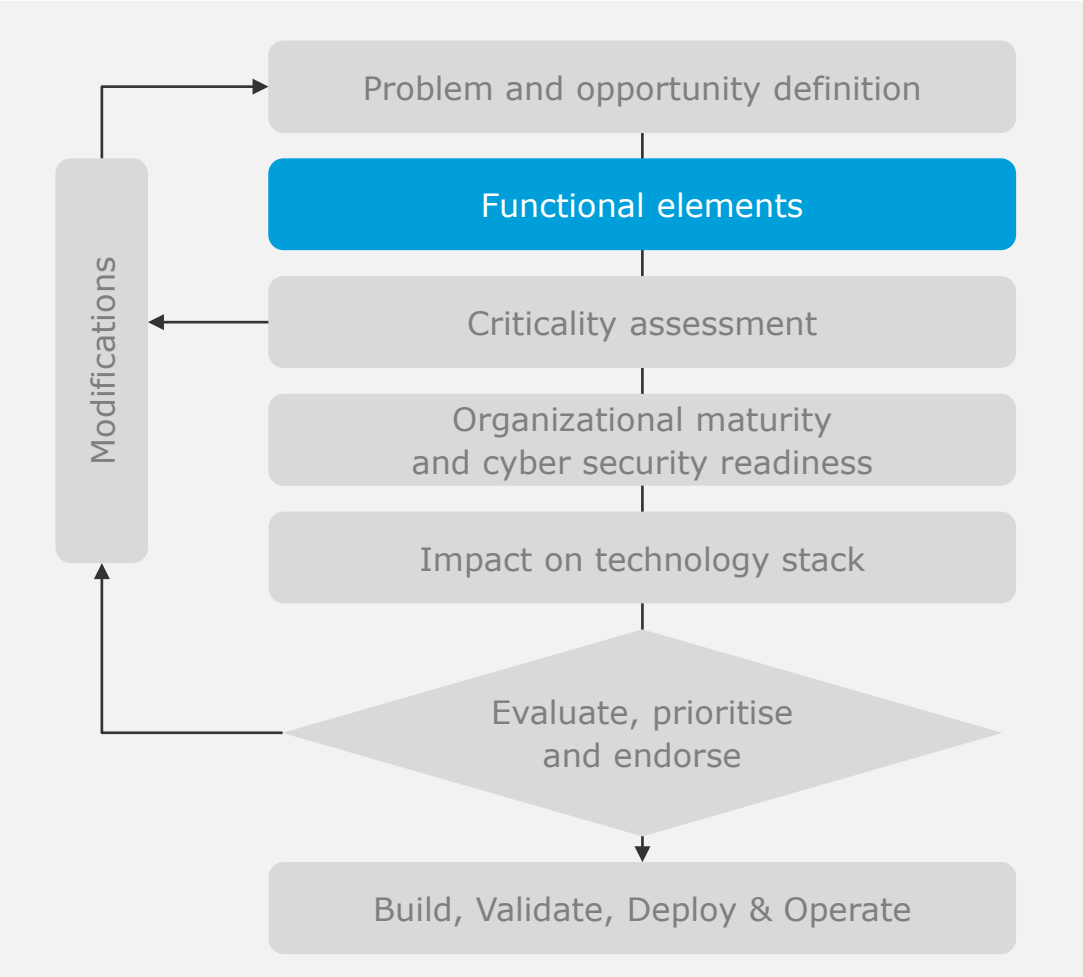
Describe the vision

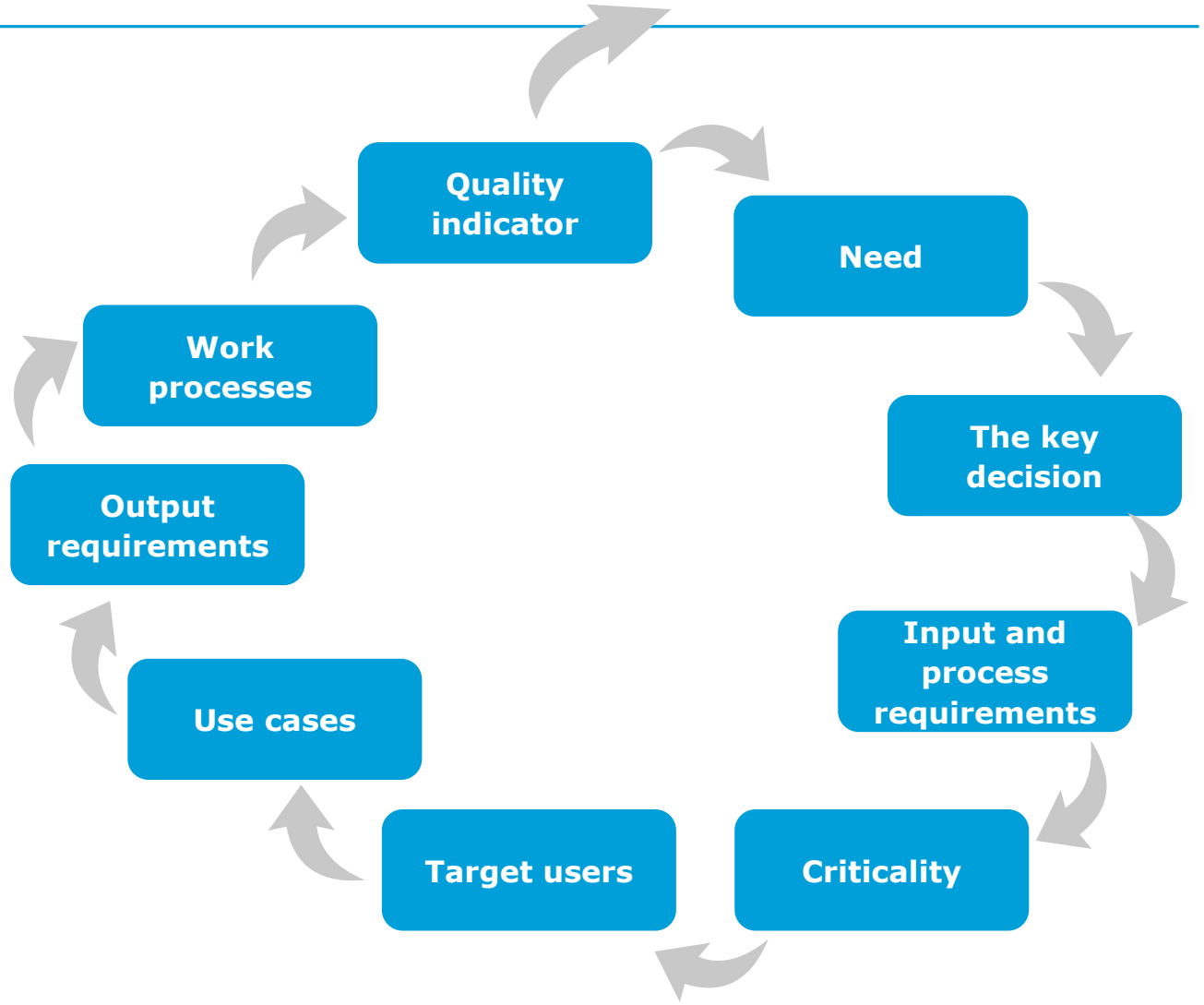
Describe the problem or opportunity

Describe the consequences

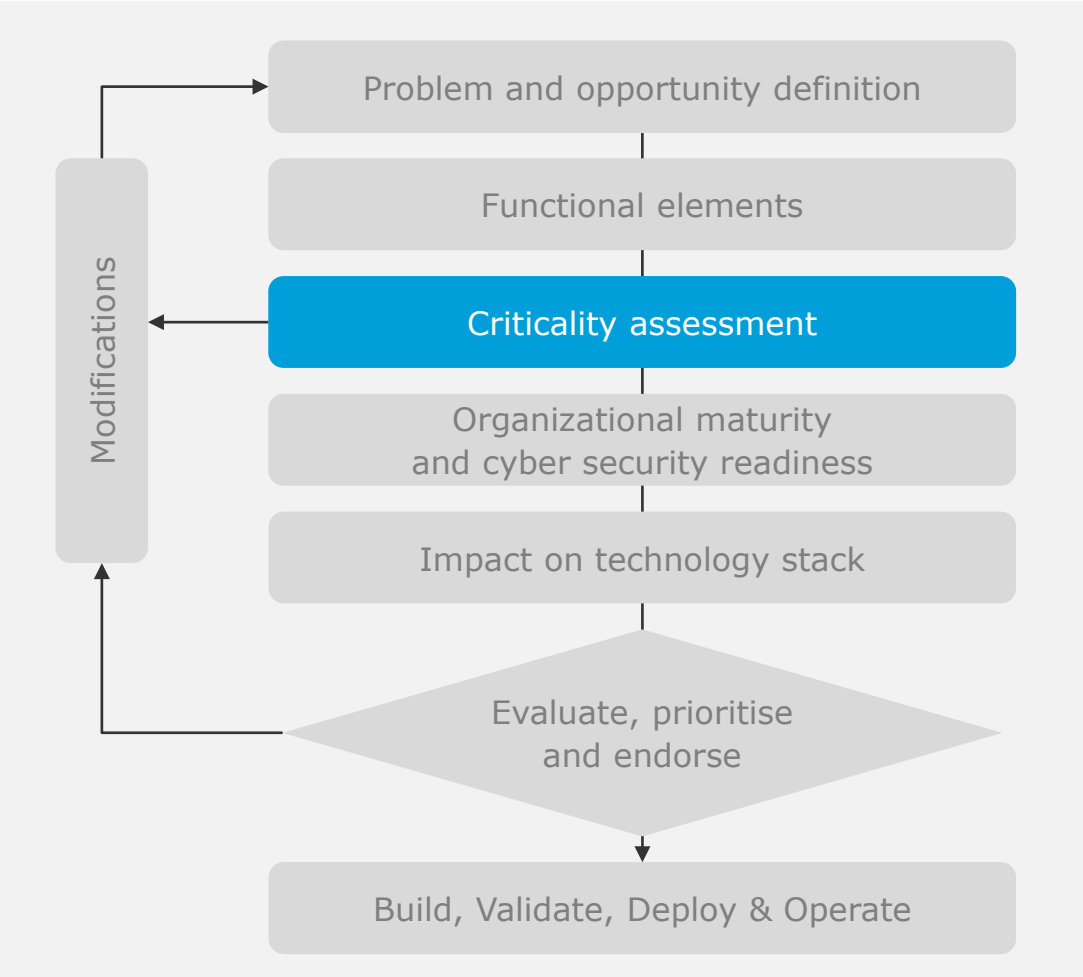
Map the stakeholders

Functional elements





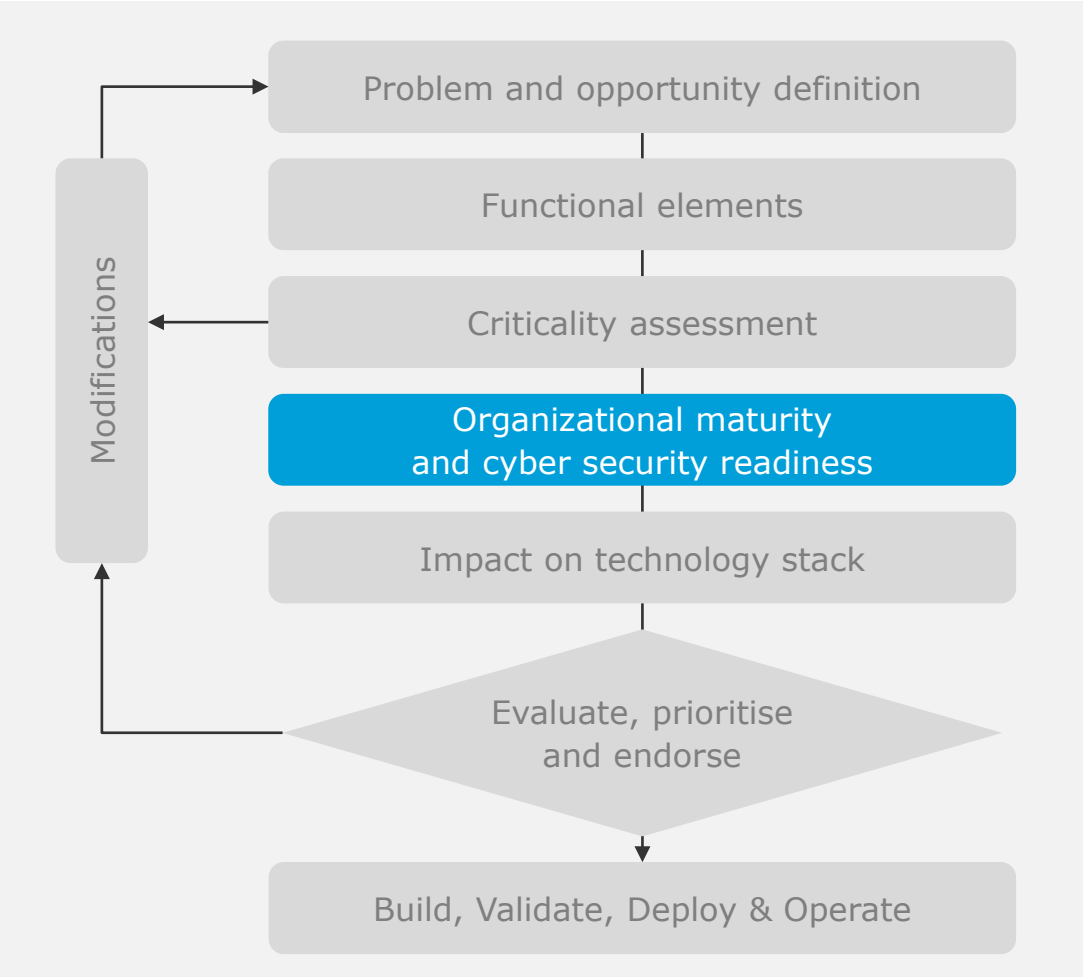
Criticality assessment

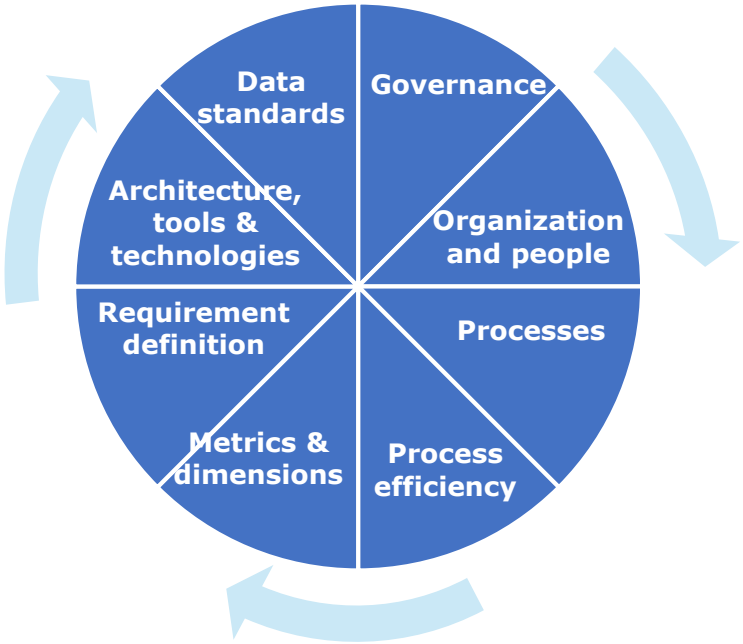


Basis for Key Decision	Potential consequence of Key Decision		
	Limited impact	Can cause delays, downtime or economic impact [1]	Can cause major failures, accidents or environmental impact
The FE is one of several sources of information and ample time for decision making	1	2	2
The FE is primary source of information or limited time for decision making	2	2	3
The FE is the only source of information and automated or time critical decisions [2]	2	3	3

1: Financial impact can also include unnecessary activities.
2: A decision is time-critical when there is limited time to validate/corroborate it with other sources of information.

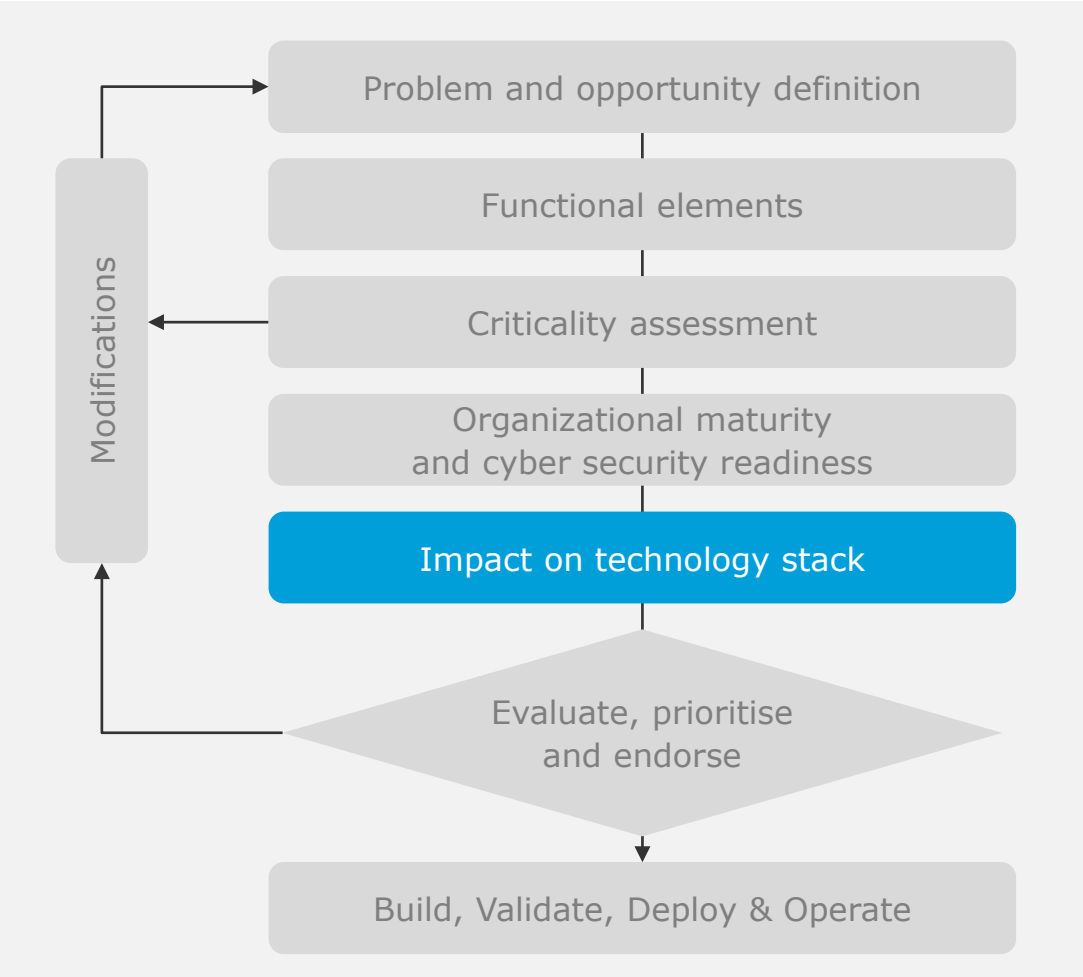
Organizational maturity and cyber security readiness



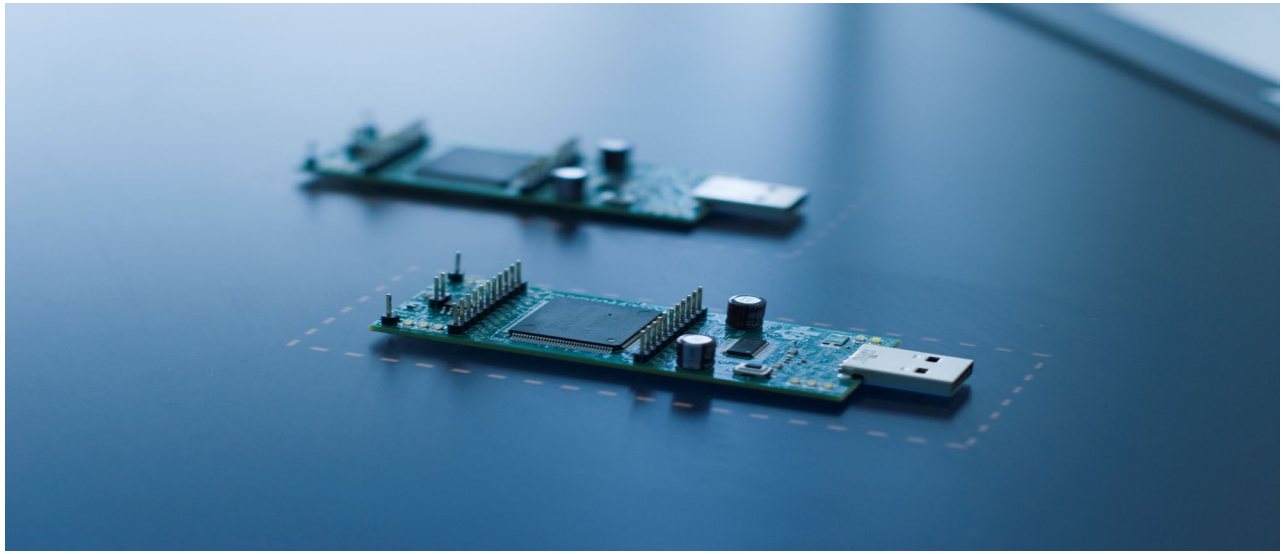


Level	Maturity
5	Optimized
4	Managed
3	Defined
2	Repeatable
1	Initial

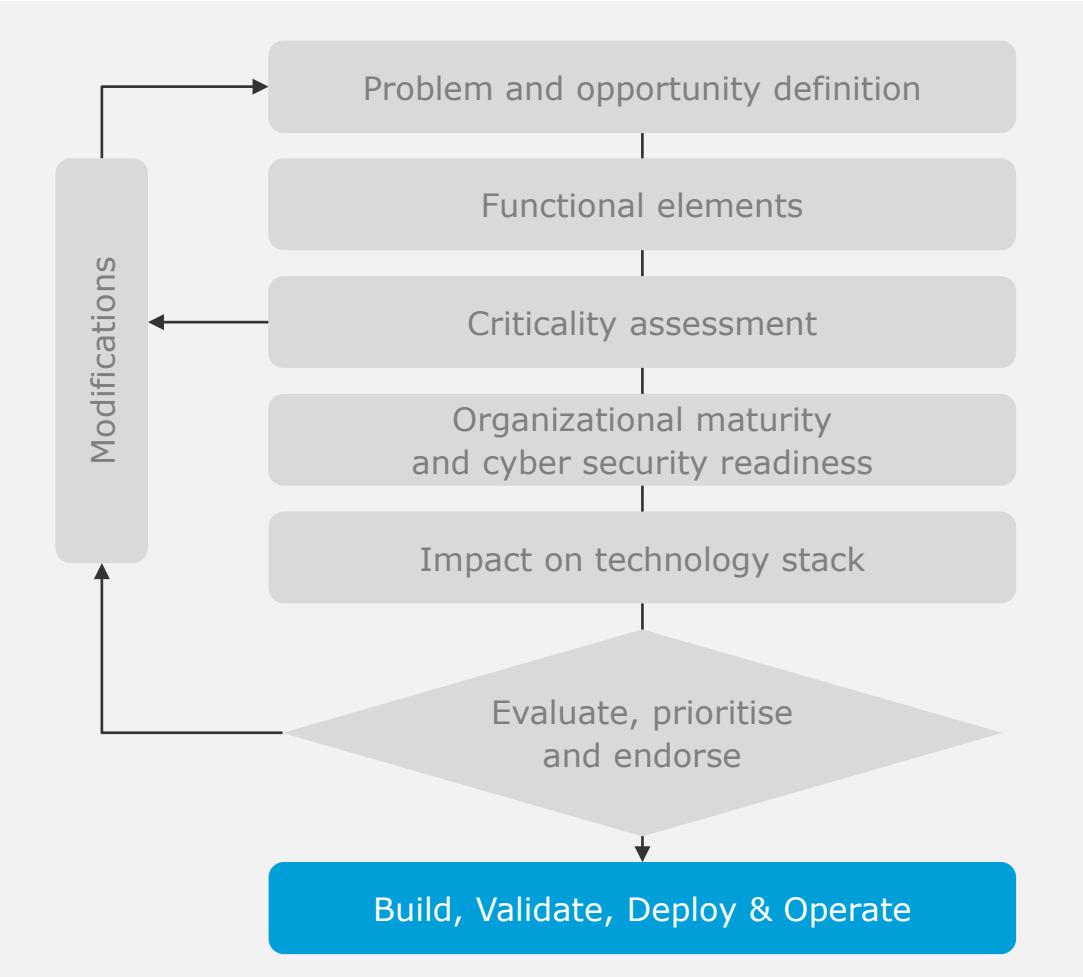
Impact on technology stack



Identify the organization's ability to deliver the required functionality and robustness of the digital twin based on existing technology, or the need for modifications or investments.



The quality indicator



"The Quality Indicator shall be presented together with the output / results of the Functional Element on the dashboard"

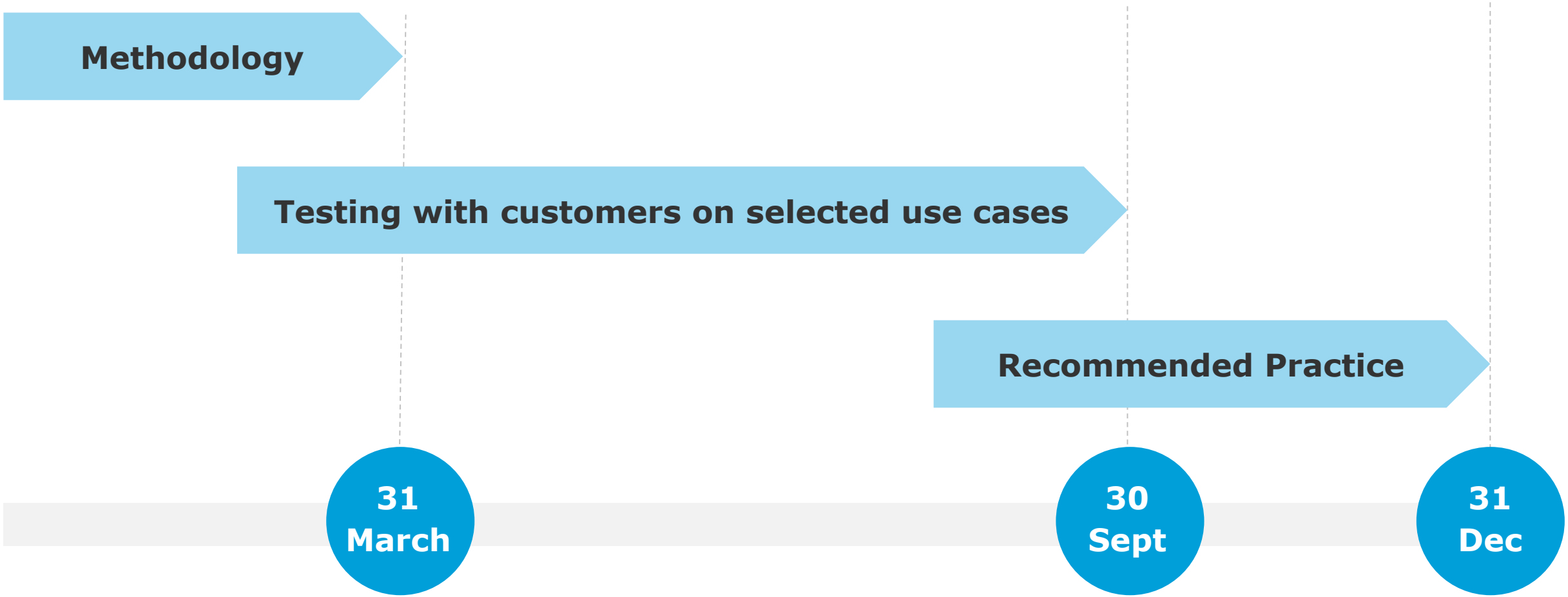
Continuous assessment of:

- **Data quality**
- **Algorithm quality**
- **Output & automated recommendations**

Periodic assessment of:

- **Qualification process status**
- **Functional elements**
- **Changes to asset**

A Recommended Practice the agile way



Leading to trusted digital twins for real decisions

10 x growth from 2019 – 2025 in digital twins

Successful implementation

TechnipFMC & Digital & DNVGL-RP-A203

Agile and systematic

www.dnvgl.com

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