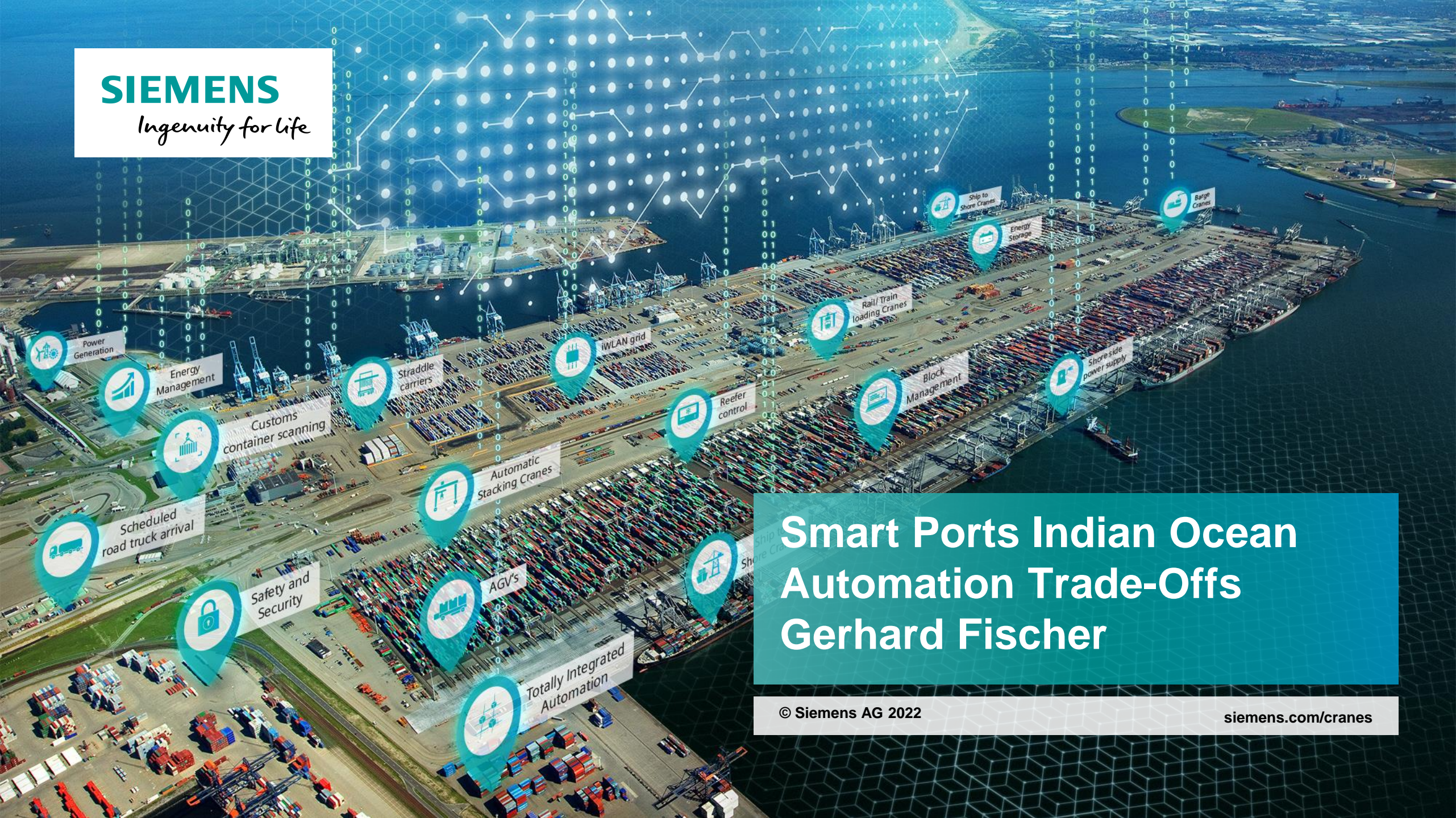


SIEMENS

Ingenuity for Life



Power Generation

Energy Management

Customs container scanning

Scheduled road truck arrival

Safety and Security

Straddle carriers

Automatic Stacking Cranes

AGV's

Totally Integrated Automation

WLAN grid

Reefer control

Rail/Train loading Cranes

Block Management

Ship to Shore Cranes

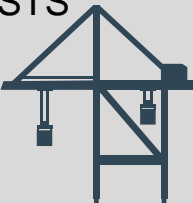


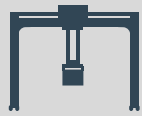


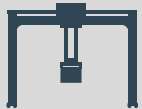


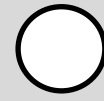
Energy Storage

Shore side power supply

Barge Cranes

Smart Ports Indian Ocean Automation Trade-Offs Gerhard Fischer

Different Crane Types - Maturity & Degree of Automation

Crane type	Sub-type	Automation Degree	Status description
 <p>STS</p>	Single trolley		LS – Limited resolution of trolley-mounted sensor is critical WS - development
	Double trolley		LS – several units in commercial operation WS - development
 <p>RMG</p>	Portal (ASC)		Ca. 1000 units in commercial operation Majority as ASC with AGV, strad and truck interface ARMG with truck interface, critical aspect of drive present in cabin
	Cantilever (ARMG)		
 <p>RTG</p>	16-wheel		First units in commercial operation 16-wheel more stable than 8-wheel Critical aspect of handling of truck under RTG in truck lane Unresolved topic „personnel safety“
	8-wheel		
 <p>Strad</p>			First units in commercial operation



Semi-automated with limited driver assistance



Semi-automated with extensive driver assistance

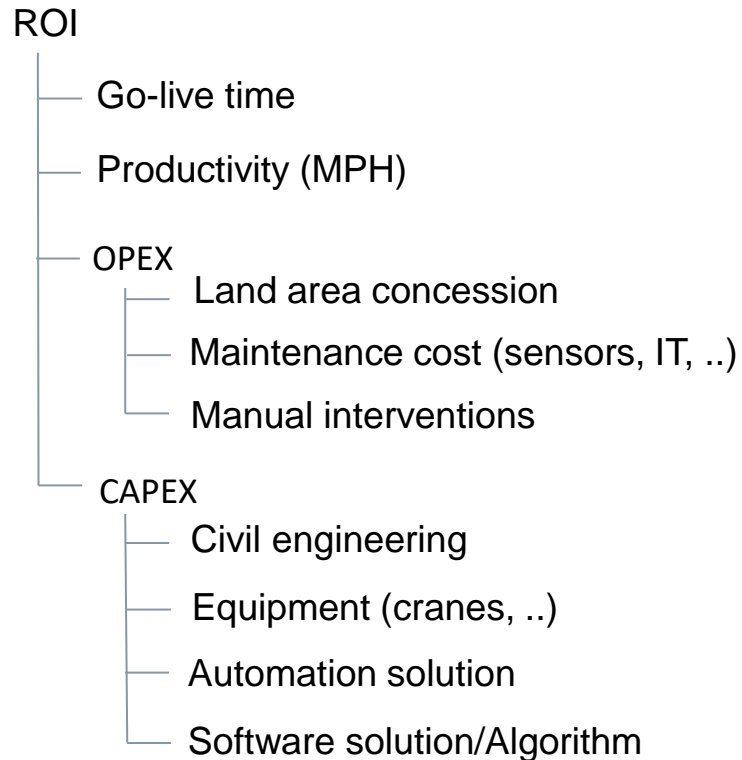


Fully automated with manual intervention

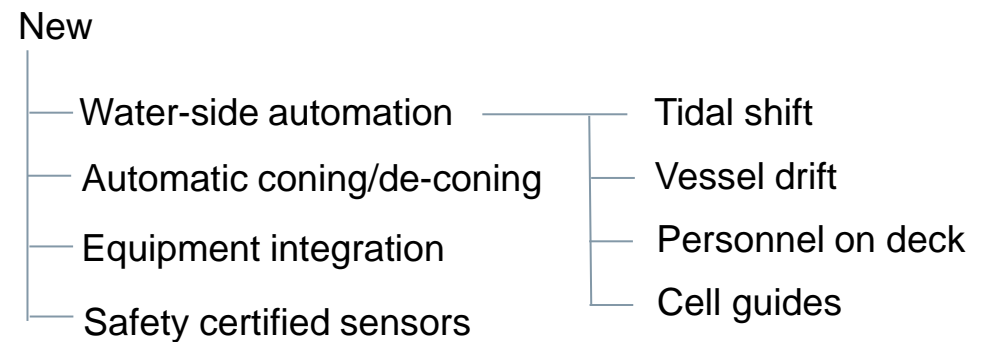
Business Case Influencing Factors



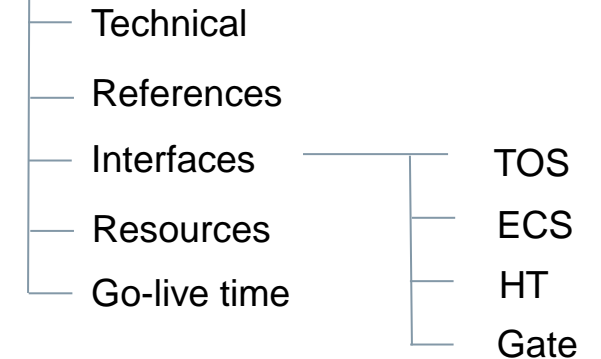
Invest €



Technology

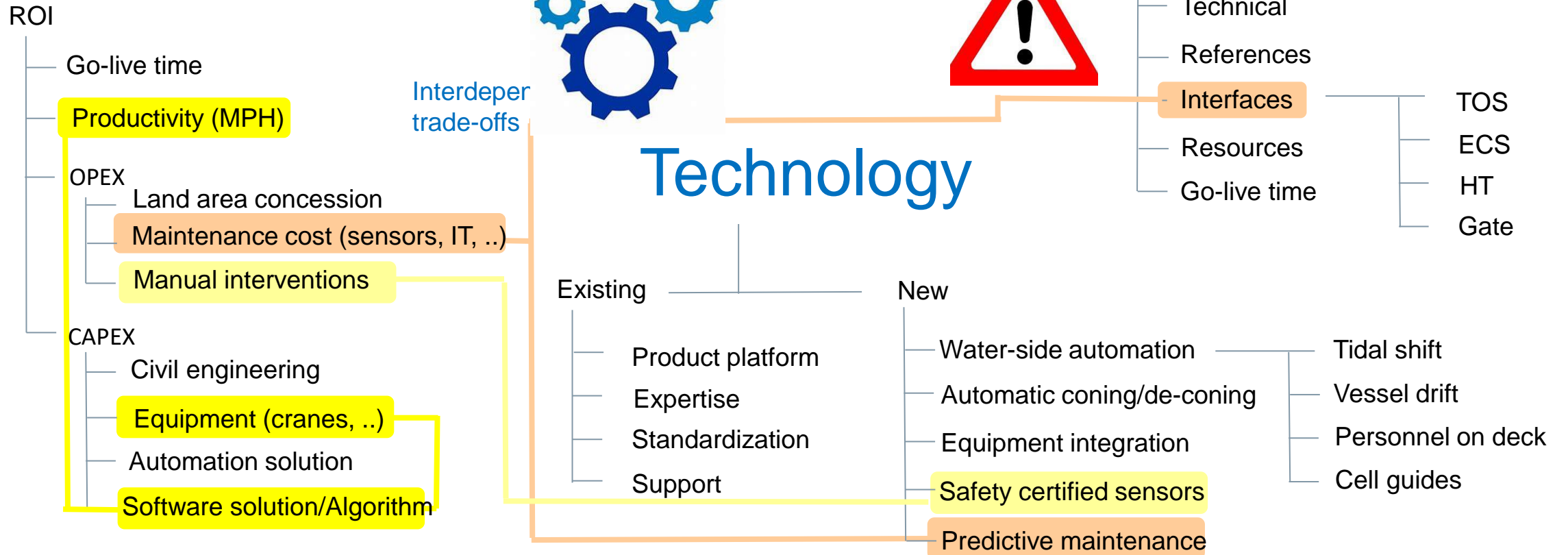


Risks



Business Case Influencing Factors

Invest €



Thank you! Merci Beaucoup!



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