



TARTU ÜLIKOOL



Function-Driven Cyber-Physical Security in Smart Manufacturing

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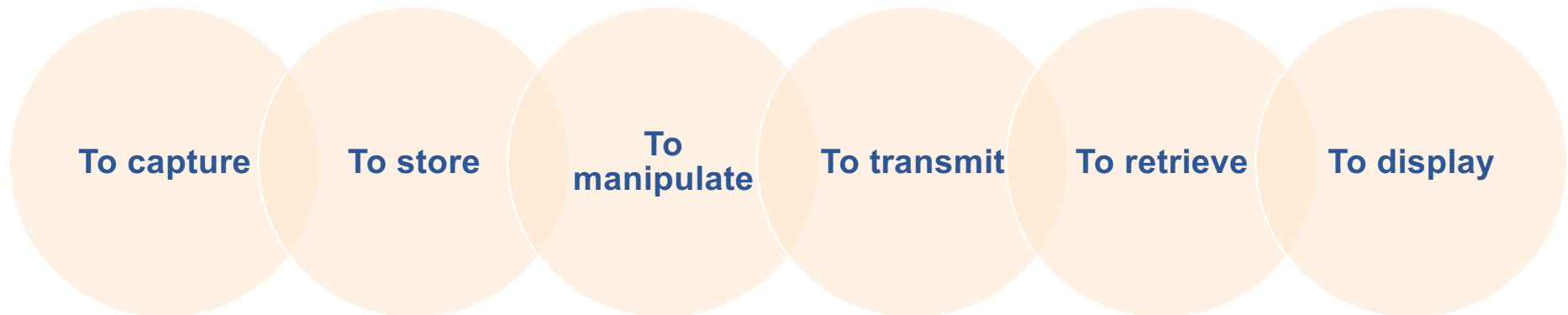
Baltic DB&IS, Tartu, Estonia, 29.06.2026



Primary RQ:

How can security risks in automated manufacturing systems and technologies be managed?

Functions



The FAST method

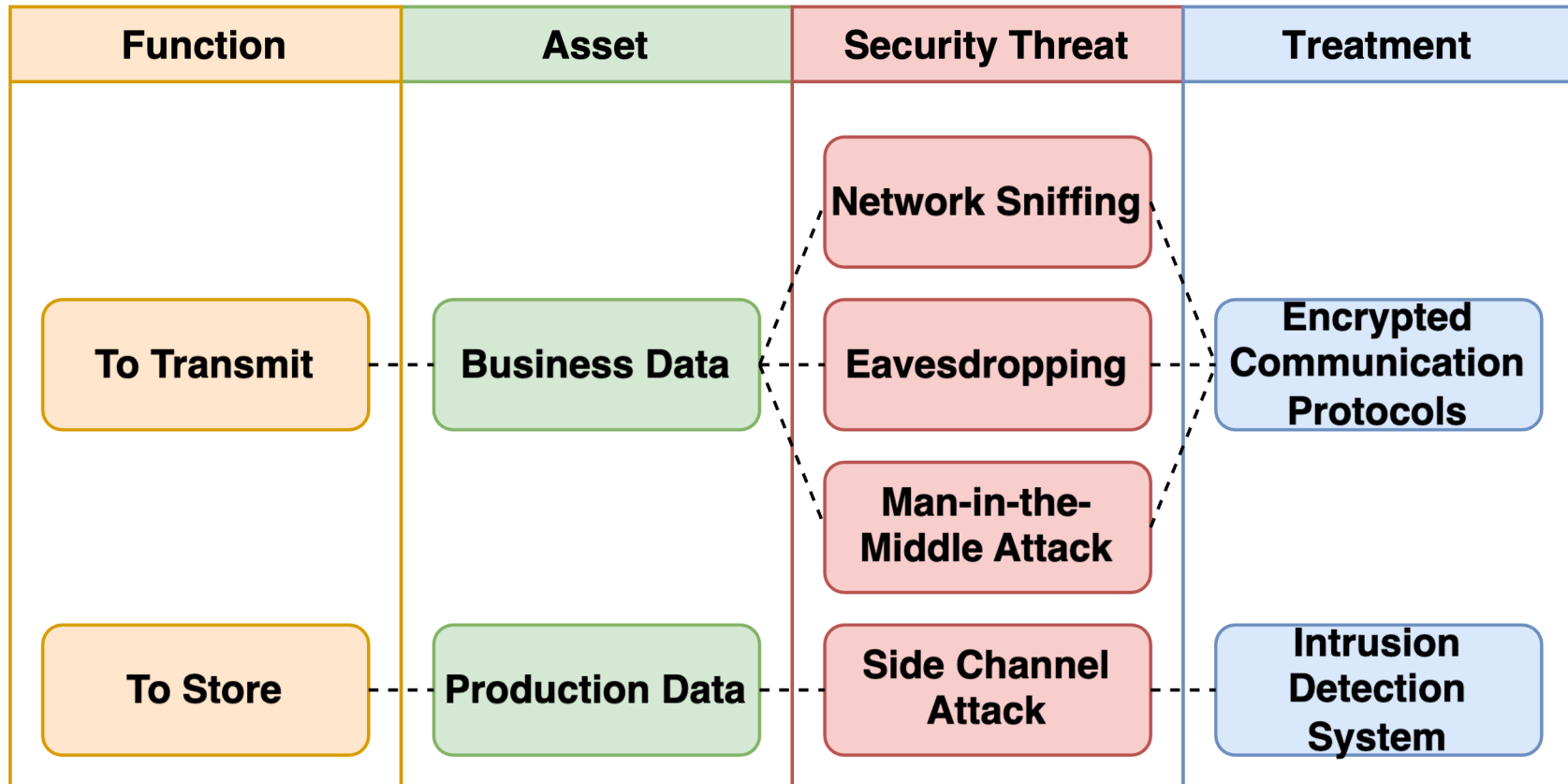
Function

Asset

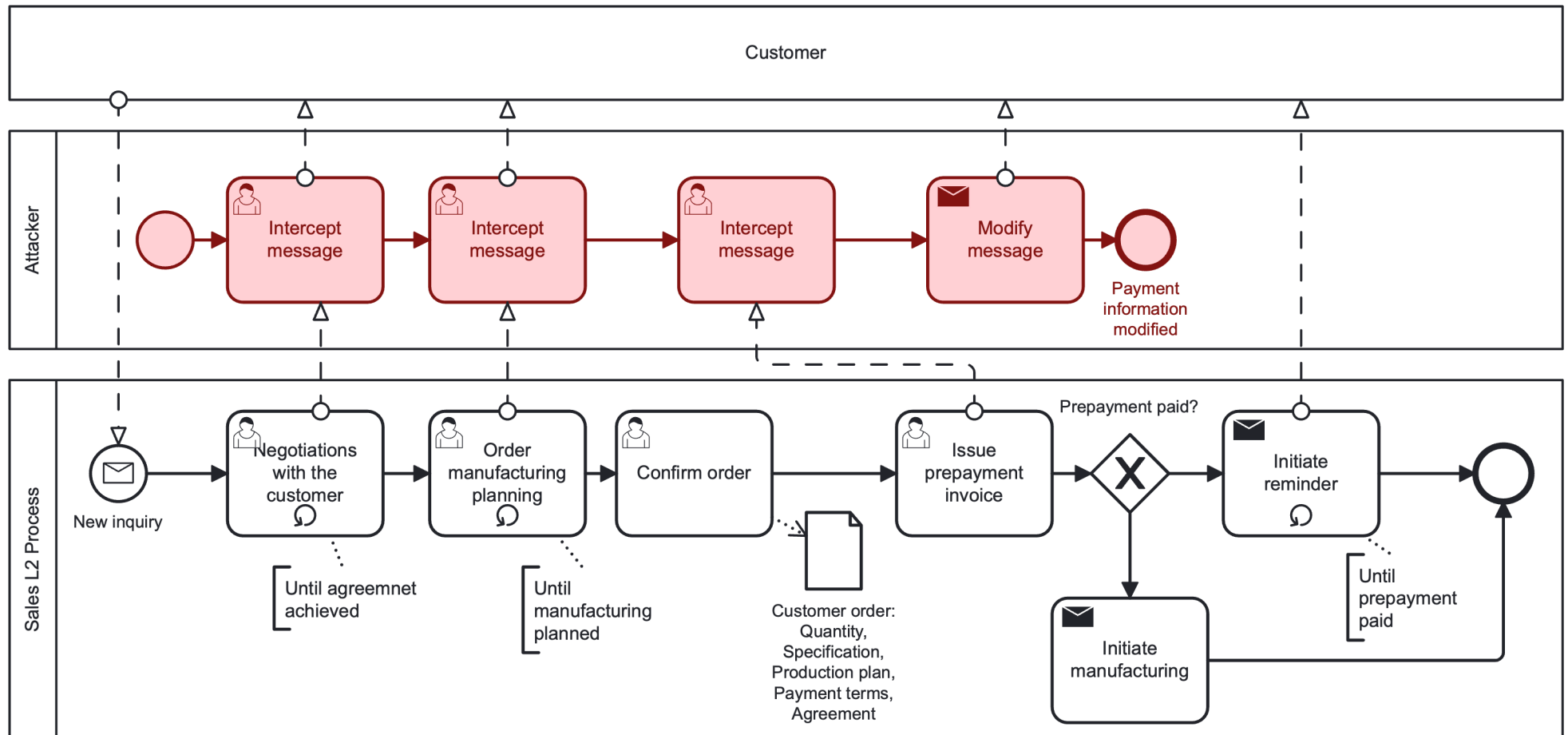
**Security
Threat**

Treatment

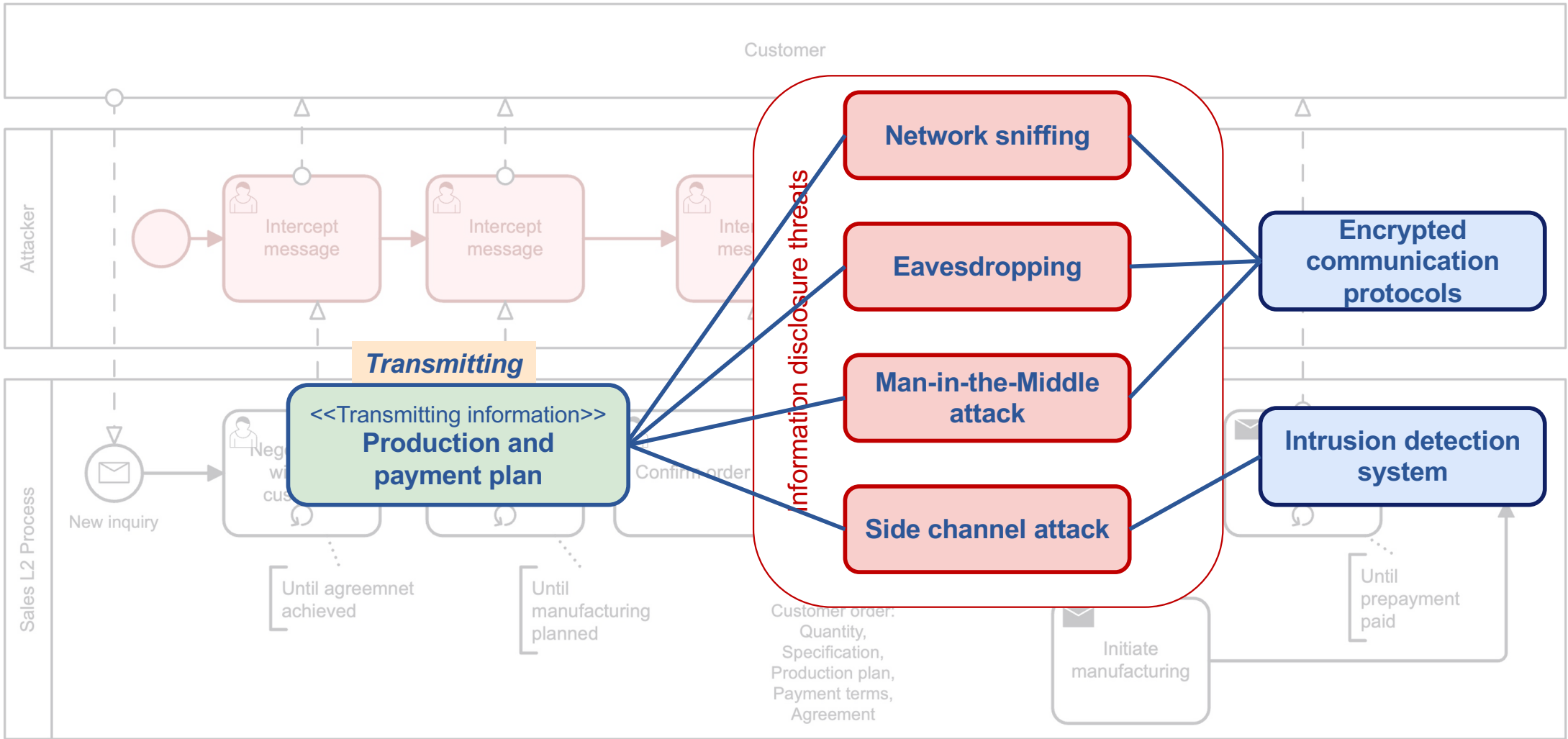
The FAST method breakdown



Example case: Baltic WoodCo



Man-in-the-Middle attack scenario during sales process



Man-in-the-Middle attack scenario

The Drilling Cell as a Case Study

- *the ABB IRB 2400 robot*
- *the ATI torque sensor*
- *the IRC5 controller*



Function (FAST)	System Asset (FAST)	Business Asset (FAST)	MITRE Asset	MITRE Tactic	Threat (MITRE ICS)	Mitigation (MITRE ICS)
Capturing	ATI Delta 330-30	Force/Torque Data	Field I/O	Collection	Adversary-in-the-Middle	M0802 – Communication Authenticity
Manipulating	IRC5	Joint Position Data	PLC	Impair Process Control	Modify Parameter	M0818 – Validate Program Inputs
Storing	IRC5 / RobotStudio	Tool Path Configuration	PLC	Persistence	Module Firmware	M0945 – Code Signing
Displaying	FlexPendant	Robot Program Logic / Diagnostics	HMI	Evasion	Masquerading	M0945 – Code Signing



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