Challenges and Security Strategies for Smart Grid Automation in Water Utilities

Peter Rus

Enterprise Architect Process Automation

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AGENDA

- CURRENT PROCESS VERSUS NEW INNOVATIONS
- THE BUSINES CASE (INDUSTRIAL) INTERNET OF THINGS (IIOT)
- WHAT YOU NEED TO ASK TO STAY INCONTROL
- HOW WRONG ASSUMPTIONS CAN HAMPER THE BUSINESS YOUR IN
- TECHNICAL REFERENCE MODEL

NEED FOR CONTROL

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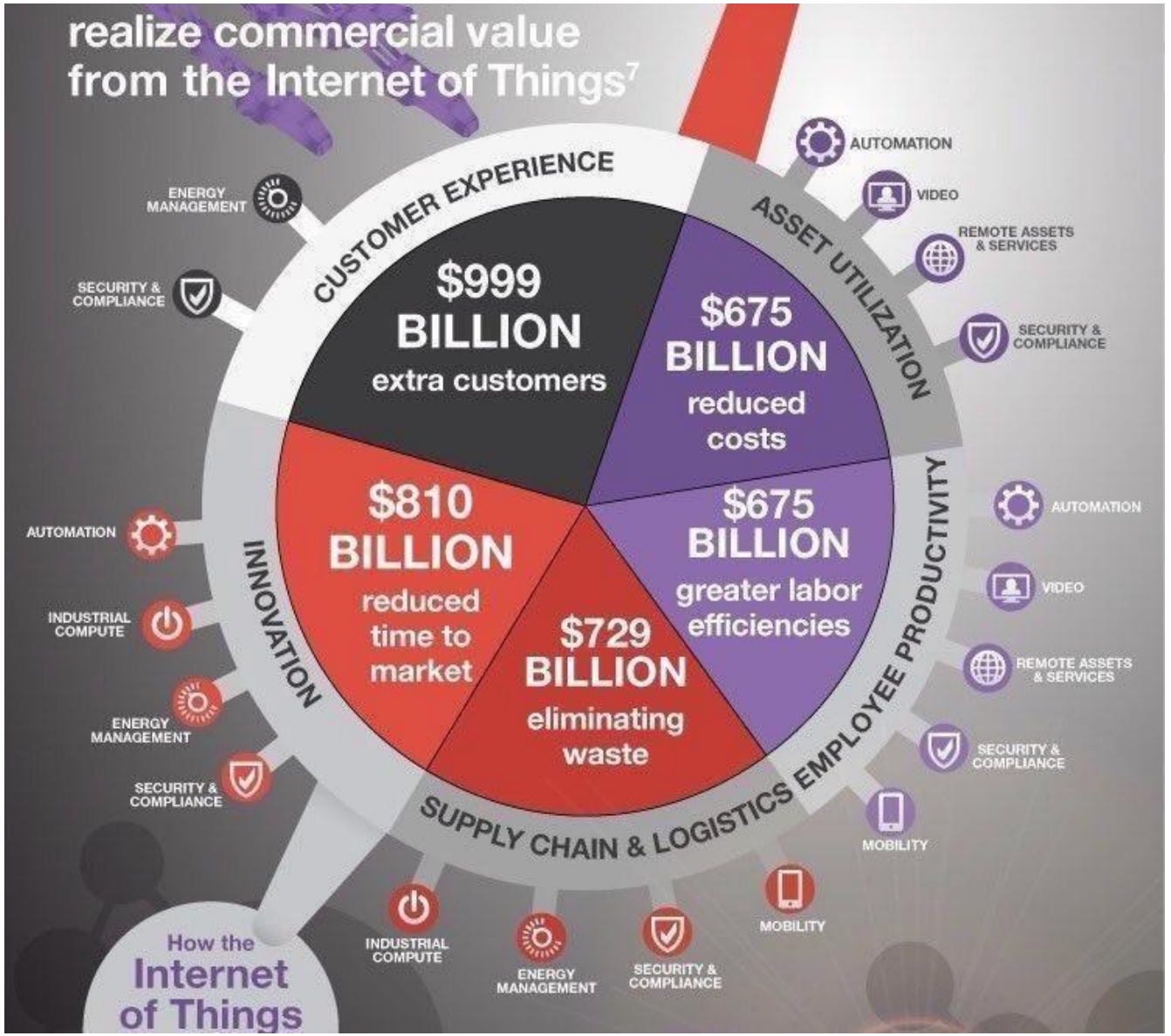
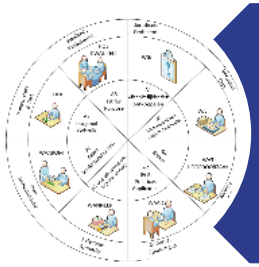


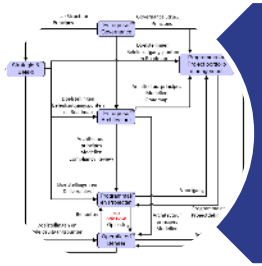
NEED FOR SPEED

JUST ASK THREE QUESTIONS



DO WE UNDERSTAND WHAT CAN GO WRONG?

DO WE KNOW WHAT OUR SYSTEMS ARE TO PREVENT THIS FROM HAPPENING?



DO WE HAVE THE INFORMATION TO ASSURE US THESE SYSTEMS ARE WORKING EFFECTIVELY?

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WRONG DESIGN -SPEEDTANKER?

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WRONG ASSUMPTIONS

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WRONG FOCUS ON COMMUNICATION MECHANISMS

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TECHNICAL REFERENCE MODEL

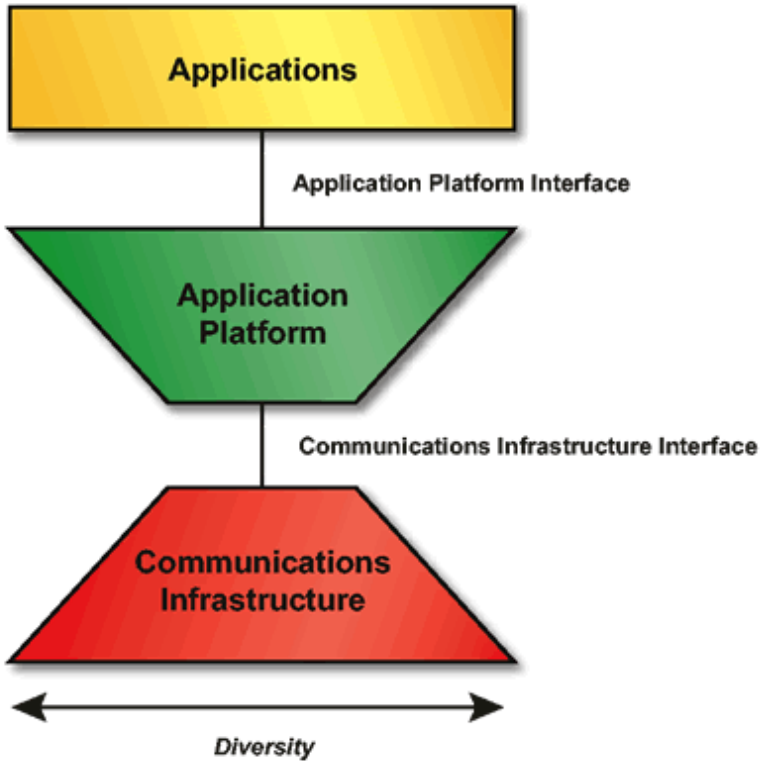
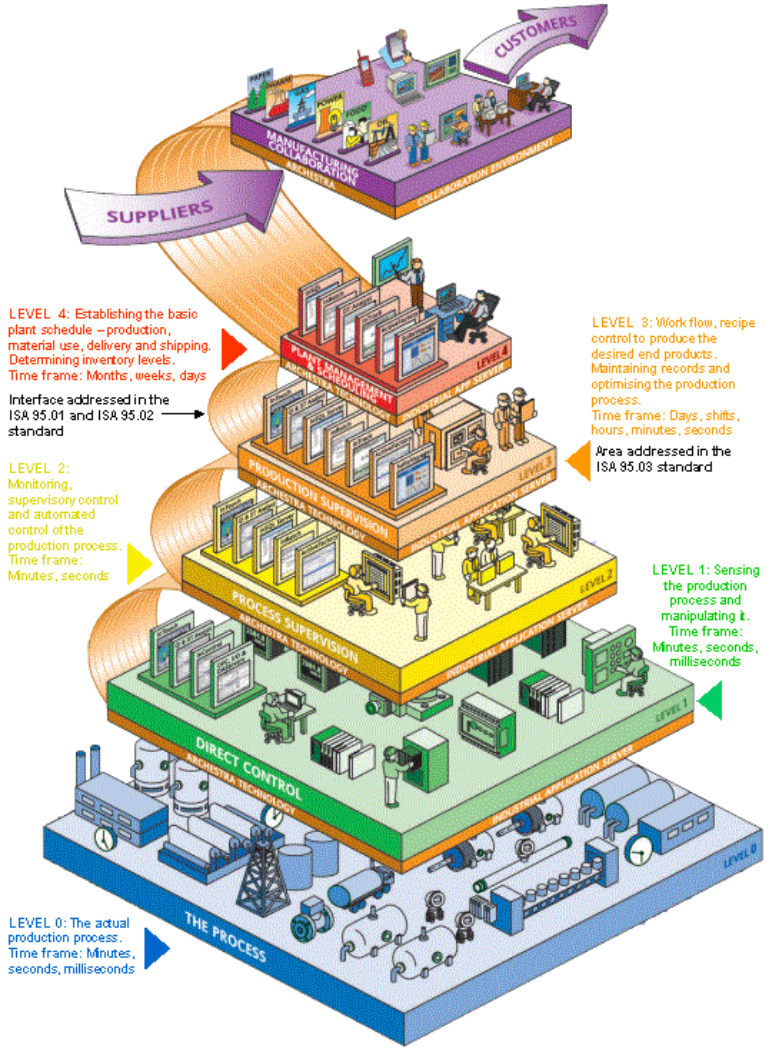


Figure: Technical Reference Model - High-Level View



WHY SPEED?
INNOVATION AND CONNECTED DEVICES

Serious Gaming using Critical Infrastructures tool and Delft3D FM in combination with the HoloLens

OpenDroneMap

OpenDroneMap

What is it?

OpenDroneMap is an open source toolkit for processing aerial drone imagery. Typical drones use simple point-and-shoot cameras, so the images from drones, while from a different perspective, are similar to any pictures taken from point-and-shoot cameras, i.e. non-metric imagery. OpenDroneMap turns those simple images into three dimensional geographic data that can be used in combination with other geographic datasets.

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WHY CONTROL?
DIGITAL THREATS AND REAL OUTCOMES

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AIRGAPPED SYSTEMS-NO SUCH THING

ars TECHNICA BIZ & IT TECH SCIENCE POLICY CARS GAMING & CULTURE FORUMS SIGN IN

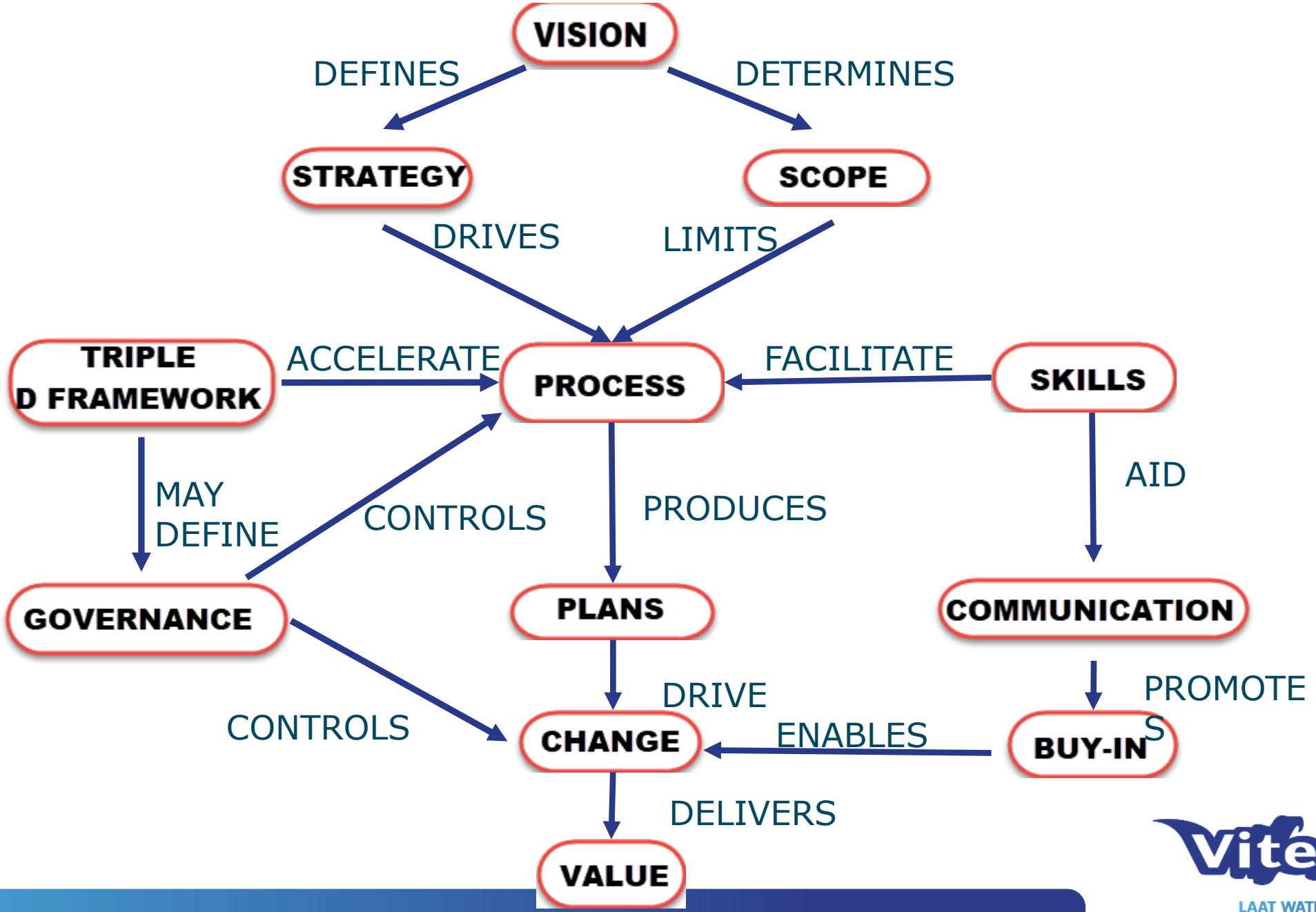
BIZ & IT —

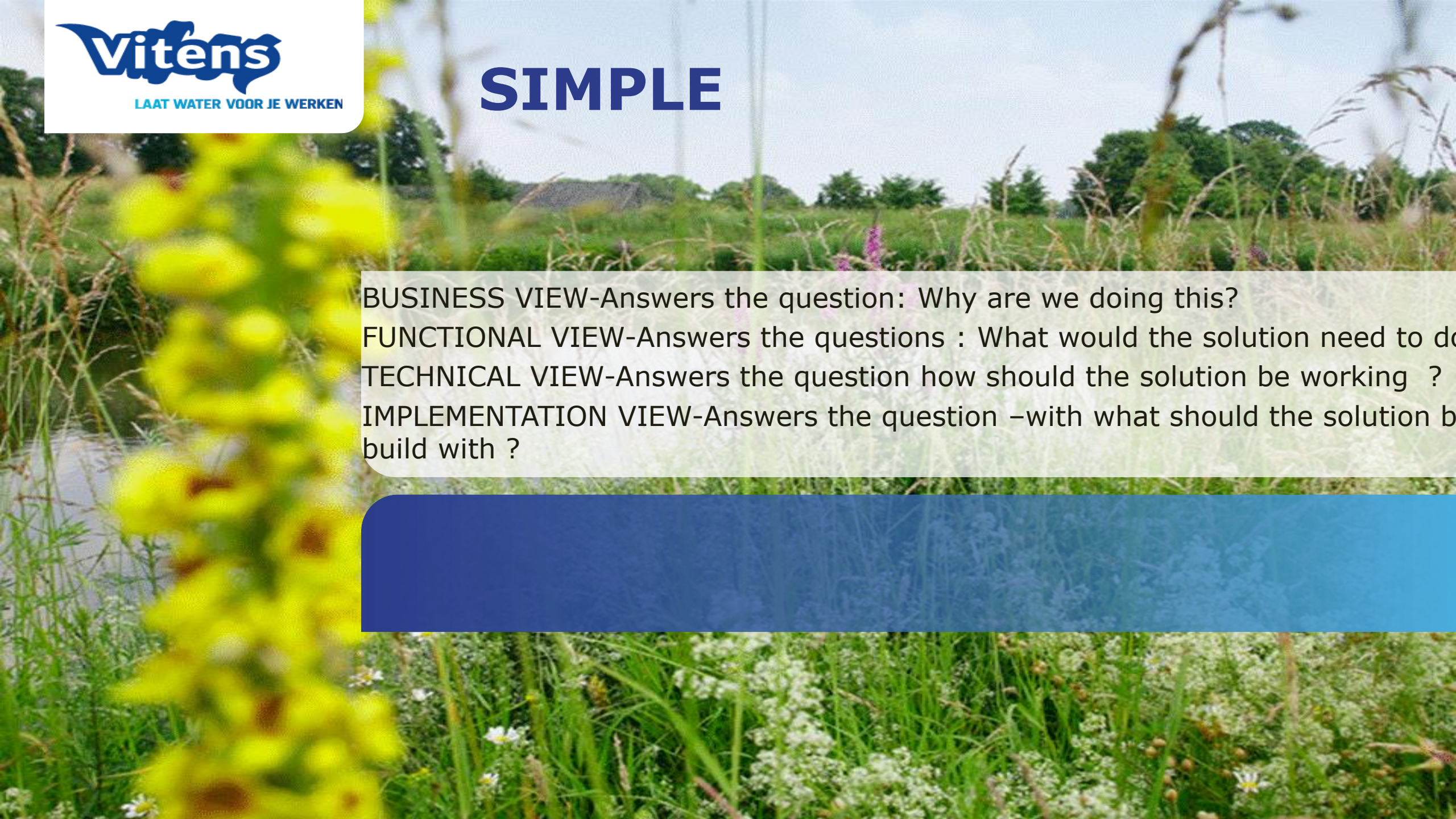
Infrared signals in surveillance cameras let malware jump network air gaps

aIR-Jumper weaves passwords and crypto keys into infrared signals.

DAN GOODIN - 9/19/2017, 4:39 PM

The proof-of-concept malware uses connected surveillance cameras to bridge such airgaps. Instead of trying to use the Internet to reach attacker-controlled servers, the malware weaves passwords, cryptographic keys, and other types of data into infrared signals and uses a camera's built-in infrared lights to transmit them. A nearby attacker then records the signals with a video camera and later decodes embedded secrets. The same nearby attackers can embed data into infrared signals and beam them to an infected camera, where they're intercepted and decoded by the network malware. The covert channel works best when attackers have a direct line of sight to the video camera, but non-line-of-sight communication is also possible in some cases.


VISION
DEFINES
DETERMINES
STRATEGY
SCOPE
DRIVES
LIMITS
TRIPLE D FRAMEWORK
ACCELERATE
PROCESS
FACILITATE
SKILLS
MAY DEFINE
CONTROLS
PRODUCES
AID
GOVERNANCE
PLANS
COMMUNICATION
DRIVE
PROMOTES
CONTROLS
CHANGE
ENABLES
BUY-IN
DELIVERS
VALUE



SIMPLE

BUSINESS VIEW-Answers the question: Why are we doing this?

FUNCTIONAL VIEW-Answers the questions : What would the solution need to do

TECHNICAL VIEW-Answers the question how should the solution be working ?

IMPLEMENTATION VIEW-Answers the question –with what should the solution b
build with ?

STANDARDS ISA 95/99

LEVEL 5

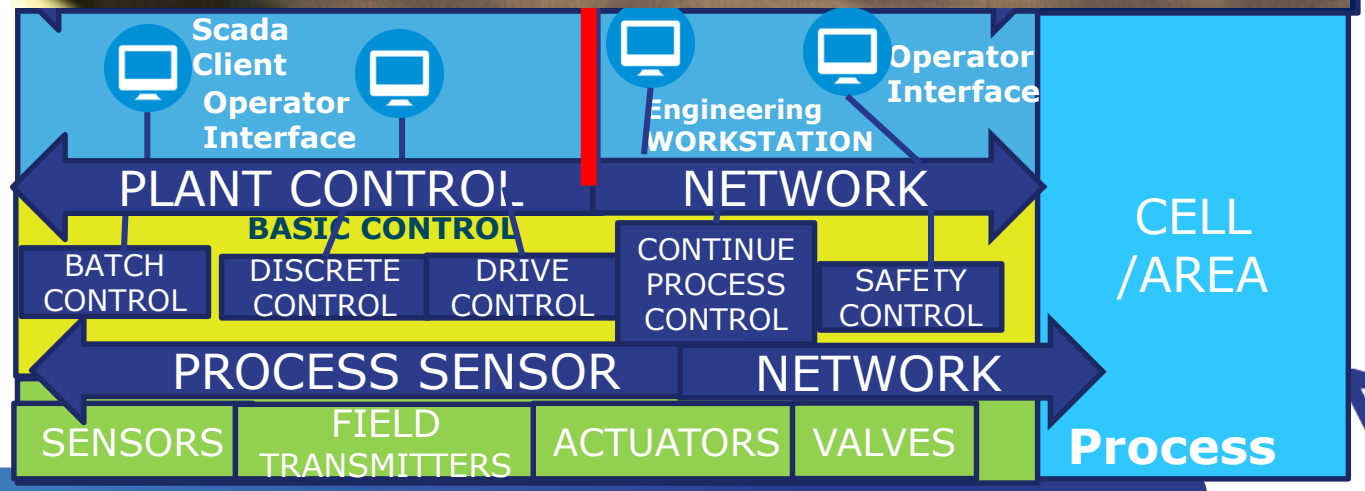
LEVEL 4

LEVEL 3

LEVEL 2

LEVEL 1

LEVEL 0



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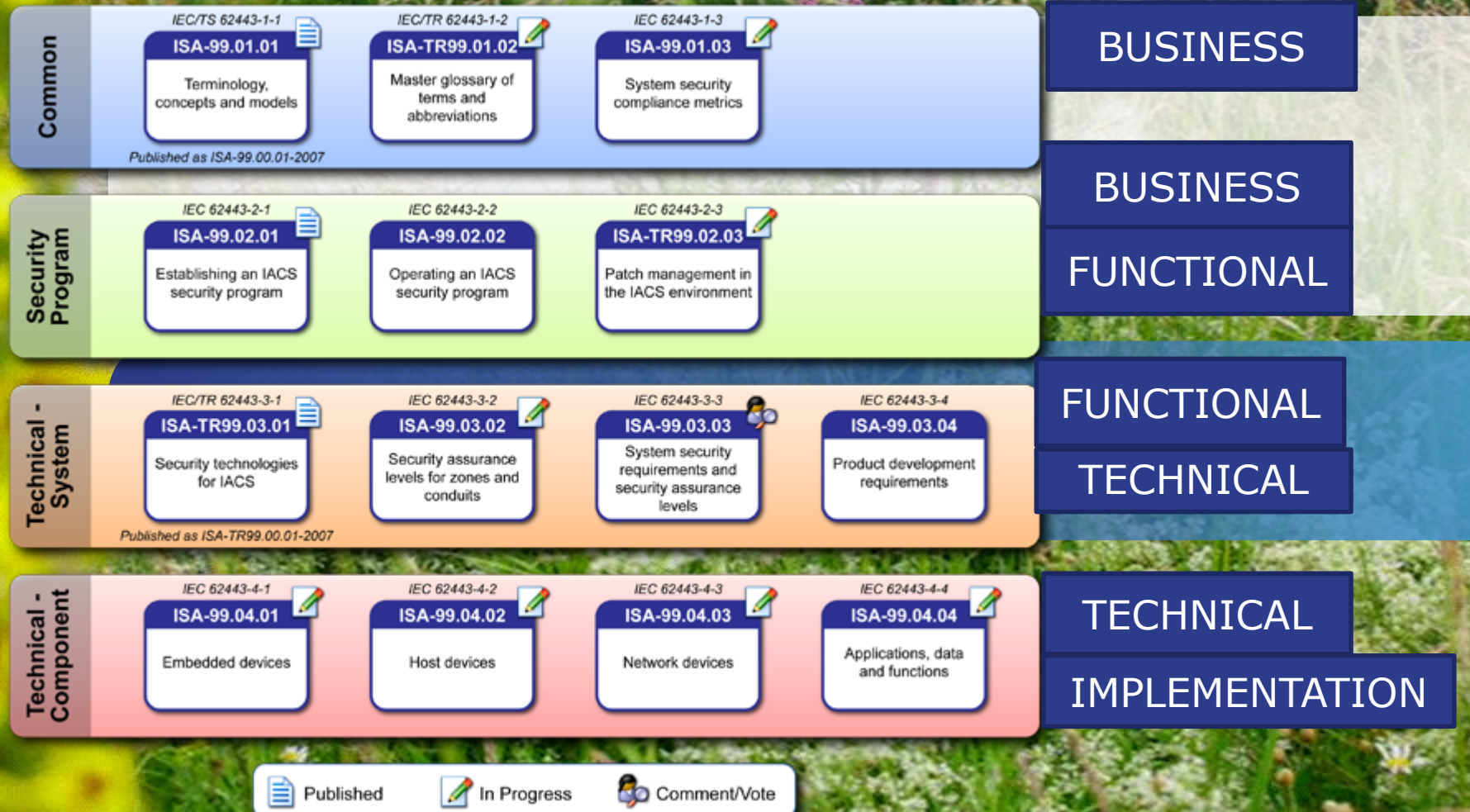

BUSINESS

BUSINESS

FUNCTIONAL

FUNCTIONAL

TECHNICAL

TECHNICAL

IMPLEMENTATION

WHAT IT WILL LOOK LIKE?

CYBER ARC

FLEXIBLE

SECURE BY DESIGN

ROBUST

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DON'T BUY A CAT IN THE BAG -ARCHITECTURE FIRST – THEN INNOVATE

The pessimist sees difficulty in every opportunity

The optimist sees the opportunity in every difficulty.

WINSTON CHURCHILL

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QUESTIONS?

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