



Optimizing midstream operations through digital transformation, innovation and technology

## Keynote Presentation: Intelligent Automation: Optimized Midstream operations through digital transformation, innovation and technology

Karthick Srinivasan

Director – Process Automation & Digitalization

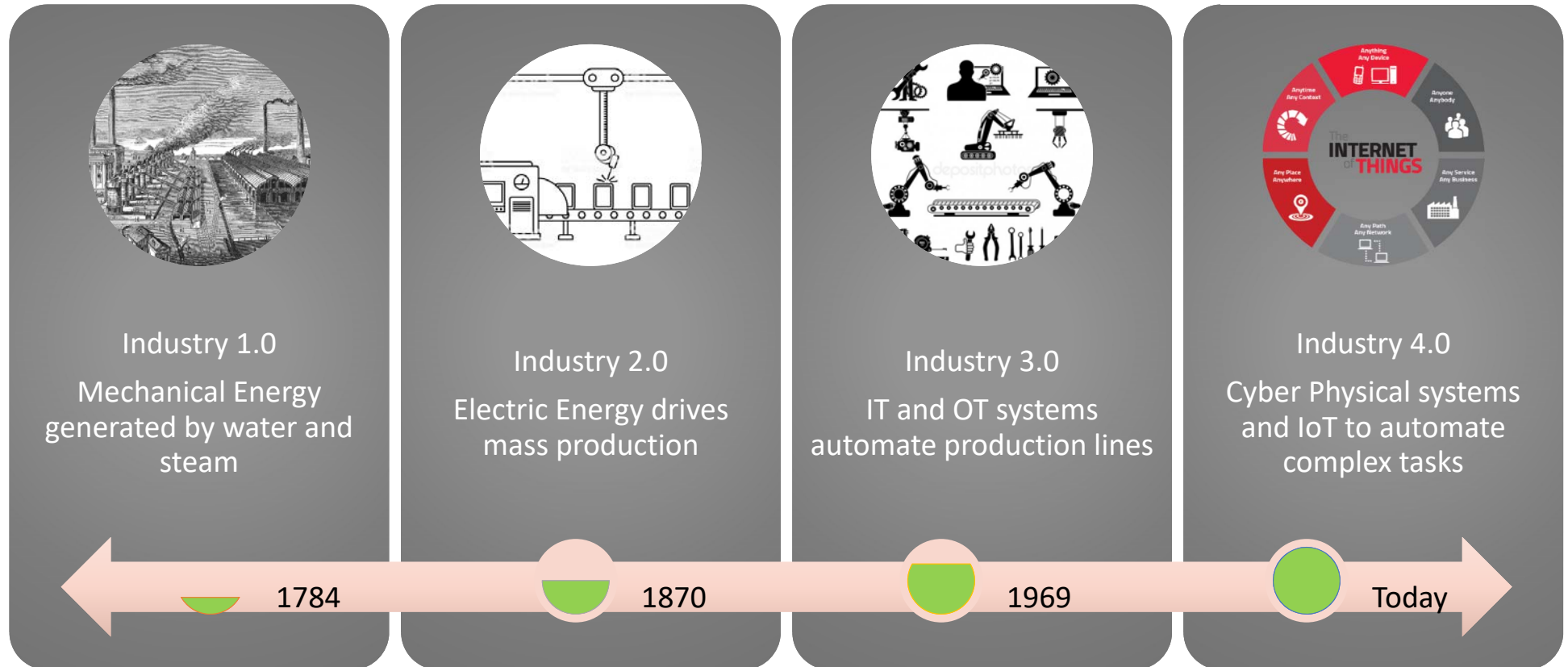
18 Feb 2020

# Agenda

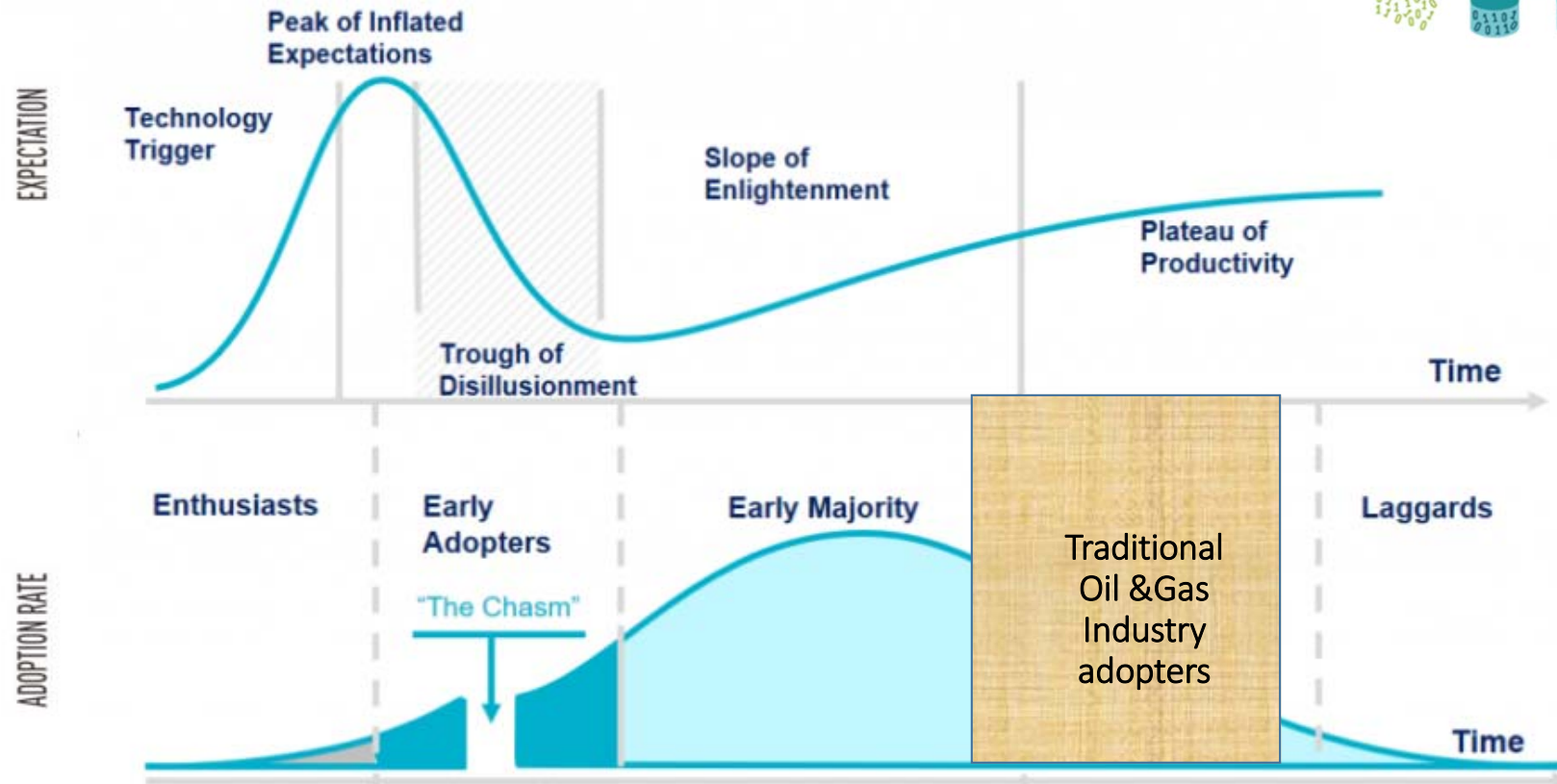
- Industrial Revolution – The Journey
- Oil & Gas: Evolutionary vs Revolutionary
- Integrated Optimization
- Digital Transformation at Pump stations
- Digital Transformation at Terminals
- Cyber security
- The Roadmap



## Industrial Revolution – The Journey

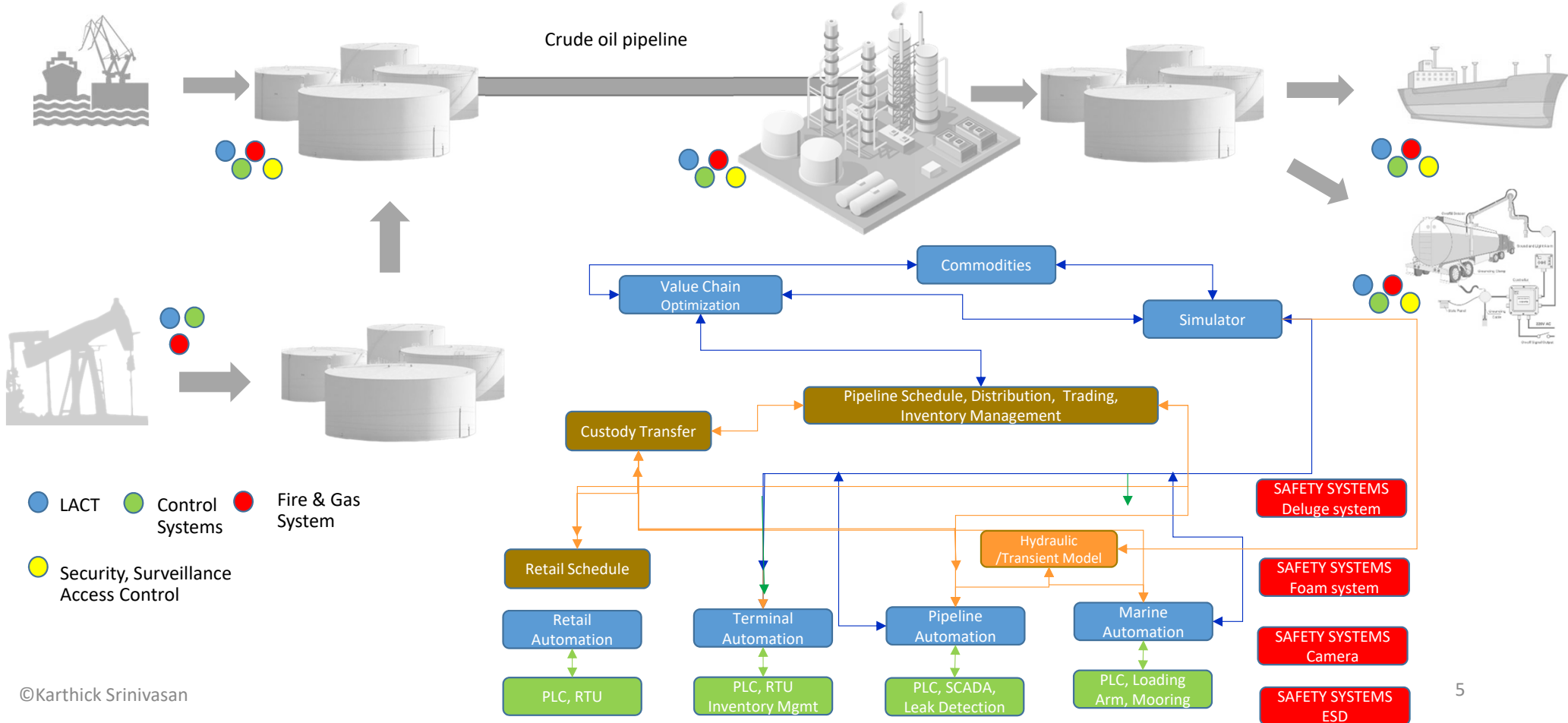


# Oil & Gas : Evolutionary Vs Revolutionary



*Convergence of Diffusion of Innovation Models*

# Integrated Optimization



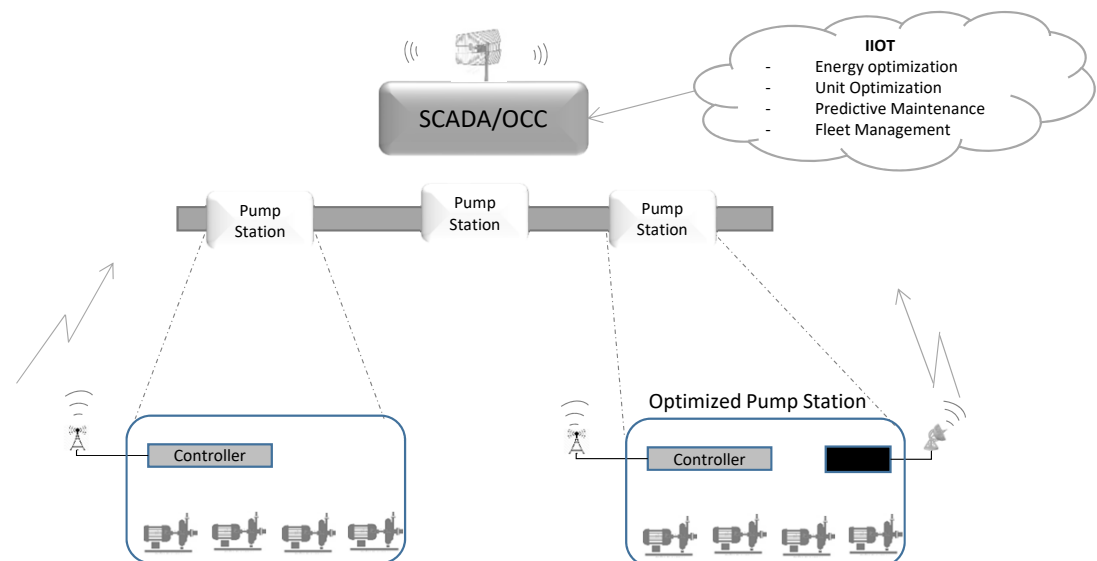
# Digital Transformation at pump stations



- Energy Optimization
- Optimized Pump station
- Analytics for Transient (batch operations)
- Station –to- Station load/process balance
- KPI for units
- Optimized DRA application
- Leak Detection evolution

## Challenge:

- Limited available bandwidth



# Digital Transformation at Terminals

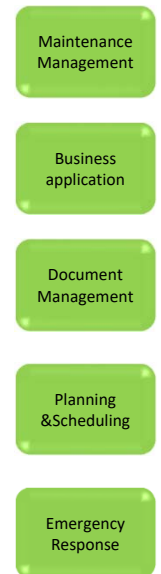


- Cloud based applications
- Different locations
- IT and OT network
- Common controller
- Digital twin
- PaaS (Platform as a Service)

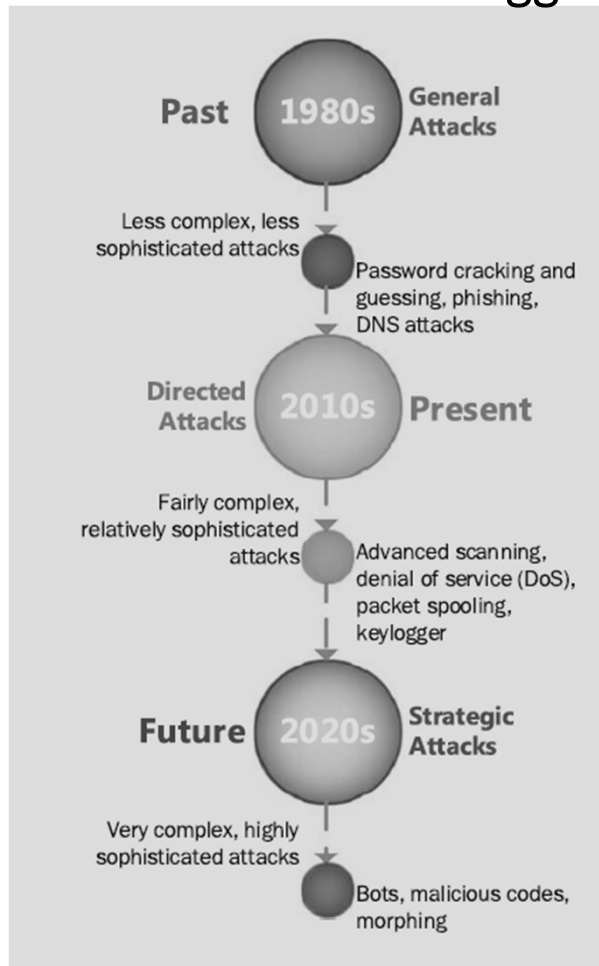
## Control System Application



## Business Application



# Biggest Challenge/Threat - Cybersecurity



©Karthick Srinivasan

2000, Australia: Maroochy Shire sewage spill – Released 1million liters of sewage into river.

2003, USA: Davis – Besse power station – Disabled security monitoring system for five hours.

2008, Poland: Public tram system – Derailed four trams by manipulating signaling systems.

2010, Iran: Nuclear plant - Stuxnet cyber worm affected more than 1000 nuclear centrifuges and 60,000 computers.

2011, Iran: Nuclear plant - Duqu Trojan based on Stuxnet design to collect data to facilitate the launch of future attack.

2014, Germany: Steel mill – Damaged the foundry.

2019, Norway: Aluminum plant – Halted production, attackers demanded ransom to unlock the system. Affected metal price in London stock market.

Source: Industry 4.0: Managing The Digital Transformation by Alp Ustundag; Emre Cevikkan





## Road map

