

# Smart Grid Forum 2019

## **MULTISERVICE SMART GRIDS SUPERVISION AND CONTROL PLATFORM IMPLEMENTATION: TECHNOLOGICAL SUPPORT OF SMART CITIES**

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# Motivation

For the first time in human history the majority of the world's population lives in urban areas.



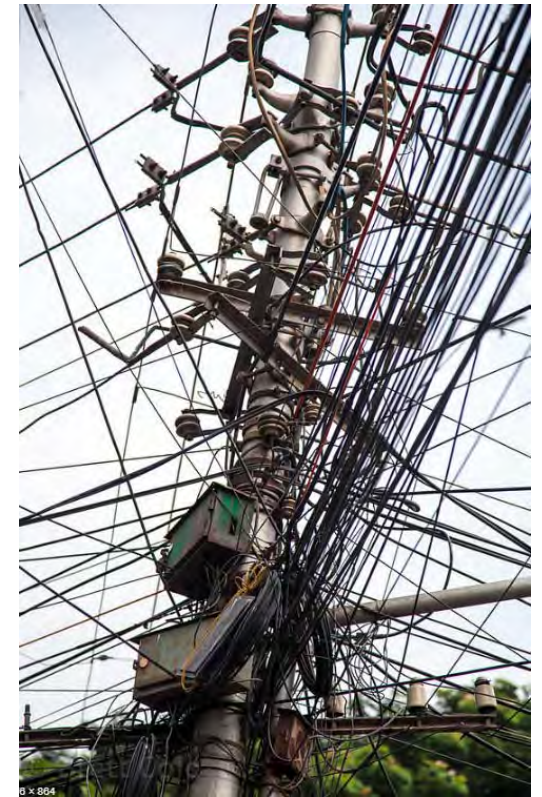
**3 billion people** – half the world's population – live in cities

**Almost 180,000 people** move into cities each day

**Two-thirds of all people** will live in cities by 2050



# The Opportunity (Not the "problem")

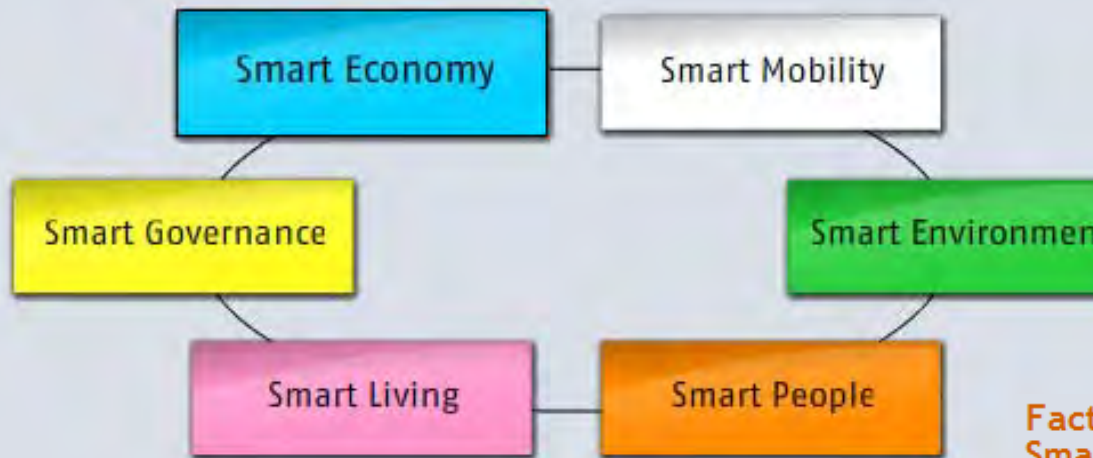


# Definitions

- Smart City Council: “.. one that “uses information and communications technology (ICT) to enhance its livability, workability and sustainability”
- U.S. Office of Scientific and Technical Information: “a city that monitors and integrates conditions of all of its critical infrastructures – including roads, bridges, tunnels, rails, subways, airports, seaports, communications, water, power, even major buildings – can better optimize its resources, plan its preventive maintenance activities, and monitor security aspects while maximizing services to its citizens.”
- IBM’s Journal of Research and Development: “an instrumented, interconnected and intelligent city.”

# The framework of Smart cities

european smartcities



Smart City  
Characteristics  
Factors  
Indicators



Factors and indicators  
Smart Mobility

	indicators	weighting
Local accessibility	3	25%
(Inter-)national accessibility	1	25%
Availability of ICT-infrastructure	2	25%
Sustainable, innovative and safe transport systems	3	25%
	9	100%

Factors and indicators  
Smart Environment

	indicators	weighting
Attractivity of natural conditions	2	25%
Pollution	3	25%
Environmental protection	2	25%
Sustainable resource management	3	25%
	10	100%

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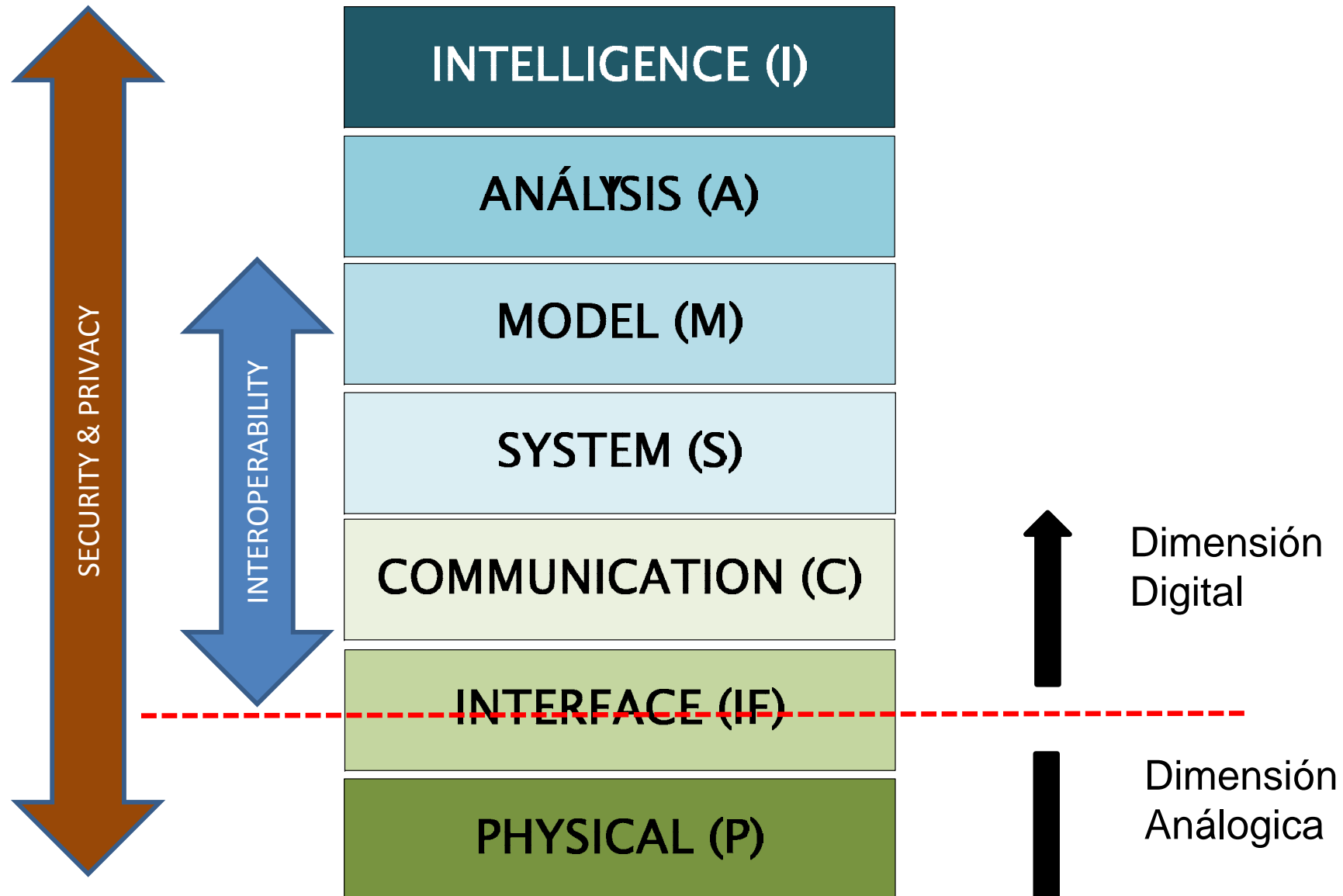
Technology Base Reference  
Models for Open Platform 3.0™

# The Scenario

# Developing an intelligent city PLATFORM.

- “The city’s digital control system will accommodate an expanding list of applications, from managing electricity demand to routing traffic to finding a parking spot, to name just a few” (Smart City council).

# Reference Model for the Electrical System 2.0

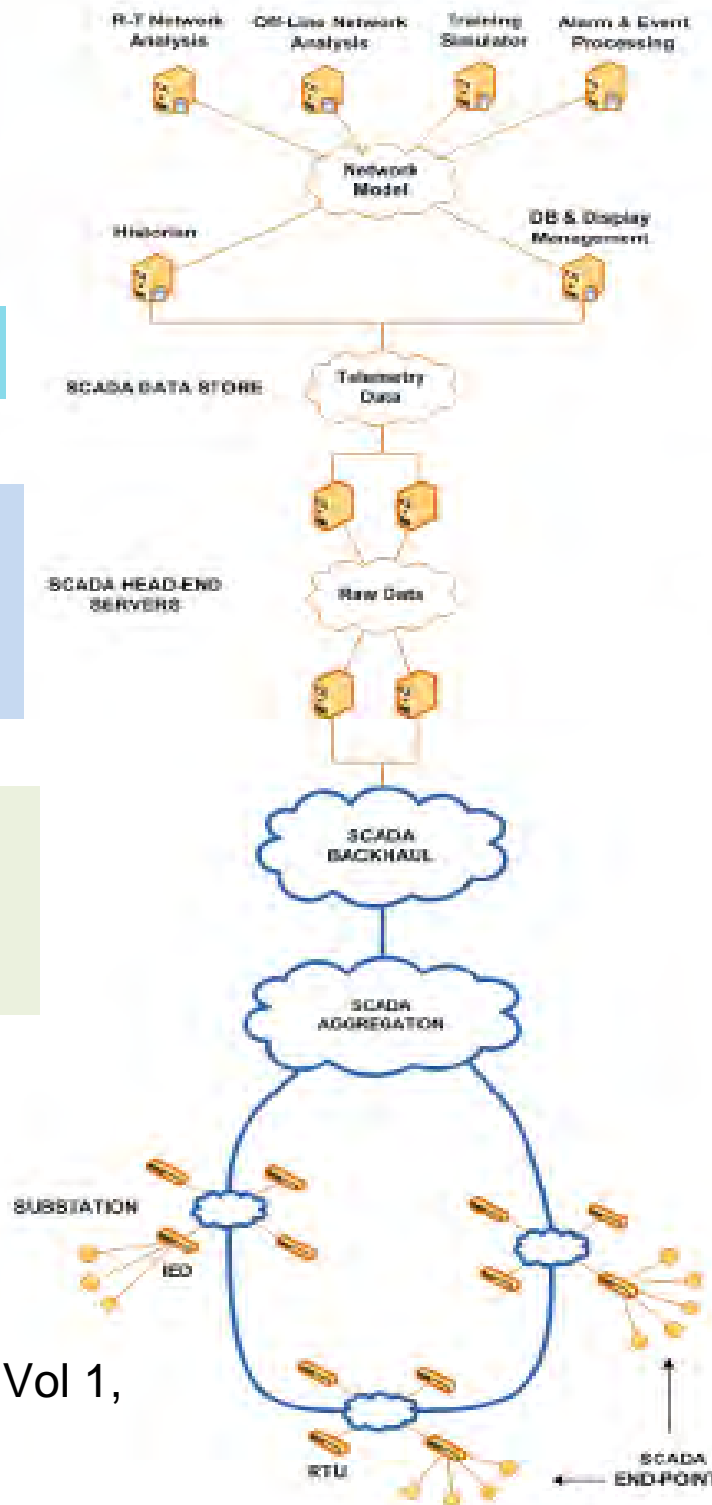




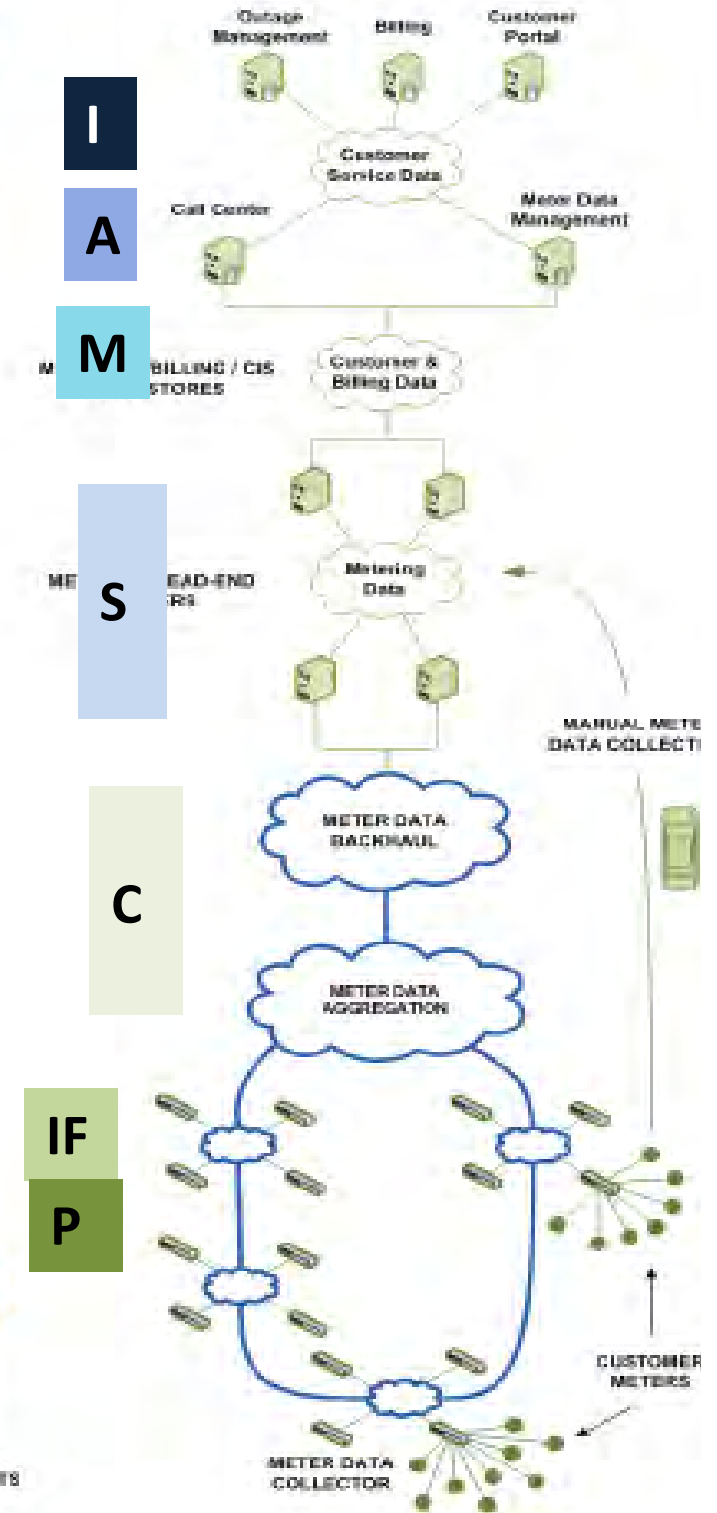
# Architecture

- SCADA and AMI

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SG Reference Architecture, Vol 1,  
SCE, CISCO, IBM



# CENTRO DE OPERAÇÕES PREFEITURA DO RIO



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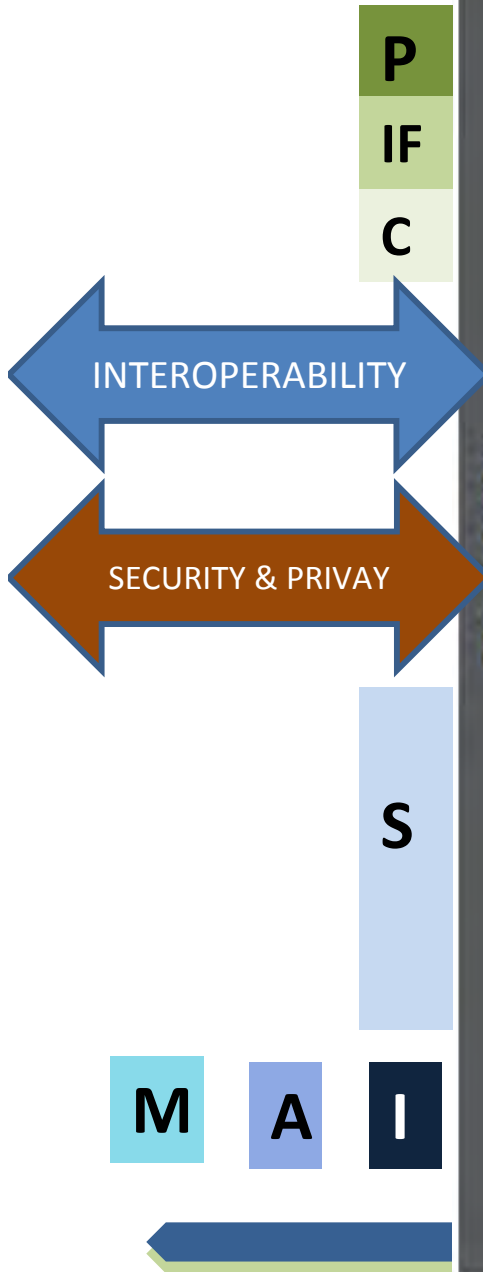
# The Solution Elements

# Smart grid : a three-level architecture



Source: Amy Ericson, President of Alstom Inc. IEEE PES Smart Grid Conference February 18th, 2015

# Targets



TECHNOLOGY	Enabler	Universal Targets
		How smart cities deploy and use ICT to enhance livability, workability and sustainability
	Instrumentation & Control	Implement optimal instrumentation
	Connectivity	Connect devices with citywide, multi-service communications
	Interoperability	Adhere to open standards Use open integration architectures and loosely coupled interfaces Prioritize use of legacy investments
	Security & Privacy	Publish privacy rules Create a security framework Implement cybersecurity
	Data Management	Create a citywide data management, transparency and sharing policy
	Computing Resources	Consider a cloud computing framework Use an open innovation platform Have access to a central GIS Have access to comprehensive device management
	Analytics	Achieve full situational awareness Achieve operational optimization Achieve asset optimization Pursue predictive analytics

Ref. Smart Cities Council

# Architecture

Communications  
integration

Broadband with  
services integration

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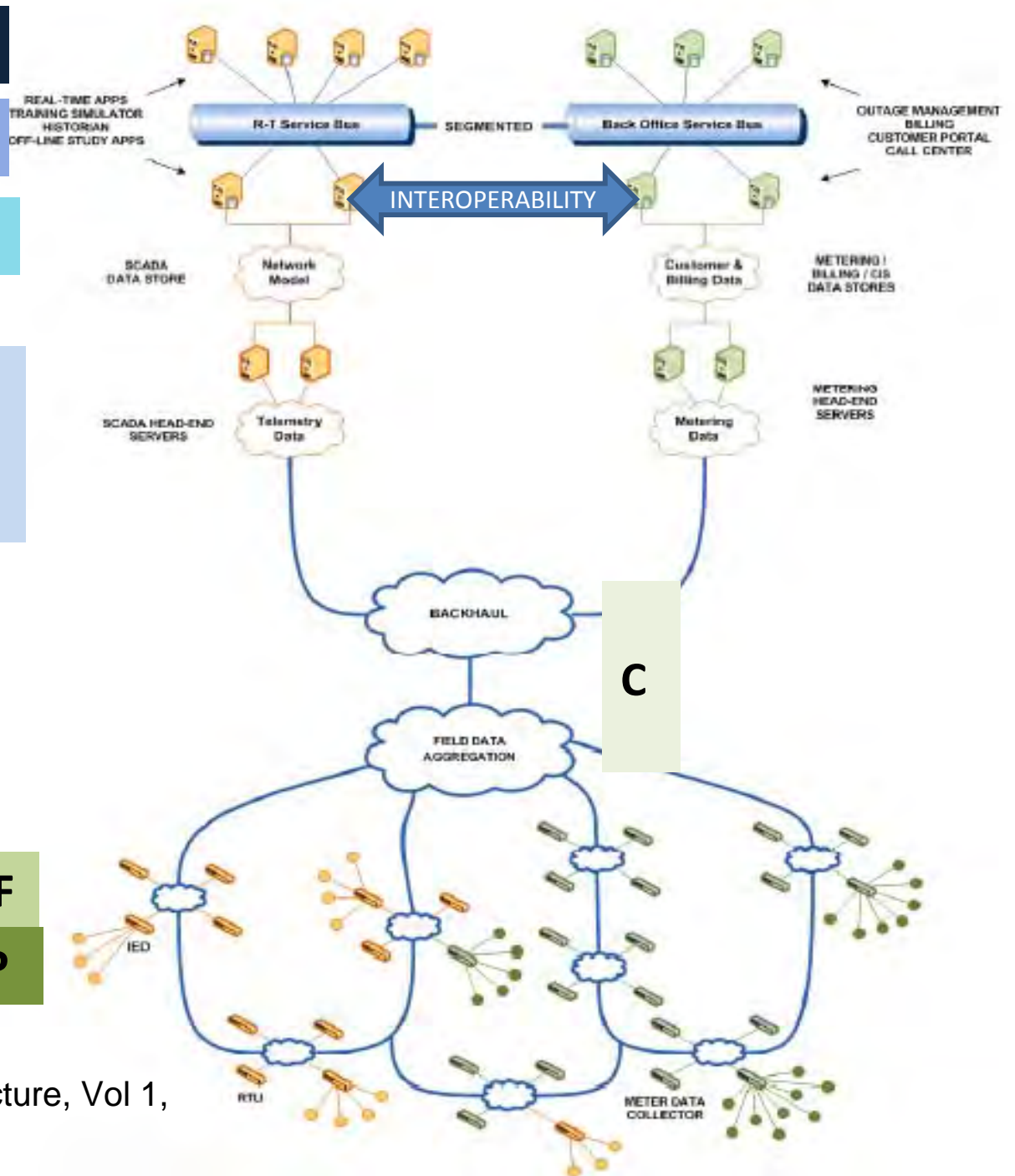
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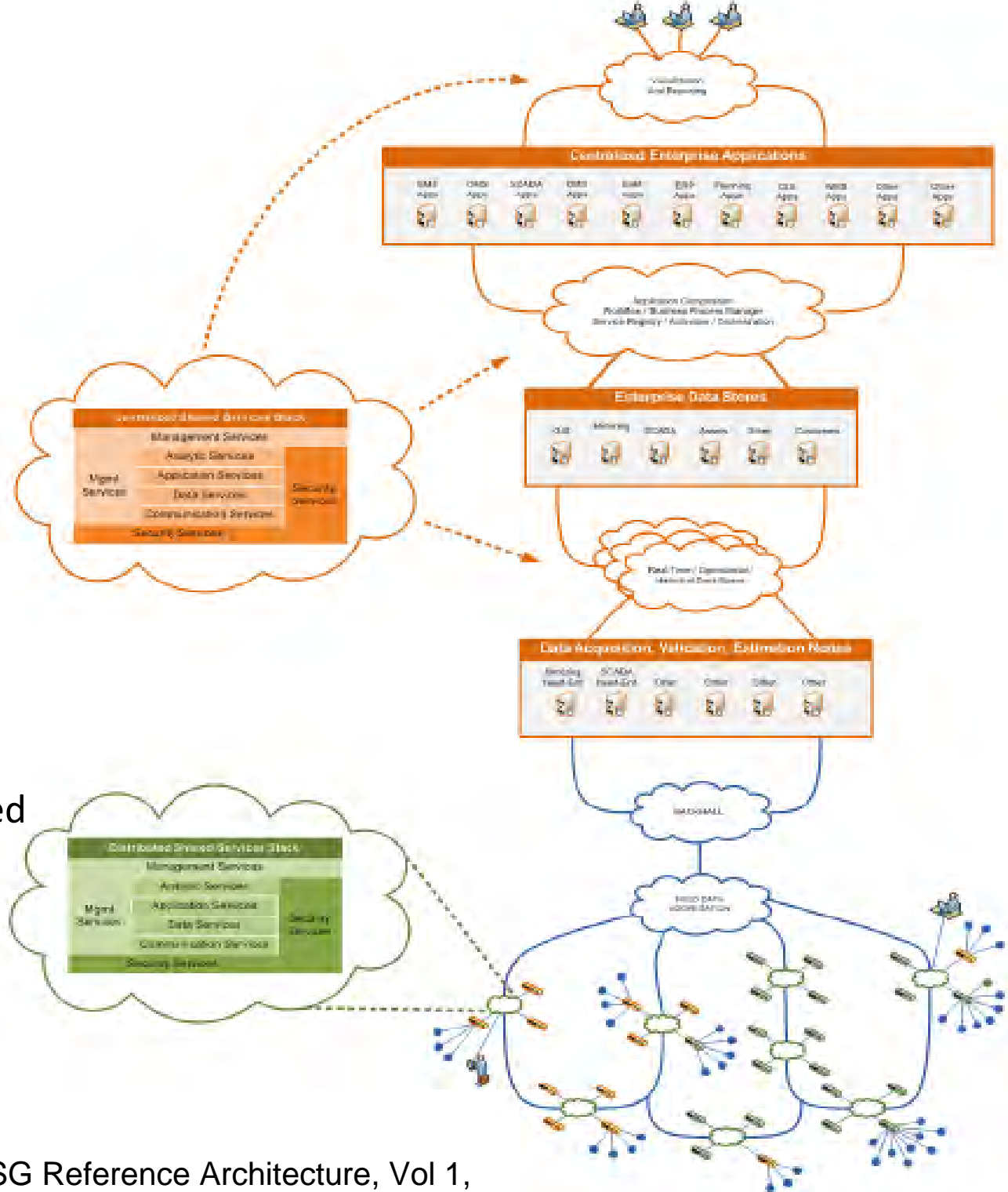
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SG Reference Architecture, Vol 1,  
SCE, CISCO, IBM

# Architecture

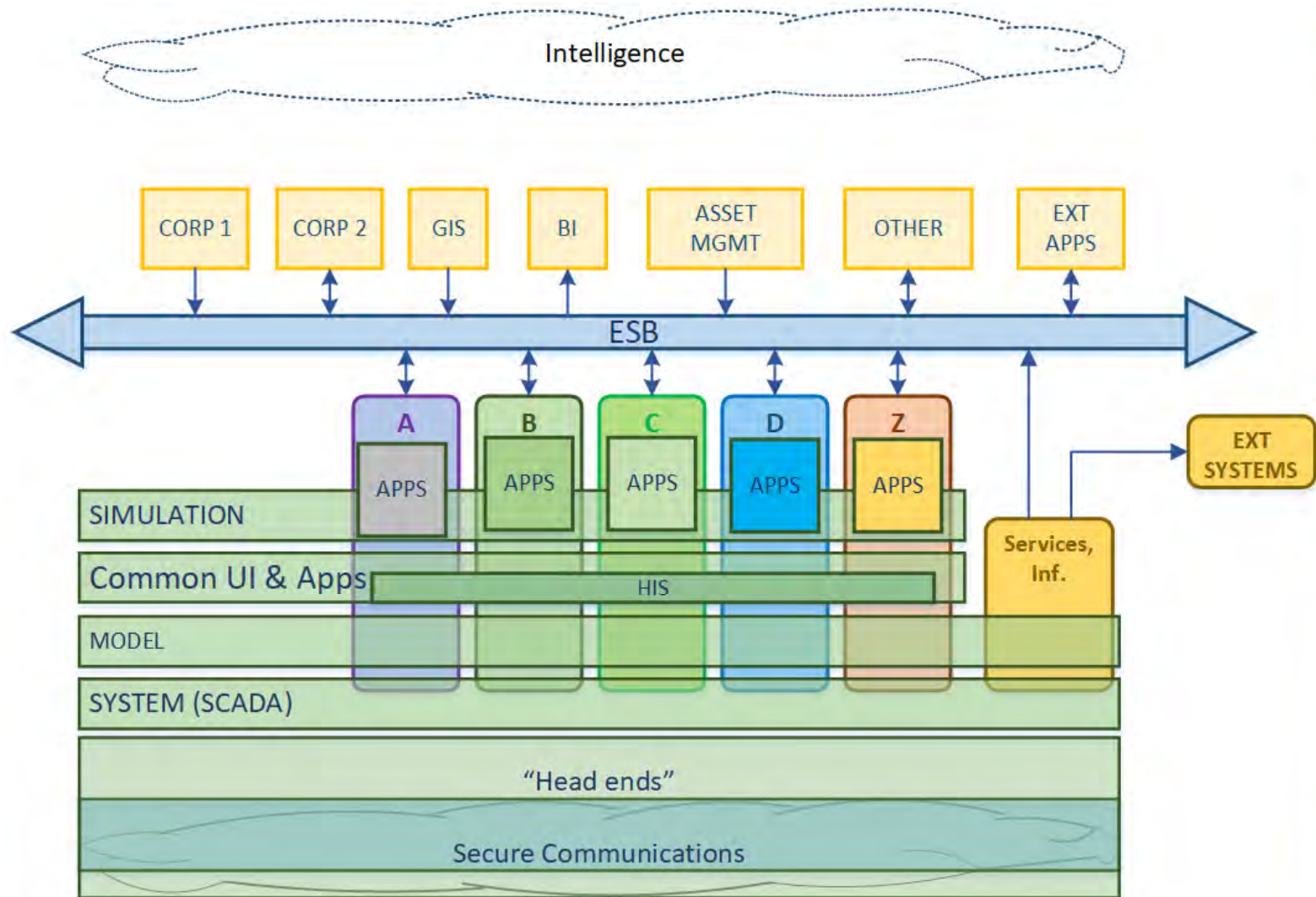
Systems integration based on "services"

Distributed resources



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# FROM SYSTEMS TO PLATFORM



- Safety
- Social Media
- Health Care
- Environment
- Health
- Urban planning
- Light
- Mobility
- Services
- Transportation

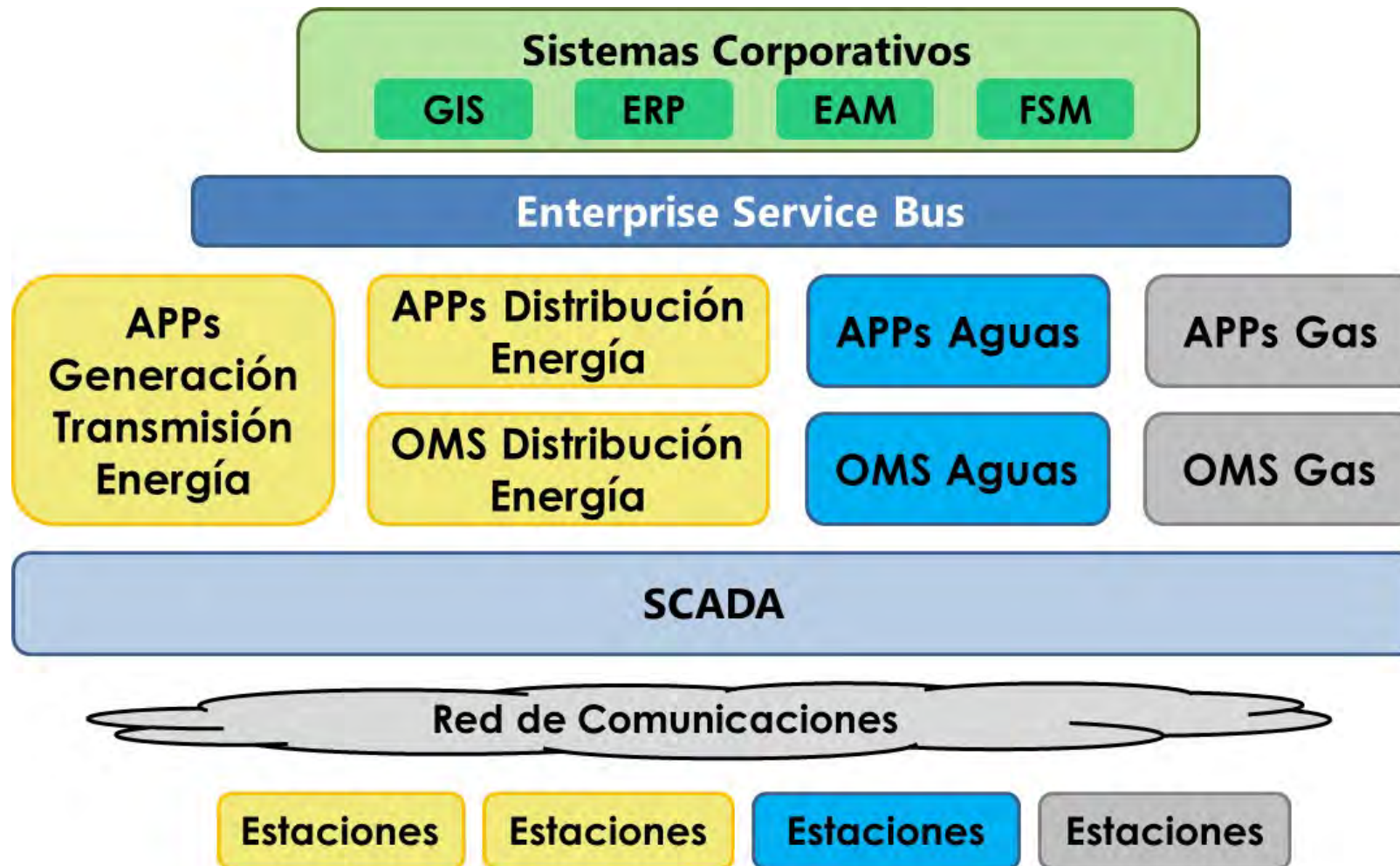






# The Implementation

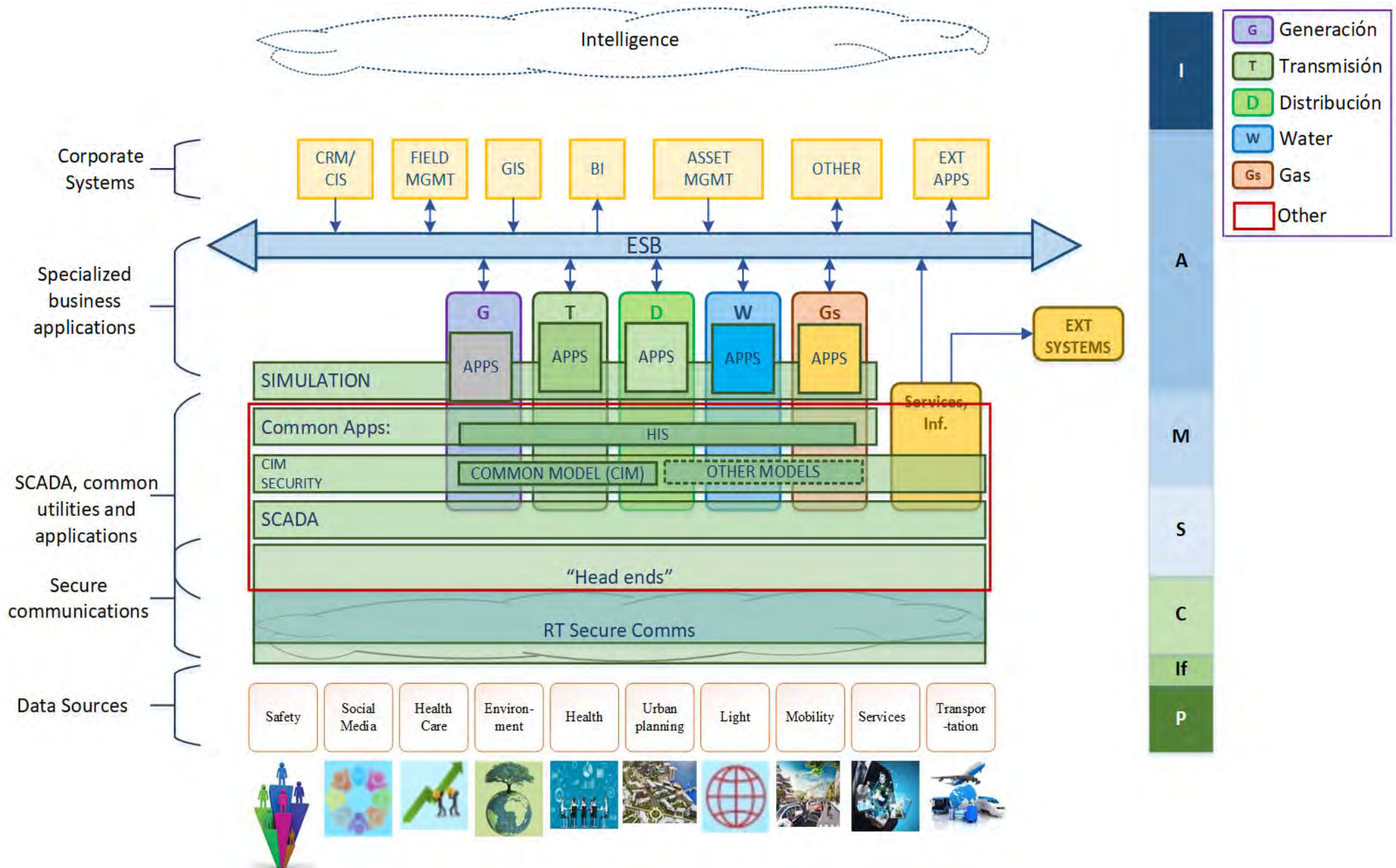
# Example of Multiservice Platform



OMS: Outage Management System

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# A system under implementation





# The (next) Future



Questions?



Thank You!

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