



SAFETY  
DESIGN  
IN  
BUILDINGS

# Data Protection and Privacy Through a Smart City lens

Presented By:  
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# Course Description



Cities around the globe are having to become digitally smarter to maintain economic, social and environmental sustainability. The modern city services and resources are being forced to keep up with the demands of digital-savvy generation, generating masses of data and wanting to connect with their surroundings. Digital upgrades in administration facilities, utilities and road infrastructures promise to make the living safe, easier and more efficient. But what are the data security implications of this evolution?

Privacy is a concern, because there's so much data being collected and there are very few trust models. This session explains how critical data protection and privacy is while developing smart cities.

# Presenter



**Deepthi Sunath**

## **Senior Consultant – Smart Places and Information Resilience | WSP**

- Deepthi holds an MBA specialised in information Systems and Security and an engineering degree in Electronics and Communication.
- During her nine years of experience in Enterprise Security and Resilience, Deepthi has been involved in driving organisations implement Information Security, Business Continuity and IT service management systems.
- She is passionate about Smart Cities and has been part of various projects that involves defining smart strategy and security for smart cities. She holds various certifications like CISSP, CISA, CISM, ITILv3 Foundation, ISO 27001 Lead Auditor.

# Learning Objectives



1. Diving into new era of Smart cities
2. Understanding data protection and privacy principles
3. Data Security and Privacy Framework in Smart City Design

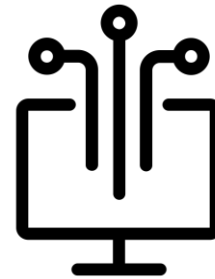
# Data Protection and Privacy Though a Smart City lens



Depthi Sunath  
Smart Places and Information Resilience  
12 December 2019

*Diving into the era of Smart*

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# Global Attacks

REUTERS

Business Markets World Politics TV More

The New York Times

## Hacking With E

### Healthcare data breach in Singapore affected 1.5M patients, targeted the prime minister

Taylor Hatmaker @TaylorHatmaker / 9:29 pm +04 • July 20, 2018



Warning sirens in Dallas around 11:40 p.m. Friday

By Eli Rosenber  
April 8, 2017

Officials in  
on Friday n



Image Credit

In what's believed largest healthcare

The breach affects includes names, as

180,000 of the 1.5 m individuals. All patient

2018, Singapore newspaper The Straits Times reports.

"Investigations by the Cyber Security Agency of Singapore (CSA) and the Integrated Health Information System confirmed that this was a deliberate, targeted and well-planned cyberattack," a press release from Singapore's

TECHNOLOGY NEWS JANUARY 18, 2017 / 3:06 PM / 3 YEARS AGO

# Ukraine's power outage was a cyber attack: Ukrenergo

3 MIN READ



Pavel Polityuk, Oleg Vukmanovic, Stephen Jewkes

KIEV/MILAN (Reuters) - A power blackout in Ukraine's capital Kiev last month was caused by a cyber attack and investigators are trying to trace other potentially infected

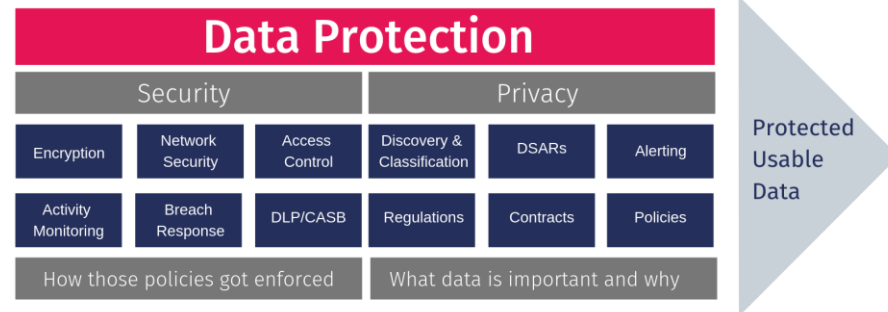
## *Data Privacy Concerns in Smart*

Smart Components	Privacy Concerns
Smart Mobility	Large volume of trajectory data may be analysed to infer locations and mobility patterns of a user
Smart Homes	Expose security codes, child behaviour, sleeping pattern, and so forth
Smart Grid	Expose private life of residents – living habits, working hours, and whether the residents are away from home
Smart Healthcare	Exposure of patient data
Smart Cards	Exposure of identity, behaviour, etc can be collected and repurposed for tracking , profiling and advertising



## Data Privacy Vs Data Security

- ✓ **Having One Doesn't Ensure The Other**
- ✓ **One Addresses Regulations, The Other Mechanisms**
- 9 ✓ **The User Controls Privacy; Companies Ensure Protection**
- ✓ **Safety From Sales Vs. Safety From Hacks**
- ✓ **Ensuring Your Data Is Only Accessed As Intended**
- ✓ **You Can't Have Privacy Without Security**



## *Data Protection and Privacy Principles Data Security Goals*

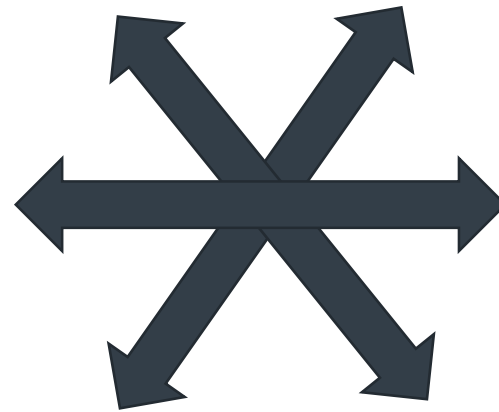
- Secrecy
- Non-Disclosure
- Access Restrictions
- Security Clearances
- Data Minimization
- Steganography

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### Implementation Techniques

- ✓ Data Encryption
- ✓ Data Segregation
- ✓ Access Control Enforcement

Confidentiality



Source :<https://www.ieee-security.org/TC/SPW2015/IWPE/2.pdf>

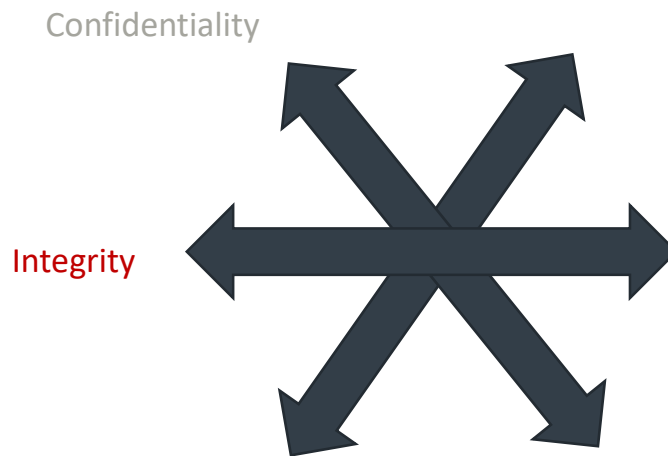
## *Data Protection and Privacy Principles* *Data Security Goals*

- Authenticity
- Detection of Data Changes
- Non-Repudiation
- Reliability

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### Implementation Techniques

- ✓ Digital Signatures
- ✓ Hash Values
- ✓ Access Control Enforcement



Source :<https://www.ieee-security.org/TC/SPW2015/IWPE/2.pdf>

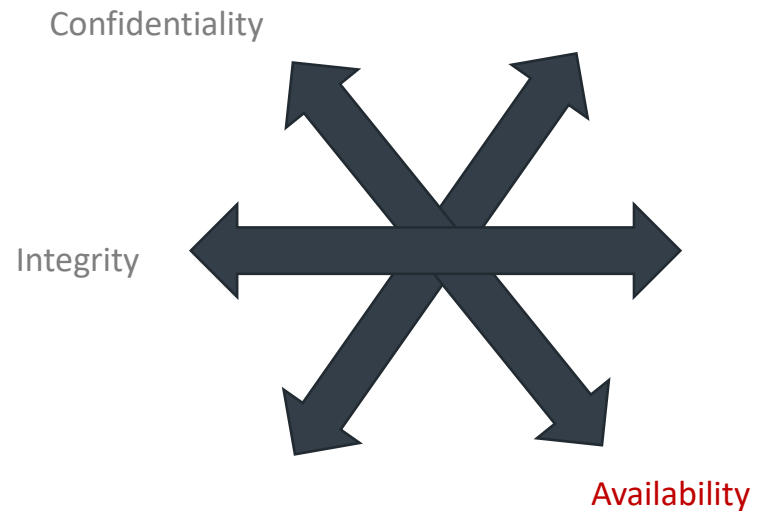
## *Data Protection and Privacy Principles* *Data Security Goals*

- Redundancy
- Monitoring of Availability
- Responsiveness
- Accessibility
- Uptime

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### Implementation Techniques

- ✓ Backups
- ✓ Load Balancers
- ✓ Failovers
- ✓ Redundant Components
- ✓ Avoidance of Single-Points-of-Failure



Source :<https://www.ieee-security.org/TC/SPW2015/IWPE/2.pdf>

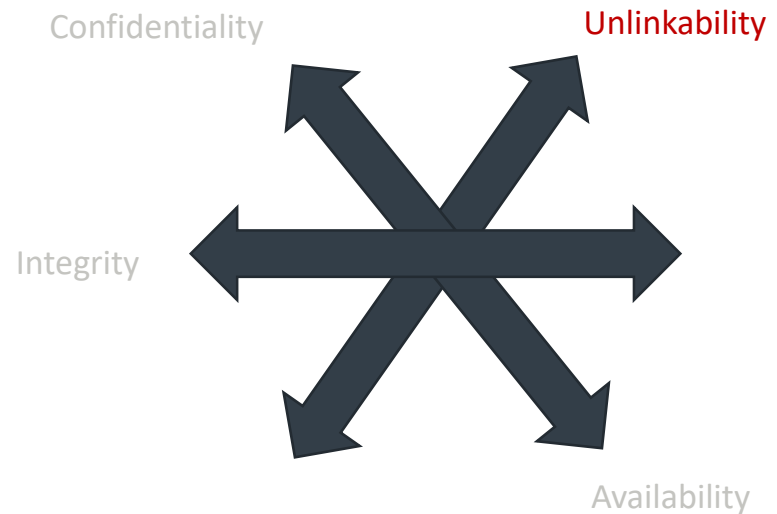
## Data Protection and Privacy Principles Privacy Goals

- Data minimalization
- Need to know
- Purpose binding
- Separation of Power
- Unobservability
- undetectability

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### Implementation Techniques

- ✓ Data Avoidance / Reduction
- ✓ Access Control Enforcement
- ✓ Generalization
  - ✓ Anonymization/Pseudonymizing
  - ✓ Abstraction
  - ✓ Derivation
- ✓ Separation / Isolation
- ✓ Avoidance of Identifiers



Source :<https://www.ieee-security.org/TC/SPW2015/IWPE/2.pdf>

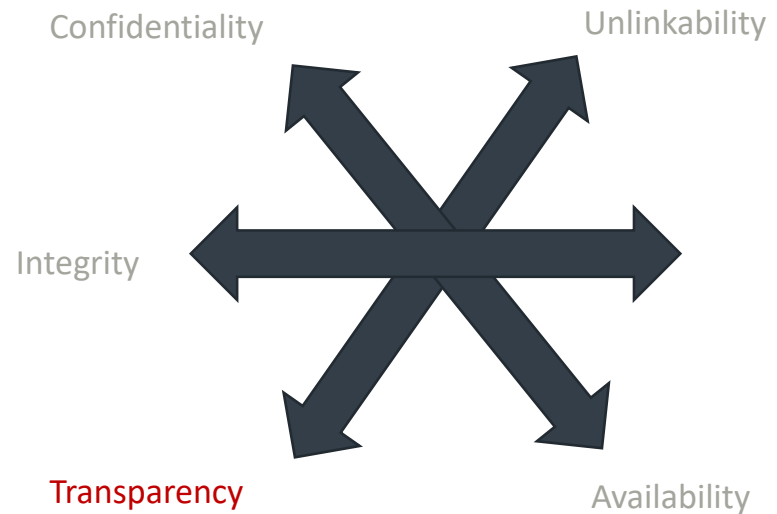
## Data Protection and Privacy Principles Privacy Goals

- Openness
- Accountability
- Documentation
- Reproducibility
- Notice
- Auditability
- Full Disclosure

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### Implementation Techniques

- ✓ Logging and Reporting
- ✓ User Notifications
- ✓ Status Dashboards
- ✓ Privacy Policy
- ✓ Transparency Services for Personal Data
- ✓ Data Breach Notification



Source :<https://www.ieee-security.org/TC/SPW2015/IWPE/2.pdf>

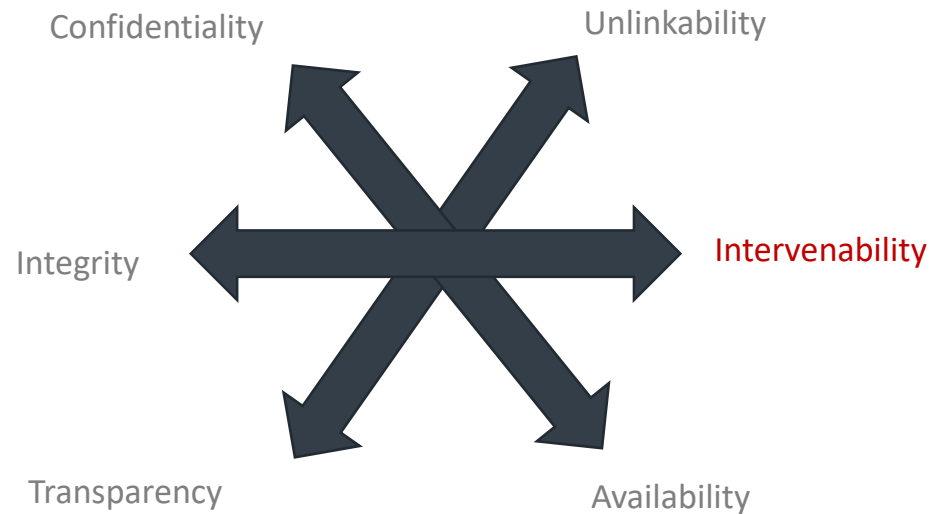
## Data Protection and Privacy Principles Privacy Goals

- Self-determination
- User Controls
- Rectification or Erasure of Data
- (Notice and) Choice
- Consent Withdrawal
- Claim Lodging / Dispute Raising
- Process Interruption

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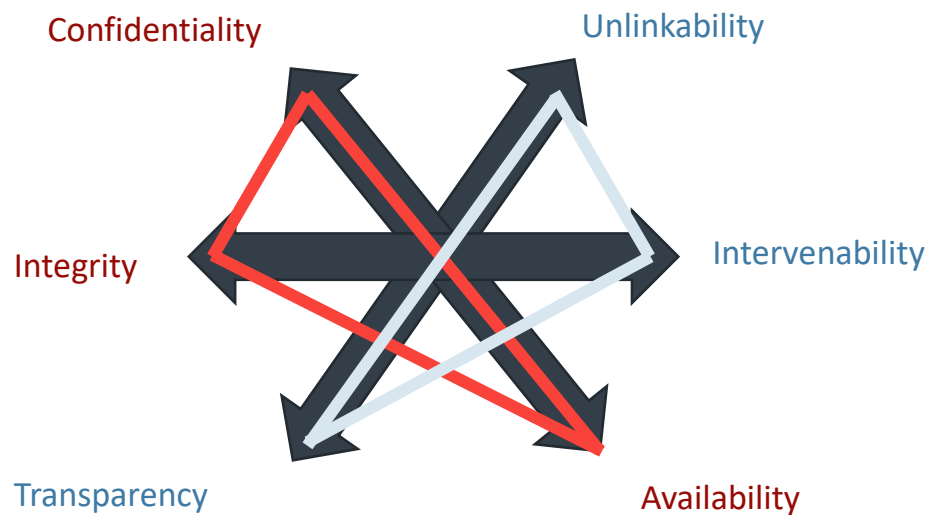
### Implementation Techniques

- ✓ Configuration Menu
- ✓ Help Desks
- ✓ Stop-Button for Processes
- ✓ System Snapshots
- ✓ Manual Override of Automated Decisions
- ✓ External Supervisory Authorities



Source :<https://www.ieee-security.org/TC/SPW2015/IWPE/2.pdf>

## *Data Protection and Privacy Principles*



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Source :<https://www.ieee-security.org/TC/SPW2015/IWPE/2.pdf>



## Security and Privacy by Design



Master Plan Consultants



Project Management  
Consultants



Service Integrators / OEM /  
Vendors

### Planning

- Appoint CISO / DPO
- Cyber security requirements in PMC & MSI RFP / bid evaluation
- Budget for Security / Privacy
- PMC is adequately staffed to oversee security and Privacy implementation and operations

- Security and Privacy Risk assessment
- Security Architecture
- MSI RFP
- Security KPIs
- Review security architecture, solution and plan by MSI

- Robust Security solution in RFP
- Appropriate number of security experts

### Design / Implementation

- Assess the quality of security/privacy implementation
- Maintain contact with various security agencies
- NDA
- Review the information collected

- Review Security policies and procedures by MSI
- Assess the security baselines for devices
- Evaluate n/w security architecture
- Review HLD LLD from security view

- Prepare security policies, architectures, BCP, DR etc
- Implement security across all layers

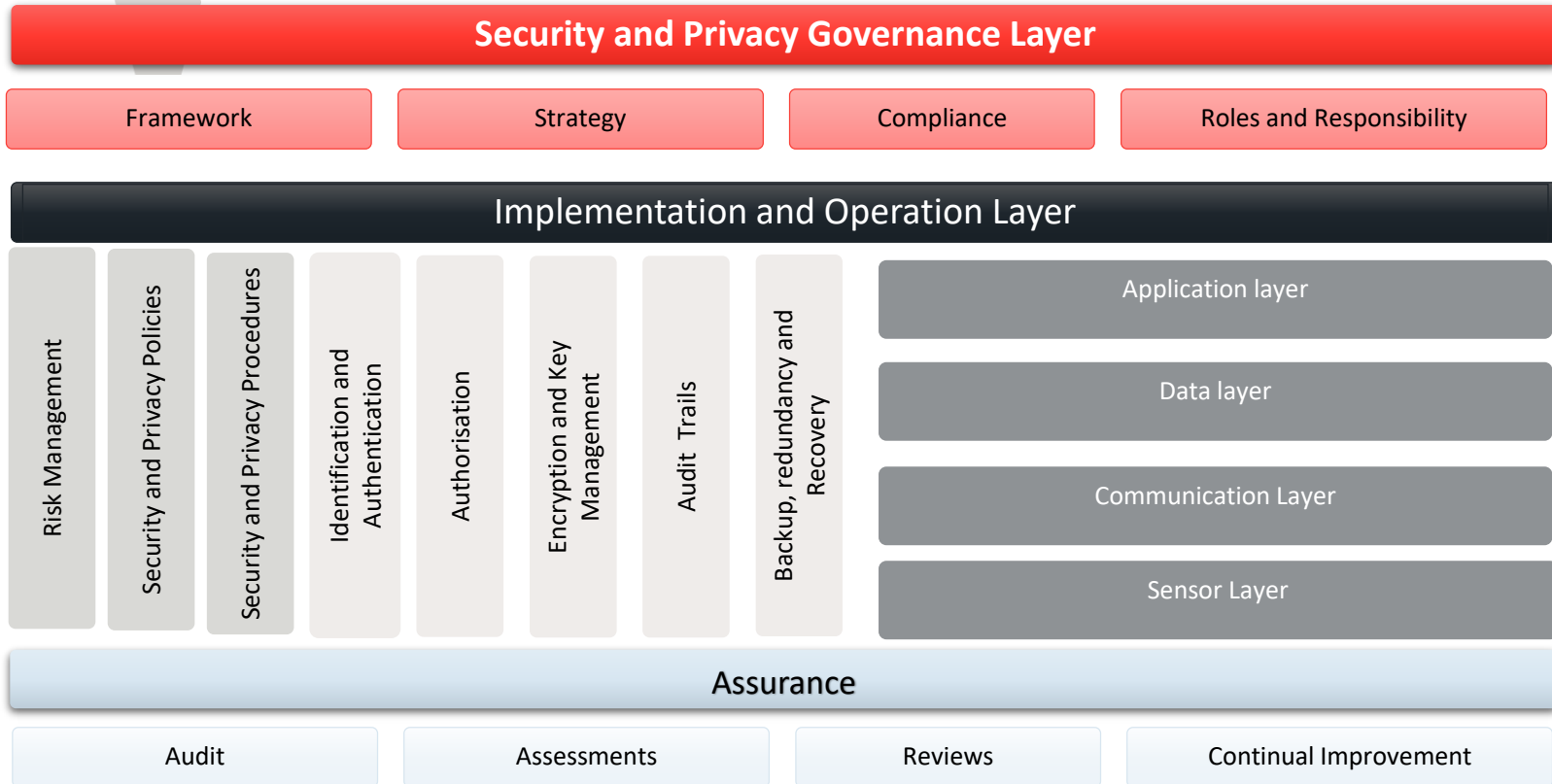
### Operation

- Conduct frequent review meetings
- Annual review of P&P
- Report security incidents
- Appoint an independent security audit agency

- Review Policy & Procedures
- Security Assessments
- Review SLAs
- Review security posture

- Maintain asset inventory
- Latest patches
- Secure OP
- SOC
- Review Firewall rules
- Report incidents
- Access Reviews
- Secure SDLC

# Data Protection and Privacy Framework





## *Takeaways*

- Data Security and Privacy principles to be considered through all phases of implementation
- Risk Based approach to be taken
- International Standards can be used for guidance
  - ISO 27000 series
  - ISO 29000 series



Thank you





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IN  
BUILDINGS**

**Thank you**