# Government Data Center Modernization Public Hearing

Agenda

- **Introduction speech by Electronic Government Agency**
- **Opening speech by Minister of Digital Economy and Society**
- **Overview of Government Data Center Modernization Strategy**
- **Government Data Center Modernization Standards**

4th Industrial Revolution - blurring the lines between the physical, digital, and biological spheres

| 1	2	3	4
1800	**1900**	**2000**	**2020**
Industry 1.0	**Industry 2.0**	**Industry 3.0**	**Industry 4.0**
The Steam Engine	**Henry Ford's T-Model**	**IT-OT Convergence**	**Digital Transformation**
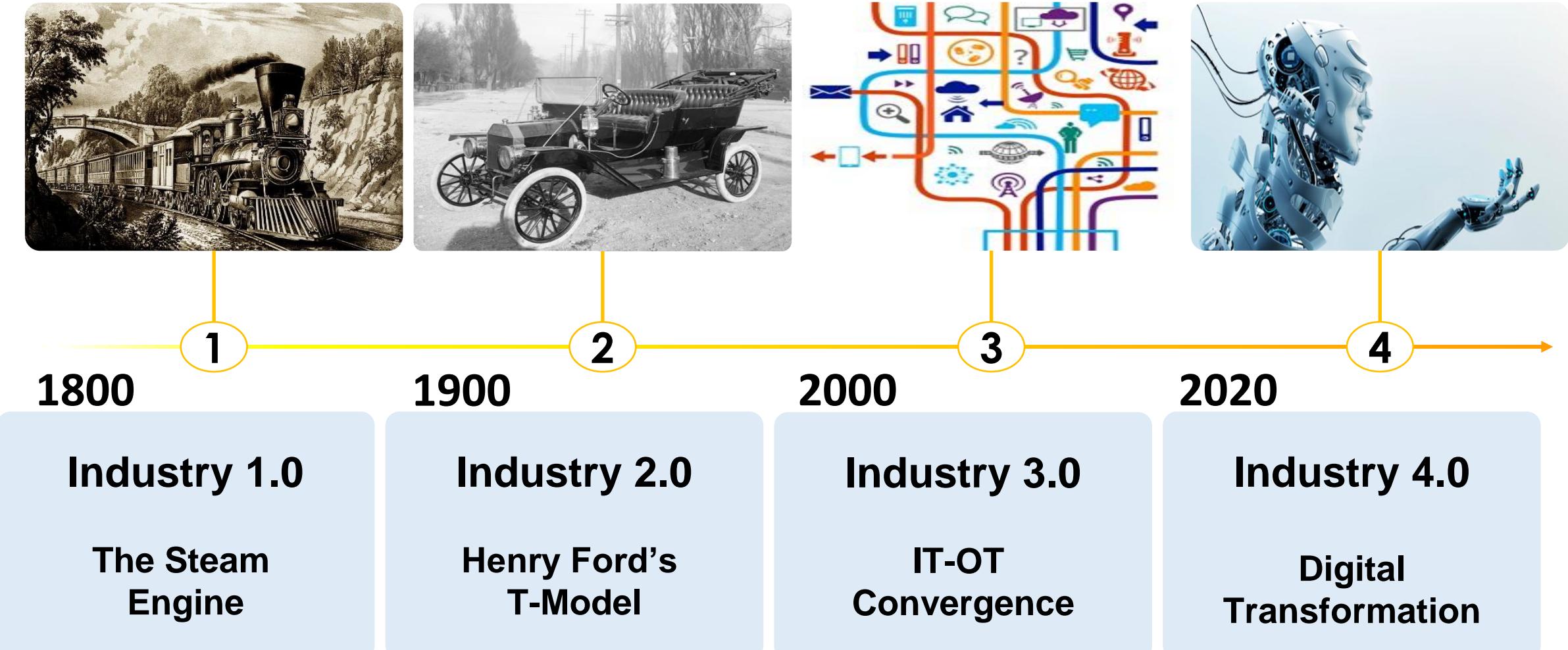
Source: WEF

Digital priorities vary across governments globally – but are of prime importance

1 Leveraging Digital to offer Next Generation Citizen Services

2 Application of Emerging Technologies to Address Social Challenges

3 Driving Initiatives to create Digital Hubs

4 Facilitating Creation of Startup Ecosystems

Building Enabling ICT Infrastructure
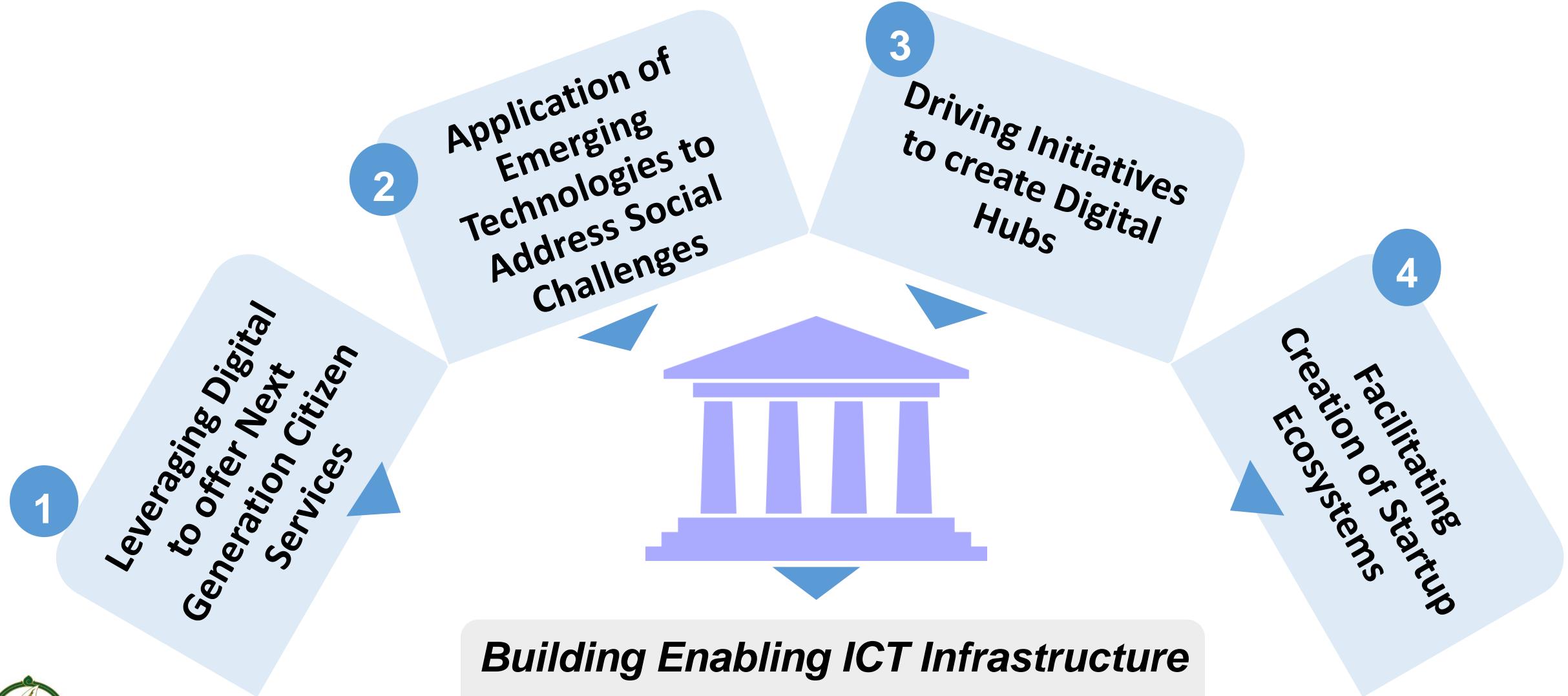
Government and government agencies globally are focusing on Datacenter Modernization to support the Digital Plans

India:
National & State Data Center initiatives for e-Gov services

South Korea:
Modernization & Cloud PAAS Initiatives

USA:
Data Center Optimization Initiative (DCOI)

Australia:
Phased approach to Data Center Modernization

UK:
Modernization - consolidation of disparate systems

Malaysia:
Data Center & outsourcing to support ICT plans
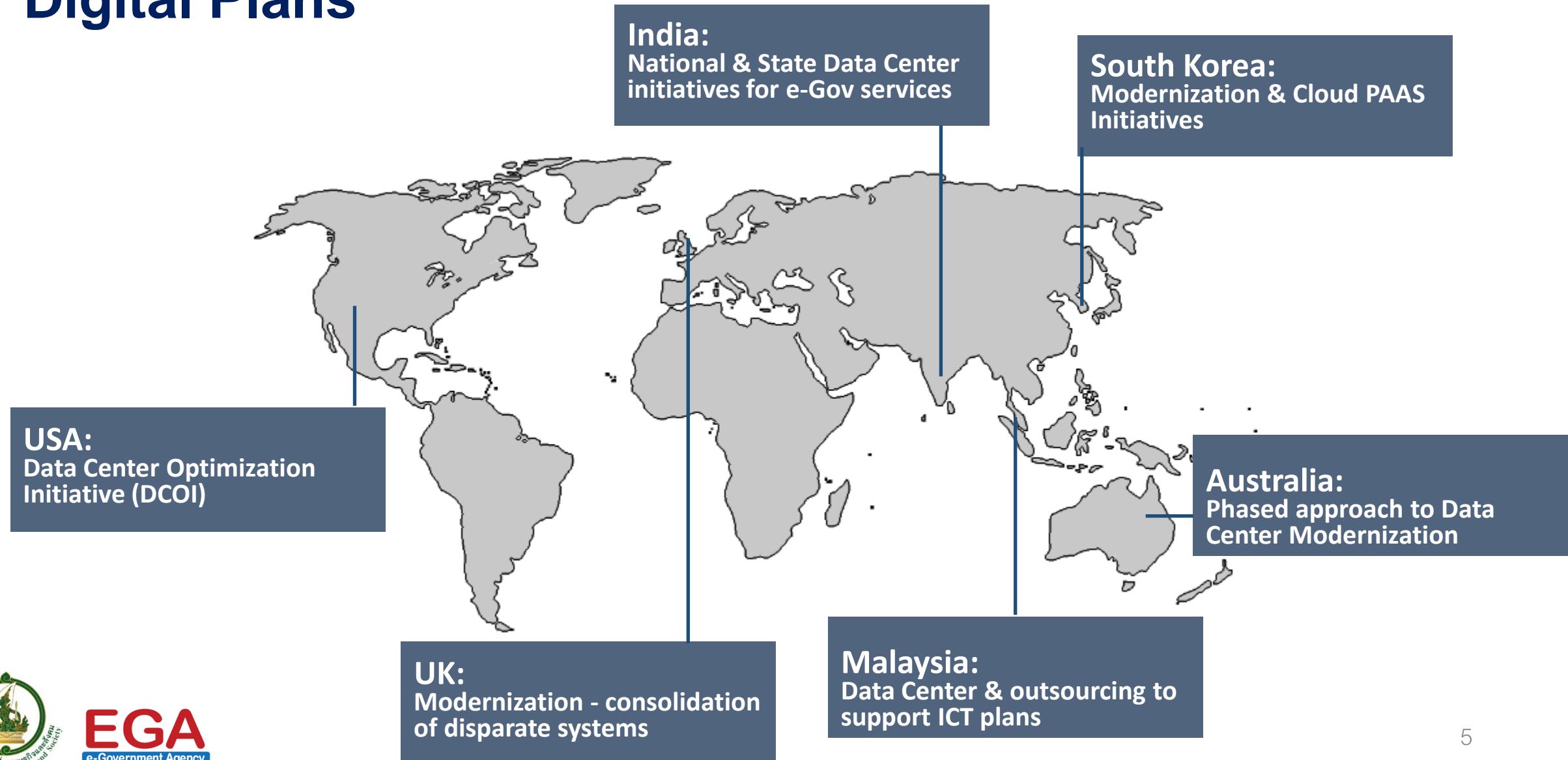
EGA has identified 4 broad aspects to the Data Center Modernization initiative

Understanding trends in international community

Identifying opportunities to define Standards of government DC service

Data Centers to Support Thailand's Digital Development Plan

Developing a Datacenter Modernization plan

Establishing a Central Administrative Office Model

The Project has been delivered in 3 Phases

Approach

A Research **B** As Is Analysis **C** Guidelines Development **D** Final Presentation

0 Project Kick Off

1 Overview of Datacenter Modernization trends & Standards Document

2 Current state of Data Centers in Scope

3 Evaluating Need for Modernization

4 Drafting of Modernization Guidelines

5 Developing Admin Model

6 Final Recommen-dations
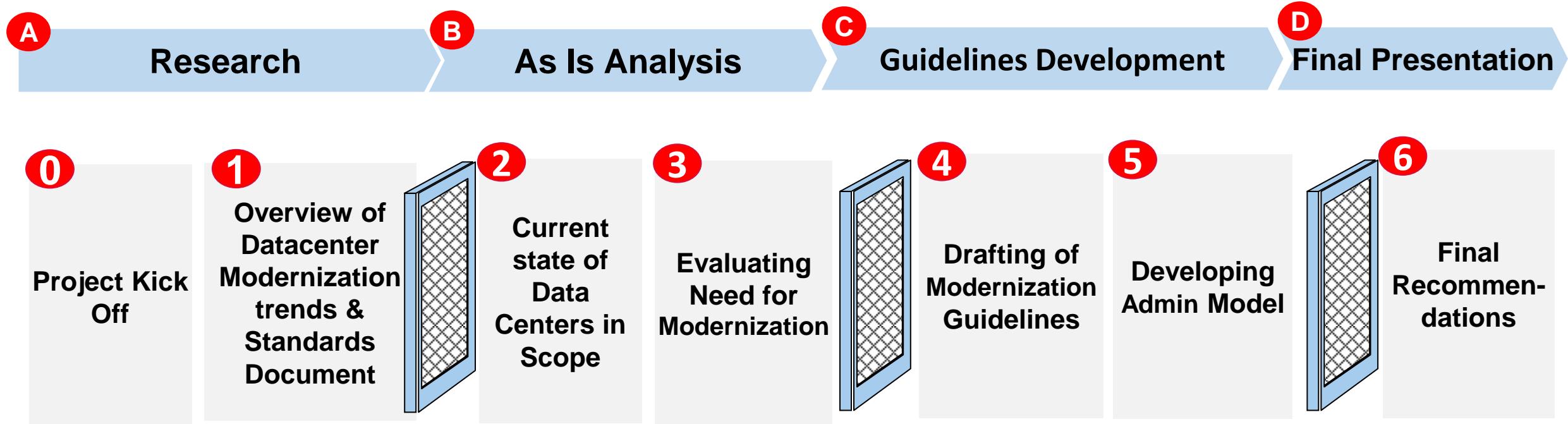
Government Data Center Modernization

Case Study Malaysia and USA

Malaysia Data Center Modernization Effect

> Establishment of two government data center

> 209 Government agencies using 1Gov*net

> 84 Government agencies using GDC1
> 50 Government agencies using GDC2

> 83% of the government services online

USA Data Center Modernization Effect

> 4000 + data centers closed and $2.8 billion in cost savings

> 180,000 plus servers still with the agencies

> 95% of agencies procuring network through government

> 1.5 million Square feet of data center space

Across the world, countries adopt DC Modernization through new tools, technologies and optimization techniques

1 Adoption of cloud at a rapidly growing pace in line with increasing maturity of cloud operations across the globe

2 Increasing investments in security technologies including encryption for own data center setups

3 Increased usage of cross-agency infrastructure sharing and shared services

4 Focus on cost optimization resulting from tighter government budgets

5 Increased focus on handling of high security data

Thai Government Data Center Modernization is a strategic initiative to help the agency data infrastructure align better with Thailand Digital Economy
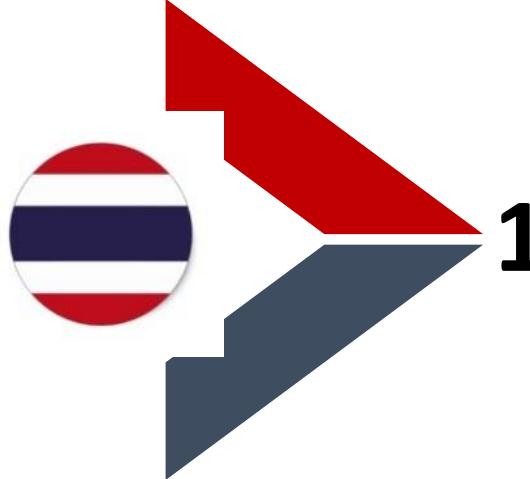
1

THAILAND OPPORTUNITY

- 70 mn population
- Strong internal demand for data center
- Data center requirements to grow 30% YOY till 2020

2

DIGITAL THAILAND

- Digital technology to develop infrastructure, innovation, data capability, human capital, and other resources
- 6 Strategies to implement goals: Build high-capacity digital infrastructure, Boost economy with digital technology, Create equitable society through digital technology, Transform into digital government, Develop digital workforce, and Build confidence in use of digital technology

3

DATA CENTER INFRASTRUCTURE

- Data center infrastructure an important component of Digital Economy
- A modern data center infrastructure is the most crucial element to accommodate growing demand for data, services, quality and digital economy

Consumer needs, aspirations and resulting data is growing at rapid pace

28mn	**34**mn	**39%**
2016 Internet Users	2021 Internet Users	2015 Internet Penetration
8th	**86**mn	**127%**
Fastest Internet in Asia	Mobile Subscribers 2015	Mobile penetration 2015

Sources: Stastica, Worldbank, Bangkokpost, NBTC

Key Considerations for Data Infrastructure

Higher Utilization	**Higher Reliability & Availability**
Higher Security	**Higher Capacity**

EGA
e-Government Agency

Government Data center issues and priorities

Data Security based decision making

Efficient operations

Multiple standards and adherence

Aging infrastructure

High volume and growth of data

Data Availability at all times

Hiring and retaining right employees

Outsourcing decisions

Future of data centers

The ongoing and massive surge in data traffic will pave the way for a stronger infra backbone.

Cloud adoption will continue to thrive and agencies would increasingly rely on cloud including Government cloud services.

Critical factors for choosing a data center options will include data security, location, cost and environment need.

Data centers would need to offer higher quality and reliable services to enable seamless business and government operations

Data centers would need to keep scalability perspective in mind due to sheer growth of data in mind.

Data centers need to be ready for needs resulting from IoT, analytics and increase in intra ministry and inter agency data management with real-time business and operational excellence

Current and Future State of Thailand Government Data Infrastructure

6 core areas of challenges faced by agencies
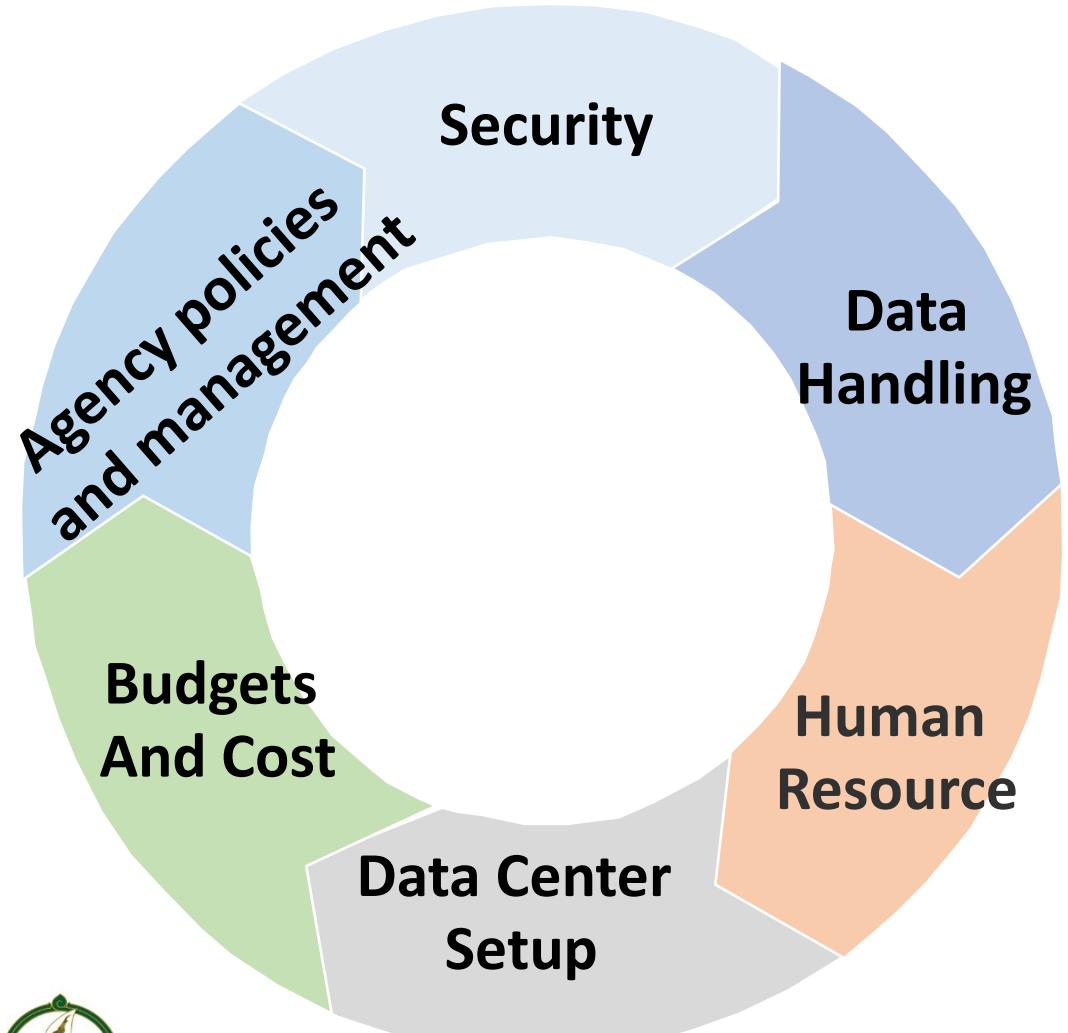
- Security includes: data security, security handling at the agency, handing of high risk and mission critical data.

- Data handling includes data integration and classification, agency responsibility, data cleansing, accuracy and quality.

- Human resources include: lack of human resources at the agency, lack of skills and overall lack of availability of skilled resources

- Budget and Cost include the allocated budgets for expenses and increasing costs of operations as well as upgradation.

- Agency policies and management include shared utilization, planning, focus on DR and backup, citizen centricity etc.

- Data Center Setup include server, storage, cabling, cooling set, power setup, floor architecture, racks, building design etc.

16

Government Agencies constrains and demands

CONSTRAINTS

Cost increase due to in-efficient operations

Limited Government Budgets

Limited Human Resource Availability, Skills and Budget

Data Classification and lack of integration

Old infrastructure and the components

Thailand Agencies

DEMANDS

Increase in Data Volume

Data security and safety

Business Continuity

Citizen centricity and readiness to support new services

Faster response, higher availability and reliability of data

Important areas of improvement

1 **Identification of standards that the agencies need to follow based on best practices and driving compliance**

2 **Developing key skills amongst the agency personnel on their business areas, technologies and servicing, and concrete steps to develop skills**

**3** **Central operations and shared services should be an important consideration**

4 **Security handling and cloud adoption**

18

Features that should represent future state

Operational Efficiency

Security Handling

Cost Optimization

Scalability

Designed for Future

Future State Operating Model

(A) Agency Own Data Centers
> Includes current infrastructure setup
> Includes shared infrastructure optimization

(B) Ministry Data Centers
> Includes current infrastructure setup broadened to ministry agencies

(C) Cross Agency Data Centers
> Includes current infrastructure setup broadened to multiple agencies across ministries and independent agencies

Future State Model For Thailand Data Infrastructure

(D) 3rd Party Colocation/Physical Hosting
> Includes current setup with better designed SLAs and requirements

(E) 3rd Party Services
> Includes service outsourcing to 3rd party for IaaS, PaaS, SaaS cloud)

(F) G Services
> Includes service outsourcing to government services for colocation; IaaS, PaaS and SaaS cloud)

Note: (E) 3rd party services does not include 3rd party colocation, which is captured as a separate service that's being also used currently as (D)

Future State Operating Model

GREEN: Improvement from current state
BLUE: No change from current state

● Very High ◕ High ◑ Medium ◔ Low ○ None

	Future State Model improvement over current state					
	(A) Agency Own Data Center	(B) Ministry Data Center	(C) Cross Agency Data Center	(D) 3rd party Colocation	(E) 3rd party Services	(F) G-Services
Handling of high security data	● (green, Very High)	○ (green, None)	○ᴮ (None)	○ᴮ (None)	○ (green, None)	◑ (green, Medium)
Handling of public data	◑ᴮ (blue, Medium)	◔ (green, Low)	◔ (green, Low)	◑ᴮ (blue, Medium)	◑ (green, Medium)	◑ (green, Medium)
Handling of important and mission critical data	●ᴮ (blue, Very High)	◔ (green, Low)	◑ (green, Medium)	◔ᴮ (blue, Low)	◔ᴮ (blue, Low)	◑ (green, Medium)
Improvement in standard adoption	◑ (green, Medium)	● (green, Very High)	● (green, Very High)	●ᴮ (blue, Very High)	●ᴮ (blue, Very High)	◑ (green, Medium)
Support in data integration	◑ (green, Medium)	◔ (green, Low)	◔ (green, Low)	◔ (green, Low)	○ (green, None)	◔ (green, Low)
Cost efficiencies	◑ (green, Medium)	◔ (green, Low)	● (green, Very High)	◔ᴮ (blue, Low)	◕ (green, High)	● (green, Very High)
Solves issues of procurement lead times and OPEX budget	○ (green, None)	◑ (green, Medium)	● (green, Very High)	◑ᴮ (blue, Medium)	●ᴮ (blue, Very High)	● (green, Very High)
Solves human resource availability and quality issues	◔ (green, Low)	◑ (green, Medium)	◔ (green, Low)	◔ᴮ (blue, Low)	●ᴮ (blue, Very High)	◑ (green, Medium)

Future State Operating Model

GREEN: Improvement from current state	Future State Model improvement over current state					
BLUE: No change from current state Very High High Medium Low None	**(A)** Agency Own Data Center	**(B)** Ministry Data Center	**(C)** Cross Agency Data Center	**(D)** 3rd party Colocation	**(E)** 3rd party Services	**(F** G-Services
Better utilization of resources and infrastructure	green half	green 3/4	green 3/4	green half	blue full (B)	green 3/4
Reduces reliance on government budgets	empty (B)	green half	green 3/4	green half	green 3/4	green full
Reduces overall cost spent by government	blue half (B)	green half	green 3/4	blue 1/4 (B)	green 3/4	green 3/4
Ensures high scalability	green half	green 3/4	green full	green 3/4	green full	green full
Ensures high resilience, availability and reliability	green half	green 3/4	green 3/4	blue full (B)	blue full (B)	green full
Effectively balances and manages technology advancements	green 1/4	green half	green full	green half	green full	green 3/4
Ability to manage future growth of data analytics/other complex computing needs.	green 1/4	green half	green full	blue half (B)	blue 1/4 (B)	green 3/4
Optimal use of government resources	green half	green 3/4	green full	green 3/4	blue full (B)	green full

22

Government Data Center Modernization (GDCM) Strategy

Guiding Principles

1 Alignment with Digital Economy and Prime Minister's vision for Government Infrastructure and Modernization

2 Strategy based on data security, criticality of applications, current operations perspective and inclusive growth

3 Utilizes the key improvements in technology via standards and SLA adoption for identified models to enable a successful realization of benefits

4 Consideration of skillsets, people development, human capital availability, and technology transfer

5 Accountability of agencies and ministries through granular steps to realize overall objectives.

GDCM Strategy

The key objective of the Strategy is to develop a data infrastructure approach to protect Thailand's high security data and to achieve operational excellence in service delivery. In achieving these, there are several other objectives including: business sustainability over long term, cost efficiency, technology innovation and preparedness for data revolution

GDCM Goals

Vision of GDCM

"To be an effective government data infrastructure that enables public service delivery through efficient, secured, cost effective and optimized operations"

Realigning government data based on security characteristics of the data to enable higher security to national security data and appropriate handling of important data

Enabling infrastructure with standardised approach and service delivery

Optimize the cost and investment for the infrastructure

Implement shared operations at agency level, ministry level and government level

Improve agency efficiency

Resulting Benefits

SECURITY

CITIZEN CENTRICITY

FUTURISTIC

EFFICIENCY

REDUCED COST
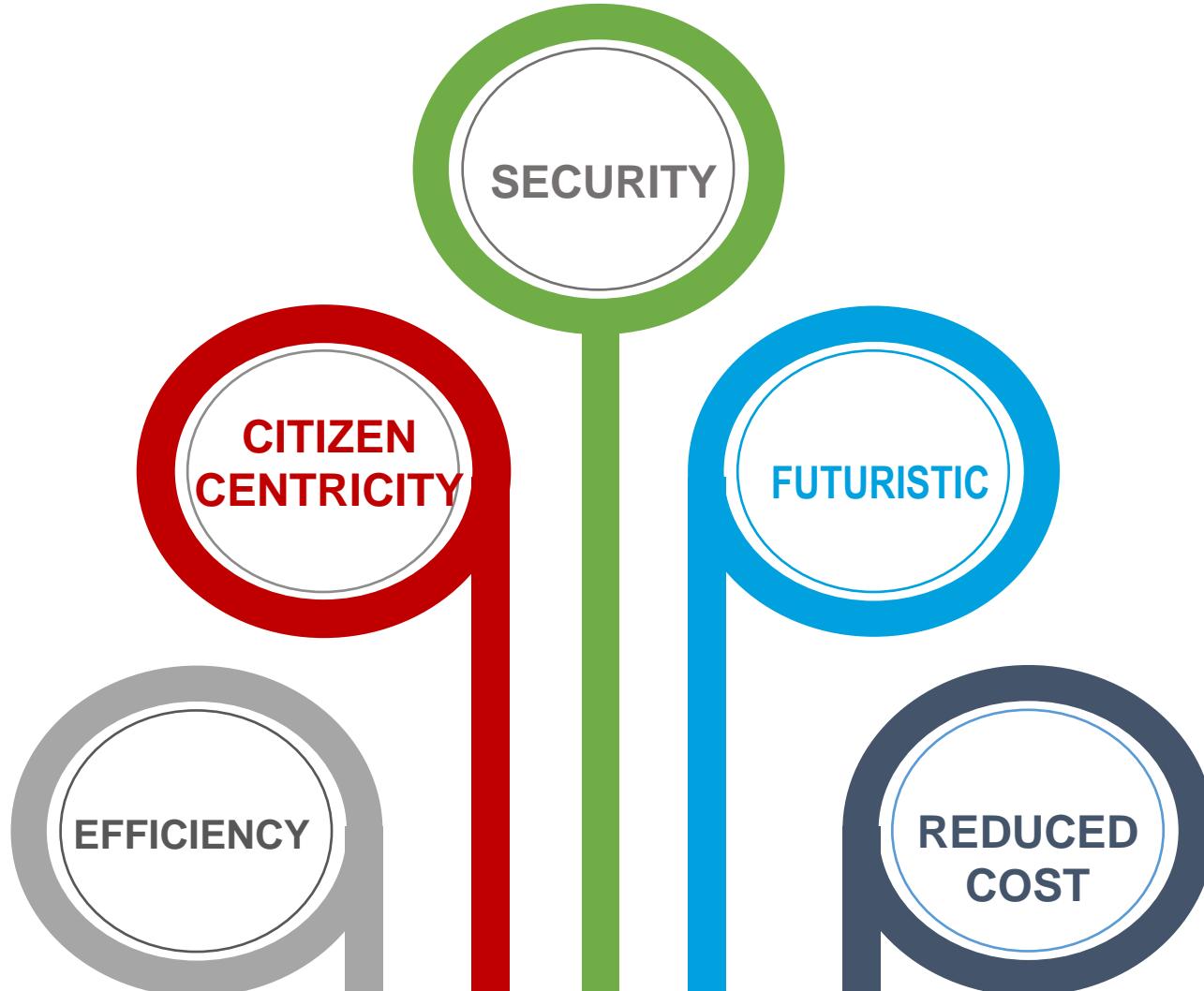
GDCM Implementation Objectives

✓ **Aggregate the total data center demand and establish feasibility studies to the realization of GDCM Strategy**

✓ **Identify and develop business requirements for the future model**

✓ **Assist early adopters to move to shared resource solutions;**

✓ **Adopt the standards to be used in data center equipment and operations so that maximum efficiencies can be achieved;**

✓ **Established shared service models**

✓ **Adoption by the identified agencies**

✓ **Publish the improvement and progress of the 5 year initiative.**

GDCM Strategy Implementation Projects

P1: iDISCOVER
Discovery study to understand feasibility of the model and requirements for alternate hosting

P2: iTRANSFORM
Project to transform agency data centers into ministry and cross agency DCs

P3: iOPTIMIZE
Project to migrate data from one model to other

P4: iTRANSITION
Project to deploy human resources across agencies and models as required

P5. iADOPT
Project to adopt the identified standards

P6: iCHANGE
Project to management change implementation and management

P7: iLEARN
Project to provide training to human resources

P8: iMONITOR
Project to monitor and report progress

P9: iNEGOTIATE
Progress to negotiate better rates, services, SLAs with 3rd. party

Performance Management of GDCM Strategy

EFFECTIVE UTILIZATION OF ASSETS, CAPACITY AND RESOURCES

SHARED SERVICES

COST EFFICIENCY

ENHANCED SECURITY

STRATEGIC FRAMEWORK
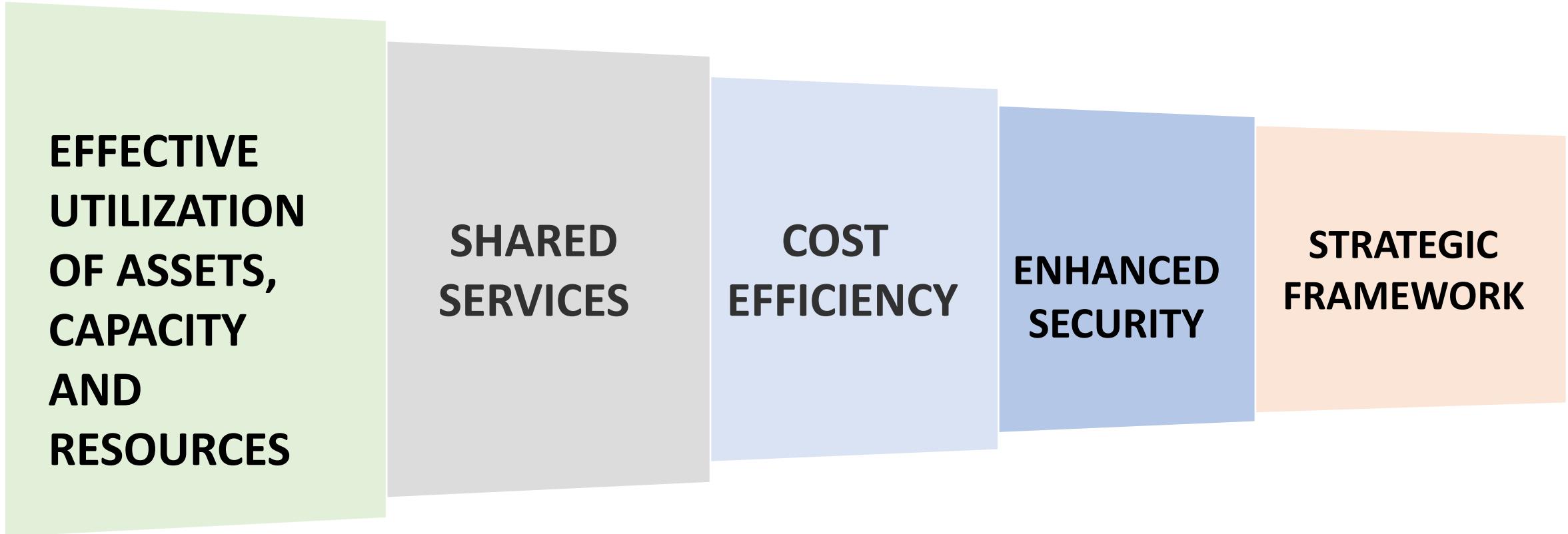
GDCM Implementation Plan (Short Version)
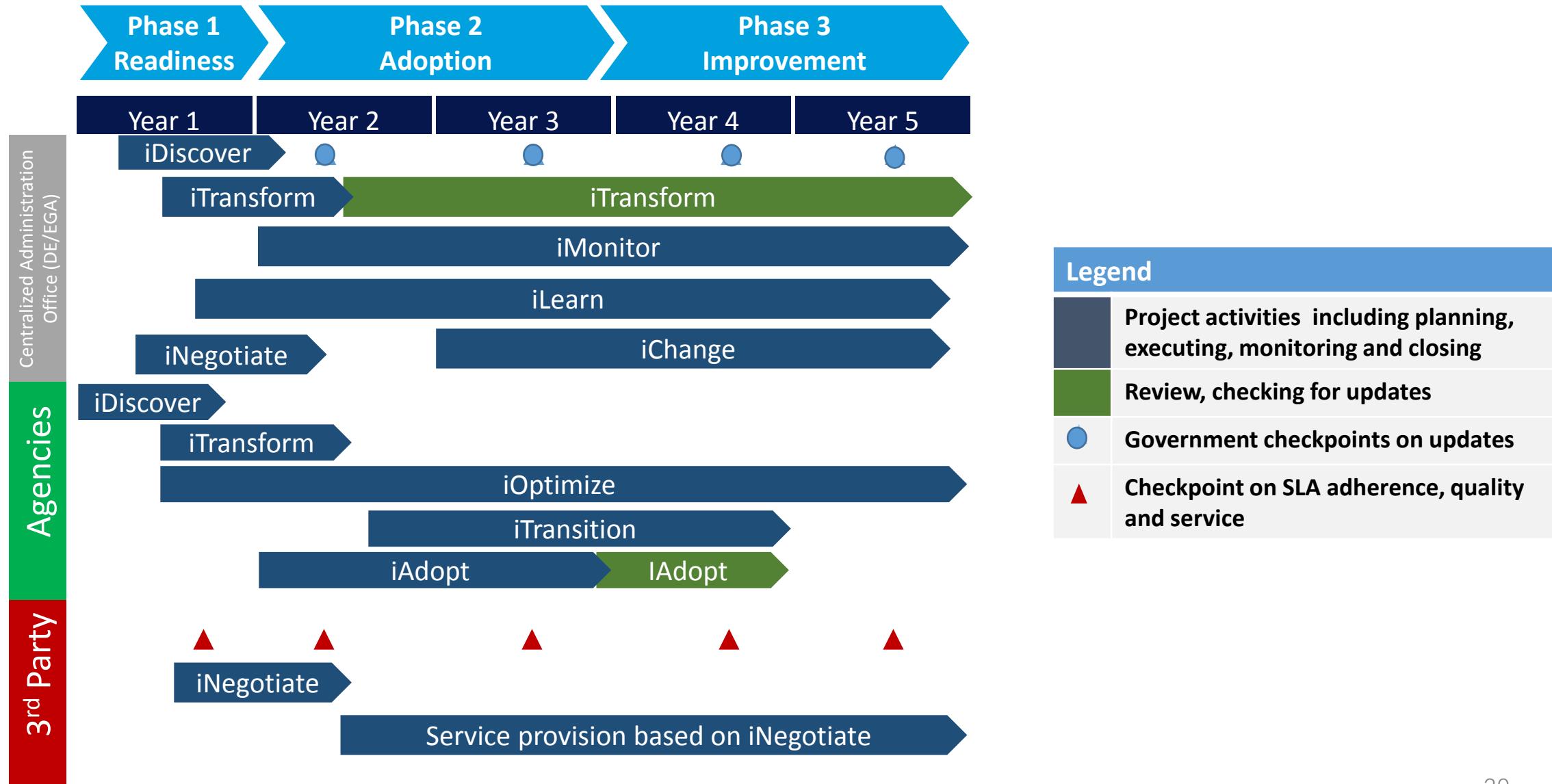
How ministries and agencies will operate in future from data perspective

ILLUSTRATIVE

Legend:
- High Security Important
- Public
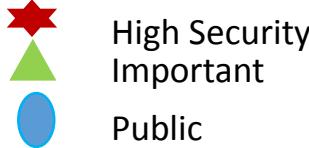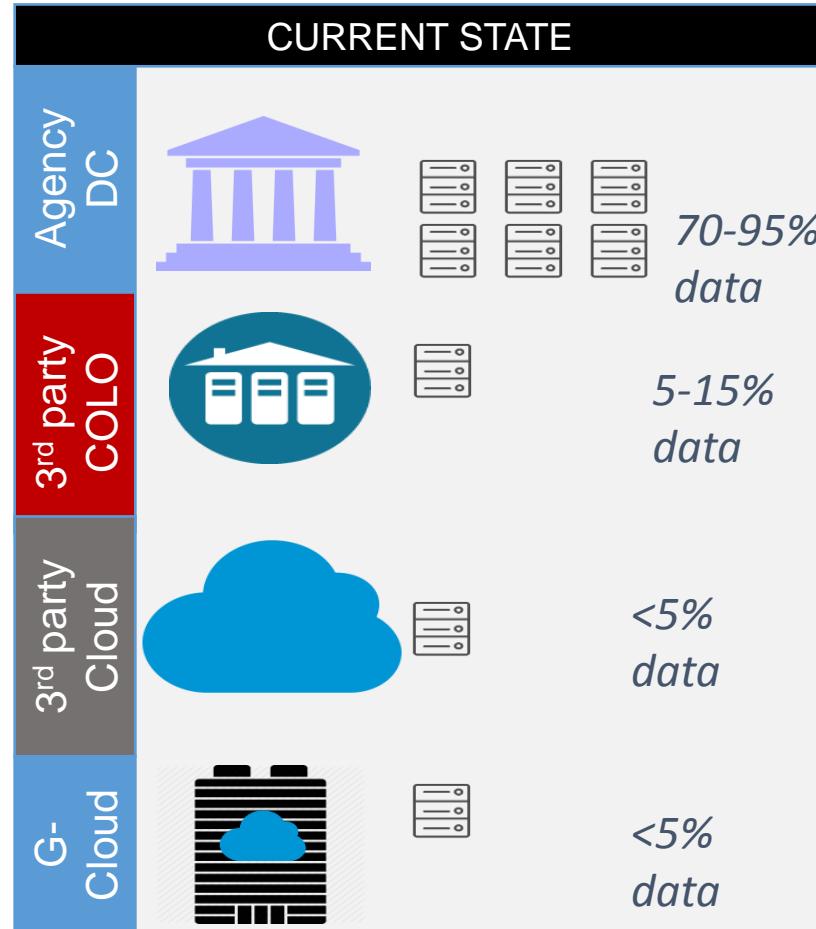
High total data volume

10-20 Agencies part of Ministry
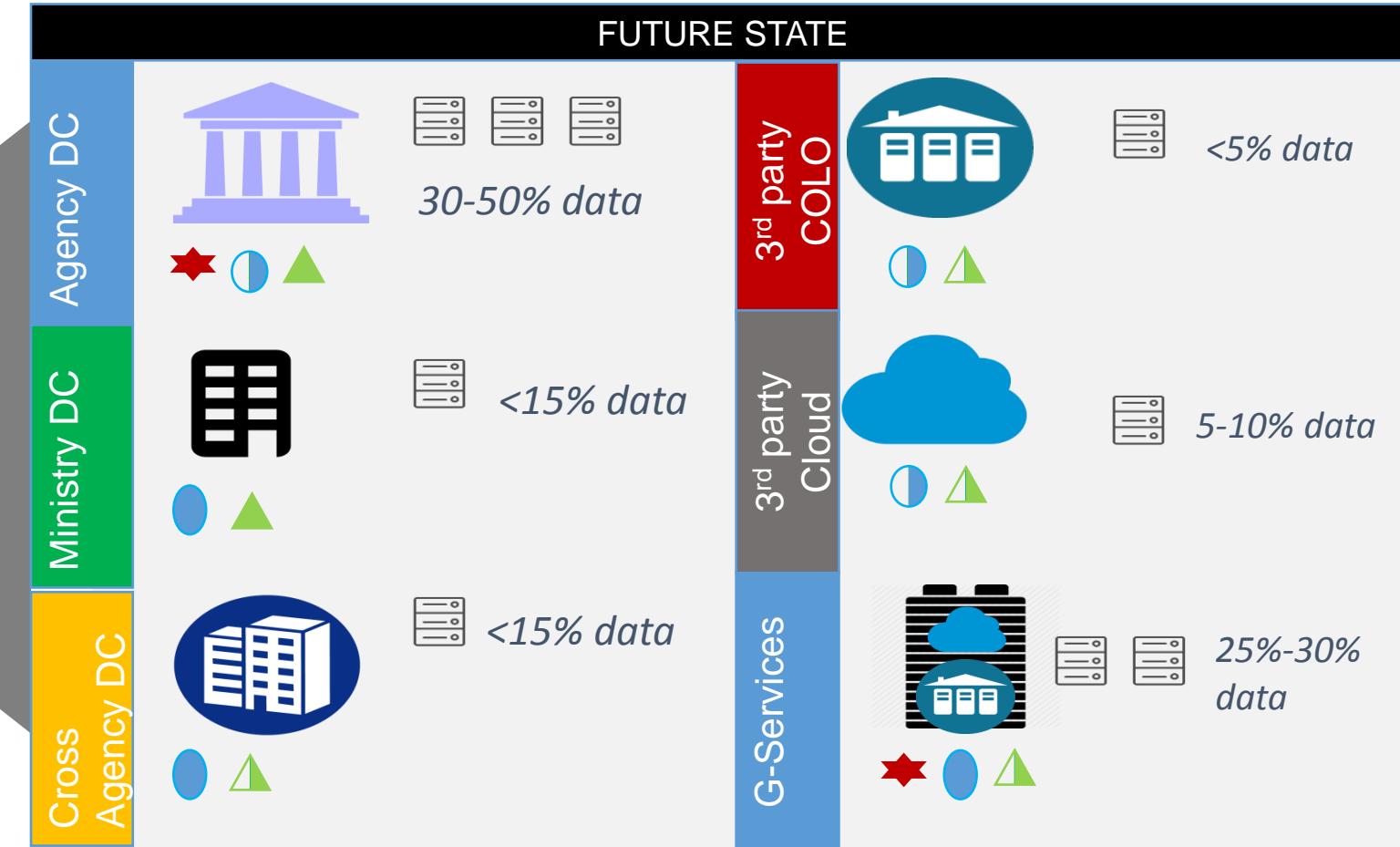
Mixed Data

CURRENT STATE

Category	Data
Agency DC	70-95% data
3rd party COLO	5-15% data
3rd party Cloud	<5% data
G-Cloud	<5% data

FUTURE STATE

Category	Data
Agency DC	30-50% data
Ministry DC	<15% data
Cross Agency DC	<15% data
3rd party COLO	<5% data
3rd party Cloud	5-10% data
G-Services	25%-30% data

31

How ministries and agencies will operate in future from data perspective

ILLUSTRATIVE

Legend:
- ★ High Security
- ▲ Important
- ⬤ Public

Medium total data volume

~12 Agencies part of Ministry
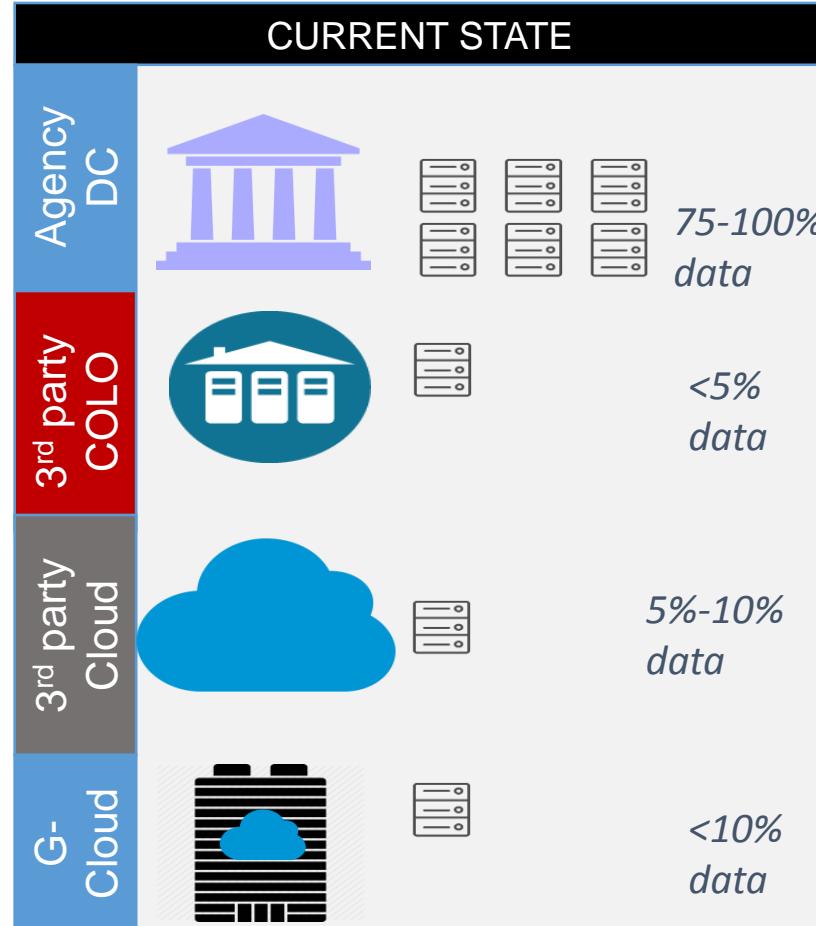
Mixed Data

CURRENT STATE

- **Agency DC** — 75-100% data
- **3rd party COLO** — <5% data
- **3rd party Cloud** — 5%-10% data
- **G-Cloud** — <10% data

FUTURE STATE

- **Agency DC** — 40-50% data ★ ◑ ▲
- **Ministry DC** — <20% data ⬤ ▲
- **Cross Agency DC** — <10% data ⬤ ▲
- **3rd party COLO** — <5% data ◑ ▲
- **3rd party Cloud** — 5-10% data ◑ ▲
- **G-Services** — <15% data ★ ◑ ▲
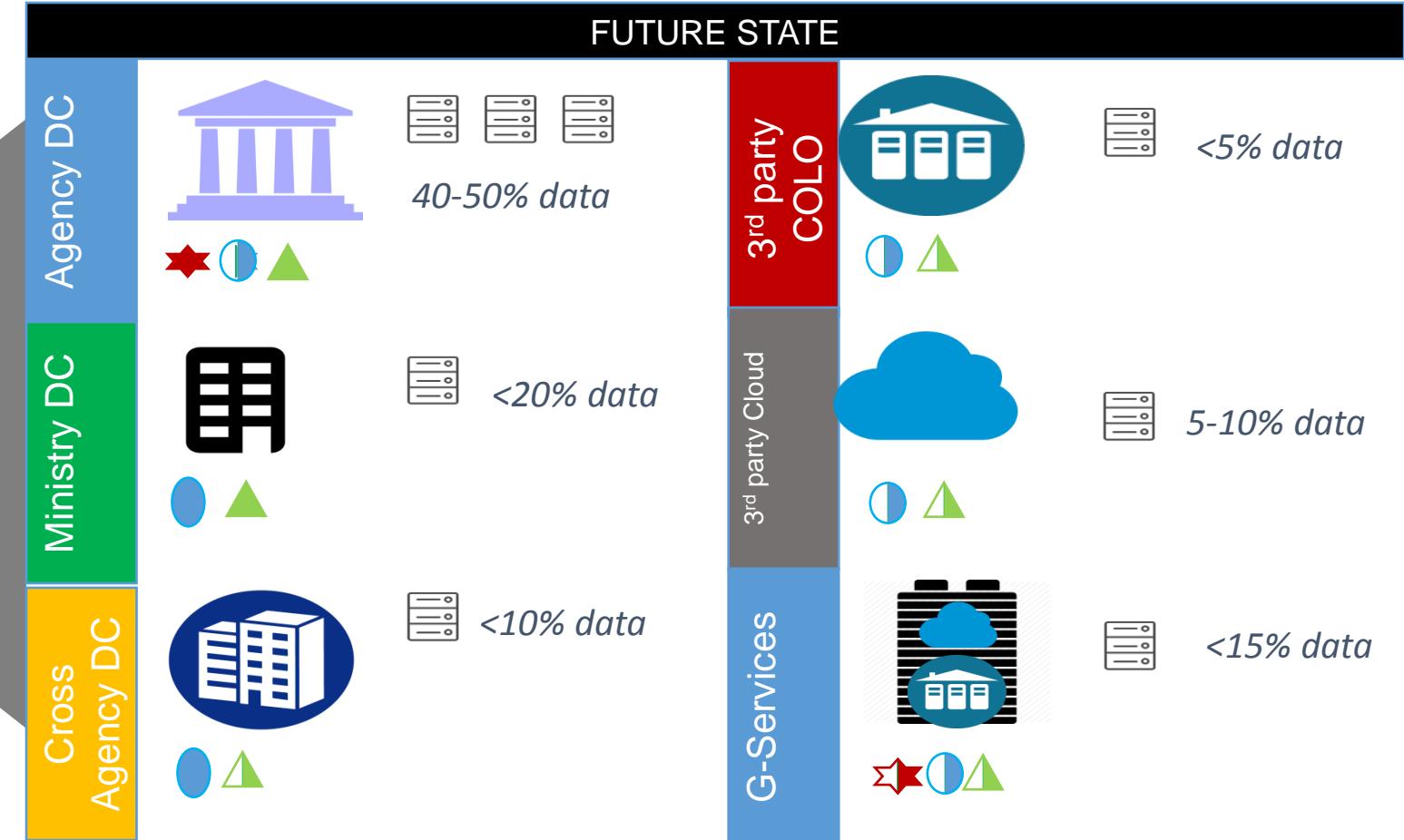
How ministries and agencies will operate in future from data perspective

ILLUSTRATIVE

★ High Security

▲ Important

● Public
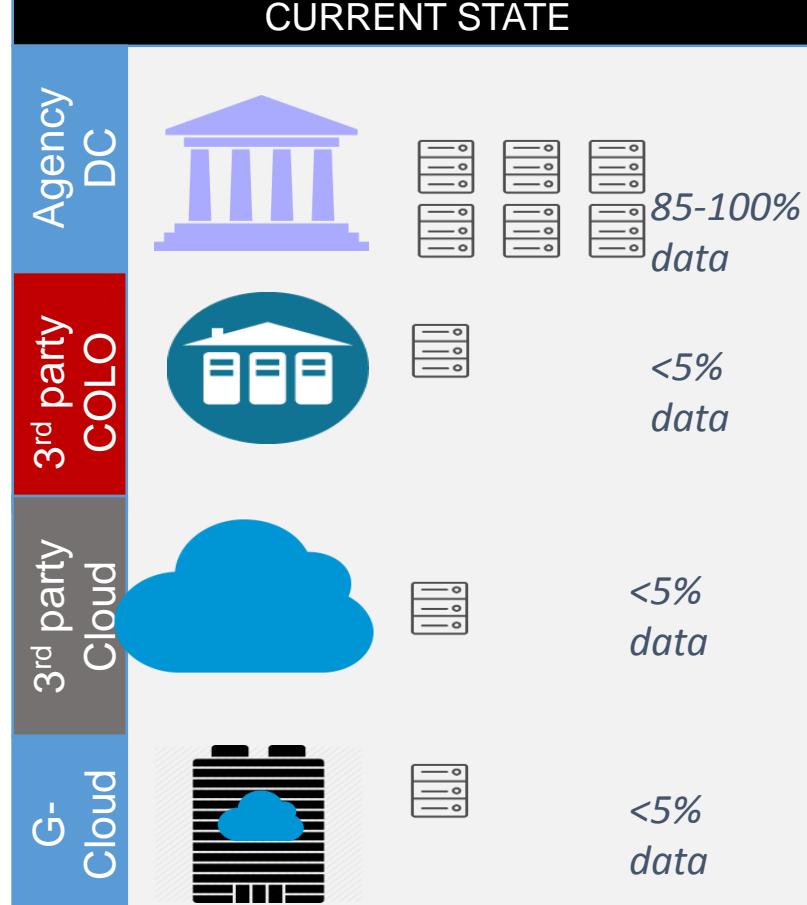
| High total data volume | <5 Agencies part of Ministry | Mixed Data |

CURRENT STATE

Agency DC — 85-100% data

3rd party COLO — <5% data

3rd party Cloud — <5% data

G-Cloud — <5% data

FUTURE STATE

Agency DC — <30 data   ★ ● ▲

Ministry DC — 20-40% data   ● ▲

Cross Agency DC — 15-20% data   ● ▲

3rd party COLO — <5% data   ● ▲

3rd party Cloud — 10-15% data   ● ▲

G-Services — ~10% data   ★ ● ▲
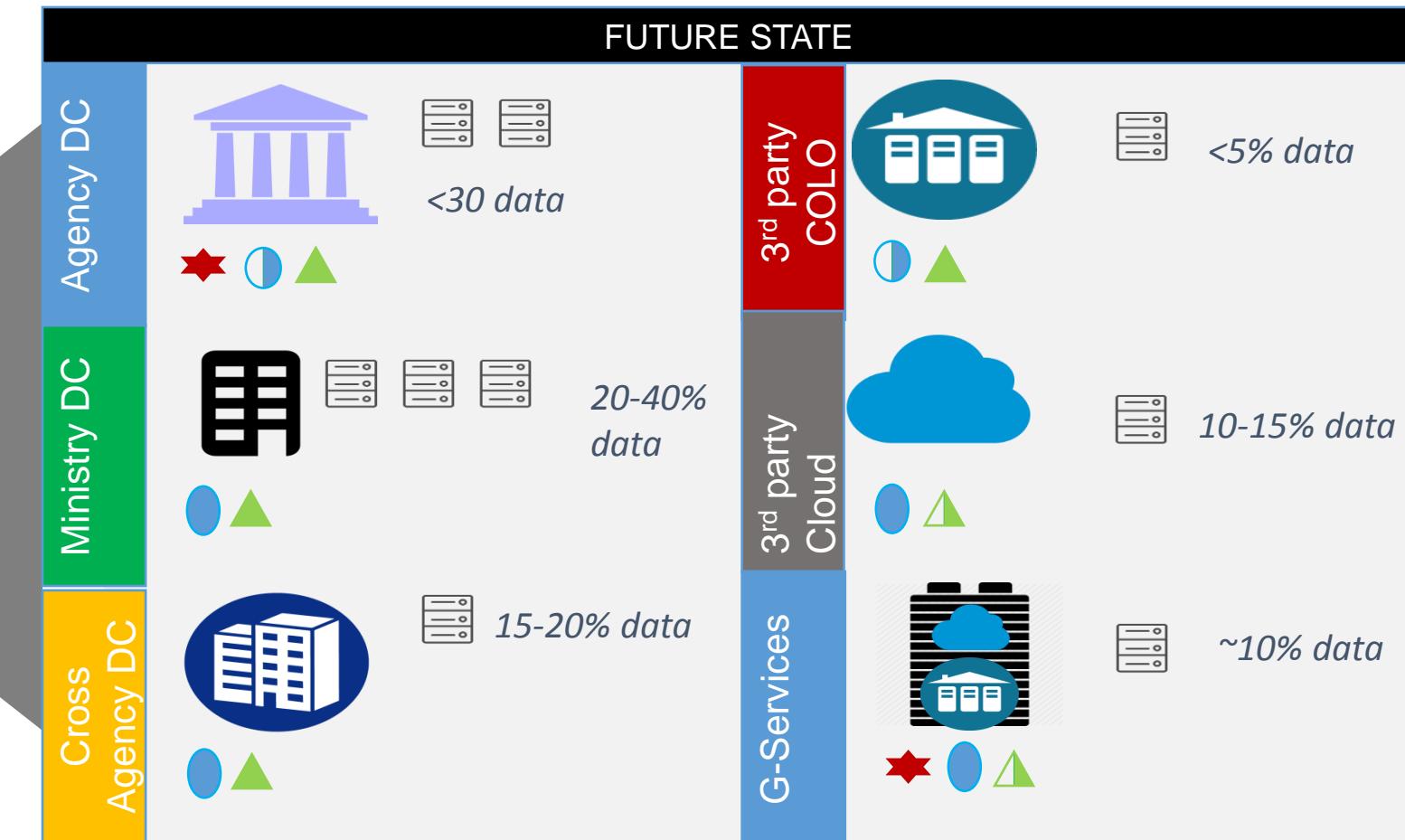
What are Standards and why are they used?

Standards play an important role in practices and requirements to enable effective management and provisioning of services in the dynamic environment performance

WHAT ARE STANDARDS?

- Standards are universally or widely accepted, agreed upon, or established means of determining what a product, service, facility or a concept is required to be or is required to behave.

- In Data Centers to develop a commitment to operate facilities that meet the rigorous guidelines and compliance needs of global businesses.

- Companies that develop industry standards work with several regulatory and standards organizations to ensure compliance—from operation of the data center to sustainability and environmental regulations.

Why are standards needed?

New technologies like data analytics, big data, Internet-of-Things and venture into smart cities

Data Explosion: f5 Exabyte's of data online in 2002 35 zettabytes in 2021

Exceptionally high energy intensity of a data center may be 10 to 100 times of a typical commercial building.

Rising energy prices and growing data center carbon emissions by 7% year-on-year through 2020.

Examples of Data Center International Standards

Energy start, NABERS, ASHARE are focused on power and cooling standards

DC start audit, SSAE 16 , Open IX and ISAE are focused on auditing of services.

ANSI/TIA

US EPA

PCI

Nabers

Uptime Institute

DC Star Audit

BISCI

ISO

Open IX

BCA/IDA

Energystar

SSAE 16

ISAE

Leed

HIPAA

ASHRAE
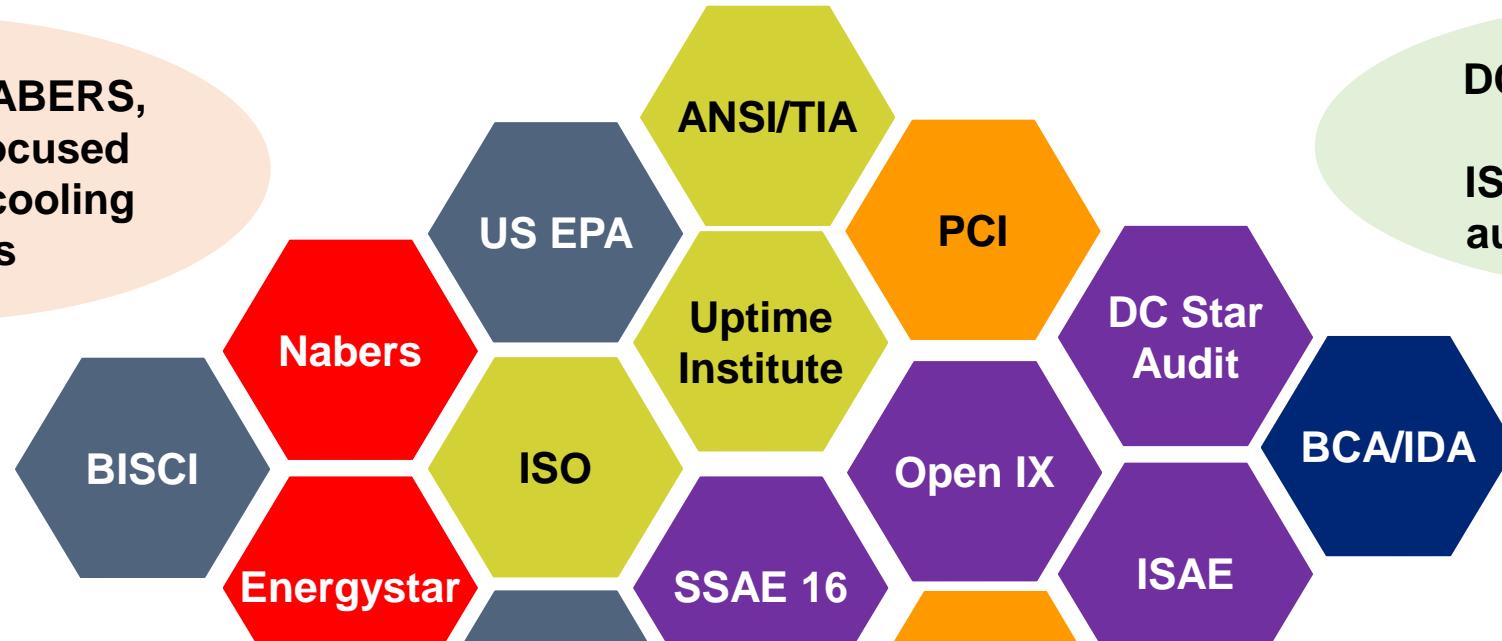
Uptime, TIA and ISO are the most popular one's among data center vendors

LEED BISCI and BCA are design standards.

PCI and HIPPA are service related standards.

Standard Adoption

Adoption Insights by Countries

Energy

- **US government-PUE**

- **UK government Green Grid**

- **Australian government-ASHARE**

Design and Structure
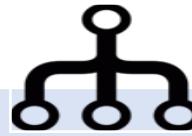
- **US government uses TIA 942 and BICSI**

- **Government of Singapore-Threat assessment**

- **Australian government-Protective Security Policy Framework**

- **US government recommends-LEED design standards**

Server Storage & Utilization

- **Singapore government-PTDCI**

- **Indian government-data center IT infrastructure monitoring tools**

- **Hong Kong government- Help desk for the data center**

- **Australian government -Proper backup, storage, and handling of data**

Adoption Insights by Countries (Cont.)

Location & Site

- **Government of Canada- Appropriate selection of the facility site**

- **Government of India accessible and expandable enough.**

- **US government -Ready access to electrical power is available from diverse sources**

- **Philippines government- Data centers should be in a zone where it needs to be free from earthquake and flooding.**

Service Level Agreement

- **The Ministry of Electronics & Information Technology of India- Appropriate Disaster Recovery and Business Continuity Plan.**

- **India- All the state government should have a DR site**

- **Multiple governments recommends using TIA or Uptime.**

Relevance and Challenges

Relevance of Standards– Data Center Standards

Efficient data centers
The cost of data center downtime has increased significantly for companies in the last couple of years. . Data center operators in the last couple of year have improved the availability and efficiency of data centers by adopting globally recognized data center standards.

Comparative analysis
By providing a common method of comparison, standards help insulate customers from the need to make their decisions on solely on the basis of the claims of a provider..

Cost Optimization
Adopt industry standards recognized technologies would help in reducing overall efficiency of data center support functions. This would help in reducing the overall costs

Environmental Impact
By adopting the data center industry best practises(using renewable energy and efficient data center), the companies are able to reduce the impact on the environmental

Key Challenges – Data Center Standards

Expensive to adopt
One of the biggest challenges faced by the data center operators is that the standards are expensive to adopt. The standards offer guidelines for operating and maintaining the data center efficiently. Adopting these best practices comes at a big price tag

Long list for data center standards
Over the years , the number of standards have increased at very fast pace globally. It is challenging for data center operators to choose between which standards to use and which not to use.

Lack of people with standards knowledge
As the list of standards is quite long, there is lack of people with skills that have data center standards knowledge. As there is scarcity of such people, it is challenging for data centers to adopt standards

Lack of people with operational knowledge
Once the data center standards are adopted, another challenges that comes into place is maintaining the standards. There is lack of people who have knowledge on how to maintain the data center standards. This is also a big challenge for data center operators.

Key Challenges – Data Center Standards

Budget is big issue for standards adoption
Most of the government agencies have fixed budges and these budgets are not much flexible to cover the standards expenses.

Many data center operators are still using legacy infrastructure
Most the data center operators in Thailand are running their data center on legacy infrastructure and legacy buildings. Adopting standards for these data centers would not be easy.

Data center operators are not experienced enough
Data center operators are not mature enough to understand value behind the adoption of data center standards.

Standard functional areas

Data Center Standards by Functional Areas
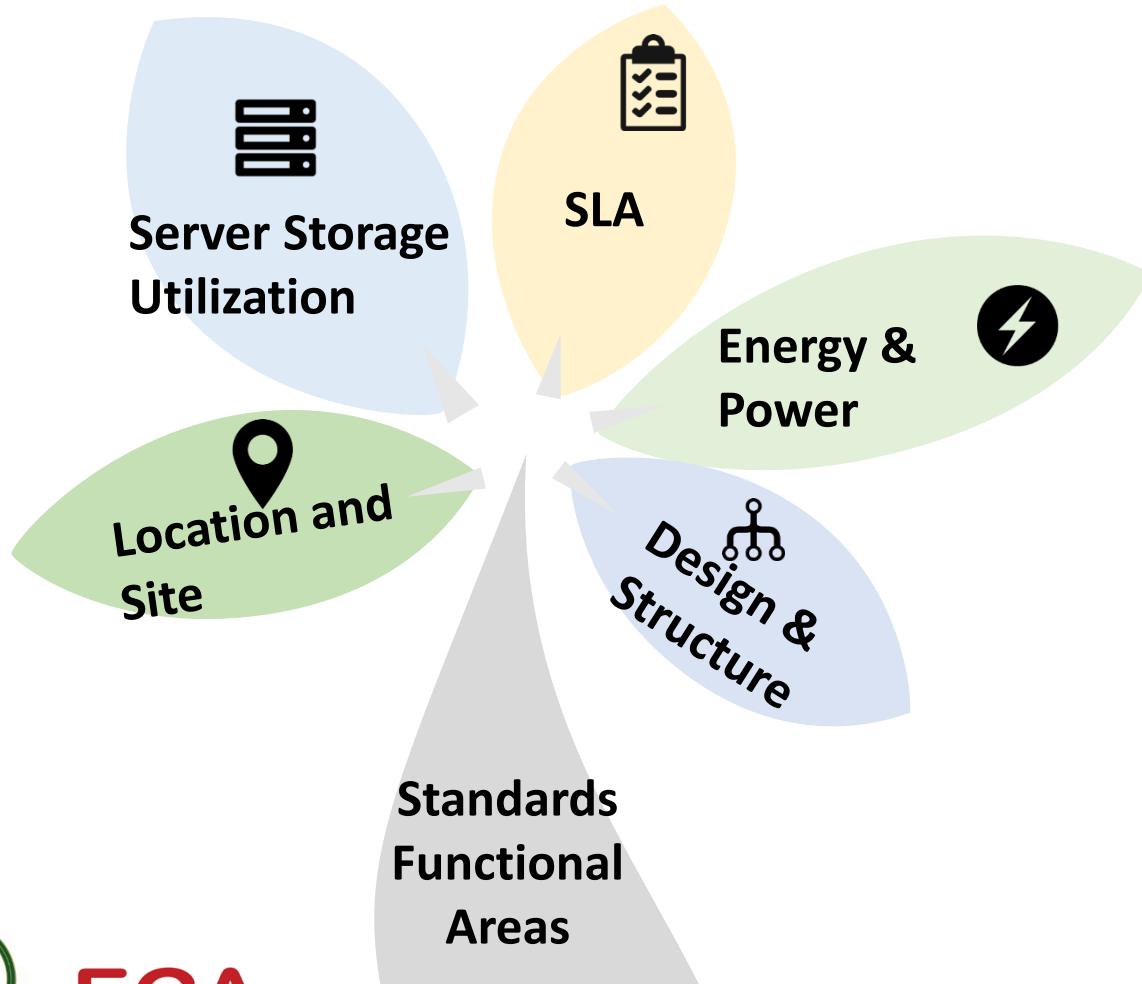
Energy and Power : This standard deals with measuring the energy consumed by equipment in data center.

Server Storage Utilization: This standard deals with utilization, monitoring of rates of IT infrastructure

Service level Agreements : This standards deals with defining the availability of data center services.

Location and Site: This Standard deals with the ideal location of data centers

Design and Structure: This standard deals how the data centers should be designed.

45

Data Center Standards by Functional Areas (Cont.)

Server Storage & Utilization

- Energy is one of the most important components in data centers.
- Data Centers consume an immense amount of power to perform functions reliably and effectively.
- The electrical costs in Data Centers typically accounts for 40-60% of the total operating costs.

Location & Site

- The data center is home to the computational power, storage, and applications necessary to support an enterprise business.
- The data center infrastructure is central to the IT architecture, from which all content is sourced or passes through.
- Proper planning of the data center infrastructure design is critical, and performance, resiliency, and scalability need to be carefully considered.

Data Center Standards by Functional Areas (Cont.)

Server Storage & Utilization
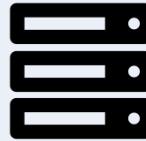
✓ **The data centers are equipped to host / co-locate systems (e.g. Web Servers, Application Servers, Database Servers, SAN, and NAS etc.) to host applications at the data center to use the centralized computing power.**

Location & Site

✓ **Determining the location of a data center is one of the crucial decisions for a company as it is based on strategy and goals of a company or government.**

✓ **Site selection plays an important role for the same as it will have direct impact on cost and TCO.**

Service Level Agreement

✓ **End-to-end service availability of the data center and its independent monitoring is the prime requirement to have reliable, seamless, smooth delivery of the services to the citizens.**

Data Center Standards Divided Further into Sub Parameters

1. Energy & Power
- Energy
- Power
- Cooling
- Redundancy
- UPS
- Lighting

2. Design and Structure
- Cabling
- Design
- Monitoring
- Security

3. Server, Storage and Utilization
- Utilization
- Help Desk
- Monitoring
- Backup
- Security

4. Location and Site Space
- Accessible & Expansion
- Power and Network Availability

5. Service Level Agreements
- Disaster Recovery
- Tier & Response time

48
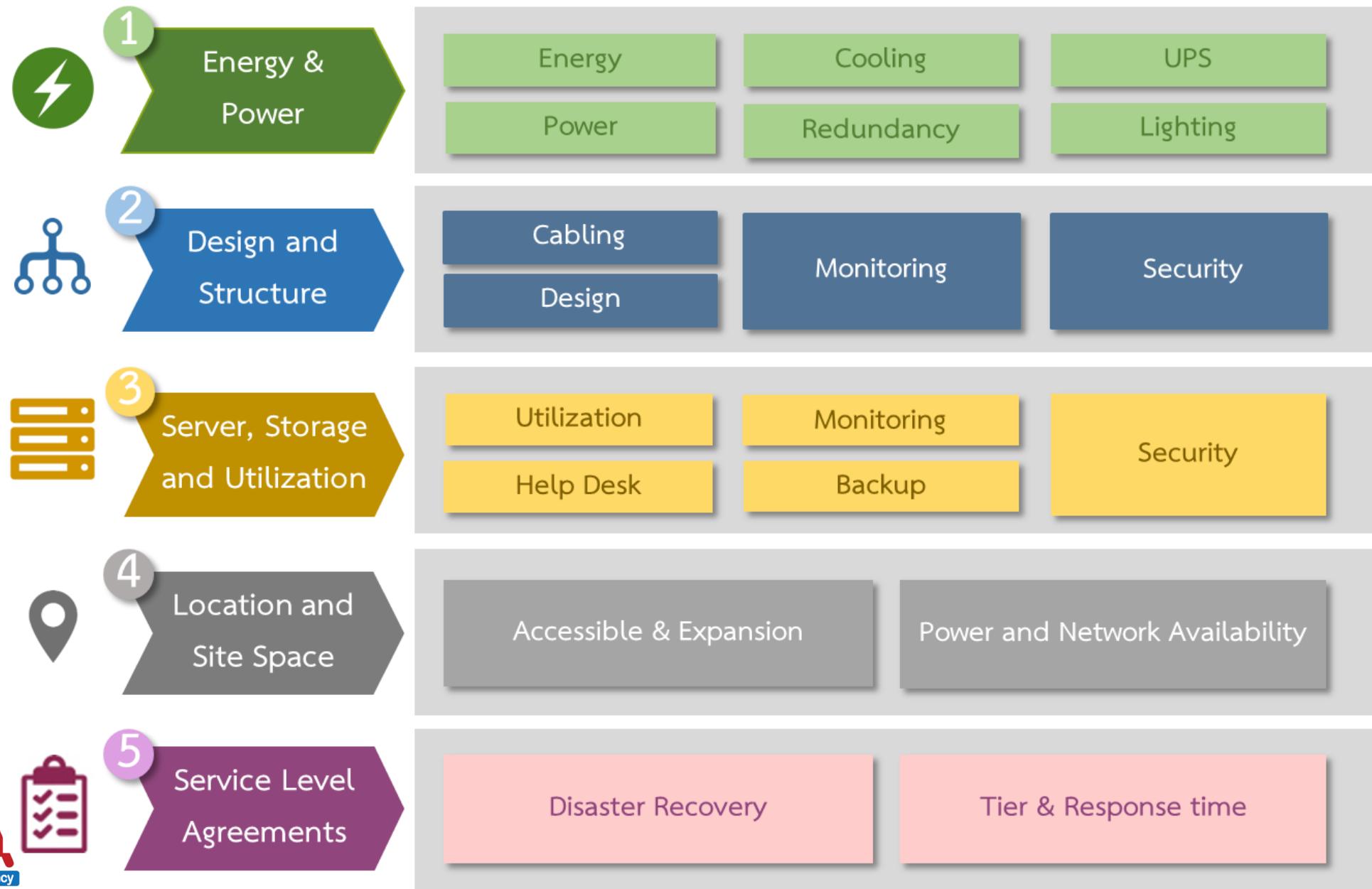
Agencies Current and Future Level for Standards

Current State of Agency Data Centers

Energy and Power Average Level

Category	Value
Cooling	2.4
UPS	2.9
Lighting	2.0
Redundancy	2.1
PUE	1.7
Meters	2.5

Legend: Meters, PUE, Redundancy, Lighting, UPS, Cooling

Design and Structure Average level

Category	Value
Monitoring	2.5
Building Design	2.5
Physical Security	2.1
Cabling	2.7

Legend: Cabling, Physical Security, Building Design, Monitoring

Server storage and utilization average level

| Category	Value
Security	3.3
Backup	3.4
Helpdesk	2.4
Monitoring IT infrastructure	2.8
Utilization	2.9

Legend: Utilization, Monitoring IT infrastructure, Helpdesk, Backup, Security

Remark: Please refer to Word document for description of Average Level

Current State of Agency Data Centers (Cont.)

SLA Average level

- Tier: 2.6
- Disaster Reovery: 3.1

Location and site average level

- Dual Supply: 2.2
- Accessible and Expandable: 2.5
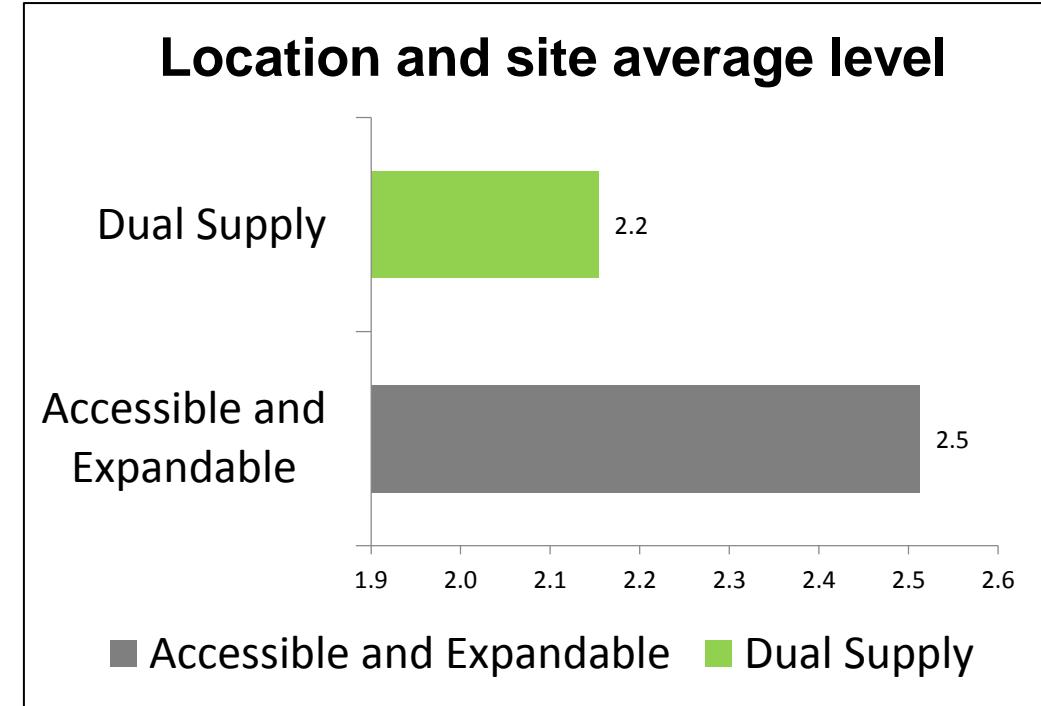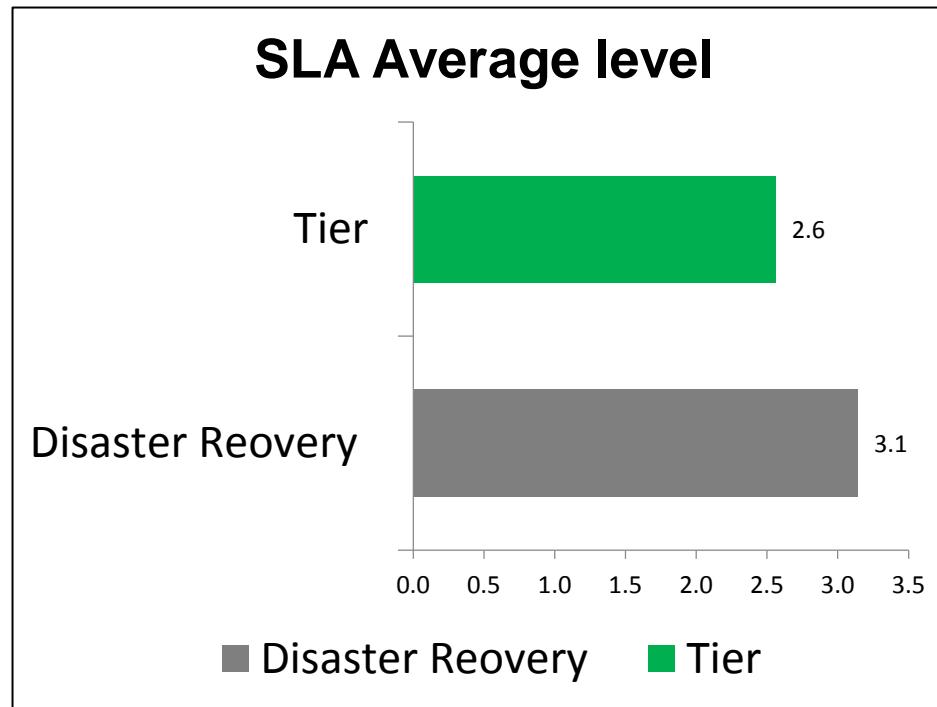
Remark: Please refer to Word document for description of Average Level

Future Recommended State of Agency Data Centers

Levels: Five (full), Four (¾), Three (½), Two (¼), One (empty)

Standards	Frost & Sullivan Future Recommended Level			
	Our Analysis Agency DC Level	Our Analysis Ministry DC Level	Our Analysis Cross DC Level	Our Analysis G services Level
Energy consumption	Two	Three	Four	Five
Power usage effectiveness	Two	Three	Three	Four
Redundancy	Three	Three	Four	Four
Lighting	Three	Three	Three	Three
UPS	Three	Three	Four	Three
Cooling	Three	Three	Three	Four
Color Coding	Three	Three	Four	Five
Security Assessment	Two	Three	Three	Two
Building design	Two	Two	Three	Three

* The chart that has been designed for the future standard adoption for government agencies. These are minimum standards that any agency should adopt and any agency having high security data should higher level of standards.

Future Recommended State of Agency Data Centers (Cont'd)

Levels: Five (●) Four (◕) Three (◑) Two (◔) One (○)

Standards	Frost & Sullivan Future Recommended Level			
	Our Analysis Agency DC Level	Our Analysis Ministry DC Level	Our Analysis Cross DC Level	Our Analysis G services Level
Monitoring	Three	Three	Four	Five
Utilization & Virtualization	Three	Three	Three	Four
Monitoring IT infrastructure and software	Three	Four	Four	Four
Help desk	Three	Three	Four	Four
Backup	Three	Three	Four	Four
Security for IT infrastructure and data	Four	Four	Four	Four
Accessible and expansion	Two	Two	Three	Four
Power and network availability	Two	Two	Three	Three
Disaster recovery	Two	Three	Four	Five
Tier and Response time	Two	Three	Three	Two

Service Level Agreements

3rd Party SLA - Key Elements

01 — It will state the business objectives to be achieved in the provision of the services.

02 — It will describe in detail the service deliverables.

03 — It will define the performance standards the customer expects in the provision of the services by the service provider.

04 — It will provide an ongoing reporting mechanism for measuring the expected performance standards.

3rd Party SLA - Key Elements (Cont.)

05 It will provide a remedial mechanism and compensation regime where performance standards are not achieved

06 It will provide a mechanism for review and change to the service levels over the course of the contract.

07 Ultimately it will give the customer the right to terminate the contract where performance standards fall consistently below an acceptable level.

3rd Party Colocation SLA Main Elements

Service description

Power	Network	Cooling
Fire	Service Reporting	Physical Security
Racks	Floor and Caged Space	Remote Hands

Service Level Metrics

Power SLA	Network SLA	Cooling SLA
Fire	Availability	Response Time

General Metrics

Maintenance	Customer Responsibilities	Terms and Conditions

3rd Party Cloud Computing SLA - Key Elements

Service details

IaaS	PaaS	SaaS

Deployment Models

Public Cloud	Private cloud	Hybrid Cloud

Service level Metrics

Service Availability	Service Credit	Service Reporting

3rd Party Cloud Computing SLA - Key Elements (Cont.)

Data policies

Data Privacy	Data security and Integrity	Data compromise response
Data Retention and disposal	Data transfer upon termination	Data location

Other Generic metrics

Interruptions	Support	Service Correction
Trainings	Transition assistance	Invoicing
Terms and termination	Warranties and covenants	Audit

Summary

- Data Center Modernization is a global need which most governments across the globe are adopting in different capacities.

- Thailand will go through a massive need for data center infrastructure in years to come due to increase in data, population and economic growth.

- Thailand data infrastructure need a modernization strategy to make it agile, secured, cost effective and efficient ecosystem.

- GDCM enables agencies to choose from 6 available options to support their data infrastructure: Agency Own Data Center, Ministry Data Center, Cross Agency Data Center, 3rd Party Colocation/Physical Hosting, 3rd Party Services and G-Services.

- Establishment of 6 models based on standards as well as strategy will ensure improved performance for agencies and reduced overall spending.

- Proposed Standards comprised of 5 domains: Energy & Power; Design and Structure; Server, Storage and Utilization; Location and Site Space; and SLA with 19 element.

- GDCM is an initial 5-year plan consisting of 9 projects to drive long-term plan.

Thank you