Course: DPR Preparation

Day 3

Session 1
Understanding e-Governance Applications

राष्ट्रीय इ-गवर्नेंस योजना
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Agenda
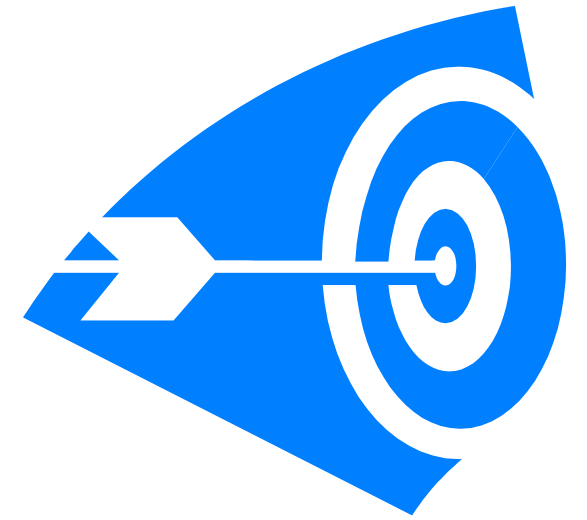
➢ Introduction to e-Governance applications

➢ Costs in e-Governance applications

➢ Customer development and COTS applications

➢ Licensing models in e-Governance applications

➢ Source code and IPR

➢ Strategic considerations

Understanding e-Governance Applications

Computer Software consisting of programs, enables a computer to perform specific tasks, as opposed to its physical components which can only do the tasks they are mechanically designed for.

There are three major categories of computer software:

▶ **System Software** helps run the computer hardware and computer system (e.g. operating systems, device drivers, diagnostic tools, servers, windowing systems, and utilities).

▶ **Programming Software** provides tools to assist a programmer in writing computer programs (codes) using different programming languages in a more convenient way (e.g. code editors, compilers, interpreters, linkers, debuggers).

▶ **Application Software** allows end users to perform/accomplish one or more specific business operations/tasks.

Understanding e-Governance Applications

Categories of Application Software:

▶ **Commercial-off-the-Shelf (COTS) Software**

    ▶ is a term for ready-made application software, available for sale, lease, or license to end users.

    ▶ COTS software is available for most of the support functions of the government and for some of the core functions of the government (e.g. HR, Finance, Supply chain, Tax and Revenue management..)

▶ **Custom Developed Software (CDSW)** l

    ▶ "in-house developed" (or "bespoke" or "tailored") software designed to meet the specific needs of end users/organizations.

    ▶ Most of the government entities in India are currently adopting custom developed software approach..

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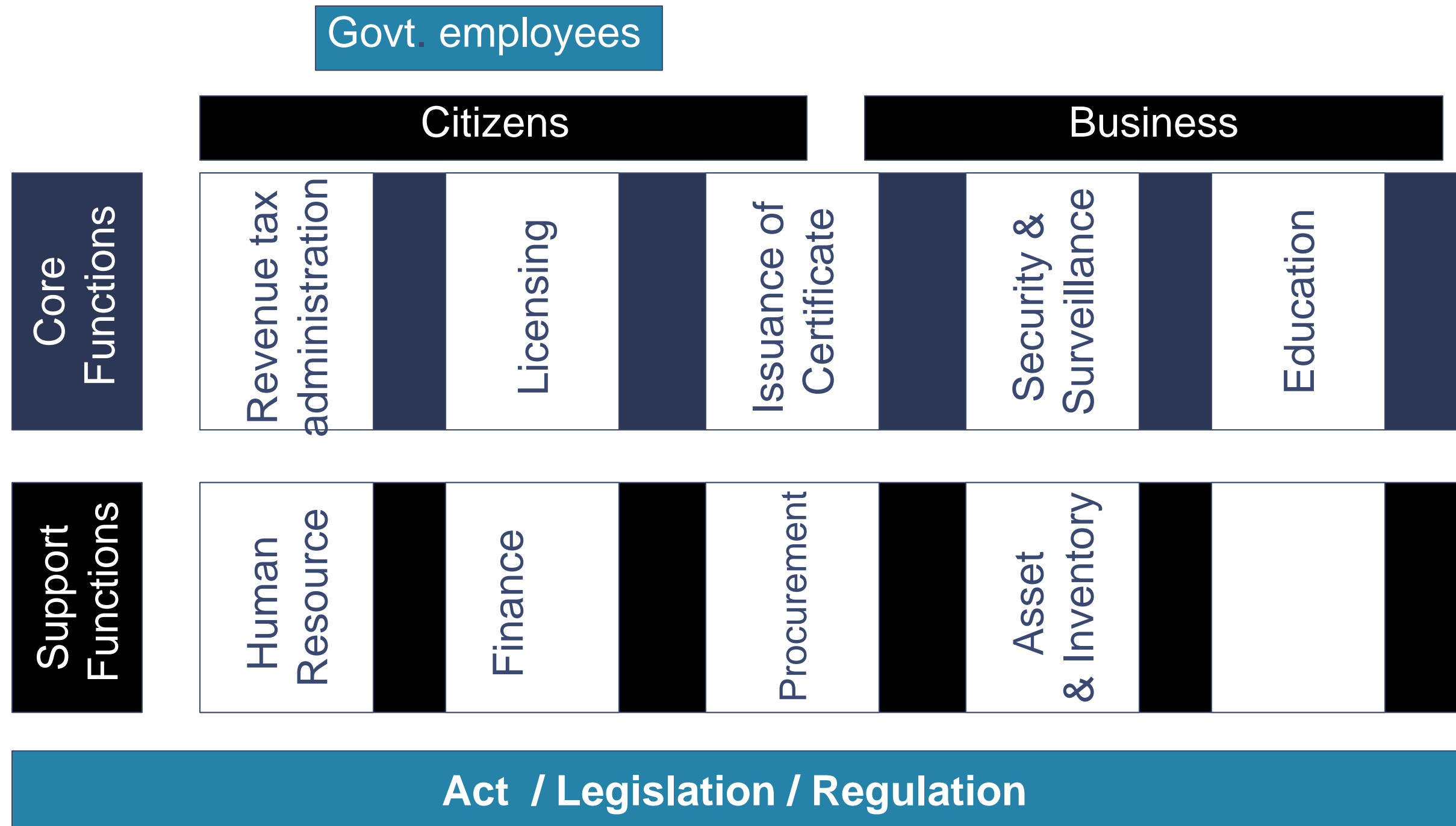
E-Government Applications Coverage (Illustrative)

G2C

- Revenue Administration Systems
- Taxes (municipalities, commercial taxes, excise, department..)
- Fees and duties (Registration department, land records..)
- Agriculture
- Public Distribution Systems
- Healthcare and Social Welfare (Healthcare, social welfare department..)
- Education (elementary, secondary, higher..)
- Security (police..)

G2B

- Registration of business
- Licenses and permits
- Filing of documents/returns
- Payment of taxes
- Procurement

E-Government Applications Coverage (Illustrative)

G2E

- HRMS
  - Recruitment
  - Career progression, Postings and transfers
  - Leaves…
  - Benefits..
- Payroll
- Pensions
- Insurance and Healthcare

G2G

- Financial Management
  - Planning and Budgeting
  - Expenditure and revenue mgmt
- Programme management and reporting
- Implementation of schemes

E-Governance Applications

Key Characteristics:

- Most of the application softwares today are on three or n-tier architecture and are web based applications

- Provides significant scope for reduction in administration burden and improving convenience to citizens and businesses – if planned and designed appropriately

- Provides significant scope for converting government services into self services, which can by performed by users by themselves without government involvement

- Custom software development and COTS/ERP applications options are available – though custom software development route is adopted predominantly

- Requires complex skills and capabilities for designing, implementation and management of high-performing applications/systems

- Functionality, user friendliness, security, performance, availability and scalability are key focus areas for design, development/deployment of systems….

E-Governance applications development during E-Governance Project Lifecycle

E-Governance Projects are identified here..

Existing applications are studied here for their relevance and suitability for upgradation

1. E-Governance Strategy Development

2. Current State Assessment

3. Future State Definition

4. Implementation approach and sourcing

5. Develop and implement IT system

6. Operate and sustain

The cost estimates for required application software are identified and a suitable business model definition and procurement is performed here…

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E-Governance applications development during E-Governance Project Lifecycle

Functional and Technical requirements for the application software required for the department are defined here…

Deployment, testing and implementation of application software is performed here…

1. E-Governance Strategy Development

2. Current State Assessment

3. Future State Definition

4. Implementation approach and sourcing

5. Develop and implement IT system

6. Operate and sustain

The cost estimates for required application software are identified and a suitable business model definition and procurement is performed here…

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E-Governance applications development during E-Governance Project Lifecycle

Software maintenance and upgradations are performed during this phase..

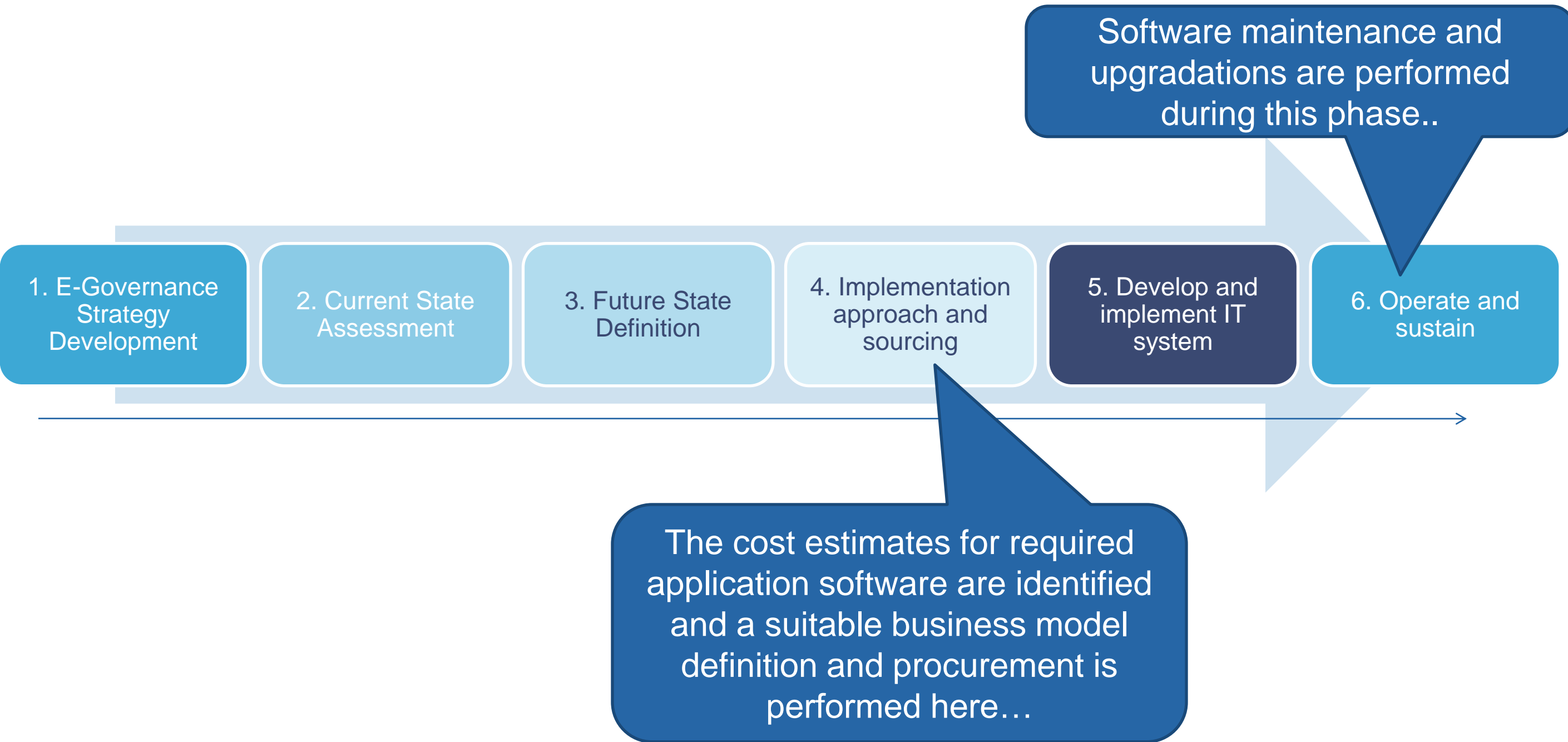| 1. E-Governance Strategy Development | 2. Current State Assessment | 3. Future State Definition | 4. Implementation approach and sourcing | 5. Develop and implement IT system | 6. Operate and sustain |

The cost estimates for required application software are identified and a suitable business model definition and procurement is performed here…

E-Governance Software Projects and Scope

| Consultancy Services | Software Design, Development and Maintenance | IT Infrastructure creation and maintenance | Citizen Service Delivery | Turnkey Project |

Software Design, Development and Maintenance

1. Definition of detailed functional and technical requirements

2. System design and development

3. Procurement and supply of software (system software, ERP..)

4. Software Testing

5. Data Digitization

6. Training and capacity building

7. Project documentation

8. Software Operations and Maintenance

9. System Software AMC

Software Project Categories:

1. COTS/ERP Implementations

2. Bespoke/Custom Application Software Development

Costs in Software Design, Development and Maintenance…

One time costs..

COTS Software:

1. System Software for Application Server, Database Server, Integration Server
2. Application Software for ERPs solutions
3. Workflow automation, Documentation Management Systems..

Services Cost:

1. Requirements study and finalization
2. Software Design and Development
3. ERP Customisation and configuration
4. Project Documentation
5. Data digitization and migration

Recurring Costs:

COTS Software cost:

1. AMC for software licenses

Services Cost (recurring):

1. Training and Capacity Building
2. Software maintenance and support, Software change management, Project documentation..

Vision & Strategy Development

Current State Assessment

Future State Definition

Implementation approach and sourcing

Develop and implement T system

Operate and sustain

Project Phases

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Investments needed in E-Governance Applications

- Investments needed in e-Governance applications depend on the model for application selection:

  - Custom development or

  - ERP/COTS model

- Each model has unique advantages and challenges associated, if not managed can seriously impact the project success

- Each model unique cost elements – important to understand cost elements in deciding the business model…

Understanding Custom Development Vs COTS Models

Custom Development:

- Application software is developed by the software developers based on the business needs of the customer

- Can involve development of a completely new software from grounds up or reusing the software components/code for requirements of similar customers (depends on IPR and source code rights)

- Can be a long drawn process as entire software is developed grounds-up

- Cost of the software development depends on the functionality of the system, technology adopted for development and the entity selected for software development – proportional to the quality

COTS/ERPs

- COTS/ERPs exists for both support and core functions of government – predominantly used in support functions currently in government

- Low level of awareness on the COTS products existing in core functions of departments (e.g. tax collections)

- Industry specific solutions (tailored for government requirements) exists

- Built on global best practices and learnings

- Inbuilt features for addressing functionality, security, performance, scalability requirements

- Cost of application software depends on the product, vendor and number of users..

Costs in Custom Development Projects

Design and Development Phase:

- Services cost

  - Requirements study

  - Design, Development and implementation

  - Training

- System software cost

  - Cost of application server, database server, web server..

  - Open source tools/systems exists for system software requirement..

Operations Phase:

- Services cost

  - Software operations and maintenance

  - Software change management and upgrades

  - Training

  - Helpdesk..

- System Software Cost

  - AMC for system software (application, web, database servers)

  - AMC costs exist for open source systems –if support is needed for tools – can be relatively low for open source systems

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Costs in Custom Development Projects

Cost Element	Per Unit Price (Rs.)	No. of Units	Cost per Item (Rs.)
Products and Tools			
Application Server software			
Web or Portal Server software			
Database Server software			
………………			
Services			
Software Design and Development			
Training			
Total Capital Expenditure..			

Recurring Cost		Y1	Y2	Y3	Y4	Y5
Products and Tools						
1	AMC for Web or Portal Server software					
2	AMC Database Server software					
3	…………….					
Services						
1	Application software support					
2	Software Change Management					
3	Training, Help desk…					
6	**Total Operational Expenditure (Opex)**	INR 0	INR 0	INR 0	INR 0	INR 0

Costs in COTS Products

Design and Development Phase:

- Services cost
    - Requirements study
    - Configuration and customisation of the product for business needs
    - Training
- Application & System software cost
    - License cost for the application software
    - License cost for the system software (e.g. database server, application server, web server)

Operations Phase:

- Services cost
    - Software operations and maintenance
    - Software change management
    - Training
    - Helpdesk..
- System Software Cost
    - AMC for application software (application, web, database servers)
    - AMC for system software (application, web, database servers)

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Costs in COTS Products

Cost Element	Per Unit Price (Rs.)	No. of Units	Cost per Item (Rs.)
Products and Tools			
Application Server software			
Web or Portal Server software			
Database Server software			
Application Software/module			
Services			
Software Customisation and Configuration			
Training			
Total Capital Expenditure..			

Recurring Cost		Y1	Y2	Y3	Y4	Y5
Products and Tools						
1	AMC for Web or Portal Server software					
2	AMC Database Server software					
3	AMC for Application Software/module					
Services						
1	Application software support					
2	Software Change Management					
3	Training, Help desk…					
6	**Total Operational Expenditure (Opex)**	**INR 0**	**INR 0**	**INR 0**	**INR 0**	**INR 0**

Understanding Licensing Models for Application and System Software

Licensing models for System Software (COTS/ERPs)

- Capital cost for purchase of software

- Licensing is based on the number of users

- For organizations with very large number of users – enterprise licensing policies exist

  - Not all vendors provide enterprise licensing policy

- Recurring cost for AMC of application software – to be paid on annual or quarterly basis

- AMC cost depends on the cost capital cot (generally between 15-22% of capital cost per year)

- AMC provides support for errors/bugs and upgrades for application software…

Licensing models for Application Software (COTS/ERPs)

- Capital cost for purchase of software

- Licensing is based on the number of servers, processors in the server or number of users

- Typically, web and application software licensing is based on the number of servers

- Database server software licensing policy is based on number of users or a number of processors in a server

- Processor based licensing is preferred in case of large number of users

- User based licensing is preferred in case of small number of users

- Recurring cost for AMC of system software – to be paid on annual or quarterly basis

- AMC cost depends on the cost capital cot (generally between 15-22% of capital cost per year)

- AMC provides support for errors/bugs and upgrades for system software…

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Understanding Source Code Ownership and IPR

Source code

- Source code refers to the software programme/code written/developed for achieving functional requirements of software

- Source code is needed for making any changes to the software functionality/design

- It is important and critical for the government to have the source code and its usage and modification rights to ensure continuity in software usage and operations – even when there is a change in the vendor

- It is critical to ensure that source code existing with the government is current and updated based on changes in application software

- The contract/agreement should have provisions to ensure usage/modification rights on the source code by the govt.

IPR

- Intellectual Property Rights (IPR) refers to ownership of the source code in software programmes

- As per Copyright act, the copy right to the source automatically rests with the developer/private partner

- In the contract, government need to get the needed rights assigned to the government (i.e. right to make changes or right to sell or extend services to other entities...)

- If government has rights on source code modification and changes, it does not mean that it has IPR

- Entity having IPR can sell or resell its software/product to multiple clients

- In COTS/ERP products, IPR is not given to the government – only usage rights are provided

Strategic Considerations in an e-Governance application

Technical Considerations:

- Functionality

- User interface

- Performance

- Scalability

- Availability

- Security

- Documentation…

Business Considerations:

- Cost of software development and maintenance

- Source code and IPR

- Software Manageability

- Data Ownership and security

- Business continuity…

Design of business model largely focuses on these business considerations…

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End of Session

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