

# Connected Government: Productivity Enhancement

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(i)

**Abstract—** Connected Government Framework helps the evolution of Government systems based on Government Architecture Strategy, Goals, Principles and Standards. It helps in reduction in the IT spending in terms of increasing functionality, availability, reusability and scalability. Adoption of Connected Government Framework provides the benefits like citizen-centricity, certificate less governance, multi-channel service delivery, improved service levels and better performance. For Government Architects, it serves as a key input when creating department/agencies future state architecture. The real value of Connected Government Framework is not in making better software applications, but in making a better government. This paper attempts to describe the Framework for the Connected Government Enterprises. This framework describes architecture for Connected Government and moves on to explain various components of the Whole of the Government that helps for the better service delivery to citizens. Connected Government Architecture enables the reuse and interoperability across Government.

**Index Terms—** Connected Government, Whole of Government

## II. INTRODUCTION

Connected Government Framework (CGF) is set of concepts, guidelines and standards for conducting analysis, design, planning and implementation of the vision, goals, strategies, functions, activities and desired outcomes of a Government [1-3]. The IT infrastructure and IT services aligned to the business strategies and business services, through standardization and integration of various departments. The real value of CGF is not in making better software applications, but in making a better government. Citizen centricity is the essence of Good Governance. It involves building a 360-degree view of a citizen across all his touch-points with the government.

The CGF applies to Whole of Government (WoG) of any category of government business like Central Government, Regional Government, Local Government and Agencies. Next Generation Technology adoption makes the business, processes more efficient and reduction in cost of delivery.

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CGF focus on two main stakeholders: Citizens and Government Departments. The indicative list of expected benefits of CGF System are,

### A. Citizens

- Integration with various departments would enable citizens with reduced number of visits to government office / departments for availing the services
- A secure transaction
- Seamless availability of information
- High Citizen Satisfaction

### B. Government Departments

- Web enabling of legacy applications
- Easy inter-departmental data exchange
- Help departmental work flow evolve
- Seamless availability of information
- Centralized management
- Shared services

The aim of Connected Government is to establish an Integrated Operating Model which enables collaboration among departments to deliver personalized services via multiple channels through which citizen participates in an outcome driven, transparent and accountable government. In addition, CGF can play a significant role in enabling the Government by providing the vital glue by overcoming bottlenecks and make the businesses more responsive, eventually facilitating service delivery.

## III. PURPOSE OF CONNECTED GOVERNMENT

During the course of assignments/experiences with various Government engagements, the author come across the following observations - some of these indicate a lack of maturity of the Global Government Initiatives and advanced technologies.

- Most of the Government departments/agencies have developed significant amount of in-house or home-grown applications which are not flexible
- Most of the custom developed applications do not have the required scalability, maintainability to sustain growth in volumes or functionality
- Applications face interoperability issues with other applications in the Government landscape. Integrating a

new application or process requires a considerable effort on part of the other applications

- Most of the government departments, the application boundaries were unclear. Additional functionality that was not in the original scope of application pushed onto it. This results into development of the small & multiple applications without proper boundaries
- Usage of Legacy systems, poor integration across various applications and Internal Systems. Most of the Integrations are developed on ad-hoc basis and Point to Point Integration
- Department to department communication is not established. Geography spread of the usage of the services does not exist.
- Redundancy of the Business Functions in different applications. Reusable services were not built
- Fragmented data across the different applications and no integrated view of the Strategic data
- Lot of Performance Issues due to the usage of the Complex Integration across various departmental systems
- Lack of Mobile Centric approach

This paper helps in overcoming above listed problems by introducing CGF frameworks for WoG Transformation. The WoG provides integrated services to citizens through a free flow of information. It helps in establishing good governance characterized by efficiency, effectiveness, transparency and foresight.

#### A. Pillars of connected government

The Goal of CGF is to enable citizens and private/public sectors to access the Government Services in effective & efficient integrated Services delivery to the customers anywhere, anytime in a form convenient to the Service recipients with Internet & other channels like Mobile Computing, WAN etc. It enables citizen to participate in Government Policies framing and decision-making, enhanced transparency, empowerment and less corruption.

Connected government is about enabling governments to connect seamlessly across functions, departments and jurisdictions to deliver effective and efficient services to citizens and businesses. The concept of connected government derived from whole- of-government approach that utilizes technology as a strategic tool and as an enabler for public service innovation and productivity growth.

The following diagram explains the various pillars of connected government and their purpose

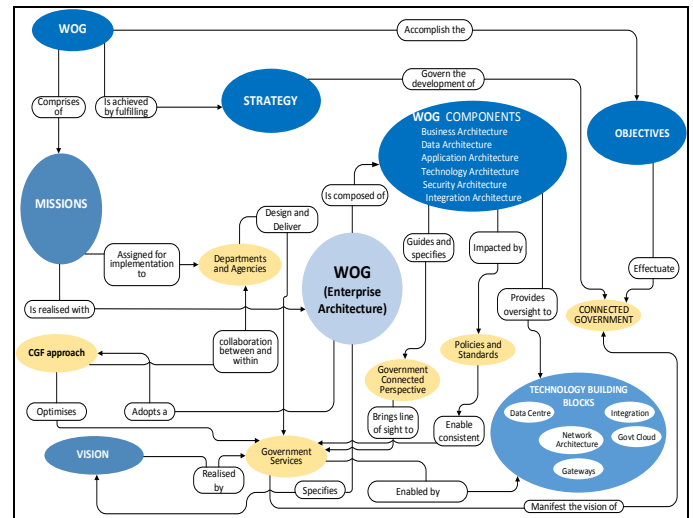


Fig. 1. Pillars of Connected Government

CGF helps to achieve the following at the abstract level,

- It is more of a communication channel to the Government
- Helps the Governments to accommodate their Strategies, Vision, Objectives and Principles
- Real time Integration Model, helps to reduce the latency of the data updates
- Used to define single source of Information
- Provides the clear vision on the managing of the information and security
- Cost Optimization across Project and Solution Portfolios, by eliminating unused or duplicate investments and assets
- Shorter Implementation Time and Cost
- Reduced effort and cost through re-use, interoperability, and IT readiness
- Faster time to market in deploying Government services
- Better-managed service level agreements through Quality of Service engines and Business
- Activity Monitoring functionality
- Improved flexibility in service creation, maintenance, and management through clear interfaces, standard protocols, service autonomy, and encapsulation
- Increased availability, scalability, and distribution of services

#### IV. CONNECTED GOVERNMENT FRAMEWORK

Connected government is about enabling governments to connect seamlessly across functions, departments/agencies and jurisdictions to deliver effective and efficient services to citizens and businesses. CGF is an abstraction of multiple solution architectures designed and implemented to solve a specific business or technical problem in a given problem space. It incorporates learnings, standards and best practices gained from multiple successful implementations. Adoption of CGF provides the benefits like citizen-centricity, certificate less governance, multi-channel service delivery, service levels and better performance.

WoG reduce challenges in the ability to leverage solutions across Government. For architects, it serves as a key input when creating department/agencies future enterprise architecture. Additional benefits of WoGs include risk mitigation, simplified decision making, improved deployment speed and cost reduction.

#### A. Layers of Connected Government Framework

The major components of the WoG are Operational applications, core data, technology, infrastructure, support and policy. The following diagram depicts the framework for the Government technology of the Whole of Government (WoG).

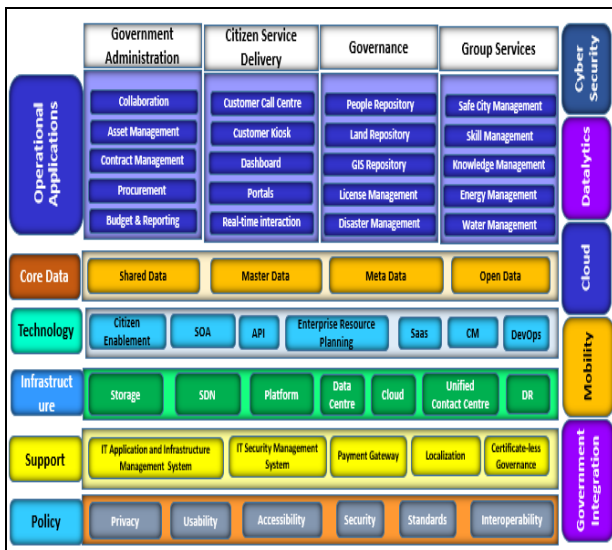


Fig. 2. Layers of Connected Government

The details of each layer is explained below,

##### 1) Operational Applications

Operational Applications realizes targeted service portfolio as required by various users such as citizens, employees and business. It moves towards adoption of standardized applications designed to work on a unified delivery mechanism and accessible through multiple end user devices. Adopting the principle of “Build once, use many times”, CGF Application Architecture:

- a) Categorizes all applications into Government Administration, Citizen Service Delivery, Governance and Group Services
- b) Promotes reduction of technological diversity
- c) Enables interoperability

##### 2) Core Data

The core data addresses the types of databases exist in the system, how they are integrated, overarching management framework that include data governance, vision, principles and standards, data security, data access, lifecycle and migration models and various data models such as conceptual, logical and physical. The core data enables:

- a) Creation and maintenance of data as the single source of truth

- b) Capturing data only once – at source
- c) Standardization of data dictionaries, master data, and metadata.

##### 3) Technology

Enable Government and Citizens to take advantage of the cutting-edge technologies like SMAC currently and those that emerge in future. The principles of open data, open standards and open APIs shall be in- grained in all the system development effort. The CEF should ensure the right balance between information security and privacy.

##### 4) Infrastructure

Government Infrastructure consists of technology building blocks that support the systems used in Government, both software and hardware. Design of Infrastructure is to fulfil the requirements of Government Enterprise Architecture with latest technologies and best suitable options. The Architecture should be modular in structure and allow easy extension, expansion, enhancement or replacement in parts, with technological advancements.

##### 5) Support

Applications that enable day-to-day operations of workforce. E.g., email system

##### 6) Policy

It provides guidance on key technology policy areas for e-Government

#### B. Architecture Principles

Architecture principles are a set of guidelines that reflect consensus across the Government. They govern the development, maintenance, and use of the enterprise architecture. Architecture Principles are,

- Organization Principles
- Data Principles
- Application Principles
- Technology Principles

#### C. Architecture Design Considerations

##### 1) Interoperability

- a) Multi-vendor environments
- b) Multi-version technology
- c) WS-\*

##### 2) Service Orientation

- a) Business and technology focused services

##### 3) Scalable

- a) Transaction volumes
- b) Functionality

##### 4) Security

- a) Secure in Design, Development and Deployment
- b) Integration of Identity

#### D. Government Integration

Government IT departments are constantly under pressure to deliver new functionality and enabling new apps, products, business models and processes. The integration of existing applications is often low on the agenda, resulting in loss of efficiency, integration errors and extended time-to-market.

Integration acts as a neural network of the government departments, to which all systems can connect. Integration is a core component in the Integrated Government that helps in achieving many of the objectives like One Government, Data sharing, Single-Source-of Truth, Crosscutting services, and Common Applications. It helps to move towards a “Certificate-less society” or, ideally towards “Service-less Services”

Using open standards and service-oriented architecture will help in realizing the principles of interoperability, reusability, extensibility, loose coupling, technology independence, vendor independence etc. In addition, the objective of the integration is to have no point-to-point integration between the various Government systems and to reduce the number of interfaces to maintain.

#### *E. Mobility*

As mobile usage rises, citizens are demanding more exclusively mobile experiences from their governments—ones that move beyond basic apps and optimizing web pages for devices. To serve mobile stakeholders, governments will be required to adopt a mobile-centric approach as part of an overall digital, e-government strategy.

Using the mobile web sites and mobile apps all the citizens can access the Government services offline from smart phones, tablets or other devices at anywhere and anytime. This will be more users friendly and helpful to the citizens and will increase the use of services by the citizens and improve the customer engagement. Citizens benefit from increased connectedness away from the place.

Mobility in connected government helps in,

- Fast reachability to all places of citizens
- As an add-on or enhanced feature to an existing product
- As a way to improve business processes and services
- Provide value to the citizens
- Ease of use and quality performance
- Improve citizen engagement
- Cultivate citizen loyalty

The suitability of government services be delivered over a mobile channel depends on a combination of demographics, frequency and recurrence of use, immediacy and urgency of use, potential level of automation, relevance of location information for service delivery, and how compelling the use of the service is.

#### *F. Cloud*

Cloud is a platform that, when combined with the internet and a growing access to powerful personal devices, will make the Digital Economy truly possible.

Cloud technology constitutes a change in computing and knowledge management, with hosted IT services delivered on a shared, internet-based platform. The real value is the ability to use that platform to combine data access and

exchange with access to low-cost computing and applications to provide efficiency and flexibility.

To realize the benefits of cloud three core elements will be used to provide evidence of this shift

- the development of a cloud strategy
- the testing of a proof of concept
- the partial implementation of a cloud environment

The main objectives of cloud adoption in Government are cost reduction, speed of procurement and deployment, and responsiveness to regulations and needs for cost cutting. Aim of the Government is to reduce its IT infrastructure investment and cut costs by lowering the total cost of ownership (TCO), and cutting down on overall spend on IT administration.

#### *G. Datalytics*

DataLytics is an integrated Business Intelligence and Data Analytics system that includes conventional and Big Data. Analytical engine takes data from various government department databases, internet, sensors, machine logs and other sources, transforms them and presents them in an analyze-able format. DataLytics provides tools for performing analysis on the data, and gain insights, make databased predictions, and identify best course of action for improving operational efficiency and governance.

Data comes from numerous sources including historical, video, audio, cell phones, geospatial, imagery, sensors, and social media.

From crime prevention to transportation, defense, national security, revenue management, environmental stewardship and social services, governments must wrestle every day with collecting, protecting, analyzing and using this data.

#### *H. Cyber Security*

Cybersecurity is an integral part of cross-functional services of IT. It classified as three major security categories,

- Data protection (encryption, cloud security, access control and authentication, secure data sharing)
- Network protection
- Device protection (server, desktop, laptop, mobile and industrial controls)

Government departments/agencies need to implement more encryption technologies that enable departments to protect the data and transmit that data securely.

### V. BENEFITS OF CONNECTED GOVERNMENT

By adopting CGF, the governments connected more than ever before being FAST (Flat, Agile, Streamlined and Tech-Savy). CGF helps to drive public sector transformation and realize connected government with the following benefits like, one government, Citizen centric government and enhanced quality of life.

#### *A. Citizens*

Benefits to the Citizens are,

- Citizen has a single window service catering to multiple departments

- Able to intelligently route the citizen request from the website / portal to the destination department and send an acknowledgement back
- Keeps a record of each transaction in a secure manner & does not open the packet data (payload)
- Seamless availability of information - The placement of constellation of Gateway Servers will facilitate in getting information and doing transactions by citizens of one Department to other seamlessly.

#### B. Government Entities

Benefits to the Government Entities are,

- Multiple Delivery Channels: Facilitate easy provisioning of government services through various delivery channels seamlessly.
- Better Audit Management & Time Stamping: Results in better tracking (auditing) and security of each transaction
- Web enabling of Legacy Applications: Legacy applications can be Internet enabled as Gateway server can act as a Web layer around them so Government Departments need to put least effort for web enabled of their legacy applications.
- Interoperability : The middleware will facilitate easy inter-departmental data exchange
- Seamless availability of information: Facilitate in getting information and doing transactions by citizens of one Government Department to other seamlessly.

Dr.Gopala Krishna Behara is an Enterprise Architect with 19+ years of extensive experience in the ICT industry which spans across Pre-Sales, Consulting, Enterprise Architecture, Service Oriented Architecture, Business Process Management, Solution Architecture, Project Management, Product Development and Systems Integration. He is certified in Open Group TOGAF, IBM Cloud Solutions. He serves as an Advisory Architect and Mentor on Enterprise Architecture, Application Portfolio Rationalization and Architecture Assurance initiatives and continues to work as a Subject Matter Expert and Author. He has worked on multiple architecture transformation engagements in the USA, UK, Europe, India, Asia Pacific and Middle East Regions that presented a phased roadmap to transformation that maximized the business value, while minimizing costs and risks.

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