ICT Enterprise Architecture uses the Indonesian e-Government Rating Dimension (PeGi) (Case Study of ICT Masterplan of Cirebon City Government)

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Abstract: *In accordance with the Instruction of the President of the Republic of Indonesia No. 3 of 2003 concerning National Policy and Strategy for the Development of e-Government, each government agency must have a Strategic Plan for e-Government Development. The Cirebon City Government plans that the master plan for the development of information and communication technology is the basis for the development of information technology applications and infrastructure in the Cirebon City Government. This study uses the Indonesian e-Government rating dimension, the guidelines of which are made by the Ministry of Communication and Information of the Republic of Indonesia, five dimensions have been determined which will be studied by the ICT masterplan, namely Policy, Institution, Infrastructure, Applications and Planning. It is expected that a plan for the implementation of Information Technology (e-Government) in the Cirebon City Government is in line with the latest developments and needs, and the availability of guidelines in the development, maintenance and management of Information Technology in order to support the tasks and functions of the Cirebon City administration.*

Keywords: Enterprise Architecture, ICT Masterplan, PeGi, City of Cirebon

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I.   INTRODUCTION

As mandated by Instruction of the President of the Republic of Indonesia No. 3 of 2003 concerning National Policy and Strategy for the Development of e-Government, each government agency must have a Strategic Plan for e-Government Development. It is intended that development activities can run harmoniously and in an integrated manner through realistic and measurable stages, taking into account initiatives originating from various work units.

The Cirebon City Government plans that the master plan for the development of information and communication technology is the basis for the development of information technology applications and infrastructure in the Cirebon City Government. With the existence of the Cirebon City Regional Regulation Number 5 of 2014 concerning the Implementation of Communication and Information Technology, it is felt necessary to attempt to re-align the e-Government masterplan so that it can be aligned with the vision, mission and direction of strategic policy, so that it can always be in line with the dynamics of the development of governance in the environment. The Cirebon City Government and supporting the achievement of development goals that are felt by the community.

II.   LITERATURE REVIEW

Enterprise Architecture, ISO / IEC 42010: 2007 defines architecture as: The basic organization of a system, which is contained in its components, their relationships with each other and its environment, and the principles governing its design and evolution [1].

The enterprise term in the context of enterprise architecture can be used to demonstrate the entire enterprise encompasses all the information and services of technology, processes, and infrastructure and enterprise-specific domains, and architectures across multiple systems, and several functional groups in the enterprise [2] [3] [4]

The ranking of Indonesian e-Government (PeGi) is an activity held by the e-Government Directorate, Directorate General of Applications and Telematics, Ministry of Communication and Information of the Republic of Indonesia, which involves Government agencies in all regions of Indonesia. This PeGi activity is an activity that is held in order to see a map of the conditions of the use of Communication and Information Technology (ICT) by Government agencies nationally. PeGi is expected to increase the development and utilization of ICT in Government agencies throughout Indonesia. In its implementation, the Ministry of Communication and Information of the Republic of Indonesia collaborates with various groups from the elements of the ICT community, universities and relevant government agencies [5] [6] [7].

III.   RESEARCH METHODOLOGY

The methodology in this study uses the Indonesian e-Government rating dimension whose guidelines are made by the Ministry of Communication and Information of the Republic of Indonesia; five dimensions have been determined which are:

A.   Policy,

B.   Institutional,

C.   Infrastructure

D.   Application, and

E.   Planning.

Each dimension has the same weight in the assessment because everything is considered important, interrelated, and support each other.

IV.   RESEARCH RESULT

ICT Analysis of Cirebon City

A.   ICT Map Strategy City of Cirebon

a.   The main theme of the development of e-Government is the integration of ICT for excellent service solutions.

b.   There is an alignment of IT Masterplan that can see the ICT condition now and see plans ahead.

c.   There is an information system that is reliable and easy to use, especially at the executive level

d.   Information systems that can be accessed through mobile devices (smartphones / PDAs)

e.   Building HR capacity and capability in the ICT field

f.   Having links with information disclosure

g.   Includes information system management in the city of Cirebon

h.   Review the information presented

i.   Planning for information that will be presented

j.   Information system integration in the local city (intranet) of Cirebon City

k.   Accommodate Presidential Instruction No. 3 from the Ministry of Transportation, Information and Communication regarding the guidance of e-Government Blueprint

l.   The resulting document can be used as an implementation guide not theoretical,

m.   The use of reliable, integrated and developing ICT

B.   Analysis of Policy Dimensions

a.   Strategic and tactical level policies are needed as guidelines for the implementation of the development and utilization of ICT in all government service department in the Cirebon City Government.

b.   Uncoordinated activities and budgets for the development and utilization of ICT for all government service department have not been coordinated, so it is difficult to plan and evaluate the effectiveness and efficiency of ICT budgets as intended by the implementation of e-Government.

c.   There is no SOP for procurement, planning, utilization and control related to the development of the e-Government of Cirebon City Government, this is at risk in the provision of procurement and utilization of ICT for each unsynchronized and non-standard government service department that triggers budget in-vulnerability.

C.   Institutional Dimension Analysis

a.   Functional organizations such as CIOs or regional ICT boards have not been formed as directed by the Ministry of Communication and Information at the Ministry of Communication and Information No. 41 of 2007, this organization is led directly by the regional head for functions that determine the policy and monitoring and development of ICT utilization.

b.   The Department of Transportation, Information and Communication currently does not fully control the development and utilization of ICT and budget control in an integrated manner, because the authority given is not optimal. so it has not been able to provide effective and efficient e-Government in the Cirebon City Government.

c.   Human resources managed by the Department of Transportation, Information and Communication are far from sufficient to manage ICT in all government service department.

D.   Application Dimension Analysis

a.   Many applications that have been developed by government service department but because government service department do not have sufficient resources so that the application becomes less optimal utilization because it is not supported by adequate ICT infrastructure that should be managed by the Department of Transportation, Information and Communication.

b.   Information systems for government in sub-districts and villages are still not fully developed so that the existing infrastructure is still not optimally utilized for e-Government needs, still limited to surfing the internet which is often not directly related to office activities.

c.   Risks that arise in terms of the current conditions of ICT applications are budget inefficiencies due to lack of optimal application operations and decreased performance due to lack of optimal application operations.

d.	Data is still scattered in each government service department and has not been inventoryed by one government service department. Risks arising from existing data conditions are difficulties in data searching, difficulties in data reporting, risks in data security, and risks in data integrity.

E.	Infrastructure Dimension Analysis

a.	ICT Infrastructure Development is very urgent to be resolved. As a modern city and located on the main coastline of the north that connects traffic between regions and is often the city where national and international events are held, Cirebon city should have an adequate information system and ICT infrastructure.

b.	The management of bandwidth is not optimal so that whatever bandwidth is available will always feel lacking so that some government service department still want to conduct their own bandwidth needs through other operators' services according to the government service department's desires, this is at risk of optimizing IT resources and the utilization of ICT cannot be controlled properly.

c.	Each government service department is in dire need of access, server and storage devices managed by the government service department of the Department of Transportation, Information and Communication. Gradually the data center will be built in accordance with the standards. Independent data center management will reduce information security vulnerabilities.

d.	Cable / wireless information / network security systems have been implemented but not audited. government service department that are connected to the internet network are constrained in providing LAN, this is also related to the constraints of the role of the Transportation, Informatics and Communication Service in providing LAN government service department including the control of each government service department LAN.

F.	Planning Dimension Analysis

a.	The City Level Development Plan (RPJMD) has not explicitly made ICT as a supporter of all aspects and acceleration is needed for its utilization.

b.	A Business Continuity Plan (BCP) for managing ICT infrastructure has not been compiled, so that in the event of a service failure, the Cirebon City Transportation, Information and Communication Agency has difficulty in carrying out a fast, accurate and effective action to ensure the sustainability of the system.

c.	The coordination of government service department ICT activities has not yet been coordinated, this makes it difficult to make policies to optimize the budget in the ICT sector

d.	Currently there is no planning and control function for implementing e-Government in the Cirebon city government.

e.	ICT implementation cannot be measured directly in supporting the Cirebon city development mission

f.	Inequality in the implementation of ICT in units in the Cirebon City Government environment

g.	The lack of uniform technological standards, policies and fairness of prices in the implementation of ICT activities in government service department

h.	Redundancy of activities related to ICT, which can actually be integrated.

i.	ICT activities are not integrated.

G.	Vision, Objectives and Strategy of Cirebon City e-Government Implementation

a.	A clear vision of the leader: Some leaders who do not have a good understanding of information and communication technology, as a result of these leaders have not been able to produce a good vision of the development and use of information and communication technology in the construction of the city of Cirebon

b.	Strong support from the community: Strong support from the community, support will be obtained if the community understands well the impact of the ICT implementation, the community will also support if the community needs and can utilize the services found in the ICT.

c.   Determination of the e-Government agenda

Recommendation of the ICT Masterplan of the City of Cirebon

A.   Vision, Objectives and Strategy of Cirebon City e-Government Implementation

a.   Vision: Realizing Cirebon to be a Smart City with efficient, effective, accountable and transparent governance with good and right e-Government governance.

b.   Mission:

–   Strengthening information and communication technology governance

–   Building an integrated information and communication technology infrastructure to improve government performance and community services

–   Develop an integrated information system in accordance with the vision and mission of the city administration

–   Improve public information disclosure

B.   Implementation Stages Strategy

a.   Strengthening the policy and institutional posture will be focused on the first and second years of the focus of the implementation of this masterplan alignment, in the third year to the end of the fifth year only a review, and the addition of SOPs as needed, while for HR more general procedures.

b.   Strengthening infrastructure to achieve ideal conditions will be carried out for the first 3 years and the next 2 years and so on, only the maintenance and replacement of the equipment must be replaced based on the effective age and level of damage.

c.   Infrastructure Development (e-Government application) in the first 2 years will be integrated into the integrated system architecture, business reengineering process in all bureaucracy, socialization and implementation of sample projects, in the next 3 years massive system development activities involving all government service departments .

C.   Policy Dimension Strategy

a.   Accelerate the preparation of regulatory provisions related to the development, management and utilization of e-government / ICT Cirebon City Government

b.   Accelerate the application of e-government development in the bureaucracy by encouraging changes in bureaucratic processes and electronic-based work culture

c.   Building and strengthening standardization of delegation of tasks and authority of ICT development to all government service departments as an effort towards effectiveness and efficiency of the development, management and utilization of ICT in the Cirebon municipal government.

d.   Conduct socialization, control and monitoring of strategic policies that are legitimate to implement, to ensure that policies have been implemented properly in all government service departments.

D.   Institutional Dimension Strategy

a.   Establishment of CIO / ICT Board functional organization where the regional head or at least the head of echelon 2 government service department is competent to make ICT policies that lead directly in controlling the development and utilization of ICT

b.   Strengthening the role of government information technology service department management institutions that are specifically and independently in the management of e-Government to facilitate coordination with other government service departments in ICT management

c.   Enhanced HR capabilities in the ICT field, both government service departments that handle government information technology service department and other government service departments

d.   Procurement and distribution of human resources related to ICT is coordinated with the related government service department to government information technology service department: number, qualifications, education

e.   Legality policy of ICT managers in the government service department

f.   Establishment of functional positions for career positions (Computer Managers, Engineers, Engineers, Researchers) for ICT HR

g.   The need for assistance for the development of ICT management

h.   The establishment of Helpdesk functions and monitoring of government service department networks, both external and internal networks, are carried out quickly.

E.   Infrastructure Dimension Strategy

a.   Accelerate the provision of Fiber Optic backbone network that reaches all government service departments and community service distribution networks up to the kelurahan / puskesmas / school level

b.   Accelerate the development and management of good Data Centers and Data Recovery to guarantee availability and increase information security

c.   Intranet utilization for communication between government service departments

d.   There is a standard policy for managing ICT infrastructure in the government service department

e.   The existence of bandwidth management policies, Public Internet Protocol (IP) and utilization of internet access for all government service departments

F.   Application Dimension Strategy

a.   Ownership development, use of integrated data / information and e-government applications within the framework of interoperability.

b.   For the management of data and information assets in the Cirebon city government, it is necessary to centralize data and information resulting from data processing in the government service department at the data center government service department.

c.   Each government service department has an information system both for community services (G2C), business world (G2B) and internal services (G2E), in accordance with the priority needs in stages.

d.   The need for metadata standardization for application development and single data management in the framework of interoperability.

e.   The Open Source Software policy is used for application development and server operating systems, while for clients / desktops use open source / proprietary software.

f.   Acceleration of Cirebon City website redevelopment and integrated government service department website development.

g.   The use of free public social media both based on text, audio and video, to publicize the government service department activities to the public, as well as respond to public responses as part of public information disclosure (KIP)

G.   Planning Dimension Strategy

a.   The establishment of this e-Government Development Plan document is used as material for the preparation of the RPJMD and strategic government service departments related to ICT development

b.   Preparation of action plan documents for each ICT activity that has a broad impact on the performance of the government service department

c.   Business Continuity Plan (BCP) for ICT infrastructure services is immediately compiled

d.   Dissemination of the development and utilization of e-government to the executive level

e.   There are recommendations for budget optimization for the implementation of ICT for all government service departments from the government information technology service department.

H.   Policy Blueprint

Table 1. Policy Blueprint

Regulation	Theme
Regulation of Mayor e-Government Polic	E-Government Management Organization which contains the Decree of Vision and Mission, Form of Organization, Autonomy, Indicators of success and Honor
	Development and Implementation of integrated e-Government applications
	Integrated infrastructure development and utilization
	Standardization of metadata
	Management of regional information assets
	Use of legal software (opensource, proprietary)
	Use of information access
Regulation of Mayor ICT SOP	Information Security and Incident handling
	Data Center Management
	LAN Network Management

I.   Planning Blueprint

a.   E-Government Planning must involve all components in the city government through a mechanism that has been established through the mayor's regulation

b.   Implementing governance of e-government planning is one of the functions of managing information systems carried out by a work unit under the government information technology service department

c.   Periodically (short-term, medium-term and long-term) e-Government planning must be made contained in official documents established through the mayor's regulation

d.   The intended planning is:

–   25 year Master Planning

–   5 year strategic planning

–   Action Planning every year

–   System sustainability planning

e.   Every content of ICT planning is part of city planning

J.   Institutional Blueprint

a.   ICT Government government service department, Cirebon City Government, namely the government service department that handles affairs.

Information and Communication System Development:

   System management is running the function:

–   Comprehensive e-Government Planning,

–   Application system planning (SIM, EIS, DSS)

– Preparation of system development documents,

– System socialization,

– Implemented system performance measurement (internal auditors and external auditor contacts).

Integrated application and system development performs functions:

– Development of e-Government applications,

– System migration,

– System security,

– Help desk system,

– Control of proprietary software,

– System development policy,

– E-government application repository.

Data management performs functions as :

– Planning data flow throughout the city government bureaucratic process,

– Inventory of basic data security,

– Backup / restore data,

– Coordinate with government service departments for data utilization,

– Planning infrastructure requirements for data storage and transactions.

– Information asset management and policies (digital documents)

– Development and management of city government websites.

Management of Information and Communication Technology infrastructure:

Data Center Management and Data Recovery Center perform functions:

– Management of all devices and requirements control running the data center and data recovery center,

– System maintenance and maintenance,

– Procurement control and data center utilization,

– System monitoring.

Network Management and ICT devices perform the functions:

– Management of data transmission media (cable and wireless),

– Inventory and control of municipal ICT devices,

– Help desk maintenance and maintenance of ICT devices in the government service department,

– Installation and maintenance as well as network control and transmission media,

– Monitoring network traffic.

Information Security Management performs the functions:

– Monitoring traffic behavior,

– Anti mallware update,

– Information security policy,

– Handling information security events,

– Coordination with institutions related to state data security.

b. Government service department owners of bureaucratic processes, namely government service departments other than ICT management government service departments as data / information owners and bureaucratic processes as users of ICT facilities and information systems in charge:

–   The business re-engineering (BPR) process is an inventory of the latest bureaucratic processes that can be automated into information systems

–   System development

–   Coordinate with government information technology service department to obtain feasibility permits regarding the need for proprietary software and applications from the central or provincial government to analyze integration with existing systems

–   Coordinate with other government service departments in terms of data acquisition, management and ownership responsibilities.

–   Utilizing ICT infrastructure, each government service department coordinates with government information technology service department

–   Every government service department should not carry out the procurement, maintenance and control of the ICT infrastructure itself, especially without coordinating with the government information technology service department, this is intended to control the security of information assets of the city government. But if there is already a system built from the center for national interests, the system can be arranged in such a way that there is no technical operational problem of access to information that disrupts the performance of the entire city government network. government information technology service department that has policy authority for securing the entire system.

K.   Application Blueprint

a.   The development of the official website of the Cirebon city government was designed to be interactive with the management of the application submitted to each government service department, the city government website of Cirebon City will be redeveloped the details of the website content and specifications:

–   Cirebon City Area Profile,

–   Cirebon City Government Profile,

–   Public policy info,

–   Cirebon City planning information,

–   Information on achievements and development results,

–   Complaints, idea exchanges and discussion forums for citizens of Cirebon,

–   Gallery City of Cirebon,

–   Cirebon City government services (info on provisions and Online forms),

–   Community Services,

–   Business Services,

–   Online bureaucracy services,

–   Social networking media for Cirebon City residents,

–   Advertising and business promotion.

b.   Development of e-government applications for the next 5 (five) years based on the Cirebon City Development Vision

Table 2. Application Development

E-mail,
Bangrir mutations,
Attendance and Payroll,
Performance assessment,

	Education and Training
	Development Data,
	City government website,
	E-Filling,
	Regional Planning,
	Regional Procurement,
	Project Management and Monitoring,
	Evaluation System and Result Info,
	Development,
	Budget System,
	Cash and Treasury,
	Regional Accounting,
	Regional Goods Management,
	Regional Goods Catalog,
	Regional Revenue Management,
	Management of Regional Companies,
	District and District Governments
	Population,
	Community Complaints,
	Spatial Planning and Environment,
	Health,
	Education,
	Employment,
	Social and Poverty,
	Transportation,
	Road Bridge and Drainage,
	Communication,
	Waste and Waste,
	Housing and Settlements,
	Green open space,
	Public Street Lighting,
	Clean water
	Taxes and Levies,
	Registration and Licensing,
	Business and Investment,
	DPRD Administration,
	Regional Election Systems,
	Legal Catalog,
	Regional Potential,
	Animal Husbandry Farming,
	Tourism,
	KUKM,

Trade Industry,	
Buildings and Buildings,	

L.   Infrastructure Blueprint

Table 3. Infrastructure Blueprint

	DC space: raise floor, wall, cyling, cooling, humidity control, dust control, smoke detector, extinguisher, cabling	Procurement of Green DC / DRC Room with TIA 942 Tier 1 standard
	Server, storage, switch, router, Firewall / IPS	Efficiency of device resources using the latest technology
	Rack, Main Power, secondary Power, UPS, Grounding, power capacity, power network	Efficiency of device resources using the latest technology
	Monitoring logical security, phisical security	SLA Guarantee 99,9 %
	Maintenance, replacement of equipment and availability of maintenance equipment	Care Daily readiness of replacement devices
	Topology and Cabling	WAN, MAN, LAN
	Backbone	Inter Subdistrict and government service department that has passed

	Distribution	From all government service departments to the village
	Physical security device	Biometric based
	Logic security device	Security before going to the network and certain allocations
	Awareness	The participation of each employee in securing information assets
	Application	Berbasis Open Source
	Disasster Recovery System (DRC) Management	Provided to a third party that guarantees customer satisfaction
	Risk / vulnerability management	Monitoring
Services	SLA	99,9 %
	Coverage	All government service departments, villages and health centers
	Capacity	Used capacity is 70% of installed capacity
	Policy	Utilization of IT, Access, IP and bandwidth
	Repository	Asset Manager Information
	Data	Single Data

	management	Manager
	Datawarehouse	Executive information system Information systems for decision making assistance
	Data Processing	Function as a Backup System
	Basic application	Web, e-Mail, VoIP dll
	Standars Services	Using the IT infrastructure Library
Manajemen	SOP	Use SS 502
	Audit IT	Every year
	HR	Optimization HR
Akses	Bandwidth dan Local Loop	Optimization needs and utilization

Data center needs for Cirebon City government:

a.   Data Recovery centers are entrusted to third parties who have good information security standards, preferably those who already have ISO 27001: 2005 or SS504 or also who use those standards even though they are not certified.

b.   Room: 2.5 x 4 meters, without glass windows / walls which are closed to the outer edge of the building

c.   Minimum number of rack 3: Rack security and storage, rack server and distribution rack

d.   Air conditioning, room temperature is below 20 degrees Celsius

e.   Raise floor and roof: when using standard materials and safe from animal access (rodents, insects or reptiles), it is very good to use as a cable line, the height of the raise floor is around 30 cm.

f.   Biometric lock security door

g.   Each cable has a label of origin and destination address

h.   Periodic maintenance for each device

V.   CONCLUSION

The results of this study are to align the strategic plan in the field of Information Technology development (e-Government) and re-arrange the implementation masterplan in the Cirebon City Government. It is expected that a plan for the implementation of Information Technology (e-Government) in the Cirebon City Government is in line with the latest developments and needs, and the availability of guidelines in the development, maintenance and management of Information Technology in order to support the tasks and functions of the Cirebon City administration.

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