

Final Report for ADDIS ABABA e-Office System Feasibility Study

December, 2013

WeGO Secretariat Office

Contents

List of Figures	6
List of Tables.....	7
Executives Summary.....	9
I. Introduction	11
1. Project Background	11
2. Project Schedule	11
3. Project Scope	12
4. Project Organization.....	12
II. Environment Analysis.....	13
1. Country Overview	13
1.1. General Information of Ethiopia	13
1.2. Ethiopia's Geographic Environment	14
1.3. Politics and Society Environment.....	14
2. City Overview	19
2.1. Addis Ababa'a General Information.....	19
2.2. Geographical Environment.....	20
2.3. Socirty and Economy Environment	21
3. Policies and Strategies.....	22
3.1. Ethiopia National Policies and Strategies	22
3.2. Addis Ababa City Policies and Strategies	25
4. Analysis of Informatization Environment.....	26
4.1. Informatization Policies and Strategies.....	26
4.2. Project Plan for Addis Ababa Informatization	29
4.3. Project Environment and Informatization Organization	30
4.4. Analysis of Informatization Infrasrtructure.....	34
4.5 Current Status of the Informatization Legal Framework.....	39
5. Implication Analysis	40

III. Technology Analysis	41
1. Requirement Analysis	41
1.1. Draft of approval / Authorization Stage	41
1.2. Stage of Receiving and sending Document Between Divisions.....	41
1.3. Document Management.....	41
2. Current Status	42
2.1. System COnfiguration	42
2.2. Business Process	43
2.3. H/W, S/W, N/W	45
2.4. Organization.....	46
3. SWOT Anlysis.....	46
3.1. Analysis on Internal Environment.....	46
3.2. Analysis on External Environment	47
3.3. SWOT Analysis.....	47
3.4. Draw Major Factors of Success	48
4. Benchmarking	49
4.1. Case of the Blue House(Korean Presidential Office)	49
4.2. Case of Korean Ministry of Defense(MND).....	52
4.3. Case of Seoul Metropolitan Government.....	55
5. Implication of Technical Analysis	57
5.1. Requirement Analysis	57
5.2. Current Status	58
5.3. SWOT Analysis.....	58
5.4. Benchmarking	59
IV. Implementation Plan	60
1. Direction.....	60
2. Vision and Strategy.....	62
2.1. Vision.....	62
2.2. Strategy	64
3. Scope of Development	66
4. System Architecture	67

4.1.	Business Architecture	68
4.2.	Data Architecture	70
4.3.	Application Architecture.....	74
4.4.	Technology Architecture	79
5.	Implementation Schedule	80
5.1.	Development of the Implementation Goals.....	80
6.	Implementation Organization.....	81
7.	Training Plan	81
8.	Operation and Maintenance Plan.....	82
8.1.	Hot-Line	82
8.2.	Conference Call.....	82
8.3.	Regular Visit.....	82
8.4.	Optiont.....	83
V.	Economic Analysis	84
1.	Estimated Total Cost.....	84
2.	Cost Breakdown	85
2.1.	Expense of each Propulsion	85
2.2.	Hardware Breakdown (details)	86
2.3.	Software Breakdown (details).....	87
2.4.	Personnel Expenditure Breakdown (details).....	88
2.5.	Required Cost by Year	89
3.	Proposed Funding Source	89
3.1.	EDCF(Economic Development Cooperation Fund)	90
3.2.	Africa Development Bank(AFDB)	91
4.	Estimated Benefit	93
4.1.	Questionnaire.....	93
4.2.	Quantitative Advantage	94
4.3.	Qualitative Advantage	94
5.	Economic Analysis	95
5.1.	Analysis on Net Present Value(NPV, Net Present Value).....	95
5.2.	Analysis on Benefit Cost Ratio(B/C, Benefit Cost Ratio).....	96

5.3. Analysis on Internal Rate of Return(IRR, internal rate of return)	96
VI. Sustainability of Project Effect.....	97
1. Qualitative Benefits	97
2. Risk Factors and Undertaking	98
2.1. Risk Element	98
2.2. Risk Element / Countermeasures	98
3. Sustainability of Project Effect	100

Figure

Figure 1. Project Schedule	11
Figure 2. Project Team	12
Figure 3. Map of Addis Ababa	20
Figure 4. Comparison of Ethiopia National Infrastructure	24
Figure 5. Ethiopia ICT 4D Plan.....	27
Figure 6. Ethiopia Informatization Plan.....	29
Figure 7. Ethiopia ICT Policy Process	30
Figure 8. Current Status of Ministry of Communication & Information Technoligy	32
Figure 9. Current Status of Addis Ababa Information Communication Technology Devel opment Agency	32
Figure 10. Curren Status of Addis Ababa City Hall Infrastructure	38
Figure 11. Work Flow Process Map.....	43
Figure 12. Success Factors	48
Figure 13. Blue House System Diagram	50
Figure 14. MND Diagram	53
Figure 15. Seoul Style Work Management System Diagram.....	56
Figure 16. e-Government Vision	63
Figure 17. Addis Ababa TF.....	64
Figure 18. E-Office System Business Architecture	68
Figure 19. Authorization Process	69
Figure 20. Sending Proces.....	69
Figure 21. Receipt Process	70
Figure 22. Discards Proces	70
Figure 23. Data Architecture	71
Figure 24. Application Architecture	74
Figure 25. Technology Architecture	79
Figure 26. Funding Process	90

Table

Table 1. General Information of Ethiopia	13
Table 2. Major Economic Indicator of Ethiopia.....	16
Table 3. Trade Scale Between Ethiopia and Korea.....	18
Table 4. Current Status of Korea Supports and Aids to Ethiopia.....	19
Table 5. General Information of Addis Ababa	19
Table 6. GTP Missions	23
Table 7. Expenses for Infrastructure Implementation in Ethiopia	24
Table 8. Addis Ababa Urban Development Index(UDI)	25
Table 9. List of Ethiopia Projects by World Bank	26
Table 10. Ethiopia e-Government Vision, Outcomes and Targets.....	27
Table 11. Current Status of Ethiopia Informatization Organization.....	31
Table 12. Current Status of ICT Infrastructure Benchmarking.....	34
Table 13. The Mission of ICT Departments in Ethiopia GTP.....	35
Table 14. Comparison Analysis of e-GDI between Ethiopia and Korea.....	35
Table 15. Specific Analysis of Ethiopia e-GDI.....	36
Table 16. Ethiopia ICT Development Index (IDI).....	37
Table 17. Current Status of Ethiopia Informatization.....	37
Table 18. Current Status of the Ethiopian Informatization Legal Framework Promoted	40
Table 19. Task Force	46
Table 20. Major Issues List.....	60
Table 21. Directionality of Target Model List	62
Table 22. Improved Tasks	67
Table 23. Department Table	71
Table 24. User Table	72
Table 25. Form Table.....	72
Table 26. Folder Table.....	73
Table 27. Document Table.....	73
Table 28. Approval Line.....	74
Table 29. Portal Functions.....	75

Table 30. Collaboration Functions	75
Table 31. Approval/Record Management Fuctions	77
Table 32. Hardware.....	79
Table 33. Software	79
Table 34. Implementation Challenge List.....	80
Table 35. Implementation Organization	81
Table 36. Training Classification.....	81
Table 37. Technology Transfer	82
Table 38. Total Investment Cost	84
Table 39. Expense of Propulsion.....	85
Table 40. Hardware Breakdown (details).....	86
Table 41. Software Breakdown (details).....	87
Table 42. Personnel Expenditure (details).....	88
Table 43. Personnel Expenditure Breakdown.....	88
Table 44. Investment Costs.....	89
Table 45. Procedure of Business Evaluation	97
Table 46. Result of Questionnaire	93
Table 47. Analysis on NPV	97
Table 48. Analysis on Benefit Cost Ratio.....	96
Table 49. Qualitative Expected Effect.....	977
Table 50. Risk Element and Countermeasures	99

Executives Summary

This report is a result of feasibility study on implementing e-Office System to Addis Ababa City Government. Addis Ababa City Government has established and implemented a long-term master plan on ICT associated with e-government by stages. WeGO(World e-Governments Organization of cities and local governments) has been providing consultation service to its member cities, and this year Addis Ababa sent a letter of intention(LOI) and was selected as one of the city for consulting.

The objective of this business is to conduct a feasibility study on the e-Office System which is essential for ICT e-government for Addis Ababa City Government. We have analyzed general and ICT environments of Ethiopia and during the analysis, we have analyzed various data collected by interviews and questionnaires to officials of Addis Ababa City Government and have suggested e-Office System model appropriate to Addis Ababa e-government based on advanced cases and up-to-date IT technologies for analysis results. In addition, we have established implementation plan by stages to set e-Office System model and, finally, described economic analysis and effects expected by e-Office System.

The result of ICT environment analysis on Addis Ababa and Ethiopian government has been concluded by study of e-Government establishment plan and strategies of Ethiopian government, laws and regulations, and organizations and ICT infrastructure. According to establishment plan of Ethiopian e-Government, infrastructural system like e-Office System should be established as a standard model and standardization and guidance of whole processes for initial implementation, operation, and maintenance has been emphasized for proliferation to other governmental organizations. It should also be established for easy sharing various information and best practices in governmental organizations and the e-Government establishment plan and strategies of Ethiopian government has specifically described security issues and utilization of open sources. Revisions and additions of laws and regulations for e-Office System is needed because there was no such law and regulation for documents management based on e-document system. They had strong will for National document management organization and well prepared and creation of the organization and definition of its role were needed because there was no such organization in organizations and ICT infrastructure of Ethiopia. They were well prepared for personal capability of information utilization and sufficiently experienced for organizational ICT environments since they were already suing PCs for their administrative works but facilities for servers such as voltage facilities, air-cleaners, and thermostats were needed for stable operation of servers.

Technical status analysis on Addis Ababa City Office was conducted through requests analysis of e-Office System, status analysis of documents management, SWOT analysis, and advanced cases analysis. Interviews and questionnaires for key officials in Addis Ababa City Office were used for requests analysis. More and more officials were using email to exchange information, and external portal website to search documents and information but

they were feeling much inconvenient since internal approval process or old documents search in Addis Ababa had been done by hands. In particular, it was hard to trace documents in approval process or exchanging them and there were many difficulties in document management such as loss when an approval officer or person in charge was absent. Since they did not have standard procedures for documents management and had done their works by ways which they heard documents and improvement for utilization by management system for written documents and maintenance of documents were needed. According to SWOT analysis on Addis Ababa City Office for e-Office System implementation, strong points were their strong will for e-Office System and high human resource capability for information utilization, and weak points were insufficient organization for the plan and insufficient experience of information technology. Threats were lack of security system for sharing and utilization of information and working difficulty caused by limited transparency and promptness of works, and opportunities were the fact that they supported e-Office System as a key infrastructure for public organizations and environments was being established by the master plan for e-government of Addis Ababa. Therefore, we set the strategies to establish an implementation plan based on cultural features of Addis Ababa City governmental organizations with advanced cases and to review swift stability strategy. We reviewed e-Office Systems of Korean government and Ministry of National Defense as advanced cases and found some points such as necessity of strong will of the decision maker, architecture design for extension of e-Office System in future, and data storage and backup plan for massive data.

We created 22 key issues for e-Office Systems through those analyses and selected 11 objectives for direction of e-Office System model. Also we set 6 key works for the model and offered organizational, system establishment, education and training, and service strategy. Finally we figured out convenience, quantitative and qualitative effects, by economic analysis and described expected effects.

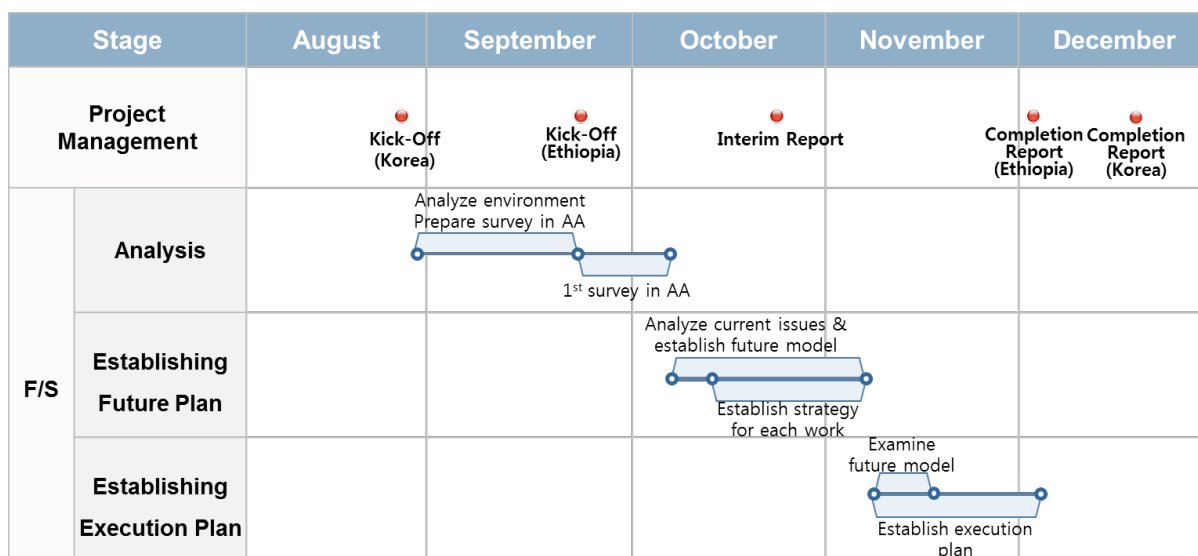
I. Introduction

1. Project Background

Clear and prompt management system for the Governmental Institutions is required in the modern era with intensified globalization and rapid growth in intelligence environment. Furthermore, system for effective decision making as well as cooperation is also required. This so called 'e-Office' system would be the solution. It is electronic-document-based system which is different from previously paper-based system. It is in progress of automation in administration taking part of the world wide 'Digital Government' project.

The City Government of Addis Ababa has established long-term master plan in ICT (Information & Communication Technology) sector and has propelled it gradually. It has put forth a multilateral effort into building the electronic documentation based cooperative system. The City Government of Addis Ababa presented special interest in the feasibility study project of implementing e-government, performed by WeGO.

2. Project Schedule



[Figure 1] Project Schedule

Project period: September 2103 ~ December 2013

3. Project Scope

- Analyze current business and ICT environment
- Design e-office system To-Be model
- Establish implementation plan
- Finance a Pilot project of e-Office system

4. Project Organization



[Figure 2] Project Team

II. Environment Analysis

1. Country Overview

1.1 General Information of Ethiopia

Ethiopia, which is located at the northeastern region of the African continent, has broad land of area, and is five times larger than the Republic of Korea. Among African countries, Ethiopia is the 3rd country following Nigeria and Egypt when it comes to population.

During the 1970's and 80's, Ethiopia underwent many border disputes and civil war under the socialistic military regime. At the same time, Ethiopia suffered from heavy droughts and failure of socialistic policies. As a result, that made the Ethiopian society unstable and impoverished. In 2013, the GDP per capita is USD 316, and a large amount of foreign aid is provided to Ethiopia.

Ethiopian cabinet has the real power of the politics and military control, and since 1991 when the EPRDF subverted the Mengistu communist regime, EPRDF have conducted state affairs for more than 20 years.

[Table 1] General Information of Ethiopia

General	Location	Northeastern side of the African continent, near the Red Sea
	Total Area	1,222,000 km ²
	Climate	Mild (high land), hot and humid (low land)
	Population	94 million (2013)
	Capital	Addis Ababa (Population: 5 million)
	Ethnic Group	Oromo (35%), Amhara (27%), etc. 72tribes in total
	Language	Amharic(official language), Aboriginal languages, English
	Religion	Christianity (61%), Islam (33%)
Politic	Independence	BC 1,000, ancient Ethiopia kingdom was established.
	Political System	Federalism (the Parliamentary system)
	Head of state	President Mulatu Teshome (Prime minister Hailemariam Desalegn)
	Congress	Bicameral system

	Main Political Party	EPRDF
	International Organization	UN, AU, IMF, IBRD, IDA, AfDB, etc.
Economy	Currency	Ethiopian Birr
	GDP	379 million dollar (2013)
	GDP per Capita	316 dollar (2013)
	Industrial Structure	Service industry 46%, agriculture and forestry industry 41%, manufacturing industry 13% (2011)
	Main Exports	coffee, gold, leather (2011)
	Main Imports	food, oil, chemical product, machine, fabric (2011)
	Natural Resources	gold, copper, natural gas, potassium
	Strong point of Economy	Plentiful agricultural development potential
Weak point of Economy	Lack of natural resources, unsettled political situation	

※ Source: CIA, the Export-Import Bank of Korea, Project team modification· reconstruction

1.2 Ethiopia's Geographic Environment

Ethiopia is located at the northeastern side of the African continent near the red sea. It is bordered by Eritrea to the north, Djibouti and Somalia to the east, Sudan and South Sudan to the west, and Kenya to the south. The land area of Ethiopia is almost 1,127,000 km².

The climate is hot and humid in the lowlands and mild on the plateau. The climate of plateau is Afro-Alpine in character, so the change of temperature isn't big. The climate of the lowlands is hot and humid due to the tropic climate. The average temperature is 20°C at Addis Ababa.

The weather is usually sunny and dry, but the short rainy season is from February to April and the big rain from mid-June to mid- September.

1.3. Politics and Society Environment

1.3.1. Current Status of Society

The population of Ethiopia is estimated at 94 million in 2012, and about 4.9% or 4.6 million of them live in Addis Ababa. Majority of Ethiopians are descendants of Semites and

Hamitics and Ethiopia is a multi-tribal nation comprised of Oromo(35%), Amhara(27%), Somali(6%), and about 80 ethnic groups.

Although Amharic is the second largest language in Ethiopia spoken by 30% of the population, it is the official language of federal government, and speakers of 4 major languages comprise about three quarters of the whole population. English is the medium of instruction in secondary schools and is the most widely spoken foreign language. The literacy rate is approximately 37~50%.

Ethiopia is one of the first Christian nations. Including Ethiopian Orthodox Church (43.5%), more than 60% of Ethiopians are Christians. However, recently the number of Muslim Ethiopians has been increasing.

According to the report of UNDP about the index for human development in 2013, Ethiopia was ranked 173rd among 187 countries.

Due to lack of hospitals or medical facilities, the average life expectancy in 2011 was 60 years. 46% of whole Ethiopians have had benefits from health facilities, which means that more than half of the people don't get benefit from health care facilities even though they are infected by AIDS/HIV, typhoid and malaria, etc.

Ethiopia is composed of more than 80 ethnic groups such as Oromo (35%) and Amhara (27%). As a result, it is possible that opinions among tribes are various without finding point of agreement.

1.3.2. Current Status of Politics

Ethiopia is a federal parliamentary republic made up of 9 states and 2 chartered cities. Based on the parliamentary government, it has two chambers of parliament.

Ethiopian cabinet has the real power of the politics and military control, and since 1992 when the EPRDF subverted the Mengistu communist regime, EPRDF has conducted state affairs for more than 20 years.

Now the EPRDF is composed of 4 parties - TPLE, ANDM, OPDP and SDPDF.

In 2005, EPRDF faced many problems such as the decrease in the number of seats and demonstration. However, EPRDF have achieved annual economic growth rate higher than 10%, so they could get overwhelming victory in the general election in 2010. In 2005 EPRDF obtained 327 of 547 seats and in 2010, 499 of 547 seats.

Meles Zenawi had a strong leadership to control the administration as prime minister, but on August 2012, he passed away from illness. Haile Mariam who was the Deputy Prime Minister and Foreign Minister succeeded the role of Prime Minister.

In 2012, Haile Mariam distributed seats of the deputy prime minister to all 4 parties

comprising EPRDF. He tried to boost the approval rating and to keep the government administration stable.

1.3.3. Current Status of Economy

Based on the implementation of infrastructure such as power system, roads and communication networks, Ethiopia could achieve increased investment and productivity. And also, it attained foreign aids from many countries. Consequently, Ethiopia recorded 9% average economic growth rate during the last 5 years.

From 2004 to 2008, Ethiopia has recorded double digits economic growth rate. However due to the global economic recession in 2009 and 2010, the remittances from Ethiopian overseas workers declined. Furthermore, the drought occurred in 2011 aggravated the crops condition. As a result, Ethiopia recorded 7.3% of economy growth rate.

In 2012, owing to the continuous commercialization of agriculture products and the relieving drought, the economic growth rate reached 8.5%. And also in 2013, due to the increased investment and electric power production, it is expected that Ethiopia will achieve near 7.1% economic growth rate. However, it is also predicted that the economic growth rate of 10%, which is needed for entering the middle income country that the Ethiopian government is aiming at to enter in 2025, will not be reached.

[Table 2] Major Economic Indicator of Ethiopia (Unit: %)

Economic Indicator	2009	2010	2011	2012	2013
Economic Growth Rate	8.8	9.9	7.3	8.5	7.1
Finance/GDP	-0.9	-1.3	-1.6	-1.2	-3.0
Growth Rate of Consumer Price Index	8.5	8.1	33.1	22.9	8.4

※ Source: The Export-Import Bank of Korea, Foreign Research Institute, Ethiopia national credit rate evaluation reports (October, 2013)

86% of Ethiopians engage in agriculture and 46% of GDP comes from agriculture. As a result, Ethiopian economic structure is vulnerable to the external factors such as price changes of agriculture products and annual precipitation etc.

Coffee had accounted for the biggest part of Ethiopian exports, approximately 50%. However, due to the dropping coffee price in international market, the sales of export decreased. As a result, in 2009, the amount of coffee export took up only USD 40 million out

of USD 160 million in total export.

Ethiopia has rich amount of mineral resources, and two natural gas fields have been found so far. Moreover, geological study showing that oil field from Sudan is extended to Ethiopian territory, makes many foreign countries show interest in Ethiopian natural resource development.

1.3.4. Current Status of International Relationship

After the collapse of the communist government in 1992, the Ethiopian government decided to follow the pro-Western policy. Since then, it has maintained good relations with the US and European countries.

Based on the military cooperation, USA has accounted for the biggest part in economic support, and the European countries, such as UK, have been supporting in large scale of aids based on the historical relationship.

Ethiopia has the strongest armed forces in Eastern Africa. So for the safety of that area, it has emphasized geopolitical issues, and it needs to establish stronger cooperation relationship with USA and Western countries.

Ethiopia is a landlocked country. So when it needs to trade through sea line transport, Ethiopia has been using Djibouti Port in Djibouti instead of Assab Port in Eritrea since the war with Eritrea. Most amount of trade is passing through the Djibouti Port due to the friendly relations between Ethiopia and Djibouti.

1.3.5. Relations with neighboring countries

After Eritrea's independence from Ethiopia, the border dispute between Eritrea and Ethiopia frequently occurred. Especially the dispute in 1998 spread to war and left a large number of casualties.

In December 2005, Ethiopia attacked the Union of Islamic Courts in Somalia to support the Somalian interim government, and in 2009 after the withdrawal of Ethiopian occupation forces, Ethiopia still has observed the situation in Somalia.

Ethiopia maintains neutrality between Sudan and South Sudan, and sent 4,200 UN peace keeping troops to Abyei, a disputed area between the two countries, for the economic benefits such as oil import.

Since 2011, Ethiopian government is building the Great Ethiopian Renaissance Dam on the Nile River with an electric power capacity of 6,000MW, but as Egypt is relying heavily on the water resource of the Nile, the tension between the two countries is getting higher.

1.3.6. The relationship with Korea

Ethiopia sent troops during the Korean War as a member of the UN forces. It sent a battalion with a total of 6,037 soldiers to Korea and since the establishment of diplomatic relation in 1963 the two countries have maintained friendly relationship.

After establishment of diplomatic relationship, economic cooperation between the two countries stayed in a meager stage. However, since the establishment of the current constitution, Ethiopia and Korea have contracted many cooperation agreements about economy, technology, culture, trade, etc.

In July 2011, the President of Korea visited Ethiopia and the two heads of the countries agreed on the establishment of partnership for growing together. Korean government also promised the sharing of the Korean development experiences for strengthening the cooperation between Ethiopia and Korea.

Ethiopia has supported the Korean policies and candidates in international stage. Particularly, Ethiopia has considered Korea as a role model for economic development, so it expects to exchange the technology or information industry knowhow from various sectors from Korea.

The amount of trade between Korea and Ethiopia was 132 million dollars in 2012, and in August 2013, the trade amount recorded 75 million dollars.

[Table 3] Trade scale between Ethiopia and Korea

(Unit: USD1,000)

Contents	2010	2011	2012	Main item
Korea → Ethiopia	50,499	106,904	107,911	Agricultural pesticides, medicines and medical supplies, cars, and construction and mining equipment
Ethiopia. → Korea	11,722	19,730	24,662	Coffee, grain and fruit, leather
Total	62,221	126,634	132,573	

※ Source: The Export-Import Bank of Korea, Foreign Research Institute, Ethiopia's national credit rate evaluation reports (October, 2013)

[Table 4] Current status of Korean supports and aids to Ethiopia

Project name	Managing institution	Approval
Power of Korean economic development	KDI	2009.09
Sululta-Gebre Guracha Strategy network implementation project (EDCF)	The Export-Import Bank of Korea	2011.12
Arsi Zone family plan and maternal childhood health promotion project	KOICA	2011.12
Strategy Establishment of e-Government and IT Technology introduction (KSP)	The Export-Import Bank of Korea	2012.

※ Source: The Export-Import Bank of Korea, 2012, World Countries Handbook, KOICA Evaluation Report

2. City overview

2.1 Addis Ababa's General Information

Addis Ababa is the capital city of Ethiopia and is located in the highlands near equator. The land area of Addis Ababa is 530 km², approximately 0.9 times of Seoul.

The name Addis Ababa (meaning 'new flower') came from the city's old name "Hora Finfinnee". Taytu Betul who was the empress of Ethiopia defined the border of Addis Ababa and in 1886 the Emperor Menelik decided the name of the city as Addis Ababa when he started building the city.

Owing to the central forced development of religion, politics, economy, and education, Addis Ababa could achieve modernization without the forced intervention of foreign power.

[Table 5] General Information of Addis Ababa

Contents	description
Total area	530.14 km ²
Location	38 degrees East longitude, 9 degrees North latitude
Average altitude	2,355m
Population	5million (estimate in 2013)
The number of Sub city	10
The number of Woreda	116

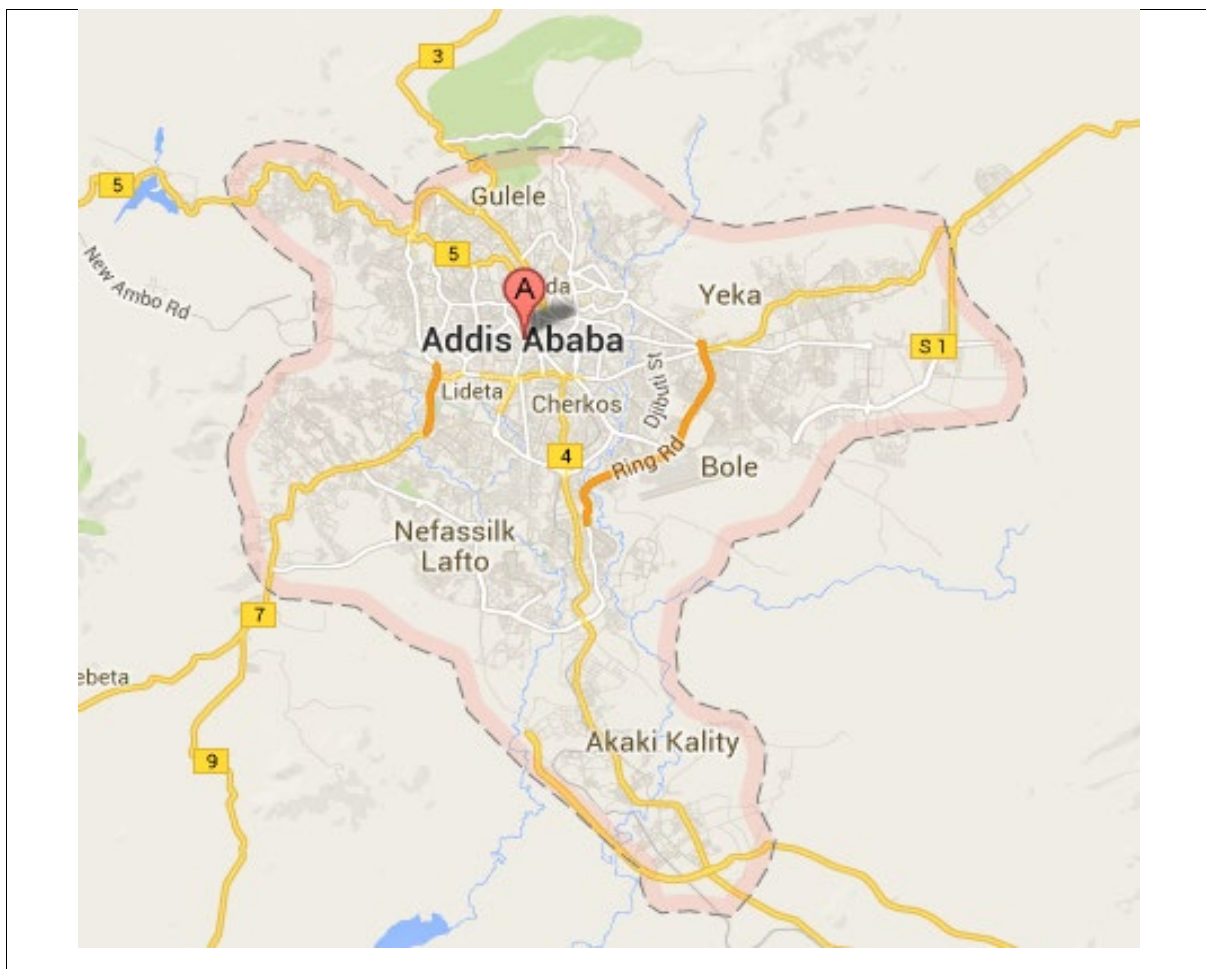
※ Source: Project team field trip date reconstruction

2.2 Geographical Environment

Addis Ababa, which means “new flower” in Amharic, is the main city of Ethiopia taking central role in economy, politics, and culture of Ethiopia. It is located in 38 degrees East longitude, 9 degrees North latitude.

The land area of Addis Ababa is 530.12km², about 0.9 times of Seoul land area. Addis Ababa is Ethiopia’s biggest city and the average altitude is 2,355m making it the 3rd highest capital city in the world.

[Figure 3] Map of Addis Ababa



※ Source: Google Map (<http://maps.google.com>)

Addis Ababa is located near Entoto Mountain and the territory spreads from where the Bole International Airport is located at an altitude 2,300m to the highland at an altitude 3,000m to the north.

Addis Ababa is influenced by subtropical plateau climate and the temperature varies depending on the altitude and the direction of wind, which leads the temperature difference more than 10°C. The average temperature of the city is approximately 20°C year round.

It has 10 sub-cities and 116 Woredas in Addis Ababa and one sub-city controls 10~50 Woredas according to the region's scale.

Bole international airport is located about 18km south of the Addis Ababa city center, and it plays an important role for Ethiopian Airlines flights as a hub airport. Moreover there is a train station connecting Ethiopia and Djibouti.

2.3 Society and Economy Environment

The name "Addis Ababa" came from the name of the old town in the area "Hora Finfinnee". Taytu Betul, who was the empress of Ethiopian ancient dynasty, defined the border of the city, and in 1886 the emperor Menelik decided the name of the city as Addis Ababa when he started to develop the city.

Before the development of Addis Ababa, Entoto played a role as a capital. However in the 19th century Addis Ababa was set up as the kingdom's new capital.

From 1936 for 5 years, Italy occupied Ethiopia, and then they changed the name from "Addis Ababa" to "Addis Abeba". However, the emperor, Haile Selassie, renamed the city as Addis Ababa.

In May, 2004, Korea and Addis Ababa established the sisterhood relationship based on the ties which were generated at the Korean War in the 1950s. Korea promised to help Addis Ababa build the war memorial, commemorative hall, Commemoration Park, etc. to enhance the relationship.

The population of Addis Ababa is approximately 5 million and about half of them are from the Amhara ethnic group. Other half of the population are of Oromo, Gurage, Tigray etc.

Most of the people in Addis Ababa use the Amharic language, others use their own language, and English is the most widely spoken foreign language.

Including Ethiopian Orthodox Church (43.5%), more than 60% of Ethiopians have Christian faith. However, the Muslim population has been increasing recently.

Addis Ababa is the economic center of Ethiopia. In case of coffee which is the main export products, auction and examination are conducted in Addis Ababa to all the coffee beans harvested in the entire area of Ethiopia. And then after the processing, coffee is exported to overseas countries.

The main industrial products produced in Addis Ababa are fabric, wooden goods, plastic, food, clothes, shoes, and chemical products, and the majority of industrial service enterprises are located in Addis Ababa.

Furthermore, many international organizations' African regional headquarters such as African Union (AU), United Nations Economic Commission for Africa (UNECA), The Federation of African Societies of Chemistry (FASC), and Horn of Africa Press Institute (HAPI) are located in Addis Ababa, which makes this city the political capital of Africa.

Addis Ababa is composed of 10 sub-cities and 116 Woredas as administrative structure. The Ethiopian federal government appoints the people in city government organization. When it comes to the mayor or the high ranking official, it is appointed following the cabinet's decision, and the party of the cabinet is decided by the people's election.

Each small cities or regions have their own institutions and the city government operates 74 agencies. Each small cities or regions don't have position distinction, and after a certain period, the changes of the high ranking officials are conducted under the agreement of the cabinet

3. Policies and strategies

3.1 Ethiopia National Policies and Strategies

Since 2002, Ethiopia has established and conducted the national development plan based on the poverty reduction strategy.

Up to now, the two projects (Sustainable Development and Poverty Reduction Program, and Plan for Accelerated and Sustained Development to End poverty) have been completed.

Under the Growth and Transformation Plan (GTP) which has started in 2010, Ethiopian government has been promoting the national development plans until 2015 as followed.

- Improvement in the quality of life through the economic development.
- Leap to the middle advanced country from the low developing country until 2025.
- Maintenance of at least 11.4% economic development until 2025.

[Table 6] GTP Missions

Contents	2010	2015
Annual average real economic growth rate (%)	10.4	11.4
Nominal GDP per capita (USD)	365	510.5
Exports proportion per GDP	13.6	22.5
Imports proportion per GDP	33.0	35.7

※ Source: KOTRA Addis Ababa Head Office, Current status of main industry (March, 2013)

Ethiopia government has established and conducted the Agricultural Development Led Industrialization (ADLI) plan to strengthen the cooperation relationship between the agriculture sector and industrial sector.

- Economic development maintenance based on the agriculture
- Implementation of infrastructure for role extension in manufacturing industry
- National infrastructure enlargement
- Qualitative development promotion for society
- Implementation of effective, transparent government system.

※ the project team explained the main contents in the ADLI plan regarding the national infrastructure related issues for these projects.

In case of the national infrastructure implementation, Ethiopian government will invest 5 billion US dollars every year after establishment of the mission plan through the demand expectation of each sector from Growth and Transformation Plan.

To implement infrastructure, Ethiopia makes use of the credit assistants and grants from foreign governments, international organizations with its own resources.

[Table 7] Expenses for Infrastructure Implementation in Ethiopia

(Unit: million USD/year)

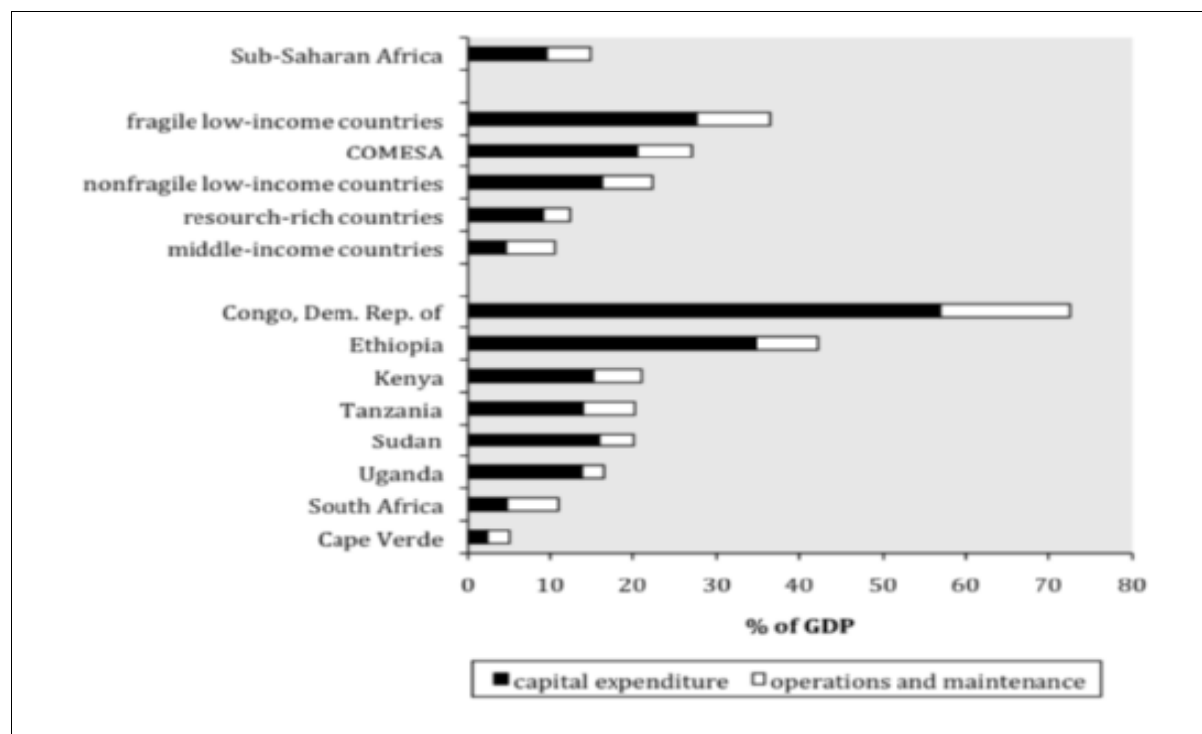
Contents	Capital expenditure	Operation and maintenance	Total expense
Information Communication Technology	72	139	211
Electric Power	3,105	276	3,380
Transportation	248	149	398
WSS	846	355	1,201
Irrigation	6	-	6
Total	4,277	919	5,196

※ Source: KOTRA Addis Ababa Head Office, Current status of main industry (March, 2013)

To implement infrastructure, international organizations such as the World Bank, EU, and AfDB is helping raising the necessary fund. Moreover, the monetary supports from developed countries such as Japan, China, Germany, the United Kingdom and the Middle East countries are provided.

According to the World Bank report, the proportion of the Ethiopian budget to implement infrastructure is approximately 42%, which is the highest level in sub-Saharan Africa.

[Figure 4] Comparison of Ethiopia national Infrastructure



3.2 Addis Ababa City Policies and Strategies

Based on the comprehensive national development plan which started in 2002, Addis Ababa has established and conducted city development policies.

Addis Ababa economic development department established urban development indicators, and defined the specific indicators for economic and social infrastructure implementation.

The establishment purpose of city development is to understand Addis Ababa's social, economic, geopolitical problems and to formulate the solutions and plans for the continuous city development.

[Table 8] Addis Ababa Urban Development Index (UDI)

Contents	Specific index
Economic Indicators	<ul style="list-style-type: none"> - Micro & Small Scale Industries - Investment - Financial Institutions - Poverty & Unemployment - Fiscal Performance Indicators - City Gross Domestic Product
Social Indicators	<ul style="list-style-type: none"> - Health - Education - Housing Sector - Environment and Waste Management - Tourism - Land Use - Social Affairs - Women's Situation
Infrastructure and Water Supply	<ul style="list-style-type: none"> - Road Network - Water Supply - Information and Communication - Energy Consumption - Transport

※ Source: Addis Ababa City Government, Finance & Economic Development Bureau, *Urban Development Indicators (2002)*, Project team reconstruction

4. Analysis of Informatization Environment

4.1 Informatization Policies and Strategies

Ethiopian government has promoted e-Government policies that can improve effectiveness and efficiency of public administration system in order to build an informatized society.

In this regard, Ethiopian government has established and promoted e-Government development plan with the support of World Bank, UNDP, and UNESCO, etc. by including this e-Government plan into 'ICT4D-10' plan which is one of the main policy of the government.

[Table 9] List of Ethiopia Projects by World Bank, AfDB

Managing Department	Project	Project ID	Date
World Bank	- Ethiopia: TFSCB Data Systems and economy -wide Analysis Project	P115154	2010-07-12
	- Additional Financing to the Public Sector Capacity Building Program Support Project	P107217	2010-03-23
	- ET- Sustainable Land Management Program (FY08)	P090789	2008-04-29
AfDB	- AfDB's USD 33m Harar Water and Sanitation Project Comes on Stream in Ethiopia	-	2013.06

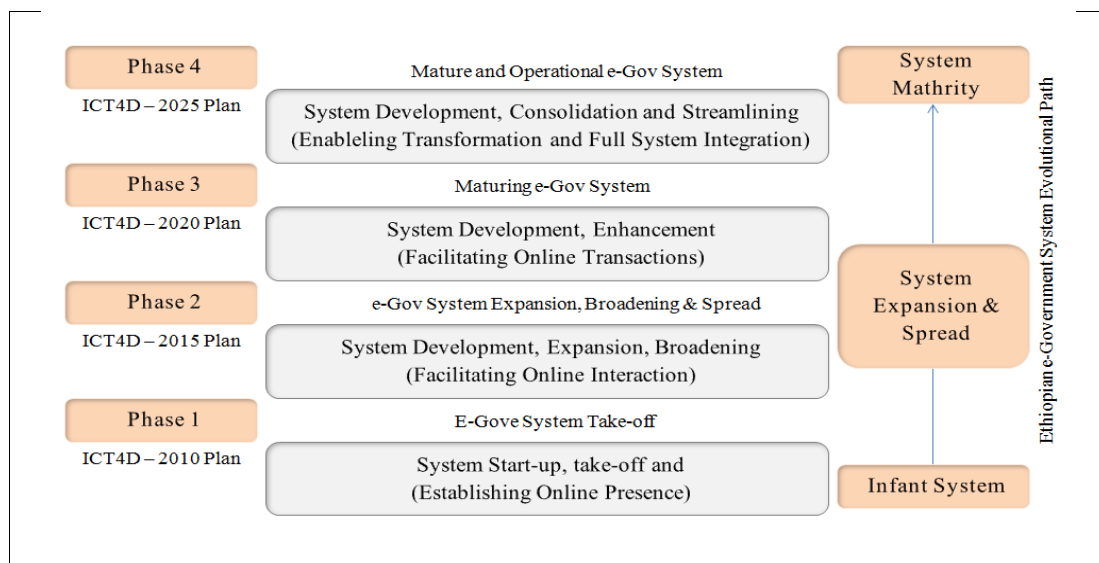
※ Source: World Bank, AfDB project list, project team reconstruction.

At the beginning, Ethiopian government conducted the 'Additional Financing to the Public Sector Capacity Building Program Support Project' and 'TFSCB Data Systems and Economy-Wide Analysis Project'. In 2011, Ethiopia Ministry of Communication and Information Technology set to work to implement e-Government with mid-long term strategy.

Moreover, Ethiopian government asked the Korean government to advise the policies for development of ICT industry and improvement of national informatization level through KSP(Knowledge Sharing Program) Projects conducted by KDI(Korea Development Institute) in 2012.

As of 2013, MCIT has conducted implementation of information system and national evaluation system for informatization and has processed mid/long-term road map establishment for e-Government development.

[Figure 5] Ethiopia ICT 4D plan



Furthermore, Ethiopian government is planning to promote e-Government project by establishing visions and missions for effective operation of administration, improved political participation of the people, and development of economy and society.

[Table 10] Ethiopia e-Government Vision, Outcomes and Targets

Vision	Outcomes	Targets
Bring government closer to the people	1. Customer Participation in Government policy/scheme design	1. Ethiopia to be amongst the top 30 countries in the world in the e-Participation index of UN by year 2015 (Ranked 135 in 2010) 2. Customer Feedback Mechanism available on all Government Channels
	2. High awareness regarding all Government Schemes/Services	3. More than 70% of Customers aware of the e-Government program
Effective Governance	3. Improved turnaround time for service delivery	4. At least 30% improvement on Government Transformation Index (GTI) from 2010 to 2015
	4. Joined-Up Government	5. Integration of Ministries/Agencies through common applications, standards and policies
	5. Customer friendly and Accountable Government	6. Capacity building of all officials on IT and Customer behavior

Improved Service Delivery	6. All services accessible within the community	7. Electronic enablement of 219 services 8. All the 4 Channels established with more than 50% uptake for alternate service delivery channels
	7. Improvement in Customer Satisfaction	9. 60% customer satisfaction 10. Published Customer Charters for all services provided by government organizations by 2015
Socio-Economic Growth	8. Improve Business Climate	11. Amongst top 75 in Doing Business rankings of World Bank for ease of doing business in the country (Ranked 116 in 2009)
	9. Growth of ICT entrepreneurship/Industry	12. Investment of under 10% of Budget of e-Government Program through PPP

※ Source: MCIT, Ethiopia e-Government Strategy and Implementation Plan Report (2011), Project team reconstruction

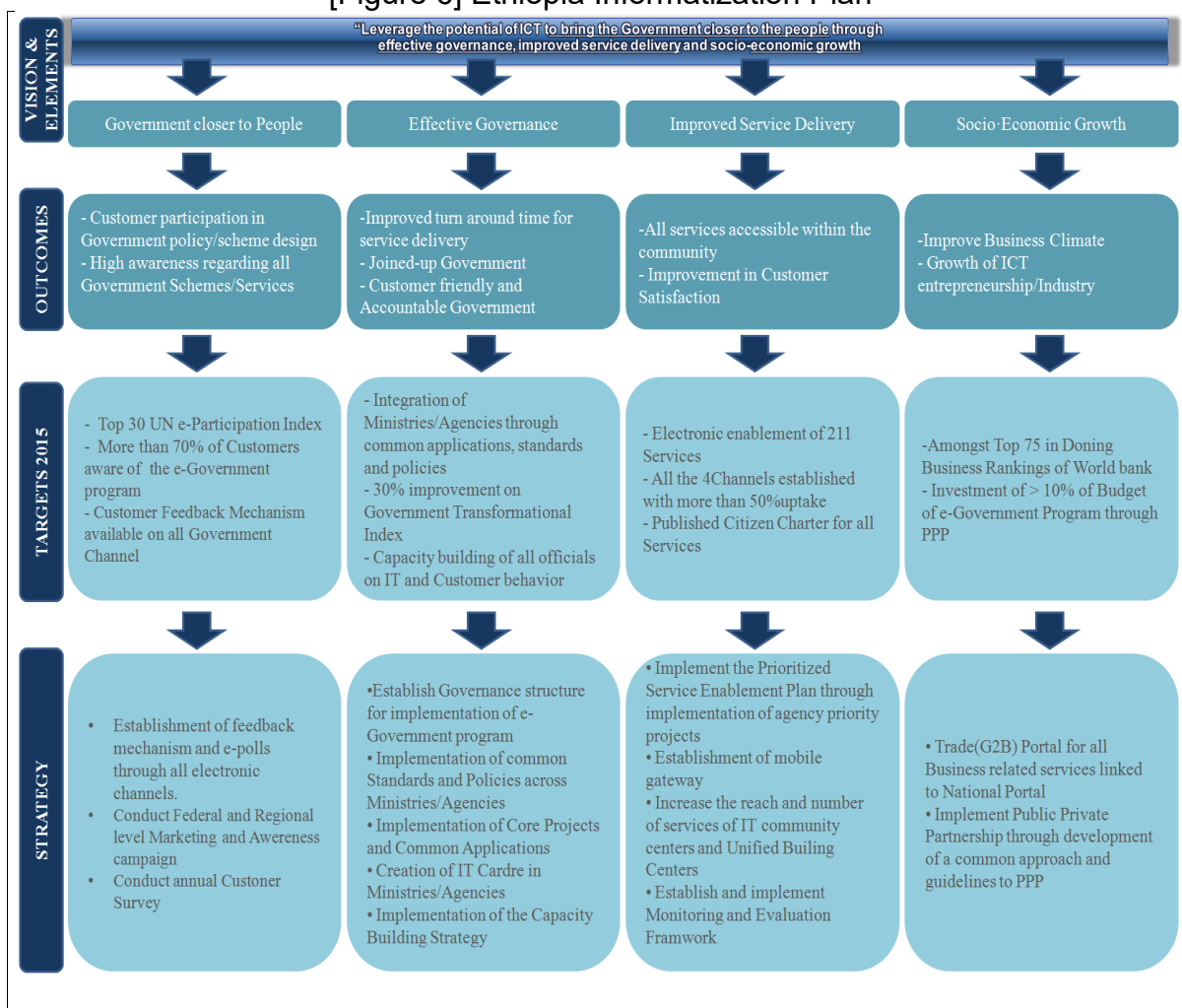
Ethiopian government suggests specific plans and medium term strategies for successful achievement in e-Government policies for 5 years from 2010 to 2015 by defining the missions and goals of e-Government.

Informatization policies of Addis Ababa are promoted in the same way as the national informatization polices are promoted. It aims at the improvement of administrative process and transparent digital society, which is based on the inside and outside interaction, by implementing the e-Government.

According to the modification of city government organization made recently, new city informatization policies establishment is under process, and it is expected that the establishment of informatization plan is completed. Besides, the issues on the national informatization promotion roadmap are reflected until the end of this year.

The city informatization promotion policies are divided into two sectors. One is the general informatization promotion plan, and the other is the establishment of the work environment through the achievement management system. As of now, the city policies are focused on improvement of the effectiveness of the data system implemented in the city government.

[Figure 6] Ethiopia Informatization Plan



※ Source: MCIT, Ethiopia e-Government Strategy and Implementation Plan Report (2011)

4.2 Project Plan for Addis Ababa Informatization

Currently, Addis Ababa recognized the necessity of informatization system implementation in the city government. As a result, Addis Ababa has invested its own budget to construct information and communication infrastructure and promoted the introduction and development of informatization system which is required for the improvement of administrative work.

The principal informatization projects such as system implementation of land administration and performance assessment are in process. Particularly, it focuses on the establishment and utilization of performance assessment using digital BSC(Balanced Score Card).

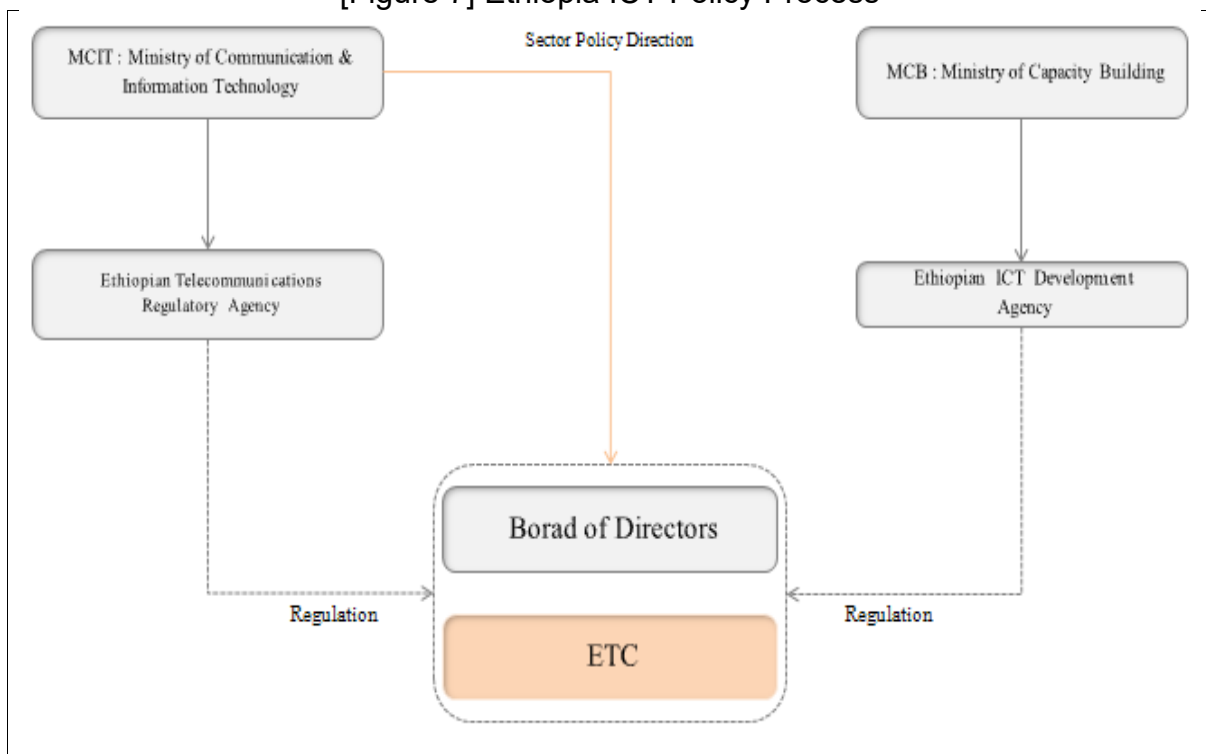
When it comes to the land management system, a German company has conducted the project and the ICTDA, which is the department in charge of city informatization, is planning to implement computer based BSC system at the newly furnished Capacity Building Bureau office.

Moreover, Addis Ababa City Government is planning to increase the number of its LED electronic display boards that are currently installed at several central points in the populated area and around the city hall for notifying issues and announcements of the city administration.

4.3 Project Environment and Informatization Organization

The Ethiopian Federal Government has established ICT infrastructure and related policies under the control of MCIT and MCB, and each department in charge of each role operates the action organization.

[Figure 7] Ethiopia ICT Policy Process



※ Source: National information Society Agency (NIA), reconstruction of AfDB trainee presentation data

[Table 11] Current Status of Ethiopia Informatization Organization

Name of Department	Role
MCIT: Ministry of Communications & Information Technology	Ministry in charge of ICT infrastructure implementation
Ethiopia Telecommunications Regulatory Agency	Agency under the ministry of transportation and communication
MCB : Ministry of Capacity Building	Ministry in charge of ICT Policies
Ethiopian ICT Development Agency	Agency under the capacity development department which promotes mid-long term ICT policies development and business organization
ETC : Ethiopian Telecommunications Corporation	Ethiopia ICT infrastructure implementation organization

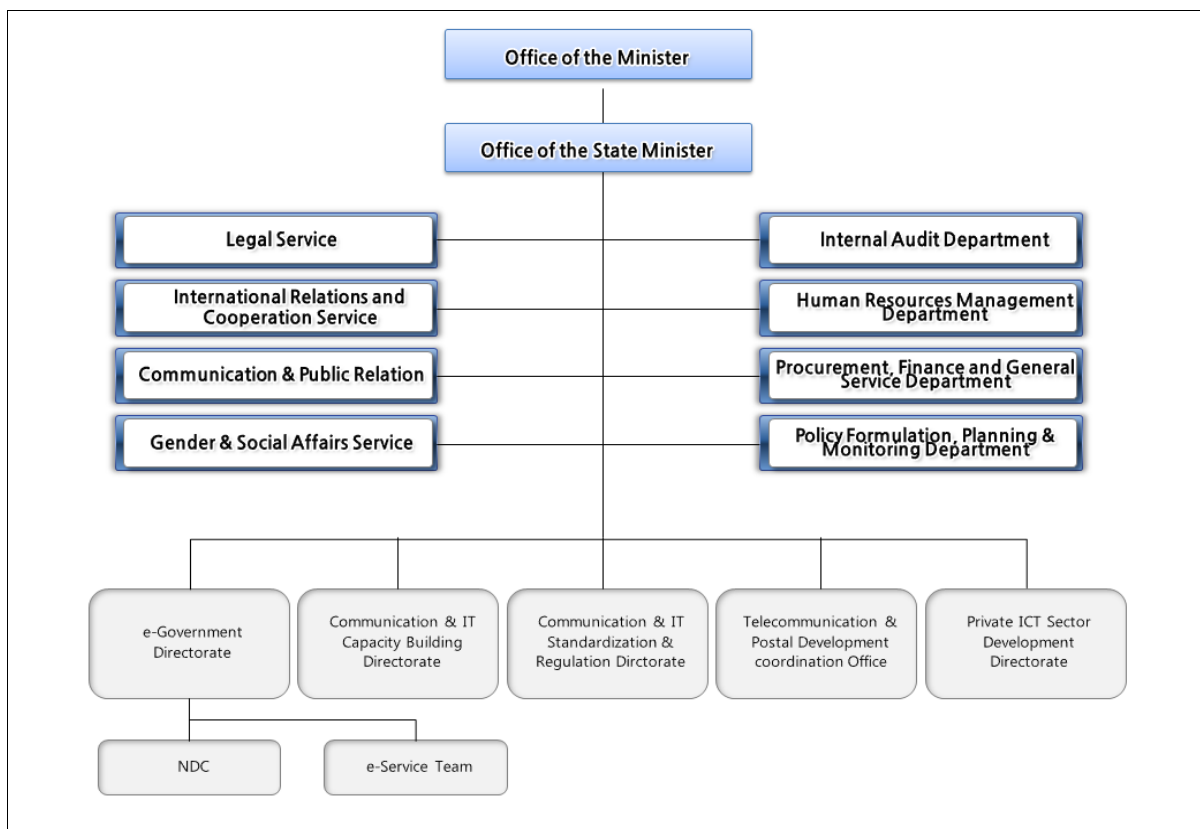
Ethiopia MCIT operates the national data center (NDC) and e-Service team through e-Government Directorate.

- NDC conducts the projects for establishing and supporting ICT communication center by carrying out services such as a video conference, network administration & security, internet service and application program hosting, etc.
- E-Service team implements the online services system for public use with every government sector and administrative institutions.

Addis Ababa's city government administration is composed of 14 Bureaus and 74 agencies.

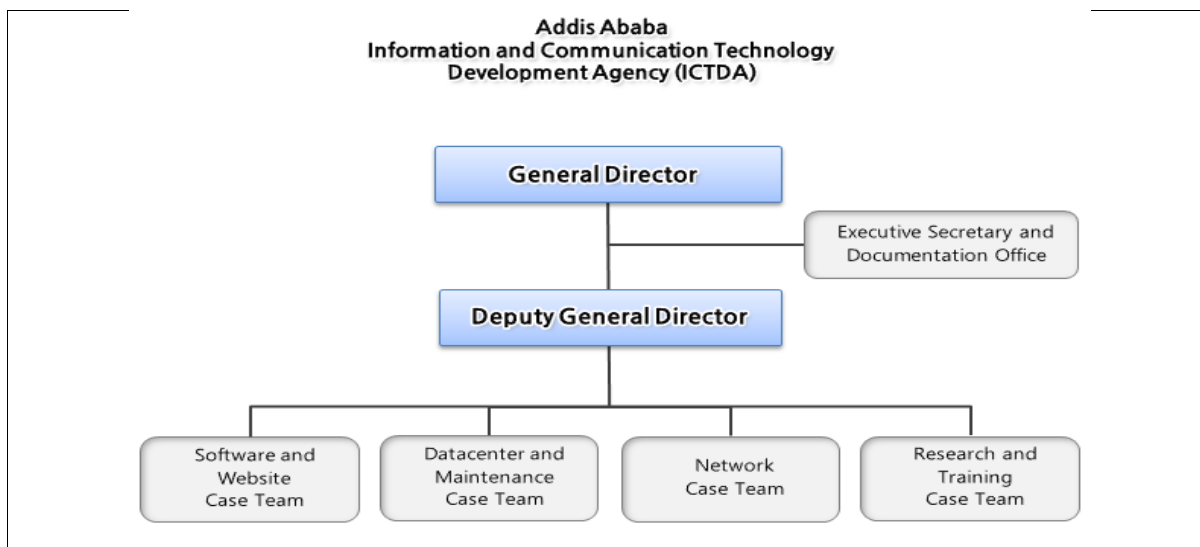
Information and Communication Technology Development Agency (ICTDA) in Addis Ababa is in charge of strategy establishment and project promotion in the city government. It is under control of the Capacity Building Bureau.

[Figure 8] Current Status of Ministry of Communication & Information Technology



※ Source: MCIT, Ethiopia e-Government Strategy and Implementation Plan Report (2011), Project team reconstruction

[Figure 9] Current Status of Addis Ababa Information Communication Technology Development Agency



※ Source: integrated result from field interview, project team reconstruction

ICTDA is comprised of 4 case teams in charge of Software & Website, Data center & Maintenance, Network, Research & Training and 1 department in charge of administration.

- Software & Website Case Team is in charge of city hall homepage management, software development and management, etc.
- Data center & Maintenance Case Team is in charge of Data center management which the city hall operates, video conference management and information equipment maintenance, etc.
- Network Case Team is in charge of administration management, monitoring, and security, etc.
- Research & Training Case Team is in charge of collecting information about informatization, supporting policy making, and training for informatization, etc.
- Document Office is in charge of operation for all administrative work occurred in ICTDA and director support in informatization training.

Moreover, ICTDA has a regular education programs for informatization by operating the Training Center with IT training session in the department.

Currently, Addis Ababa's city hall implemented the communication infrastructure and information equipment in the city hall by its own budget, which led to more convenient work environment with PCs and internet.

- The city administration of Addis Ababa has offices in 2 buildings; the main city hall and the new building. The supply of IT equipment is already finished for both buildings.
- The new building is under installation of communication network system and is planned to be completed in 2013. Some departments already use the wireless communication network.
- The old building is already equipped with information devices and network system, and each public official use 1 desktop or laptop PC.

Most administration work in the department is done by conventional face to face talk and printed document, and only basic works such as information search, document creation is done by using PC.

- Recently introduced information devices are used only for the basic work such as writing and printing documents. Most administrative works are conducted under the approval of the person in charge, manually.
- There are no standard or procedure to process administrative documents and work. As a result, each department and organization has its own way to conduct the work, which results in the work inefficiency such as repeated work or slow process between different bureaus.

4.4 Analysis of Informatization Infrastructure

In 2006, Ethiopia Telecommunication Corporation (Ethio Telecomm: ETC) promoted the expansion of implementation in communication network through the network upgrade contract with 3 Chinese companies (ZTE, Huawei, and Chinese International Telecommunication Construction Corporation).

The overall level of information and communication technology in Ethiopia is quite low. The state-owned telecommunication enterprise Ethio Telecom monopolizes the whole market, which leads to the absence of the competition in market.

[Table 12] Current status of ICT infrastructure Benchmarking

Contents	Unit	Ethiopia	Other low income countries
Mobile phone coverage	% population	9.9	48.2
International bandwidth	Mbps/capita	0.3	5.8
Internet	subscribers/100 people	0.0	0.1
Landline	subscribers/100 people	1.0	0.8
Mobile phone	subscribers/100 people	1.6	15.1
Price of monthly mobile basket	3.37	11.12	9.9
Price of monthly fixed line basket	2.00	13.58	-
Price of 20-hour internet package	14.85	67.95	11.0
Price of a 3-minute call to United States	3.33	2.59	2.0
Price of inter-Africa telephone calls, mean	1.27	0.72	n.a

※ Source: KOTRA Addis Ababa Head Office, Current status of main industry (March, 2013)

The price of ICT service is relatively cheap compared to other countries. This price is due to the support from high price of international telephone call. Ethiopia's information and communication fee doesn't reflect the expense structure because of the absence of competition in the market.

Ethiopian government is aiming at 3 million wired telephone subscribers, 40 million mobile phone subscribers and 3.69% of broadband internet service users.

[Table 13] the Mission of ICT Department in Ethiopia GTP

Contents	2010	2015
Landline Telephone subscriber (million)	1	3.05
The density of Wire Telephone (%)	1.36	3.4
Mobile phone subscribers(million)	6.52	40
Mobile phone coverage (%)	8.7	45
Internet service subscription (%)	0.187	3.69
Mobile phone service subscription (%)	Less than 50	90

※ Source: KOTRA Addis Ababa Head Office, Current status of main industry (March, 2013)

Ethiopian government's goal is the establishment of government portal and e-Pay portal, various information system for national assembly, finance, roads, national defense, society, service, tax management, tourism industry, environment monitoring, rural development, etc.

According to the 'e-Government survey 2012' by UN, Ethiopian e-Government is ranked as 172nd among 190 countries. Interestingly, the online service index which shows the level of practical public administration service is quite highly ranked compared to other evaluation items in the survey.

[Table 14] Comparison Analysis of e-GDI between Ethiopia and Korea

Contents	Online service	Communication infrastructure	Human resource	Total	
				index	ranking
Ethiopia	0.4706	0.0093	0.2119	0.2306	172
Korea	1.000	0.8356	0.9494	0.9283	1

※ Source: UNPAN, *UN e-Government Survey 2012*

- ※ Online Service index: National portal site, Health, Education, Social welfare, labor finance, etc. It evaluates the general capacity of providing public service to the people.
- ※ Information communication index: 5 index (The number of estimated internet user per 100people, the number of telephone lines, the number of joining mobile phone. The number of wire internet member) are surveyed in the way of weighted value.
- ※ Human resource Index: 2 index (The adult literacy rate, the rate of school attendance) are surveyed in the way of weighted value, and it reflects the acceptance rate of e-Government service.

The level of Ethiopian e-Government is about to change from the first step which means the starting stage to the second step which means the development stage and is able to provide the complex one-way information service and the simple two-way online service among the 4 steps mentioned in the e-Government survey.

[Table 15] Specific Analysis of Ethiopia e-GDI

Contents	Description	
Online service	Evaluation index	0.4706
	Stage1 (7% rate in importance)	83%
	Stage2 (24% rate in importance)	62%
	Stage3 (30% rate in importance)	10%
	Stage4 (39% rate in importance)	45%
	Total	41%
Communication infrastructure	Evaluation index	0.0093
	The number of estimated internet user per100people	0.75
	Penetration of wire telephone per 100 people	1.10
	Penetration of mobile phone per 100 people	7.86
	Penetration of Internet per 100 people	0.09
	Penetration of broadband per 100 people	0.00
Human resource	Evaluation index	0.2119
	The adult literacy rate (%)	29.82
	The rate of school attendance (%)	55.25

※ Source: UNPAN, *UN e-Government Survey 2012*

According to the ITU 'Measuring the information society 2013' report, the informatization development index of Ethiopia is 151st among 157 countries, which shows the current low level of informatization status.

[Table 16] Ethiopia ICT Development Index (IDI)

Contents	ICT Access		ICT Use		ICT Skill		Total	
	Index	ranking	Index	ranking	index	ranking	index	ranking
Ethiopia	1.64	149	0.07	153	2.80	150	1.24	151
Korea	8.28	11	8.22	2	9.86	1	8.40	1

※ Source: ITU, *Measuring the Information society 2013*

[Table 17] Current Status of Ethiopia Informatization

Contents	Description	2011	2012	
Access Indicator	Penetration rate of computer per household	1.0	0.9	
	Penetration rate of mobile phone per 100 people	16.7	23.7	
	Internet speed per internet user (Bit/s)	6,974	5,065	
	Penetration rate of computer per household (%)	1.8	2.1	
	Penetration rate of internet per household (%)	1.5	1.9	
Use Indicator	The number of Internet users (%)	1.1	1.5	
	Penetration rate of internet broadband per 100 people	0.0	0.0	
	Penetration rate of mobile phone broadband per 100 people	0.3	0.4	
Skill Indicator	The percentage of school attendance	secondary	37.6	37.6
		Tertiary	7.6	7.6
	The literacy rate		39.0	39.0

※ Source: ITU, *Measuring the Information society 2013*

Recently, Addis Ababa City Government secured equipment of informatization system. In addition, the government established communication infrastructure and data center for conduction of internal administrative work by its own budget.

- Now Addis Ababa's city hall has established and operated two data centers. The main data center is located in the city hall, and the other data center is located in Bole for prevention of disaster or emergency.
- Addis Ababa city government states that some of departments moved into the new building and the infrastructure establishment projects for a new building which have been conducting now are completed in 2013.
- The public officials in the Addis Ababa's city hall use 1 PC per person and utilize various OS system such as Window XP, Window Vista according to their work.
- Some manager level officials use more than 1 PC and laptop. It is thought that the supply of information equipment in the city hall is sufficient.

Safety equipment such as UPS, dehumidifier, and fire extinguisher for prevention of disaster or emergency which came from the irregular electronic power supply is quite well prepared.

- To prevent the damage from irregular power supply or black out, some offices has small UPS. And big UPS, standby generating unit, dehumidifier and fire suppression equipment also have been installed recently for data center operation.

[Figure 10] Current status of Addis Ababa city hall infrastructure



※ Source: Addis Ababa City hall, data from the field trip in data center

4.5 Current Status of the Informatization Legal Framework

Ethiopian government is planning the modification of the legal framework for informatization system and e-Government establishment under the recognition of the necessity that successful promotion and enactment of informatization strategies and policies are required.

Ethiopian government has finished all required preparation for making the legal framework such as ‘the law for public use of government informatization system standard or framework’, ‘national e-Commerce law’, etc. And the examination and approval process of the legal framework is proceeding.

[Table 18] Current Status of the Ethiopia Informatization Legal Framework Promoted

The name of legal framework	current status
1. National Electronic Transaction Law	In the stage of preparation for the draft
2. National Data Protection Law	
3. e-Commerce Law	
4. Computer Misuse and Cyber Crime Law	
5. e-Signature Law	In process
6. National Public Key Infrastructure (PKI) Framework	
7. National Enterprise Architecture Framework for Ethiopia	
8. Government Information Systems Interoperability Framework/ Standard (e-GIF)	In evaluation of the court approval

※ Source: MCIT, Ethiopian Government Portal, data related the legal framework reconstruction

Currently the legal framework of Addis Ababa informatization plan is in the stage of preparation, and there are no policies of regulations for conducting this informatization projects and administrative work.

It is considered that use of related administrative information and electronic signature in the e-Government promotion are required. However, it is expected that it takes some time to enact or modify the most of legal framework.

There are no standards or procedure to process administrative documents and work. As a result, each department and organization has its own way to conduct the work, which results in the work inefficiency and duplication.

5. Implications Analysis

Federal government of Ethiopia and Addis Ababa City Government shall promote the active informatization projects under the necessity of establishing informatization and e-Government system as an important factor to national development by improving the effectiveness of public administrative work.

As a result, it is showing the strong will to establish the specific national informatization policies and communication infrastructure.

Addis Ababa has already finished the implementation of communication and informatization infrastructure by its own budget, which shows its high level of preparation.

However, the officials in the city government use the information equipment only when they do very simple work. To improve work effectiveness and minimize repeated work, it is required to expand usage of information equipment.

Because of the absence of specific legal framework which is required to conduct informatization projects, the enactment and modification of the legal framework for administration work informatization have to be considered urgently.

There are no standards or procedure to process and manage the administrative documents and work. As a result, each department and organization has its own way to conduct the work, which leads to the work inefficiency. Hence, the standard or regulation of work process is required.

III. Technology Analysis

1. Requirement Analysis

In order to have a To-be model in e-Office system, we conducted questionnaire and interview on the related people of Addis Ababa. Officials who answered the survey were 12 people including staff of AAICTDA. Most of them were actively using PC's and the interview and survey were conducted by personal visit or explanation of the content and we got answers through Email or hard copy. Answers and analysis on them are as in the following:

1.1. Draft of Approval / Authorization Stage

No one used hand-written paper document but used PC for the work performance. For authorization, everyone used face-to-face meeting and signature on the hard copy paper document. The process of the authorization was taking on average of 9.1 hours, which is more than one working day. For the loss of the document in the approval procedure, average of loss rate was 2.5%, but in many cases, loss of the document means inconvenience of finding the document rather than physically losing the document. Lastly, all the respondents felt monitoring is necessary in the process of authorization.

1.2. Stage of Receiving and Sending Document between Divisions

Respondents answered that it took 9.2 hours for sending approval document within Addis Ababa City Office, and 15.0 hours outside of the city office, which are both more than one working day. For the loss of documents in the process of receiving and sending documents, officials responded 3.6% for delivery within City Office, and interestingly 1.8% for outside offices. Lastly, everyone felt inconvenient due to the lack of monitoring in receiving and sending process, so felt the need of monitoring function.

1.3. Document Management

All of the respondents felt more or less uncomfortable for current system using paper document. About the time for searching the document, the average time was 2.9 hours, but the answered varied from less than an hour to more than a day. Lastly, all of the people answered that it would be more comfortable for searching document to use searching engines such as Google.

2. Current status

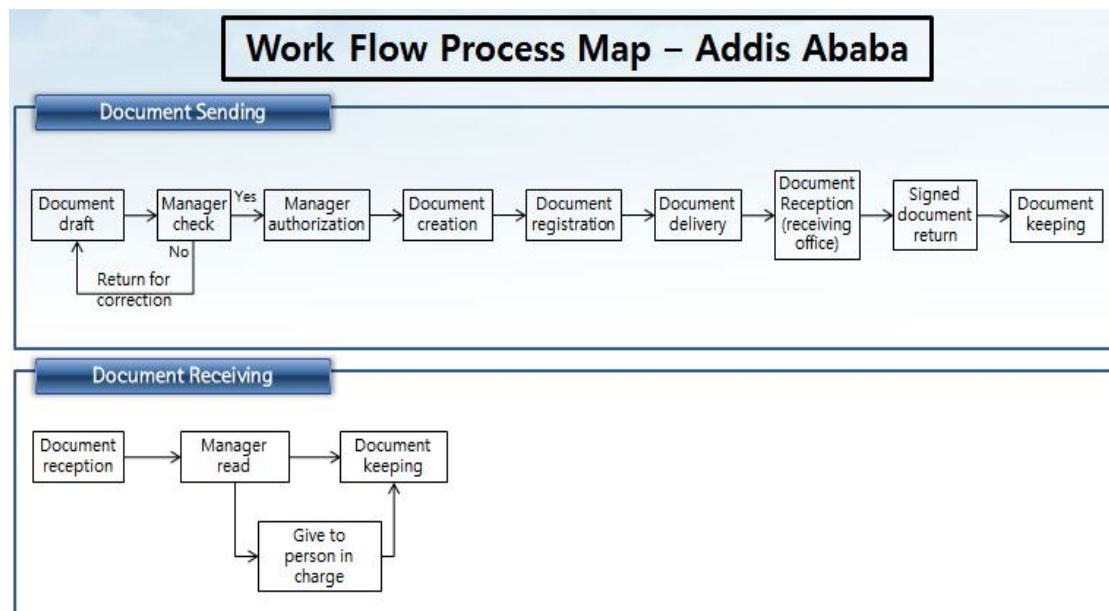
2.1. System Configuration

In Addis Ababa, administration process is based on paper document. The core processes of the administration are receiving external documents, approving internal documents, and sending external documents to other staff. Creating documents for authorization is based on PC document but approval as well as distribution/acceptance is based on conventional manual method.

The steps below outline the work flow process of document sending and receiving in Addis Ababa city. All official flow of the documents created in Addis Ababa can be divided as draft/sending and receiving/keeping.

- a) Document draft: Person in charge makes a document regarding a specific issue and give it to manager.
- b) Manager Check: Manager reads and checks whether the contents of document is appropriate.
- c) Manager Authorization: Manager signs and approves the document.
- d) Document Creation: Person in charge duplicates the approved document one more copy than the number of recipients plus cc. and gives them to the document officer.
- e) Document Registration: Document officer stamps at each copy and records description of document in the document logbook by creating reference number.
- f) Document Delivery: Postman visits each assigned office and delivers documents.
- g) Document Reception: Document officer of the receiving office writes description of document in the document logbook and signs at the document for keeping (or returning)
- h) Signed document return: Postman returns to office with the document with signature of receiving office(s).
- i) Document keeping: Document officer keeps the returned document in the folder according to reference number.
- j) Manager read and sign: Manager reads and signs the received document (make comment/orders on it)
- k) Give to person in charge: Manager gives the corresponding document to the person in charge of that issue.
- l) Document keeping: Document officer keeps the signed document in the folder in the order as recorded in the document logbook.

In this work flow scenario, the whole process relies on the handling of paper made document, and when a created document is sent to external bureaus, exceptional event that might occur are only dealt by non-standard manual method. Each time a document is created, it should be duplicated as many as the number of recipients, and during the delivery process, risks such as loss or damage exist. Furthermore, because the process of signing and receiving are all done manually, reliability is not guaranteed and it is very hard to monitor the process.



[Figure 11] Work Flow Process Map

2.2. Business Process

In Addis Ababa, the flow of business process for administrative works are based on internal cooperation of sharing printed documents, flow of authorization, managing documents for the records and receiving or sending documents to other Governmental Institutions. The following is the analysis on each process:

2.2.1. Flow of Cooperation of Documents

There are memo, letter, phone, fax and email in Addis Ababa to share information internally. The method of official communication, however, is limited on hard copy. Generally, email is not regarded as an official communication method. In current situation, documents sent through email should be re-sent in a hard copy format. The method of communication could be changed according to the subjects but there are no clear criteria on this.

Some officials in Addis Ababa don't think that email is a legitimate communication method. Accordingly, we could guess that there could be resistance

for implementation of e-Office System in the future. Solution to handle the changed environment is also needed.

2.2.2. Flow of Authorization

Currently the biggest issue relating to the authorization in Addis Ababa is that there is no management system for document tracking which can be used to understand the flow of authorization. This is a serious problem for it takes long time for the authorization and since there are no guideline(formal form of approval), document may change every time it gets authorization. This is because of manual offline authorization.

Another problem in manual authorization is the loss of document due to the lack of management system for document tracking so that we can't keep track of the flow of authorization. Especially when the person in charge of authorization is out of office for long-term, document become more likely to be lost and the creator of that document have to re-write the document.

In addition, there is no clear standard system and there are no criteria of approval. Each person in charge takes different criteria based on their own experience so that document may become different every time. Standardization is highly required. There is no regulation, so in case of the long absence of the person in charge, the loss or pileup of document frequently occurs.

2.2.3. Flow of Document Management

Bookshelves that are used to store approved documents are also managed manually and it takes long time to manage and use the documents. Searching, obtaining, managing of information is not easy. For the list of document management, it is written based on basic items.

Storage environment for the approved document is also inferior that the loss of documents occurs frequently since humidity or temperature of the space is not adequate for storage.

Physical space for increasing paper shall also be needed. In current system, when the amount of authorized document becomes particular quantity, it is moved to storage room.

It takes too much time for searching and obtaining the information needed for the business performance under the current Library system.

Classification plan of documents(information) is only based on serial numbers by departments and years so that hard to be used.

2.2.4. Flow of Sending and Receiving of Foreign Document

There is no formulated form for the document which is being distributed internally in Addis Ababa. For the document being sent or received between foreign institutions, there is only a rough form. If the form of document is different between institutions, the business performance process could be ineffective since reworking of the document may be required for format modification. The lack of form also makes problem in document management. Different formats in searching and using of information make users confused and it is hard to personally manage them.

2.3. H/W, S/W, N/W

2.3.1. H/W

- Servers
There is a main server facility in the City Hall building, and a backup server in a separate building in Bole.
- Personal computers
Every person in the City administration has a desktop or laptop PC. Some staff even have both.
- Printers and Scanners
Usually there is a printer in every office, but they are used as local printers, each connected by USB port, instead of network printers.

Some offices have scanners or multi-function printers.

2.3.2. S/W

- PC Operating Systems
Every PC uses MS Windows based operating system, and the version varies from Windows XP to Windows 8.
- Desktop Applications
All personal computers are using Microsoft Office (2007 and 2010).
- E-mail System
Every staff has email accounts, but they are commercial email service such as Yahoo Mail or Gmail..

2.3.3. N/W

- City Hall
Every office is connected with fiber optics cable, but because of the limited transmission speed from the telecommunication company, so far it doesn't make big difference from the conventional copper cable in terms of speed. Wi-Fi is installed

but doesn't have any security means such as password. Some offices, including Capacity Building Bureau, moved to a new building that doesn't have high speed internet, but will finish installment until end of year.

- **Woreda Office**
Woredas in Addis Ababa are connected to a nationwide public high speed internet, Woreda-Net.

2.4. Organization

Addis Ababa organized the following Task Force for the F/S project. The TF is composed of personnel from ICTDA which is in charge of the IT related works, but as ICTDA is under the Capacity Building Bureau, it can play the role of making overall improvement of the business process of Addis Ababa City Office.

[Table 19] Task Force

NAME	POSITION	EMAIL
Tesfaye Haile Gebreslassie	General Director, AAICTDA	ethioaddis19@gmail.com
Tewodros Negussie	Research & Training Expert, AAICTDA	tewodresnegussie2000@gmail.com
Genetu Desalege	Deputy General Director, AAICTDA	boshe2009@yahoo.com
Mebratu K.Mariam	Software & Website expert, AAICTDA	mekidan@gmail.com
Ermias Kebede	Software & Website expert, AAICTDA	ermgud@gmail.com

3. SWOT analysis

3.1. Analysis on Internal Environment

In the inner capable point of view, law/regulation, policy, workers, management, procedure and technology shall be analyzed.

- **Vision and Strategy of Addis Ababa**
Transferring paper documents to digital format is under way using scanner although there is not a clear vision or strategy for whole e-Office system in Addis Ababa. Understand the necessity of inducing e-Office in the future.
- **Analysis on Current State of the Organization**
Addis Ababa is consisted of 17 bureaus/authorities and 50 agencies/offices. Documents are sent and received by each offices.
- **Business Procedure**

All tasks are processed with papers and completed documents are stored in the folder and the folders in the storage box and storage book. Comments are noted on blank spaces or back page of the documents.

- Technical Stage
Lack of e-Office related system.

3.2. Analysis on External Environment

- Analysis on policy
Lack of e-Office related system or strategy.
- Analysis on law and regulation
Law and regulation related with e-Office (electronic document, management of public and noted document, management guidelines) shall be revised.

3.3. SWOT Analysis

- Strengths
 - S1. Increasing necessity and will in strategy or policy on informatization of Addis Ababa and Ethiopian leadership
 - S2. Effort to open business result and to improve clarity
 - S3. Management of electronic business manual standardization
- Weakness
 - W1. Lack of standard about system connection of Addis Ababa
 - W2. Lack of flexible cooperative system according to the change of the organization
 - W3. Repeated documents management supporting part (combined with manual labor)
 - W4. Lack of revision of processing procedure for up-to-date technology
 - W6. Lack of supporting function of gathering and deciding opinions for document management
- Opportunities
 - O1. Positive prospect for the business by advanced core infra of the Governmental Institutions with the support from the City Government
 - O2. Application of up-to-date technology and gradual implementation according to the Government policy
 - O3. Opportunity for setting strategy made by modifying law/regulation and defining acceptance

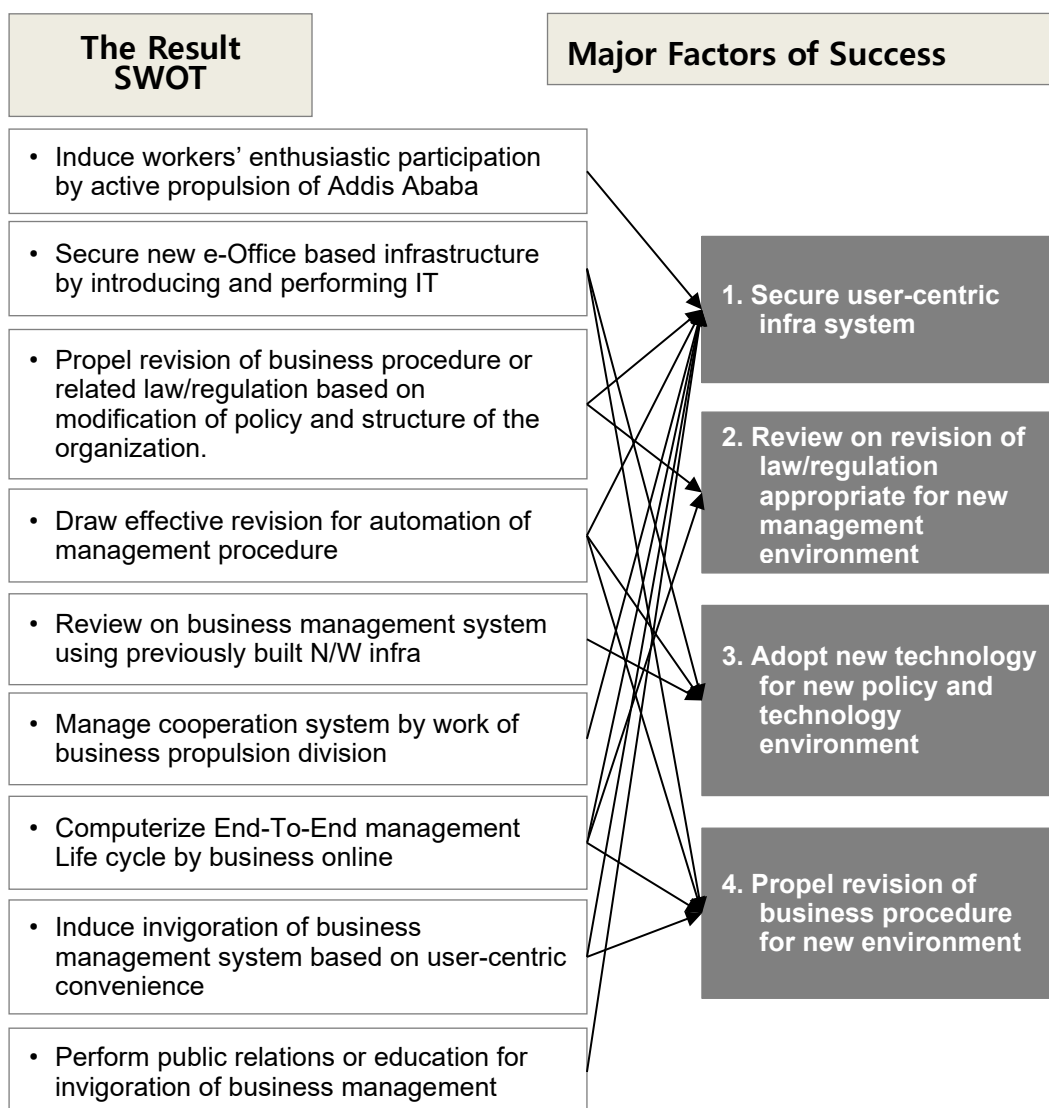
- Threats

T1. Lack of security system due to public use of connection and information

T2. Decrease in business productivity or maladjustment to new system due to the change in document management system

3.4. Draw Major Factors of Success

[Figure 12] Success Factors



4. Benchmarking

4.1. Case of The Blue House (Korean Presidential Office)

4.1.1. Overview

The Blue House had needs of scientific management for records for low productivity of administrative works, such as records and maintenance, based on written documents and implemented e-Office system as a part of innovative policies for national records management as a center of administrative works in government. The e-Office system with special records management functions helped Korean government accomplish transparent and highly reliable government by standards for document and enhancing work effectiveness based on thorough records, management, openness, and utilization.

- Status before e-Office

Before e-Office system was implemented, The Blue House had limited scope of documents for recording and supervising, and important documents for decision making such as record of meetings were not objects for record management. Documents were exposed to risk of concealment and fabrication and it was hard to collect public opinions on policies.

- What made this project

The president ordered to implement innovative roadmap of national records management by stages by emphasizing necessity and importance of scientific records management.

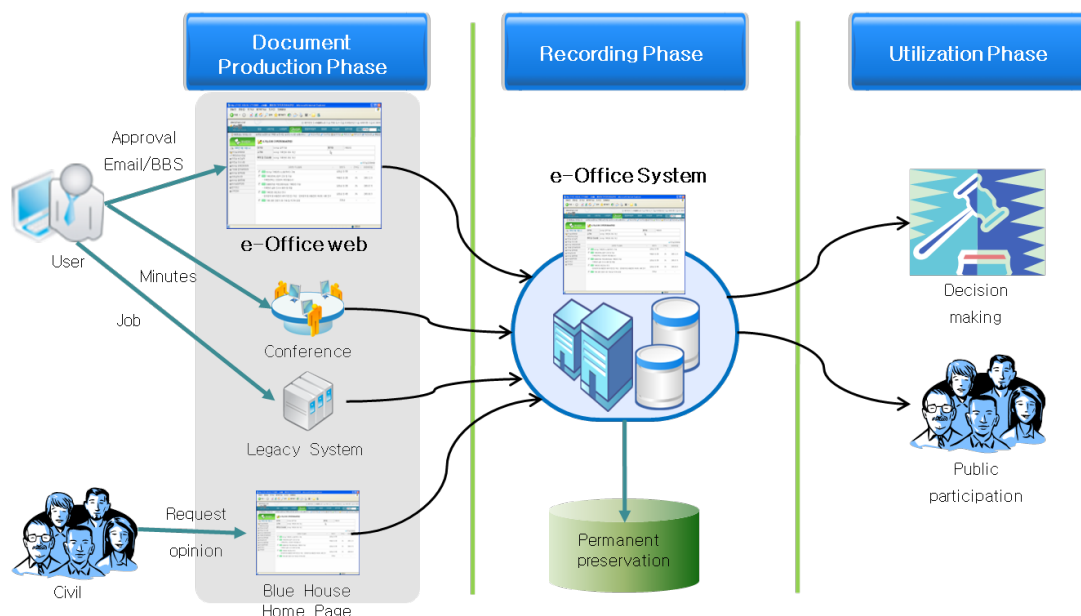
4.1.2. System Diagram

Documents are created by e-Office web, record of meetings, respective working systems, and collecting public opinions, and stored thoroughly into e-Office system. The documents can be accessible by Korean people through Internet according to classifications, for example, immediate access by immediate open or access after designated period by stay period before open etc. Well managed documents play a key role in decision making or encouraging people's participation.

4.1.3. Key Functions

The e-Office system with special function of record management has basic e-Office function, creation and registration of records, arrangement and maintenance of records, record standard management, open and utilization of records, and management of confidential records etc.

- Basic e-Office System function
 - Approval Function: Drafting, Approval, Sending, Receiving
 - Collaboration Function : Email, BBS, Scheduler, Name Card
 - e-Document Delivery Function



[Figure 13]. Blue House System Diagram

- **Creation and Registration of records**
 - Immediate recording after approval
 - Immediate recording of Report, Diary, Order after creation
 - Non-electronic records, specimen of natural history.
- **Arrangement and Maintenance of records**
 - Maintenance – Library management, Digitalization
 - Abolition
 - Transfer – Creation records report, Transfer
- **Standards Management**
 - Standards for records management
 - Classification table for working records
- **Open and Utilization of records**
 - Re-evaluation of records management
 - Open of Information
 - Information search and access
 - Statistics, Tracing audit
- **Management of confidential records**
 - Management of confidential records
 - Re-classification of confidential records

4.1.4. Effects of the system

The Blue House has established a system for truthfulness, reliability, faultlessness for records by the e-Office system with special record management function, checked record creation status and classified the documents (open, non-open, or confidential) by function of statistics and surveillance, and prevented loss, concealment, or fabrication of records. Status before e-Office system is as follows.

- Record loss (notes, schedule, diary, individual work system, home page etc.) for unclear rules of scope of records and acquisition
- Abolition without approval and loss for unclear management of non-electronic records and no automatic surveillance
- Poor records arrangement for difficulty in checking creation records and maintenance status
- Hard to verify truthfulness of documents for unclear receiving method and standards
- Hard to reflect change of classification table
- Difficulty in opening information and public relations of policies in timely manner for unclear standards for records open and no automatic surveillance
- Self-storing or abolition of confidential records for unclear submission and maintenance standards for confidential records

Effects of e-Office system are as follows.

- Truthfulness, reliability, and faultlessness of records by prevention of fabrication and loss based automatic recording and management from creation of records.
- Real time check for records creation status by documents code numbers issued when registration and thorough records arrangement by search function
- Prevention of omission of opening by automatic open function
- Easy reflection of classification table change
- Strengthen security and management function for confidential records by transfer function and prevention of concealment by re-evaluation function
- Interesting people and encouraging their participation by open of valuable information

4.1.5. Results

The Blue House can create documents by standards of record management from creation of records to utilization, and process the documents to transfer stage in consistent manner by e-Office system. The administration that emphasized

people's participation was established by opening these valuable information. We found these three points from the Blue House case.

- Need of legal measures
 - Need of revision of laws to force recording of all works
- Importance of standardization of records management
 - Creation of valuable records through consistent system from records creation by standardization of records management
 - Records should be created under consideration of search and utilization from the beginning
 - Standards customized by international standards
- Accomplishment for increased people's participation
 - Enhance interest of people in national policies and collect people's opinion by opening records
 - Record works utilizing collected information from people's participation
 - Enhance people's trust and effectiveness of works by these processes

4.2. Case of Korean Ministry of National Defense(MND)

4.2.1. Overview

In MND, since the Republic of Korean Joint Chiefs of Staff, Army, Navy, Air Force, and each subordinate organizations respectively had defense networks and the networks were not connected, exchange of documents had been done by manual methods. Also each armed forces within defense network had different electronic approval systems so that it was hard to connect each other. Electronic documents exchange system was established by interconnection of military information portal system and revision of management rules. The system helped Korean military become stronger by exchange of electronic documents among different organizations including vessels in duty, remote posts, and small islands that had not been connected to conventional defense network.

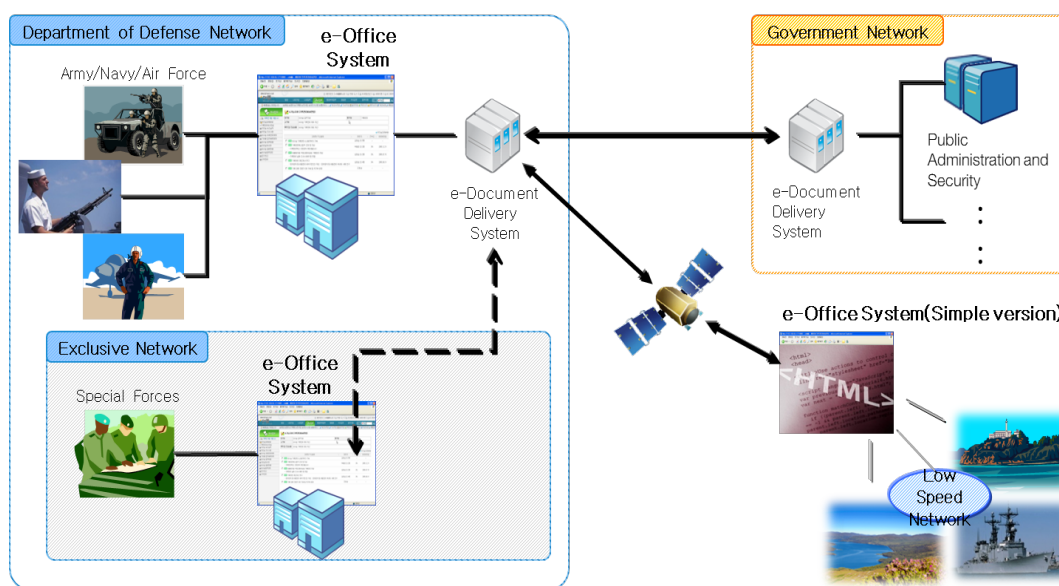
- Status before the system

Since MND, each armed forces, and subordinate organizations had different e-Office systems, cooperation by documents was not easy. Due to the non-standard e-Office systems it was also difficult to exchange documents with governmental organizations. There also was difficulty in exchanging documents with other organizations including each armed forces.
- What made the system

The standard e-Office system was established by extension of web based applications by wide defense network project of MND and standardization by revision of business management rules and needs of inter connection to other systems.

4.2.2. System Diagram

Document distribution from inside the MND has been created to make military document circulation available to the government network which was physically separated. Also it has been implemented that highly confidential troops, such as special forces, can also circulate its documents in the same manner. This is available for the document distribution inside the MND which switches between MND network and the government network. Also it has been created to have smooth document distribution in the environment with the environment of Low Speed Network satellite. The electronic document distribution system is performed by the e-Office system of electronic data, approval, distribution list, document requisite, etc.



[Figure 14] MND Diagram

4.2.3. System Main Function

The special e-Office system with the military e-document distribution system provides simple e-Office function, group interlocked system, information connection system between MND Net, independent closed net, and government information network.

- Simple e-Office System Function
 - Authorization Function: draft, Authorization, dispatching, accepting function
 - Collaboration Function: Email, BBS, Scheduler, Business Card
 - e-Document Delivery Function
- group interlocked system
 - SSO certification (Single Sign On) offering API
 - Accepting Document , receiving choice
 - User organization report automatic alternation and synchronization

- Information connection system
 - Link with EDMS
 - Material Information System
 - Link with KMS
- MND Net, Closed Net, Government net of document distribution function
 - separated function of network document distribution

4.2.4. Introduction Effect

It has been possible for the strengthened e-Office System document distribution for the MND to provide quick decision making and mutual help even with the low speed network environment such as remote small islands and navy vessels, and also with troops spread out in the nation, and with the administration network independent from MND network.

The next describes situations before the introduction of e-Office Systems.

- It was difficult to have seamless cooperation in low speed environment (small islands, vessels, remote posts)
- Difficult to have quick decision making, cooperation determination
- Difficult for mutual help between other administrations/ministries
- Different from standard document papers between other administrations
- Difficult with the non-standard e-Office system combined and document distributions
- Manual unit document distributions

The following explains the effect after the introduction of e-Office System

- It is available to have seamless cooperation in system planning in low speed environment even with a restricted environment
- It is available for troops in islands, remote areas, and navy vessels using the e-Office System to provide quick decision making, and cooperation determination
- Data transfer with other nationwide administrations network is possible regardless of the data processing environment and document distributed
- Availability of standard e-document between other administrations/ministries

4.2.5. Implications

The special e-document distribution lets low speed network in remote posts, small islands, navy vessels and more in considering specific environments in distribution documents, for it to be possible for document distribution in electronic document distribution.

- Using standard e-Office System
 - Because they implemented standard e-Office System, e-Office System can be used anywhere, including remote posts, small islands and navy vessels, and enables information acquisition and quick communication.
- Standard needs of electronic document distribution
 - Standard electronic document distribution for smooth distribution is needed not only for the military but also for other administrations
- Government Authorization needs for products
 - System needed for officially appointed Standard electronic document distribution to accredit and administer
 - Governmental authorization is favored for faster and unified system diffusion
- Network environment for independent e-Office System
 - The e-Office system can be used without any problems in low speed network environment with various methodology and technology.
 - Using e-Office System both with super high speed environment and low speed environment

4.3. Case of Seoul Metropolitan Government

4.3.1. Background

In Seoul Metropolitan Government, implementation of “paperless” official documents has been achieved using the e-Document System since 2001, but due to the amendment of laws and regulations regarding the management of official record and administrative work, a system reconstruction was required.

- Enhance responsibility and transparency of decision making by changing the focus from management of administration output with approved documents to digitalization and recording of whole approval process.
- Change of decision making structure from vertical to open, bilateral, horizontal structure using tools such as Memo Report
- Change of work processing management from absence of planned work processing system to systematic work processing system using schedule management

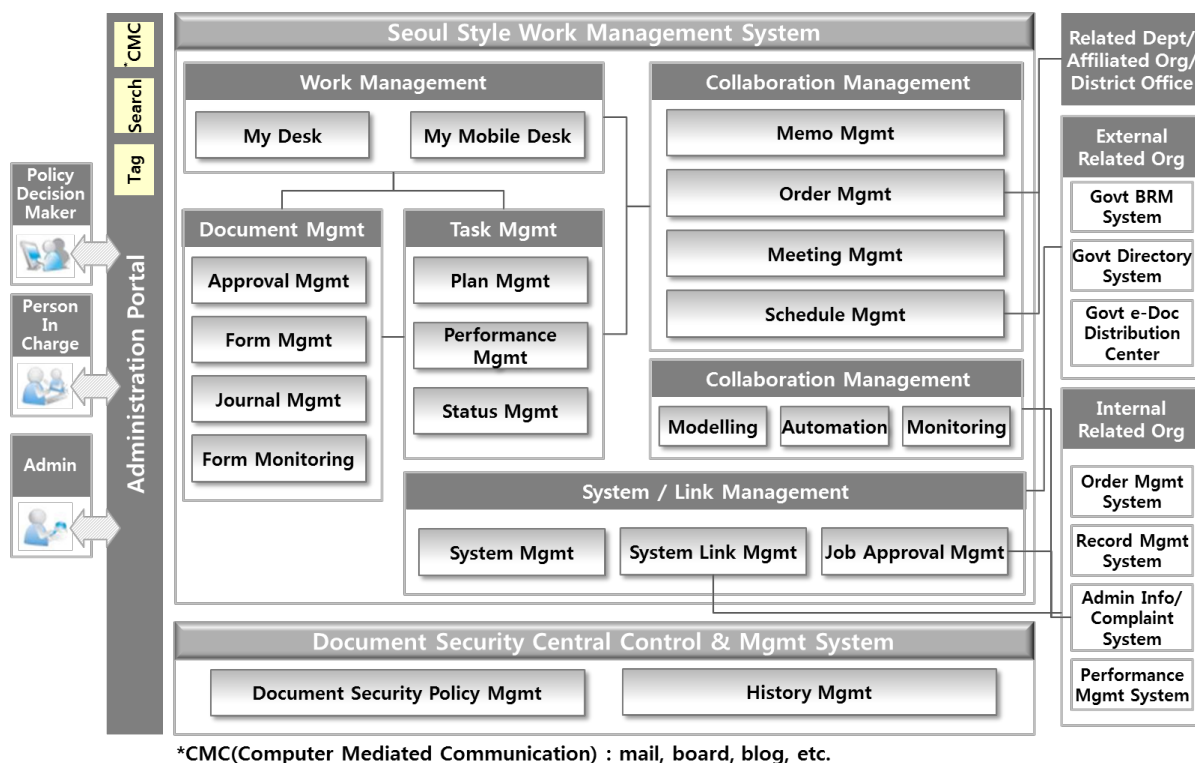
4.3.2. Need for Seoul-style Work Management System Background

The specialized functions of Seoul e-Document System makes a high user friendly and accessible system, thus contributing to enhanced productivity and transparency.

- Example) Case of Office of Waterworks of Seoul
 - By using a specialized link(linked form), systems managing customers and bills are built and operated

- Such system is contributing much to improved productivity and to corruption prevention by automatically creating draft document.
 - By using the “accounting form sending/receiving function”, the system is helping improvement of accounting document processing convenience and transparency
 - By using attached document signature function, enhancing speed of work processing in office distant from main office.
- When asked if they wanted to extend usage of specialized functions, most of the offices replied yes.
 - Limitation of common system caused by various requirements of each departments
 - In the case of Integrated On-Nara System(e-Office System of the central government of Korea), a flexible source management policy and enhanced user centric service policy was required because of the difficulty in applying diversity such as automation service using latest technology(BPM, Web 2.0)

4.3.3. Structure of the System



[Figure 15] Seoul Style Work Management System Diagram

4.3.4. Effects of Implementation

- Decision maker : Enhancing transparency due to the history record of all process including order - execution – report.
 - Progress monitoring of important tasks
 - Ubiquitous work environment using latest technology
- Middle level manager : Building collaboration system of related organizations (plan, budget, assessment) for important tasks
 - Information search for the plan, output, and status of corresponding project
 - Efficient support for collaboration (memo report, meeting management, schedule management)
 - Enhanced responsibility and transparency of decision making by history management during working process
- Person in charge : Working more efficiently by applying
 - Smooth job handover following change of organization
 - Maintaining user friendly functions by applying Seoul customized functions
 - Integrated work environment by link between administration information systems

5. Implication of Technical Analysis

Implications benchmarked for advanced instance suggests requirement Analysis Current Status, SWOT Analysis for the target of Implication of Technical Analysis for Addis Ababa.

5.1. Requirement Analysis

Required analysis for Addis Ababa users was done by surveys and interviews. The content carried out was task of draft and approval, task among the dispatch and reception of documents, task of document organizations, and below are some of the analysis result.

- a) With the current situation, for the user communication it provides inefficient elements such as face-to-face talk, phone, paper documents and fax
- b) Existing documents were done by manual works which cause longer lead time to be processed. Especially the transmitting/receiving of documents takes a long period of time.
- c) There was no way to track and monitor the documents. The circumstance while the authorization progress is difficult especially for the in process review report, also the papers got lost relatively often.

- d) It is difficult to search and practically use stored documents. Each person in charge may use a PC to find documents that were made with their own PC easily, but they are having difficulties using actual hard copy documents in Addis Ababa
- e) Most Addis Ababa officials use PC to perform task of Email, internet search, and word processing, which gives them a fine informational ability. Therefore, while implementing e-Office System, the requests of the users should be thoroughly applied.

5.2. Current Status

Current status analyzes Addis Ababa system composition, business procedure; H/W with S/W present condition and the organizational circumstance which provides a viewpoint as follows.

- a) While looking at current document management task, there is no specific determined standard document, so forms that had been used before were used.
- b) There is no informational system for document management. However, the scanning and digitalizing of personnel record card is on its way, and some officials are using email for their work.
- c) The management for the paper documents that is being created continuously is not clear, so expense for paper purchase and document storage space is occurring.

5.3. SWOT Analysis

SWOT analysis was done not only with Addis Ababa but with Ethiopia government's ICT contents and it provided the following success elements.

- a) Infra secured system is needed after the user's connected documents. This is because the document organization needs flexibility.
- b) There needs to be an improvement review of the new environment improvement system. When e-Office System is introduced, it has to change to an electronic signature. Also, for the paper of the printed copy to show effectiveness in documents, an improvement in law system is needed.
- c) From now on, new technology affecting government environment and technology environment is needed. Recently Web2.0 emerged and web technology are both being developed and especially from the government branch the Open Source usage is expanding. A review is needed with the new technology review with the technology environment needed.
- d) New business process with the new technology technique and process refinement is needed. As the basic hand work has been changed to electronic

work there needs to be documental review improvement. When handling these electronically, a lot more objects for the productivity business procedure is newly established.

5.4. Benchmarking

Benchmarking Analyzing with e-Office System has been implemented for the Blue House and Ministry of National defense. These systems were built and managed 10 years ago with the e-Office System. The advanced example gave us some important implications.

- a) The determined will of the highest decision maker is essential. In Korea, the President and the whole administration had a strong will for implementing electronic government, and based on that will, all required standard about government was made and information system appropriate for each departments was implemented. The Korean e-Office System of course was spread in a quick time and safe settlement was established.
- b) e-Office System's expansion and reliable expansion was needed. In Korea, the e-Office System has been introduced and it took more than 10 years to manage to expand by interlocking and connecting to the system. Therefore what is asked in the e-Office System of Addis Ababa is that easy expansion for e-Office system must be secured for interlocking and connection of diverse works and standards about the information.
- c) The data storage plan and backup plan is needed. As the paper documents turned into electronic documents, the electronic documents number rose tremendously. The consideration for this data storage and backup must be considered.

IV. Implementation Plan

This page suggests the direction of e-Office System target model which is based on ICT environment on Chapter III and the implication of engineering analysis on Chapter IV. And after drawing an improvement issue for materializing direction of presented target model, it defines a final target system and suggests each part of strategies to build the target system

1. Direction

The direction to build e-Office System implementation is based on ICT environment and the implication of technical analysis. Each part of major issues to comprise e-Office System target model materialize details to build e-Office System target system finally. These charts are major issues based on ICT environment and the implication of technical analysis.

[Table 20]. Major Issues List

No.	Major Issues
I.01	Absence of Cyber law <ul style="list-style-type: none"> ✓ It's aware the necessity of Cyber law, but there are not any legal systems today
I.02	Document management manual which is not suitable for the environment of electronic document <ul style="list-style-type: none"> ✓ Manual only for paper document exists. ✓ Vague and abstract management regulation ✓ The present personnel who don't know the existence of the present manual (Lack of forcibleness)
I.03	The current group structure which focuses on paper document management, and their roles <ul style="list-style-type: none"> ✓ Necessity of regroup for building e-Office structure and management
I.04	There are many kinds of ways to communicate, but it takes a long time and it's inefficient <ul style="list-style-type: none"> ✓ It's inefficient and it takes a long time because of using conventional communication tools such as face-to-face talk, phone call, paper document, Fax etc
I.05	It takes a long time to process all documents and it's inefficient <ul style="list-style-type: none"> ✓ It takes a long time because it processes all documents manually ✓ Inconvenience of take along paper documents
I.06	Mechanism's absence to process document pursuit system <ul style="list-style-type: none"> ✓ There is no document pursuit system to trace process of document and situation ✓ The documents sometime are processed as lost documents by reason of a person's absence who can approve
I.07	Library management system which is based on manual system. <ul style="list-style-type: none"> ✓ All works in Library processes by manual system, and there are no supporting systems for Library works ✓ For example, document release register, it's drawn by hand.

I.08	<p>Poor Library environment</p> <ul style="list-style-type: none"> ✓ Working place and environment in Library today is very poor. ✓ There is no humidistat, air conditioner, fire extinguisher to keep documents safely.
I.09	<p>Inconvenience of researching data and application.</p> <ul style="list-style-type: none"> ✓ Inconvenience to visit Library personally to open the documents. ✓ Because of inconvenience of researching and using documents, it's inadequate for using information for decision. ✓ It's hard to research information after because all documents are assorted into system of classification and serial number
I.10	<p>Uncertain the latest information</p> <ul style="list-style-type: none"> ✓ No guarantee that the latest information because it takes a long time to register in Library.
I.11	<p>Absence of the standard for certain document</p> <ul style="list-style-type: none"> ✓ There aren't any definitions about standard size and dotted signature line
I.12	<p>No system for document management.</p> <ul style="list-style-type: none"> ✓ There is no information system for supporting data formation, data distribution, and storage.
I.13	<p>Establishing e-Office through users' opinions</p> <ul style="list-style-type: none"> ✓ Necessity of securing the applicability through establishing system which is based on users' opinions.
I.14	<p>Awareness of the necessity of ICT education</p> <ul style="list-style-type: none"> ✓ Addis Ababa organization members and other institution members expect the ICT education expansion through e-Office System
I.15	<p>Constructing system for connection</p> <ul style="list-style-type: none"> ✓ Consider of connection with other e-Office System and expansion.
I.16	<p>Resource problems about physical place and paper etc</p> <ul style="list-style-type: none"> ✓ The problem that the necessity of having a physical place to keep all paper documents ✓ Waste of the paper resource because of processing manual system.
I.17	<p>Necessity of tighten up the security system for document computerization.</p> <ul style="list-style-type: none"> ✓ Necessity of the systemic and political plan for the security system of e-Office System
I.18	<p>Necessity of the data backup and storage system.</p> <ul style="list-style-type: none"> ✓ Necessity of making a plan for computerizing paper documents ✓ Necessity of making a data backup plan.
I.19	<p>Constructing e-Office System through the newest technique application</p> <ul style="list-style-type: none"> ✓ Application of the newest technique to follow the changeable information technique
I.20	<p>Maintainable retention for expansion of e-Office System</p> <ul style="list-style-type: none"> ✓ Constructing a system for continuous expansion of e-Office System ✓ Securing the maintainability for connection with Addis Ababa
I.21	<p>Necessity of a strong will of a decision-maker</p> <ul style="list-style-type: none"> ✓ For success of constructing and managing e-Office system, a decision-maker of Addis Ababa needs a strong will

I.22	<p>Necessity of the standard which is led by the government.</p> <ul style="list-style-type: none"> ✓ For the amicable connection with other institutions and systems, the standard is led by the government ✓ Through successful Addis Ababa e-Office constructing, it set up as Ethiopia government's e-Office System.
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The following issues that follows the important e-Office System for the target model are as follows.

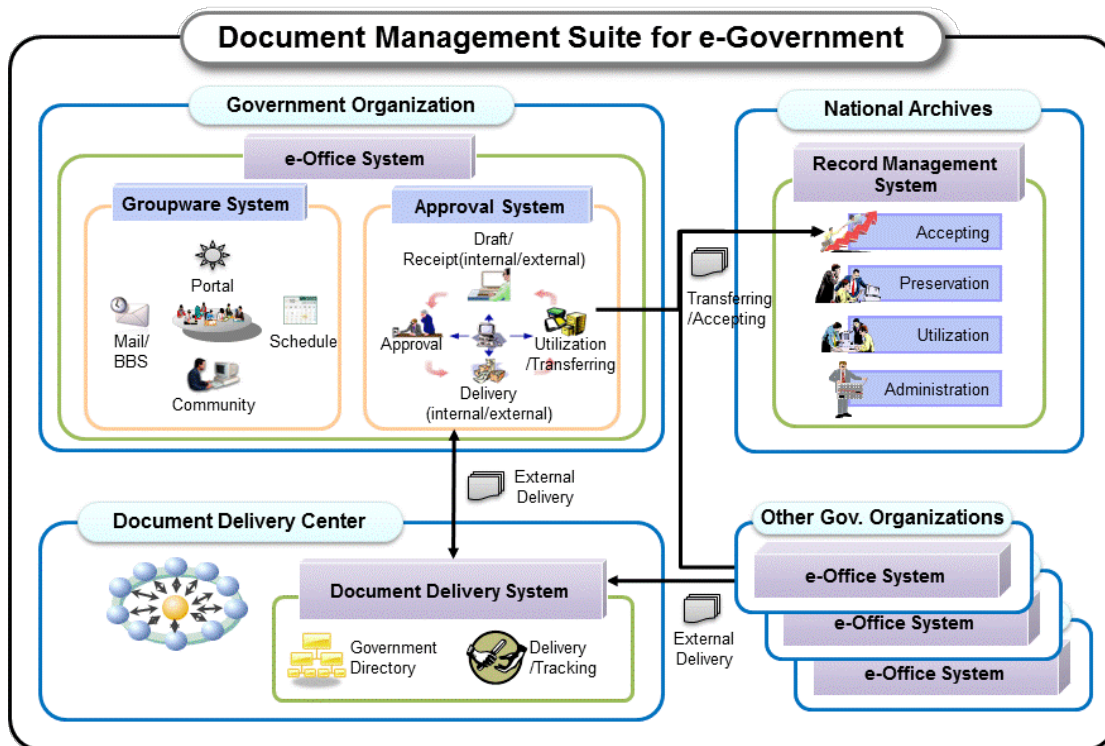
[Table 21] Directionality of target model List

Related major issues No.	Directionality of e-Office System target model	
	No.	Contents
I.01	D1	Modify various laws and regulations for a systematization of e-Office
I.02, I.03, I.11, I.22	D2	Modify the standard which is related to e-Office.
I.02, I.11	D3	Necessity of upgrading document management process.
I.12	D4	Necessity of creating information system to support data formation.
I.03, I.07, I.08, I.16	D5	Necessity of automatizing Library work management system.
I.04, I.05, I.06, I.09, I.13	D6	Necessity of securing the convenience through upgrading document application system.
I.04, I.05, I.09, I.10	D7	Necessity of the informatization tool for information sharing and co-operation.
I.14, I.21	D8	Necessity of inspiring informatization mind for ICT, e-Office System
I.19, I.20	D9	Necessity of the introduction of system for extensibility and external connection
I.17, I.18	D10	Necessity of the plan for e-Office System security and data backup.
I.15	D11	Necessity of the informatization tool for document distribution with other institutions.

2. Vision and Strategy

2.1. Vision

The picture is the Vision of government standard through building e-Office System in Ethiopia.



[Figure 16] e-Government Vision

Addis Ababa government invents a standard e-Office System and installs it at each institution as a building plan of Addis Ababa electronic government. Addis Ababa’s standard e-Office System provides a Groupware System and an Approval System to change manual administration system to electronic administration system. Using by a cooperation function, each government institution may secure information transmission rate and cooperation system, and may manage Life Cycle such as deadline of data, approval, data formation, and distribution electronically using by Approval System. Document circulation with other institutions doesn’t depend on post or a person. Using electronic document circulation server, the efficiency of administration between institutions maximizes. The paper documents and electronic documents which have to be preserved in the long term move to City Archives to complete the city information management system. The efficiency through Vision may be summarized as follows.

- Fast decision making
 - A fast approval process prevents a delay in decision making.
 - Work productivity is enhanced as document processing time is shortened.
- Smooth communication
 - Document information is recycled and shared through fast and quick search.

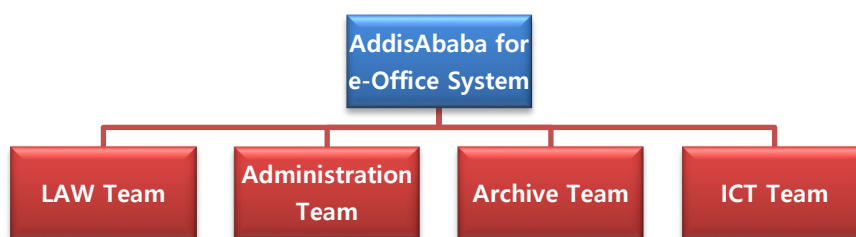
- A document sharing system is established so that everyone can use the documents anytime when they are needed.
- Paperless Office
 - A more comfortable office environment is created by saving document storage space.
 - Unnecessary documents are controlled not to increase.
- Cost reduction
 - Automated document tracking eliminates the risk of document loss and allows missing document to be easily tracked.
 - Automated document processing reduces the expenses incurred from producing paper documents and receiving/sending documents.
 - Document storage and management costs are reduced.

2.2. Strategy

2.1 Vision is aimed at all government institutions and it considers expansion and management. It's necessary to make a plan for each part to achieve its vision. Basically, test-operating and expansion system are stable strategy, therefore, we suggest a strategy of test-operating and expansion system. The strategies are Organizational unit and strategy, Establishing system strategy, Service strategy, System management strategy and Education training strategy.

2.2.1. Organizational unit and strategy

For establishing and managing e-Office System in Addis Ababa, it is necessary to have organization unit and team role as follows



[Figure 17] Addis Ababa TF

- LAW Team
The major role of Law Team is amending legal regulation which is related to e-Office System. This includes amending legal regulation to performing works for electronic documents, electronic signature, and document circulation.
- Administration Team

The major role of Administration Team is establishing the standardization of electronic document. It's aimed at the standardization of works related with electronic document management such as document forms, document classification system, and document processing system according to document life cycle.

- Archives Team

The major role of Archives Team is establishing the standardization of electronic document preservation including paper document. The team may make guidelines to preserve data and establish the standardization for storage and disposal.

- ICT Team

ICT Team invents, installs, educates, and preserves the system which is defined by Administration and Archives Teams.

2.2.2. Establishing system strategy

Establishing system strategy is that a document manager involves in the first stage of development to establish system which is mainly for users. Also, adopting the solution which has many international experiences to customize for Ethiopia's environment.

- Analysis/design stage

On analysis/design stage, involving a document manager in, but selecting a system which has a great international result to compare with Ethiopia's document management situation. Therefore, it adopts The Best Practice from advanced examples and reflects Ethiopia's situation. Also, implementing the standardization of document management and preparing changed agendas to train users.

- Development stage

On this development stage, introducing actual solution which has actual manage experiences to customize according to Ethiopia's environment. This is for securing The Best Practice of advanced example, adopting the newest technique and minimizing error on development stage.

- Testing strategy

On strategy of test-operating, there are function test, integrated test, and performance test. Comprising user group for function test to check reflection of the claims postulated of users. If other systems are connected, integrated test may include connection test, and it implements scenario-centric system. Performance test is testing an efficiency of server. Using by performance test tool to test objectively.

2.2.3. Education training strategy

For education training strategy, is implements manager education training and users training separately. Especially, manager education trains how to manage system stably including error measure and backup system step. User education trains including online manual and video manual to maximize education efficiency.

2.2.4. Service strategy

Although the system is established, it needs each part of verification for opening stable system. This considers the expansion of main work's stage and the expansion of user's stage. Therefore, assigning several departments to implement assigned work to minimize error and user efficiency for security. To manage expansion work, expands assigned works to the whole works and expands user after.

- Strategy of test-operating

On strategy of test-operating stage, object work and group have to be selected. Expanding object work and eliminating problem on function and management together to verify the whole object work. If it's not possible to verify, makes multiple test-operating departments to verify the whole object work.

- Diffusion system

Diffusion system implements after education training user. Operates Help Desk for user to response error and question quickly. Therefore, Help Desk can be divided into two parts which are education part to response user's error and maintenance part to response system error. Besides Help Desk and telephone call education, responses well using by various communication system such as manual, video, and FAQ. For maintenance part, it establishes a group and steps for complement, test and reflection cycle to response error quickly.

- Level of whole conviction

The level of whole conviction happens after the whole users education is completed, and with the users quick and smooth function the help desk is operated to quickly respond to the error and inquiry cases. In another words, the Help Desk is used to maintain cope with the user's malfunction of the education area and the system's disability quickly. The field education of the Help Desk uses phone education apart from manual, videos also including FAQ with Questions and answers to reply in the forums to provide diverse sort of community. The Maintenance domain shows an area of handicapped quickly in supplements, tests, and resulting cycle when this is established.

2.2.5. System Management Strategy

System management strategy maintains the purpose of managing. The system management maneuvers according to the procedures exactly. Also fully acknowledge the data to the backup and recovery procedure exactly. Also fully acknowledge the data to the backup and recovery procedure.

3. Scope of Development

The target development objective would be e-Office System directive to the establishment. The next shows the e-Office System model goal of the improved task and connection.

[Table 22] Improved Tasks

Related major issues No.	Improved tasks
D1, D2	Improving e-Office related law/system ✓ Addis Ababa's e-Office System related with the law/system provides new legislation and amendment of the Ethiopia government for the basic law/system of the information reform
D2, D3, D6, D8, D10	Reestablishment of the managing process ✓ Currently with the manual process of the documents, the e-Office System is used as a basic material of the Addis Ababa efficiency
D2, D3, D4, D6, D7, D8, D9, D10	e-Office System establishment ✓ What happens in Addis Ababa documents can be administered at Life-Cycle combined to build increase in effectiveness of the information business
D3, D9, D11	Establishing document distribution system ✓ Addis Ababa and e-Office System established by other government branches and document mutually by the government to give effectiveness of interagency of the Ethiopia , the government branch before who secured combined distribution
D3, D5	Establishing records management system ✓ What happens in the document Addis Ababa Life-Cycle can be used as an information system to show the effectiveness improvement and Addis Ababa information securing the status
D6, D9, D10	Electrification of existing paper documents ✓ By organizing the existing paper documents range and standard define of the former convenience of the government official

The improving task above included a task of e-Office System and document distribution system, the following report of Addis Ababa shows the e-Office System shows a construction reasonable for the e-Office System

4. System Architecture

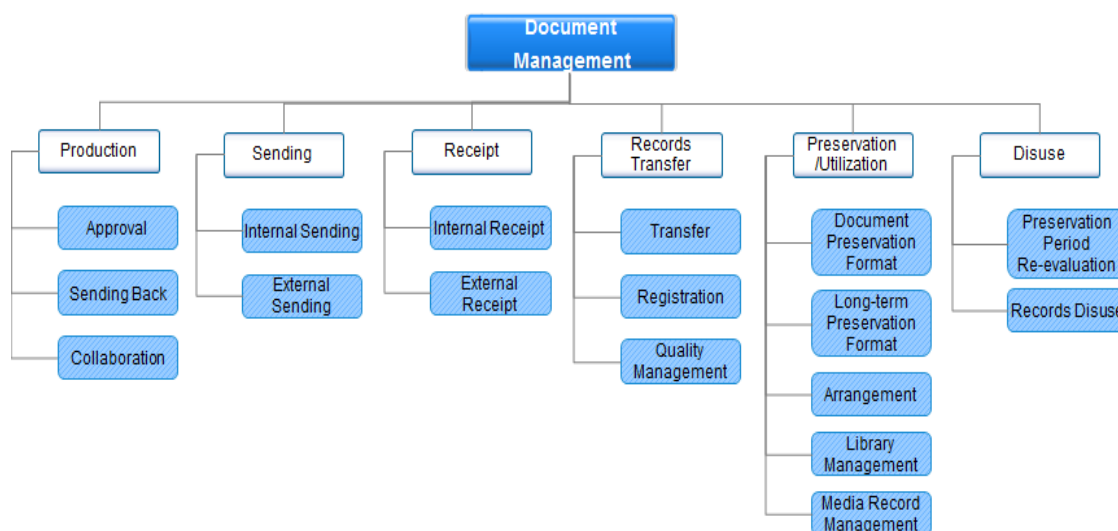
E-Office System Architecture Direction is shown as it follows.

- Establish architecture that can integrate conventional diverse communication
- Establish architecture enabling fast document handling
- Establish architecture which can trace at each level
- Establish architecture of convenient search system

- Establish architecture able to fund the standard
- Establish architecture able for diverse process
- Establish architecture of the henceforth government branch document distribution
- Establish architecture of the diverse security system
- Establish architecture reflecting up-to-date technique
- Establishing architecture of interlock and connection of different systems
- Establishing architecture of global agreement to standard technique

4.1. Business Architecture

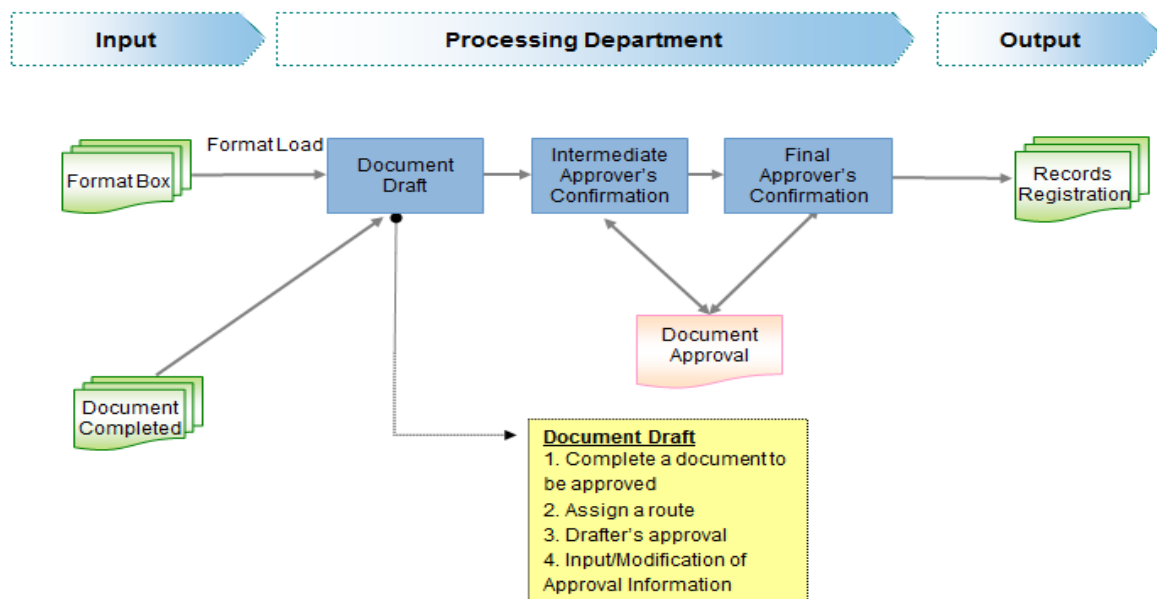
Business Architecture of e-Office System is made based on the analysis from the research about Addis Ababa and from best practices. Business analysis was made from the view point of documents handling, the following model is established



[Figure 18] e-Office System business Architecture

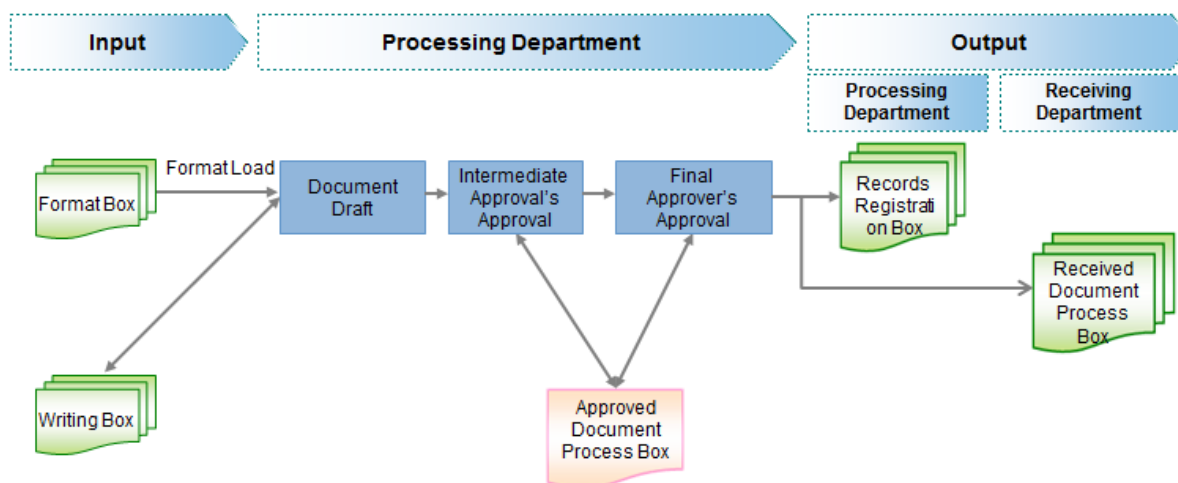
- Creation – Authorization process

In the phase of creating a document for approval, approval process is composed of the following organization and process.



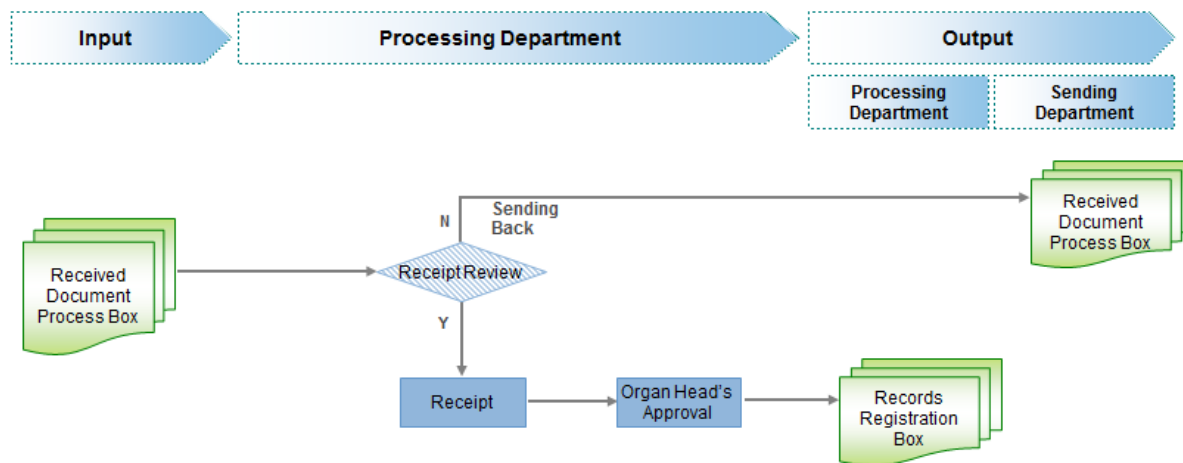
[Figure 19] Authorization Process

- Sending – Internal process
Internal sending of authorized documents is sending document to an office in the same organization, and is composed of the following organization and process.



[Figure 20] Sending Process

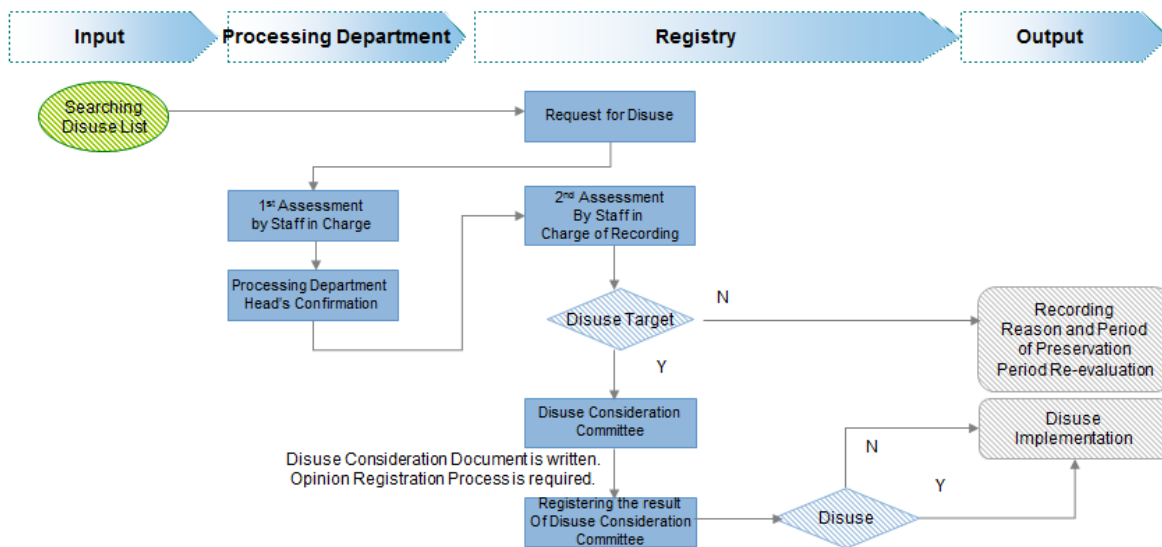
- Receiving – Internal process
Internal receiving of authorized documents is receiving document that was sent by an office in the same organization, and is composed of the following organization and process.



[Figure 21] Receipt Process

- Discard – discarding documents

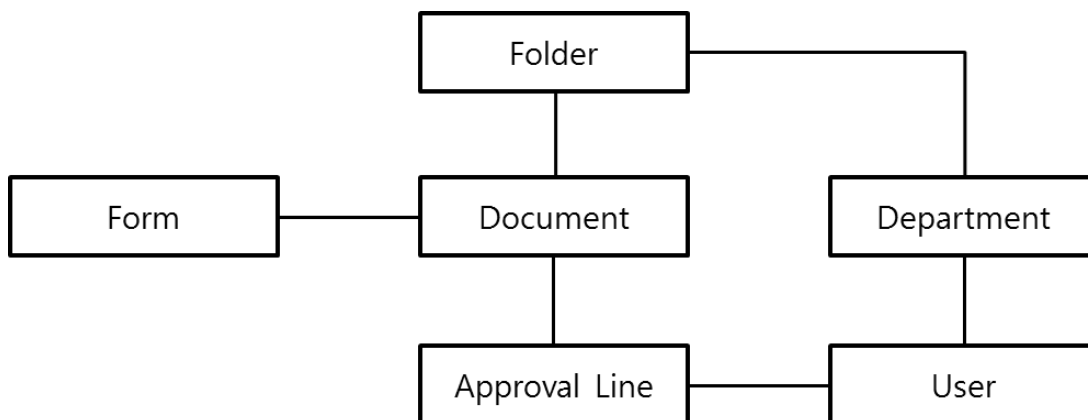
Authorized documents are discarded according to keeping period that is set for each document, and is composed of the following organization and process.



[Figure 22] Discard Process

4.2. Data Architecture

Data Architecture is a diagram of the data structure in the e-Office System. Basically, the e-Office System operates based on organization data and user data. Each organization has each document folder and each document folder can have documents. Also each document can have an approval list which is connected with the user data. Each document is then mapped with the format information.



[Figure 23] Data Architecture

Each important data structure is the same as followed

- Department

[Table 23] Department Table

Attribute	Properties
Department ID	Department Innate Number
Department Name	Department Name
Top Department ID	Top Department's ID
Turn	Same High Rank Department of my turn Department
Represent Department certainty	0 - Normal Department 1 - Represent Department
Mailbox possessing	0 – No Mailbox 1 – Have Mailbox
Document possessing	0 – No Document 1 – Have Document
Department Abbreviation	Department Abbreviation
Department Code	Department Code
National Code	National Code
Department Fax Number	Department Fax Number
Homepage Address	Department Homepage Address
Email Address	Department Email Address
Main Number	Department Main Number
Zipcode	Department Zipcode
Address	Department Address
Department Introduction	Department Introduction

- User

[Table 24] User Table

Attribute	Properties
User ID	User inherent ID(Automatic number)
Department ID	Afflicted Department ID
User Name	User Name
Approval number	Approval user number
Absence certainty	0 – not Absence, 1 – Absence
Gender	M – Male, F – Female
Certainty of the manager receiving	0 – normal user , 1 – receiving manager
Security Level	Self Security Level
Number	Department user number
Concurrent certainty	0 – not concurrent , 1 – concurrent
Login Password	User Login Password
Byname	User byname
email Address	email Address
Homepage Address	Homepage Address
HouseZipcode	House Zipcode
HouseAddress	House Address
House phone number	House phone number
House fax number	House fax number
Mobile phone number	Mobile phone number
Beeper Number	Beeper Number
Photograph name	Road of the photograph name
Wedding anniversary	YYYYMMdd
Year Month Birthday	YYYYMMdd
Business responsible	Description of business responsible
Employee	Employee Number

- Form

[Table 25] Form Table

Attribute	Properties
MODE ID	MODE ID
DESCRIPTION ID	DESCRIPTION NAME ID
CHANGING DATE	CHANGING DATE
USE DIVISION	“1”-USE(USER USE) (DEFAULT) “2”-USEAGE(SYTEM USEAGE) “9”-NOT USEAGE
YOUR TYPE	YOUR TYPE
TYPE NAME	TYPE NAME
DESCRIPTION	TYPE DESCRIPTION
VERSION	TYPE VERSION

- Folder

[Table 26] Folder Table

Attribute	Properties
Folder ID	Folder ID
Process Chart ID	Process Chart ID
Folder Name	Folder Name
Folder Description	Folder Description
Personnel ID	ID of person in charge
Keeping Period	1 year, 3 years, 5 years, 10 years, 20 years, semi-permanent, permanent
Expected reading Frequency	1 : High 2 : Low 3 : Medium (Default)

- Document

[Table 27] Document Table

Attribute	Properties
Approval ID	Approval document ID
Registration Number	Document Registration Number
Title	Approval Document Title
Keeping Period	1 year, 3 years, 5 years, 10 years, 20 years, semi-permanent, permanent
Document Security Level	Security level of the document
Open selection	1 : Open 2 : Partial open 3 : Confidential
Format ID	ID of the format
Draft Date	Date when the document was drafted
Draft ID	ID of the person that made draft
Urgency	0 : Normal 1 : Urgent(Notified as Urgent on document. Applied in Notify)
Secrecy	0 : Normal 1 : Secret document Secret document needs password to open
Attachment	0 : No attachment 1 : Attachment exists
External Document	Classification when registering external document 0 : normal document 1 : document body exists 2 : only the title is registered
Storage ID	ID created when stored after approval
Approval completion date	Date of completion of approval
Approval Status	One of the following: draft, absence, waiting, complete, and return
Final approver ID	ID of the final approver
Return date	Final approval and return date
Registration Division	1 : E- Document creation/Sent 2 : Normal document submission 3 : Drawing creation/sent 4 : Drawing submission 5 : Photo film yype 6 : Audio/Video record 7 : Card creation/submission 8 : Card transfer/sent

Document Number	The registration number on the approved document Department Name + Serial Number
Number of attachment	Number of files attached

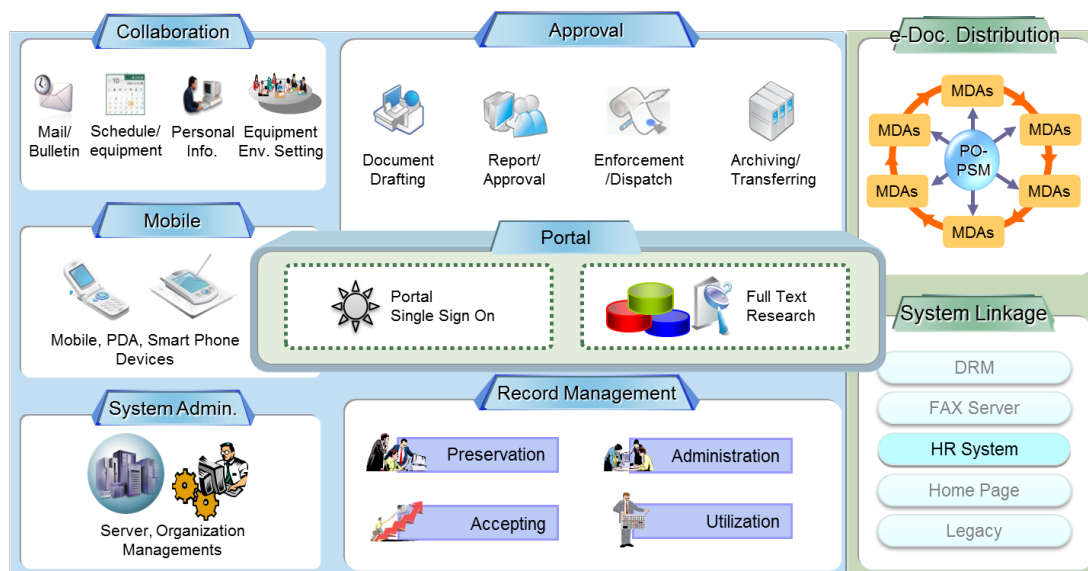
- Approval Line

[Table 28] Approval Line

Attribute	Properties
Approval ID	Approval ID
Approval Number	Approval number by order
Approval Status	One of the following: draft, approval, waiting, incomplete, return
Approval ID	ID of the approver
Absence	Whether the approver is present or absent
Approval Time	Date and time of the approval
Completion requirement date	The date requested for completion of approval

4.3. Application Architecture

Application Architecture shows the main feature of e-Office System. The following figure shows a structural diagram of the entire application of e-Office System



[Figure 24] Application Architecture

Detailed functional descriptions of each unit are as follows:

- Portal

[Table 29] Portal Functions

Key Functions	Description
Personalization service	<ul style="list-style-type: none"> • Create multiple pages and personal pages automatically/manually, provide role-based pages per group, personalized Website and personalization templates • Manage user attributes required for personalization as user profile
Search	<ul style="list-style-type: none"> • Search by attribute and within search results
System management	<ul style="list-style-type: none"> • ID/password authentication: authenticate ID/password that users enter by comparing them with information that portal manages • Authentication source authentication: authenticate ID/password that users enter by comparing them with information that authentication source (LDAP,AD, etc.) manages • Allow users who log in via SSO authentication solution through SSO interface to access portal without separate log-in procedure (applicable in case of SSO solution adoption or implementation) • Template creation and management function to allow users to opt for a variety of portal setups as per their role • Monitoring information for system data and information access
Security management	<ul style="list-style-type: none"> • Control access as per user role (ACL) • Control access and authorize users as per workspace, page or portlet • Support SSL encryption

- Collaboration

[Table 30] Collaboration Functions

Key functions	Description	
Board	Write post	<ul style="list-style-type: none"> • Write post to several boards concurrently • Send original post as body of text or attachment of e-mail
	View post	<ul style="list-style-type: none"> • Configure boards at multiple levels • Set up member authority per board (Read title, Read body of text, Write post, etc.) to allow several organizations to use the same groupware without mutual interface and interface boards among multiple groups as necessary • Create and utilize boards (team board) for specific organization, department or project team • Search all boards or some sub-boards at choice by specific condition (postdate, number of hits, recent/unchecked posts, etc.) • Ensure quick and accurate search returns by a variety of conditions without using separate commercially available search engine
	Manage board	<ul style="list-style-type: none"> • Support posting reservation, emergency posting, secure posting (designate access authority), anonymous posting, posting for circulation (comment collection possible) • Set up board attributes such as posting template, validity term (posting expiration date), disclosure/non-disclosure, reminder/secret and community, etc. • Designate manager per board (in case of board for community or department) • Allow manager to register, edit, delete default posting template

		at choice
E-Mail	Write e-mail	<ul style="list-style-type: none"> • Create/register and use mail template freely as necessary • Create necessary mail templates such as daily report or weekly plan freely as necessary • Support a variety of editing functions (HTML Control) • Provide the same features as conventional word processor to allow users to edit mails in a variety of styles • Designate receiver <ul style="list-style-type: none"> ① Designate receiver in a variety of methods such as selecting one from organization directory, address list, LDAP users (3rd party organization) or entering receiver directly ② Designate receiver by role or responsibility (department head, department manager, document manager, document receipt/transfer administrator, schedule manager, etc.) ③ Set up mail group for all mails, per department or individual and designate receivers • Restrict file attachment size
	Send e-mail	<ul style="list-style-type: none"> • Forward incoming mail as body of mail text or attachment • Prevent disclosure of receiver identity between receivers • Allow sender to check mail receipt, receipt time or recall mail
	Receive e-mail	<ul style="list-style-type: none"> • Default search (by mail box, sender, title, date, read (Y/N), etc.) • Sort mail list (in ascending/descending order, by date or read (Y/N), etc.) • Save original copy of internal/external Web mail or multiple mails from mail list at a time
Schedule	View/ manage schedule	<ul style="list-style-type: none"> • View daily/weekly/monthly schedules • Set up default/iterative/shared schedules
	Shared schedule in/out box	<ul style="list-style-type: none"> • Agree/reject/delete received schedule • Provide schedule information to other user sharing schedule • Notify attendees of meeting details (venue/time) when scheduling a meeting
	Manage schedule of others	<ul style="list-style-type: none"> • Share and manage schedule of others upon advance approval (secretary function)

- Approval / Record Management

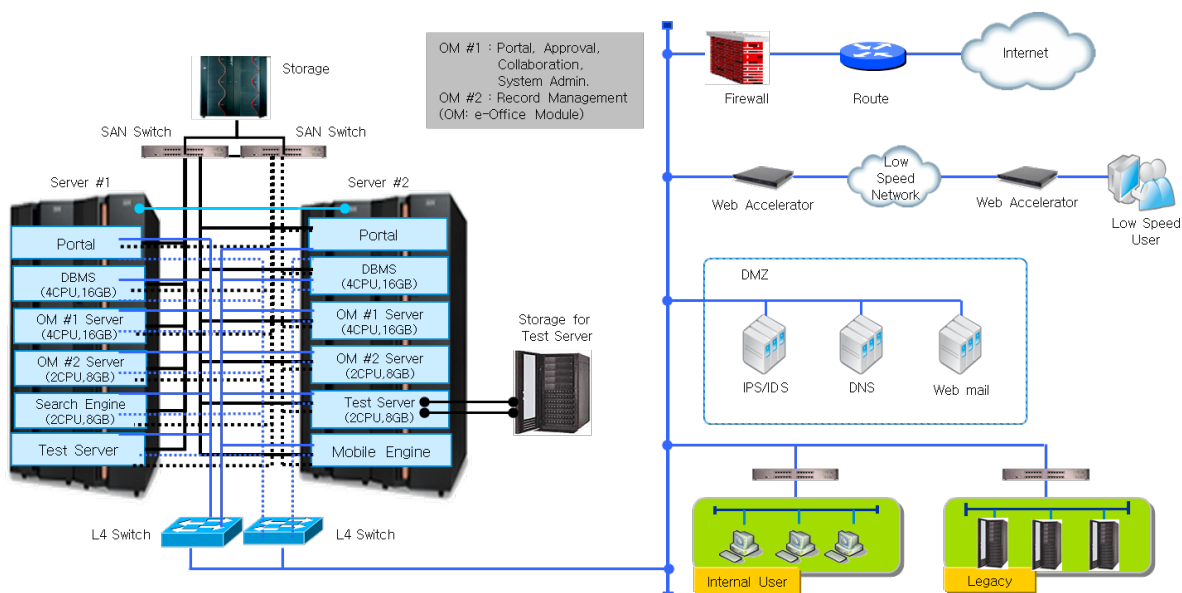
[Table 31] Approval/Record Management Functions

Key functions		Description
Document Production - Draft	Create/designate template	<ul style="list-style-type: none"> • Designate overall or department-specific disclosure scope for each template • Retrieve a template at random among the templates registered by administrator • All templates/Department templates /Recent templates • Filtering by template type • Retrieve and complete saved proposal and approval documents (include summary, attachment and comment when saving proposal and approval document)
	Draft document	<ul style="list-style-type: none"> • Draft document, using templates • When editor starts, enter proposer/proposer's department/department head/address automatically as per organization and user profile data • Enter or allow users to select abbreviation of document registration number generation department • Designate document security class, disclosure scope or need for quick approval • Enter search keyword in document journal • Support attachment of all types of files, summary and comment • Save proposal document temporarily and allow users to reuse it
	Designate approval line	<ul style="list-style-type: none"> • Designate and save approval line in organization directory • Designate internal/external/3rd party destination for document • Apply recent approval line as per approval line designation, template • Allow users to designate new approval line at choice in organization directory • Save and reuse approval group • Notify users of resignation or transfer of approver in approval group
	Designate receiver	<ul style="list-style-type: none"> • Display receiver and C.C in the same line • Receiver type (department, destination group, receiver group, off-directory department, etc.)
	Attach file	<ul style="list-style-type: none"> • Attach document, audio/video files from document box or local PC
Process approval	View approval progress	<ul style="list-style-type: none"> • View approval progress of document that user has proposed or approved • Check drafter, reviewer and approver of approval document • Check time of delay in each step of approval process
	Approval/Return	<ul style="list-style-type: none"> • Allow approver to approve approval document • Allow approver to return approval document
Receipt	Receive Document	<ul style="list-style-type: none"> • Generate production (receipt) registration number • Register attached file

		<ul style="list-style-type: none"> Support consecutive registration
	Distribute document	<ul style="list-style-type: none"> Distribute incoming documents to destination documents or re-Distribute returned document by re-designating destination documents Post incoming correspondence to public bulletin board by designating bulletin board as destination
Document box	Receive document	<ul style="list-style-type: none"> Notify document arrival, designate person in charge of incoming document Receive incoming document, generate incoming document number automatically Retrieve comment on incoming document
	Register document	<ul style="list-style-type: none"> Save incoming document in classification folder to designated folder and record log
	Compile incoming document	<ul style="list-style-type: none"> Classify and register incoming document upon receipt
	Distribute incoming document	<ul style="list-style-type: none"> Distribute incoming documents to destination documents or re-Distribute returned document by re-designating destination documents Post incoming correspondence to public bulletin board by designating bulletin board as destination
	Delete (cancel) incoming/outgoing document	<ul style="list-style-type: none"> Return incoming document, cancel transfer of outgoing document Return document to go out, re-transfer outgoing document
	Manage incoming document list	<ul style="list-style-type: none"> Register hardcopy (paper) document Generate production (receipt) registration number Register attached file, support consecutive registration
	Set up authority for document box	<ul style="list-style-type: none"> Manage/add/delete/modify folder Set up read/write/manage authority per each folder
	Search approval document box by department/ Individual	<ul style="list-style-type: none"> Search record compilation registry, record registration log, informal documents, dissemination log, cooperation log, and folder by attribute Search personal document box, complete document box, document receipts
	Search document box of other department	<ul style="list-style-type: none"> Share document box of other department Allow box manager to authorize users and departments to access applicable box
	Designate document manager per department	<ul style="list-style-type: none"> Designate document manager (receiver) per department Designate person responsible for processing incoming document Designate folder manager
	Support functions for document box	<ul style="list-style-type: none"> Provide document production (receipt) registration log (general request document/outgoing/incoming document lists) Provide document dissemination log(list of documents that have been Distributed from destination department following arrival) Export log and list data in .txt file format(CSV : Excel)

4.4. Technology Architecture

Technology Architecture shows the hardware configuration and software configuration. The following figures are the hardware configuration set for clustering based on 2,000 users



[Figure 25] Technology Architecture

- **Hardware**
The number of users affects hardware specifications. The table below is based on 200 users in Addis Ababa

[Table 32] Hardware

Item	Specification	Remark
PC Server	CPU: 2Core 4.2GHz, Memory:8G, HDD: 300G	Except clustering
UPS		

- **Software**
Software specification is also based on the assumption of 200 users

[Table 33] Software

Item	Unit	Unit Price	Cost	Remark
e-Office Server	1	20,000	20,000	Standard Edition
e-Office Client	200	500	100,000	Standard Edition
Search Engine	1	50,000	50,000	
Oracle 10g	200	N/A	N/A	Standard Edition
Tomcat	N/A	N/A	N/A	Open Source
Linux	N/A	N/A	N/A	Standard Edition
Total			170,000	

5. Implementation Schedule

Implementation Schedule is to show the overall schedule for developing the target system. In order to successfully build the E-Office System, not only we need to develop the target system, but also need to revise law/system and standardize document management as noted in the range of development of V.3. Therefore, in the implementation schedule, we redefine goals and propose the overall schedule.

5.1. Development of the implementation goals

The table below shows redefined development of implementation goals, specifically set forth for the scope of V3.

[Table 34] Implementation Challenge List

Implementation goals	Activities
Improving e-Office related law/system	<ul style="list-style-type: none"> • Modify related law/system • Revise related regulations to raise the legal basis for electronic documents
Redefining document management processes	<ul style="list-style-type: none"> • Improving process, format, process standardization
Implementing e-Office system	<ul style="list-style-type: none"> • Build the basic functions such as collaboration, approval, record management, portals, and mobile • Expand users and applicable jobs • Mobile services need coordination with telecomm company
Document distribution system	<ul style="list-style-type: none"> • Establish document distribution system • Gradually expand the e-office system to all bureaus /agencies for a pilot document distribution system • Need for further plans
Record management system	<ul style="list-style-type: none"> • Establish record management system • Gradually expand the record management system to all bureaus /agencies to build a citywide record management scheme
Digitalization of current paper documents	<ul style="list-style-type: none"> • Change conventional paper document of Addis Ababa to digital format • Build a classification structure optimized for Addis Ababa • Scan paper documents and register/use in the classification structure

6. Implementation Organization

[Table 35] Implementation Organization

Name of organization	Main function	memo
PM	Responsible for providing leadership on all administrative issues related to the project. He/She will be stationed in Ethiopia and will monitor and evaluate progress of all project tasks and provide directions for timely completion.	Full time participation during project
QA	Responsible for quality control of each document created by the project team. He/She will examine all documents in each phase and report the results regarding quality to the project manager	
Consultants	Responsible for improving E-office system related laws and regulations and re-defining document management process. They will analyze existing laws and regulations, submit an improvement plan, and propose new document management rules that can control both paper and e-documents.	20 M/M
Development	Establish Addis Ababa standard e-Office System	26 M/M
	Document distribution system in Ethiopia	20 M/M
	Standard e-office system to build institutions in Ethiopia applied to three different distribution system	36 M/M
	Establish Addis Ababa standard e-Office System	34 M/M
	Standard e-office system to build institutions in Ethiopia applied to three different distribution system	30 M/M
Data input	Scanning paper documents to electronic files	36 M/M

7. Training Plan

Given the specific needs of overseas project, training team will be organized along with actual project team members. In addition, technical support organization will provide remote support to the project team to facilitate training programs.

- Training

[Table 36] Training Classification

Classification	Description
Solution training	<ul style="list-style-type: none"> • e-Office System • Delivery System • Record Management System
System user and operator training	<ul style="list-style-type: none"> • Business user training • System manager training • Product operation training(Portal, e-Office, DBMS, WAS) • Developer training

※ Training schedule and method will be adjustable, subject to discussion.

- Technology Transfer

[Table 37] Technology Transfer

Classification	Description
Participation of hands-on staff in project	Spontaneous technology transfer via project implementation Internalize project management techniques
Technology transfer by training	Technology transfer via hands-on training programs
Technical advice and data	Head office organizations to provide technical advice Provide materials on best practices and e-Government/ICT trends

Following the completion of the project, e-office solution provider will help the customer stabilize the system as early as possible, harnessing its experience in numerous system implementation and maintenance projects as follows.

- Continuous and effective maintenance support
- One-Stop support system built on single point of customer contact
- Support migration planning and provide information on new technologies
- Suggest future roadmap

8. Operation and Maintenance Plan

When each inspection system step is completed, it goes back to the maintenance phase. By default, the primary supplier will be chosen as the maintenance of local businesses, each supplier performs as solutions. Here is the summarization of maintenance activities by the suppliers.

8.1. Hot-Line

- Supplier will establish a hot-line dedicated for Addis Ababa
- Hot-line conduct communications by landline phone, email and instant messenger
- Due to different time zone between two countries, landline phone and instant messenger will be available from 9:00AM to 12:00PM Addis Ababa local time

8.2. Conference call

- Once in every two weeks, conference call will be conducted
- Conference call will be made by landline phone or by video conference with device provided by supplier.

8.3. Regular visit

- Addis Ababa visit twice a year

- A standard visit will be Monday to Friday, and unless the visit is due to system failure, USD500 per day will be charged after exceeding five days.

8.4. Option

- In case of visits for maintenance per request other than regular visits, airfare and accommodation will be charged at cost. Maintenance and repair cost will be charged USD500 a day, including the day of departure and return
- When database or database column is added for system improvements, additional fee according separate quotation will be charged .

V. Economic Analysis

On this page, investment costs shall be estimated to fully propel the business to give great efficiency on administration by automating document management of the Addis Ababa City Government. Major propulsions are demonstrations of building e-office system in Addis Ababa City Office and its sub-cities, building document distribution system for distributing electronic document between Governmental Institutions and document management system managing the whole city document.

Furthermore, estimate direct and indirect advantages through propulsion. In addition, compare and analyze total investment costs and direct advantages for follow-up propulsion. Lastly, review the economical validity of the business propulsion.

1. Estimated Total Cost

Total cost consists of expense on hardware, software and personnel expenditure. Personnel expenditure includes package customizing, building DB and consulting. Total cost investigated for the propulsion shall be estimated \$8,966,100. Expense on hardware is \$1,669,300, expense on software is \$5,133,800 and personnel expenditure is \$2,163,000. In addition, expenses by stage are as in the following:

- Total expense in Stage 1 is about \$1,137,600
- Total expense in Stage 2 is about \$2,902,200
- Total expense in Stage 3 is about \$969,060
- Total expense in Stage 4 is about \$370,800

[Table 38] Total Investment Costs

Propulsion		Stage 1	Stage 2	Stage 3	Stage 4	Total
		Y	Y+1	Y+2	Y+3	
Hardware		189,600	628,800	183,180	-	1,001,580
Software		480,360	1,796,400	598,320	205,200	3,080,280
Personnel Expenditure	Customizing	144,960	477,000	187,560	165,600	975,120
	DB Building	87,480	-	-	-	87,490
	Consulting	235,200	-	-	-	235,200
	Subtotal	467,640	477,000	187,560	165,600	1,297,800
Total		1,137,600	2,902,200	969,060	370,800	5,379,660

2. Cost Breakdown

These are the total costs details divided by propulsions and items.

2.1. Expense of each Propulsion

Each expense spent on hardware, software and personnel by each propulsion and total costs are as in the following:

[Table 39] Expense of Propulsion

Propulsion		H/W	S/W	Personnel Expenditure			Total
				Customizing	DB Building	Consulting	
e-office System	Modify law/regulation relating e-office	-	-	-	-	121,200	121,200
	Modify document management system process	-	-	-	-	114,000	114,000
	Digitalize previous document	-	-	-	87,480	-	87,480
	Building Addis Ababa e-office system	189,600	480,360	144,960	-	-	814,920
	Building 3 additional institutions	568,800	1,441,080	367,200	-	-	2,377,080
	Subtotal	758,400	1,921,440	512,160	87,480	235,200	3,513,680
Building Document Distribution System	Building document distribution system in 4 additional institutions	60,000	355,320	109,800	-	-	525,120
	Subtotal	60,000	355,320	109,800	-	-	525,120
Building Document Management System	Building document management system	183,180	598,320	187,560	-	-	969,060
	Transfer documents in 3 institutions	-	205,200	165,600	-	-	370,800
	Subtotal	183,180	803,520	353,160	-	-	1,339,860
Total		1,001,580	3,080,280	975,120	87,480	235,200	5,379,660

2.2. Hardware Breakdown (details)

Total investment cost of hardware is \$1,669,300 and hardware breakdown by each propulsion is as in the following:

[Table 40] Hardware Breakdown(details)

Propulsion		Item	Spec.	Price	Qty	Total	
Building e-office system	Modify law/regulation relating e-office			-	-	-	
	Modify document management system process			-	-	-	
	Digitalize previous document			-	-	-	
	Building Addis Ababa e-office system	app/DB server	8core	67,320	2	134,640	
		Mobile server	2core	4,920	1	4,920	
		Storage	1TB	16,320	1	16,320	
		SAN switch		7,740	2	15,480	
		L4 switch		9,120	2	18,240	
		Subtotal					189,600
	Building 3 additional institutions	app/DB server	8core	67,320	6	403,920	
		Mobile server	2core	4,920	3	14,760	
		Storage	1TB	16,320	6	48,960	
		SAN switch		7,740	6	46,440	
		L4 switch		9,120	3	54,720	
		Subtotal					568,800
	Subtotal						758,400
	Building document distribution system	Building document distribution system in 4 additional institutions	LDAP server	4core	21,840	1	21,840
			app server	4core	21,840	1	21,840
Storage			1TB	16,320	1	16,320	
Subtotal					60,000		
Building document management system	Building document management system	app server	4core	59,580	1	59,580	
		DB sever	4core	42,000	1	42,000	
		Storage	1TB	16,320	5	81,600	
		Subtotal					183,180
	Transfer document in 3 institutions			-	-	-	
	Subtotal					183,180	
Total						1,001,580	

2.3. Software Breakdown (details)

Total investment cost of software is \$3,080,280 and software breakdown by each propulsion is as in the following:

[Table 41] Software Breakdown (details)

Propulsion		Item	Spec.	Price	Qty	Total
Building e-Office system	Modify law/regulation relating e-office			-	-	-
	Modify document management system process			-	-	-
	Digitalize previous document			-	-	-
	Building Addis Ababa e-office system	e-office system	200user	156	200	31,200
		e-office system for mobile	200user	102	200	20,400
		Search Engine	2core	33,480	1	33,480
		DBMS	8core	147,480	2	294,960
		WEB/WAS	8core	50,160	2	100,320
		Subtotal				
	Building 3 additional institutions	e-office system	200user	156	600	93,600
		e-office system for mobile	200user	102	600	61,200
		Search Engine	2core	33,480	3	100,440
		DBMS	8core	147,480	6	884,880
		WEB/WAS	8core	50,160	6	300,960
		Subtotal				
Subtotal						1,921,440
Building document distribution system	Building document distribution system in 4 additional institutions	e-office delivery system	4core	205,200	1	205,200
		LDAP	4core	51,300	1	51,300
		DBMS	4core	73,740	1	73,740
		WEB/WAS	4core	25,080	1	25,080
Subtotal						355,320
Building document management system	Building document management system	e-office Record Management	4core	205,200	1	205,200
		Search Engine	8core	45,000	1	45,000
		DBMS	8core	147,480	1	147,480
		WEB/WAS	16core	200,640	1	200,640
	Subtotal					598,320
	Building document management system	e-office Record Management	4core	205,200	1	205,200
Subtotal						803,520
Total						3,080,280

2.4. Personnel Expenditure Breakdown (details)

Personnel expenditure for whole labor force is estimated \$1,297,800. Personnel expenditure according to package customizing, building DB and consulting service are as in the following:

[Table 42] Personnel Expenditure

Section	Grades of Labor Force				Note
	Beginning	Intermediate	Advanced	Expert	
Package Customizing	4,080	5,640	6,600	8,400	
DB Building	2,100	4,080	5,100	6,600	
Consulting Service	7,800	10,200	12,600	15,000	

Also, Labor force breakdown by each propulsion is as in the following:

[Table 43] Personnel Expenditure Breakdown

Propulsion		Business Year	Period	Beginner	Intermediate	Advance	Expert	Total
Building e-Office system	Modify law/regulation relating e-office	Y	4M	-	4	4	2	121,200
	Modify document management system process	Y	5M	-	5	5	-	114,000
	Digitalize previous document	Y	6M	30	6	-	-	87,480
	Building Addis Ababa e-office system	Y	8M	6	12	8	-	144,960
	Building 3 additional institutions	Y+1	9M	9	18	9	-	367,200
Subtotal								834,840
Building document distribution system	Building document distribution system in 4 additional institutions	Y+1	5M	5	10	5	-	109,800
	Subtotal							
Building document manageme	Building document management	Y+2	7M	7	20	7	-	187,560

nt system	system							
	Transfer document in 3 institutions	Y+3	6M	6	18	6	-	165,600
	Subtotal							
Total								1,297,800

2.5. Required Cost by Year

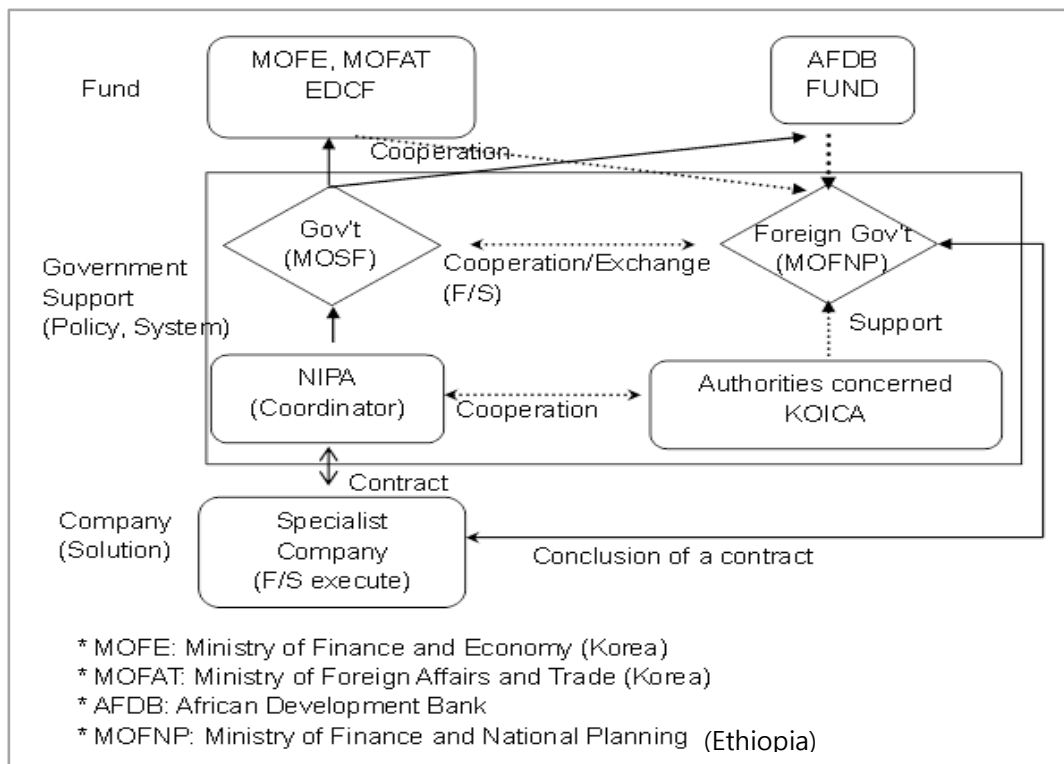
Expense spent in each year by propulsion is as in the following:

[Table 44] Investment Costs

Propulsion		Y	Y+1	Y+2	Y+3	Total
Building e-Office system	Modify law/regulation related e-Office	121,200	-	-	-	121,200
	Modify document management system process	114,000	-	-	-	114,000
	Digitalize previous document	87,480	-	-	-	87,480
	Building Addis Ababa e-Office system	814,920	-	-	-	814,920
	Building 3 additional institutions	-	2,377,080	-	-	2,377,080
Building document distribution system	Building document distribution system in 4 additional institutions	-	525,120	-	-	525,120
Building document management system	Building document management system	-	-	969,060	-	969,060
	Transfer document in 3 institutions	-	-	-	370,800	370,800
Total		1,137,600	2,902,200	969,0600	370,800	5,379,660

3. Proposed Funding Source

To propel follow-up propulsion, volition as well as financing are important. Though there are various methods to propel the project, we would get finance from AFDB and EDCF. The procedure is as in the following picture:



[Figure 26] Funding Process

3.1. EDCF(Economic Development Cooperation Fund)

EDCF is the aid fund of the Korean Government, which founded in 1987 to support developing countries and contribute to the global community as required of its global status.

3.1.1. Procedures

EDCF throws funds according to 5 stages; review and preparation on project, test, decision, performance and evaluation.

- Stage 1 : project identification and preparation
 - Make official report; country strategy paper(CSP) clarifying the purpose and strategy of induced project by investigating validity of the business and Apply for financing.
- Stage 2: appraisal
 - Upon receipt of aid request, screening is commissioned to the Export-Import Bank of Korea, and the bank conducts the process as follows:

[Table 45] Procedure of Business Evaluation

Step	Explanation
Preliminary review	The Export-Import Bank determines whether the applicant's country is eligible to receive the tied aid pursuant to the OECD guidelines, and whether there is a risk of default. It also reviews feasibility of the project and whether the project is for commercial purposes.
Data Gathering	The bank collects data first through researches on literature. Then, it sends the project questionnaire and legal questionnaire to the beneficiary country as well as the agency in charge to gather further information.
Field Research	The bank sends to the beneficiary country a delegation consisting of experts including, if necessary, lawyers to conduct a field investigation.
Final Report	The bank prepares a report considering all the data gathered through application, feasibility reports, questionnaires and minutes.
Approval	Based on the final report, the Ministry of Finance and Economy determines whether to grant aid, and, if so, how much to support on what conditions.

- Stage 3 : loan agreements(disbursement)
 - Once it is determined to grant aid, the beneficiary country is notified of the decision, and, upon acceptance by the country, an agreement is entered into between two countries. Then, the bank executes a loan agreement with the country on behalf of the Korean government.
- Stage 4 : project implementation
 - Upon execution of the loan agreement, the borrower country (or agency in charge) takes actions to make relevant procurements. Then, the Korean government begins to send fund based on progress.
- Stage 5 : evaluation
 - Evaluation is conducted upon completion of the project to verify whether the project achieved its goal and what economic and social effects it has brought about.

3.2. Africa Development Bank(AFDB)

Established to help development efforts on the continent, the African Development Bank (AFDB) Group comprises three distinct entities under one management: the African Development Bank (AFDB) which is the flagship or parent institution, established on August 4, 1963 in Khartoum, Sudan, by the then 23 newly independent African countries; as well as two concessionary windows - the African Development Fund (ADF), established on November 29, 1972, by the African Development Bank and 13 non-

African countries, and the Nigeria Trust Fund (NTF), set up in 1976 by the Federal Government of Nigeria.

The overarching objective of the African Development Bank (AFDB) Group is to spur sustainable economic development and social progress in its regional member countries (RMCs), thus contributing to poverty reduction.

3.2.1. Procedures

AFDB throws funds according to 5 stages; review and preparation on project, test, decision, performance and evaluation.

- Stage 1 : Project identification and preparation
 - Make official report; country strategy paper(CSP) clarifying the purpose and strategy of induced project by investigating validity of the business and Apply for financing.
- Stage 2 : Project appraisal
 - During project appraisal, ADB Group examines project feasibility through an appraisal mission. The appraisal mission - in consultation with the government and other stakeholders - examines the project's technical, financial, economic, technical, institutional, environmental, marketing, and management aspects as well as potential social impact.
 - Following the field appraisal, the mission then prepares an appraisal report with memorandum of loan proposal from the President to the Board and draws up a draft loan agreement for negotiation.
 - After the Senior Management Committee has completed its work and recommended the project or program for Board approval, a draft project proposal is submitted to all parties involved including the Government for review.
 - Feedback is collected, and the Government is then called for negotiation with ADB. During negotiations.
- Stage 3 : Board approval
 - After negotiations with the government, the loan proposal is submitted to ADB's Board of Directors for approval.
- Stage 4 : Implementation
 - Project implementation starts from the moment the project is declared effective. ADB Group projects are implemented by the executing agency according to the agreed schedule and procedures. The supervision of implementation however enables the Bank Group to make sure the physical realization of the project is progressing smoothly and in accordance with the implementation schedule and details.
- Stage 5 : Post evaluation

- After the project facilities and technical assistance activities are completed, ADB prepares a project completion report (PCR) or technical assistance completion report to document the implementation experience. These reports are prepared within 12 - 24 months of the completion of the project.

4. Estimated Benefit

4.1. Poll

12 officials from 4 agencies/offices answered to the questionnaire, and the result and expected effect after implementing e-office is as follows.

[Table 46] Result of questionnaire

	Current			After e-office		Save(month)	
	AVG	daily	monthly	Per doc	monthly	hour	%
Time for document authorization (hr)	9.1	12,756	280,622	3	92,400	188,222	67%
Lost document during authorization	2.5%	35	770	0	0	770	100%
Time to send documents to other offices (hr)	9.2	9,150	201,300	0	0	201,300	100%
Time of feedback from other offices (hr)	17.7	17,727	390,000	4	88,000	302,000	77%
Lost document during delivery to other office	3.6%	36	792	0	0	792	100%
Time to giving documents to person in charge (hr)	11.8	9,467	208,267	0	0	208,267	100%
Time to send documents to out of AA (hr)	15.0	6,000	132,000	0	0	132,000	100%
Time of feedback from out of AA (hr)	32.4	12,960	285,120	6	52,800	232,320	81%
Lost document during delivery to out of AA	1.8%	7	158	0	0	158	100%
Time to search document (hr)	2.9	1,171	25,760	0.2	1,760	24,000	93%

➔ Total time saved expected in a year: 1,288,087 hours

➔ Total number of documents loss prevented: 1,720

4.2. Quantitative Advantage

We made quantitative measuring tool for decrease in expense and business hours and calculated the output using the results from interviews and surveys. Assuming that a public officer of Ethiopia get average \$300 a month, work 22 days a month and 8 hours a day. Inflation rate and wage rate shall not be considered.

4.2.1. Advantage of building e-office system

We can expect quantitative advantages from decrease in time for authorization, automation of document distribution between offices, decrease in consumption of paper and decrease in time for searching documents by building e-office system. Each quantitative advantage is as in the following:

- Reduction from the saved time
 - The total authorization, delivery, and searching time saved is expected to be 1,288,087 hours.
 - 1,288,087 hours is equivalent of 7,319 man-month, and with a monthly wage \$300, it is equivalent of \$2,195,603
 - Reduction from prevention of document loss
 - The total number of documents loss prevented are 1,720 in a year.
 - Because it takes 1 hour for document production(estimate), 3 hours for authorization of a document, and average 5 hours for delivery, time saved is 15,480 hours.
 - 15,480 hours is equivalent of 88 man-month and with a monthly wage \$300, it is equivalent of \$26,386
 - Decrease in paper consumption
 - Average 5,913,600(1,400 documents x 4 pages x 4 copies x 22 days x 12 months) sheets of A4 copy papers used in a year for the printing of documents nowadays.
 - Expected to use only 1/4 of current use, so 4,435,200 sheets will be saved.
 - When a paper costs \$0.01 per sheet, advantage of the decrease of paper document printing in a year shall be estimated \$44,352
- Therefore, quantitative advantage of City Office by implementing e-office system shall be \$2,266,341.

4.3. Qualitative Advantage

These are the advantages that can hardly be quantitatively calculated in the aspect of efficiency in business and customer service.

- Improved efficiency by automation in document management
 - Prompt process of business by removing delaying factor with flow of document tracking system and Increased credibility by decreasing rate of lost document
 - Improvement in production such as keeping document, quick searching and in business performance by removing ineffective process
 - Improvement in business performance by common use of information in real time
 - Improvement in accessibility as well as convenience by building mobile based environment
 - Improvement in business performance by downsizing the workplace and revising working environment
- Improved competencies as well as competitiveness of the Government of Addis Ababa
 - Improvement in competitiveness and status of the city by establishing electronic document management system for efficiency in administration ahead of surrounding nations

- Improved service to people by virtual storage and instant release of official documents
 - Preserve the record on the process of policy and expand public information for participation of the people and spread the use of public records.

5. Economic Analysis

Standard for the analysis according to the propulsion shall be 5 years. 12% social rate of discount shall be the discount rate to decide the validity of common investment. Analysis on net present value, benefit costs ratio and internal rate of return shall be processed.

The result is: Net present value is over 0, benefit costs ratio is over 1 and internal rate of return is bigger than social rate of discount. Accordingly, economical value is acknowledged.

5.1. Analysis on Net Present Value(NPV, Net Present Value)

Estimate the yearly profit with the investment costs by each year according to the schedule of propulsions and direct advantage by each year of major propulsion and apply social discount rate (12%). Convert it with present value and calculate Net Present Value.

Previously calculated investment costs, profit from yearly direct advantage and Net Present Value of present value of profit are as in the following. \$542,767 is Net Present Value of the business which is the total of present value of yearly profit. Accordingly, NPV is over 0 and it is judged economical.

[Table 47] Analysis on NPV

Section		Y	Y+1	Y+2	Y+3	Y+4
Investment Cost		1,137,600	2,902,200	960,060	370,800	-
Advantage	Reduction from saved time	-	548,900	2,195,603	2,195,603	2,195,603
	Reduction from prevention of document loss	-	6,597	26,386	26,386	26,386
	Decrease in paper consumption	-	11,088	44,352	44,352	44,352
	Subtotal	-	566,585	2,266,341	2,266,341	2,266,341
Net Profit (Advantage-Expense)		-1,137,600	-2,335,615	1,306,281	1,895,541	2,266,341
Present worth factor(12%)		0.8929	0.7972	0.7118	0.6355	0.5674
		-1,015,714	-1,861,938	929,785	1,204,651	1,285,983
NPV		542,767				

5.2. Analysis on Benefit Cost Ratio(B/C, Benefit Cost Ratio)

Total of present value of yearly induced investment costs is \$4,254,817 and total present value of advantage is \$4,790,247 so Benefit Costs Ratio is estimated 1.13. Details are as in the following. Accordingly, as Benefit Costs Ratio(1.13) is over 1, that it is judged to be economical.

[Table 48] Analysis on Benefit Cost Ratio

Section	Y	Y+1	Y+2	Y+3	Y+4	Total
Investment Costs	1,137,600	2,902,200	969,060	370,800	-	5,379,660
Present worth factor (12%)	0.8929	0.7972	0.7118	0.6355	0.5674	
Investment cost in current value	1,015,763	2,313,634	689,777	235,643	-	4,254,817
Advantage	-	565,585	2,266,341	2,266,341	2,266,341	7,364,608
Present worth factor(12%)	0.8929	0.7972	0.7118	0.6355	0.5674	
Advantage in current value	-	450,884	1,613,182	1,440,260	1,285,922	4,790,247
Benefit/Cost Ratio	4,790,247/4,254,817 = about 1.13					

5.3. Analysis on Internal Rate of Return(IRR, internal rate of return)

Internal rate of return is the discount rate that the present value of total advantage and total investment costs become as same of follow-up propulsion. The calculating formula is as in the following:

$$\text{Internal Rate of Return(IRR)} : \sum_{t=0}^n \frac{B_t}{(1+r)^t} = \sum_{t=0}^n \frac{C_t}{(1+r)^t}$$

Here, B_t is present value of advantage, C_t is present value of investment costs, r means social discount rate, t means time of analysis and calculated internal rate of return is 27.9%. Accordingly, 27.9% of internal rate of return is bigger than 12% social discount rate and so that it is judged for economical.

VI. Sustainability of Project Effect

1. Qualitative Benefits

Gathering the expected effects of major propulsions, improvement of efficiency of the work by reduction in the processing time and increase in information handling, improvement in city competitiveness by following the international standard and improvement in display of information by organizing document DB shall be expected.

[Table 49] Qualitative Expected Effect

Propulsion		Expected Effect
Building e-office system	<ul style="list-style-type: none"> • Modify law/regulation related e-office • Modify document management system process • Digitalize previous document • Building Addis Ababa e-office system • Building 3 additional institutions 	<ul style="list-style-type: none"> • Improve business performance and credibility by removing delaying factor with flow of document tracking system • Improve business performance by downsizing the workplace and revising working environment • Facilitate data searching needed for business • Improve business performance by common use of information in real time • Build knowledge-based system by sharing display materials • Modify service by invigoration of various kinds of public information
Building document distribution system	<ul style="list-style-type: none"> • Building document distribution system in whole city office 	<ul style="list-style-type: none"> • Reduce processing time for distribution between institutions • Secure availability of document distribution • Improve distribution method and credibility by reinforcement of monitoring and management of the system • Improve scalability by applying open-end International Standard on document distribution system
Building document management system	<ul style="list-style-type: none"> • Building document management system • Transfer document in whole city office 	<ul style="list-style-type: none"> • Improve productivity ; keeping notes of business process, using quick after searching • Innovate document work by innovation in all procedures and On-Line systemization • Guarantee clear administration by thorough document of official business • Secure historic materials by policy makers' thorough document • Improve customized service by extending the range of public information

2. Risk Factors and Undertaking

Notice the potential risk element to promptly avoid danger during the business and make a proper reaction to prevent the problem. In this way, successful business completion as well as setting of new document management system by inducing e-office system can be accomplished.

2.1. Risk Element

These are the potential risk elements that are to be solved to fully accomplish the business with details. They are divided into 3 sections: in the aspect of customer, technology and business propulsion

- Risk Element in the aspect of Customer
 - Confusion or demoralization of workers due to the changes in business procedures and structure of the organization in new system
 - Lack of customers' understanding of content, range, purpose or effect of the business
 - Delay in schedule in the process of decision making or approving among customers
 - Lack of understanding of technology relating to the business
 - Dissatisfaction with applying new process in new system
 - Damage in propulsion due to delay in the previously planned schedule
- Risk Element in the aspect of Technology
 - Difficulty in connection between previous system and new system
 - Impracticable application of up-to-date technology in previous ICT environment
 - Difficulty in choosing hardware and software in new system
- Risk Element in the aspect of Business Propulsion
 - Customers' dissatisfaction with their requirements due to delay in schedule and shortfall of output
 - Lack of human resources, technology, equipment for business performance
 - Delay in whole business schedule
 - Dissatisfaction with application requirements of new system
 - Difficulty in financing for follow-up propulsion according to road map

2.2. Risk Element / Countermeasures

Here the countermeasures for each risk element as following:

[Table 50] Risk Element and Countermeasures

Section	Risk Element	Countermeasures
Customer	Confusion or demoralization of workers due to the changes in business procedures and structure of the organization in new system	Continuously give public relations as well as usage education for the understanding of purpose, necessity and effect of the new system
	Lack of customers' understanding of content, range, purpose or effect of the business	Regularly provide information relating the project
	Delay in schedule in the process of decision making or approving among customers	Organize exclusive team for continuous propulsion
	Lack of understanding of technology relating to the business	Organize team with veteran of ripe experiences in system development for the propulsion Provide and Educate technical information relating to the project
	Dissatisfaction with applying new process in new system	Continuously give public relations for the understanding of purpose, necessity and effect of the new system
	Damage in propulsion due to delay in the previously planned schedule	Plan and propel strategic and anticipative financing for follow-up propulsion by exclusive team for propulsion
Technology	Difficulty in connection between previous system and new system	Clearly review connection method of previous system and Induce connection server
	Impacticable application of up-to-date technology in previous system	Choose technology that can applied to new system Choose hardware and software considering with further development
	Difficulty in choosing hardware and software in new system	Induce and develop the verified hardware and software Review the certification of bender enterprises
Business Propulsion	Customers' dissatisfaction with their requirements due to delay in schedule and shortfall of output	Pay for delay in process Input professionals and Continuously review the propulsions
	Lack of human resources, technology, equipment for business performance	immediately manage the budget of project manager, human resources and other resources
	Delay in whole business schedule	Reschedule projects by discussion as well as workshops with customers
	Dissatisfaction with	Build system by modifying it with

	application requirements of new system	requirements from users
	Difficulty in financing for follow-up propulsion according to road map	Plan and propel strategic and anticipative financing for follow-up propulsion by exclusive team for propulsion

3. Sustainability of Project Effect

The project is the part of automation in administration which is core of worldwide 'Electronic Government' project. The project is about building e-Office System for the Government of Ethiopia to build effective administrative system with electronic document and building document distribution system and document management system. It is the necessary system. With this project, the Government of Ethiopia shall become the best Government among Africa by improving national capacity of administration, production and service. To keep and enhance the effect of this project the followings should be performed:

- To keep continuous relationship with people in charge of Ethiopia and Addis Ababa city
 - Ask for budget or performance planning
 - Ask for internal propulsion process of Ethiopia and Addis Ababa city
 - Educate continuous use of the system and Regularly provide related information
 - Use the system in other Governmental institutions in Ethiopia and expand the business with the promotion effects
- Disseminating the usage of the system to surrounding nations and its promotion effects
 - Get the chance of expanding the business or starting the new one by presenting and introducing the usage of the system in Ethiopia Addis Ababa city in various conferences such as KOAFEC Conference, IT Service Conference.
- Continual financing planning for the follow-up propulsion
 - Apply to International Organizations such as EDCF, World Bank, AfDB for the result of Feasibility Study to propel the follow-up project propulsion