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Computer Aided Strategic Planner for the MDG Matrix

User Guide

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Abstract

This document is intended to serve as a User Guide of a strategic planner that is being developed to support the MDG (Millinium Development Goals) Matrix. This computer aided planner serves as an instrument to advance the MDGs quickly, universally and effectively. As compared to the related efforts that primarily provide documents on the subject matter, this comprehensive planning tool goes much farther -- it systematically guides the user through strategic planning steps and supports a wide range of capabilities such as a portal of portals, intelligent decision support tools, and simulations/games. In particular, the strategic planner is part of a comprehensive planning environment that offers capabilities for entrepreneurship, industry analysis, and detailed planning.

1. Overview and Motivation

The MDGs (Millinium Development Goals) is a major initiative with profound implications. The use of information and communications technology (ICT) to advance the core MDG priority areas (Poverty Eradication and the Financial Crisis, Climate Change, Governance, Health, Education, Gender, and HIV) is an active area of work. A matrix has been developed to guide the progress in this area. Although many issues listed in various columns of this matrix have been and are being discussed, real progress towards MDGs is slow as observed in the UN-GAID Conference at Monterrey, Mexico (Sept 2-4, 2009). The major challenge is how to support this MDG matrix:

- Quickly (i.e., without any further delays),
- Uniformly (i.e., to all segments of the civil society),
- Universally (i.e., to all people around the globe), and
- Effectively (i.e., to make a real difference in practice)

To meet this challenge, discussions led at Monterrey by Dr. Amjad Umar, Dr. Alexei Tickimorove, Mr Sarbuland Khan, Dr James Poisant, and others focused on utilizing "best practices" because many such practices have accumulated in using ICT for economic development, healthcare, education and other areas of interest. However, best practices mentioned in Monterrey consisted mainly of published reports and web links, at best. While possibly useful, there is little known data that shows or proves if these documented best practices have been used to actually assist decision makers in making intelligent, well informed decisions that resulted in effective and efficient implementations and results.

A significant exception at the Monterrey Conference was a session on "Educating ICT Leaders Through ICT: An Innovative Approach" that showed results from a three year R&D project focusing on best practices [1]. The main output of this research is an innovative computer aided planning toolset that captures best practices and working solutions to specific problems under certain conditions as patterns [2, 3, and 4]. These patterns can be stored, retrieved, modified and combined with other patterns to form larger and more complex patterns to represent complex best practices. This tool illustrated how best practices can be used effectively to make a wide range of decisions within the overall scope of IT planning, integration, security, administration and entrepreneurship.

A major conclusion of this discussion was that documents and websites that simply list best practices are not very valuable because they leave the task of customizing and assembling of best practices into solutions to the user – a daunting task. In addition, most users can handle simple retrieval and display situations themselves but need help when best practices need to be customized and assembled into solutions. Thus the documents and links to best practices do not help where the users do need help.

Follow on discussions led to a decision to go beyond debates and to build an extensive strategic planning tool that can be actually used by governments and their constituents to quickly, uniformly and effectively advance MDGs. This computer aided strategic planner is expected to play an increasingly important role

in guiding the decision makers through the maze of choices as the technology landscape changes more rapidly and becomes more complex. Instead of disconnected efforts in different directions and documents containing best practices with no ideas about how and when and where to use them, we will offer a high quality planning environment that will allow storage, retrieval, customization and manipulation of ICT best practices to meet the challenges in education, healthcare, and economic development. The strategic planning environment is introduced in Section 2 and explained in Section 3 through a series of screenshots.

2. Computer Aided Planning to Advance MDGs – A Quick Overview

Figure 1 shows a conceptual view of the overall computer aided planning environment that is being designed to advance the MDGs. Highlights of this planner are:

- **Status:** Proof of concept prototype (Direction: stop talking about problems, start building solutions)
- **Objective:** Help developing countries to build IT plans quickly and effectively based on latest thinking (international standards, published best practices in the form of processes, case studies)
- **Origin:** Based on previous industry experience plus R&D on computer aided IT planning (patterns, case-based reasoning, collaborating expert systems, support to fill knowledge gaps in SMBs),
- **Peer Reviews:** Results published in top peer reviewed journals (e.g., IEEE Trans. On Engg Management). Research funded by IBM, DARPA, Telecom Providers. Ideas used in large telecom, healthcare, manufacturing, govt agencies
- **Main Goal:** use this research to address the problems in developing countries (ICT solutions to support MDGs). Rely more on user inputs, less on provider inputs

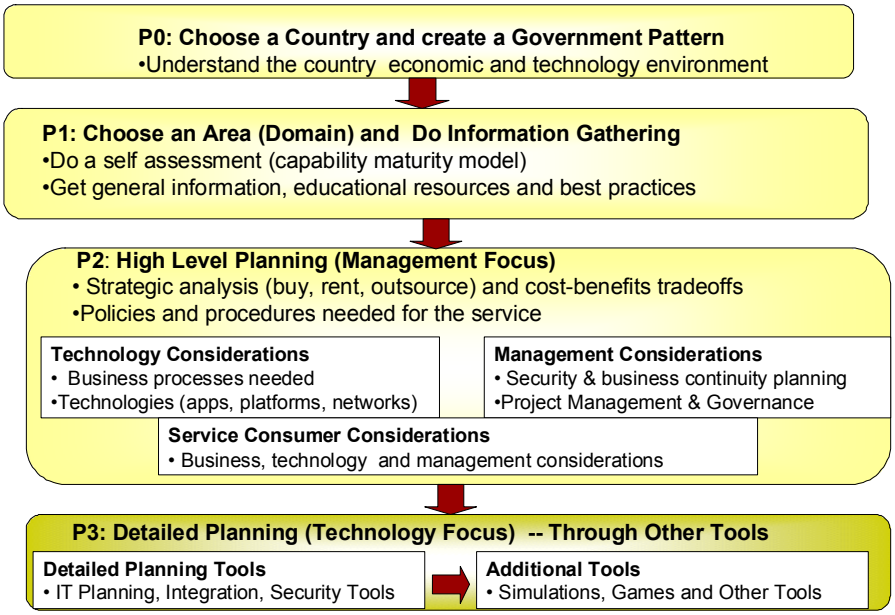

Figure: 1: Computer Aided Strategic IT Planner)-- Key Components and Flow

The computer aided strategic planner systematically guides the government officials and system implementers through different phases of a planning process as shown in the diagram. The following description shows the flow of the Planner, for providing healthcare services in a developing country.

- **P0 Phase**: the user (government agency) chooses a country (e.g., Nigeria) and creates a government pattern
- **P1 Phase**: the user selects a service to be deployed (healthcare). It then goes through a self assessment (based on the capability maturity model) and gets access to general information, educational resources and best practices (e.g., reports from UN, other links, university courses etc) on healthcare
- **P2 Phase:** the government agency is led through strategic analysis (buy, rent, outsource) and cost-benefits tradeoffs associated with the healthcare service. It also is guided through policies and procedures needed for the healthcare service. The key elements of the strategic plan are produced in terms of business architecture, application, technology architecture and management architecture
- **P3 Phase**: the detailed planning environment can be developed through an extensive IT planning, integration, security and administration (PISA) tool. The user may choose other simulations, games and decision support tools for detailed planning.

A short tutorial on the Strategic Planner, with video clips, can be found at the following link: **http://www.ngesolutions.com/websitepids/movies/index.htm**

3. Strategic Planner – A Closer Look

Table 1 shows a more detailed view of the Strategic Planner> The main phases of the planner (P0, P1, P2, P3) are displayed in column 1, the main activities (steps) in each phase are shown in column 2, and the main tools, techniques, and standards used in each step are listed in column 3.

Sample Scenario:

The balance of this section explains the activities performed in the three phases through screenshots. The screenshots were created to develop a strategic IT plan for healthcare in Venezuela.

Table 1: Computer Aided Strategic Planner – A Closer Look

Planning Phases	Activities Performed	Tools, Techniques & Standards Used
P0 (Government Modeler) Choose a Country and create a Government Pattern	S1: Define the country Profile and specify the level of use for the ICT	Fetch and use various indicators from sources such as World Economic Forum, UNPAN, ITU
	S2: Create a government pattern for the chosen country	Use the Patterns Repository to fetch and display a generic government pattern
	S3: Customize the pattern based on user inputs	Defaults for the patterns are based on external data sources
P1 (Initializer): Choose an Area (Domain) and Do Information Gathering	S1; Define a service in different areas that support the MDGs (e.g., healthcare, education, economic development)	The services are based on the government pattern and use the ITIL ITIL (IT Infrastructure Library: www.itil-officialsite.com
	S2: Get general information, educational resources and best practices	Extensive literature from diverse sources is accessed and displayed.
	S3: Do a self assessment of the PMO (present method of operation) and FMO	Uses the Capability Maturity Model (CMM) measures (0 to 5) for assessment.

	(Future Method of Operaation)	
P2 (Strategic Planning): High Level Planning (Management Focus)	Cost-benefits tradeoffs	Uses the McFarland Model
	Strategic analysis (buy, rent, outsource)	Uses an intuitive decision model based on time, in-house expertise,
	Policies and procedures needed for the service	Policies from different sources are fetched and displayed. Oracle Policy Automation
	Business processes needed	Zackman model and US-FEA (Federal Enterprise Architecture)
	Technologies (apps, platforms, networks)	OAG (Open Application Group -Website: www.oag.org, W3C (www.w3c.org), ISODP (ISO Distributed Processing), Cisco guidelines
	Security & business continuity planning	SSI (System Security Institute), and ISO 9000 (for quality mgmt)
	Project Management & Governance	PMBOK (Project Management Book of Knowledge) by Proj Mgmt In.(PMI) COBIT (Control Objectives for Information
	Interoperability and Integration Considerations	SOA, SPOCS(large European initiative for interoperability – http://www.eu-spocs.eu/)
P3 (Detailed Planner): (Technology Focus) -- Through Simulations	Consolidated Report that shows: • Summary of the interactions • Requirements (RFP) format • Standards used (with explanations)	Requirements document is based on IIBA ((International Institute of Business Analysis): Website: www.theiiba.org
	Detailed Planning & Implementation Tools	Games, simulations, planning tools,

3.1: P0 Phase –Initialization and Government Information Gathering Phase

In the P0 phase, the user (government agency) chooses a country (e.g., Venezuela) and creates a profile for that country. A profile basically represents a scenario that a user wants to create and experiment with. Figure 2 shows a sample screen that shows the existing profiles that have been created already by the user. A user can create new profiles or reuse/extend existing ones.

Figure 2: Government and Service Profiles

The P0 phase, as shown in Table 1, consists of three major steps:

- S1: Define the country profile and specify the level of use for the ICT
- S2: Create a government pattern for the chosen country
- S3: Customize the pattern based on user inputs

Figures 3, 4 and 5 display screenshots of how a user creates a new country profile (Figure 3), creates a government pattern that is fetched from a pattern repository (Figure 4) and then customizes it by defining which one of the government services are centralized and decentralized (Figure 5). Figure 6 shows a very high level summary of the information gathered in this phase.

A few points about the overall user inputs and screen design:

- The user session, after signing in, is guided through a control panel.
- The system automatically determines which phase/step you can invoke and this is indicated by a red arrow.
- Each phase/step, when invoked, produces a model and then returns control to the control panel.
- Each screen provides help and short tutorials/explains, indicated by "?", about the subject matter. For example, Figure 3 shows several explanations on different aspects of the screen.
- As shown in Figure 3, the bottom toolbar provides buttons for access to several other related tools such as a meta portal, simulations, solutions repository, etc. .

Figure 3: Initial Interview to Create a Government Profile

Figure 3 shows the interview to create a government profile:

- Name of country: Pick a name from the list
- Government Profile Title: To start, you can create a profile ("model") of your country or use an existing profile. The profile captures essence of an enterprise and is populated as a result of interviews to be conducted as we proceed. You can use any name to create a profile. The profile is saved for future use. When you logon again, all profiles created by you are shown. You can create a new profile to model a new situation or use an existing one.
- Web Usage Desired: shows the different stages of web usage, from no usage to enterprise 2.0 and digital corp.
- Mobility Usage Desired: shows the different stages of mobility and wireless communication usage, from no usage to mobile corporations.
- Desired Use in Services: shows how many services will be digitized ranging from few services to all services.
- Time Horizon for Materialization of Vision: shows when is the expected digitization expected to take place (one year, two years, three plus years)

Figure 3 also shows a data integrator that accesses pertinent pieces of information about Venezuela from a wide range of information sources such as the MDG Monitor, ITU, UN, and World Economic Forum. This information is used to help make decisions in the planning process.

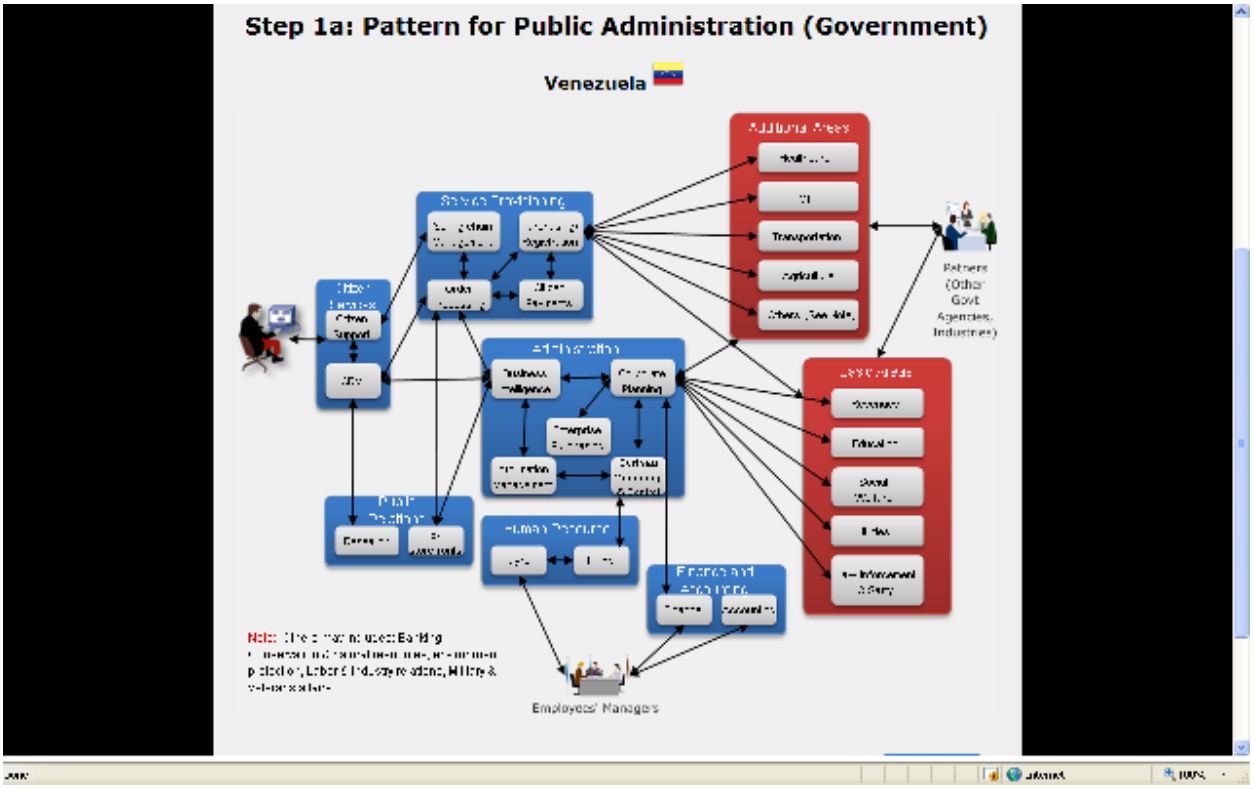

Figure 4: Sample Government Pattern

Figure 4 shows a general "pattern" of government services. Patterns are a well-known format for capturing knowledge and best practices. In essence a pattern represents core knowledge that can be specialized for different situations. The pattern represented in Figure 4 represents the core services provided by a government and can be specialized and customized based on user inputs. For example, a user customizes this pattern for Venezuela as the user proceeds with the next step shown in Figure 5.. The modified pattern is used to make later decisions. Exhibit1 gives a quick overview of patterns.

Figure 6 summarizes the main information that has been captured in this phase of the interview.

Exhibit1: Patterns – A Quick Overview

A pattern T is represented by T(p, s, e) where p is the problem to be solved, s is the solution (what works in practice), and e is an example. Additional information such as diagrams, context, benefits, consequences, and limitations can also be added to a pattern to help the designer. In addition, each pattern is assigned a name. The main value of a pattern is the solution s that represents the best practice and what works in real life situations. The solution s is provided to a designer as a generic solution -- a sketch -- that can be refined and specialized based on the situation, additional inputs, or inferences from other patterns. Solutions in a pattern can depend on previous choices represented by other patterns.

Initial focus of patterns in computing has been on technical areas such as design patterns, architecture patterns, and pattern languages. Considerable attention is now being paid to business patterns, security patterns, integration patterns and the like.

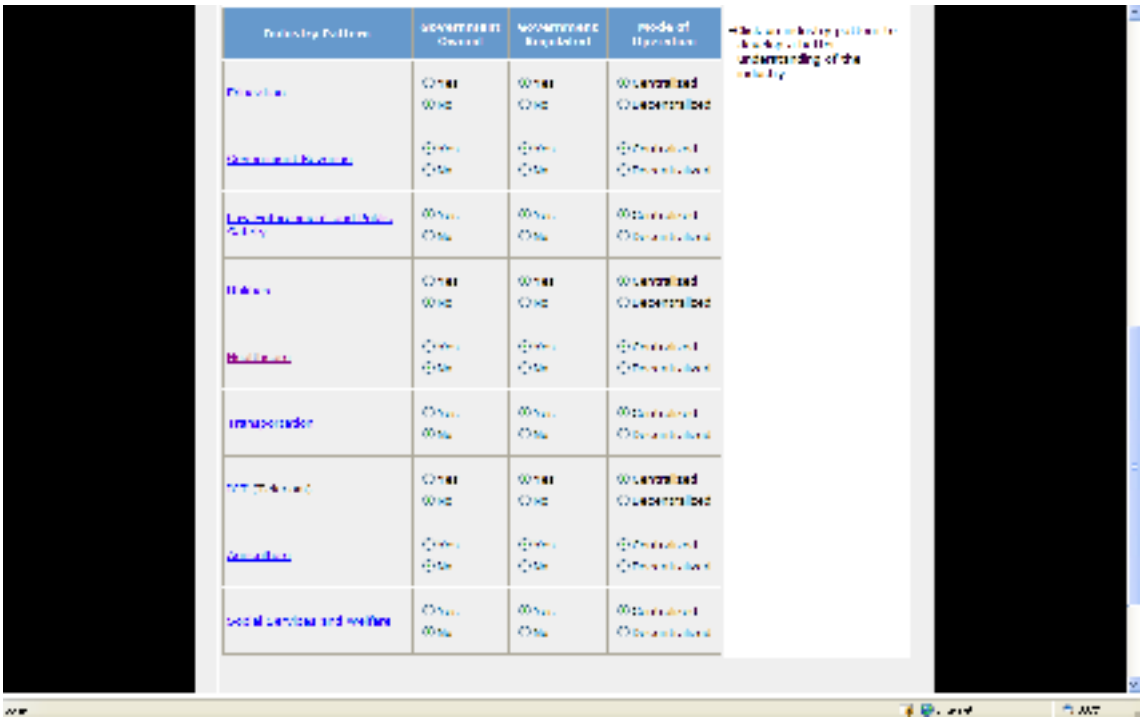

Figure 5: Customization of Govt Pattern

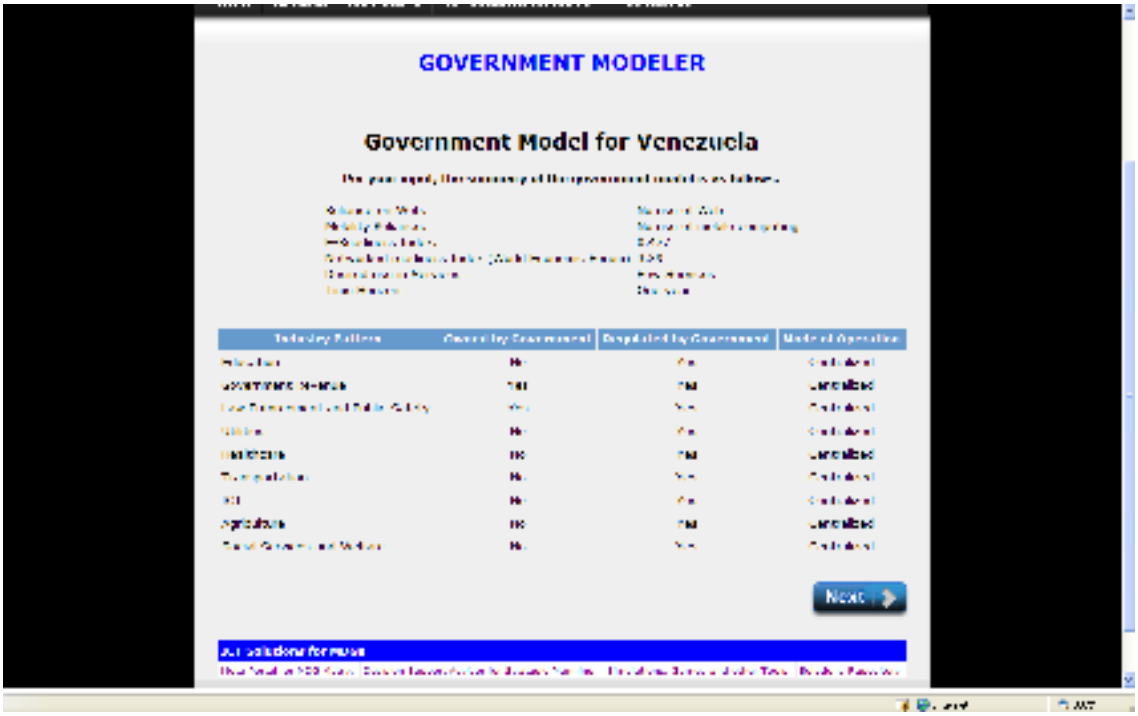

Figure 6: Summary of Govt Pattern

3.2 P1. Service Initialization Phase

This phase gathers information that is specific to the service that will be offered by the government. The following steps are used in this phase:

- S1: Define a service in different areas that support the MDGs (e.g., healthcare, education, economic development). Specifically, choose an area (domain) and service by using pull down menus.
- S2: Get general information, educational resources and best practices needed to support this service.
- S3: Do a self assessment of the PMO (present method of operation) and FMO (Future Method of Operation)

Figure 7 shows the control panel to define a new service and Figures 8 through 11 illustrate the main activities performed in each of these steps.

Figure 7: Creating a New Service Profile

Figure 8: Selecting a Service Doman and Service Type

Figure 8 shows how a user creates a service profile and then selects a service domain (e.g., healthcare, transportation, social services, and transportation) and then a service within the domain. In case of Venezuela, the user is selecting service domain of healthcare and service of administrative services. The user also specifies the government style (e.g., ownership) for the chosen service.

Exhibit 2: Service – A Quick Overview

A service, from a business/government point of view, is something that is delivered to the customer. It is something of value offered to customers – it may involve many internal processes that are not exposed to the consumer. A standard definition of service is:

Definition: "Service is a way to deliver value to customers" (from ITIL Standard, www.itil.org)

Examples:

- Dry cleaning is a business service. The processes that support this service are taking the order, sending the clothes for cleaning, etc
- Online purchasing is a service. The processes that support this service are verifying the customer, checking inventory, and notifying a customer.

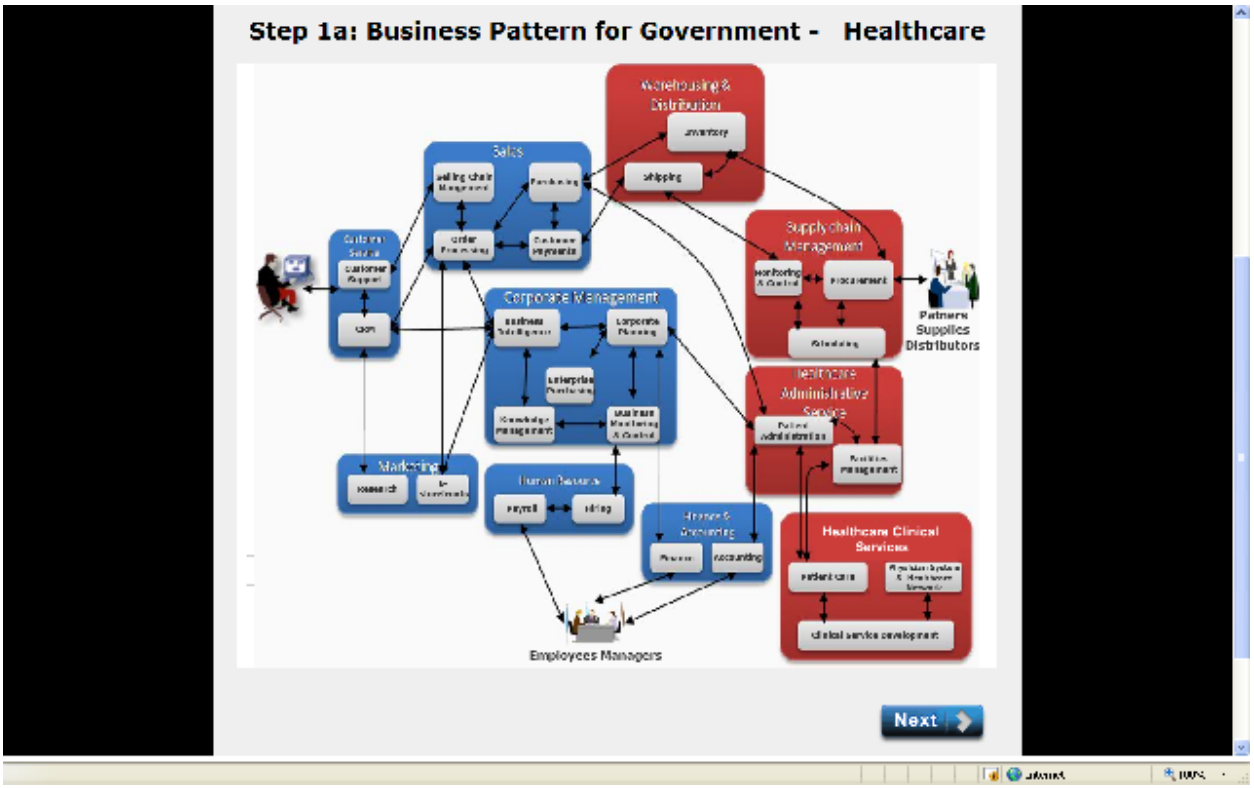

Figure 9: Healthcare Pattern

Figure 9 shows the healthcare pattern because the user has selected healthcare as a domain for investigation. This pattern shows the main business processes in healthcare and their interactions with each other. This pattern is fetched from a pattern repository and and can be viewed, queried and manipulated by the users to fit user needs. .

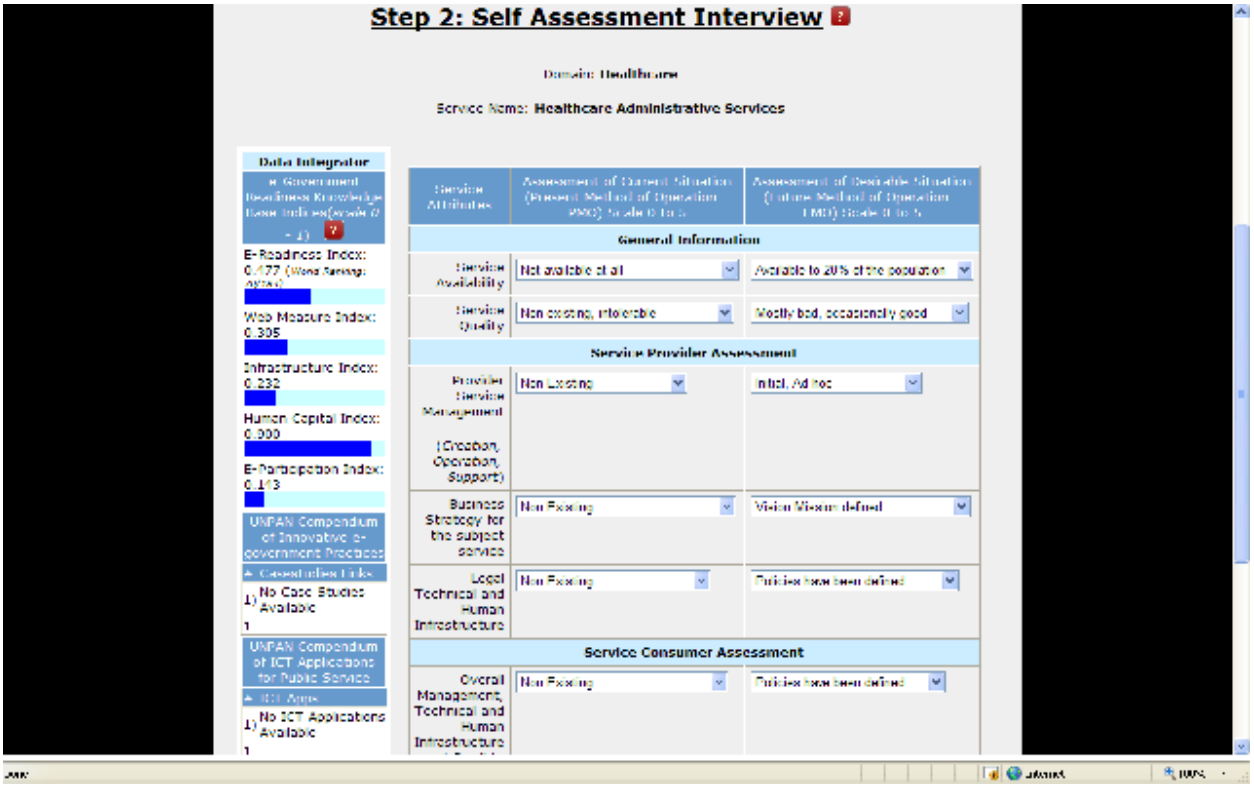

Figure 10: Self Assessment Interview

Figure 10 shows a self assessment interview that concentrates on the present method of operation (PMO) and future method of operation (FMO) of the chosen service -- administrative healthcare. The purpose of this assessment is to fully understand the current PMO and the desired FMO. This understanding is essential in strategic planning.

As can be seen, the assessment entails evaluation of service provider management, the business strategy, and the legal/technical infrastructure needed for the selected service.

The Data Integrator, shown on the left side, once again displays pertinent sites that provide valuable information for this service.

Figure 11 shows how a user can explore additional sources to learn more about the selected service. This step concludes the Service Initialization phase.

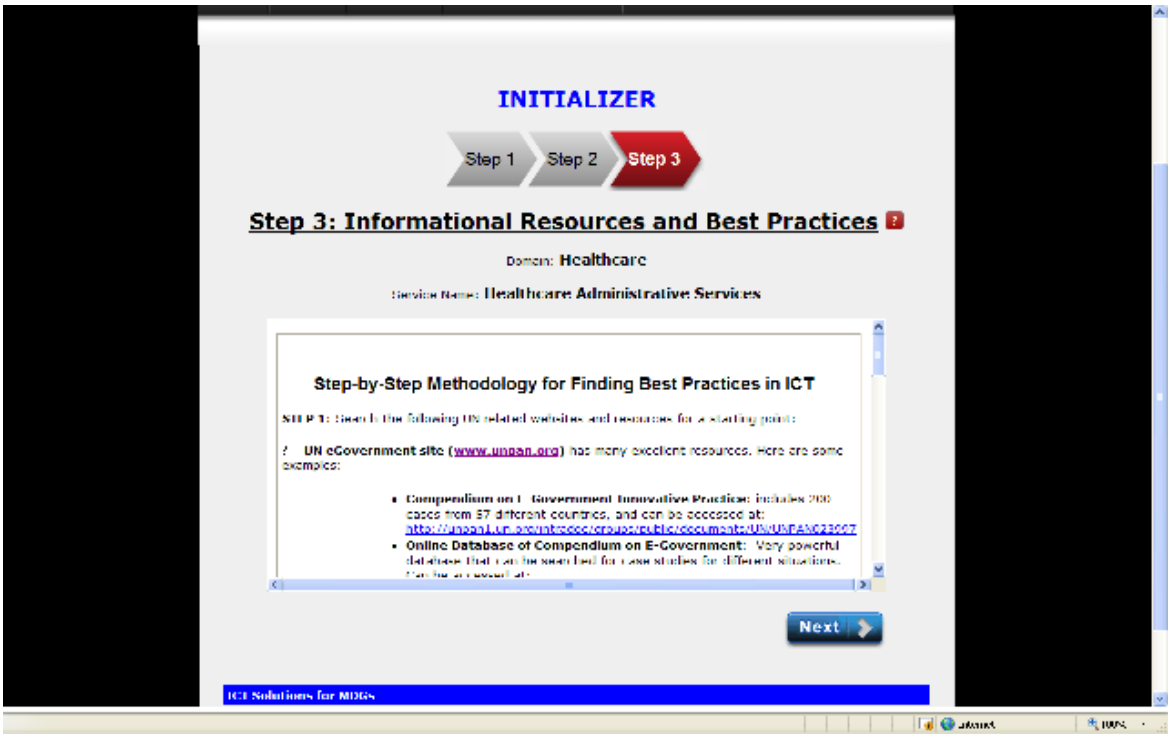

Figure 11: Informational Resources

3.3 P2: Strategic Plan Generator :

This phase uses the information gathered in the previous two stages and generates a strategic plan. The generated plan produces a technical plus management plan that consists of the following crucial pieces of information:

- Cost-benefits tradeoffs; buy, rent, outsource option analysis; and policies and procedures needed for the chosen service
- Business processes and the technologies (apps, platforms, networks) needed to support the chose n service
- Security & business continuity planning, project management & governance, and interoperability and integration considerations

This information is the main output of the Strategic planner. The main steps of Plan Generator are:

S1: Strategic Analysis that involve cost/benefit analysis of the service to be developed, and determination of the most appropriate strategy to be used to deploy this service (e.g., buy from another supplier, rent it from another supplier, outsource it from another supplier, do it yourself through a government agency, or extend an existing service). In addition, the policies and procedures needed to deploy and support this service are evaluated and analyzed. Figures 12, 13 and 14 illustrate different activities within this step.

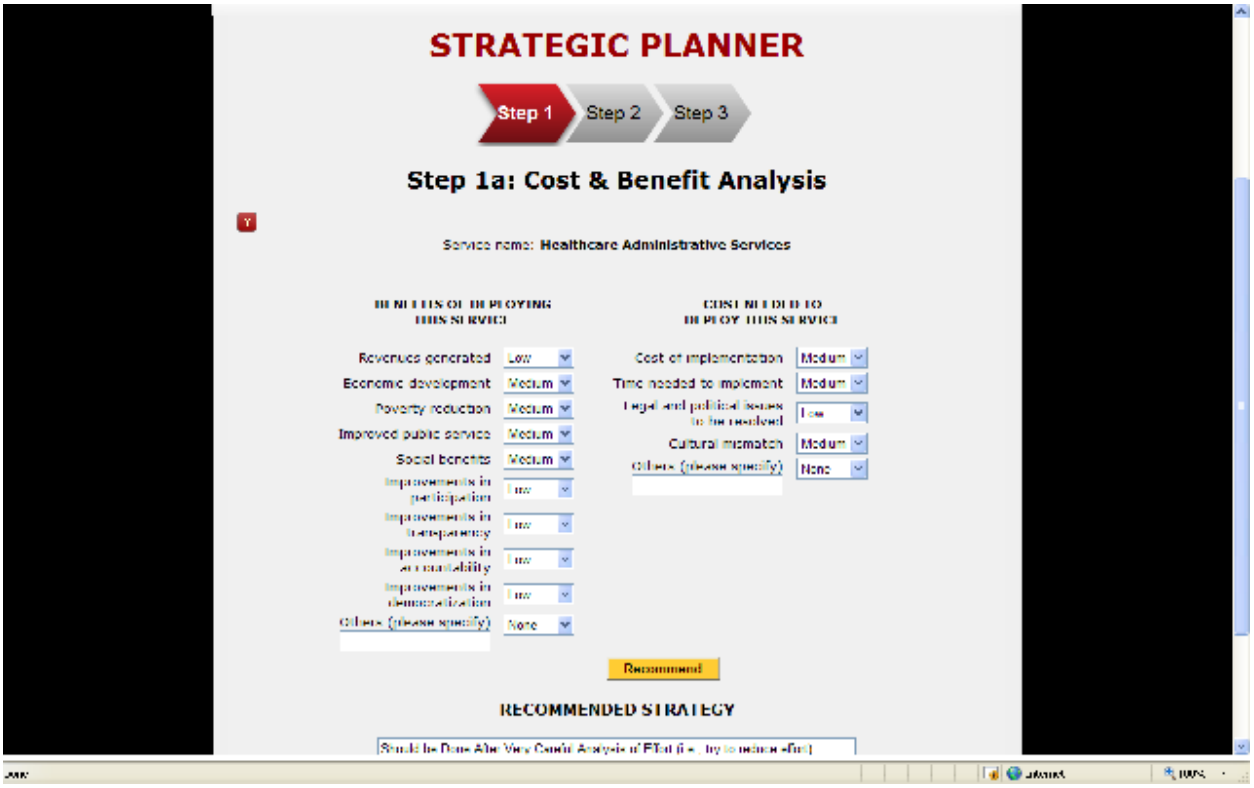

Figure 12: Cost Benefit Analysis

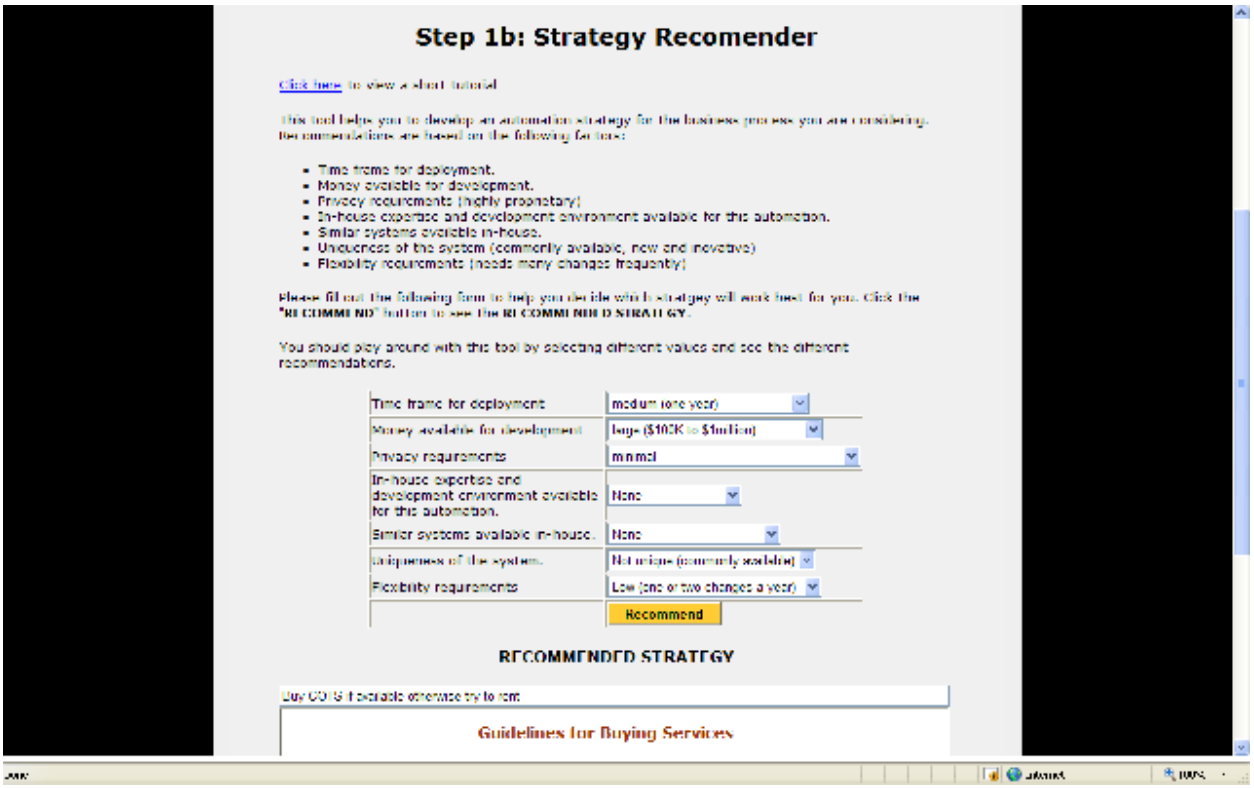

Figure 13: Strategy Recommender

Figure 14: Policies and Procedures Needed

S2: Generate the plan needed to support the chosen healthcare service. This plan consists of IT as well as management components. Figures 15 shows the overall concept of the plan being generated and Figure 16 through Figure 22 display the different components of the overall plan. Specifically:

- The business processes needed to deploy and support the healthcare service are shown in Figure 16
- The application software needed for the healthcare service is displayed in Figure 17.
- The computer and communication platforms support (middleware services, and wired/wireless networks) to support the healthcare service is displayed in Figure 18.

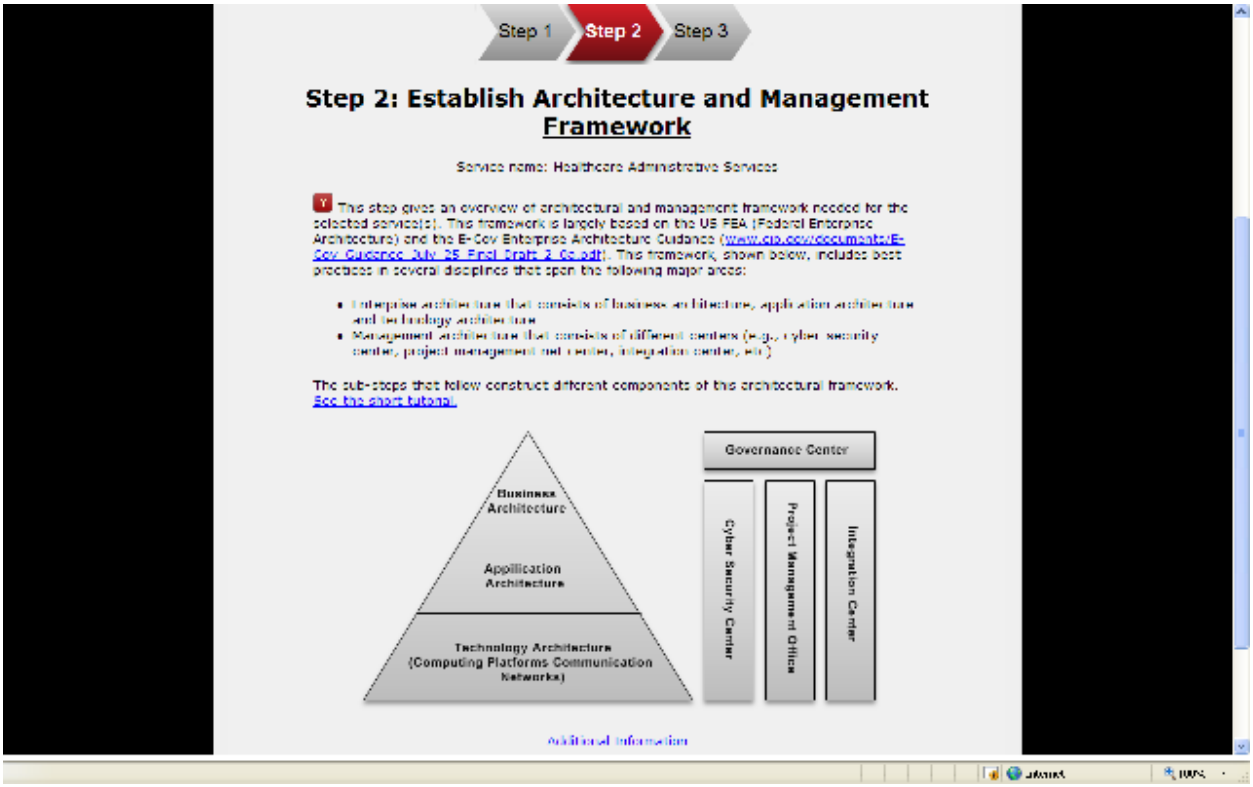

Figure 15: Overview of an IT Architecture Needed

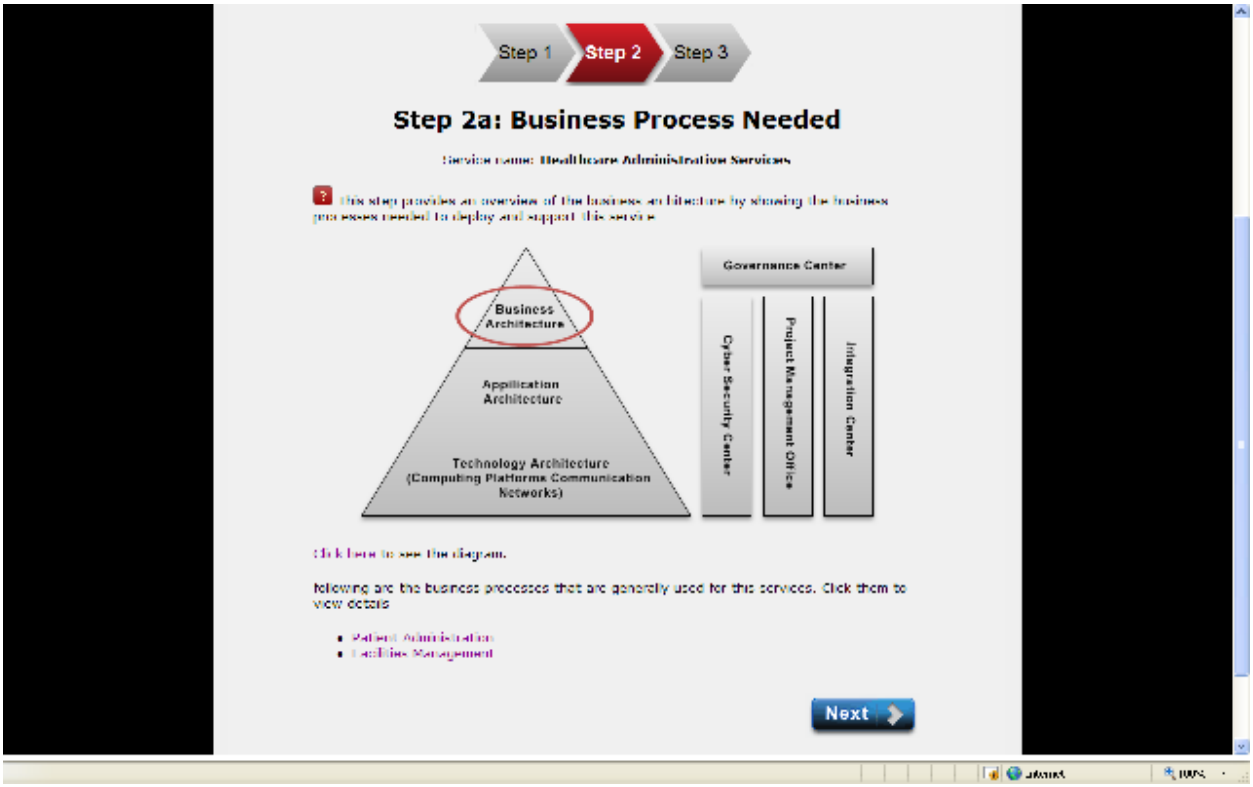

Figure 16: Business Processes Needed

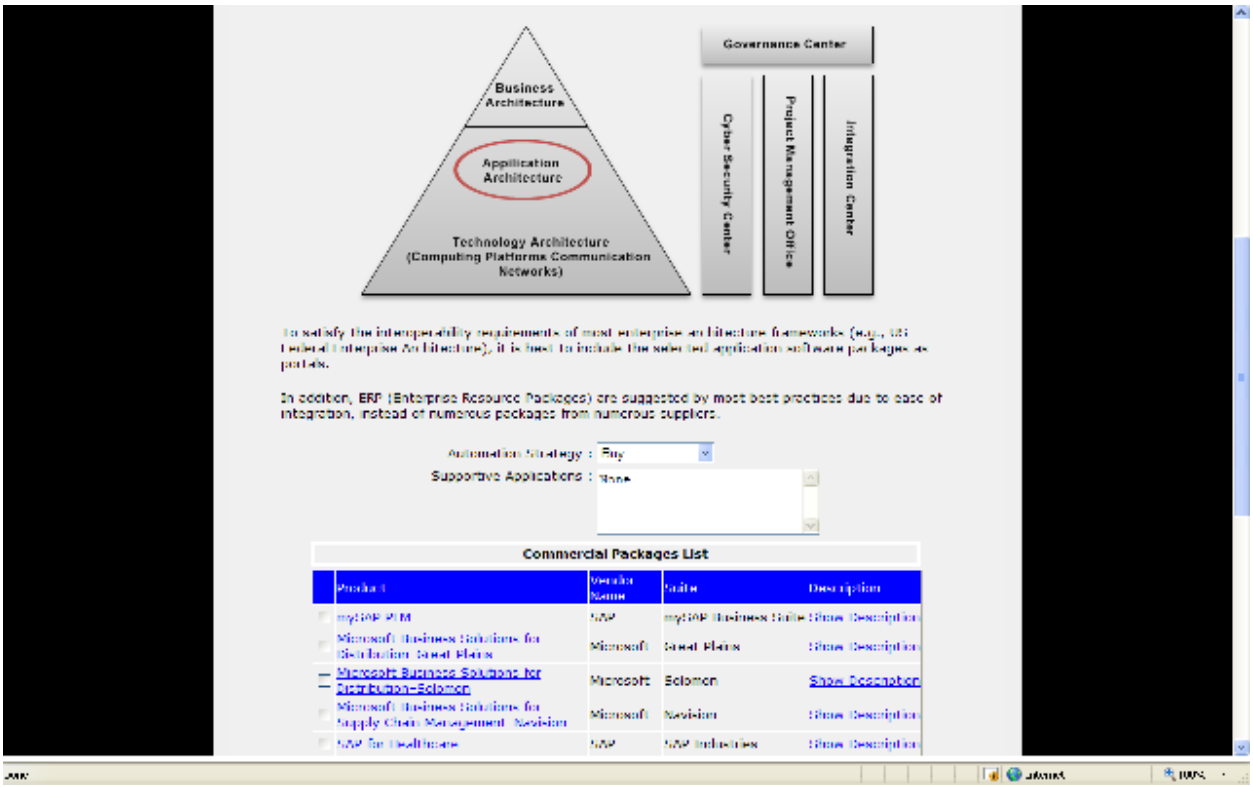

Figure 17: Applications Needed

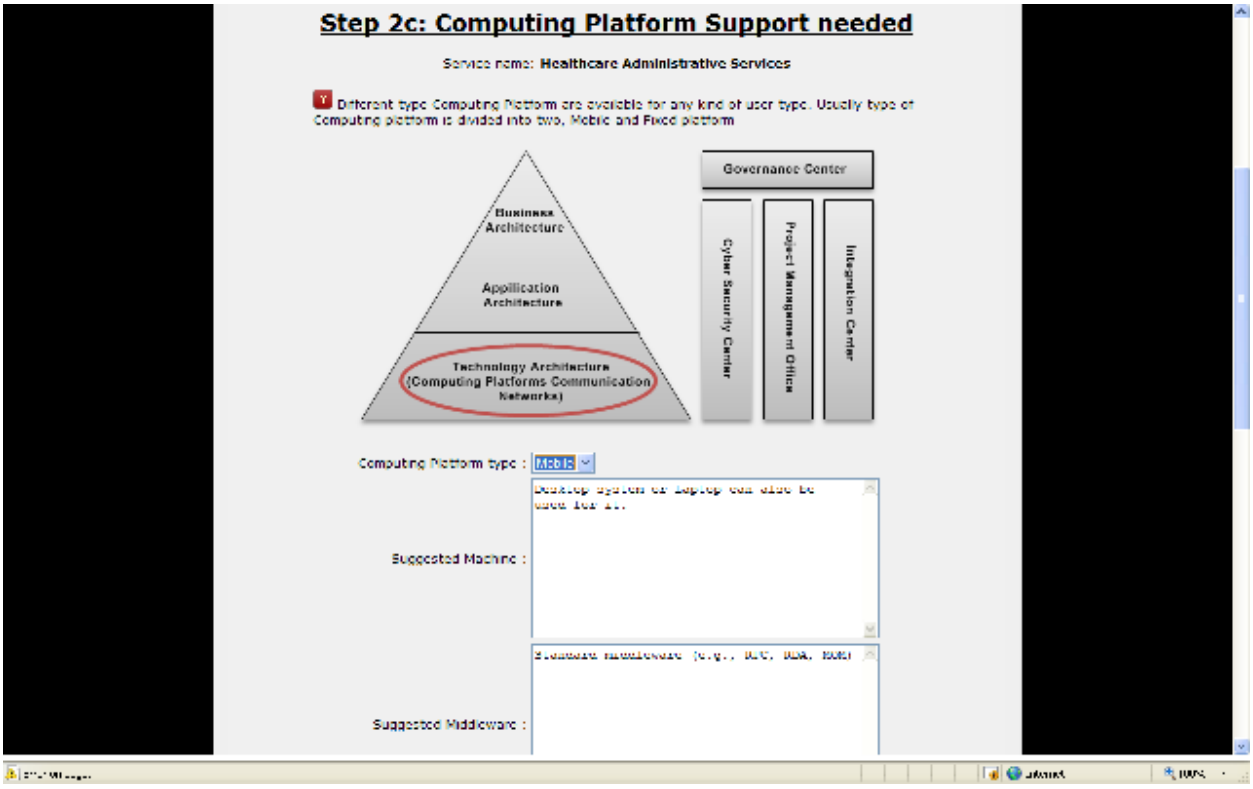

Figure 18: Computing and Communications Technologies Needed

In addition to the technologies plan, this phase also suggests a solid management plan that consists of the following:

- Overall governance needed for this service, shown in Figure 19
- Business continuity planning needed for disaster recovery, shown in Figure 20
- Project planning (work breakdown structures, staffing, etc), shown in Figure 21.
- Interoperability and integration issues, shown in Figure 22.

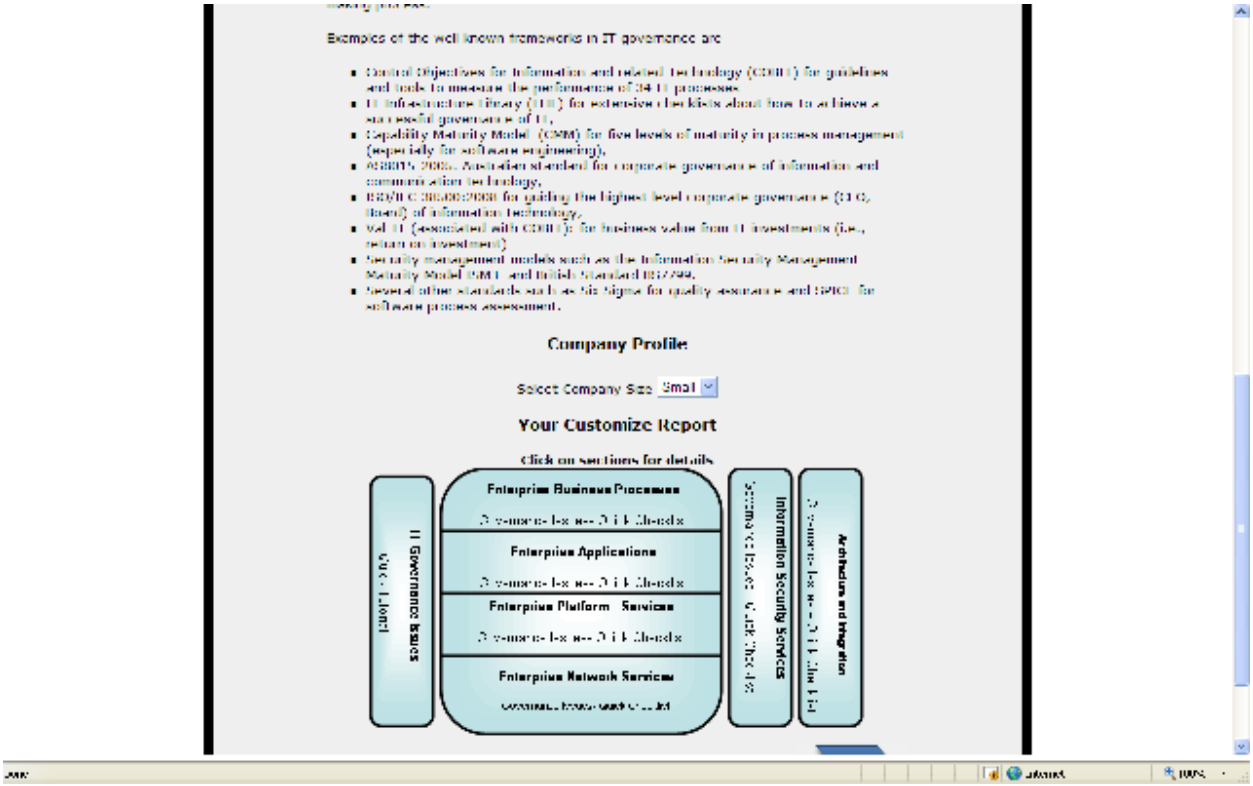

Figure 19: Management and Governance Considerations

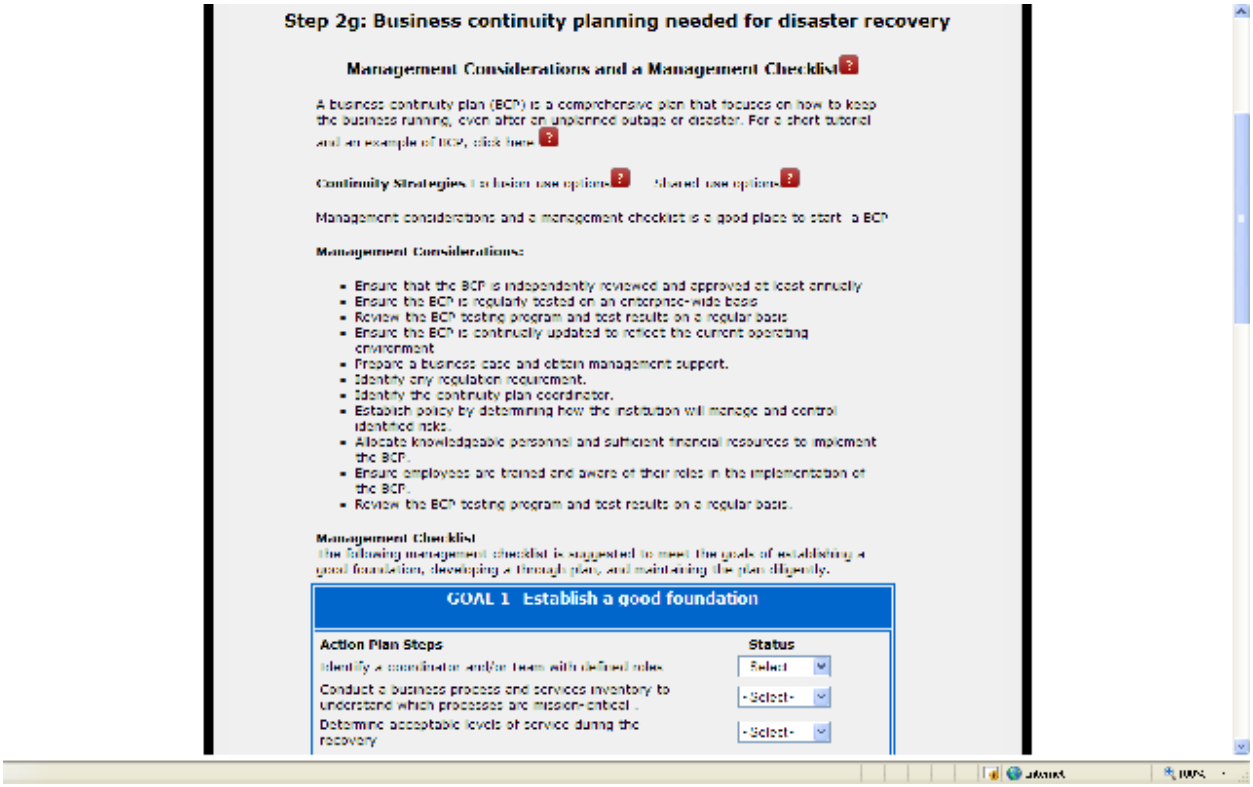

Figure 20: Business Continuity Planning

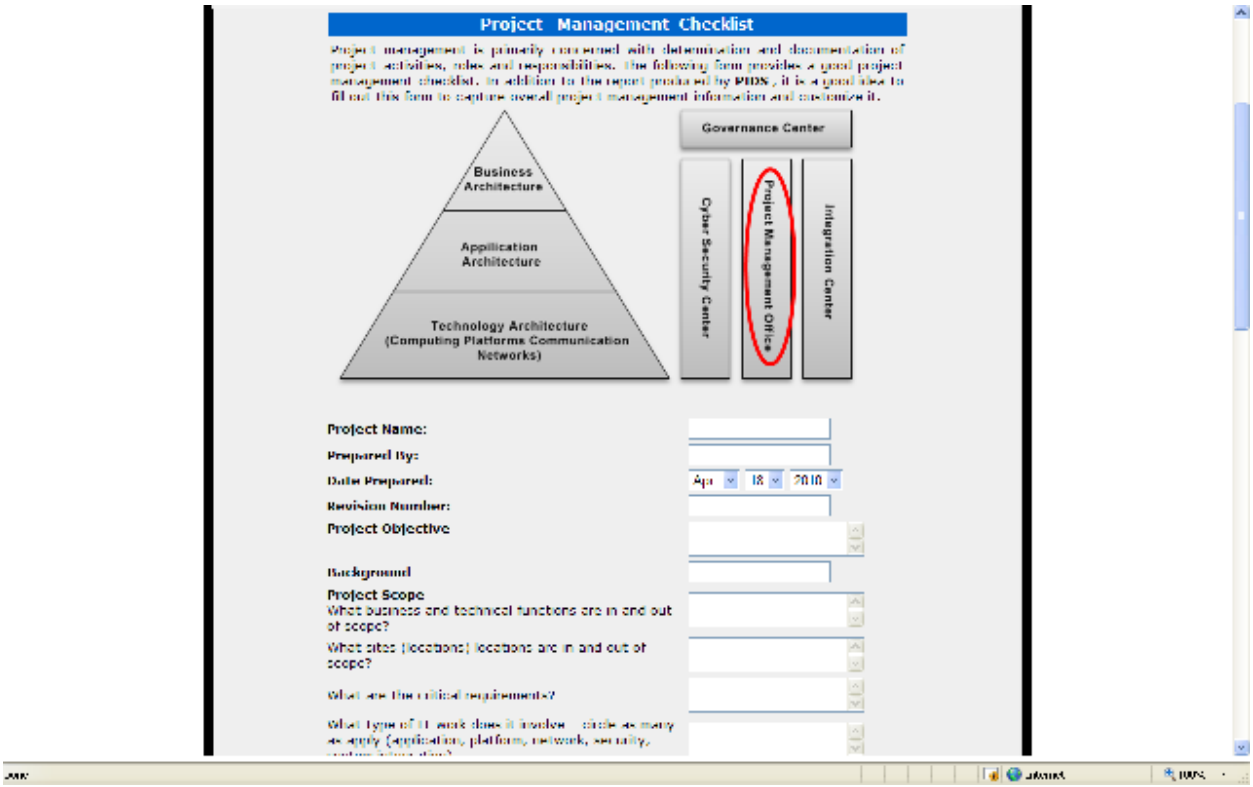

Figure 21: Project Management Information

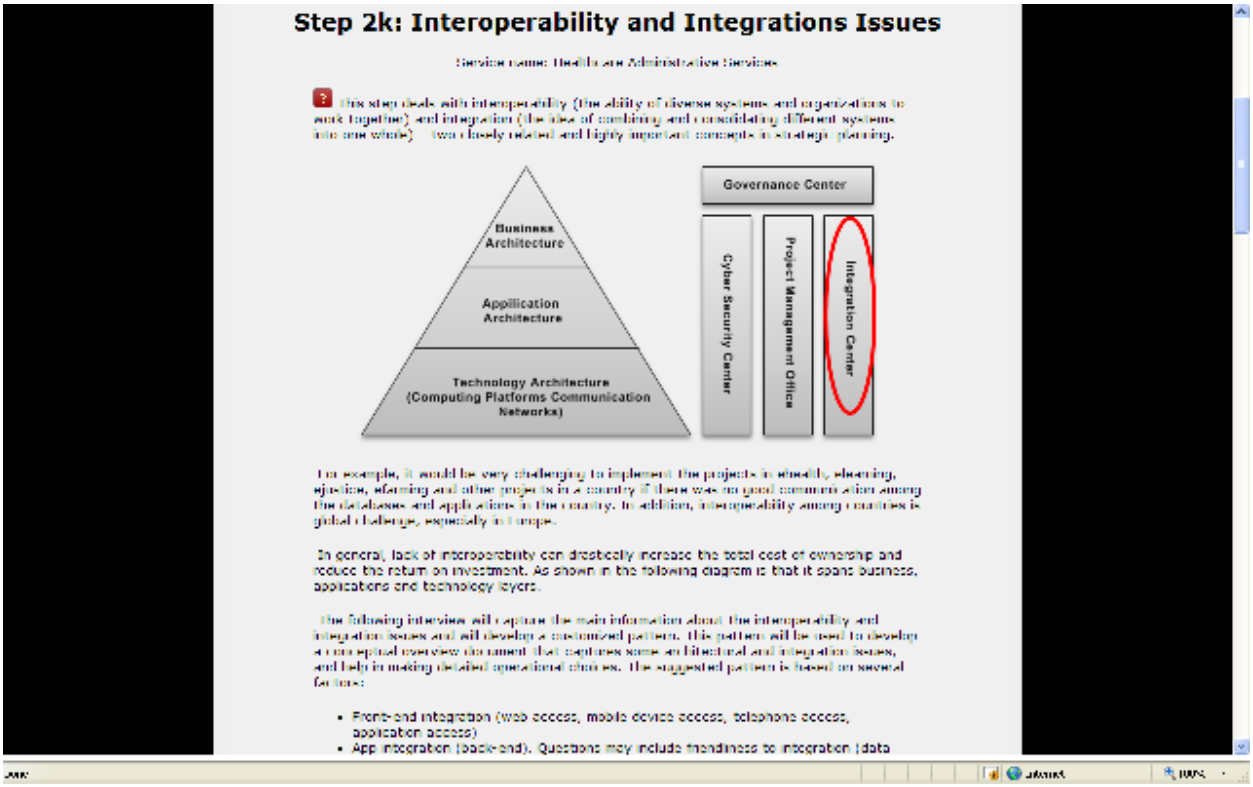

Figure 22 Interoperability and Integration Issues

3.3 P3: Detailed Planner

To conclude the strategic planning, a detailed consolidated report (Strategic Plan) is created and then the users are given a great deal of freedom to select and invoke the type of tools they need. The generated plan consists of the following:

- Summary of the interviews in P0 and P1 and the plans generated in P2.
- Requirements (RFP) format
- Standards used (with explanations)

Figure 13 shows a screenshot of the Detailed Planner. Broadly speaking, the user in this phase can follow two different paths:

- **Use the detailed planning tools that are integrated with the Strategic Planner.** An example of such a tool is the *PISA* (Planning, Integration, Security & Administration) environment that directly accepts the outputs generated by Strategic Planner and generates very detailed and well documented plans. Another possibility is to use a a knowledge portal for entrepreneurship, called *GEZA* (Global Entrepreneurship for All), that provides a set of knowledge services ranging from starting a business to international partnership and outsourcing opportunities. In addition, an industry pattern repository called *PARIS* (pattern Repository for Industry Segments) can be invoked to access the business patterns for more than 20 industry segments including education, healthcare, transportation, telecom, and manufacturing. PISA, GEZA and PARIS collectively can be and have been used for educational as well as consulting services. Instead of several

disconnected tools that address parts of the problem, the detailed planning environment captures the complex interdependencies between the business and technology building blocks of real life situations.

- **Additional simulation, gaming and educational tools** can be invoked in addition to, or instead of, the well integrated tools. A collection of papers, presentations, demos and training sessions on different aspects of ICT Leadership Education will be offered through this portal.

Figure 23: Detailed Planning Initiation

4. Concluding Comments

We are in the process of developing a powerful instrument to advance the MDGs quickly, universally and effectively. This instrument, an IT Strategic Planner – is in its early development stages but can generate highly specialized and useful plans. This document has provided information that could be of value to the users of the Strategic Planner. The Strategic Planner is based on open standards and best practices. Table 2 gives an overview of the most significant standards and best practices that are being used in the different stages of the Planner.

Table 2: Best Practices, International Standards and Defacto Standards Used

Phases	Key Best Practices, International Standards and Defacto Standards Used	Phases

General Information Gathering and Requirements	IIBA ((International Institute of Business Analysis): an independent non-profit professional association concerned with the over all field of Business Analysis. Provides best practices and guidelines in requirements management, systems analysis, business analysis, requirements analysis, and project management. Website: www.theiiba.org UML (Universal Modeling Language): a heavily used graphical language to represent business requirements and process flows. Introduced by OMG (Object Management Group). Website: www.omg.org.	General Information Gathering and Requirements
Strategic Analysis	ITIL (IT Infrastructure Library): a widely accepted approach to IT service management. Originated in Britain, ITIL provides a cohesive set of best practice, drawn from the public and private sectors internationally. Website: www.itil-officialsite.com US FEA (Federal Enterprise Architecture): a widely used framework for developing enterprise wide architectures for US government agencies. Website: http://www.whitehouse.gov/omb/e-gov/fea/ Oracle Policy Automation: a business rules management system that helps governments to automate complex, rapidly changing policies as well as to provide consistent advice to citizens across multiple service delivery channels. Website: www.oracle.com	Strategic Analysis
Detailed Phases	**Key Best Practices, International Standards and Defacto Standards Used**	**Detailed Phases**
Detailed IT Planning (application planning, platform planning, network planning)	ITIL (described previously) OAG (Open Application Group):An active group involved in publishing the best practices in applications. Website: www.oag.org. W3C (World Wide Web Consortium): the home of web technologies and widely used as a source of open standards in web technologies. Website: www.w3c,org. ISODP (ISO Distributed Processing): a popular framework to define distributed systems. Website: www.iso.org	Detailed IT Planning (application planning, platform planning, network planning)
Architecture, Integration and Interoperability	SOA (Service Oriented Architecture): A comprehensive architecture for building integrated and flexible applications based on services. Good website: www.ibm.com/soa/ FEA: Described above SPOCS: This is a large European initiative for interoperability. The focus is on EU cross-border systems. Website: http://www.eu-spocs.eu/	Architecture, Integration and Interoperability

Security and Administration (security planning, audits and controls, business continuity planning, project planning, quality management)	PMBOK (Project Management Book of Knowledge): Published by Project Management Institute (PMI), this book clearly specifies the best practices in different aspects of project management (e.g., risk management, cost management). Website: www.pmi.org. COBIT (Control Objectives for Information and related Technology): an approach to standardize good IT security and control practices. COBIT provides tools to measure the performance of 34 IT processes. Website: www.cobit.org. ISO 9000: ISO specifications for quality management with highly respected certification. ISO 9001 is most heavily used. Specifies requirements for certifications (e.g., quality policy, quality manual, quality objectives, quality procedures, quality documentation). Website: www.iso9000.org	Security and Administration (security planning, audits and controls, business continuity planning, project planning, quality management)