ADDIS ABEBA UNIVERSITY

SCHOOL OF INFORMATION SCIENCE MASTERS PROGRAM

DESIGNING CORPORATE PORTAL AS INFORMATION INFRASTRUCTURE: ETHIOPIAN AIRLINES WEB PORTAL

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A Thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master of Science in Information Science

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APPROVAL SHEET OF THESIS

SCHOOL OF GRADUATE STUDIES

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I, the undersigned declare that this work is my original work, has not been presented for a degree in this or any other universities, and all sources of materials used for the thesis have duly acknowledged.

Tesfaye Kasahun: ---------- ----------

Investigator: Signature: Date:

As thesis research advisor, we hereby certify that we have read and evaluated this thesis prepared under our guidance by Tesfaye Kasahun entitled "corporate portal as information infrastructure: "Ethiopian Airlines Web portal". We recommend that it be submitted as fulfilling the thesis requirement.

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Advisor: Signature: Date:

As a member of the board of examiners, we certify that we have read, and evaluated the thesis and examined the candidate. We recommend that the thesis be accepted as fulfilling the thesis requirements for the degree of Master of Science in information science.

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List of Abbreviations

HTML: Hypertext Markup Language

XML: Extended Markup Language

LDAP: Lightweight Directory Access Protocol

AOL: American Online

MSN: Microsoft Network

B2C: Business to Customer

B2B: Business to Business

B2E: Business to Employee

ERP: Enterprise Resource Planning

PDA: Personal Digital Assistance

ESPN: Entertainment and Sports Programming Network

EIP: Enterprise Information Portal

IUE: Information Use Environment

ET: Ethiopian

IS: Information Systems

EWP: Enterprise Web Portal

BI: Business Intelligence

ROI: Return on Investment

IE: Information Ecology

CP: Corporate Portal

EP: Enterprise Portal

TAM: Technology Acceptance model

Abstract

Background: - A good designed corporate web portal will support business organization to communicate and deliver organizational information easily. A given web portal can be measured by its valuable content, structure, information and easily accessibility of its information by its users. The objective of this study is to design a corporate web portal as information infrastructure by using the idea of modified Taylor's value added model and Davenport's information ecology.

Methods: - There are different types of portals. But this study mainly focuses on the corporate web portal of Ethiopian Airlines. Ethiopian Airlines has basically two types of employees' supportive and line staff. The existing portal gives service mainly to supportive staff. But the basic or line staffs have limited access to the portal due to their work conditions. For this reason, data was collected from supportive staff using purposive sampling method. The collected data was analyzed to obtain representative inputs to design the proposed corporate web portal.

Results: - To make portal as main source of information to organization, information ecology of the organization and information behavior of users has to be designed as shared information infrastructure and the designed web portal has to add value to users on their daily activities. Then the organization's information can be easily accessed and shared to all users centrally.

Even there are different areas for a research on the corporate portal, the researcher believes that this study serve as a pilot to design and implement fully operating shared web portal. Therefore, this thesis is flexible, open and modifiable for any change which is found to be important.

Key words: *Corporate Web portal, Information Ecology, Value Added System, User's Information Requirement Behavior.*

CHAPTER ONE: INTRODUCTION

1.1. Background of the Study

Web portals are sites of information that appeared in the early 90's. It was a real boom, but in the year 2000 when the dot com emerged a lot of portals disappeared. But the best ones are still active after many years. A Web portal is a special web site designed to act as a gateway or an entry point giving suitable access to other web sites.

Tatnal (2003) define web portal as follows: *A portal is a collection of technologies (i.e., HTML, XML, Web services, LDAP directory, databases) that function together as a presentation tool to securely display corporate data, add to it information on the Internet, and customize and simplify access to that information. A portal grants access for organizational employees, clients, and business partners to information for which they are allowed access and it hides information which has not been approved. It gives this customized access through a secure login to a directory and from that directory, the rights and privileges that are granted access to portal applications and data.*

Sadeh and Walker (2003) suggest that one of the many useful applications of the Web in general is the creation of the concept of Web portals, often referred to simply as "portals." According to the suggestion above, portal is a Web site or Web service that provides information content to a specific community. Web portals include wide reaching online services such as American Online and Microsoft service network (AOL and MSN), as well as services targeted at very specific community practice interested in education, sport, medical and research.

Web portal is basically the most beneficial access point for the user of the web as they can easily go from one page to another navigating the information of their need. Portals have the information stored into links to various topics such as news, business, sports, entertainment, finance, travel, chat, and employee self-service, games, group discussion, build community, find links to other web sites and much more. Yahoo, Google, Excite, Lycos are popular portals on the Internet.

Portals are classified as either being large recognized gateways like AOL and MSN or popular directories and search engines such as Google, Bing, Yahoo and Alta Vista. Beside this definition, there have been some disputes on the question of what actually constitutes a site to be classified as a portal. But, researchers agree on the definition of portal is a "Gateway" to the Internet.

To Caitlin Fitzsimmons (2003), the term portal has multiple meanings from a simple Web site with extra links to a complex employee Intranet. Basically a portal provides its employees, customers, suppliers, and other partners with centralized access to content and applications. In its most basic form a portal simply summarizes content from different data sources. Some of the more basic and simple definitions come from Glaner-Hobel (2002), whose view of a portal is simply "Whatever you need it to be!" that means it should have the capability to adapt itself to the current needs of an individual using it and should also be a sort of home base, a single entry point to resources from a range of other Web data sources.

Currently, customer expectations are increasing at the same rate as that of information technology innovations. The traditional organization structures and business models are no longer sufficient to deliver products and services. Organizations are changing enormously in their design, business models, and strategies to reach global customers Wingenroth (1999). Today's, enterprises are challenged to do things faster, better, and more cost-effectively in order to remain competitive, Hoven (2001) spring & Sweeting (2002). Because of these there is a strong need to share knowledge for individuals, teams, and enterprises to work together to effectively contribute to an enterprise's success in competitive economy. Current market strategy, global competition, and technological innovations drive enterprises to practice the concept of real time enterprises. Real time enterprises provide on time information to employees, customers, suppliers and partners and try to make sure that any bit of information is always up-to-date. Real time enterprises represent the future of knowledge enabled business processes wherein digitized organizations interact with increasing speed and any specific event results in a real time response. For this purpose, enterprises have invested in a variety of informational Web sites, Web-based applications, and partner and internal employee using portals. In doing so, enterprises have successfully expanded the number of channels through which they can share their information and the number of modes used to interact with customers, partners, and

employees. Mobile employees and increasing use of portable devices such as PDAs (personal Digital Assistant) and cell phones lead to demand for anytime, anywhere access to enterprise business information. Enterprises are deploying enterprise portals to improve employee productivity. A structured enterprise Web portal enables secure access to information and provides a broad array of modular resources and services, such e-mail, discussion forums, surveys, help desks, and employee self-service. Before the Internet, external interactions with customers, employees and partners happened via only through the phone. With the growth of web portals, customers, employees and partners now interact with an enterprise via phone, Web applications, and e-mail. In response, enterprises are increasing investments in enterprise web portals.

Information management provides a structure and process through which separate databases and information systems can be integrated so that information is only entered and maintained at central point and it is shared and available to all users for numerous purposes. Achieving this integrated, shared information requires organized, structured information architecture.

This framework should also be supported with a change in culture, organizational structure, business process and information sharing practice from the present way of developing, maintaining, and owning information systems in isolation to an environment of sharing, cooperation, and collaboration across all functional and organizational levels.

An enterprise wide portal framework would integrate together many disparate systems. An enterprise wide portal is intended to offer a single, centralized point for linking to a collection of applications and a method for initiating processes. In an integrated portal, employees can go to one place and perform searches across different storages, such as public folders, Web sites, file systems, databases, and a collection of other repositories. A portal's core functions include email, group calendaring and scheduling, databases, threaded discussions, integrations, employee self-services and custom application development to support business to customers (B2C) and business to business (B2B) and business to employee (B2E) business models.

An enterprise portal can be used to:

- **Streamline processes: -** A portal can be used for cooperation, communication and work process through collaboration tools like E-mail, group discussion and calendaring, and scheduling.
- **Improve decision making: -** A portal can be used to "Real Time" information. It can be used to log frequently asked question to improve efficiency in customer service. Manager can post and deploy new working procedures to many divisions or sites. Portals can be used to integrate Enterprise Resource Planning (ERP), Data Warehouse and Business Intelligence to facilitate fast and better decision making.
- **Build Intellectual Capital:-** Portals can be used to create, store and share organizational knowledge among employees. Portal can be used to manage important business and technical knowledge. Users can utilize this information through centralized and secured portal interface.
- **Improve Employee Activity:-** portals allow employees to work more effectively. A portal can streamline necessary functions, allowing employees to find the information they need, when, and where they need it. Portals can provide consistent information on policies and procedures. They can also enhance a corporate community by improving physical and virtual relationships between employees.

Portals can provide tangible business value to the enterprise, but they must be planned and designed effectively to realize business process changes. Therefore, this research discusses enterprise information portal.

1.2. Types of Web Portals

Roberts-Witt (1999) declared that there are three types of web portals. These are: Data Portal which is concerned with running structured data as Enterprise databases with a single point of access. The second is Information Portal: this is identical to the Data Portals but this type of portal is concerned with managing unstructured data such as video, Audio, e-mail, text, and other documents by using indexing and cataloguing systems with search and retrieval functionality. The third is a collaborative Portal is the type that center of attention is on group interactive functionality as well as the integration of the enterprise by bridging intranet, extranet, private source data, and community information. The users are also allowed to access all joint functions such as classified topics, conferencing, team discussion, news channel, calendaring, and the abilities to personalize their interface.

According to Tatnall (2005), there is no definitive categorization on types of portals but portal community offers the following list:

• **General (Mega) Portals**: - In the case of general portals the intent is to provide links to all sorts of different sites of the user's choosing. Many of these general portals have developed from being simple search tools (such as Yahoo, Google, Bing etc.), Internet service providers (such as AOL), and e-mail services (such as Hotmail). An important goal of a general portal is to become the page a user returns to each time they want to access something on the Web. It will be successful if it can provide most of the services, information, and links that users want.

• **Vertical Industry Portals: -** Are usually based around specific industries. They aim to aggregate information relevant to particular groups, or "online trade communities" of closely related industries to facilitate the exchange of goods and services in a particular market as part of a value chain. Vertical industry portals often specialize in business commodities and materials such as chemicals, steel, or petroleum products.

• **Horizontal Industry Portals: -** Portals can be described as horizontal when they are utilized by a broad base of users across a horizontal market. Horizontal industry portals are typically based around a group of industries or a local area. Bizewest was an example of a horizontal industry portal.

• **Community Portals: -** Are often set up by community groups such as (www.elaunceston.com) and Cape Breton or based around special group interests such as Women.com. These portals attempt to foster the concept of a virtual community where all users share a common location or interest and provide many different services depending on their orientation.

• **E-marketplace Portals: -** These extended enterprise portals often offer access to a company's extranet services and are useful for business-to-business processes such as ordering, tendering, and supply of goods.

• **Personal**: - Following the trends towards mobile computing, personal portals are increasingly being embedded into mobile phones, wireless PDAs, and the like. Some appliances are also being equipped with personal portals aimed at allowing them to communicate with other appliances or to be used more easily from a distance.

• **Information Portals:** - Although these, in most cases, can also be classified into one of the other categories, information portals can also be viewed as a category in their own right as portals whose prime aim is to provide a specific type of information. The sports information portal ESPN is one example of an information portal.

• **Specialized: -** Are designed to satisfy specific niche markets. In many cases these can also be classified as information portals. For example, ESPN is targeted towards 18 to 34 year-old males, while iVillage is targeted towards women.

• **Enterprise Information Portals: -** The term enterprise or corporate information portals (EIP) is now often being applied to the gateways to the corporate intranets that are used to manage the knowledge within an organization. These are designed primarily for business-to-employee (B2E) processes and offer employees the means to access and share data and information within the enterprise. An EIP may include facilities such as: a categorization of information available on the intranet, a search engine covering the entire intranet, organizational news, access to e-mail, access to common software applications, document management, links to internal sites and popular external Web sites and the ability to personalize the page.

Variations on EIPs include business intelligence portals that are designed to act as gateways to decision-making processes and to provide competitive intelligence, business area portals that support specific business processes such as personnel or supply chain management, and facilities designed to support the field sales forces.

1.3. Information Ecology and Information Use Environment

Yogesh Malhotra (2002), whose is work on information ecology and knowledge management, he used to define information ecology as “the complete information environment” of the organization. The full information environment can addresses all of organizations values and believe about information. The way information is distributed, shared, stored and this can be referred to as behavior and work process.

Information ecology is an emerging, loosely-defined field generally concerned with modeling information processes in human systems. The term has been used in computer science and business management.

According to Bonnie A. Nardi and Vicki L. O’Day (1999) definition, information ecology is a system of people, practices, values, and technologies in a particular local environment. In information ecologies, the spotlight is not on technology, but on human activities that are served by technology.

Thomas Davenport comes up with a new idea, how to get information management with in an organization environment. Davenport discussed that the information that produced hardware systems considerably less valuable to managers than information that flows in from different sources. He defined a method that incorporates the enterprise whole information environment. The author described the importance of developing the total strategy for information use, Explores, and political situations that can frustrate information sharing and underlines the importance of how people really use information. In addition to this, how they search for information systems, modify information systems, share information systems, store information systems, and even ignore information systems.

A library is information ecology. It is a place where store of books, magazines, tapes, films, and staffs that can help you find and use them. A library may have computers, and other computer systems. In a library, access to information for all clients of the library is a core value. This value shapes the policies around which the library is organized, including those relating to technology. A library is a place where people and technology come together in one place and guided by the values of the library. Likewise, an enterprise is information ecology where employees, customers, business transaction, processes, and technologies and systems interact together to accomplish their goal.

Detrol (2000) used the concept of information ecology to design information systems with Taylor's value added model. Currently his research may not appropriate to the current practice and use of information in the organization. Although, davenports idea still used in different research, Taylors value added model lacks current technological and human information use environment. This paper based on Davenport's idea with Taylor's modified value added model which designed by Eisenberg and Dirks.

Taylor (2000) defined information use environment (IUE) as the core requirement to the design information systems must started from an analysis of the information use environment (IUE). Emphasize on the Environments which problems arise and which require information for solution. Taylor advises that if the current system design approaches were created users dissatisfaction, then systems could be designed that were more responsive to a wider variety of user needs.

Taylor identified four components of the information use environment:

- Information setting
- People
- Problems and
- Resolutions

In his value added model, there are three steps for the design and operation of systems by analyzing IUE. The first one is analyzing and translating to "information terms", the second is analysis of IUE to create value-added processes for the information system and the last one is

comparing the advantage of the value-added processes by determining how the outputs of the system help users solve their problems.

Enterprises have Web-based applications, and partner and internal employee use portals. In addition, enterprises have deployed a number of channels through which they can share their information and the number of modes used to interact with customers, partners, and employees.

Ethiopian is one of the dramatically booming Airlines. The communication channels with internal employees and external partners becoming very mandatory. One of the communication channels is Ethiopian Airlines web site for its customers as well as its internal corporate web portal for its employees. This study mainly focuses on Ethiopian Airlines web portal.

1.4. Over View of Ethiopian Airlines Enterprise

Ethiopian Airlines (ET) is government owned Airline and the flag carrier of Ethiopia. The Airline was founded in December 21, 1945 and started its operation in April 08, 1946 with a flight to Cairo. During the past sixty eight plus years, Ethiopian has become one of the continent's leading carriers, unrivalled in Africa for efficiency and operational success, turning profits for almost all the years of its existence. IATA just published the 58th edition of its annual World Air Transport Statistics for 2013. Ethiopian is for the first time in its history the largest airline in Africa in terms of revenue and profit ahead of South African Airways. It also ranked 18th and 37th in the world respectively in Profit and Revenue.

Operating at the forefront of technology, the Airline has also become one of Ethiopia's major industries and a veritable institution in Africa. It commands a lion's share of the pan African network including the daily and double daily east-west flight across the continent. Ethiopian currently serves 82 international and 17 domestic destinations operating the newest and youngest fleets and it is star Alliance member.

- Vision of Ethiopian Airline- vision 2025

  Ethiopian will be the most competitive and leading aviation group in Africa by providing safe, market driven and customer focused passenger and Cargo Transport, Aviation Training, Flight Catering, Maintenance Repair and Overhaul (MRO), Ground Services, Domestic and regional services by 2025.

- Mission Statement
  - To become the leading Aviation Group in Africa by providing safe and reliable passenger and cargo transport, aviation training, flight catering, MRO and ground services whose quality and price "value proposition" is always better than its competitors.
  - To ensure being an Airline of choice to its customers, employer of choice to its employees and an investment of choice to its owner.
  - To contribute positively to the socio-economic development of Ethiopia in particular and the countries it operates in general by undertaking its corporate social responsibilities and providing vital global air connectivity.
- Value Statement
  - As an airline, safety is our first priority.
  - ET is a high performance and learning organization.
  - We are an equal opportunity employer
  - We treat internal and external customers the way we would want to be treated
- The critical success factors for ET
  - Trained and knowledgeable man power
  - Safety
  - Customer handling
  - Marketing strategy
  - Fuel price (external factor) and
  - IS (Information systems) infrastructure

1.5. Ethiopian Airlines Enterprise Web portal

Currently Ethiopian Airlines business operation is highly dependent on information technology and its information system is mainly categorized in to two parts: back office and Front office systems. To mention some of them, Ethiopian now running enterprise resource planning (ERP), business intelligence (BI) and enterprise web portal (EWP) system to facilitate its business processes. The ERP systems used for supporting operations like human capital management, financial management and logistics. Business intelligence system is used for supplying executive summery and statistical report for decision makers and the web portal is used for users/employee self-service. The following are list of departments currently working as a unit in the IS section.

- Commercial and Galileo systems
- Enterprise Resource Planning (ERP) Systems
- Marketing and Sales Systems
- Operation Systems
- Business Intelligence and Integration
- IS infrastructure
- Cargo Systems

1.5.1. IS infrastructure

This section is mainly responsible for the configuration, installation and maintenance and trouble shouting of Systems, databases, networks and communications devices. Each department has its own portal page for information display, storage and access. Ethiopian currently uses Microsoft exchange share point and SAP portal which is currently in the configuration process.

1.5.2. The Corporate Web Portal Features

The existing share point exchange server provides the following services.

- Create new pages, sites, and lists
- Add users to "Members" group to edit pages
- Search over sites, documents, and people
- Centrally store, manage, and access documents across the enterprise
- Create Business Document Workflow
- Create key performance indicators and reports
- Deploy an InfoPath form to a Document Library
- Users can access and continue collaboration on documents wherever they are
- Create wiki pages
- Create Announcements
- Create Contacts
- Create Discussion boards and databases
- Create Links, calendars, tasks, issue tracking
- Create work space
- Import content to Spreadsheet
- Connect outlook and share point server for information sharing and tracking
- Create picture libraries
- Share documents with colleague
- Team discussion
- Site personalization
- Collaboration
- Blogs
- Microsoft office project space
- Navigation Inheritance:
- Site Categorization by local, region, and by departments
- User permission management
- Create employee activities site

- Create employees self-service benefits, training and activity scheduling
- Manufacturing process management
- New store opening
- Clinical Trial Initiation and Management

1.6. Statement of the Problem

A good designed enterprise web portal will support business organization to communicate and deliver organizational information. A given web portal can be measured by its valuable content, structure, information and easily accessibility of its information by its customers. Web pages can be linked by information or direct link connection. This connection allows search engine grasp data related to search query directly to the linking web pages from the web sites structure. This structured web provides a business to link the information of its own Web site to enable navigation and categorization of its information into site maps. So, this allows its users the ability to access the desired information.

Portals support easy to use, easy to navigate, employee self-service, allowing employees and customers and partners to manage a larger part of their relationship with the firm. They collect a variety of tools and software application that support work flows to be streamlined, as employee's arcos departments and execute business plans more effectively and efficiently.

For customer, portals provide single access point to all enterprise resources they depend on. Portals can be secure gateway to the "know how" of a firm, allowing it's users to get the information they need at the level of detail.

Detrol describes Corporate portals are single-point Web browser interfaces used within organizations to encourage the gathering, sharing, and dissemination of information throughout the enterprise. This tool is used to manage and access information from disparate sources across the organization.

However, traditional data-driven approaches to portal design often ignore the information needs and practices of customers, partners, and employees. That means users information Environment (IUE) is not properly managed and it becomes less valuable. As a result, corporate portals can

suffer from usability problems such as poor navigation and inappropriate display of information, lack of integrations with different systems, problems of engaging employees with the firm. Most information systems designers give less attention about what user's want, why they want them and how systems are able to meet their needs. Portals are not considered as the main source of information by their employees. In addition to this the information ecology of the organization doesn't reflected on the portal site. Portals can be designed as shared information work space. Due to these reason they are supporting the enterprise below their capabilities. The existing portal simply provides information retrieval rather than information seeking systems. In contrast information seeking is more human oriented than information retrieval.

According to Gartner (2012), portal content and collaboration submit, 40% of portal initiatives fail to achieve ROI (return on investment) and 10% to 15% of portal initiatives are scrapped altogether. Many projects are taking multiple years to complete or are running out of funding, and can even tarnish the reputation of the group running the portal effort. For these reasons and others, portal redevelopment success rates are amazingly low. From the five of the more common portal problems discussed at the Gartner Summit and their possible solutions: the reason to the entire above problem is too many organizations ignoring end-users is one of the main problems listed in the research. As Jim Murphy discussed, end-users don't see value in a portal that doesn't directly help them do their job.

More focus is given on information content and technology rather than awareness on information needs and organizational information environment.

To understand the potential of portals as shared information work spaces, a new direction may be required in corporate portal design. According to Rice (1996) and Thyfault (1996) typically organizations launch portal and intranet development initiatives as a means to reduce internal information publishing costs and enhance corporate information distribution.

Taylor in his value-added model for information systems development, he suggests that current design approaches could be improved by an approach which concentrates on the user and attempts to understand the criteria by which information will be judged to be valuable. He states that users and their environments are critical and necessary ingredients to the understanding and

improvement of systems, and that developer need to be able to describe user environments and translate those descriptions into useful parameters for systems design.

Davenport also underlines the need to understand information environments (IE) and the way people use information in their work settings Davenport (1997). Davenport criticizes traditional information management approach such as those which stresses the use of technology or suggest information be managed like other valuable corporate resource in organizations like capital and labor Horton (1979).

Therefore to solve this problem, this paper explores the potential of portals as information infrastructure for organizational information access and use, share and the need for a new direction in portal design that calls for an awareness of people's situation, the problems they typically face, and the way organizational participants utilize information to solve their working problems.

1.7. Research Questions

Does the existing corporate web portal add values to users information need?

Does the existing corporate web portal meet end-users information behavior?

Does the existing corporate web portal contain information ecology of the organization?

Does the existing web portal used by end-users to meet their information need?

1.8. Objective of the Research

The main objective of the research is to explore an optimal Portal Framework as information infrastructure for Ethiopian Airlines Enterprise.

1.9. Specific Objective of the Research

- Review the corporate portals
- Reviewing Taylor's value added model
- To review modified Taylor's value added model
- To review information ecology of an organization
- Design and conduct the research
- Discussion on the research results
- Explore corporate portal as shared information work space and finally
- Make Conclusion and recommendation based on the findings

1.10. Significance of the Study

This study is very important particularly to Ethiopian Airlines enterprise mainly portal users. It's central role to deliver good and timely business information to top managers, operational managers and to cell employee. It can help greatly in doing transactions easily and in a flexible way efficiently. It collaborates or engages different types of employees in the organization. It makes easy the work of the users simple and easy. A well designed and visually appealing portal plays very crucial role in building strong corporate identity of a company. The study results can also be adapted to other type business organization.

1.11. Scope and Limitation of the Study

The Scope of the research is to validate the current corporate web portal and restricted to explore an optimal portal framework as information infrastructure for Ethiopian Airlines using idea of modified Taylor's value added model and Davenport's information ecology. The study will not cover other types of portals like community portal, General portals, vertical industry portals,

Horizontal Industry Portals, E-market portals, personal/mobile portals, information portals, specialized/Niche portals etc.

1.12. Organization of the Paper

The rest of this thesis contains five sections. The next section contains a review of literatures related to the problem. Section three covers the research methodology which includes research design, research approaches and methods, research techniques and methods of data analysis. Section four discuses about output of the research analysis and Section five propose corporate portal structure and final section make conclusion and recommendation.

CHAPTER TWO: LITRATURE REVIEW ON ENTERPRISE PORTAL

Corporate portals (CP), Enterprise information portals (IEP) and Enterprise portal (EP) are commonly used interchangeably. Enterprise portals expand the corporate information to other roles outside the organization such as customers, vendors and suppliers. In this chapter about the concepts, challenges and gaps on previous research of enterprise web portals is discussed. The research of different authors about enterprise web portal will be presented.

2.1. Basic Feature of Enterprise Web Portal

- **Single Gateway to an Enterprise Information Resource**

A portal aggregates information from multiple resources and access content and applications to multiple users. In other words a portal is an all-in-one Web site used to find and to gain access to other sites, but also one that provides the services of a guide that can help to protect the user from the chaos of the Internet and direct them towards an eventual goal (Arthur Tatnall, 2003). Google "One Account or One password" is good example to describe the potential usage of single sign on. We can access our emails, chats, news, and Google plus etc. information using single account.

- **Integration**

One feature of portal is, it concepts to integrate different systems and application functionally or physically to bring all components in one place to easily access its information to users.

- **Personalization and Customization**

The need for personalization and Site differentiation is significant in the world of information overload. We can reduce information overload based on the following points.

  - Value added information
  - Frequent, useful and content updated information
  - Interactive graphical user interface and
  - Information personalization for specific users and user groups

Users can customize the look and feel of their web environment. Customers who are using EP's can edit and design their own web sites which are full of their own personality and own style. They can also choose the specific content and services they prefer. On the site (Base22.com, 2013) discuss about the best practice for personalization in portals and internet site, personalization is the set of business rules that can use any information to select what the designers and business will want.

- **Mobility**

Mobility is the application of mobile technologies in information services. Now a day's internet services can be accessed through mobile phone. Enterprise portals can also reached by mobile devices.

- **Access Control**

It is the ability for the web portal to limit specific types of content and services users have access to information resources. It manages the mapping between portal content and services over portal users and users group.

- **Collaboration**

The tool used to facilitate virtual communities in the organization by collaborating project teams, virtual meetings, project management, calendar management, scheduling etc. According Detlor (2000) research on corporate portal as information infrastructure, corporate portals offer organizational users the ability to access a wide variety of information sources directly from the desktop. By functioning as an underlying Web infrastructure for information management, portals can provide firms with a shared information work space that facilitates access to information content, organizational communications, and group collaboration.

2.2. Challenges and Opportunities of Enterprise Web Portals

A case study research about "How can a portal enhance access to the information needed by a private investor in the stock market?" by H.Z. Esterhuizen (2000) on Tradek.com organization, an Enterprise portal can add values to individual and group users of information resource in the company. The paper clearly discussed information needs of the users but information ecology (information Environment) of the organization not included. This is the main problem during systems designing like Enterprise web portal.

Information ecology is organization's information environment, and consists of numerous interacting and interdependent social, cultural, and political subsystems that shape the creation, flow, and use of information in the organization. Therefore organization's information ecology influence what kind of information produced and stored, what information made available and to whom, and to what information required and valued in task performance. The frame work to information ecology attempts to concentrate on people rather than technology. Xiuzhen Feng and Michel L. Ehrenhard (2007) had discussed the influence of cultural on Enterprise portal design. From a technical point of view, extending an enterprise to global scale presents challenges, but none that cannot be overcome.

These challenges come due to different cultural difference of individual users information need. Global scale also brings different languages, different life styles and different cultures, all of which affect the perceptions and expectations of users (Ruta, 2005). According to Xiuzhen Feng and Michel L. Ehrenhard there five design factors that need to be considered. These are language, color, icons, symbols, and layout. We can see from authors idea, the needs and preference of users should be considered during systems design. Culture is one of the information ecology in the organization. Individuals, groups, and organizations can have complex needs during Enterprise portal design. Without giving attention to users and organization information the outcome of the result not satisfactory as expected.

Currently most campus portals have been designed to focus on the service integration needs of enrolled students. Few of the portals on the market today into account the need of faculty, staff, graduates, prospective students and other constitute groups.

A case study conducted by (Detrol, 2004) on Telecommunication Company based in Canada. There are three main reasons for the company to have enterprise portal. The purpose of the portal was to provide information access, retrievals and to foster organizational communication and to support team collaboration on project. Second, the company had a broad range of enterprise portal users with diverse cross section of departments. Third the portal was developed to support a variety of knowledge work related tasks, such as gathering and sharing of information and collaboration of works across the departments and teams.

A research based on user and knowledge portals by (Detrol, 2004) describes the social factor shaped and influenced by community of practice, user support and training has an effect on how to utilize information technology and organizational employees to adopt in their work. In addition, he tries to answer the question what are the factors that influence from users perspective which encourages or promote the utilization of firm's wide knowledge portals.

To help and find answer to this question attentions turns to popular Technology Acceptance Model (TAM) developed by (Davies, 1989, 1983) then revised by (Ventakesh and Davis 1996). TAM has identified the model ability which explains and predicts acceptance of information technology at work palace. It also provides a guidance why knowledge portals may or may not be adopted and used by organizational Employees for knowledge work.

According to TAM there are two beliefs which play a fundamental role in influencing computer acceptance behavior in individuals: perceived use fullness and perceived ease of use. Perceived usefulness: is defined as using information systems will enhance his or her job performance.

Perceived ease of use: how it is simple to access it functionality very easily. Due to its luck of attention, TAM is extended to TAM2 as a means of better understanding the influencing factors.

Corporate portals, whose main reason is to provide easy access to enterprise digital information and use metadata and extensible Mark-up Language to join unstructured data to structured data from enterprise operational databases, providing access to corporate information through a personalized interface, accessible over the internal hypertext network on the Intranet.

From this point of view, the utilization of portal can be influenced by different perspective according to the above discussions systems are designed to support users or organization to utilize information systems to support their daily activities.

2.3. Information Systems and Web Portal

There are different approaches to Information systems design based on their context and processes. The researcher will review the work of different authors on systems development approaches during systems design.

User-centered approach is one of the process in which used to identify the needs of users information requirement. User-centered design is a multi-stage problem solving process that helps designers to analyze how a user's use a system and to measure the validity of their assumption in relation with their information requirement.

User-Centered approach is essential for the success of the systems design. In contrast, this approach fails to promote human interests and focus on the closure of technical problems.

Taylor's Value-Added model used to provide a unified framework for focusing on user needs and preferences in evaluating and designing information systems. It was developed in the early before the wide-spread of computer technologies and before the World Wide Web technologies. The model holds up remarkably well in terms of explaining why various systems and systems attributes are useful and desirable or not.

The Value-Added Model seeks to explain what users want, why they want them, and how systems are able to meet (or not meet) those needs? "What do users want from information systems that would enable them to perform better? (Mike Eisenberg/Dirks, 2008)

Taylor proposes that existing design approaches could be enhanced by an approach which attentions on the user and recognize the criteria by which information will be judged to be valuable. He states that users and their environments are critical and necessary elements to the understanding and improvement of systems, and that designer need to be able to describe user environments and translate those descriptions into useful parameters for systems design.

Taylor highlighted that information systems are all about meeting the needs of users. The Value-Added Model provides an organized framework for considering system processes that add value in order to meet user needs. For example Taylor's original Value Added framework is presented in table 1.

User criteria of choice	**Interface (Values Added)**	**System (Value-added Processes)**
Ease of use	Browsing Formatting Interfacing I (Mediation) Interfacing II (Orientation) Ordering Physical accessibility	Alphabetizing Highlighting important terms
Noise reduction	Access I (item identification) Access II (subject description) Access III (subject summery) Linkage Precision Selectivity	Indexing Vocabulary control Filtering
Quality	Accuracy Comprehensiveness Currency Reliability	Quality control Editing Updating Analyzing and comparing data

	Validity	
Adaptability	Closeness to problem Flexibility Simplicity Stimulatory	Provision of data manipulation capabilities Ranking output of reference
Time saving	Response speed	Reduction of processing time
Cost saving	Cost saving	Lowe connection time

Table 1: Taylor's Value-Added Model.

- **User criteria of choice**

Includes the broad categories of criteria that are useful to users in selecting system or evaluating how systems are working. The criteria are not rigid. The criterion is depending on the person, situation, needs, settings and other user centered aspects.

- **Interface (Values Added)**

These are specific values that add value in order to meet the "User criteria of choice". For example, Closeness to problem, Flexibility, Simplicity and Stimulatory used to meet user criteria of "Adaptability".

- **System (Value-added Processes)**

These include processes, features, and elements of the system that add to the related values identified in "interface (Values Added)" and which meet "User criteria of choice". For example, Indexing, Vocabulary control and filtering contribute to add value of Access I (Item identification), Access II (Subject description), Access III (Subject summary), Linkage, Precision, and Selectivity which combine to address "Noise Reduction".

Taylor presents a three part view as the basis for the model: user, interface, and system. The "User" part focus on the problems which establish the criteria of choice. The "Interface" is a negotiating space between the user and the system.

Taylor classified information system modeling into three: user, interface, and systems. The user classification focuses on the problem situation of which establishes the "user criteria" of choices. The interface is the negotiating space between user and system. The values added by system to increase users in making choice. The system includes the specific processes that add specific values (Taylor 1986, p. 49).

Taylor's model was developed well before many of the technological changes that have fundamentally altered human society, e.g. the personal computer, cell phones, the Internet, the World Wide Web. However, the model is robust and highly useful in explaining why these and other technological innovations are adopted and valued by individuals and organizations (Eisenberg, Dirks, 2008).

By considering this, Eisenberg and Dirks proposed a modified model. This proposed modification is presented in table 2.

User criteria	**Values Added**	**System Processes**
Ease of use	Browsing Simplicity Formatting Mediation Orientation Ordering Accessibility	Alphabetizing Highlighting Formatting Simplifying

Noise reduction	Item identification Classification Summarization Order Referral precision Selectivity Novelty	Indexing control Vocabulary Filtering Selection Hyper linking Semantic connecting Search
Quality	Accuracy Comprehensiveness Currency Reliability Validity Authority	Quality control Editing Updating Analyzing Selecting
Adaptability	Contextually Flexibility Simplicity Privacy	Data manipulation capabilities Sorting Customizing User profiling Informed consent Choice
Performance	Time saving Cost saving Security Safety	Bandwidth Parallel processing service Processor speed Resource allocation /sharing Multi tasking common protocols

		business Practice Encryption Password protection
Pleasing	Aesthetics Entertaining Rewarding Engaging Stimulating	Design Gaming Reinforcing

Table 2, Eisenberg and Dirks Modified Taylor's Value-Added Model

Here the modified value added model contains more additional points that consider current user's information needs. Using the original Taylor model, Detlor used to design a portal frame work. But original Taylor's value added model designed long years back and it doesn't meet current requirements of information users. Therefore modified Taylor value added model can be used to evaluate and design information systems. From an industry perspective, the Modified Value-Added Model can be applied in at least three ways (Eisenberg, Dirks, 2008).

- Developing new systems and Tools
- Refining/improving existing systems
- Studying competitive offerings

CHAPTER THREE: RESEARCH METHODOLOGY

Study area: The research area of this study mainly in Ethiopian Airlines corporate web portal.

3.1. Nature of the Study

The nature of this study is validating the existing web portal based on user's information requirement behavior and information environment of the organization and proposing optimal web portal based on the research outcome. There is no proposed model before my study and this study has no intention to draw general statistical analysis.

3.2. Research Design

Since the purpose of this study is identifying facts, ideas and feelings about the current practices of web portal design and it adopts a descriptive research is appropriate for the problem at hand.

3.3. Research Approaches

To gather the needed primary and secondary data, the researcher used both qualitative and quantitative data collection approaches. Close ended Questionnaire and open ended interview was distributed to the target respondent to collects qualitative and quantitative data.

3.4. Sampling Method and Technique

The researcher defined the study at Ethiopian Airlines. Once target population was defined, the next task was taking representative samples. The researcher used a non-probability sampling method which is purposive sampling techniques. In addition to this, the personal observation of the existing corporate portal and source of information in the organization also reflected on the research analysis.

Purposive sampling technique was used to select respondents from Ethiopian Airlines employees and employer to get quantitative and qualitative data. The basic reason to select purposive sampling method is the frequent interaction of employees within the portal.

3.5. Source Population

Positions and roles in the Airline are divided into two major groups, i.e.

- Basic or Line positions such as: Pilots, Airline technicians, cabin crews, aviation academy instructors and reservation and sales agents.
- Support/administrative staff

The sample units for the study are Support/administrative staff because Basic or Line position employees are difficult to get them due to their work conditions and most of the time these employees have less interaction with the portal site. The researcher may get less input from line or basic employees during data collection. Therefore, the final outcome may not consider this groups but at the end the researcher recommend this employee to get access of portal site and get knowhow to help their information need.

3.6. Target Population

The target population of this study is Support/administrative staff of Ethiopian Airlines.

3.7. Sample Size

A total of 29 respondents were involved in the case study for the questionnaire. In using the purposive method, there were steps which the researcher followed. The steps which the researcher used grouping at department level:

- Dividing the population in to different departments.
- Listing population size in to each department.
- Taking samples purposive from each department.

For dividing the institution into departments, the basic criteria were the frequent usage of web portal. The size of population in each department is different in number. For this reason, purposive samples were taken proportionally. Departments which contain large number of employees have more representatives. And Departments contain less number of employees have less representatives. This

means that samples vary from one department to the other. The number of respondents selected from each department is proportional and representatives of the population.

Listing of workers in areas of interest was obtained from responsible departments. Even though the number of available staffs could be known, not all of them were important for the study at hand; therefore, the researcher distributed questionnaires to each department from known groups.

The following table gives the summary where questionnaires and interviews were distributed for respondents which were selected using Purposive sampling.

Table1: sample size taken from portal user respondents in Addis Ababa, Ethiopian Airlines, 2014

Purposive sampling		
Number	Departments compositions	Sample Size
1	Finance	7
2	HR	5
3	Marketing & Sales	4
4	Public relations	1
5	Customer Services	1
6	Maintenance & Engineering	2
7	Flight Operations	2
8	Aviation Academy	2
9	IT	2
10	Internal Audit	2

11.	Legal Counsel	1
Total		**29**
Purposive Sampling		
Web Portal Designer	1	
Chief information officer	1	
Total	2	
Grand total	**31**	

Table 3 Sample size, Source own survey (2014)

Educational status of respondents in Addis Ababa, Ethiopian Airlines, (2014)

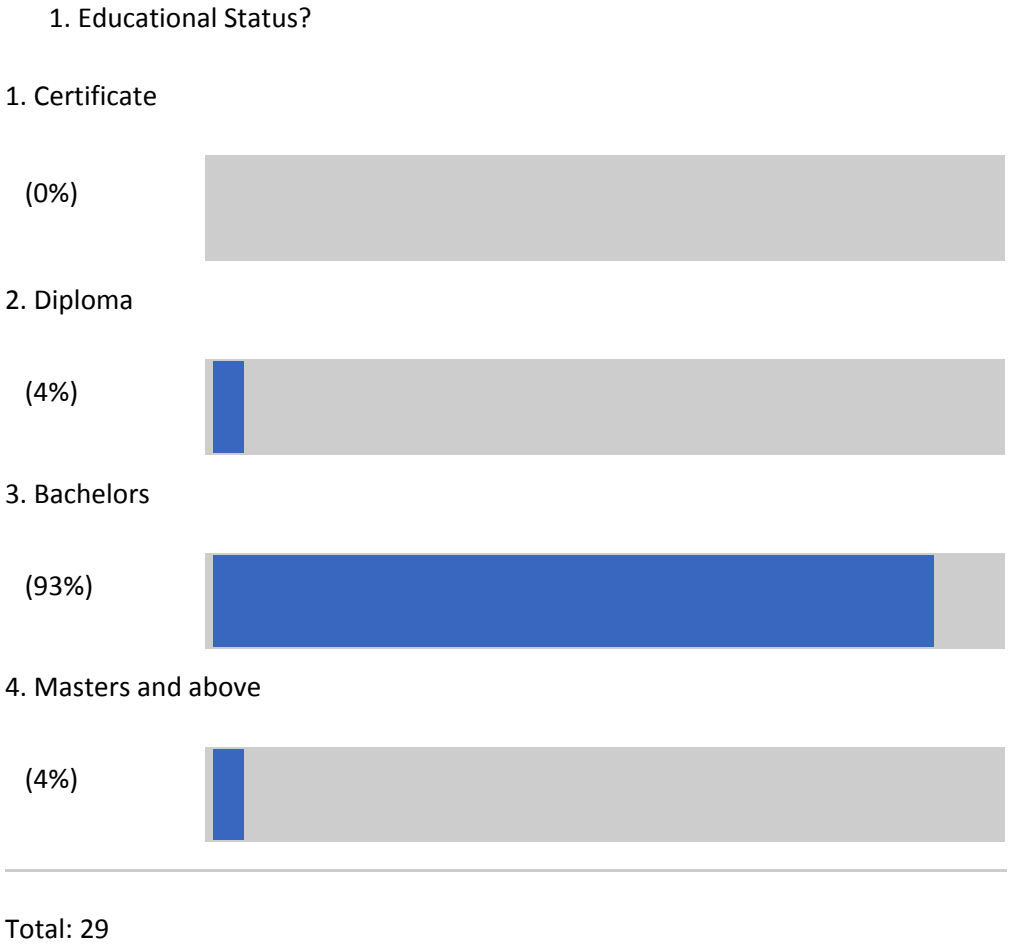


Figure 1: Respondents educational status, Source own survey (2014)

3.8. Methods of Data Analysis

Collected quantitative data were analyzed using simple descriptive statistics using frequency and percentage. The qualitative data obtained using interviews were analyzed and interpreted based on themes. Corporate IT manager and web portal developer were interviewed about the current web portal user's information requirement and information ecology of the organization. Selected staffs were also asked about their usage and requirements during web portal design. Questionnaires grouped into six strata and interviews grouped into two based on variables

obtained from literature. The researcher try to relate the information obtained from above representatives during result analysis and discussions.

3.9. Definition of Variables

A dependent variable is a variable that can be affected by anther variable (s). In this study, they are grouped into ease of use, noise reduction, quality, adaptability, and performance and pleasing.

Independent variable is variable that can impact corporate web portal site.

Regarding, the qualitative data, research questionnaires contained a series of 23 questions and grouped in to six sections like ease of use, noise reduction, quality, adaptability, and performance and pleasing.

3.10. Pilot Survey

Before conducting the study a pilot survey is collected from few respondents to check the validity of the questionnaires. There were some feedbacks collected from respondents and corrected on the questionnaires. A sample interview also delivered to respondents before processing the interview questions.

CHAPTER FOUR: RESULTS AND DISCUTIONS

This chapter is devoted to results and discussions of the study based on questionnaires and interviews that were extracted from research problems of the study. Descriptive analysis is provided and discussed under different sections.

4.1. Overlapping Data

If some response segments are unrelated to any category these data were not assigned to any category, in other ways there were responses which are not relevant to the research objectives.

4.2. Quantitative Data Analysis

To understand the current practice of corporate portal, different questions were asked to users. The questions are grouped into Ease of Use, Noise Reduction, Quality, Adaptability, Performance and Pleasing. Under Ease of Use, there are different characteristics which are used to measure users criteria of choice and similarly there are different characteristics for the other variables. On this questionnaires user's information requirement behavior is discussed based on the variables above.

The results given under Ease of Use in Figure 1 shows that, 55% of the respondents replied that they can easily browse information they require on the portal, 59% of them use web portal without any help desk assistance. Even if 55% of the respondents replayed they can easily access the web portal whenever they need But 54% of respondents replayed that it is difficult to move or navigate from one portal site to other site.

❖ *Ease of use*

1. Do you easily browse the information you need on the web portal?

1. Agree

(55%)

2. Disagree

(45%)

2. Do you simply use the web portal without any help desk assistance?

1. Agree

(59%)

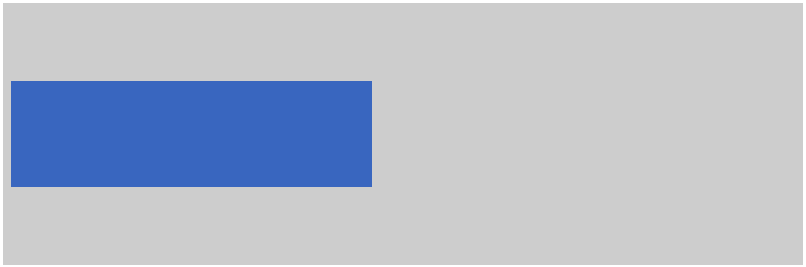
2. Disagree

(41%)

3. Do you easily move from site to site without any problem over the web portal?

1. Agree

(46%)



2. Disagree

(54%)

4. Do you easily access the web portal whenever you need?

1. Agree

(45%)

2. Disagree

(55%)

Total: 29

Figure 2: Ease of use, user responses, and 2014

- *Noise Reduction*

The results given under Noise Reduction in Figure 2 shows that, 52% of the respondents replayed that they can clearly identify the information they require on the portal. But in contrast 76% respondents replayed that information posted on the portal has information categorization problems. Also 76% respondents discussed that the web portal lacks summarized information and 76% respondents discussed that, there is a lack of references that directs to source of information on the portal.

5. Do you clearly identify the information you require on the web portal?

1. Agree

(52%)

2. Disagree

(48%)

6. Do you get information you require on the web portal categorized the way you need?

1. Agree

(24%)

2. Disagree

(76%)

7. Do you get any summery information on the web portal?

1. Agree

(24%)

2. Disagree

(76%)

8. Is there any Reference that directs you to a source of information on the web portal?

1. Agree

(24%)

2. Disagree

(76%)

9. Is there any order of information on the web portal?

1. Agree

(34%)

2. Disagree

(66%)

10. Can you obtain relevant resources from a collection of information on the web portal?

1. Agree

(38%)

2. Disagree

(62%)

11. Do you get specific aspects of information on the web portal based on your perspective, beliefs, and attitudes?

1. Agree

(24%)

2. Disagree

(76%)

12. Do you see daily updated new information on the web portal?

1. Agree

(21%)

2. Disagree

(79%)

Total: 29

Figure 3: Noise Reduction , user responses, 2014

- *Quality*

The results given under quality Category in Appendix III shows that, even if they have enough authority and trust the information posted on the portal but it lacks accuracy and completeness.

- *Adaptability, Performance and Pleasing*

Even though, the existing web portal helping the organization by saving cost and it is secured from un authorize user but 59% of the respondents discussed that the current web portal site requires communication facilities to improve employees' engagement and collaboration like group collaboration and task scheduling. About 68% of the respondents replayed that the information posted on the portal requires user's information requirement based on their work related problem situation. Please refer to appendix III for more information to the user's response.

On the questions about the impact of graphical user interface on user's productivity, the majority 71% of the respondents replayed that it has an impact on their productivity. And 68 % percent of the respondents believe that the existing web portal lack users' engagement which used to felicitate the communication between colleagues to solve their work related problem.

4.3 Qualitative Data Analysis

The interview is categorized into organizational information ecology and information requirement behaviors of users during portal design.

- **Organizational Information Ecology**

Information ecology refers to the practices of individuals or groups in the organization and consists of numerous interacting, interdependent social, cultural, and political sub systems that shape the free flow of, creation and use of information in the organization. The details of our interview on information ecology can be discussed as follows.

Q1. What are the sources of information in your organization?

The sources of information in the organization are the following:

- *Organizational manual*
- *Organization policies and procedures*
- *Team meetings*
- *Conferences and presentations*
- *Friends and customers*
- *Business reports*
- *Vendors*
- *Magazines*
- *Email*
- *Internal databases*
- *Company web sites*
- *Group discussion*
- *Company news*
- *Informal talks to staff*
- *Walk-through*

Q2. Are these listing of below information ecology known in your organization? If yes, how could you manage them on the corporate portal within source of information that you listed above?

- Organizations mission
- Intranet goals
- Information management plans
- Information culture
- Information politics
- Information settings
- Information staff and Information handling

These lists of activities are known in the organization. For example organizational mission is one of the core points for the corporate strategies. We have already identified and running the business by considering our vision including its missions. We are also working on the intranet to help our employees get access of self-services, employee appraisals and so on. Currently we have rules and procedures for the management of internal database records in addition the information cultures of the organization are as follows:

- *Induction for new entrants – History, Mission, Vision and Value statement of the company*
- *On-job training*
- *Mentoring*
- *Coaching*
- *Skill development program (adopted from Lufthansa)*
- *Recurrent training*
- *Annual general assembly, workshops and seminars*
- *Educational assistance program*
- *Crew meetings and activity reports*
- *Informal meetings/discussion forums*
- *Operational guides, policies and procedures*
- *Exit interviews*

- *Case based reasoning etc.*

Information politics is refers the follow of information within departments and outside of the departments. One department output can be an input to the other. Some information may be distributed by others through informally, but this information can affect the smooth flow of information with the company. We encourage every staff to discuss his idea on the crew meeting, division meeting, quarterly meeting and general assembly meeting.

Information settings: Besides the central hub in Addis Ababa, our employees work on regional offices, and international offices outside Ethiopia. Employees can connect and access information they need through VPN, remote connections etc. to solve their work related problem. Information staff: Every employee has its own information access level on the system based on his information requirement behavior and on each presentations, business meetings, annual conferences and discussions employees can participate to get or understand the existing problem situations.

Information handling: Daily business transactions recorded and stored for future references. Other information creation, sharing and dissemination practices are one of organizational memory and for this we need to have a mechanism to capture for future utilization.

In relation to sources of information and management of information ecology under question number two, like organizational manual, policies and procedures already exist on the portal but Internal data base records, business reports, group discussion and the like needs further work. The list of information ecology discussed above, all of them exist in the enterprise and the management at central point like on corporate portal requires giving attention.

- **Users Information Behavior**

This interview has two parts. The first part is about user's information requirement that can add values on their daily task. The second part contains the information environment of the organization.

- **Question Part1.**

Now you have a requirement from one of the departments in your organization to create a portal site for their employees. The new site should support employee self-service, work flow between departments, schedule appointments etc. In addition to this, they need the portal site should add values on their daily process and the following are list of user criteria of choice.

Before starting to design users' requirement, how do you identify the major user set, their information need, their work related problem situation, and the way they utilize information?

And the site should support the following points:

- Easy to use
- Free from noise
- Should contain Quality information
- Adaptable to a new requirement change
- Fast to respond to user request and
- Attractive Graphical user interface

Q1. Have you ever designed portal site before based on this kind of requirements? If yes, can you tell me how you solved the problem?

Q2. How can you create a portal site which supports the above points?

Q3. How can you identify user's information requirement behavior?

- **Answer Part 1**

All corporate employees require portal access. Before starting to design portal site we identify what they require. Most of the time users' information requirement is related to their problem situations. They use information for creating, sharing, and storing of any information related to their work.

Answer1. *Currently there are diverse requests from user side. But their request is different from department to department and it is not clearly defined.*

Answer2. *Although the portal site is easy to utilize and somehow fast to respond to user request, the graphical user interface, adaptability, quality information and noisy data content needs further work to improve.*

Answer3. *Before creating the site, the user departments identify their requirements. After we agreed on their information requirement we move to design.*

- **Question Part 2.**

Imagine you have additional requirement from your customer (Corporate Manager) to include organization information ecology on site. The users can create, modify, and share organizational information on the portal site.

Q1. How do you identify organizational information ecology?

Q2. How do you include this organizational information ecology on the portal site?

Q3. How could you design a portal site that can add values to its users?

- **Answer Part 2**

Answer1 .*A few of information environments are known like organizational mission, organizational culture. But the rest of them require high attention for future work.*

Answer2. *Based on User request this information ecology is created and stored on the portal such as organizational manuals, policies and procedures, reference materials, service request*

forms and organizational strategies. But the other part of organizational information environment currently not explicitly reflected on the sites.

Answer3. *By analyzing user's information need, we design a portal site then we measure their satisfaction. From their feedback and we correct and modify the site.*

CHAPTER FIVE: THE PROPOSED CORPORATE PORTAL FRAMEWORK

Corporate web portal can be designed as shared infrastructure by considering information ecology of the organization and information behavior of individuals or groups. The corporate portal infrastructure is used for users to create, share and use of organizational memory. This proposed framework combine modified Taylor's value added model and Davenport's ports information ecology approach. According to Detlor work on corporate portal, to design a corporate portal as shared workspace three nested structure should work together. These are Information ecology, information behavior, and value added processes. Before designing a corporate portal, analysis of the current information ecology of the organization and information behavior of the users should be identified. As defined before information ecology refers to information environment of the organization, that is the way they create, share; utilize information through-out the organization. Information behavior refers the practice of individuals or groups how they obtain information to solve their work related problems. The following points discus and integrates the three nested design layers of corporate portal.

5.1. User's Information Traits

Information need is very complex, dynamic and it is not easy to define simply. The best way is to learn their information requirement by observing and learn from their work environment. In order to understand their work settings three steps analysis is required. First we have to see who the users are in terms of their information need and seeking behaviors. Second we categories the structure of work related problems. Finally we record and observe information behavior and practices of individuals and groups to solve problem.

5.1.1 Analyzing Information Users

According to Taylor, there are list of points developer should aware of before going to portal design and the main steps in designing corporate portal as information infrastructure we should first understand who the major sets of users are, what work they perform, and how they require, acquire and use information.

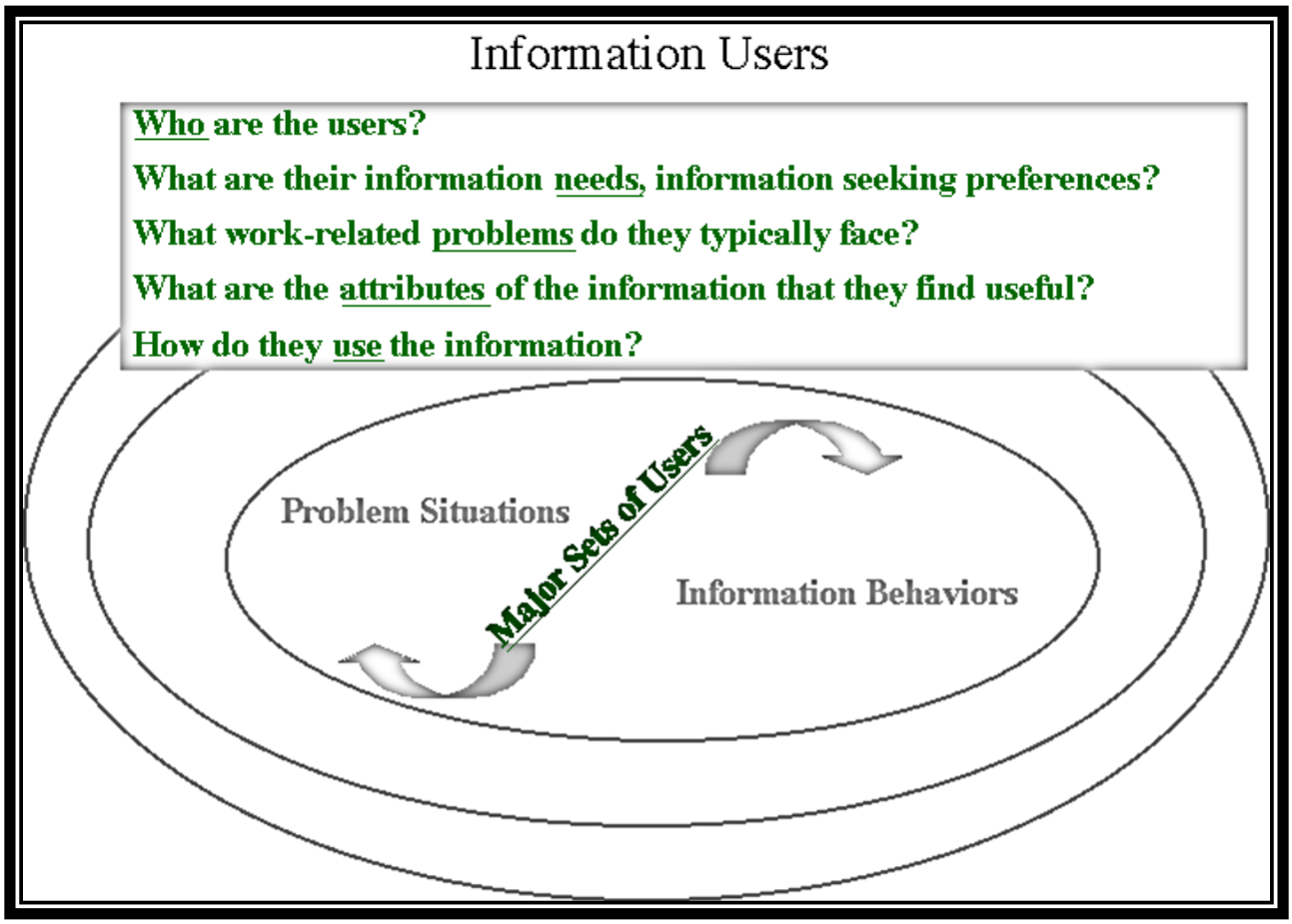


Figure 4: Information Use Environments

Users' information need and seeking behaviors can be identified from Source of information in the organization like Organizational manuals, Organization policies and procedures, Team meetings, Conferences and presentations, Friends and customers, Business reports, Vendors, competitors, Magazines, Emails, Internal databases records, Company web sites, Group discussion, Company weekly news, Informal talks to staff etc.

After identifying the above points on figure 4 and considering information sources, we can add user's information requirement on the portal. If the information requirement of the user is to understand the problem situation of work related problem we create a link and provide the required information on the portal. If the users need self-service on the portal we create a link and provide the link to the user.

5.1.2 Analyzing Problem Situations

We have to take time on user's information requirement problem. Because they need information to solve their work related problems. We have to understand how users perceive their work related problem situations, how they identify and obtain information to solve their daily problems. Taylor and MacMullin (2000), identified in Figure 5 there are eleven dimensions that sufficiently define information attributes of most work related problems situations. These problem situations can be categorized into the following points. These are problems which are already known and problems which are hidden that need further analysis. For example, some problems can be easily solved if they are familiar, Expected, Well-structured and simple problem situations other kinds may vague, complex and ill-structured needs detail investigation.

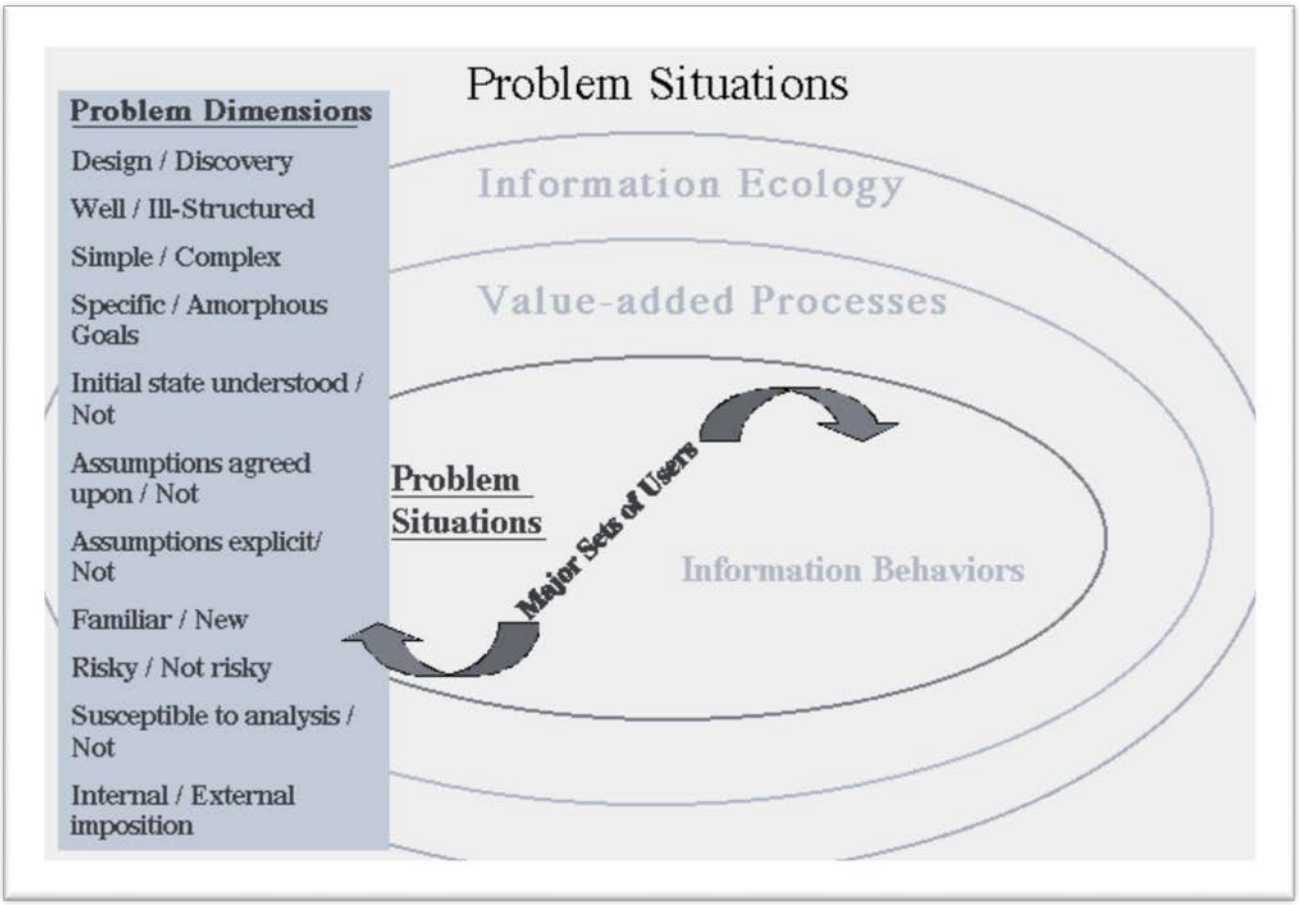


Figure 5: Problem Dimension

It may be helpful to recall that an analysis of problem situations serves two important purposes: One they provide a rich representation of users' information needs and Two they establish the criteria by which users determine the values or effectiveness of the information they encounter.

5.2. Information Ecology of the Organization

Information ecology contains different interacting and interdependent social, cultural, political systems that shapes the creation, flow, and use of information. By analyzing information ecology, we can identify what kind of information produced in the organization. Analyze the availability of information resources and to whom they shared. Then we can design the corporate portal by considering Davenport's work on information ecology based on Figure3 which shows the integrative frame work. The following points should be identified and analyzed before creating a portal site.

First analyzing organizations mission: We can associate the mission of the organization with the portal site. In this case the mission of the organization is to be the leading aviation group by providing safe and reliable passenger and cargo transport services, flight catering and Ground services, aviation academy and MRO services. Then employee can get and see any information of the organization related to organizational purpose.

Analyzing Intranet goals of the organization: The intranet goal of the organization should be aligned with the vision of the organization by providing reliable and quality information to its employees and help managers to make better decision. And the portal site also should be designed a single point of contact for most of information sources in the organization.

Analyzing information culture of the organization: There are some of the practices of sharing, creating and utilizing of information in the organization. These can be classified in to the following points:

- Induction for new entrants
- On-job training
- Mentoring
- Coaching
- Recurrent training
- Annual general assembly
- Workshops and seminars
- Crew meetings and activity reports
- Informal meetings/discussion forums
- Operational guides, policies and procedures
- Internal database records etc.

Having this in mind and identifying other information sources we can integrate to portal site.

Information politics is the flow of information in the organization and this can lead to unproductive, information hiding and storing. An organization's physical setting can also impose particular rules, constraints and requirements. For example, an organization that is dispersed over different locations, or whose employees spend most of their time in the field, would need to address issues such as information access, remote communications, data up-to-date, and so on. Even though information staff is clearly vital players in the information ecology, they are

surprisingly often ignored in intranet design projects. The level of their participation needs to be identified. Finally, an organization has to design a plan for information handling rules and to management records and archives, and the maintenance of institutional memory. These routines are important because they allow the organization to store and retrieve organizational knowledge or memory for future references.

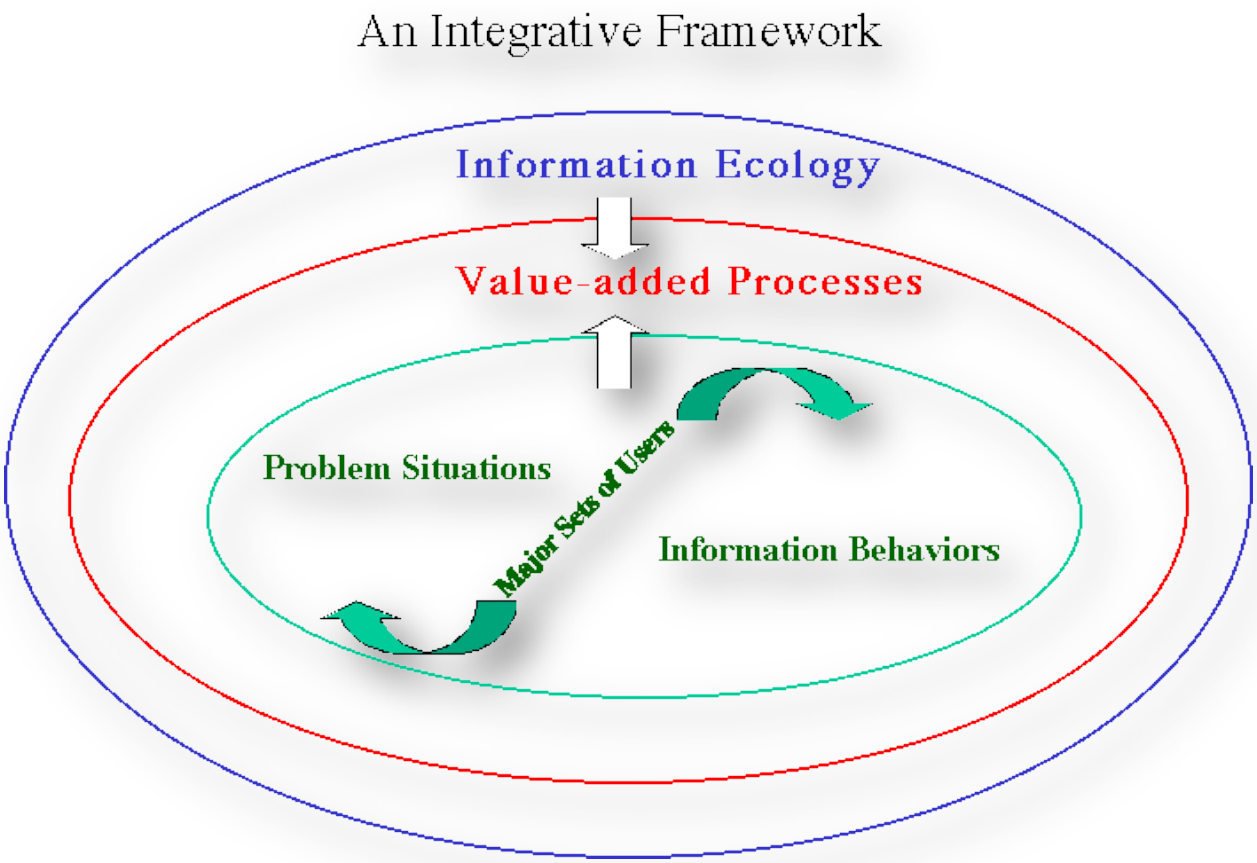


Figure 6: Behavioral-Ecological an integrative Framework for Intranet Design

5.3. Value Added Process

From the analysis of organization information ecology and users information behaviors we can design portal as value added process and we have to magnify the value of information to the organization and its users. The following points will help developer to analyze and create usable system to the users.

- Understand information behavior of users to solve their problem situations
- Improve organizational information ecology by considering major sets of users in the organization
- Design portal as content, communication and collaboration environment
- Help organization to create and use organizational knowledge to make valuable business decision
- Connect all, information sources, internal applications and databases to create single point of access

5.3.1. Analyzing Portal at User's Layer

Intranet applications may be designed so that they directly support the information behaviors of users as they resolve their work-related problem situations. This requires a reasonably accurate and complete description of these information behaviors. We can propose that the concepts presented here – problem dimensions, information traits, and information use patterns – can characterize information behaviors with enough true detail to guide design. For example if user's information behaviors are "well-structured, simple, familiar, understood, well designed and have specific purpose" then provide links to users of information on the portal.

If problems are "ill- structured, complex, new problem situations, initial state of the problem not understood and there is no specific goals" identify and analyze the problem situations then give portal link and information that help users to solve their problem situation. By seeking and valuing information with behaviors that are high on the "qualitative, soft, and diagnostic scales," and then using the information in certain recurrent patterns or categories. Each of these sets of dimensions, traits, and categories then serve as design parameters which describe the types of

information and the forms of information seeking and use practices that intranet applications can be designed to support.

5.3.2. Analyzing Portal at Enterprise Layer

At the organizational level intranet applications and services may be designed to fit or improve the organization's information ecology. Where properties of the ecology contribute positively to the attainment of organizational goals (for example, an information-sharing culture, skilled information staff, well-developed information handling procedures, integrating enterprise resource planning systems and well-designed company business reports. There are different aspects of the ecology that block or reduce organizational effectiveness (for example, geographically dispersed work units, information feudalism, and information overload and the intranet might be designed to compensate or reduce these negative effects.

5.3.3. Analyzing Portal at Presentation Layer

When considering portal interface structure, it is useful to distinguish between the visible structures and the underlying structures. The visible structures provide the organization the designs of pages, groups of pages (known as sub sites), and the entire portal itself.

The underlying structures are core services, such as authentication, access controls, and metadata management, as well as the policies and procedures that govern the evolution of the portal. These structures are not necessarily visible when they work well, but their absence is all too apparent. When users cannot work with essential applications because of access control problems or when navigation tools direct searchers to inappropriate content because of miss categorized metadata, users become all too aware of these underlying services.

Many pages use the basic three-panel structure shown in figure 7. The top area contains global information about the site, the left side area contains navigation controls and links to commonly used objects, and the large central panel is home to the substantive content of the portal.

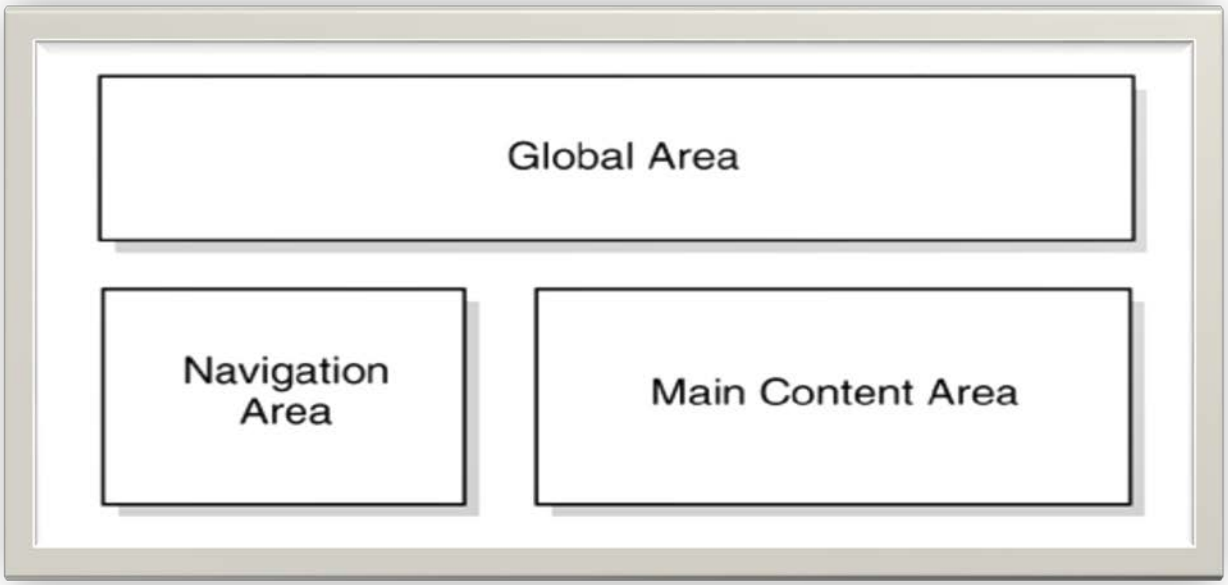


Figure 7: Portal at Presentation Layer

The global area is consistent across the portal and often provides links to a home page, contact information, accessories, or other frequently used applications.

The navigation area provides a localized context for users. If you went to the human resources area of a portal you would expect to find navigation links to training, policies and procedures, benefits information, and related material; in a health and safety area of the portal you'd expect to find information on material safety, accident prevention, and reporting procedures. The role of the site navigation area is to provide an immediately visible and easily accessible path to related components in the portal while keeping the user from being overwhelmed by the full breadth of the portal.

There are several common approaches to organizing the navigation area. First, the area can be organized by organizational structure.

In the modified Taylor's value added chapter two of literature review, classified information system modeling into three: at user level, at interface level, and at systems level. At the user level the classification focuses on the problem situation of which establishes the "user criteria" of

choices. It includes the broad categories of criteria that are useful to users in selecting system or evaluating how systems are working and designing systems. The criteria are not rigid. The criterion is depending on the person, situation, needs, settings and other user centered aspects.

The interface is the negotiating space between user and system. The values added by system to increase users in making choice. The system includes the specific processes that add specific values.

These are specific values that add value in order to meet the "**User criteria of choice".** For example, Browsing, Simplicity, Mediation, Orientation, Ordering, and Accessibility, used to meet user criteria of "**Ease of Use**". And Item identification, Classification, Summarization, Order, Referral and Precision used to meet user criteria of "**Noise Reduction**".

The system includes the specific processes that add specific values. These include processes, features, and elements of the system that add to the related values identified in "interface (Values Added)" and which meet "**User criteria of choice**". For instance, Data manipulation, Sorting, Customizing, User profiling, informed consent and Choice contribute to value added of Contextually, Flexibility, Simplicity and Privacy which combines to address user criteria of "**Adaptability**".

5.4 Portal as Shared Information Infrastructure

The corporate portal that can be used to classify information for retrieval, search engine for exact and specific information request, links to web sites and information resources, help employees to get information regardless of their physical presence and more advanced web portal can include features like work group productivity tool such as e-mail, calendars, work flow, project management, expense reporting, travel request, employee self-services and transaction based information extractions systems.

Corporate portals can have the power to provide enterprise with shared communication workspace for the creation, exchanging, reuse of enterprise knowledge. Information management provides structure and process which helps separate databases and sources of information integrated so that information is managed at central point and shared to all users.

After the analysis of information behavior, information ecology and value added processes of the organization we can design portal as shared and integrative information workspace framework.

This framework should also support with changing in culture, organizational structure, business process and information sharing practices.

A portal's core functions include email, group calendaring and scheduling, shared folders/databases, threaded discussions, integrations, employee self-services, workflows, project management tools, issue tracking, Discussion Board, access documents across the enterprise, custom application development to support business to employee (B2E) etc. A portal can be used for cooperation, communication and work process through collaboration. Portals can be used to integrate Enterprise Resource Planning (ERP), Data Warehouse and Business Intelligence to facilitate fast and better decision making. Portals can be used to create, store and share organizational knowledge among employees. Portal can also enhance a corporate community by improving physical and virtual relationships between employees. There are three types of portal. These are: Data portal, information portal and collaborative portal. Data portal used to run enterprise structured data. The second type which is information portal similar to data portal but it concerned about unstructured data management. Collaborative Portal is third type of portal. It center of attention is on group interactive functionality as well as the integration of the enterprise

by bridging intranet, extranet, and community information. The users are also allowed to access all joint functions such as classified topics, conferencing, team discussion, news channel, calendaring, and the abilities to personalize their interface.

The term enterprise or corporate information portals (EIP) is now often being applied to the gateways to the corporate intranets that are used to manage the knowledge within an organization. These are designed primarily for business-to-employee (B2E) processes and offer employees the means to access and share data and information within the enterprise.

An EIP may include facilities such as: a categorization of information available on the intranet, a search engine covering the entire intranet, organizational news, access to e-mail, access to common software applications, document management, links to internal sites and popular external Web sites.

By providing such features, corporate portal have the power to provide enterprise with shared communication workspace for the creation, exchanging, retention, reuse of enterprise knowledge. To explain this shared workspace is presented in Figure 8. The picture describes three major components of portal. First one is the Content space: which helps to facilitate information access and retrieval, the second one is Communication space: which used to negotiate, collective interpretations and share information's and the third one is coordination space: used to support cooperative work action.

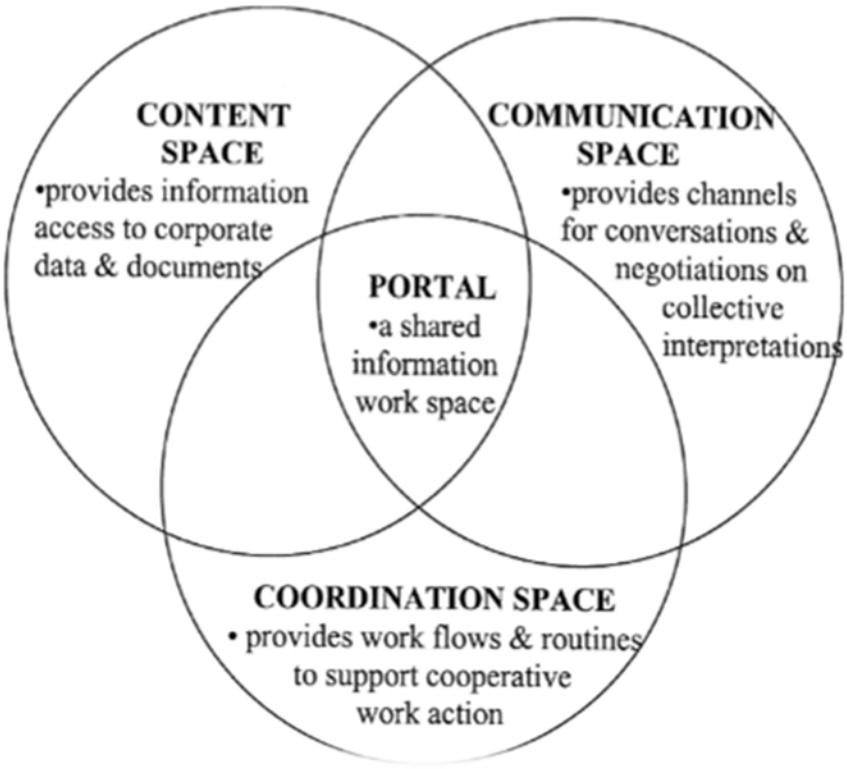


Figure 8: Portal as shared information workspace

For example, by addressing the information behaviors of employees, portals can functions information content spaces that provide relevant information in ways that organizational Participant prefer and find useful.

By facilitating the creation, flow, and use of information within firm's information ecology, portals can function as coordination and communication spaces which support the exchange of ideas and know-how, the discovery of other experts in the company, and the creation of products and services by groups of people throughout the organization. Therefore, by incorporating functions and features which enhance the potential usefulness of information, portal can promote better user engagement of these systems.

CHAPTER SIX: CONCLUSION AND RECOMMENDATION

6.1. Conclusion

An enterprise web portal will provide the organization to communicate and deliver the required information. The success of portal can be measured by the services provide to its users. But the existing portal often ignores the information needs and practice of users. Due to this reason, the corporate portal suffer from usability problems such as poor navigation from site to site and inappropriate display of information which doesn't related to users problem situations, lack of integrations with internal application and databases, problems of engaging employees and group collaboration within the firm.

Based on the assessment (questionnaire, interview and personal observation) on the existing web portal, the consideration of users' information requirement behavior, information ecology of the organization and the understanding the benefits of the portal that add values to users, the researcher forward the following conclusion based on the results obtain from chapter four of research results and discussions made.

The present practice of analyzing and identifying users' information requirement behavior follows traditional way of problem solving mechanism. Information users and designers will not follow clearly requirement identification processes.

By analyzing major set of users and existing problem situations, the researcher can easily define information requirement of users. However the current practice of designing portal doesn't start from analysis of the information use environment of users.

In addition to this, the organization has a good practice of different interacting and interdependent social and cultural systems that shapes the creation, flow, and use of information. These practices have given less value to users to create completed information environment. The organization needs to focus information flow beyond the technology. The full information environment can addresses all of organizations values and believe which we can call it organizational information ecology. Portal can be the main area to control and manage the flow of information in the organization. But the organization slightly utilizes the portal functionality

to manage the information ecology of the organization and the organization mainly exercises the site for document management.

Even users criteria of choice differs from person to person but the existing web portal suffer Ease of use, problem of site classification, summarization and lack of reference on the portal that help users to search information they need. Beside this, the quality of information posted on the portal needs to be accurate, complete and up-to-date. Furthermore, the existing portal has an issue of adaptability like flexibility of changing users' information requirement, contextually and customization problems. Furthermore, Performance and pleasing are also the other parts of existing portal difficulties. The current practice of portal design doesn't consider the engagement of employees to share and discus their problem situations.

The researcher can conclude that even if the existing portal contains different feature which supports the internal process of the organization and there is good practice information management activities but the portal is performing below its capacity and it is adding fewer values to users. If the organization works on the practice of information ecology and user's information requirement behavior, the organization can get more benefit from the portal. The newly proposed information infrastructure framework will solve most of the existing portal problems and the portals will be the central point of information resource in the organization.

6.2. Recommendation

One of the several useful applications of the Web in general is the creation of the concept of Web portals. As mentioned above, corporate web portal now on wards serving an organization with single source of information. A good portal design benefits of the user of the web as they can easily go from one page to another by navigating the information they need. Most of the portals have information stored into links to various topics such as news, business, finance, travel request and employee self-service, games, group discussion, build community, find links to other web sites and much more.

Currently, customer expectations are increasing at the same rate as information technology innovations. The traditional organization structures and business models are no longer sufficient to deliver products and services.

For this purpose, enterprises have invested on information system such as corporate portals.

The Ethiopian Airlines web portal is currently serving as content management system. It can be created as shared information infrastructure by centralizing all corporate information on the site. Users can log on and see whatever information they need.

The corporate portal contains the following features: data storage area, manage and access documents across the enterprise and Create Business Document Workflows, Create key performance indicators, sharing information and documents within colleague. By coordinating these, we can create content space. For instance, Wiki pages, Blogs, Announcements, Discussion boards and databases, Links, calendars, E-mail and tasks monitoring, issue tracking, project management can be used to create collaboration and communication work space. In addition to this, the portal contains the following activities. Site Navigation and Site Categorization by international, region and by departments. Site personalization used to solve problems of graphical user interface.

The Ethiopian airlines have different source of information like:

- Internal databases
- Organizational manual
- Organization policies and procedures
- Team meetings
- Conferences and presentations
- Friends and customers
- Business reports
- Vendors
- Email
- Company web sites
- Group discussion and
- Company news

Similarly the organization has a practice of information creation and sharing culture. In addition to these the organization also working on intranet goals and information management plans.
If we can association Davenport's information ecology of the organization with portal features, the organization can get more return on investment. The existing web portal is mainly used by supportive or administrative staff but basic or line staffs have less interaction. The organization can solve this problem by using the idea of Davenport's organization physical setting which used to impose particular rules, constraints and requirements. For instance, an organization that is isolated over different areas, or whose employees spend most of their time in the field, would need to address issues such as information access, remote communications, get up-to-date data, and so on.

Finally, the existing problems of users information requirement behavior and problems of quality information, problem of noisy information and problem of adaptability on the corporate portal can be modified by adopting modified Taylors value added model. Portal developers can also easily learn and identify user's information behavior, their problem situation and information requirement during system design.

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Appendices

Appendix I

Sample interview with respective managers

Declaration

we are undertaking a research on the prospects of corporate portal of Ethiopian Airlines Enterprise. As part of the study, we are assessing the current portal features and from the finding we will propose new portal design. We respectfully request your cooperation in completing this interview for the aforementioned purpose. We assure you that, we will not identify you in person; nor will we disclose any part of your individual response.

On our interview we discuss how information ecology of the organization is managed on web portal.

Before starting our interview, I want to make a short brief about what is information ecology in the organization. Information ecology is organization's information environment, and consists of numerous interacting and interdependent social, cultural, and political subsystems that shape the creation, flow, and use of information in the organization. Therefore organization's information ecology influence what kind of information produced and stored, what information made available and to whom, and to what information required and valued in task performance. The frame work to information ecology attempts to concentrate on people rather than technology.

1. What are the sources of information in your organization?

Answer

The sources of information in the organization are the following:

- *Organizational manual*
- *Organization policies and procedures*
- *Team meetings*
- *Conferences and presentations*

- *Friends and customers*
- *Business reports*
- *Vendors*
- *Magazines*
- *Email*
- *Internal databases*
- *Company web sites*
- *Group discussion*
- *Company news*
- *Informal talks to staff*
- *Walk-through*

2. Are these lists of information ecology known in your organization? If yes, how could you manage them on the corporate portal?

Answer

These lists of activities are known in the organization. For example organizational mission is one of the core points for the corporate strategies. We have already identified and running the business by considering our vision including its missions. We are also working on the intranet to help our employees get access of self-services, employee appraisals and so on. Currently we have rules and procedures for the management of internal database records in addition the information cultures of the organization are as follows:

- *Induction for new entrants – History, Mission, Vision and Value statement of the company*
- *On-job training*
- *Mentoring*
- *Coaching*
- *Skill development program (adopted from Lufthansa)*
- *Recurrent training*
- *Annual general assembly, workshops and seminars*
- *Educational assistance program*

- *Crew meetings and activity reports*
- *Informal meetings/discussion forums*
- *Operational guides, policies and procedures*
- *Exit interviews*
- *Case based reasoning etc.*

Information politics is refers the follow of information within departments and outside of the departments. One department output can be an input to the other. Some information may be distributed by others through informally, but this information can affect the smooth flow of information with the company. We encourage every staff to discuss his idea on the crew meeting, division meeting, quarterly meeting and general assembly meeting.

Information settings: Besides the central hub in Addis Ababa, our employees work on regional offices, and international offices outside Ethiopia. Employees can connect and access information they need through VPN, remote connections etc. to solve their work related problem. Information staff: Every employee has its own information access level on the system based on his information requirement behavior and on each presentations, business meetings, annual conferences and discussions employees can participate to get or understand the existing problem situations.

Information handling: Daily business transactions recorded and stored for future references. Other information creation, sharing and dissemination practices are one of organizational memory and for this we need to have a mechanism to capture for future utilization.

In relation to sources of information and management of information ecology under question number two, like organizational manual, policies and procedures already exist on the portal but Internal data base records, business reports, group discussion and the like needs further work. The list of information ecology discussed above, all of them exist in the enterprise and the management at central point like on corporate portal requires giving attention.

Thanks for your collaboration

Appendix II

Interview with portal developer

Declaration

we are undertaking a research on the prospects of corporate portal of Ethiopian Airlines Enterprise. As part of the study, we are assessing the current portal features and from the finding we will propose new portal design. We respectfully request your cooperation in completing this interview for the aforementioned purpose. We assure you that, we will not identify you in person; nor will we disclose any part of your individual response.

This interview has two parts. The first part is about user's information requirement that can add values on their daily task. The second part contains the information environment of the organization.

Part1.

Now you have a requirement from one of the departments in your organization to create a portal site for their employees. The new site should support employee self-service, work flow between departments, schedule appointments etc. In addition to this, they need the portal site should add values on their daily process and the following are list of user criteria of choice.

Before starting to designing users' requirement, how do you identify the major user set, their information need, their work related problem situation, and the way they utilize information?

P1. The 1st requirement is: The site should support:

- Easy to use
- Free from noise
- Should contain Quality information
- Adaptable to a new requirement change
- Fast to respond to user request and
- Attractive Graphical user interface

Q1. Have you ever designed portal site before based on such kind of requirements? If yes, can you tell me your approach?
Q2. How can you create a portal site which supports the above points?
Q3. How can you identify user's information requirement behavior?

Part2.

Imagine you have additional requirement from your customer (corporate manager) to include organization information ecology on site. The users can create, modify, and share organizational information on the portal site.

Q1. How do you identify organizational information ecology?

Q2. How do you include this organizational information ecology on the portal site?

Q3. How could you design a portal site that can add values to its users?

Answer sheet

Part 1

All corporate employees require portal access. Before starting to design portal site we identify what they require. Most of the time users' information requirement is related to their problem situations. They use information for creating, sharing, and storing of any information related to their work.

Ans1. *Currently there are diverse requests from user side. But their request is different from department to department and it is not clearly defined.*

Ans2. *Although the portal site is easy to utilize and fast to respond to user request, the graphical user interface, adaptability, quality information and noisy data content needs further work to improve.*

Ans3. *Before creating the site, the user departments identify their requirements. After we agreed on their information requirement we move to design.*

Part 2

Ans1. *Few of information environments are known like organizational mission, organizational culture. But the rest of them require high attention for future work.*

Ans2. *Based on User request this information ecology is created and stored on the portal such as organizational manuals, policies and procedures, reference materials, service request forms and organizational strategies. But the other part of organizational information environment currently not explicitly reflected on the sites.*

Ans3. *By analyzing user's information need, we design a portal site then we measure their satisfaction. From their feedback we correct and modify the site.*

Thanks for your collaboration

Appendix III

Questionnaires to portal users

Declaration

we are undertaking a research on the prospects of corporate portal of Ethiopian Airlines Enterprise. As part of the study, we are assessing the current portal features and from the finding we will propose new portal design. We respectfully request your cooperation in completing this interview for the aforementioned purpose. We assure you that, we will not identify you in person; nor will we disclose any part of your individual response.

1. Educational Status?

1. Certificate

Number Of Responses 0 Percentage Of Responses (0%)

2. Diploma

Number Of Responses 1 Percentage Of Responses (3%)

3. Bachelors

Number Of Responses 26 Percentage Of Responses (90%)

4. Masters and above

Total: 29

2. Your gender

1. Male

2. Female

Total: 29

3. Your Position in the company?

1. Staff/Expert

Of Responses (86%)

2. Supervisor

Number Of Responses 4 Percentage Of Responses (14%)

3. Manager

Number Of Responses 0 Percentage Of Responses (0%)

4. Director

Number Of Responses 0 Percentage Of Responses (0%)

5.Executive

Number Of Responses 0 Percentage Of Responses (0%)

Total: 29

4. Your experience at Ethiopian Airlines

1. Less than 5 Years

2. 5 -10 Years

3. 11-15 Years

4.16-25 Years

5.Above 25 Years

Number Of Responses 0 Percentage Of Responses (0%)

Total: 29

5. You are from which division in the company?

1. HRM

Number Of Responses 6 Percentage Of Responses (21%)

2. Finance

Number Of Responses 6 Percentage Of Responses (21%)

3. Marketing & Sales

Number Of Responses 3 Percentage Of Responses (10%)

4.Maintenance & Engineering

6.Flight Operations

7.IT

8.Aviation Academy

9.Internal Audit

(7%)

10.Legal Counsel

Number Of Responses 1 Percentage Of Responses (3%)

11. Alliance & Corp. Str. Planning

Number Of Responses 2 Percentage Of Responses (7%)

Total: 29

Ease of use

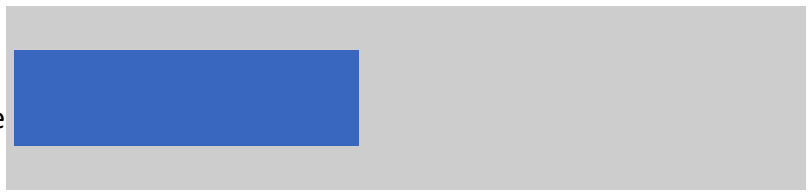
1. Do you easily browse the information you need on the web portal?

1. Agree

Number Of Responses 16 Percentage Of Responses (55%)

2. Disagree

Number Of Responses 13 Percentage Of Responses



(45%)

Total: 29

2. Do you simply use the web portal without any help desk assistance?

1. Agree

Number Of Responses 17 Percentage Of Responses (59%)

2. Disagree

Number Of Responses 12 Percentage Of Responses (41%)

Total: 29

3. Do you easily move from site to site without any problem over the web portal?

1. Agree

Number Of Responses 13 Percentage Of Responses (46%)

2. Disagree

Total: 29

4. Do you easily access the web portal whenever you need?

1. Agree

2. Disagree

Total: 29

Noise Reduction

5. Do you clearly identify the information you require on the web portal?

1. Agree

Number Of Responses 15 Percentage Of Responses (52%)

2. Disagree

Number Of Responses 14 Percentage Of Responses (48%)

Total: 29

6. Do you get information you require on the web portal categorized the way you need?

1. Agree

Number Of Responses 7 Percentage Of Responses (24%)

2. Disagree

Number Of Responses 22 Percentage Of Responses (76%)

Total: 29

7. Do you get any summery information on the web portal?

1. Agree

2. Disagree

Total: 29

8. Is there any Reference that directs you to a source of information on the web portal?

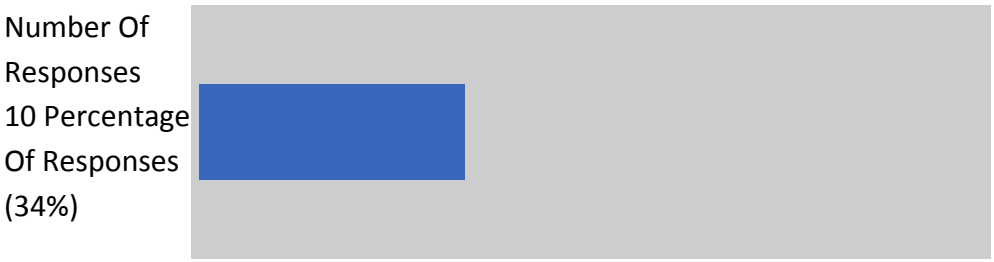
1. Agree

2. Disagree

Total: 29

9. Is there any order of information on the web portal?

1. Agree



2. Disagree

Total: 29

10. Can you obtain relevant resources from a collection of information on the web portal?

1. Agree

2. Disagree

Total: 29

11. Do you get specific aspects of information on the web portal based on your perspective, beliefs, and attitudes?

1. Agree

2. Disagree

Total: 29

12. Do you see daily updated new information on the web portal?

1. Agree

2. Disagree

Number Of Responses 23 Percentage Of Responses (79%)

Total: 29

Quality

13. Is the information you find on the web portal accurate?

1. Agree

Number Of Responses 14 Percentage Of Responses (48%)

2. Disagree

Number Of Responses 15 Percentage Of Responses (52%)

Total: 29

14. Do you get complete information on the web portal based on your need?

1. Agree

Number Of Responses 7 Percentage Of Responses (24%)

2. Disagree

Number Of Responses 22 Percentage Of Responses (76%)

Total: 29

15. Do you trust the information posted on the web portal as reliable information resource?

1. Agree

Number Of Responses 21 Percentage Of Responses (72%)

2. Disagree

Number Of Responses 8 Percentage Of Responses

(28%)

Total: 29

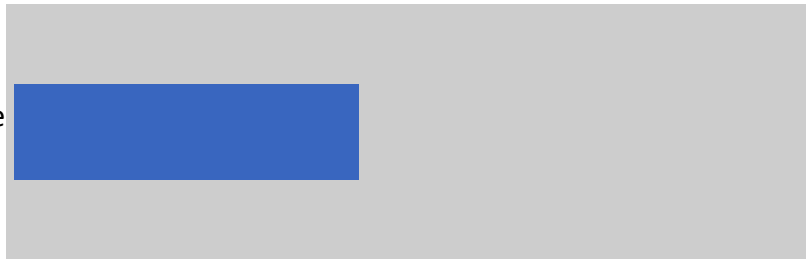
17. Do you believe that you have enough authority on the web portal to get the information you need for your daily task?

1. Agree

Number Of Responses 16 Percentage Of Responses (55%)

2. Disagree

Number Of Responses 13 Percentage Of Responses (45%)



Total: 29

Adaptability and Performance

18. Do you think that the information you search on the web portal related to what you need?

1. Agree

Number Of Responses 11 Percentage

Of Responses (41%)

2. Disagree

Number Of Responses 16 Percentage Of Responses (59%)

Total: 29

19. Do you think the web portal will save cost?

1. Agree

Number Of Responses 27 Percentage Of Responses (93%)

2. Disagree

Number Of Responses 2 Percentage Of Responses (7%)

Total: 29

20. Do you think the web portal is protected against unintentional threat like fire, flood, and earthquake?

1. Agree

2. Disagree

Total: 29

21. Do you think the web portal sensitive information is secured against intentional criminal activities like theft, damage and unauthorized modification?

1. Agree

2. Disagree

Total: 29

Pleasing

22. Does the design of the graphical user interface of the web portal have an effect on your productivity?

1. Agree

Number Of Responses 20 Percentage Of Responses (71%)

2. Disagree

Number Of Responses 8 Percentage Of Responses (29%)

Total: 29

23. Do you think the information presented on the web portal in an engaging ways to facilitate the use of the portal services and communication with colleagues?

1. Agree

Number Of Responses 9 Percentage Of Responses (32%)

2. Disagree

Total: 29