Towards the Globalization of Communication Using Global Information Systems (GIS): From Theory to Practice

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Abstract—This paper presents a comprehensive study of global information systems. The variety of components and distributed mechanisms, besides the practical domains are illustrated. An explanation of GIS complexities is provided and a comparison of different related approaches is described. Two dimensions of communication globalization.

Index Terms—A Global Information System, Communication Globalization, GIS Synthesis, GIS Approaches.

I. INTRODUCTION

Before 1980s, ad hoc free of charge applications on Mainframes facilities the business processes and nobody imagined these days [1]. During 1990s,the software with individual entity released and many models for system development from SDLC, Spiral, RAD, Agile, etc. as well as many classifications for Information systems developed: MIS, DSS, TPS, ESS, etc. In those days every organization has asked for total solution [2]. The 2000s when information retrieval and hypertext in form of WWW developed, it was assumed as a powerful global information system [3].

Nowadays, scholars consider the web services and other technical tools as the main facilitators that should be integrated to form a comprehensive Global Information System (GIS) [4]. GIS integrates a large spectrum of global facilities and IT services through a core concept: global distributed approaches. The aforementioned new perspective changes the academic perspective. The global information system is applicable in a large range of organizations [5]. From simulation of effects of agricultural activities to automated control and intelligence reports in air defense control systems could be assumed as the scope of GIS [6]. With popularity of the using of global information systems, the new complexities will be raised (See Fig. 1). Barczak addressed the main reasons for complexities: a) Dissimilar languages b) cultures and c) time zones [7]. Arranging some program to solve these complexities is senior manager's duty in each global organization. GIS could be assumed as a double-edged sword. Reliance on unreliable GIS with invalid information and out-of-date data will face managers to unexpected critical problems.
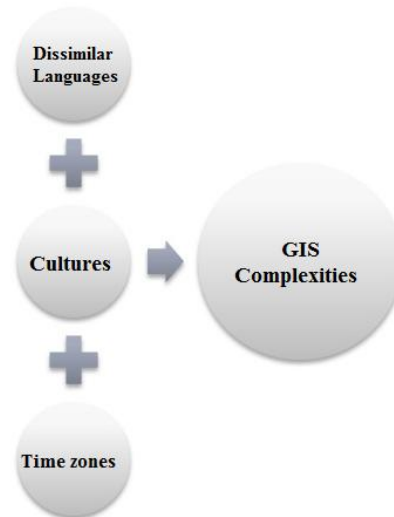
Fig. 1. The major reasons of GIS complexities

II. GROWTH IN ALL DIMENSIONS

In year 2000 in peak of globalization era, many articles focused and targeted global information system concepts and practices [3]. Most of them concentrated on the business aspects of GIS. Bowon focused on specific set of variables that could be assumed as fundamental elements for IT effectiveness in the *global* context [8]. The 35 Korean firms surveyed and showed that if IT effectiveness in a global firm can enhance through advancing the IT application level. The survey declared that in globalization process all departments and parts have to be promoted to support the IT plans. Fig. 2 shows the multi-aspects of a GIS.
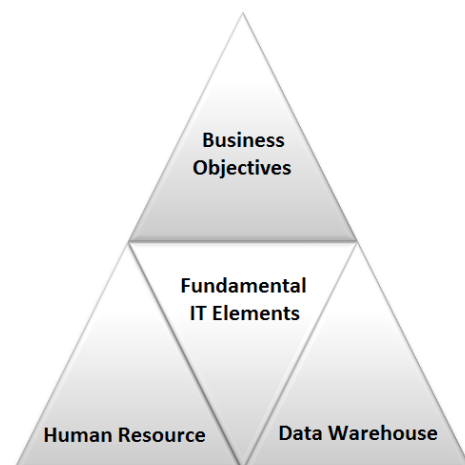

Fig. 2. Multi-aspects of GIS

III. GLOBAL INFORMATION APPROACHES

In 2003 Wolfgang stated data warehouse systems are a well-known and widely spread approach for supporting management decisions [9]. The researcher described that data in a warehouse are imported from transactional processing systems of a company. They mentioned that the main reason is this fact that the World Wide Web is rarely seen as a potential data source. They believe that software applications are used widely by companies because data in WWW are rather semi-structured or even in some cases do not have any structure. HTML format has no semantic Meta data and XML files have no grammar or different grammar. Some information that coded in pictures or presented in binary file format have another problem to use as a source for data (See Table I).

TABLE I: THE FEATURES OF MANAGING DECISION APPROACH

Decision Approach	Structured Data	Semantic Meta Data	Appropriate Grammar
WWW	No	Almost	Almost
HTML	Almost	No	Almost
XML	Almost	Almost	No
Warehouse systems	Yes	Yes	Yes

IV. PROFESSIONAL PRACTICES OF GIS

IT and ITC scholars are focused on several professional aspects of global information systems during past decade. Many of companies, enterprises, and research centers have worked on the integrated information systems as well as embedded software. From one perspective, an integrated global information system could be developed using GIS [10]. GIS could be defined as a system for processing multiple layers of information. Therefore, GIS is a major approach for global competition.

V. GLOBAL POSITION SYSTEM AIDED GIS

Decesare represented a research in a totally different scope: movements, connectivity, and resource selection of Rocky mountain Bighorn sheep [11]. The author had provided a wisdom model using two GISs. Besides Global Information System, GIS is a same synonym for Geographical Information System and GPS stands for Global Position system. Researchers derive some variables from a global information system to quantify resource selection of Bighorn sheep. Some of their variables are Distance to nearest escape terrain (m), Distance to nearest water (m), Distance to nearest road (m), Distance to nearest xeric grass (m), Distance to nearest open canopy forest (m), Elevation (m), Slope (degrees), Slope aspect, treated as three indicator variables, Solar radiation index. According to article, explanatory variables are selected for resource-selection modeling and compiled these data in a global information system (GIS) using ArcView 3.2a. Their researches showed that global information system could not be limited in office automation, document processing, or web application. Therefore, GIS could cover several professional, general, and specific domains.

VI. TWO DIMENSIONS OF GLOBALIZATION OF COMMUNICATIONS

Holznagel stated that there are two crucial dimensions for globalization of communications [12]. This research emphasized that each dimension has specific aspects and confusing these two aspects will influence the total performance of all business processes in a global organization. The first dimension is an infrastructure aspect conducted of the technical network. The second aspect is based on using the first dimension as the infrastructure. Neglecting one aspect of these two, likely, affects the performance of the ICT tools in all level of communication.

Lehmann describes "how the Australasian Produce Co-Operative1 (APCO), a marketing cooperative in a land-based industry in Australasia attempted to create a global information system" [13]. As Lehmann stated, the GIS project is started in 1996 with a charter for the Food Information Systems and Technology (FIST). The first project is named *Business Process Benchmarking* and had three major stages: 1) Prototype system development 2) Prototype implementation in a small number of pilot sites and 3) Roll-out of the global system. Weiner combines both emergency department and trauma registry databases using a Global Information System *to analyze the crash data geographic information* [14]. He tried to make a model through GIS and showed that how pedestrian safety could be achieved, especially for children. The research results suggested *changing in environmental factors* as a mandatory activity for the effective control. Using GIS for such a research type pave the way to more professional objectives.

GIS could be used in totally different domains. Hamilton and Nowak have worked on another professional area. Authors' research examined the relationship between insolation, climate, and hibernacula of black-tailed, Great Basin, and western diamondback rattlesnakes at four sites in Arizona, Nevada, and Utah using an insolation GIS [15]. The results show that rattlesnakes in cool climates utilize hibernacula with insolation values higher than those of their surroundings.

VII. SUMMARY

Global information system covers a high range from office automation in a global organization to embedded intelligent system for traffic control. Researches show that, there are two approaches that have to follow concurrently to develop and using GIS, The first approach is setting program for making the global system culture to involve all level of staff as well as customers. The second approach is promoting the system information through promoting staff. Adopting the second approach, knowledge workers have to concentrate more and are familiar with advanced IT technologies and enhanced tools.

In a global organization, besides employees, leaders, and managers have responsibility to set the strategies based on the current situation in the globe. This objective just could be achieved through familiarity with up-to-date knowledge and technologies. Using traditional leadership and neglect the cheap and easy to access technologies and tools likely causes fatal failure, especially in the nature of global organization:

global competition.

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