Information System Development Methodologies
Gender Issues In A Developing Economy

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Abstract: This paper provides preliminary results of INDEHELA-M, a joint Finnish-Nigerian project undertaken by a prominent Nigerian software development company. The main objectives of the project are to produce empirical information and understanding of the practice and problems of information systems development (ISD) in Nigeria, and to facilitate Nigerian ISD practitioners by improved methods, techniques, practices, and education, according to their needs. Gender participation in ISD was also introduced to study the methodologies employed in ISD projects and the effect (if any) on gender participation and/or access to information technology and create gender balance awareness in Software Development Companies in Nigeria. This was to take stock and understand the factors that lead to gender segregation within information technology (IT). Despite the remarkable increase in the percentage of girls' access to education, we found that women are not present or have been assigned a marginal role in ISD projects. This paper highlights gender trends in IT education in Nigeria and identifies gender disparity in the Information System Development methodologies employed. We also documented female access to IT. The paper concludes by proposing that the way forward for women is active participation in IT in Nigeria as a proxy for other countries given the same socio-economic environment.

1. GENDER DIFFERENCE IN NIGERIAN CULTURE

The economic crisis in Nigeria since the early 1970's led to many development strategies. Government policies and programmes were introduced to achieve equity and improve the economy. These policies

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assure that communities and households are homogenous units which pool all resources and activities to benefit the common good of all, both male and female. However, neither the alleviation of poverty nor development interventions affects all individuals uniformly [3].

Formal education is the key facilitator of positive behavior and high income earning skills. Gender differences in Nigeria occur at all levels. The higher the level of the schooling system, the higher the female enrolment and completion rate declines. Even those who manage to go to school concentrate in the humanities, education and social sciences [12]. Girls face sex disparities in educational achievement, and experience a higher educational wastage. For example, girls drop out more often from school due to pregnancies, early marriage, or heavy demands to perform household tasks. For economic reasons, girls are offered as domestic assistants for the purposes of sending male children to school [2].

As a result of the relative lack of access to formal education, there is an overwhelming presence of women in low-paying, insecure, informal sectors of the economy. The inferior social and economic position of Nigerian women relative to men is due to their limited access to strategic resources like formal education, and reflects societal traditions and myths. Men continue to dominate all spheres of life even when it is solely a female affair. For example, in family planning programmes, traditionally men have the power to allow women to participate [4]. Changes and improvements in one aspect of women's lives may not necessarily be matched by equivalent changes in another. Equal employment options do not necessarily follow equal opportunity for education, and equal political power does not necessarily follow equal access to either education or jobs. More women now participate in all sectors though the ratio of such active women to their male counterparts is still very low. For example, there have been two women University vice-chancellors out of over forty such posts at anytime in Nigeria, though presently, men have replaced both. Increase in female participation in these activities has not influenced female attitudes towards traditional roles as wives and mothers.

Culture is a strong explanatory variable in understanding the predominant gender ideology in the society and in ISD it is an important variable that introduces its own problems. In general, gender inequality pervades most societies. The extent of inequality between the sexes depends on ethnicity, geographical setting, social class, and historical period. Although the specific cultural details vary in Nigeria, women are subordinate to men. A major feature of traditional Nigerian society is the patriarchal structure. Among the Yorubas of Southwestern Nigeria, women kneel in front of their husbands almost all the time (e.g. when serving the food on the table, when exchanging greetings) as a visible sign of the wives' subordinate positions to their husbands.

The overall lower status of women compared to men is summarised in what Itavyar [6] identified as a common saying among the Tivs-"Kwase Hemen Tyay ga" (meaning, "a woman does not lead a battle"). Hence, men are born to lead among the TIV men of Nigeria, while girls are treated as 'parcels' to be exchanged in marriage without being able to make a choice.

Also the institution of female seclusion ("Kuble" in Hausa language), supported by Islamic injunctions, and intensified during the colonial era as a form of resistance to external domination, has further heightened the subordinate position of the Hausa Muslim women [5]. These women cannot freely mix with strange men, and they are therefore constrained from pursuing careers outside their homes, so that they are not exposed to non-Muslim men and women and their non-Islamic ideologies. Again, the Hausa culture of "Kunya" (modesty or shyness) encourages that girls remain shy and obedient to their husbands. A woman, more often than not, derived her social status from her two major roles, a wife and a mother. As a mother, her energies are devoted to the life-preserving activities of procreation, having as many children as possible. She will enjoy a higher social status from the birth of male children.

2.   ISD RESEARCH SETTING

ISD in Nigeria is still largely a complex and unstructured process, usually with ambiguous goals, which in effect has a strong implication on ISD process and outcomes. ISD in this research work is defined as the process by which some collective work activity is facilitated by new information technological means through analysis, design implementation, introduction and sustained support [8].

The INDEHELA-Methods project (Methods for Informatics Development for Health in Africa) is a joint project between the Obafemi Awolowo University, Nigeria, and University of Kuopio, Finland; it is funded for a period of five years (1998–2001). The objective of this research is to study ISD practices with a plan of producing a 'Made-in-Nigeria' ISD methodology which: (1) addresses the needs of Nigerian systems developers based on what the practitioners themselves see as areas for improvement; (2) incorporates the latest results of the international ISD research; and (3) pays special attention to issues like sustainability, affordability of the resulting system, socio-economic issues (e.g., gender impact) and community involvement. The research framework is as shown below.
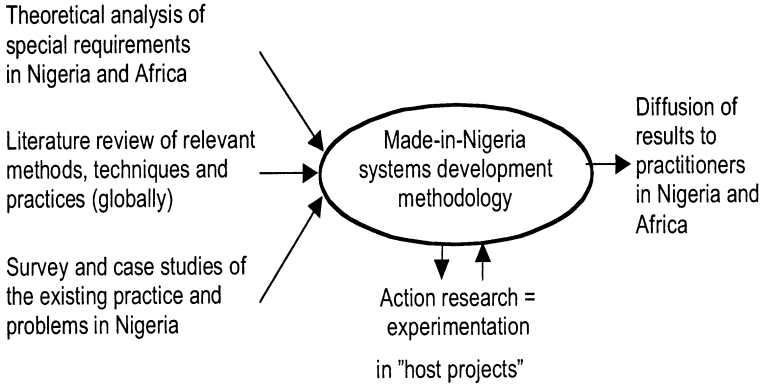
Theoretical analysis of
special requirements
in Nigeria and Africa

Literature review of relevant
methods, techniques and
practices (globally)

Survey and case studies of
the existing practice and
problems in Nigeria

Made-in-Nigeria
systems development
methodology

Diffusion of
results to
practitioners
in Nigeria and
Africa

Action research =
experimentation
in "host projects"

Figure 1: The overall research design [8].

A development methodology based on Activity Theory was identified
from the literature and was applied to a primary healthcare information
system and based on the result of experimentation [7] it was modified to suit
needs. In the activity analysis the system developer first identifies the
collective work activity which the new information system is to directly
facilitate. The developer then assists the representatives of that activity to
identify the outcome, process, actors, means, and other main elements of that
activity. The scope of the analysis is then enlarged by studying who the
outcomes are intended for (e.g., doctors, managers) and what kind of an
activity they use the system for. Then we move from analysis to *activity
development* by identifying where there is need for improvement. During
this step the participants have the opportunity to identify the need for new
information technology, and also the need for training, organisational
change, or the like [10].

The experience of men and women in organisational life is different
depending on their roles and responsibilities in the gender distribution of
labour. Some are created by the society since the colonial era and
subsequently transferred to work organisations. Such gender divisions of
labour are often characterised not only by their differential access to and
control over resources and the different value accorded to the respective
activities of women and men [11, 12], but also by culture. In studying the
socio-economic impacts and to develop practicable methods to manage it,
we are focusing on the *gender-related impact* of IS development and use. In
any ISD, there is an interactive System of human, physical and capital
resources. However, for management to identify the appropriate gender
balance in ISD methodology, the central gender questions must also be

addressed. For example, how can the long-standing "male-stream" tradition be changed? How can the negative perception of women be addressed?

There are about a thousand computer companies in Nigeria with activities ranging from hardware sales, software development, training, and computer related courses, to electronic data processing. Eleven software companies in Lagos were initially selected for our survey. The companies were large and small, locally and foreign-owned, producing packaged software and tailor-made systems. Interviews were conducted in November 1998 and March 1999 with 39 project managers or IT professionals with at least three years of experience in information system development. A questionnaire was designed and administered for gathering information about the companies, projects and methods.

A broader interview/questionnaire was designed in November 1999 to capture basic data of a wider range of companies in a quantifiable format. The purpose of this basic questionnaire is to provide a "landscape view" of the main features of software industry in Nigeria. The questionnaire will be administered to the selected companies and new ones in January to February 2000.

3.   FINDINGS

Since the project is still on going, preliminary results are reported. In most cases computer-based information systems are used to make an activity more effective. 'Impacts on' society as a whole are never considered (Figure 2). However, in Health care, effectiveness is measured by the health condition of the patient.

It was observed that the ISDM and tools employed are mostly not standardised. One of the most impressive company directors gave a summary of the company's ISDM as "design from a business point of view," that is, for every ISD; different strategies are employed depending on requirements. The choice depends on the system requirements. However, whichever methodology is employed, the client (user) participation was recognised as a major factor in the success of the ISD. Technical decisions also depend on the client's preference although the clients are encouraged to opt for new technologies (especially the operating environment, etc.). The resulting software packages' acceptability depends solely on the user while sustainability depends both on the user and system developer.

All the companies interviewed affirm that fresh graduates need to be retrained if they are appointed since their educational background does not reflect new trends in ISD techniques. In fact, one of the companies preferred

non-professional to the trained university graduates as it is easier to re-train the non-professionals.
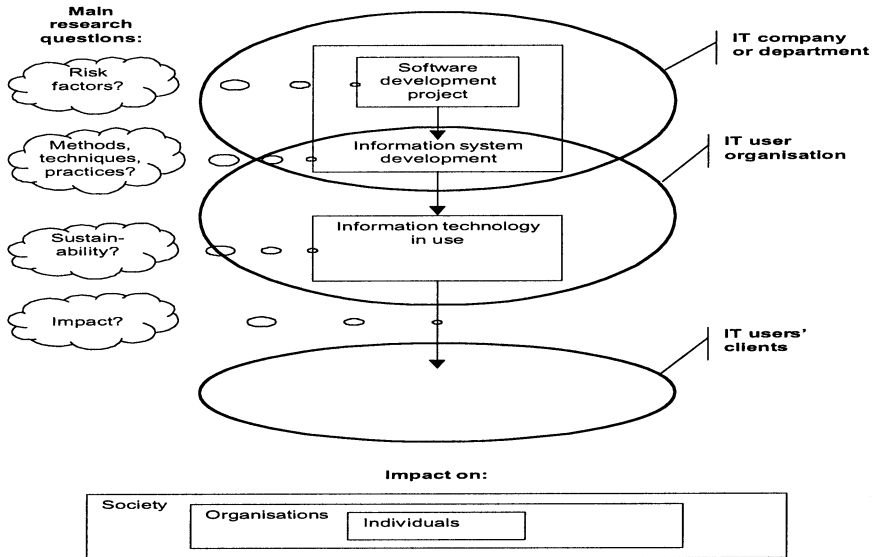

Figure 2: The research questions in the survey and the case studies [10].

Women are not affected in the same way as men by the forces, which guide organizational life in ISD; for example mobility is an important factor in ISD. The higher the possibility of mobility the less likely women are to be employed. Women of marriage age are most affected. One of the company directors said, "mobility determines stability and therefore sustainability." The recruitment pattern favors men more than women who more often than not rely on securing jobs through personal contacts. All the companies interviewed maintained that recruitment in ISD is gender blind, employment criteria is such that management needs are achieved. These companies emphasise the fact that the strength of an ISDM is in the quality of staff. It was observed that masculine ethics, political sentiments and ethnic relations often influence recruitment in these companies. Even then, very low percentages of these women are in hard core ISD. The most generous of these companies has 70% male and 30% female employees. One of the companies has about 2% female professionals and the only indigenous software house whose business is strictly system development, unlike the other ISD companies, has no female in the establishment. This is not

surprising since there are fewer females studying computer science [10, 11]. The unequal placement of men and women in this field is taken for granted and even the jobs assigned to women often require dependence and passivity. This is likely due to the fact that the control mechanisms used in ISD companies for women reinforce the subordination to which women are subjected in society. In Nigeria, this trend is likely to continue until work and family interests are seen to complement each other.

With regard to performance at work, it appears employers' expectations are different for each sex. For example, one of the company directors believes women are better at requirement analysis than at programming, implementation, or other ISD phases. His assertion was that females pay more attention to every little detail than do their male counterparts. The consensus in the companies was that good performance on the part of a woman was due to effort, while for men, good performance was attributed to ability. Men are believed to be more predictable, while women are more temporary and situational and with no firm commitment to future performance (i.e., women in ISD are viewed as less predictable and generally unstable).

Promotion exercises in ISD do not seem to favour women [12]. Most of the companies visited have no women at the management level. This may be rooted in traditional belief that men regard women as weak and lacking leadership qualities.

4.   CONCLUSIONS AND RECOMMENDATIONS

Women should be empowered to take part with others to shape the ISDM policies that enhance their professional practice. This requires a shift away from concentration on adult female literacy, access to credit, etc. to active promotion of social changes necessary to achieve gender equality, and eradication of women's social subordination to men. The following are recommended for women empowerment in ISD:

1. Programmes which aggressively target men through innovative information, education and communication activities and service delivery approaches that induce attitudinal change in men in support of women's social acceptance at all levels;

2. Programmes that address women issues from cultural, religious and social backgrounds, with the goal of empowering women in their quest for equality and development (The programmes should focus on activities that will change the subordinate status of Nigerian women in all spheres of life);

3. From childhood, girls should be encouraged to participate in all activities, there should be no segregation between boys and girls even at home and girls' interest in science should aggressively be encouraged.

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