Information Technology Interoperability Issues:

The Challenges of Bank Recapitalisation and Consolidation

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ABSTRACT

The recent recapitalization drive of the Central Bank of Nigeria (CBN) is aimed at reshaping the Banking industry where customers and investors can build some degree of confidence in the system. Out of the eighty nine (89) banks in the country only very few of them will be able to weather the storm. Lately there has been a number of recapitalization drives through the sales of securities while some took to the option of mergers and acquisitions.

However, recapitalization may not be without technological hitches resulting from the integration of the various infrastructures of the different banks coming together. This paper attempts to review the compatibility issues using the Simple Object Access Protocol (SOAP) and the XML-based (Extended Markup Language) integration layer with the aim of proffering solutions at reduced cost and complexity.

Keywords: Integration, interoperability, Compatibility, Traceability and Flexibility.

1.0 INTRODUCTION

The issue of bank recapitalization has generated a lot of ripples within the banking industry. The Central Bank of Nigeria (CBN) has given Nigerian banks December 2005 ultimatum to shore up their capital base to ₦25 billion. This policy is intended to enhance their liquidity base, strengthen their ability to assume risk, enhance global competitiveness as well as introduce sanity and stability into the sector. This reform is aimed at taking a pre-emptive and proactive measures to prevent distress within the system and to strengthen the system in such a way that will bring about much trust to such an extent that depositors go to sleep with rest of mind [1]. Thus these will increase the productive base of the economy which will bring about the much awaited transformations in the manufacturing sector, the agricultural sector and the small and medium scale enterprises.

CBN has equally made available to the operators some ways of escape. These include: Consolidation through mergers, sales of securities, and outright acquisitions or takeovers. Some mergers have taken place with Memorandum of Understanding (MOU) established.

Prominent among them are the First Consolidated Bank (FCB) which is an amalgamation of Hallmark bank, Gulf bank, Allstates and Lion bank. While the Intercontinental group has Gateway bank, Global bank, Intercontinental bank and Equity bank, and the Astrabank group has Assurance bank, First Atlantic bank, Guardian Express bank and Manny bank etc.

However, the success of the consolidation drive is highly dependent on the ability of the participating banks to recognize the implications and opportunities of a shifting environment. Players must respond aggressively by adopting an appropriate IT strategy that would secure the software and hardware components, migrate customers across multiple distribution channels, and champion the internet as a fundamental element of their core banking services [2].

The exercise of integrating business process, practice, and culture is a very complex one and may manifest in various forms detrimental to the customer, staff and management. Therefore, the integration of technology in banking business needs a lot of planning [3]. The issues that come to bare include the legal/enabling environment, the complexity of integrating the various organizations arising from the merger, human resources, technology, customers and so on. Therefore, the entire process calls for a well thought out procedures to ascertain retention and long-term success.

2.0 SYSTEM INTEGRATION

System integration is a continuous exercise in most organizations resulting from the need for both the public and private sectors to remain competitive. The motivating factors revolve around:

(a) Technological issues: the need to improve on quality of services at reduced cost.

(b) Dynamic nature of the business environment: the constantly changing business environment and human needs.

(c) Collaborative issues: the need for collaborative work regardless of geographical location. This supports free flow of information across international boundaries.

(d) New partnership issues: the need for mergers and acquisitions thus the demand for all the resources of the merging parties to be integrated at reduced cost and risk.

2.1 States of System Integration

There are four (4) states of system integration reflecting their unique properties, aspects and complexities [4] Each state has a unique economic value and can be applied to specific situations of an organization. The states are:

State 1: Interconnectivity

State 2: Interoperability

State3 : Semantic Consistency

State 4: Convergent Integration

The first three states are contingent on technology and

its status; while the fourth represent a convergence of technology and human performance, process, and knowledge.

State 1 : Interconnectivity

This involves making various pieces of disparate equipment and technologies work together. This includes the sharing of peripherals, the simple transferring of files, and the creation of common pathways between different components.

State2: Interoperability

This refers to the ability to make one application and technology function with another in a seamless manner. Most vendors provide this level of integration through regular update to feed other applications and providing interfaces for other databases.

State 3: Semantic Consistency

This involves the provision of access to data and minimising potential errors in human interpretation. Achieving this goes beyond database implementation, it includes rationalization of data.

State 4: Convergent Integration.

This is the most sophisticated for integration that is dependent on the success of the first three states. Besides integrating technologies, applications, and the rationalisation of shared databases. Therefore, convergent integration involves the integration of technology with business processes, knowledge, and human performance.

3.0 SOAP AND XML INTEGRATION PLATFORM

SOAP (Simple Object Access Protocol) is a simple XML (Extensible Markup Language) based protocol for inter-application exchange over HTTP (Hypertext Transport Protocol).

SOAP provides a way to communicate between applications running on different operating system with different technologies and programming languages. Today's applications communicate using Remote Procedure Call (RPC) between objects like DCOM and CORBA which constitutes security and compatibility problems as services are always blocked by firewalls and proxy servers hence the importance of SOAP [5,6]. SOAP is HTTP based hence it is supported by Internet browsers and servers and it is a key element of Microsoft's Net Architecture for future web application development.

3.1 Extensible Markup Language (XML)

XML is a markup language like HTML but designed to carry and describe data unlike HTML which only displays data. XML has no predefined tags like HTML, hence it is free and extensible. That is users are at liberty to invent tags freely. It is the platform for wireless application protocol (WAP) and wireless markup language (WML). Oftentimes in practice, computer systems and databases contains data in incompatible

format This is one of the greatest challenges facing developers today particularly, in the face of the ongoing capitalization and consolidation drive [7].

Therefore, converting data to XML is a way out of this complexity by creating data that can be read by many different types of application. It is the most favoured language for exchanging financial information between businesses over the Internet [4,7]. It stores data in plain text format hence it is an ideal tool for hardware and software independent data sharing.

XML is hardware, software and application independent and has the capability of presenting data on several platforms besides the standard HTML browsers. Other clients and applications can access XML files as data source as if it were the databases thus making them available for all agents for reading and manipulation.

3.2   Simple Object Access Protocol (SOAP)

SOAP is composed of XML documents containing the following elements:

a. **Envelop**

   This section identifies the XML document as a SOAP message.

b. **Header**

   This section contains application specific information (like authentication, payment etc) about the SOAP message.

c. **Body**

   This element contains the call and responses information

d. **Fault**

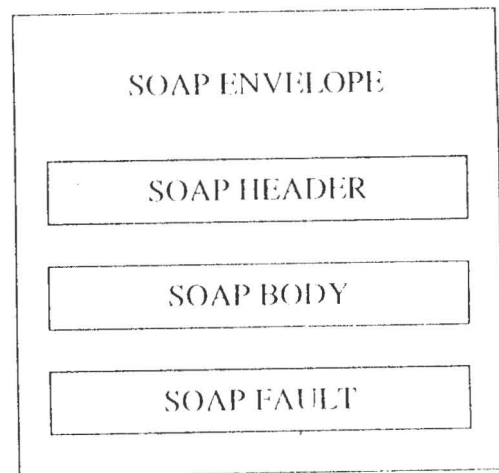   This element is optional but generally used to handle exceptions.

Fig. 1 Structure of SOAP

Generally, SOAP is coded in XML, uses envelop namespace and encoding namespace. There are three attributes default namespace viz: actor, mustunderstand, and encodingstyle.

where

Actor moves information from sender to receiver along several endpoints.

Mustunderstand signifies whether a header entry is optional for the recipient to process; and **encodingstyle** defines the data types used in the document.

The Skeleton of SOAP message

- ?XML version   "1 0" ·
- < soap: Envelope
- xmlns: soap = http://www.w3.org/2001/12/soap-envelop
- soap: encodingstyle = "http:// www.w3.org/2001/12/
- soapencoding" ·

```
<soap:Header>

———————————-

—  ———- ———- -

</soap:Header>

———————————-

———————————-

<soap:Body>

———————————-

———————————-

<soap:fault>

———————————-

———————————-

</soap:fault>

</soap:Body>


<soap:Envelope>
```

3.3   Sample XML Document to Obtain Balance

We assume the following particulars:

- Name of Bank = countrybank.org
- Name of Client = Charles Ayo
- Account Number = 2000570305

We have:

```
<?xml version = "1.0"?)

<env:Envelope xmls:env = http://www.w3.org/2002/06/
soap.envelope>


<env:Header>

<t:transaction

Xmls:t=http://countrybank.org/document>

Env:role = http://www.w3.org/2002/06/soap.envelop/
role/next
```

```
Env:mustunderstand = "true">

</t:transaction>


<env.Body>

<m:GetBalance

Xmlns:m = http://country.org/Accounts>

<0:accountstransaction

<0:Acctnumber> 200570305 </0:acctnumber>

<n:name> Charles Ayo </n:name

</0:accountstransaction>

</m:GetBalance>

</env:Body>

</env:Envelope>
```

4.0   IT INTEGRATION

Integration is critical to the success of mergers because of the underlying technologies. Within the Nigerian banking sector, the e-banking concept is commonplace. Thus, IT is used on a larger scale than any sector of the economy. Examples are Telephone/Internet Banking, Electronic Funds Transfer (EFT), Credit/Debit Cards, and Automatic Teller Machine (ATM) etc. However the degree of participation varies from one bank to another. A more critical aspect is that of software integration. There are about ten (10) banking software in the banking sector. They are Globus, Finacle, Kapiti, Bankmaster, Flexcube, Equinox, Phoenix, Basis, etc.

Therefore, bringing together many banks on different software platforms necessitates a careful approach to harness and integrate their individual databases.
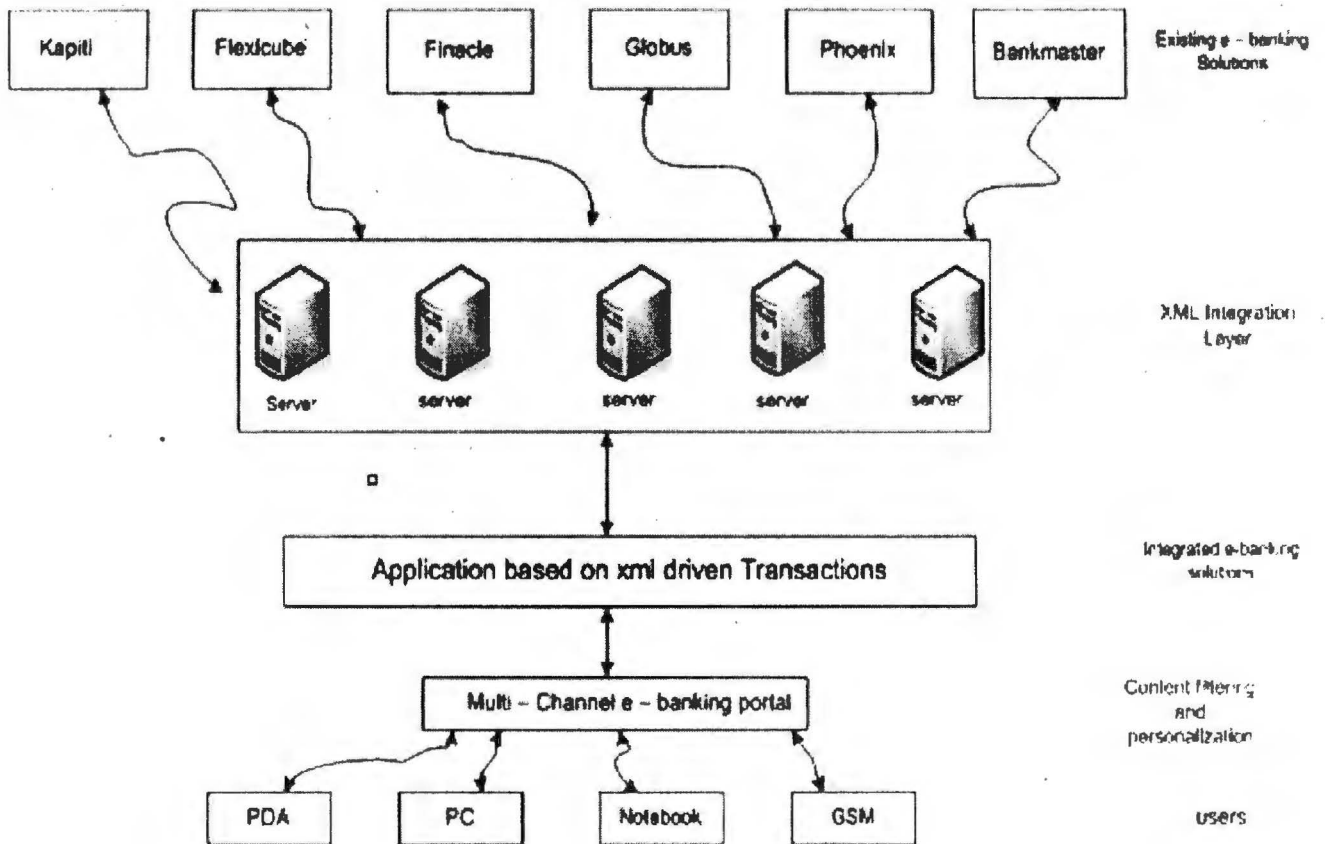
4.1   Software Integration

Fig. 2 Integrated e-banking Portal

The System is composed of five layers:

a.   User

This layer provides access to the portal through both wired and wireless channels. It allows users to provide customized and valuable information.

b.   Content Filtering and Personalization

This layer filters the user's request as well as the request from the bank.

c.   Integrated e-banking solutions

This layer provides contents and application based on XML driven transaction and workflows.

d.   XML Integration Layer

This layer allows the development of rich client application that can be accessed through XML and processed too. Such applications are platform independent hence users are afforded ease of use.

a.   Existing Systems

This layer is composed of all the existing banking software.

4.2   Peopleware Integration

The merging of two large companies is a huge undertaking, involving a great deal of legal and financial wrangling. Unfortunately, high-power meetings and paperwork often receive the greatest allocation of

resources, while the "peopleware" aspects are neglected.

Mergers frequently fail in part because managers neglect human resource issues, which are rarely considered until serious problems arise. The role of people and the organizational cultures is often placed in a marginal position, and most of the energy is invested in strategic and financial planning. However to increase the likelihood of a successful combination of Banks and interoperatability, there is need to give high priority to human resources and organizational culture along with strategic issues.

Mergers can be threatening for employees and produce anxiety and stress. The identifiable patterns of emotional reactions experienced by employees during a merger and labeled this phenomenon the "Merger-Emotions Syndrome" [8]. Figure 3 illustrates the stages in the syndrome, showing the downsizing, plateau, and upswing.

News of the Merger   Commitment to the situation

Denial   Enjoyment

    \   ↑
                                                    /
      Fear   Liking
        \   /
          Anger   Interest
              \   /
                Sadness   Relief
                      _____/

Fig 3: **Stages in the Merger-Emotion Syndrome**
Source: Hunsaker and Coombs, (1988)

Management should recognize that these emotions exist among the employees and deal with them as expeditiously as possible. At a minimum, managers should provide positive feedback to employees, emphasizing that their performance is commendable under the stressful situation brought about by the acquisition, in order to alleviate negative work-related feelings.

Depending on the type of merger, and amount of integration between the two organizations, some duplication of functions is likely to occur, resulting in the termination of some employees and managers.

To alleviate the ill effects of downsizing and the resultant stress, it was recommended that personnel decisions regarding loss or changes in responsibilities should be communicated openly as soon as possible [8,9]. " The longer the fear of the unknown exists the more damage will be done as the most qualified people look for more secure positions, and the other employees scurry to ensure security for themselves".

To dispel or correct misinformation, employees should be apprised of any downsizing strategies. It was also recommended that "if some downsizing and rationalizing is necessary, be honest about it. Tell people what is going to happen. Do not drag it out. Get the bad news behind you". If downsizing strategies are conducted in this manner, at worst management's integrity will remain intact, and every future communication to employees by management will seem credible [10]. If they are not, employee commitment to the organization may be

thwarted and may not be regained for sometime if at all. A merger can emphasize or even exaggerate the differences in status between employees; the resultant structure is often a constant reminder of who the 'winners' and who the 'losers' are. Differences in organizational cultures including management style can thus lead to competition between employee groups. This also could lead to "we/they" attitude. It is therefore very important to try to avoid this attitude by carefully and strategically mixing employees as much as possible at all organizational levels.

A practical advice to help ensure that there will be peopleware interoperatability and the process of merging will succeed is:

- To conduct a Cultural Audit.

- To conduct a Merger Stress Audit.

- Provide Employees with avenues to express concerns.

- To provide positive feedback to help alleviate the insecurity and fear of the employees.

- To recognize that the merger emotions syndrome exists.

- To prepare and deliver a realistic merger preview. This will allow employees to cope x with new or modified job demands.

- Conduct downsizing strategies as soon as possible.

- Management should share as much information as it can with employees before, during and after the process.

- To establish common culture by integrating the best of both companies into a common culture for the new organization.

4.3   Hardware Integration

History has proven conclusively that when a bank merger fails, it is usually for one of two reasons namely: (a) The acquirer either paid too much or (b) It botched the integration of the acquired bank's technology after the deal was done [11]. It was also noted that the integration challenge still remains and it is nearly as difficult as ever. However, there is a myriad of decisions that must be made during a post-merger integration project:

- How many call centres or data-processing sites should the new bank keep?

- Which bank's loan processing or teller platform system is superior?

- Should it try to accommodate the functionality of the acquired bank's technology platform – saving, for example, a unique Internet banking feature that its own system lacks? *or*

- Should the acquired bank's customers move to its various banking system in an effort to rationalize the combined technology infrastructure as quickly as possible and cut cost?

With the reliance on IT systems to handle everything from in-branch transactions to online banking, technology is central to today's modern banks. Resolving IT issues after a merger is a big exercise and the identification of numerous, sometimes countless systems for accounting, operations and servicing for example, can lead to unwanted surprises.

It is however, imperative that banks immediately address inventory systems by:

- Addressing the compatibility of their technology platforms,

- Identifying the number of system redundancies and

- Estimating integration costs.

Although a target that is technologically advanced can offer IT expertise, the challenge remains whether existing infrastructure in either bank has sufficient scalability to handle the integration and growth of the combined entity for the foreseeable future.

Electronic Connectivity is the communication hardware backbone. The first step in the interoperatability process is the ability for two or more systems to exchange information electronically. To do this, the network and communication infrastructure must be in place. Many technologies facilitate this type of communcation, but the Internet Protocol (IP) dominates. Security layers and access control mechanisms can be laid upon the IP foundation. Most of these solutions lie in dedicated hardware. Connectivity amongst the banks should be rapid, consistent and decentralized for effective integration.

Recent research has shown that the secret of most viable banks in Nigeria lies in their dogged believe in IT[12]. Examples of such are: First bank, Union Bank, Zenith bank, GTB, and host of others.

Therefore IT integration resulting from mergers and acquisitions would only require a reallignment of the available resources of the merged banks. Thus the networked equipment at the various state branches still stand, the VSAT and Radio links realligned and redirected as appropriate. Thus, the VSAT at the various state headquarters are connected through a hub to the satellite for efficiency. The proposed hardware connectivity for inter state and intra state are presented in figures 4 and 5.
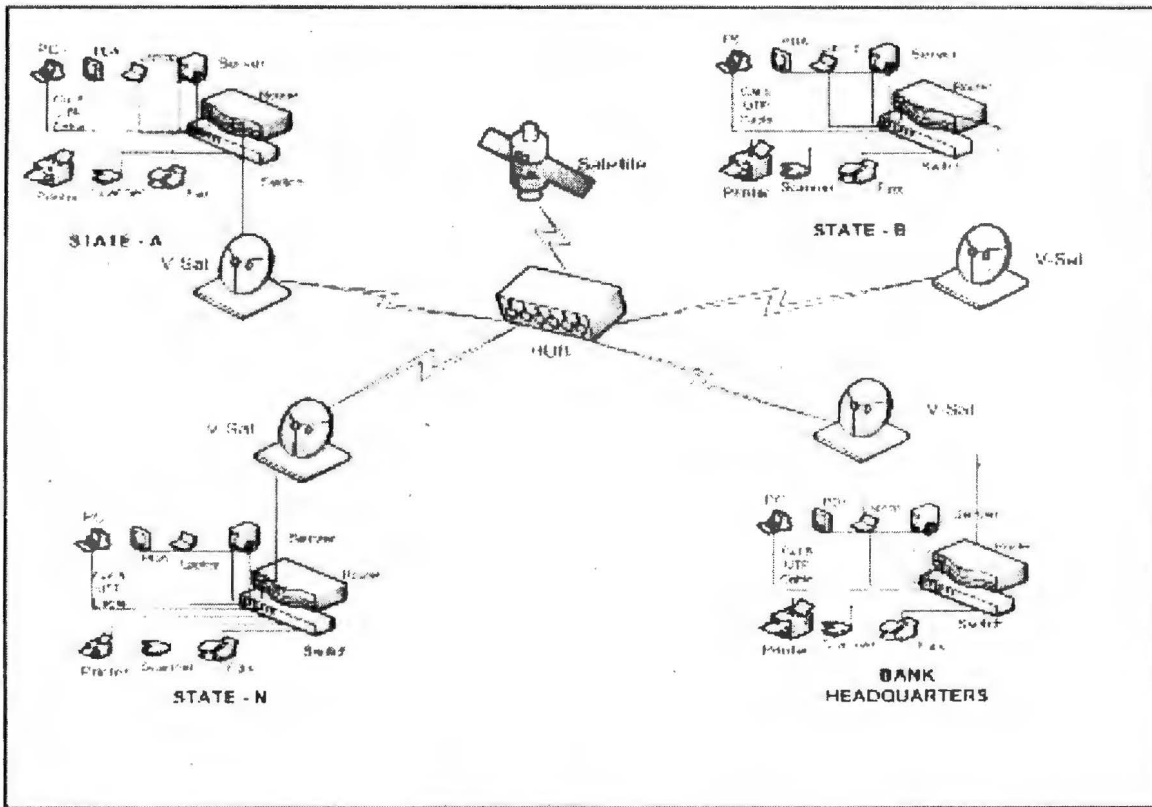
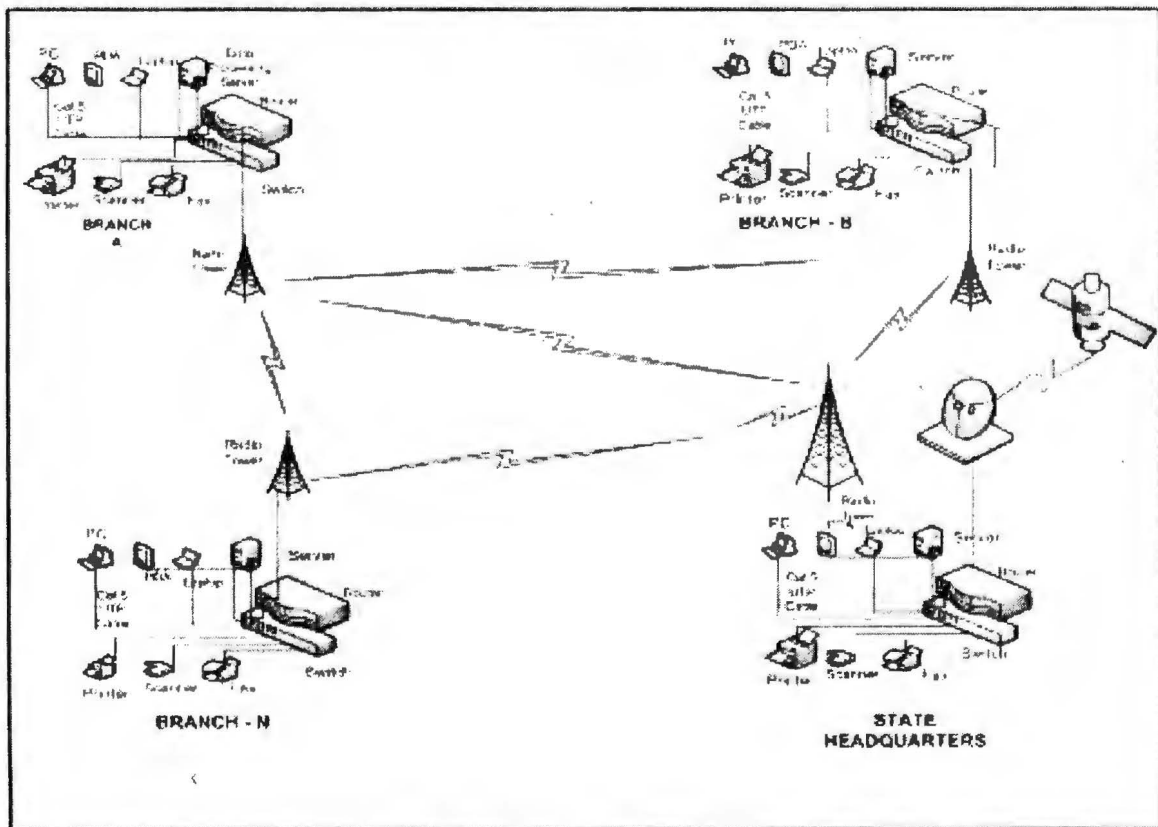**Figure 4: Hardware Connectivity (Inter State)**

Figure 5: Hardware Connectivity (Intra State)

Undoubtedly, more branches will emerge as a result of mergers but some branches that are within the same vicinity will be closed down. This will necessitate particularly within a state to redirect the Line-of-Sight of the radio antenna and where distance is an issue, a scaled down VSAT or mirowave can be employed not only for attenuation but reliability.

5.0   IT Migration

The integration of two banks is complicated and time consuming but the cost savings realized from full and smooth migration can be substantial. Banks tend to have complex operational structures, often with many brands, branches, and product sets. But amid that complexity, it is possible to structure an approach that taps synergies, serves customers, at least as well as they were served before, and achieves suitable trade-offs among internal parties. To merge these structures for maximal synergy and minimal customer disruption, it is necessary to transform the IT functions that underpin them. This will lead to a rapid migration that captures synergies quickly and a slow one that focuses on a smooth experience for customers.

Migration process however could be manual or automated. A manual migration involves physically closing down a customer's account on the old system and opening a new one on the target system. This will take time and resources and introduce the possibility of human errors. However, an automated migration, while faster and more accurate, will require the IT staff to construct complex routines, with significant mapping in order to address all possible account relationship scenarios.

To reduce cost and complexity all the key interest groups in mapping of an integration strategy should be involved in the migration process. This will meet the needs and expectations of customers while at the same time vigorously pursuing the anticipated synergies of the merger.

6.0   RECOMMENDATIONS AND CONCLUSION

A major obstacle to the current recapitalization and consolidation drive is the issue of interoperability and compatibility. Therefore having an XML-based integration layer leaves the existing systems intact and operational. This is a lot of relief to the banking sector as existing customer records are readily accessible without much ado.

Technology is prime to mergers and acquisitions and a failed IT integration is of high consequences. Therefore, there is need for proper planning and execution Interoperability offers a heterogeneous environment to operate.

The compatibility of disparate technologies operated by the merging banks is the greatest technical problem facing the consolidation exercise. Therefore, the software and hardware proposal presented will bring about a seamless convergence of all the service delivery channels. Interoperability leads to proper management of the

available resources as it offers heterogeneous environments and thus making the transition seamless and business as usual.

Similarly, additional cross-system operations and workflow can be added in a modular fashion to implement new services, while the multi-channel e-banking portal provides the user interface component to the distributed processing environment with support for both mobile and electronic banking.

Finally, **"A word of caution!!"**. The integrated system must be tested with caution with clinic option for backup alternative to prevent accidental loss of data as well as prevent the disruption of operation.

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