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Methods for Achieving Seamless Migration of Digital data

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Abstract: Structural properties and interpretations of business data have changed across the globe in a recent time. Accordingly, how to achieve flawless migration of digitally oriented data during consolidation of different corporate organizations are increasingly generating research concerns given the growing rate at which most consolidations frequently failed globally. Experience and research suggest that different establishments can garner diverse formats of digital data weekly. Secondly, most organizations that intend to consolidate their resources often implement and operate different digital resources for service delivery. Using financial firms as examples, there are inherent vulnerabilities in the front-end and back-end of digital systems that financial setting is using to support service delivery. Thus, consolidation's team is often faced with critical issues on how to avoid failed consolidation. Therefore, this paper critically explores migration of digital data. The paper also discusses issues to be considered by professionals whenever multiple organizations have agreed to merge their businesses together. Consolidation and its duality are also explicated. We further present practicable suggestions on how companies can easily achieve seamless integration during migration of digital data across heterogeneous sources.

Keywords Consolidation; data integration; seamless integration; Mergers; Acquisition

INTRODUCTION

It is a well-established fact that different organizations that adopt digital resources to augment their businesses are often necessitated to acquire diverse sources of data for them to adequately meet the requirements of their businesses globally (Michal et al, 2015). Recently, this new business paradigm is generating a major research concern whenever multiple companies or businesses have decided to consolidate their digital data to form a mega company. The fact is that most global organizations must gather; process and report business data such as image, text, document and encrypted files before they can concurrently conform to best global practices, regulatory standards, provision of effective customers' services and attainment of corporate objectives. Thus, accurate understanding of data that originate from multiple platforms becomes a critical issue to the human analysts as the size of the data to be analyzed increases.

Using financial setting that deals with investments or savings, private and corporate activities as our example, the global market is highly competitive (Cyree, 2010). Thus, financial companies are often required to embrace new computer's technologies for them not to be rapidly obsolete in achieving effective service delivery in this new era of globally competitive market. The necessity for market's segmentation can make shareholders to go for consolidation in other to form a viable and dominant establishment. Consolidation is a complex concept nowadays. Consolidation can be used to describe mergers of one or more companies with weak or viable company or companies so that they can collectively dominate the market at which they operate (Shsu, 2015). Successful consolidation can boost the stability of the business and subsequently increases the profitability the management will accrue to their shareholders at the end of each year. That is consolidation have the tendency to increase the returns on investment (ROI) for the shareholders. In this era of massive unemployment across the globe, successful consolidation can promote job's security across labour market.

Conversely, there are plentiful consequences of failed consolidation. Demergers, litigations, unemployment, bankruptcy and systemic failure are few of the consequences of failed consolidation in a recent time.

Furthermore, in Figure 1 for instance, conceptual view of consolidation shows its dichotomy into mergers and acquisitions. Merger can be seen as an amalgamation of commercial companies to form a mega company that will operate under single management. Merger can also be seen as fusion or consolidation of two corporations into one corporate group. In essence, merger is the integration of departments and units of legacy companies into an integral whole. A merger can occur in the form of outright acquisition of smaller or ailing companies by viable a company (Quora, 2015). In other words, acquisition is the act by the strongest company to contract, assume and totally purchase one or many unstable companies. Acquisition can generally lead to transferred possession at the end of the consolidation. Shareholders of different viable companies may agree

to combine their resources together to form a mega company that will have huge capital base, numerous branches and elaborate influence in the global market. In this case, the ownership of the smaller companies that are acquired suddenly change or lapse at the end of the merger.

Shareholders expect the liquidity of the mega company to be better than any of its legacy systems whether consolidation involves mergers or acquisition. The term liquidity is used to describe the capacity of a company to be in cash or possess assets that are easily convertible to cash or its debt paying capability. Broadly speaking in Figure 2, consolidation involves fusion of all segments of the legacy systems. For instance, assets to be consolidated are the capital and liability of each company. They include the available funds, cash with other organizations and cash in hand within the legacy's organization while liabilities can be debits, deficit, overdraft; loans incurred by the legacy's organization and the obligation for each legacy company to make future payment. Fixed assets are resources such as cars, computers, tables, land and building that an organization possesses. Fixed assets can be the physical properties that an organization uses to run daily business.
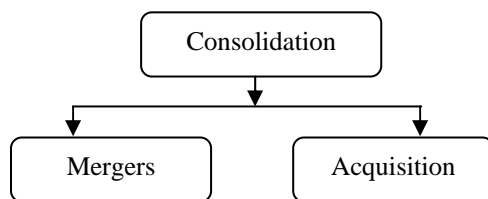

Figure 1: Conceptual view of consolidation

Thus, this paper basically discusses important technical issues that are often considered during consolidation of digital data.
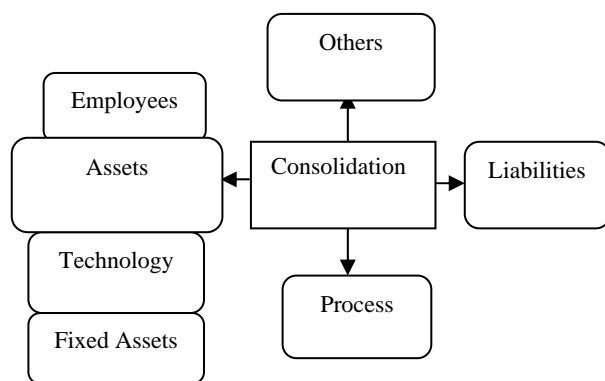

Figure 2: Consolidation is a broad perspective

Findings suggest that challenges with consolidations are enormous. Consolidation of digital data can necessitate employees to acquire new computer and operational skills, new knowledge about certain computer products, novel techniques for delivering effective service delivery and new knowledge about digital interface with third-party's applications. Consolidations that lead to the acquisition of new digital tools can enhance productivity of workers at their various workplaces. Nevertheless, experience suggests that there are associated costs for such developments to effectively drive personal development and productivity across private and corporate settings. On a broad perspective, some consolidations can incorporate novel innovations that must be incorporated into workplace to effectively drive office automation.

Furthermore, there are two paradigmatic relationships within the conceptual analysis of the acquisition of technologies during consolidation of digital data and whenever employees must embrace new computer's technologies for them to have improved productivities after consolidation of digital data.

Besides the peculiarity of the aforementioned conceptual views, the newly embraced technology can make the end-users to completely overhaul their entire old digital infrastructure and replace them with the new products or toolkits. Similarly, the newly embraced tools may also lead to a partial revamping of the existing infrastructure in the organization in other to augment the efficacies of business procedures.

Nevertheless, each of the above possibilities has their drawbacks and tradeoffs that stakeholders must ascertain before assenting to decisions to embark on consolidation of their companies.

Additionally, the significant contributions of this paper are many. The paper broadly discusses the concept of consolidation of digital data from technical perspective. Basic concepts that will help system's auditors, management and human operators to mitigate challenges inherent in consolidation of digital data are elaborately discussed.

In addition, this paper significantly presents causes and consequences of failed consolidation in lucid and coherent manner. Unlike most ideas that are excellent on papers but are practically unachievable, pragmatic steps and strategies for ensuring seamless migrations of digital data are also suggested in this paper.

The remainders of this paper are organized as follows. Section 2 discusses concepts of data analytic during consolidation. Section 3 will discuss technical issues during consolidation; section 4 gives consequences of failed consolidation while section 5 concludes the paper.

DATA ANALYTIC DURING CONSOLIDATION

During consolidation of digital data, it is imperative that integration's team should carried out in-depth investigation into the component parts of the various sources of available data and their

relationship with the front-end and back-end of the software they intend to migrate into the new platform.

In this context, data integration describes the act of combining digital data from various sources into a mega platform. Data integration can be interchangeably used to signify systems integration or the conversion of digital data into a consolidated platform. Fundamentally, the necessities for companies to migrate their digital data from one platform to another platform are unavoidable nowadays especially if the business is massively growing or progressing. Government, shareholders and economic reasons are some of the core factors that can compel companies to merge their resources together.

Data analytics are easily possible whenever financial data is stored in a computer system irrespective of whether the repository is a standalone computer or a collection of interconnected computer systems (Shay, 2004). Such data is portable to share and transported across many users. Data that is stored in computer systems are veritable tools for supporting strategic decisions and planning purposes (Han and Kamber, 2006). Consequently, mergers and acquisition of weak companies are often possible among corporate organizations. In Bill (2011), merger is an amalgamation of two or more companies to form one big company that is being managed by the same management. Acquisition occurs whenever a more viable company takes outright possession of another company (Edwin, 2008).

Usually, there are three crucial areas where threats can confront financial organizations that intend to merge or integrate their computer data together. Firstly, private computers and computer's peripherals usually have some inbuilt flaws are not possible for all the existing audit techniques to reveal, elucidate and propose strategies that will mitigate all of the inherent flaws. In general, companies will need sound Information System (IS) audit controls, strong contingency and realistic strategies to mitigate intrusions before companies can stop or mitigate electronic frauds and sharp practices that can occur during and after data migration.

Besides fraud and deceit, system can naturally generate certain degree of computer's errors during data migration. The applications can improperly or partially update some tables that provide input to other services, applications or tables.

Furthermore, the conversion team can unknowingly commit human errors that may not be immediately ascertained during the testing and extraction of the data from the legacy locations until the new locations are vigorously analyzed by competent experts. In fact, the end-users may eventually discover some computer errors that they may not be able to immediately discern how they can correct them. On the other hand, if the strategies set up to mitigate the above issues take precedence over the preventive measures, then, the data owners must

have efficient computer forensic methods that will enable them to thoroughly investigate the entire processes before, during and after the data has been migrated to the new platform. Internal and external fraudsters can exploit audit issues or vulnerabilities in the process of migration of financial data from legacy systems to new platforms (Shay, 2004). The severity of the incidents that the participating companies can incur depends on the sensitivity and the usefulness of the data to be migrated. Hence, data migration is a critical computer project that must be thoroughly planned, implemented, monitored and reviewed by experienced professionals.

As shown in Figure 3, data migration can involve the need to migrate data from multiple sources to one platform. Example is the case of mergers and acquisition of two or more companies to form one big company. Similarly, a company might want to integrate their offline branches together to form one central data repository to cite a few. In essence, this paper discusses some of the issues that can affect data migration at each stage that is involved in the conversion process so that stakeholders can identify such issues and addressed prior to the commencement of the project and if the need be, they can easily rectify them after merger. One of the contributions of this paper is its ability to further buttress audit issues that are often over-sighted during conversion of computer data from the practical perspective.
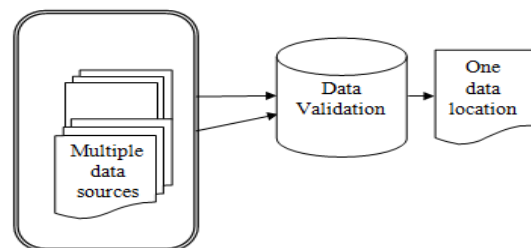

Figure 3. Overview of data migration during consolidation of digital data

This paper has also provided additional hints and guideline that will complement the skills of computer professionals while supervising data merger, data acquisition and data migrations from one platform to another platform. In addition, we have explicated some risks in data migration and how they can be mitigated.

CONCEPTUAL DISCUSSIONS OF SYSTEMS INTEGRATION

The need to integrate computer systems from two or more financial companies together as shown in Figure 4 may arise. Consolidation or systems integration is the underpinning pivot that merger and acquisition rest upon in modern business. Merger is

defined as the amalgamation of two or more companies to form a robust company.

Contrarily, acquisition denotes the act by which a company otherwise known as an acquirer takes outright possession of one or more companies from their original owners. Companies engaging in mergers and acquisition typically sign a memorandum of understanding (MoU). MoU is the foremost stage of contractual agreement between two or more companies to substantiate the managements of the participating companies have agreed to willing consolidate their businesses together and henceforth acting as a unified company under the same management. The requirements for migrating data during mergers and acquisition of financial companies are different from non-financial companies.
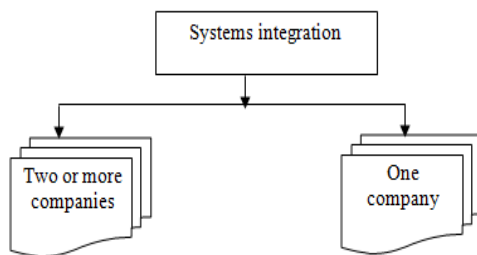

Figure 4. System integration

Figure 5 illustrates potential resources that can be migrated in the context of consolidation of financial data. In Figure 6, we propose waterfall approach to demonstrate critical processes in the consolidation of digital data. The conversion teams must take the inventory of computer systems to be integrated. Such inventory must encompass the entire computer systems across the legacy companies. The responsibilities of integration experts depend on the diversity of computer resources to be migrated. The consolidations of financial data usually include extraction of data from account, rate, interest, hold fund; cheques payment issue, time deposit, facility, banker's acceptance, account's charges, loans, signature and standing order.
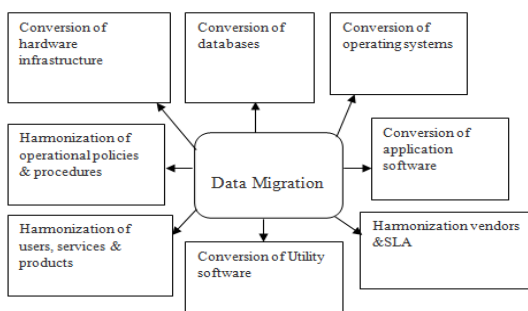

Figure 5. Migration of financial data during consolidation of digital data

The new platform should be mergers and acquisitions of operational policies, hardware, computer software (operating systems, application and utility's software), vendors of their respective legacy systems. Service providers and Service Level Agreements are some of the essential parts of digital resources that should be consolidated as well

Once the management has approved the consolidation, it is essential to set up a team of data integration that will carry out the extraction and migration of the data from all the legacy systems involved in the mergers into the new platform. The team should consist of specialists and representatives selected from the merging organizations.
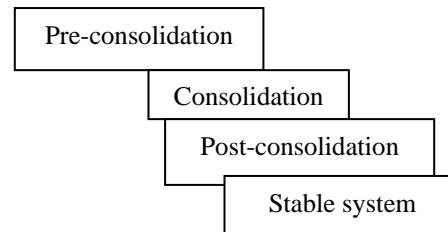

Figure 6. Waterfall's approach to the consolidation of digital data

Technical consideration is very important in every consolidation. It is imperative to incorporate the Head of Information Technology and core managers of each organization into the team. The team should be assigned with the responsibilities to conduct scoping of the consolidation. The project manager or the integration's team should liaise with a range of business units and departments that will be actively impacted by the conversion during the scoping of data migration. Such communication will be helpful to determine and predict the nature of the consolidation; the quality expected by each unit, the existing ability of employees; deadline, significance of the data migration's process and how to suitably prioritize tasks.

Scoping in the above context can help integration's team to quickly identify solutions, refine their strategies, redefined scope of data extraction; realistic plans and strategies that can help them to complete the tasks without difficulty. Some companies may outsource some aspects of the consolidation of their digital systems to consultants. Consultants may be hired as project managers. The duties of the project managers may include negotiation and reconciliation between integration's team and the managements; planning, execution and monitoring stages of the conversion. The consultants should be capable to establish unambiguous, well-informed and manageable objectives from the commencement of the consolidation to the end of the project. They need to collaborate with the legacy companies to construct resources the conversion will require and assist them to supervise and manage constraints (cost, time, efficacy and quality).

Further still, data migration generally involves setting the objectives of the integration, identifying potential risks in the integration; identify how to effectively manage, reduce or eliminate the risks, setting realistic deadlines and judicious allocation of computer resources to achieve the objectives earlier stated for the project within its deadline. Such measures are central impetus for the completion of data migration within the agreed deadlines. Furthermore, the prevalence of security concerns have necessitated the need to actively monitor, track and constantly update the stakeholders with the progress and achievements the integration's team is making on routine basis. In this case, effective communications, team spirit and excellent interpersonal relationships are necessary skills that internal and external stakeholders should possess to achieve the desired objectives. The criticality of the paradigm of inventory of computer systems in the reconciliation and validation of migrated data after data conversion has been achieved cannot be underestimated. Many researchers suggest that a computer machine is an electronic data processing device that accepts raw data from its input devices and processes the data into a human readable form (output). Thus, a standalone computer system can basically be divided into hardware, software and the human element. The complexity of the resources to maximize productivity increases from a standalone implementation to networking systems.

Database migration during consolidation of digital data

It is possible to have multiple databases within a legacy system. Hence, the list, names, functions, tables, attributes and schemas of existing databases in the legacy systems must be ascertained prior to the commencement of their conversions.

Data migration can be from one database to another database. For instance, computer data can be migrated from Sybase database or Access database to another database such as Oracle platform or vice versa. It can as well be from a lower version to a higher version of the same Database Management System (DBMS).

Operating systems integration during consolidation of digital data

Data migration may require analysts to merge two or more operating systems together. In Figure 5, the conversion team must therefore understand the various forms of operating systems in the legacy systems. They must also agree on the operating systems to discard and particular versions they will select as the universal platform to migrate all the legacy systems to during their meetings before the conversion will commence. Limitations can arise due to lack of needed skills. Thus, audit issue arises whenever they accepted approach is not properly documented. Lack of compliance with regulatory standards or principles upon which the resources to

be migrated depend and insufficient data information that will be manually inputted into the new platform are supplementary issues that integrators must deeply consider in the contextual migration of operating systems within a financial setting.

All application software must be integrated in accordance with user's requirements. These should include office tools such as word processing utility, spreadsheet and Internet browsers, utility for printing and editing documents, Database Management Systems (DBMS) such as Oracle database, Access database, MySQL database and Sybase (Han and Kamber, 2006). In addition, system's software such as Microsoft Windows, Macintosh (OS X), UNIX and Linux operating systems in the legacy systems and suitable hardware for them after integration must be considered to avoid incompatible platform.
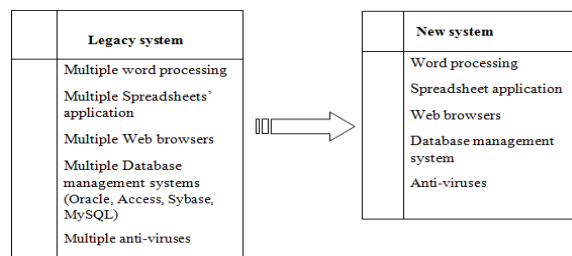

Figure 7. Understanding the legacy systems during consolidation

Technical issues to be considered during consolidation of digital data

Migration of digital data within a financial sector can progress through multiple stages as shown in Figure 7. Accordingly, it is imperative to incorporate inbuilt security measures as much as possible in each stage of the consolidation. The quality of security measures that can be incorporated into data extraction should commence with the data formats agreed by the integration's team. Usually, the formats of the data to be migrated depend on the specifications agreed by the integration's team. Some data may be required to be organized in rows and columns. In this case, such data will appear in the form of organized grids, lattices or cells. Secondly, it is also possible to import sequence of data with certain fields or attributes in the form of records. Some data might need to be concatenated before they can be migrated into the new platform. Data concatenation is the procedure whereby the sequence of attributes in a record of data is joined together by at least a special character. Proper document of the extraction routines, data formatting and inbuilt paddling that is done to the data should be carried out and they must be dully approved by the management.

The data's definition may recommend that the attributes in the data should be delimitated for the data to conform to the new platform. This can be carried out by concatenating some attributes of the data with special characters. Some special characters

that can be used to concatenate data during extraction are hysteric (*) and quote (-).

Delimiters can format data in many formats. Experience suggests that data to be migrated can be configured differently (David, 2009). Delimiters may occur in different formats and the data may have different formats of file extensions. The actual formats of each kind of data can depend on different platforms and software in the new platform.

The significant of data formatting is many. For instance, the formats of output data can reduce or increase frauds and illegal update of data during consolidation of digital data. Data can be extracted in the format of Portable Document Format (PDF). This kind of output data helps users to print, view; annotate and restrict illegal modification to the structure, content and attributes of the data by external operators. The format also helps analysts to restrict access to the data by password, encryption and digital signature. More so, textual documents, graphical and multimedia images can be converted into PDF. Users can extract, reprocess and use such data for further purposes. Thus, analysts can create an editable version of data that is extracted in the format of PDF. The extension of a file in the PDF format is 'dotPDF' (.PDF).

The Comma-Separated Values (CSV) can be used to format output data during consolidation of digital data. Data that is extracted in the format of the CSV comprises of entries that are separated by delimiters or special characters. Some of the delimiters that can be used to delimit data in CSV formats are comma (,); exclamation mark (!), semicolon (;), hysteric (*), single quotation mark (ˋ), double quotation mark (") colon (;), double colon (:), hash (#) and vertical bar (|). A file extracted in the CSV format has an extension of '.CSV'. Such an output file can accommodate text format so that they can be easily readable to most digital applications and human analysts. Data extracted in the format of a text file has an extension of '.txt'. Nevertheless, there are dangers in saving digital data in text files because they can be edited and written by illegitimate applications.

Digital data can be extracted in the format of printer (prn). Data that is extracted in PRN's format will in the form of print file and its extension will be '.prn'.

Digital data can also be extracted in the format of data file. A data (DAT) file helps analysts to restrict users from manually opening the file. Hence, the data file can be opened, read and referenced by specialized toolkits.

DOCUMENT (DOC) file is another format for extracting digital data. Digital data that is extracted in the format of document can signify textual information. The data can also be in the forms of charts, tables, multimedia images and graphical images. Document files are familiar inputs to word processing applications. The extension of document's data is denoted by '.doc'.

Digital data can be extracted in the format of Extensible Markup Language (XML), or image files in the formats of TIF, JPEG and PNG. Video files can exist in many formats such as MPEG, MKV, mp4 and MPG. The codes that carryout the extraction of these data must be able to Open, Read and Extract or Write from their various sources in the agreed formats.

The central issue here is that auditors working with the consolidation's team must ensure that each extraction code is extracting the data in an append mode. This will enable all the information to appear in a sequence of records.

In essence, digital data that is stored in computer systems can be extracted using automated programs in any of aforementioned formats. Since there are limited proprietary toolkits that can adequately meet the requirements of the consolidation's processes, it is necessary that integration's team should develop their codes. An audit issue can occurs if extraction's codes are not properly reviewed and if they are tested by amateurs. Some codes may be repeating certain records at a hidden interval especially if they involve reading from heterogeneous relational tables. Such problem can be resolved by calculating the numbers of records the codes have extracted in the output file.

Strategies to mitigate audit issues during consolidation of digital data

There are numerous strategies that can help stakeholders to mitigate unforeseen circumstances during and after consolidation of digitalized data. Audit issues can arise at any stage of consolidation. Irregular meetings between teams saddled with consolidation and the top managements of legacy systems is one of the audit issues that should be averted throughout the processes of the consolidation.

Quality and the skill possess by the individual members of the team teams saddled with consolidation can be a source of serious audit's concern. Skill auditing and early determination of the integrity of each team's member can lessen the abovementioned issue and negative impacts it will have on business process and workers that are working in the mega company (Nehinbe and Nehibe, 2005).

Quality of technical team can impact on data migrations during consolidation of digital data. Awareness, training and capacity building are antidote to alleviate fears and poor performance while working with the legacy system.

Auditors should embed internal controls in the core stages of the consolidation of digital data. The efficacy of the control measures employed in this context should be tested to ensure that they do not impede organizational and operational processes.

Essentially, the central idea here is that collaborative efforts of professional system's auditors,

technical and non-technical experts can help to evolve feasible strategies to implement suitable mitigations in this context.

Planning phase of data migration during consolidation

The success attained in the process of migration of financial data is often pivoted by some critical factors such as the scoping of the project. Consequently, it is imperative for the integration's team to meticulously plan ahead of time. This will assist them to evolve feasible stages to migrate the data irrespective of the degree of homogeneity or heterogeneity of the data.

The scoping is an initiative that can progress through multiple stages. The purposes of scoping may subsume identification of the potential impacts of the data migration on the business operations and how each department will receive sufficient supports upon the completion of the migration. Scoping in the context of financial data can also help an organization to discern and isolate unimportant stakeholders from core stakeholders in the migration's processes.

Good planning can help to synergize collaborative team's work and to actively organize resources that are needed to achieve successful consolidation. Excellent planning can help financial companies to avoid recruitment's errors and to ensure they completely eliminate redundancy in the integration's team.

Approval to commence consoldiation of digital data

The various computer programs that are written to extract the financial data from their various sources must be properly tested to ascertain that they are working in accordance with their designed objectives. All the computer programs that are developed to extract the data must be implemented in the test areas. After they have been thoroughly tested and ascertained that they are working according to the designed objectives, the date of the real-life conversion can be determined.

According to best practice, it is advisable to convert computer systems during weekend to reduce interference and to have enough time to correct potential conversion issues that may arise. Hence, it is imperative that top management should endorse the document to show their legal support and commitment to carry on with the migration. In the case of financial data for instance, the content of the document should also include how to deal with exceptions such as irreconcilable items on the date of data conversion.

Reconciliation phase after consolidation of digital data

Human analysts must carry out reconciliation of chequebooks and bank statements of legacy systems before consolidation and compared them with respective chequebooks and bank statements in the mega system. Usually, integration of massive data from multiple platforms may not be seamless. According to best practices, it is imperative for the integration teams to design automated methods for reconciliation converted computer data especially whenever they are dealing with massive data.

Similarly, there are indications whereby Manual methods for reconciliation can be employed to complement automated methods for reconciliations between the items in the legacy systems with the new system (platform). In this case, data reconciliatory team must be prudent and observant so that they can identify fallacious or suspicious entries. There should be approved procedures for dealing with fallacious or suspicious entries.

Some suspicious transactions may be due to system's errors, human errors while some may be deliberately cooked into the database. Thorough understanding of the legacy systems will thus provide insightful understanding of the new system in this case.

Database cleansing phase during consolidation

Some attributes of financial data in the database may have been truncated or corrupted during data formatting. Some segments of the data may be incorrect or there may be other reasons to update the data in the new platform.

The quality of each table and record of data may need to be augmented by adding additional attributes. Hence, approval of inspection of the data with the view to cleanse them is necessary after conversion.

Avoidance of manipulation during consoldation

Digital data can be erroneously or deliberately modified or lost in transits during consolidation or extraction into a new platform Therefore, people that are involved in the handling of the extracted data must be strictly supervised by Information Systems auditors.

It is unsafe to send migrated data through emails or external computer's networks. Hence, there should be external disks that are dedicated for the storing and migration of the data from the programmers that are extracting the data and to team that is implementing the process in the new platform.

CONSEQUENCIES OF FAILED CONSOLIDATION

This section suggests some of the consequences of failed consolidation. Failed consolidation can lead to demergers. Demerger is a phenomenon whereby companies that have already consolidated their resources decide to opt out of the merger and subsequently reverse to their respective legacy systems. Demerger can signify the fission of company into two or more parts as agreed by the stakeholders.

Besides, some shareholders may be disgruntled at the end of the consolidation. One of the main

penalties for inability to achieve seamless integration is segregation. Such disgruntled shareholders may be sequestering the mega system and they may eventually go to court to alter their previous Memorandum of Understanding (MoU).

Data vandalism is a serious challenge whenever consolidation fails. Data can be vandalized through defacement, sabotage and damage by powerful segment of the legacy systems that does not completely support the consolidation. This problem can be tedious to resolve if both the legacy systems and the new platform are vandalized by saboteurs.

In addition, some sections of the employees may be disgruntled by the outcome of the mergers especially if they experience or foreseen bad working conditions. Resolving legal issues if they arise at post-consolidation depend on the complexity of the issues involved. Temporary possession of the mega system by legal authority is easily resolvable through dialogue, transparency and capability to reconcile legacy systems with the mega system.

CONCLUSION

We explicate consolidation and its duality in the context of integration of digital data in this paper. We define merger as the combination of two or more companies to form a mega company. The resulting company is expected to be robust and better positioned in the market than any of its legacy companies. The mega company is usually seen to be strong enough to withstand and overcome market's challenges and adversities if the merger is seamless.

Thus, consolidation's team often faced critical issues like security of financial data, how to handle series of inherent audit and forensic issues, how to achieve faultless migration whenever the data is extremely heterogeneous and how the team must successfully migrate the data from their various legacy systems to the improved platforms within a short life cycle.

This paper has suggested that consolidation of digital systems in the context of a financial sector is a broad concept that is closely related to system's integration, data migration and data conversion. The above-named concepts can be viewed collectively as the integration of logical and physical components of computer systems together which must be strictly carried out in accordance with specific requirements of the users. We have further discussed several formats that are commonly used to digital data. Some of the formats discussed are extensions of files such as '.doc', '.pdf', '.text', '.dat', '.csv', '.xls' and '.prn'. Suitable mitigation strategies must be adopted since new technology has two profound impacts on IT management. It is necessary that best practices are employed to safeguard and to strengthen the positive impacts, importance and benefits for using new technology for consolidation of digital data.

Similarly, suitable business contingency approaches such as regular backup, ability to lessen system downtime in data conversion and competence to promptly reverse to legacy systems if the integration fails are key antidotes to eliminate some of the potential negative impacts and challenges inherent in the usage of new technology associated with migration of computer data.

Additionally, we have extensively discussed series of security, audit and forensic issues in this paper. We suggest that some computer codes for extracting digital data may possess inherent bugs which may not be immediately discernible to the programmers that have written them. Such bugs or weaknesses can be substantiated with rigorous analysis on many files or relational tables. We have also discussed series of formats of digital data. For instance, experience shows that text data is easily translated and decipherable by human beings and digital data that is extracted in textual format can be delineated by series of alphanumeric characters.

We have opined that the advancements in digital technology over the years have drastically influenced developments in all aspects of digital systems that are used in the financial sector worldwide. In Anita (2010) for example, computer and hardware industries evolve through many generations such as Vacuum tubes, transistors, Integrated Circuits (ICs), Microprocessors (intelligent chips) and Artificial Intelligence (AI). Similarly, computer software industry has witnessed developmental changes across Machine language, Low level or assembly language and structured programming languages such as Common Business Oriented Languages (COBOL), C and FORTRAN languages, text formatting and in the areas of languages for accessing database management systems such as Structured Query Language (SQL) (Anita, 2010). The consolidation's team should remember that there are outstanding developments as well across different computer peripherals over the years. Seamless integration is a major challenge while dealing with consolidation of big digital data (David, 2009).

Seamless migration of digital data during consolidation goes beyond achieving perfect, consistent and coherent data whenever the new platform is compared with their respective legacy systems. Research and personal experiences often suggest that the existing computer security measures and Information System auditing techniques are increasingly becoming inadequate to completely curtail or wholly prohibit weaknesses that can emerge in course of migration of big digital data (Han and Kamber, 2006; Shay, 2004; Nehinbe, 2011). Hence, consolidations without some issues to be resolved after consolidations are rarely possible.

Accordingly, we suggest that the existing validated procedures and standard templates for migrating big data must be properly fine-tuned to lessen their inherent weaknesses and to prohibit exceptions at all

phases of consolidation of big digital data. The concepts of vulnerabilities in digital systems and electronic fraud are common issues in digital setting (Nehinbe, 2010, Shay, 2004). However, the actual features that will enable financial operators to discern all of them and suitable strategies that will completely exterminate them in the modern digital era are concerns of stakeholders in financial setting.

Essentially, consolidations can fail at the end of the merger. Failed consolidation may lead to litigations, unemployment, bankruptcy and systemic failure. Besides, one of the main penalties for inability to achieve seamless integration is segregation which may be due to some disgruntled shareholders sequestering the mega system. Some sections of the employees may be disgruntled by the outcome of the mergers especially if they experience or foreseen bad working conditions. Resolving legal issues that arise due to failed consolidation depend on the complexity of the issues involved. We suggest that temporary possession of the mega system by legal authority should be resolvable through dialogue, transparency and capability to reconcile legacy systems with the mega system.

Nonetheless, this paper has not intensely discussed the conversions of different peripherals of digital toolkits used across all organizations. We have not completely covered the underpinning principles and threats to consolidations in a generic term. Additionally, we have not explored how to demerge corporate data whenever consolidation has failed in this paper. Thus, we intend to pursue the aforementioned areas in our future research work to advance the quality of this research work.

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