

Knowledge Sharing as a Tool for Professional Development in Surveying and Geoinformatics in Nigeria

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Key words:

SUMMARY

Knowledge and information are becoming key factors of development. Increasing scientific understanding and rapid advances in information and communication technologies are leading to unprecedented changes in how knowledge is produced and disseminated. The world is today regarded as a Global village. This revolution can be applied in the sharing of knowledge for professional development in Surveying and Geoinformatics.

Professional development is an integral part of the growth of any professional. This can be achieved through formal and informal training. In Nigeria, mandatory Development Programme has been instituted as a means of developing the competence of Surveyors in the country. This current way of development can be strengthened through knowledge sharing using the Internet as a tool. With the Internet, various sites relevant to professional development of Surveyors including FIG sites and sites of FIG affiliates in different countries could be accessed. The Nigerian Institution of Surveyors can easily share knowledge relevant to its professional development with similar associations.

Knowledge sharing will certainly assist in professional development of the members of the Nigerian Institution of Surveyors using information technology and communication as a medium.

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1. INTRODUCTION

Surveying and Geoinformation activities involve the performance of multitude of services besides determining land and property lines. They include: mapping the land for planning; managing National Geospatial Infrastructure; construction stakeout for buildings; geodetic and control surveying; as-built surveying; stakeout for other types of construction; directing the positioning of barges, dredges, hydraulic structures and offshore platforms; aligning heavy plant machinery; surveying for oil, metal ore and other mineral extraction prospecting, on the ground and below ground; mapping the bottom of bodies of water; quality control and quantity measurements in construction and mining; surveying for planning, construction and maintenance of routes; photogrammetry and remote sensing; GIS design; and GIS data collection; GIS maintenance; etc.

With the advances in technology, the business of surveying and geoinformation development is a big challenge. The form and content of surveying and geoinformation knowledge are now subject to change. Nwilo and Osanwuta (2001) and Matteo et al (1996) support the view that knowledge is scattered among various kinds of sources, including paper files and computer media which belongs to the competence of specific experts or to the shared experience of an organisation. To this end, many surveyors believe that the most valuable knowledge is the tacit knowledge existing within peoples' heads, augmented or shared via interpersonal interaction and social relationships. Practicing surveyors and business organisations should view knowledge as their most valuable and strategic resource, and bring that knowledge to bear on problems and opportunities as their most important capability. They should realise that to remain competitive they must explicitly manage their intellectual resources and capabilities.

1.1 What is Knowledge?

Knowledge is increasingly being recognised as a vital organisational resource that gives leverage and competitive advantage. It is fundamental to organisational competence, which Egbu (2001) defines as an ability to sustain the coordinated deployment of assets and capabilities in a way that promises to help a firm achieve its goals. Another way of understanding knowledge is to distinguish it from data and information. According to Zack (1999), data represent observations or facts out of context, and therefore not directly meaningful. Information results from placing data within some meaningful context, often in the form of a message. Knowledge is therefore that which we come to believe and value based on the meaningfully organised accumulation of information through experience, communication, or inference. Knowledge can also be viewed both as a thing to be stored and manipulated and as a process of simultaneously knowing and acting - that is, applying expertise.

A host of factors have given impetus to the growth of new knowledge to be shared. These include down sizing, non-availability of surveying jobs, non-recognition of the importance of surveying before and after a project, which had resulted in the loss of “cooperate memory” in Nigeria. Another factor is the convergence of new digital surveying equipment, RTK DGPS, telecommunications, and the multimedia. Thirdly, these new equipment had changed the conventional mode of practise, reduced delivery time and introduced values to be added to surveying products.

The importance and value of the organisation’s knowledge has been recognised by the significant increase in attention that the subject has received. Egbu (2001) also identified the knowledge worker as the employee of the future. However, Zack (1999) further explained that knowledge could be tacit or explicit. Tacit knowledge is subconsciously understood and applied, difficult to articulate, developed from direct experience and action, and usually shared through highly interactive conversation, story-telling and shared experience. In other words, tacit knowledge resides within individuals; the real potential for small organisation is to transform individual knowledge into organisational knowledge. In contrast, explicit knowledge is more precisely and formally articulated. Although more abstract, it can be more easily codified, documented, transferred or shared. Similarly, the potential of any surveying and geoinformation organisational knowledge base is only achieved when the knowledge experts or specialists exchange their expert opinions (and the information that forms their opinions) building a deeper understanding across specialist disciplines and thus expanding the knowledge base of the organisation. In this regard, when knowledge is shared and utilised, the professional development in surveying and geoinformation increases.

2. KNOWLEDGE AS A TOOL

While having unique access to valuable resources is either one way to create competitive advantage, in some cases this may not be possible, or competitors may imitate or develop substitutes for those resources. Surveying and Geoinformation organisations having superior knowledge, however, are able to coordinate and combine their traditional resources and capabilities in new and distinctive ways, providing more value for their clients than can their competitors. That is, by having superior intellectual resources, an organisation can understand how to exploit and develop their traditional resources better than competitors, even if some or all of those traditional resources are not unique. Therefore, knowledge can be considered the most important strategic resource, and the ability to acquire, integrate, store, share, and apply it is the most important capability for building and sustaining competitive advantage. The broadest value proposition, then, for engaging in knowledge sharing is that it can enhance the organisation’s fundamental ability to compete.

In the past, it was fashionable to complain of making good use of acquired raw data. The solution thus lay in the transformation of these data into information with the help of next-generation technology and better management. Our investments in these next-generation surveying and geoinformation technology overweigh the values we will be getting. That is why we must look to knowledge sharing as a means of leveraging these IT investments and transforming information into knowledge.

The enthusiasm of sharing knowledge is that it provides the right information to the right decision-maker at the right time, thus creating the right conditions for new knowledge to be created. This therefore points to the business value of information. Business value here refers to the key of deciding whether it might make sense to invest in knowledge. Farris (1999) gave an insight to the potentials of business value from the following perspectives:

- i. Capturing and distributing employees' undocumented knowledge. This is particularly important in a time of downsizing and outsourcing, and when the workforce is aging and headed toward retirement.
- ii. Making existing data and documents more widely available and more useful.
- iii. Combining dissimilar data and information to get a more holistic picture of opportunities and challenges.
- iv. Expanding and improving training. Training should continue throughout an employee's tenure, so that the organisation is continually upgrading its skills.
- v. Dealing with information overload. Most of us are not suffering from a lack of information. Instead of more information, we need better ways of filtering, storing, and retrieving the information we already have.

Sharing knowledge of surveying and geoinformation within the profession help create community of practise. Once again, it gives users the opportunity to view different reports, research findings, and suggestion on similar practice or equipment about “what is new” or in existence.

In the views of Kogan (2001), sharing knowledge help bridge the gap between generations of Surveyors. In the case we have three categories: traditional – those who are resistive to change; modern – those who believe that things should remain the way they are; and next-generation – these are the experimental surveyors. By providing a platform where knowledge sharing take place, motivation, productivity and morale will equally improve.

3. ACQUISITION OF KNOWLEDGE

Information and knowledge either is created within the organisation or can be acquired from many different internal and external sources. As mentioned above knowledge could be tacit or explicit. Therefore, knowledge acquisition should be based on the exchange of tacit knowledge within a community of practice. Its transfer to other communities requires its explication. It is subsequently internalised and made tacit again through reapplication. Knowledge transfer, then, can be categorised by one of four types representing knowledge creation, explication, transfer, and internalisation processes respectively: tacit-to-tacit, tacit-to-explicit, explicit-to-explicit, and explicit-to-tacit (Zack, 1999).

At the organisational level of surveying and geoinformation, the flow of knowledge between firms resembles the flow between communities within a firm. Tacit knowledge is created and shared within the firm. To promote sharing and reuse within the organisation, the knowledge may be explicitly articulated and codified. This creates the potential for the knowledge to diffuse out of the firm and into the organisation at large where it can be absorbed by individuals. At the same time, a similar process may be occurring with other firms in the organisation, creating the opportunity for the firm to absorb knowledge from the organisation

and to internalise it through its reapplication within the firm. In this way, the strategic knowledge environment of the industry can be viewed as the sum of the interactions among the knowledge strategies of the individual firms in the geoinformation organisation.

To the individual practicing surveyor and/or the experimental surveyor, websites from agencies like FIG, RICS, ACRSM, ISPRS, IHO, ESRI, etc will assist to educate geomaticians on current development, training opportunities, articulated and codified experiences and findings, visualise demonstrations of most surveying equipment usage in the development of the profession in Nigeria.

4. KNOWLEDGE SHARING MECHANISMS

This is aimed at creating knowledge services that will provide a framework for identifying and meeting knowledge needs to support surveying and geoinformation practice in Nigeria. As we mentioned above, knowledge is of two kinds: we know a subject ourselves, or we know where we can find information on it. Typically, surveying and geoinformation organisation contains a small number of relatively large firms and a very large number of quite small firms. About 98% of surveying and geoinformation firms employ fewer than five professionals. This fragmentation reflects the economics of production and encouragement that has characterised their inability to develop their access and transfer of knowledge. Too few surveyors are trained to replace the aging workforce and too few are acquiring the technical and managerial skills required to get full value from new technologies.

Therefore, many innovation processes in the surveying and geoinformation activities are becoming increasingly interactive, requiring simultaneous networking across multiple communities of practice such as professional groups, business groups, etc. This networking involves communication and negotiation among different communities interested in the innovation process. Aldred (2003) argued that in sharing knowledge, organisations will have to open to, formal and informal, information and knowledge flows from both networks and portals. At the same time, they must protect and preserve their intellectual capital and knowledge base because it is upon this latter point that survival depends. Apart from that, communications ensure there is no duplication across projects; set up channel of communications if several data sources are identified. The networks and portals should have the ability to search for and provide required information quickly and easily when dealing with enquiries and feedbacks. A website in this regard is essential for collating data and providing other information of interest to surveyors or geomaticians. One of the benefits of such a website is that surveyors or geomaticians can have a trusted, single source of data. Finally, the website would provide a framework that will easily enable trusts to provide this information and display in an acceptable manner.

Surveying and Geoinformation organisation need to recognise the importance of an active process management of knowledge creation, gathering, storing, and exploitation. The culture and climate and the mechanisms in place should allow for the possibility for knowledge to be readily shared and transferred from project to project across project and organisational boundaries.

Egbu et al (2000) described the associated characteristics of knowledge sharing mechanism as:

- i. A culture where there is openness and willingness to share knowledge and information supported by the top management.
- ii. A culture where people feel secure in their jobs and genuinely feel valued with some form of ownership or involvement;
- iii. A no blame culture and a risk tolerant climate where continuous improvement is achieved through learning from mistakes; and
- iv. Flexibilities in the lines of communications allowing top – down bottle up and lateral flow of information and knowledge support/ knowledge management in organisations.

Egbu (2001) further presented specific mechanisms that innovative organisations should put in place for transferring knowledge and embedding knowledge sharing into organisational culture. These include:

- i. Creation of knowledge teams – i.e. staff from all disciplines to develop or improve methods and processes.
- ii. Shareware – the provision of platforms, occasions, and locations that encourage knowledge exchange.
- iii. The introduction of knowledge web networks of experts/communities of practice who collaborate across division/strategic business units.
- iv. The establishment of intellectual capital teams, whose roles include the identification and auditing of intangible assets such as knowledge.
- v. The provision of collaborative technologies such as Intranets or GroupWare for rapid information access.
- vi. Define and communicate knowledge performance behaviours.
- vii. Make knowledge performance organisation policy
- viii. Identify key knowledge workers and knowledge performance positions.
- ix. Rewarding knowledge sharing behaviours and incentivise key knowledge management actions.
- x. Take action on poor knowledge performance.

5. APPLICATION OF KNOWLEDGE SHARING FOR PROFESSIONAL DEVELOPMENT IN SURVEYING AND GEOINFORMATICS

Knowledge sharing for the professional development of surveying and geoinformation can be classified into integrative and interactive; each addressing different knowledge sharing objectives (Zack, 1999). This approach provides support-processing capabilities while enabling interaction to integrated dimensions worthy of considerations. These include knowledge content, people, culture, process, and technological infrastructure Egbu (2001).

5.1 Integrative Applications

Integrative applications exhibit a sequential flow of explicit knowledge into and out of a repository. Repository here refers to websites of international Federation of Surveyors (FIG), Royal Institution (RICS), American Congress for Remote Sensing and Mapping (ACRSM),

International Society for Photogrammetry and Remote Sensing (ISPRS), International Hydrographic Organisation (IHO) and the Nigerian Institution of Surveyors (NIS). In practice, these organisations (producers) and surveyors or geomaticians (consumers) interact with the repository rather than with each other directly. The repository becomes the primary medium for knowledge exchange, providing a place for members of a knowledge community to contribute their knowledge and views through conferences, books, and most of all unrestricted access to their libraries. The primary focus tends to be on the repository and the explicit knowledge it contains, rather than on the contributors, users, or the tacit knowledge, they may hold.

Integrative applications vary in the extent to which knowledge producers and consumers come from the same knowledge community. While still exhibiting a sequential flow, the repository provides a means to integrate and build on their collective knowledge. This ensures that field surveyors, academia, and researchers have access to active feedback or modification, knowledge and best practices to enhance knowledge sharing. This is more the case with small and medium organisations that do not have as much financial backing and investment on knowledge sharing programmes compared to larger organisations.

Regarding the organisational roles for managing integrative applications, acquisition requires knowledge creators, finders, and collectors. Capturing verbal knowledge requires real practical experience, demonstration by manufacturers, interviewers, and transcribers. Finally, organisations may need people to train users to critically interpret, evaluate, and adapt knowledge to new contexts.

5.2 Interactive Applications

Interactive applications are focused primarily on supporting interaction among people holding tacit knowledge. In contrast to integrative applications, the repository is a by-product of interaction and collaboration rather than the primary focus of the application. Its content is dynamic and emergent.

Interactive applications vary by the level of expertise between producers and consumers and the degree of structure imposed on their interaction. Where formal training or knowledge transfer is the objective, the interaction tends to be primarily between instructor and student, or expert and novice, and structured around a discrete problem, assignment, or lesson plan.

In contrast, interaction among those performing common practices or tasks tends to be more ad hoc or emergent. They may take the form of a knowledge brokerage - an electronic discussion space where people may either search for knowledge (e.g., "Does anyone know...") or advertise their expertise. The most interactive forums support ongoing, collaborative discussions. The producers and consumers comprise the same group of people, continually responding to and building on each individual's additions to the discussion. The flow continually loops back from presentation to acquisition. With the appropriate structuring and indexing of the content, a knowledge repository can emerge. A standard categorisation scheme for indexing contributions provides the ability to reapply that knowledge across the enterprise.

Interactive applications play a major role in supporting integrative applications. For example, a forum can be linked to an electronic publishing application for editors to discuss the quality of the contributions, or to offer a place for readers to react to and discuss the publication. Best practice databases typically require some degree of forum interaction, so that those attempting to adopt a practice have an opportunity to discuss its reapplication with its creators.

Regarding the organizational roles for managing interactive applications, acquisition requires recruiters and facilitators to encourage and manage participation in interactive forums so that those with the appropriate expertise are contributing. The refining, structuring, and indexing of the content often is done by the communicators themselves, using guidelines and categories built into the application, supplemented by a conference moderator. Assuring the quality of the knowledge may require quality assurance personnel such as subject matter experts and reputation brokers. Managing a conference repository over its lifecycle usually falls to a conference moderator. Others may be required to work with users to help them become comfortable and skilled with accessing and using the application.

6. CONCLUSION

This paper looked at the concept of knowledge, knowledge as a tool and the growing importance of knowledge sharing as a source of professional development in surveying and geoinformation. It looks at the situation of the surveying and geoinformation profession in Nigeria and recommends revival mechanism through knowledge sharing. International Associations such as the International Federation of Surveyors (FIG), Royal Institution of Chartered Surveyors (RICS), American Congress for Remote Sensing and Mapping (ACRSM), International Society for Photogrammetry and Remote Sensing (ISPRS), International Hydrographic Organisation (IHO), and other affiliates can be of immense assistance to the Nigeria Institution of Surveyors (NIS), the academia and practitioners in the acquisition of knowledge through their websites.

As mentioned earlier, Knowledge that can be shared is of two types, the tacit and the explicit and can be both short and long- term investment. It lies at the essence of humans as individuals and respecting the role of knowledge and learning may be the most effective approach to becoming an employee of the future. Finally, significant benefits can be derived from acquisition and application of both tacit and explicit knowledge provided there is the culture of openness and willingness to share knowledge and information.

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