

## **EDUCATION AND CURRICULUM DEVELOPMENT INITIATIVES RELATED TO SPATIAL DATA INFRASTRUCTURE DEVELOPMENT**

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### **EXTENDED ABSTRACT**

Technological convergence and Social convergence are the two prime issues to be considered whenever new developments are being initiated for improving the quality of life. The spatial data infrastructure development is no exception that can ignore these prime issues. In fact Spatial data infrastructure is a system which includes not only the hard ware and software but also the people. E-governance, with an appropriate SDI and good governance framework, has the potential to complement and enhance E-government and also governance in general. . In short, good governance and spatial information (and associated SDI) have symbiotic relationship that form the basis of opportunity to systematically tackle sustainable development in a more peaceful, informed and transparent way. There is a synergistic relationship between good governance and information whereby good governance creates a healthy legal, institutional and socio-political-economic framework for information to flow, and the information flow in turn facilitates sound decision-making for good governance. Sustainable development demands complex decision-making that weighs up environmental, social and economic consequences of the choices that are made about how resources will be used. Implementation of SDI at global or national level is in its initial stages. As a result the implementation process is getting further articulated. The rapid pace of development in technology creates a complex landscape of standards and policies. What spatially based information products does the organization produce, how often they are produced, who produces them, how are they produced and what bottlenecks are there. Also there is need to look into the future – what spatially based information products would decision makers like to have available which are not presently not produced. eg., new kinds of analysis, analyses at a finer scale or more frequently produced using more current data etc., It is in this background the issues related human resource development in spatial technology should be addressed and discussed. The prime issues need to be attended to are as follows:

- The generic benefits of investing in information systems
- The roles which information systems fill within organizations
- The modes by which SDI shall move from a technological to a user orientation
- Education and curriculum development initiatives related to SDI

This paper addresses primarily on the last issue mentioned above while accepting that the first three items mentioned have significant role in determining the scope of the 4<sup>th</sup> one. Many SDI educators seek to expose students to hands on work through the

medium of a GIS project, an exercise combining concept and practice. Primarily SDI educators are not clear or still debating over where SDI should be located within the educational system. Is it just a subset of some standard discipline, to be taught as an elective within that discipline, is it a branch of geographical science or is it a discipline in its own right. The difficulties that this debate has created within academic community are significant. GIS has penetrated very widely into education and this will strengthen its position as an option within numerous disciplines. However, at the same time, the growing capabilities of SDI and the growing implications of their use will ensure an ever increasing mass of material critical to and legitimately reformulated within, the scope of both science and studies. The phrase a speck of everything and everything about a speck summarizes this issue. This is basic dilemma facing the educators For a full education on GIS the students need to understand the not only the scientific and societal problems to which it might be applied, but also the complex managerial, legal and ethical questions that must arise from them. At the same time they must have understanding to be able to play the case-hardened version of the technology.

The SDI applications will thus appear in more and more contexts, again providing more scope for teaching the breadth. The down side is that the new software goes in hand with new access to data and new groups of GIS users who are generating more and more ethical, social and economic issues which should be taught in sequence.

Two particular problems are however generic to most national spatial data policy arenas. The first is how to ensure that the user needs – especially latent ones and those of users with modest resources – are considered in the creation and provision of SDI. This is particularly acute when governments are the data providers. The second generic problem is to ensure that those organizations bearing the costs of any new policy also reap tangible benefits; without this little will happen for economic and political systems are rarely altruistic. The ultimate success of NSDIs and more generally GIS will be very strongly influenced by how well such problems are addressed.

In almost all the literature on GIS education it is assumed that what we teach will be studied as a precursor to a career in the spatial information industry. Many in the GIS industry are at some time in their career worked in the IT sector,. Next is few may have qualification and experience in a relevant profession which is now using GIS. These people do not have proper facilities for education and training – What is needed is professional development programs and continuing professional programs. A very important step is to survey the actual roles played by the individuals in the industry, the skills they possess, and the skills they report as necessary in fulfillment of their roles. The evidence of job advertisement can justify the skills required. What seems to emerge from this is that, just as educators and trainers need to understand the industrial requirement, so prospective employers must have an understanding of what is possible and realistic. One of the challenges in converting the rhetoric of sustainable development into reality is to use the potential of Spatial Data Infrastructures (SDIs) in raising the level of informed dialogue about rights and obligations over land.

There is no single formula for determining what types of curricula can be universally adopted and what technology will be needed to store, analyze and disseminate the spatial information within and SDI context. It depends on what priorities and limitations

apply in each context. For example, if sustainable development were a priority then there would be a demand for information relevant to each of the competing components of sustainable development, namely environmental, social and economic. Whatever the technology that is applied, steps need to be taken to design governance infrastructures, such as legal and institutional infrastructures, that work to produce a coherent, integrated approach to the collection, maintenance and dissemination of spatial information as well as clarify what access/privacy principles should apply in the design of and SDI. Whatever a country's situation, there are basic requirements such as data sharing policies and metadata standards that can be established and applied early to pave the way to the future. The issues on education and curriculum development on a "yet to evolve" or "still in evolving stage" subject like SDI can be expected to be a be full of loose ends and the extent of topics considered for review and consolidation in this presentation is no exception.

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