

The Issues Involved in Developing An Information Policy for Digital Spatial Data for Trinidad and Tobago

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Several governmental and para-statal agencies in Trinidad and Tobago have embarked on the development of spatial databases for Geographic Information Systems (GIS) applications. These agencies are convinced that GIS technology will provide a useful tool to aid their decision-making processes. Most of these databases are being developed in-house and the resulting data generated by these various agencies represent significant investments in economic and human resources. It is therefore essential that these data are utilised in the most efficient way possible. To ensure effective use, an information policy for the sale and dissemination of spatial data is required. Several important issues need to be addressed in setting up this policy. These include an investigation into the merits and limitations of open access versus cost recovery policies, determining whether the laws allow for agencies to obtain copyright for spatial data and the implications of the Freedom of Information Act 2000 on the expected discretionary powers of agencies to sell spatial data. These issues have been widely debated in the United States, Canada and the European Community. Drawing from these experiences, this paper discusses the issues involved in developing a policy for spatial information dissemination by government agencies in Trinidad and Tobago.

1. Introduction

Several state and para-statal agencies have embarked on the development of digital databases for mapping and geographical information systems applications. For example, the Town and Country Planning Division, the Land and Surveys Division, the Central Statistical Office, the Water and Sewerage Authority, and the National Housing Authority are all in various stages of database development. All of these agencies are either self-financing or using funds obtained through loan agreements for this endeavour. Most of these agencies' mandate requires them to acquire spatial data for use in their normal functions. These digital databases are being developed for internal use for the most part.

The resulting data generated by these various agencies represent significant investments in economic and human resources. It is therefore essential that these spatial datasets are utilised in the most efficient way possible. Besides striving for effective use of these data by the producing agency, the sharing of these data with other agencies or the sale of these data to other agencies are valid alternatives to avoid duplication of efforts. It also provides a means to recover the cost of production. The effective sharing of data, while protecting the investment made, requires the establishment of information policies by the agencies concerned. Several important issues need to be addressed in setting up this policy. These include an investigation into the merits and demerits of open access to data versus cost

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recovery policies, determining whether the laws allow for digital spatial data to be copyrighted, and the implications of the Freedom of Information Act on the expected discretionary powers of agencies to sell spatial data.

If agencies are indeed allowed to sell data, then the laws governing contracts need to be studied to determine the most effective strategy for ensuring maximum benefits to both the agency and to the country as a whole without breaching these contracts. With contracts, several other issues arise. These include a pricing policy for selling data; standards that data must satisfy to avoid liability; policies on updates and maintenance of datasets; and privacy issues. Another area that may be of issue is government competition with private enterprise and whether this policy is an acceptable one.

This paper examines several of the issues that arise in setting up an information policy. Section two examines the most significant issue that drives the information policy and the decision to recover costs rather than provide open access to data is by far the most important one. If an agency intends to recover costs, there are several laws that must be examined. These include the Copyright Act, the Freedom of Information Act, contract laws, and patents. Section three discusses these legal issues. The sale of any product brings with it several responsibilities. Standards must be maintained, liability issues must be addressed, and privacy must be ensured. These are discussed in sections four, five and six respectively. An important factor in recovering cost is that of product pricing. Mechanisms for determining costs are examined in section seven. Section eight presents discussions and conclusions.

2. Open Access Versus Cost Recovery

The most important question to address is: Will the Freedom of Information Act make available all government information to the public which does not threaten national security, breach confidentiality of contracts, and the privacy rights of individuals? The answer to this question determines whether or not agencies are allowed to sell their information. An examination of the Act suggests that all government information that does not affect national security and personal privacy will be made available to the public. The next question that arises: Should agencies provide

data at cost of copying or should they try to recover cost of production of these datasets?

The decision to recover full costs of development of digital spatial datasets comes with several responsibilities. It has been argued that the advantages of recovering costs are far outweighed by the disadvantages that arise with this policy (Johnson and Dansby 1995, Lopez 1993, Onsrud 1992). However, others have argued for cost recovery (Epstein and McLaughlin 1990, Rhind 1995). A summary of these arguments is presented here so that the decision of whether or not to recover cost may be made in a more informed manner. Most of these are extracted and sometimes paraphrased from articles by Rhind (1995), King (1995), Onsrud (1992), Johnson and Dansby (1995), and Archer and Crosswell (1989).

2.1 Arguments for Open Access

Open access is supported by the following arguments. These are summarised from papers and discussions from American, Canadian and British researchers and policy-makers. It is argued by some that any information used in the normal decision-making process of the government, especially if these data are produced for that sole purpose, should be made available to the public because it ensures transparency, an ingredient essential to democracy. Open access broadens the user community, and eventually the producer community, creating a better environment to foster and maintain systems. Conversely, cost recovery creates ill-will and resentments. It is further argued that an informed citizenry is a more vigilant one. Since these data are already paid for by taxpayers, why should they pay for the use of these data again? It is believed that the cost of setting up the mechanisms for recovering revenue may be higher than the cost of production of the data. Additionally, enforcing copyright may prove to be problematic. The illegal copying of digital data is easy to achieve and difficult to prevent. It is argued that maximum benefit to all citizens is achieved if data are freely available. A major concern is that the selling of a product brings with it contractual obligations. If any damage is caused, the issue of liability arises. Are agencies permitted and prepared to make such agreements? Another problem that arises is how to ensure that users are equitably charged for data.

2.2 Arguments for Cost Recovery

On the other hand, several arguments are used to justify cost recovery. A summary is provided here. See Dando (1995), Rhind (1995), Epstein and McLaughlin (1990), and Archer and Crosswell (1989), for more detail discussions.

Creating spatial databases that are of high quality is very expensive and time-consuming. Consequently, advocates of cost recovery argue that the users that benefit most should pay for these costs. That is, users of data that are expected to derive the most gains from the data should pay more. Similarly, the maintenance of data can be almost as expensive as creating new data. Whoever needs up-to-date data should fund the maintenance. Those with the expertise to produce a valuable product and who hold the intellectual property rights, have a competitive advantage. This benefit should be utilised. This is especially valid since only a fraction of the population benefits from the availability of free data. It is argued that although spatial data is generated and used in the daily operations of an agency, other benefits may be gained from making these data available to other users. Since some may benefit more from its availability than others, the ones enjoying this added benefit should pay more. Cost recovery policies ensure greater equity because the user rather than the taxpayer pays. As the spatial data collection becomes economically self-sustaining, taxes may be reduced or certainly spent on other important national development. It is argued by some that cost recovery policies force most state agencies and private organisations that use spatial data to assess their priorities for spending. Several issues arise from the above arguments. These are discussed in the sections that follow. A compromise position that may be used is to have government fund the initial creation of key spatial databases of national importance and thereafter have a "user-pays" cost established for the continued maintenance of the data.

3. Information Protection and Legal Issues

The ownership rights have to be held by the vendor before he/she can transfer these rights. The question here therefore is: Can intellectual property rights be established for digital spatial data? See Samuelson(1991) for a discussion on information as property. There are several instruments available in the

laws that are used for traditional products. Their applicability to digital spatial data is briefly examined here.

3.1 Patents, Trademarks, Trade Secrets

Patents are used for the protection of ideas, procedures, processes, systems, methods of operation, and discoveries (Yoches 1989). For example, the design for a new cover for a coffee cup or Velcro, may be patented, however digital data do not fit into any of these categories. Consequently, this instrument cannot be used to protect digital spatial databases (Jakes 1989). This applies to most countries including Trinidad and Tobago.

The marks "Coca Cola," "Pepsi," and "KFC" are all trademarks and these are all used for marketing a product or set of products. These marks have a value because they carry a reputation for quality, consistency and reliability. The marks themselves are registered and not the products (Yoches 1989). Digital data cannot be protected in this manner (Samuelson 1991).

Trade secrets are formula and recipes that are used in trade (18 USC 1905). For example, Coca Cola and KFC have their secret recipes that form an important part of their products. Trade secrets are only protected by companies that hold them. If for any reason they lose these secrets, then there is no recourse since once they become public, they are no longer secrets (Walter 1991a, 18 USC 1905, Trade Marks Act 82:81).

3.2 Copyright

"Copyright normally covers original works of authorship fixed in any tangible medium of expression, now known or developed from which they can be perceived, reproduced or otherwise communicated, either directly or with the aid of a machine or device." (US Code 17 § 102 (a)).

Works of authorship include the following (US Code 17 § 102 (a)):

- (i) Literary works;
- (ii) Musical works, including any accompanying words;
- (iii) Dramatic works, including any accompanying music;
- (iv) Pantomimes and choreographic works;
- (v) Pictorial, graphic, and sculptural works;

- (vi) Motion pictures and other audio-visual works; and
- (vii) Sound recordings (US Code 17).

In Trinidad and Tobago, The Copyright Act, 1997 goes further in its protection. It specifically covers "... collections of mere data (data bases), whether in machine readable or other form, provided that such collections are original by reason of the selection, coordination or arrangement of their contents."

The copyright acts state "in no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work." (US Code 17 § 102 (b), The Copyright Act, 1997).

It may be inferred from the above summary of the copyright laws of the United States that for works to be protected in the US, it must be an original work that shows originality and expression (Samuelson 1991). It does not protect facts and this is supported by case law. In the few cases dealing with digital data, the court ruled that the compilation of facts do not constitute an original work no matter how much effort has been put in creating it. See for example *Feist Publications Inc. v. Rural Telephone Services Co., Inc.* The implications of this case are discussed in Walter (1991a), Samuelson (1992), and Awerdick (1993). The major implication of this case is that for a work to be protected, it must be demonstrated that the work is original. The basis of originality for the author of a compilation must be demonstrated on the way the facts are presented. "The focus should be on whether the selection, coordination and arrangement are sufficiently original to merit protection" (Holland 1995 pg 9.). The copyright laws in Trinidad and Tobago may indeed protect digital databases if it can be proven that these databases satisfy the originality criteria.

An important consideration when dealing with digital data is that these data may be given away or sold but still kept (Onsrud 1991). Similarly, someone can steal the data but the owner will still have these data. There is a difficulty in proving ownership because there is no way of proving that these facts are an original work (Walter 1991a, Awerdick 1993). Using copyright to protect digital databases is therefore not enough to ensure full protection (Samuelson 1991,

Walter 1991b). However, protection of maps is possible because these can be proven to be original works of art (Karjala 1995). A difficulty with this approach is to determine when a map can be classified as a work of art.

3.3 Contracts

An agency may draw up contracts or grant licenses to individual users or agencies for digital spatial data. For example, the Water and Sewerage Authority (WASA) may decide to sign a contract with a private consultant for the sale of their spatial data. In the contract, several conditions for use may be stipulated. Such limitations may include the number of copies of the spatial database that can be made, the individuals who may have access to the data, the sale of the data to other users by the consultant, the particular applications for which the data may be used, and so on.

The major problem with contracts is that they may be difficult to enforce (Onsrud 1996). It is extremely difficult to prove that the contract has been breached (Einhorn 1992). Ensuring that all the conditions are met is almost impossible except if full access is given to monitor the work being done with the data at all times. This is not realistic; so the use of contracts also has shortcomings. However, a carefully phrased contract may provide the necessary mechanisms to ensure compliance (Simon 1990, Tarter 1992).

4. Product Standards

Spatial data standards are normally set by professional organisations, by legislation or national agencies. However, if digital data are to be sold, a problem that may arise is that these data may now need to satisfy standards that are determined by the consumer. This requires the agency responsible for selling the data to cater to the special needs of individual consumers. However, this is not the case to date with several national agencies in Trinidad and Tobago. In fact, no agency to date provides any form of standards documentation to users. So far, users either pay for whatever is available or collect data on their own. This has proven to be extremely costly to some agencies.

If a data producer decides to sell data, the data producer cannot only produce data that satisfies their own requirements but those of customers. There is an additional expense in ensuring that data meet higher

standards. Higher standards demand increased data checking and verification, documentation and accuracy. To satisfy these demands may require additional staff, computer hardware and software, higher resolution data sources and additional fieldwork. Some argue that the benefits gained from selling data to external users may be outweighed by the additional expenses that have to be incurred (Holland 1995).

An approach that may be beneficial to both agencies and to customers is the creation of partnerships where the agencies will produce the base data and private sector business will then use that data to develop value added products that may have higher specifications and accuracy to sell to customers. This arrangement ensures that the role of the government and private sector are clearly defined and compliment each other.

5. Product Liability

A major disadvantage that comes with the sale of data is that of product liability (Epstein *et al.* 1998, Anderson and Stewart 1995, Johnson and Dansby 1995, Tarter 1992). Because spatial data are used for making decisions that may have significant implications in the allocation of resources, the data used must be suitable for that purpose (Beard 1989, Ramlal and Beard 1996). If losses are incurred because of erroneous data, even if the data were not intended for the purpose for which it were used, the data vendor may be held liable for these losses (Johnson and Dansby 1995).

While there are no examples of court cases in Trinidad and Tobago, a few cases exist in the United States that may provide some insight into the scope of the issue being discussed here. In two cases, *Brocklesby v. US.* and *Jeppesen & Co. and Aetna Casualty v. Jeppesen & Co.*, both involving aeronautical charts (Johnson and Dansby 1995, Toedt 1990), the US Supreme court ruled that the chart vendor, Jeppesen & Co. was liable for the losses incurred by the companies involved. In both of these cases, the charts were misleading. This caused elevation levels for the airport runways to be misinterpreted. Although the data was valid for its original purpose, the errors in interpreting the data representation caused planes to crash. Several million dollars were awarded to the airlines.

Protection from liability requires more than a disclaimer from the vendor. A more effective strategy is to provide data quality information with the dataset

along with a statement that stipulates the applications for which the data may be used and the applications for which it may not be used (Beard 1989, Ramlal and Beard 1996, Tarter 1992). This statement should be easily visible to the user. This puts the onus on the user to ensure that the data are used appropriately.

6. Privacy Protection

The privacy of individuals needs to be protected whether or not digital datasets are involved (Brody 1992). The difference with digital data is that large amounts of diverse data about an individual may be made easily available to anyone willing to pay the asking price. These datasets may provide confidential information about any person or corporate citizen. This information may be damaging if placed in the wrong hands. The consequences of not protecting the privacy of citizens may prove expensive both to citizens and the data providers (Dansby 1992). The data providers may be held liable for any privacy infringement that may occur because of their sale of these data. So far, no cases dealing with privacy infringement and digital data have been tried in Trinidad and Tobago. However, one can expect privacy infringements to arise in Trinidad and Tobago if digital data about individuals are made available to the public.

To avoid liability problems, digital spatial database vendors should put into place measures that would minimise the risk of being sued for infringements. Guidelines on what type of data would most likely give rise to a suit should be drawn up so that these data are not included in the datasets being sold. The vendor may also use contracts to prevent purchasers from using the data in any way other than those specified by the vendor. This shifts the burden of responsibility to the purchaser to ensure that confidential data are not abused. An alternative is to have the spatial information industry develop codes of practice so that data producers and vendors as well as the public may be protected. This approach demonstrates a sense of responsibility by the industry towards the public.

7. Pricing Policy for Spatial Data

Fixing the price of spatial data requires careful consideration. Should data be priced depending on the consumer's ability to pay or should there be a flat rate for all consumers? See Rhind (1995) for a discussion on pricing policy. Would a consumer be asked to pay

for the entire database or only for the portions that are required? If portions of data are sold, would themes be sold separately or must all themes be bought. The owners of the database must decide how each of the above questions is to be addressed. Several factors influence the pricing policy: the cost of data collection, the marketability of the data or the quality of the data, the ability of consumers to pay, the type of data being supplied and the level of support that are to be provided to customers. It may be noted that these factors might lead to several different prices if each is evaluated.

The vendor must decide whether the price charged for data includes the cost of hardware and software used for the development of the database along with the cost of data collection, input, editing and manipulation. While this may be desirable, the price may become prohibitive for many consumers and therefore reduces the customer base. Ideally, the quality of the data should determine the application for which these data may be used. Therefore, the price would be significantly driven by the quality of the data. The number and type of consumers who are willing to pay for data in Trinidad and Tobago is limited. Pricing should be varied according to the customer's ability to pay. This will vary significantly for public agencies in Trinidad and Tobago since budgetary allocations vary significantly from one agency to the next.

The extent of maintenance that the vendor is willing to provide to the customer would also influence the price charged for spatial data. Since expenses are incurred in updating data, the price may include this at the initial stage of purchase or at the time of update. A decision on update charges should be included in the pricing policy. It may be noted that the national Government ultimately decides on the data sharing and pricing policy for spatial data.

8. Discussion and Conclusion

The development of spatial databases is expensive. For most government agencies, database development represents a significant investment. Although these spatial data are compiled for an agency's daily operations, other agencies and private sector consumers may be interested in using these data. The agency producing the spatial database have three options for dealing with requests for access to their data: provide open access at the cost of copying, charge market value price to recover cost of production, or allow no access.

Each of these options brings with it several issues. A no-access policy means that other agencies will have to fund the collection and compilation of databases for themselves. This policy essentially causes duplication of efforts and expenditure. It is obvious that this policy is not a desirable one if data are to be shared. The open access of data may cause the loss of valuable income to the agency producing the data. The decision to recover costs brings with it several responsibilities. These must be weighed with the expected income to determine whether it is worthwhile to choose this path. While it may seem attractive at first, several hurdles as described above must be overcome. It is noted however, that the decision to choose any of these options rests solely on the policy-makers of the agency owning the data assuming the absence of any over-riding public policy.

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