

Spatial-it the practical IT-challenges(2)



Introduction

In the 1999 issues of Geoinformatics we've introduced Spatial-it. Spatial-it as a collective noun for a series of article, but more important as the name of a concept that introduces a new approach to Geo-IT. In a nut shell Spatial-it can be described as the mechanism that allows all employees in the Enterprise to benefit from the powerful visual aspect spatial information as integrated in the everyday information systems represents. Information presented in a geographic way, either complementing or maybe even replacing the alphanumeric data, results in faster comprehension of the information which will result in an improved efficiency of the operations and an optimisation of the decision support, and thus in measurable economical benefits.

The following pictures were used in previous articles to illustrate the structure of the Spatial-it concept. It shows how modern information technology allows us to merge the traditionally highly technical specialised and often separated graphic-based environments via the Enterprise Data base with the other business applications. Benefits are found in the integration of the technical environment themselves, but the main win of Spatial-it is found at the business application level.

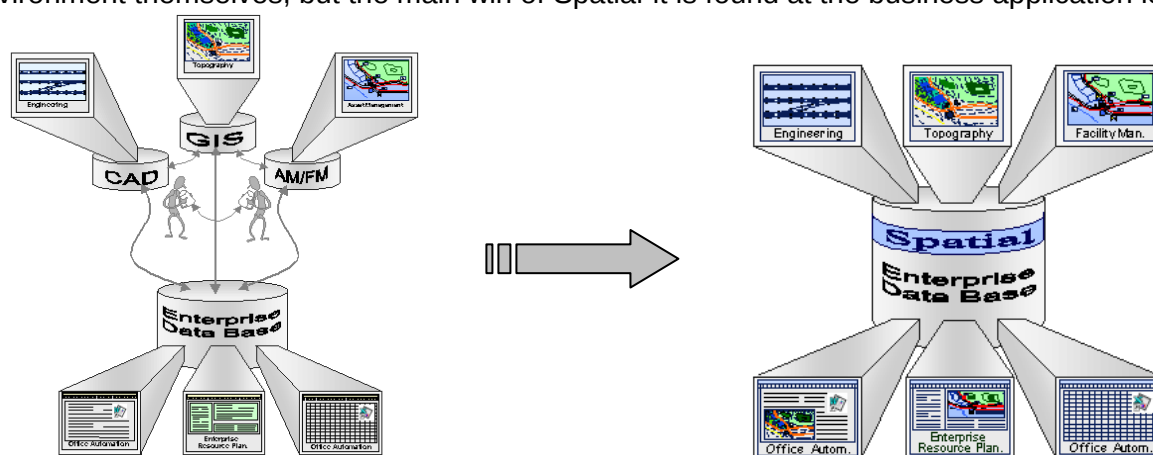


Figure 1: Geo-IT migrates to Spatial-it

In the previous article we've looked at some practical aspects that introducing this technology brings about. In the December '99 issue you can read about the changing business for software vendors of CAD and GIS technologies. It also explains how the typical computer of the "new" users of spatial information and their peripherals urges the developers of Spatial-it applications to be creative and selective in presenting the spatial-data alongside the alphanumeric data. This article picks up from there. We'll leave the technical issues for the moment and look at some practical organisational aspects.

Usergroups

First it's good to get a clear picture of the users of the spatial information and what their requirements are. To do that we will divide the users in three groups related to the different usage and requirements of the spatial information

✓ "Viewing"

A large group of users will use spatial information for unlimited reasons on an ad-hoc basis. This group will most of the times just views the data and ask simple questions of it. In general the insight in spatial data is minimal, so retrieving the required "picture" from a spatial-datawarehouse should be as easy as opening a "Word" document. Ideally they have access via a "5-button-max" application. Inter/Intranet technology plays a major role in enabling both the access to the data as in offering the required "simple" application interfaces.

✓ "Usage"

This group represents the professionals who can benefit from access to spatial data in their daily activities. They may work 10 to 20% of their time with such systems and don't want to be bothered with a complex "techy" environment. This group is familiar with the spatial information and knows how to interpret it. They will analyse data and can be expected to ask complex questions of it. They require immediate access to the spatial information, familiar (easy-to-use) software and integration with the office software. They can be served with more comprehensive Internet or client-server applications

✓ "Data management"

In order to allow the described "viewers" and "users" to have easy access to the spatial data, an other group of users in the organisation will have the responsibility to ensure that the data is available and of the right quality (read: up-to-date, complete, correct, etc.). This group of users in general are highly skilled employees who understand the complexities as data accuracy and consistency, geographic projections, design and maintenance rules. These users tend to spend 80 to 90% of the time creating, maintaining and managing the geographic data. To be able to do this they require an extensive set of functionality.

Looking at an organisation it will be hard to clearly define who belongs to which group. Just think of a different way of dividing the users. A the division based on the various disciplines within the Enterprise. This view offers a different perspective. So a employee will have different roles. One can be the data manager for her or his specific discipline and have viewer or user roles when looking at information of an other discipline.

Where the described division, based on the usage of spatial-data, does help us is in the understanding of the kind of applications we need to provide the enterprise to ensure we optimally benefit from the available spatial data.

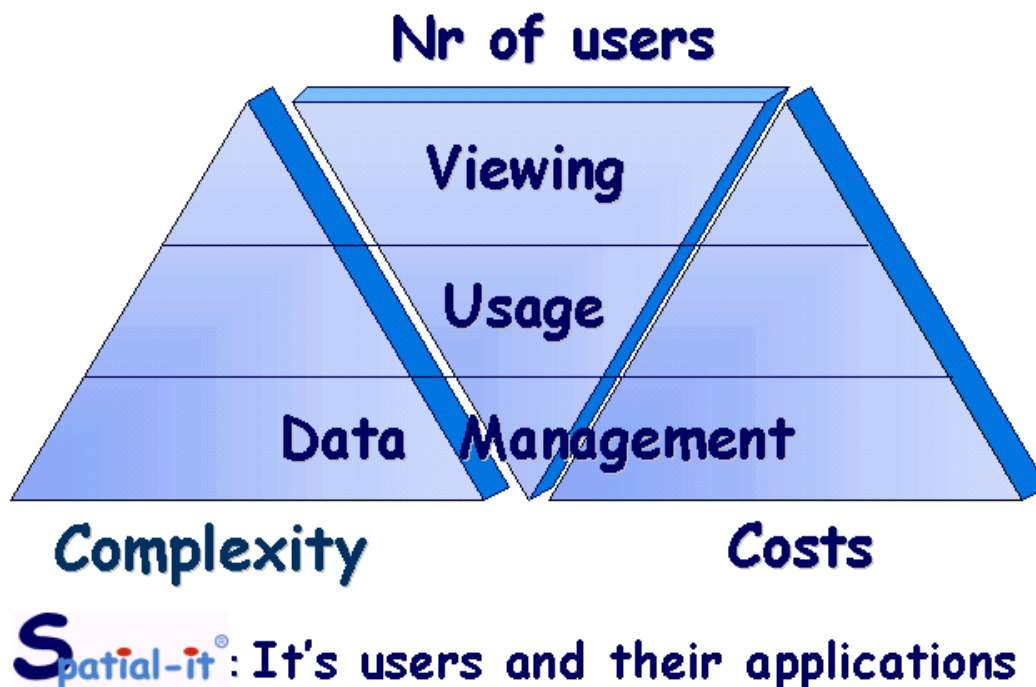


Figure 2 Users

Looking at the numbers it's obvious that for the limited number of "data managers" in an organisations, a larger group of "users" can be identified. The "viewers" easily outnumber the others by factors. Where traditional Geo-It systems focused on the data management and maintenance-society, today the emphasis is more and more on the user-viewer community.

As figure 2 illustrates, the complexity of applications is inversely proportional to the number of users in a group. Obviously the costs go hand in hand with the complexity of the applications. The good news here is that a lot of organisations have invested heavily in acquiring and maintaining the spatial data for their specialists. Therefore Spatial-it can focus on the user and viewer society, thus providing many employees with spatial information at relatively low costs, and significantly increase the return on the spatial-investments.

Top-down or Bottom up

Using the triangles of figure 2 once more, a relevant question to raise at the start of a Spatial-it project in an organisation is where to start. If we define the complex data-management environment as our "bottom" and the viewing environment as the "top", the question is top-down or bottom-up? Unfortunately the answer is less straightforward as the question may suggest. The answer depends on the current situation at the enterprise. For organisations that tend to use (geo)graphic information in their primary processes, like the Government, Telecom/Utility companies or the Process industry the data-management environment in general is in good shape and provides a solid base for a Bottom-up approach. In that approach Spatial-it will integrate the (geo)graphic information with relevant alphanumeric information and present it to the "users" and "viewers" in the organisation.

If however an organisation doesn't traditionally have all required spatial data "readily available", we might want to use a different approach. A Top-down approach is not exactly the right

description in this context as it's hard to present the viewers in the organisation with spatial information if it isn't available. However it will be possible to introduce Spatial-it to large groups of users by focussing the data-management environment on the actual needs of the organisation. Let's as an example look at an application that supports the accommodation of the employees in a Facility management process. Basically this process involves questions as how many employees we have, how many rooms with how many square meters, which parameters influence the optimal accommodation of a organisational unit etc. As figure 3 illustrates, a spatial view of the available rooms aids value to this information process.

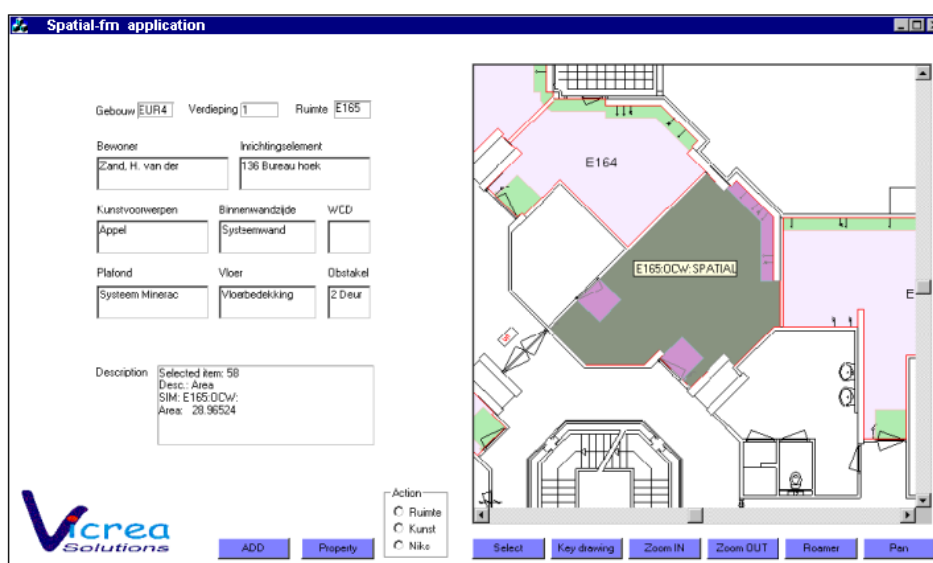


Figure 3 Example of Spatial-it application

In order to implement such a system the “Top” part is leading. Which functionality should we provide the “user” group, responsible for the accommodation (including moving) of employees and the maintenance of the corporate buildings. And maybe for the larger group of viewers; how can they reserve a meeting-room for a presentation on such and such day, and what options do they have to configure the chairs for their audience?

When implementing such a system the data-management environment will be supportive to the users and viewers. Looking at the spatial components of this application they are rather simple. For reference purposes the floor-plan of the building is useful, but there's no need to know all architectural details. The rooms, in this screenshot the coloured polygons, represent the “intelligent” spatial elements, maybe complemented with spatial info on obstacles within them, wall-outlets and/or furniture location. So our data-management environment won't be all that complex, a drawing or maybe even an image of the floor-plan plus some intelligent spatial elements is all it takes to provide the organisation with a usefull Spatial applications. Compare this to the complex objects stored in the spatial-data-warehouse of a municipality, or a Utility company, and you will appreciate the difference in spatial-data management.

So coming back to the question “bottom-up or top-down?”, this can only be answered if one knows the status-quo of the organisations information systems. The introduction of Spatial-it should in all situations be focused on providing the large viewer and user community of the organisation with the relevant data for their job.

Introduction in the organisation

Talking about introducing Spatial-it in the organisation, it's worth to look at that aspect in more detail. As with all new idea's and the introduction of new technology it often takes one or two "believers" in the organisation to get underway. People who combine a knowledge of the organisation and it's processes with an innovative character, a keen interest in modern information technology and an urge to move on. Looking at the ratio of this kind of persons opposite to the more conservative members of an organisations community they often are a small minority. In order to successfully implement Spatial-it it's key to spread the enthusiasm of the "believers" among their colleagues.

In this process the following steps are important:

- ✓ Draw up an inventory of concrete Spatial-it opportunities, how can it support the business processes.
- ✓ Promote opportunities to the organisation using concrete examples rather than emphasising the "great" technology.
 - ✓ Presentations tuned to the audience, in this context both operational user and the management need to be addressed.
 - ✓ Where possible use a pilot application to get the right mind-set, a picture tells more than a thousand words....



Figure 4, Introduction in the organisation

- ✓ Draw up a master-plan explaining the overall target, the project-scope, measurable and controllable project-steps and obviously the expected costs and benefits.

In the Spatial-it projects Vicrea Solutions was involved we've seen that following these steps it is possible to create the required commitment in the organisation, thus assuring a successful introduction. As every step takes time we've noticed that sometime the process frustrates the initiators of the process, the "believers". Often they want to move at a faster pace than the rest of the organisation can accommodate. As we're convinced the final results of the introduction is measured in the actual operational usage of the applications, the time spend in creating the right mind-set and the organisations commitment is well spend, or putting it bolder "a must".

Data quality and Responsibilities

Once we allow all employees access to the available information, data-quality becomes, if possible, even more important than it was before. As long as data is restricted to a relatively small group of insiders, the lack of quality of data can be compensated by the knowledge of its users. They'll know some of the data isn't up-to-date, or that part of the information is missing because of this or that reason. The users still will know how to interpret the information presented to them.

How different the situation becomes when virtually any colleague will have access to the information and use it in unforeseeable situations. It's vital that the information that is presented satisfies high quality standards.

In order to achieve this goal the organisation will have to define the responsibilities for the various data-sources clearly. The data-management, in figure 2 drawn as bottom of the applications, indeed forms the fundament for a successful Spatial-it implementation.

In the various projects we've learned that presenting information to a wider audience is seen as both a quality and as a thread. Positive as now the data the users couldn't access in the old time or only via time-consuming procedures is easily available. A thread as the data of the own organisation can now be accessed by "outsiders". In the next article we'll look at these and other aspects related to the data-management.

IT-partner

Spatial-it can still be seen as a new innovative approach to building Enterprise information systems. In a period where pioneers are joined by early adapters, not many organisations will be self-supporting in managing the introduction. It will be valuable to benefit from experiences gained in other projects, both on organisational aspects as on technology issues. Obviously you can find professional partner organisations that are more than willing to help you implementing this new technology.

But be selective in finding the right IT-partner. As Spatial-it fills the traditional gap between GIS solutions and the other business processes it's not obvious that every GIS-solution provider can do the job. Knowing what a GIS can do is not enough. A broad view on the processes within your organisation, how they interact and where to find the "winning" applications are probably of greater importance. Technically a good knowledge of databases and development languages are essential. Probably above all you need to look for a clear and well defined vision on Spatial-it.

Conclusion

As I've concluded the previous article there's no intention to scare you out of implementing Spatial-it in your organisation, on the contrary. As we try to share some of our experiences in implementing this technology in organisations with you, we obviously emphasise the more complex aspects. Hopefully the information will be of use when you consider implementing Spatial-it in your organisation. Following the right approach you won't have many problems overcoming the mentioned challenges. And as I've written earlier in this cycle of articles on Spatial-it, the result will be very rewarding!

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