

Chapter 21

BIM and Geospatial Information Systems

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ABSTRACT

Historically and traditionally, location based information merely represents a feature's location in a real world setting. Advances in information technology (IT) and data collection techniques have revolutionised the Geographical Information System or Geospatial Information Systems (GIS) industry. The relatively recent explosion in data storage and processing capabilities has led to more detailed and accurate data being collected. This provides a far greater data rich environment and more opportunities for exploiting this information. It is not enough to only know where something is. Questions like but what is it, what's nearby and what are the associated attributes' are more relevant now. A data rich Geospatial Information System allows for detailed spatial (location based) queries to be performed to explore and analyse these geographical relationships. In parallel to this information explosion, the built environment has started to embrace this revolution. In essence, a building is a component of a larger group of features which is linked by infrastructure and other elements to create a holistic system. The common factors which connect this system together all have an associated location. When viewing a building in isolation it is clear that it is made up of a number of different individual features. Information about these features is a key part to its design, construction, operation and maintenance. The term (BIM) Building Information Modelling refers to the information system which is developed to manage built features. Of course a building doesn't float in space; it is closely related to other features and infrastructure. This chapter will explore the value of integrating BIM and Geospatial Information Systems into a single system, why this is important, and how this can be achieved.

1 INTRODUCTION

There has undoubtedly been a growth in the use of Geospatial Information Systems (often referred

to as GIS) and BIM over the last few years. In the last few years the GIS market has evolved from technology that was once specialised to becoming part of the enterprise. As D.Duffy (2003) says,

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“according to Daratech, a Cambridge, Mass., market research company, the total revenue from GIS software topped \$1 billion in 2001, which represented a growth of 9 percent in 2001 over 2000”.

It can be argued that there are a number of reasons for this growth such as:

- The convergence of related technologies which benefit from location (spatial) information;
- Realisation of benefits and efficiencies that are the result of a more collaborative approach;
- Greater emphasis on managing information as an asset which is re-usable;
- The traditional CAD/BIM and GIS silos moving closer together with the emergence of people with both skill sets working on common platforms
- Interoperability barriers are starting to be removed; there is a more standards driven approach to data collection and storage which is helping to provide a framework for data exchange.

A building, however big, small or complex is one component of the wider built environment. Even as a single entity it creates a vast amount of information just by existing. Any works that are planned or any maintenance and operational schedules require information about the components which combined together make up the structure. In a true architectural sense a building is not designed as a single entity. Consideration is given to its context within the direct locality as well as the wider environment. It is not as simplistic as, BIM is inside the building and the geospatial (GIS) space is everything outside the building.

Chances are the “building” is physically connected to a combination of “assets” outside which provide water, energy and communications. These

“assets” are then connected to other buildings and assets and so the networked system continues. Looking at it this way it seems obvious that an integrated system would be the most sensible approach.

2 COLLABORATION

Collaboration is a phrase that has crept into the AEC vocabulary and is now part of the common vernacular. From the latin *collaborare* the definition is to “work together”. There is often agreement during a project inception meeting that project work streams should collaborate more combined with talk of using common systems and standards. What is sometimes lost at this point is why this is important and what the benefits are in terms of real measurable business returns. The short sighted approach is to ignore these ideas of collaboration to focus on the “deliverables”. After all, this is how performance is measured. You don’t often hear of clients being glad about costs spiralling upwards because the suppliers decided a BIM was required or a complex geospatial system would solve all the projects problems. Often the long game isn’t considered. As Simon Rawlinson (2006) states

“Fragmentation of the process and the continued separation of commissioning, design, construction and operation take away the incentive to use BIM for facilities management”.

The perception of low level collaboration will hinder the investment and development of the joined up BIM. This will be discussed later in this chapter.

Stepping back and consider the vision. Putting any known barriers aside what is the BIM and geospatial vision. You could sum it quite simply as “one version of the truth”; a single information portal which provides an accurate, query-able data hub relating to all aspects of the built environment.

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