

Realestate online information systems

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Abstract. Several commercial real-estate sites provide listings of available commercial property on the Internet. These listings are generated on the basis of selection criteria as floor area, price and location. Despite the obvious utility of the listings and their promise for the transaction process and market transparency, one third of commercial real-estate listing sites went bankrupt in 2001 and 2002. To provide an explanation for the failure, 63 commercial real-estate sites were analysed and classified into three basic business models: the Research / Information model, the Marketing model and the Transaction model. A common success factor for all models is the functionality of the site, especially interaction between the user and the available information. The paper proposes that the transfer of existing architectural representations, information-processing instruments and decision-taking tools is an essential component of future development towards integrated services that accompany a building throughout its lifecycle. This transfer amounts to (1) the addition of building and contextual information from standard documentation and online information services, (2) the derivation and coherent description of programmatic requirements database, and (3) advanced user interaction with building information.

Keywords. e-commerce, human-computer interaction, building information systems, web-based communication

Introduction: building information as an architectural application area

The emergence and popularization of the Internet and especially WWW technologies have had a profound effect on architecture. The new possibilities for synchronous and asynchronous communication and cooperation have stimulated and supported not only the automation but also the globalization of most practices, processes and products (Mitchell, 1995; Mitchell, 1999). In addition to being a contributing factor to rationalization and innovation, the Internet has also been approached as a new application area for architectural design (Schmitt, 1999). In particular, the spatial metaphors underlying Internet interfaces

and information structures have been considered as an extension of the designs traditionally produced by architects.

The significance and relevance of architectural thinking for such spatial structures have yet to be tested seriously. It appears that, despite the attraction of a new application area, the requirements and processes of this area are too complex and (superficially at least) dissimilar to these of traditional architectural areas to allow for a smooth transfer of architectural activities. A possible additional reason for the reluctance of architecture to transgress the confines of traditional applications is the current dominance of extrinsic, mostly commercial activities in architectural computerization. The popularization of the computer

has diminished drastically the influence of architectural research and education on the development of computerization in architectural practice. The wide availability of relatively affordable commercial solutions (mostly derived from related areas) has led to extensive computerization at a practical, frequently superficial level where analogue practices are generally merely replicated. Moreover, architectural education is frequently determined to a large degree by what happens in practice at this level.

It is therefore hardly surprising that the treatment of building information on the Internet is largely based on what is possible with general-purpose commercial systems. These offer ample technical means for interaction with building information but no answers concerning the reasons, purposes and subjects of such interaction. In other words, architecture seems unable to become the unchallenged custodian of digital building information. Research is once again attempting to present a coherent and comprehensive specification of requirements and criteria for digital building information (e.g. www.iai-international.org/iai_international/: May 2003) but this specification appears to aim more at existing processes and products within traditional architectural areas. In terms of general utility of building information, architecture has yet to realize the potential of existing knowledge and experience with respect to the specificity, reliability and transparency of online systems.

Real-estate online services

The immediacy and modernity of the Internet did not go unnoticed in the real-estate world. As with other publicity activities, information normally available on paper became readily available online. The transfer of illustrated catalogues describing available property to HTML pages posed few problems with the obvious exception

of keeping information up-to-date beyond the periodicity of the analogue publication. The subsequent addition of e-commerce possibilities to the Internet meant that this information could serve as a basis for electronic transactions that complemented or replaced conventional activities of a real-estate agency. The result of these conditions was the rapid emergence of several commercial real-estate sites. These provided not only digital copies of the analogue property catalogues but also search facilities that permitted selection of appropriate candidates.

Search and selection in real-estate sites normally rely on databases that describe properties in terms of their salient features. Such features include pragmatic data (like the address of the property, its use type and architectural style), spatial and functional constraints (floor area and ceiling height), building aspects (e.g. construction type, available facilities and fixtures), as well as transaction information (rent or price, date or period of availability). Queries formulated in terms of combinations of these features can identify appropriate accommodation in a flexible, interactive manner. The results of a search can be used for decision-taking by themselves or form the starting point for browsing through the usual natural-language and pictorial descriptions of a property in a digital catalogue.

Despite the obvious utility of these sites, providing real-estate listings on the Internet did not prove as straightforward as expected. Of the commercial real-estate listing sites active at the beginning of the century one third went bankrupt in 2001 and 2002. These obviously included rash attempts to safeguard an early market share with an unfinished product, but the number of serious, carefully set-up enterprises with a background in the real-estate world cannot be neglected. Most of these were e-commerce companies located in the United States but continental Europe has also had its failures. However, even these failed

attempts illustrated the promise for the transaction process and market transparency in real-estate management. Appropriate online facilities make transactions more efficient, faster and less costly. Transparency in both the transaction process and in the description and analysis of supply provides potential tenants with more control and a broader choice. Consequently, we can assume that the high percentage of failure relates more to the specific design and implementation of the real-estate listing sites.

In order to ascertain the reasons for this failure we examined 63 commercial real-estate listing sites (both active and failed). The purpose of this was to provide a comprehensive and coherent description of the phenomenon with respect to the structure and practices of the real-estate market, the possibilities and limitations of online information processing, as well as the potential of architectural documentation and analysis. The starting point was real-estate business considerations, such as value proposition, customers, activities supported, profit model and market entry. These were correlated to constraints derived from the state of the art in the computerization of architectural and building information, so as to arrive at a specification of functionality and possibilities for further development.

The results of the analysis made clear that the websites have fundamental differences with respect to revenue and scope (i.e. additional services, such as transaction information, links, research and news). Other differences such as geographic market focus and property types are less critical and relate to the background or the development stage of a site. Consequently, the sites were classified into three basic business models (Slywotzky and Morrison, 1999; Hamel, 2000)

1. The Research / Information model, which obtains revenue from analyses on market conditions. The listings are provided free of charge and

serve primarily as input for the research (www.costar.com: May 2003).

2. The Marketing model, which is financed by customer fees for the presentation of property to potential tenants (www.egpropertylink.com: May 2003).

3. The Transaction model, in which the complete transaction is conducted largely through the web and for which tenants pay a proportional commission (www.tenantwise.com: May 2003).

Underlying all three models is the intention to have a clear impact on the transaction value chain, the role of the broker and the position of the tenant, as well as the transparency of the market. Much of this impact relates to the functionality of the site, especially with respect to architectural decision-taking. For example, the matching of accommodation requirements to available space or the identification of necessary building alterations require explicit, structured architectural information and appropriate domain knowledge for its processing.

Architectural information and real-estate decision-making

The relevance of architectural information processing to the functionality of real-estate listing sites reinforces our working hypothesis concerning the extensibility of architectural information processing to other application areas that deal with the built environment. The process of finding and adapting appropriate property clearly echoes architectural designing with respect to both information and discrete stages and procedures. As in architectural design, one of the early stages is the derivation of a brief that expresses the requirements of the client in functional and spatial terms. This brief is then matched to spatial structures (new designs or existing buildings) and the degree of satisfaction is evaluated both quantitatively and qualitatively. Conflicts lead to proce-

dures that normally refine the original decision but may also refute it. The final results of the process are recorded in contractual documents that specify the current state of the building or location as well as its future form and structure.

These similarities form the basis for the transfer of existing architectural representations, information processing instruments and decision-making support tools from conventional architectural applications to real-estate listing sites. The resulting information systems form integrated services that accompany a building throughout its lifecycle as a consistent and coherent background to all kinds of analysis, communication and decision-taking. In this framework real-estate listing sites focus on the occupation stage, where the following architectural and building information-processing activities take place:

1. Contextual enrichment: the availability of contextual information on the Internet enriches the description of a property with pragmatic information that relates to its location. Examples of such information are accessibility by car or public transportation, the proximity of educational or commercial facilities, social and demographic characteristics of the immediate area, as well as the structure and connectivity of general infrastructure. These may contribute general constraints for the selection of a property in the early stages. They also help elucidate and quantify consequences of a decision, e.g. additional costs for transportation or for connecting to a network.

2. Programmatic analysis: determining the potential tenant's qualitative and quantitative spatial requirements goes beyond the mere specification of required floor area. The description of activities that need to be accommodated should also contain the salient functional requirements of each activity and relationships between activities. This information can be translated into spatial structures such as annotated access graphs at different abstraction levels (Steadman, 1983). In

turn these structures can be expressed as search criteria for identifying possible candidates for the accommodation of programmatic requirements. This presupposes that available real-estate information is organized similarly in architectural databases that can be accessed by such search criteria, which may be vague, incomplete or even inconsistent (Demri and Orłowska, 2002).

3. User interaction: deciding whether a property is suitable is more than a simple comparison of a dominant requirement such as floor area with the available building stock. Selection normally relies on multiple, interrelated criteria in a cyclic process of refinement and rejection. This involves typical architectural design problems such as identification of local conflicts between requirements and the building layout or structure, and investigation of the significance of these conflicts in spatial, functional and financial terms. The solution of these problems facilitates intelligent profiling of the searcher that enables the site to anticipate his actions and complete user input (Shearin and Lieberman, 2001).

Discussion

The addition of architectural information-processing facilities to real-estate listing sites assumes that the availability of contextual information and the presence of information processing instruments form primary attractions for the user. The analysis of user requirements and the critical matching of these requirements to possible solutions should occupy a high percentage of logon time. Iterative use of the corresponding site facilities supports progressive search refinement that focuses user attention to the possibilities offered by a small number of buildings (as opposed to viewing a loosely defined large selection of appropriate and inappropriate buildings).

References

- Demri, S. P. and Orłowska, E. S.: 2002. Incomplete information: structure, inference, complexity. Berlin, Springer.
- Hamel, G.: 2000. Leading the revolution. Boston, Massachusetts, Harvard Business School Press.
- Mitchell, W. J.: 1995. City of bits. Space, Place, and the Infobahn. Cambridge, Massachusetts, MIT Press.
- Mitchell, W. J.: 1999. E-topia. Cambridge, Massachusetts, MIT Press.
- Schmitt, G.: 1999. Information architecture: basis and future of CAAD. Basel, Birkhäuser.
- Shearin, S. and Lieberman, H.: 2001. Intelligent profiling by example. Proceedings of the International Conference on Intelligent User Interfaces (IUI 2001). Santa Fe, New Mexico.
- Slywotzky, A. J. and Morrison, D. J.: 1999. The profit zone: how strategic business design will lead you to tomorrow's profits. New York, Wiley.
- Steadman, J. D.: 1983. Architectural Morphology. London, Pion.

