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A FUTURE THROUGH AN ARCHITECTURAL PAST?

Designing an online information package for Al Jahili Fort

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Abstract. This paper details the process that students of UAE University's Department of Architectural Engineering have undergone in packaging architectural heritage data online. Facilitated by the Abu Dhabi Authority for Cultural Heritage, students were introduced to historical data. They digitally reconstructed a historical fort in Al Ain, UAE – Al Jahili Fort – and investigated methods of packaging the gathered information online. Some observations and assessments (strengths and weaknesses) pertaining to the unique historical information packaging are highlighted in this paper. In addition to acquiring skills in producing architectural abstractions and graphic composition, students assessed several online interactive techniques. A set of rules or patterns were prescribed to enhance the clarity of chosen data. While providing insights to the processes of and considerations in designing an online information package for an architectural heritage project, the underlying objective is to question the possibilities and role necessary in sculpting the future of CAAD education to propel the discipline forward through the medium. What would be the implications? It also asserts the notion that digital space may be architectural education's imminent next 'final' frontier.

Keywords. CAAD Education; Information Packaging; Architectural Heritage; Online Presentation.

1. Introduction

The amount of digital data has escalated exponentially in the past decade including those relating to architectural subjects – both historical and contemporary. In the digital world, 'presentation' [of data] has become an over-

used term, almost interchangeable for 'showing' or 'exhibiting'. To frame the topic more precisely, this paper adopts the concept of 'information packaging' instead.

Particularly in this past decade, we have been witnessing a phase in which we struggle to cope with the pace of production and the presentation of architectural data. Organising and collecting information into a single archive for ease of retrieval have been and still being attempted and developed – for example, Stouff et al. (2001), Ham (2002), Koutamanis (2007), Barci Castriota and da Silva Angelo (2007), Stefaner et al. (2008), Cheng et al. (2009). Meanwhile, in the midst of this struggle, in architectural education, we appear to have overlooked the most fundamental reason for having the information 'presented' – i.e., to facilitate an in-depth understanding about a particular subject. There is an urgent need to look beyond collecting, archiving, retrieving data or creating metadata. To say that architectural knowledge could be presented as a mere database of retrievable data is to suggest that architectural design itself could be reduced to a warehouse of catalogued building materials. Neither serves justice.

Historical architecture especially has largely been reduced to repositories of data. Besides databases of architectural information, the concepts of digital architectural information presentations we still often encounter today are what most are familiar with – ones that are intrinsically based on traditional slideshow or print format with additions of hyperlinks. The ability to 'hyperlink' information is one of the strengths of the digital media and usually the only feature that is extensively applied in most websites (eg. The Architecture Week Great Buildings Collection, 2009). Apart from being faster than printed materials in navigating from one group of data to another, they have not necessarily been utilised in manners that contribute sufficiently to the in-depth understanding of architectural subjects. Instead, we frequently experience that the reverse is true.

CAAD education has generally been successful in serving the industries by producing graduates who possess at least the fundamental skills to produce architectural abstractions – working drawings, 3D visualisations, etc. If we are able to push the envelope further by cultivating habits and skills necessary to present these abstractions online effectively, we could help propel the discipline to an unprecedented level of knowledge sharing as opposed to mere data sharing. Digital information package design should become an emerging area of attention in architectural education to escalate continued knowledge formation within the field.

2. Information package design

There are perhaps only two simple precursors to grasping the concept for an effective online packaging of architectural information:

- **Realisation of digital opportunities.** Many educators or academics still fail to perceive the digital platform beyond a mere exhibition space for hyperlinked architectural abstractions. We also seem to have underestimated the internet as a potential source of knowledge, generating graduates who are ill-prepared to communicate their architectural ideas online with utmost clarity. Most websites seen on the internet should not be considered appropriate as examples to present architectural information. Digital architectural abstractions come in various forms. Appreciating what each could offer and exploring how it could be fully applied also provide links necessary for maximising the opportunities.
- **Working with limitations.** There is a need to cultivate an awareness of the reality, not only of the opportunities they present but also the challenges and limitations. Designing an effective online information package requires a considerable time and effort. Choice of tool(s), technical know-how, screen real-estate size, the absence of a presenter, clarity of information, the choice of abstractions, their inter-relationships, human behaviour/psyche, etc, are just some of the issues.

As mentioned above, in order to augment understanding, due to the nature of the subject, architectural information should not be presented in similar manner as those in conventional web pages. However, there are some applicable 'standard' issues in web design that could be deemed common and need to be adhered to:

- **Navigability.** The ease of exploring a site and simplicity of navigation would help in transitioning an audience from one area of content to another. Navigation difficulty may adversely affect a viewer's cognitive thought processes.
- **Graphic composition and design.** The choice of graphics, layout, typography and their properties as well as placements could affect the perception and prejudgment of the content of a website. Too often, information is unnecessarily and/or inappropriately 'decorated'. To the extreme, some decorations have taken precedence over the content. Tufte (1990) drew parallels between them and 'Duck' or decorated shed in architectural design as highlighted by Venturi (1972).
- **File size.** Online materials are usually kept to the minimum possible size for optimum access speed.

Based on analyses of Tufte's proposed strategies of presenting information on printed medium (Tufte, 1990) and assessments of digital information packages (Kwee, 2007) in addition to analyses of student past projects (including the project detailed below), at present, the following are identifiable, strat-

egy patterns useful in augmenting the dimensions of digital architectural information:

- **Depth of information, validity and accuracy.** All of these require extensive research and tight collaborations with experts in the field to ensure that information that needs to be delivered is relevant, valid, accurate and of adequate details. Density or richness of information can rarely be provided by the information package designer alone unless he/she also serves an active role in the procurement and production or design of the architectural object and/or data.
- **Visual emphasis.** This is based on the argument that architecture is more effectively and immediately represented in visual forms than in written texts. The propensity of texts being a more culturally-biased form of representation seems to be another reason. However, this does not suggest diminishing the role of texts which are often integral supporting narratives.
- **Contextualisation of abstractions.** Since each architectural abstraction speaks its own narratives, its location in relation to another can usually also affect how it is perceived and understood. Ideally, all similar narratives [in abstractions] should cumulate into larger coherent structures.
- **Information layering.** As an extension to the above point, abstractions that are largely similar, but of differing information dimensions could be layered to highlight the congruity while adding extra relevant information depth. For example, a sectional perspective could be layered upon a sectional working drawing of the same view to visually and informatively complement one another (figure 1).
- **Visual continuity.** Due to the ease of hyperlinking of data, abrupt transitions between visual components are commonly observed in many online architectural presentations. Furthermore, an author's familiarity of the subject often renders a false assumption that viewers are also able to connect visual data or information readily. Viewers are usually coerced to provide their own mental translations to link.
- **Legibility.** Resolution of images or drawings and the screen that displays them naturally affect how well the information is read. Drafting and other graphic software applications have been successful in dealing with this by enabling

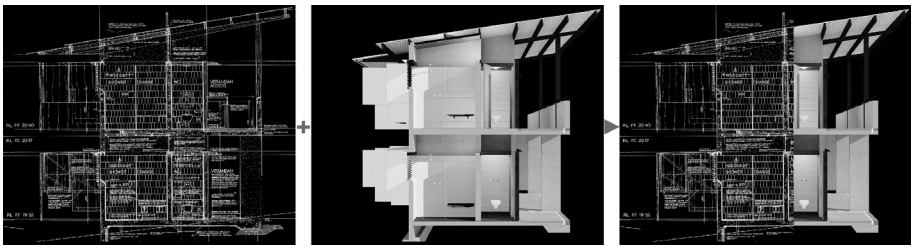

Figure 1: Layering a construction drawing and digital model in interactive manner to increase Depth of Information – the whole could be more than the sum of its parts.

users to zoom and pan to work with detailed drawings in vector or raster/ bitmap formats. However, architectural content providers or distributors have yet to adopt this to improve the legibility of their online data they present.

The above patterns are crucial in addressing the issue brought up by Scott Johnson (1997) – issue which reveals that forcing one to translate representations would inadvertently drain his or her cognitive resources affecting the individual's ability to use existing knowledge and problem solving strategies. The loose relationships between abstractions or representations in many architectural publications may be attributed by limitations of that printed media has imposed. The adverse effects to cognitive process has thus been long inadvertently overlooked and 'accepted' to the extent that digital opportunities have not been rigorously investigated. This 'acceptance' of the norm has become a deeply anchored culture that appears to override conscious, critical judgments.

3. Al Jahili Fort project: process and outcome

The Al Jahili Fort (reused as a museum) was located in the city of Al Ain within the emirate of Abu Dhabi, United Arab Emirates. This student project aimed to explain the historic fort online. It was with the assistance of and support from the Abu Dhabi Authority for Culture and Heritage (ADACH). While the project attempted to instill sensitivities towards the treatment of historical information and awareness of its online digital packaging considerations, it also served as a pilot study for a national grant application.

Similar classes have been conducted in the past with varying degrees of success (Kwee, 2009). The only difference in this particular was the subject matter, where additional data gathering would be required.

There were 14 female students involved in the project. They grouped themselves into four. Later, however, one team decided to split, resulting in five groups in the final. Due to cultural restrictions, female students would have limited access outside the university. This posed a minor challenge in arranging visits to the site.

The general process could be summarised as follows:

- **Data collections.** This comprised an information session by ADACH, interviews with the museum personnel, site measurements, procurement of survey drawings, photos of details and materials. Two site visits were arranged to facilitate the collection of onsite data – one at the beginning of the semester, and one near the completion of their 3D models to allow them to validate their collected data and gather additional materials – e.g., texture images for material mappings.
- **Digital reconstruction.** The digital reconstruction of the fort commenced

almost immediately after the initial site visit. Little time was set aside for familiarisation of the 3D software application in use – namely 3D Studio Max. Although all were senior students, most had no prior 3D modelling experience. Questions raised during the skill sessions were discussed with the entire class. Students who were able to solve the technical problems that others encountered were asked to demonstrate their solutions; in addition to encouraging peer-learning, it was deemed an effective way for students to retain their new-found knowledge. The 3D sessions were much tailored to deal with the fort digital reconstruction and manipulations. Students were also introduced to various other abstractions such as virtual reality in QuickTime format and VRML, Augmented Reality using ARToolKit as a means to viewing their 3D models as well as text-to-speech technology by AT&T Lab (2009). The idea of using Augmented Reality was quickly abandoned when it was realised that the file size exceeded the system's ability to display the digital model realtime.

- **Information packaging.** Lecture and discussion sessions were conducted to allow students to rethink the uniqueness of the subject, thus its information packaging. Students also critiqued existing online websites, discussing the graphics, clarity and effectiveness. Thereafter, students reviewed the materials that they had and proposed ways to deliver them based on these discussions and the patterns listed in Section 2. Lessons on web-authoring were conducted, specifically targeting on simulating these patterns to package their fort information. This proved challenging for none of the students had any previous experience in web-authoring. The basics of graphic file formats and treatment for web contents had to be learnt in addition to understanding computer coding in ActionScript (Flash CS3). Some ready-made templates were dispensed to assist students while others were sourced from the internet, but they needed to be modified to suit individual group project. Student presentations of the project development were done at regular intervals allowing feedback from their peers.

The final web pages were submitted and they were published online using the university server to host. These can be viewed from: http://faculty.uaeu.ac.ae/Verdy_Kwee/Spring2009/ST/index.swf.

4. Outcome discussions

It was encouraging to observe that some students have begun to explore presenting various abstractions in non-conventional manners. However, a few issues, assessments and caveats were also noted:

- **Team work.** The idea of working in team was entirely optional, but all students opted to work in groups. The planning was left entirely to them. It was interesting to observe that the students decided to subdivide the fort into parts, assigning each to every team member. Due to this arrangement, where members

work individually on their own segments, consistency in the final information packaging was an issue. This related not only to the general design or outlook of the 'pages' which was easily solved, but extended to the choice and quality of abstractions and navigation (figure 2). Although a higher number of team members helped in the collection of information at the initial stages, it was found difficult for team members to agree on the overall packaging standard. Team dynamics played an important role in the degree of successful integration.

- **Information accuracy.** Initial feedback from ADACH was encouraging. However, it was highlighted that some aspects of the published information were inaccurate. There was also inadequate depth of information. A closer working relationship could have been established early between students and the experts in ADACH. This was lacking due to the associated logistical problems in arranging direct dialogues with the relevant personnel during the design process. ADACH had intended to use some of the materials but by the end of the semester, students did not seem to respond actively to ADACH request for information changes and corrections.
- **Timeframe and student workload.** Understandably, to expect the project to adhere to all the principles of information packaging would have been unrealistic for a course which was of three credit hours in length. On average, students undertook around 17–20 credit hours of classes for that semester.
- **Availability of tools and user adeptness.** At present, available authoring tools

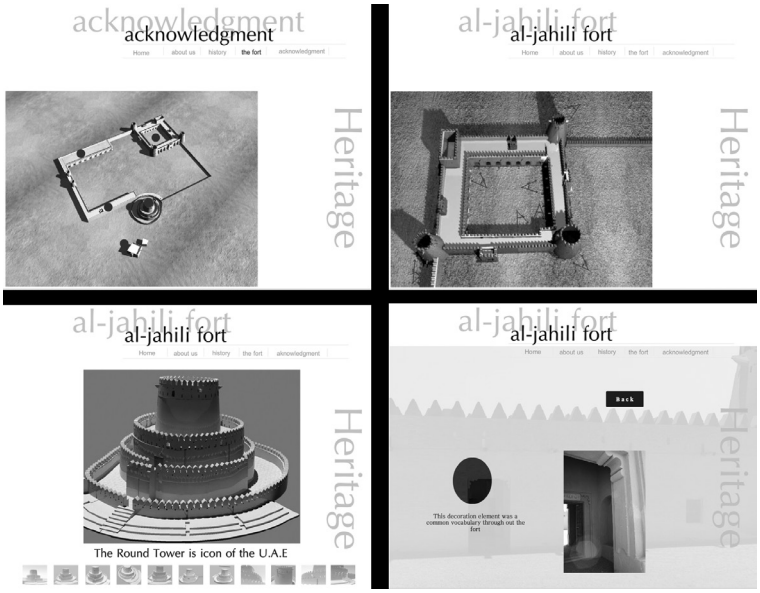

Figure 2. Differences in choice of navigation styles, 'buttons', abstractions and qualities amongst pages were markedly apparent in the team project.

lack user-friendliness and their learning curve is usually lengthy. For students to master the tools within a semester was extremely challenging. However, the main aim was to understand the concept of architectural information packaging.

- **Delineation and learning from the conventions.** Constant exposure to mostly-standard designs of web pages appeared to prevent some students from disengaging themselves easily from the conventions. On the other hand, while attempting to address some issues in the design of architectural information packaging, many students neglected other fundamental aspects such as navigability and file sizes.
- **Choice of abstractions and implementation.** It was also noted that students were much too preoccupied to show what they could do with the skills they acquired. In many instances they overlooked assessing what abstractions to use and failed to strategise the manners in which to use them with the tools they had (e.g., figure 3).
- **Inclusion of additional information.** Since the information packages were done in Flash CS3 authoring software, future inclusions of additional information will require the original files and understanding the structures of the written design logics. Reviewing these structures can be time consuming.

5. Conclusions and further studies

We are still very much at our infancy stage in digital architectural information packaging. Rethinking and implanting the concept of information packaging for the future of architectural education calls for investments not only in technologies but also in expertise. Effective online architectural information package designs can never entirely rely on experts outside the field – e.g.,

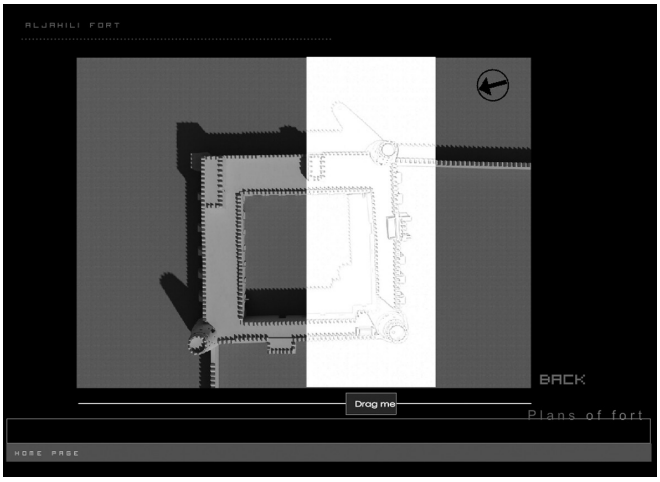

Figure 3: Layering of two congruous abstractions without adding to information depth.

web designers– much less on automation based on algorithms like that found in data mining, for example. They require an in-depth comprehension of the subject and the cognitive issues involved to be able to create and/or relate appropriate abstractions in the most coherent manners. Endless creations and publications of data fragments are prevalent on the internet and online database systems. Experts are required within the field to piece these into easily-absorbed knowledge.

The implications are potentially larger than it might first appear. Effective information packages should be able to reduce mistranslations of architectural ideas which are more often explained through various abstractions or representations than the physical object itself. This undertaking promises a heightened increase of knowledge formation speed, facilitating more profound and accurate academic analyses and syntheses.

From the angle of information treatments, by adopting similar patterns of information packaging, the direction of future architectural documentation formats could also be fashioned – formats which have largely remained the same throughout the past centuries. A reestablishing or development of current technologies necessitates this process.

Only equipped with an awareness of the theories and critical understanding of the opportunities and limitations, could the next generations help usher architectural education into a new knowledge frontier. It poses a challenge to schools to revamp their CAAD curricula to instill this awareness in order to strengthen the fundamentals of the discipline which will consequently and perhaps indirectly help better serve the industry as well.

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